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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1923

PUBLISHED BY THE NAUTICAL ALMANAC OFFICE, U. S. NAVAL OBSERVATORY, BY DIRECTION OF THE SECRETARY OF THE NAVY AND UNDER THE AUTHORITY OF CONGRESS.
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PRICE ONE DOLLAR

WASHINGTON
GOVERNMENT PRINTING OFFICE
1921

U. S. NAVAL OBSERVATORY.

Rear Admiral J. A. HOOGEWERFF, *U. S. N., Superintendent.*

Checked 1975

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NOTE.—Those whose names are printed in italics devote only a small portion of their time to work of the Nautical Almanac Office.

July, 1920.

PREFACE.

This volume of the *American Ephemeris and Nautical Almanac*, the eighth to be issued under the international agreement resulting from the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911, was prepared under the immediate supervision of Captain W. S. EICHELBERGER, Corps of Professors of Mathematics, U. S. N., the Director. The character of the matter herein contained and its arrangement are the same as in the immediately preceding volume.

The naval appropriation bill approved August 22, 1912, contained the following:

The Secretary of the Navy is hereby authorized to arrange for the exchange of data with such foreign almanac offices as he may from time to time deem desirable, with a view to reducing the amount of duplication of work in preparing the different national nautical and astronomical almanacs and increasing the total data which may be of use to navigators and astronomers available for publication in the American Ephemeris and Nautical Almanac: *Provided*, That any such arrangement shall be terminable on one year's notice: *Provided further*, That the work of the Nautical Almanac Office during the continuance of any such arrangement shall be conducted so that in case of emergency the entire portion of the work intended for the use of navigators may be computed by the force employed by that office, and without any foreign cooperation whatsoever: *Provided further*, That any employee of the Nautical Almanac Office who may be authorized in any annual appropriation bill and whose services in whole or in part can be spared from the duty of preparing for publication the annual volumes of the American Ephemeris and Nautical Almanac may be employed by said office in the duty of improving the tables of the planets, moon, and stars, to be used in preparing for publication the annual volumes of the office: *Provided further*, That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

The Greenwich ephemerides of the Sun, Moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune were furnished by the office of the British *Nautical Almanac*.

The conjunctions, phenomena, and configurations of Jupiter's satellites I–IV and the apparent places for Greenwich transit of 38 circumpolar stars were furnished by the office of the *Connaissance des Temps*.

The apparent places for Greenwich transit of 121 ten-day stars were furnished by the office of the *Almanaque Nautico*.

The apparent places for Greenwich transit of 137 ten-day stars were furnished by the office of the *Annuario Astronomico di Torino.*

In accordance with the recommendations of the *Congrès International des Éphémérides Astronomiques,* most of the material furnished from abroad is based upon tables prepared in the American Nautical Almanac Office. In the Introduction are mentioned the various tables upon which the different ephemerides are based.

The following computations were made by the American Nautical Almanac Office:

In Part I, all the hourly and daily variations for the quantities furnished from abroad except in the case of the right ascension and declination of the Moon.

In Part II, the quantities used in computing the apparent places of the stars from their mean places; the mean place list; the interpolation of the apparent places of 214 stars from transit at Greenwich to transit at Washington; the apparent places of 611 stars; the interpolation of the ephemerides of the Sun, Moon, and planets from Greenwich noon to transit at Washington; the stellar magnitudes of the planets.

In Part III, the data relating to the eclipses of the Sun and Moon; the data relating to the occultations of stars and planets by the Moon; the ephemerides for physical observations of the Sun, Moon, Mars, and Jupiter; the elements of the illuminated disks of Mercury and Venus; the stellar magnitudes of the planets; the data concerning the satellites of the planets except Jupiter's satellites I–IV; the diagrams of the satellite orbits; the list of phenomena; the list of observatories with their geographical coordinates; the tables for the determination of latitude and azimuth from observations of Polaris; and the tables for the determination of the time of the rising and setting of the Sun and Moon.

All computations made in the American Nautical Almanac Office and those received from the other offices were subjected to checks to insure absence of errors.

J. A. HOOGEWERFF,
Rear Admiral, U. S. Navy,
Superintendent Naval Observatory.

WASHINGTON, *July, 1920.*

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ERRATA.

The American Ephemeris, 1921.

Page.					
670	Ottawa, Canada, Longitude	*for*	51ˢ.95	*read*	51ˢ.98

The American Ephemeris, 1922.

682	Ottawa, Canada, Longitude	*for*	51ˢ.95	*read*	51ˢ.98

INTRODUCTION.

The ephemeris of the Sun is constructed from NEWCOMB's *Tables of the Sun, Astronomical Papers of the American Ephemeris,* Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8″.80, *Paris Conference, May, 1896.*

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$X = R \cos \lambda$$
$$Y = R \sin \lambda \cos \omega - 19.3\, R\beta$$
$$Z = R \sin \lambda \sin \omega + 44.5\, R\beta$$

The reductions to mean equinox are computed by the formulæ—

$$\Delta X = +Y \sec \omega\, \Delta\lambda \sin 1''$$
$$\Delta Y = -X \cos \omega\, \Delta\lambda \sin 1'' + Z\Delta\omega \sin 1'' + 9.1\, \tau R \sin (\lambda + 6°)$$
$$\Delta Z = -X \sin \omega\, \Delta\lambda \sin 1'' - Y\Delta\omega \sin 1'' - 21.9\, \tau R \sin (\lambda + 6°)$$

where the numerical coefficients are in units of the seventh place of decimals and

R=the Sun's distance from the Earth,
λ=the Sun's true longitude,
β=the Sun's true latitude, expressed in seconds of arc,
ω=the obliquity of the ecliptic,
$\Delta\lambda$=the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,
$\Delta\omega$=the reduction of the mean to the apparent obliquity,
τ=the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from BROWN's new *Tables of the Motion of the Moon* (in manuscript).

The ephemerides of Mercury, Venus, and Mars are derived from NEWCOMB's tables of these planets, *Astronomical Papers of the American Ephemeris,* Vol. VI, parts 2, 3, and 4. Corrections derived from *Astronomical Papers of the American Ephemeris,* Vol. IX, part 2, have been applied to the ephemeris of Mars.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by GEORGE W. HILL, *Astronomical Papers of the American Ephemeris,* Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from NEWCOMB's tables of these planets, *Astronomical Papers of the American Ephemeris,* Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of NEWCOMB's *Tables of the Sun*, *Astronomical Papers of the American Ephemeris*, Vol. VI, part 1. The formulæ from which this nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{aligned}\delta\psi = &-(17''.234+0''.017\ T)\sin \Omega \\ &+ 0''.209 \sin 2\ \Omega \\ &- 1''.257 \sin 2\ L \\ &- 0''.049 \sin (3\ L+78°.7) \\ &+ 0''.110 \sin (L+75°.3)\end{aligned}$$

$$\begin{aligned}\delta\epsilon = &+9''.214 \cos \Omega \\ &-0''.090 \cos 2\ \Omega \\ &+0''.546 \cos 2\ L \\ &+0''.021 \cos (3\ L+78°.7) \\ &-0''.009 \cos (L-78°.7)\end{aligned}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers are as follows:

Terms of Long Period.	Terms of Short Period.
$\delta\psi = -(17''.234+0''.017\ T)\sin \Omega$	$-0''.204 \sin 2\ \mathbb{C}$
$+ 0''.209 \sin 2\ \Omega$	$+0''.011 \sin (\mathbb{C}+\Gamma')$
$- 1''.272 \sin 2\ L$	$+0''.068 \sin (\mathbb{C}-\Gamma')$
$+ 0''.126 \sin (L-\Gamma)$	$-0''.034 \sin (2\ \mathbb{C}-\Omega)$
$- 0''.050 \sin (3\ L-\Gamma)$	$-0''.026 \sin (3\ \mathbb{C}-\Gamma')$
$+ 0''.021 \sin (L+\Gamma)$	$+0''.015 \sin (\mathbb{C}-2\ L+\Gamma')$
$+ 0''.012 \sin (2\ L-\Omega)$	$+0''.006 \sin 2\ (\mathbb{C}-L)$
$\delta\epsilon = + (9''.210+0''.0009\ T)\cos \Omega$	$+0''.088 \cos 2\ \mathbb{C}$
$- 0''.090 \cos 2\ \Omega$	$+0''.018 \cos (2\ \mathbb{C}-\Omega)$
$+ 0''.551 \cos 2\ L$	$+0''.011 \cos (3\ \mathbb{C}-\Gamma')$
$+ 0''.022 \cos (3\ L-\Gamma)$	$-0''.005 \cos (\mathbb{C}+\Gamma')$
$- 0''.009 \cos (L+\Gamma)$	
$- 0''.007 \cos (2\ L-\Omega)$	

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars are explained on pages 200 and 201. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from NEWCOMB's *Catalogue of Fundamental Stars*, *Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2.

In general, the names of the stars are the same as in NEWCOMB's Suggested List of Fundamental Stars, except that the FLAMSTEED number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of HEIS or GOULD have been used. In all such cases, H^1 or the letter G precedes the constellation name, as, for example, 5 H^1. Cassiopeiæ and 38 G. Horologii.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

The spectral classification has been furnished by the Harvard College Observatory. The notation is that of *Annals of Harvard College Observatory*, Vol. LVI.

The mean places, annual variations, and annual proper motions of the stars have been taken from NEWCOMB's Catalogue, except that those of

ϵ Hydri, 38 G. Horologii, and π Centauri have been taken from *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Institus zu Berlin*, 1907, No. 33.

The values of $\Delta\alpha$ and $\Delta\delta$, which are given for the companions to the stars γ Andromedæ, α^1 Crucis, ζ^1 Ursæ Majoris, and 61 Cygni, have been taken from Boss's *Preliminary General Catalogue*, and those for α^2 Geminorum from DOBERCK's elements given in the *Astronomische Nachrichten*, 1904, vol. 166, page 145.

The formulæ for the computation of the Besselian and Independent Star Numbers are given on page 200, the coefficients being those given by NEWCOMB in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation, depending on the Moon's mean longitude, have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides are corrected for the effect of these short-period terms is given on page 201.

According to the formulæ on pages 200 and 201 the star constants a, b, c, d, a', b', c', d' are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha - \alpha_0$ (s)

$+0.000\,003\ \tau^2 \sin\alpha$, $-0.000\,149\ \tau^2 \cos\alpha$ } $\tan\delta$

$-0.000\,0650\ \tau^2 \sin 2\alpha$

$+0.000\,0103 \sin 2\,☊ \cos 2\alpha$, $-0.000\,0107 \cos 2\,☊ \sin 2\alpha$ } $\tan^2\delta$

$+0.000\,0620 \sin 2\,☉ \cos 2\alpha$, $-0.000\,0622 \cos 2\,☉ \sin 2\alpha$ } $\sec^2\delta$

$+0.000\,0513 \sin(☉+☊) \cos 2\alpha$, $-0.000\,0507 \cos(☉+☊) \sin 2\alpha$, $+0.000\,0097 \sin(☉-☊) \cos 2\alpha$, $-0.000\,0053 \cos(☉-☊) \sin 2\alpha$ } $\tan\delta \sec\delta$

To $\delta - \delta_0$ (″)

$+0.000\,975\ \tau^2 \sin^2\alpha$

$-0.000\,023 \cos 2\,☊$

$-0.000\,080 \cos 2\,☊ \cos 2\alpha$, $-0.000\,077 \sin 2\,☊ \sin 2\alpha$ } $\tan\delta$

$+0.000\,040 \cos 2\,☉$

$-0.000\,467 \cos 2\,☉ \cos 2\alpha$, $-0.000\,465 \sin 2\,☉ \sin 2\alpha$ } $\tan\delta$

$-0.000\,039 \cos(☉+☊)$

$-0.000\,380 \cos(☉+☊) \cos 2\alpha$, $-0.000\,385 \sin(☉+☊) \sin 2\alpha$, $-0.000\,380 \cos(☉-☊)$, $-0.000\,040 \cos(☉-☊) \cos 2\alpha$, $-0.000\,072 \sin(☉-☊) \sin 2\alpha$ } $\sin\delta \tan\delta$

These terms are negligible for stars whose declination is numerically less than 80°, but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of seven stars have been corrected for the effect of annual parallax. These stars, with the adopted values of the annual parallax, are—

	″		″
τ Ceti	0.31	α Centauri	0.75
ϵ Eridani	0.32	α Aquilæ (Altair) . . .	0.23
α Canis Majoris (Sirius) .	0.38	61 Cygni	0.30
α Canis Minoris (Procyon)	0.33		

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri have been corrected for the effect of orbital motion. AUWERS's

elements were used for Sirius and Procyon, and SEE's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from NEWCOMB's Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the *Star List of the American Ephemeris* [*Supplement to the American Ephemeris and Nautical Almanac*] for 1910 and 1911, and in the *American Ephemeris and Nautical Almanac* for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1923.0	1924.0	1923.0	1924.0	1923.0	1924.0
$\Delta\alpha$	$-0^s.131$	$-0^s.126$	$-0^s.021$	$-0^s.009$	$+0^s.554$	$+0^s.535$
$\Delta\delta$	$-1''.29$	$-1''.38$	$+0''.70$	$+0''.74$	$+4''.15$	$+3''.82$

These corrections have not been applied to the mean places as published in this volume.

The stars occulted by the Moon have been selected from the *Catalogue of Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL's method, the special forms employed being a modification of those developed in CHAUVENET's *Spherical and Practical Astronomy*.

In the computation of the elements of eclipses, the following corrections to the longitude and latitude of the Moon have been applied. These corrections, corresponding to a correction of $+7''.0$ in mean longitude and $-0''.5$ in latitude, have been assumed in each case to be constant during the eclipse.

G. M. T. 1923		δv	δb
		$''$	$''$
Mar.	$2^d.$ 16^h	+7.9	+0.2
Mar.	17 1	+6.3	−1.1
Aug.	25 23	+6.8	−1.1
Sept.	10 9	+7.8	+0.2

The elongations of the satellites of Mars are derived from elements given by H. STRUVE in *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The conjunctions and phenomena of Jupiter's four brighter satellites are derived from SAMPSON's tables. The configurations are derived from a continuation of DAMOISEAU's tables by M. POTTIER.

The elongations of the Vth satellite of Jupiter are derived from unpublished elements deduced from the observations of BARNARD.

The differential coordinates of Jupiter's VIth and VIIth satellites are derived from elements and tables given in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The positions of the rings and the elongations and conjunctions of the satellites of Saturn are derived from elements given by H. STRUVE in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; with corrections communicated by H. STRUVE to the *Berliner Jahrbuch*. The differential coordinates of Phœbe are derived from elements and tables given in *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent outer dimensions (a and b) of the rings of Saturn are also according to STRUVE; the relative dimensions of the rings are computed from BESSEL'S data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of Ariel and Umbriel, the inner satellites of Uranus, are derived from the data of NEWCOMB'S *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I. The elongations of Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. STRUVE in *Abhandlungen der K. Preussischen Akademie der Wissenschaften*, 1912.

The elongations of the satellite of Neptune are derived from elements given by A. HALL in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is 16′ 1″.50, while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., 15′ 59″.63.

In the computation of the ephemeris for physical observations of the Sun the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	7° 15′
Longitude of the ascending node of the Sun's equator on the ecliptic	73° 40′+50″.25 (t−1850)
Sidereal period of rotation (mean solar days)	25^d.38

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π, by the formula,

$$S=0.272\,469\,\pi+1''.50$$

where the constant 0.272 469 is derived from the equatorial horizontal parallax given on page xvi and the semidiameter given on page xvii; and the constant 1″.50 is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$\sin S=0.272\,274 \sin \pi$$

In the computation of the ephemeris for physical observations of the Moon, the following notation and formulæ have been used, the value of I and the formulæ for physical libration being those given by F. HAYN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907:

I=the inclination of the Moon's mean equator to the ecliptic (=1° 32′.1),

Ω=the longitude of the ascending node of the Moon's orbit, or the longitude of the descending node of the Moon's mean equator,

C=the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east,

λ, β, α, δ=the geocentric longitude, latitude, right ascension, and declination of the Moon,
i=the inclination of the Moon's mean equator to the Earth's true equator,
Δ=the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic,
Ω'=the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator,
$\mathbb{C}$=the Moon's mean longitude, referred to the mean equinox,
g'=the Earth's mean anomaly,
g=the Moon's mean anomaly,
ω=the angular distance of the perigee of the Moon's orbit from its ascending node on the ecliptic,
b, l=the optical librations in latitude and longitude, respectively,
δb, δl=the physical librations in latitude and longitude, respectively,
$b+\delta b$=the Moon's geocentric libration in latitude=the Earth's selenographic latitude,
$l+\delta l$=the Moon's geocentric libration in longitude=the Earth's selenographic longitude,
δC=the physical libration of C,

$$\mu = -0'.617 \sin 2(\Omega - \lambda),$$
$$A = \sin I \cos(\Omega - \lambda),$$
$$\tan B = \tan I \sin(\Omega - \lambda),$$
$$\lambda' = \lambda + \mu + Ab,$$
$$b = B - \beta,$$
$$l = \lambda' - \mathbb{C},$$
$$\sin C' = \sin i \frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i \frac{\cos(\alpha - \Omega')}{\cos b},$$
$$\delta b = +108'' \sin(\omega + l) + 37'' \sin(\omega - l) - 11'' \sin(g + \omega - l),$$
$$\delta l = +12'' \sin g - 59'' \sin g' - 18'' \sin 2\omega,$$
$$-[108'' \cos(\omega + l) - 37'' \cos(\omega - l) + 11'' \cos(g + \omega - l)] \tan b,$$
$$\delta C = -[108'' \cos(\omega + l) - 37'' \cos(\omega - l) + 11'' \cos(g + \omega - l)] \sec b,$$
$$C = C' + \delta C.$$

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars	$\alpha = 21^h\ 10^m\ 0^s + 1^s.565(t-1905)$ $\delta = 54°\ 30'\ 0'' + 12''.60(t-1905)$
Position of north pole of Jupiter	$\alpha = 17^h\ 52^m\ 0^s.84 + 0^s.247(t-1910)$ $\delta = 64°\ 33'.34''.6 - 0''.60(t-1910)$
Rotation period of Mars	$24^h\ 37^m\ 22^s.65$
Rotation period of Jupiter, System I.	$9^h\ 50^m\ 30^s.004$
Rotation period of Jupiter, System II.	$9^h\ 55^m\ 40^s.632$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon	52°.01
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon	47°.31
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon	96°.58

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395–403 and 517–524).

The adopted semidiameters of the planets, with the authority for each, are given on page xvii. Their stellar magnitudes have been computed from formulæ given by G. MUELLER in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories the authority for the various positions is given in each case. The latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ, are computed from the formulæ on page xvi, using the flattening $\frac{1}{297}$ obtained by JOHN F. HAYFORD in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the *Paris Conference*, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1923.

New Year's Day	Monday,	Jan. 1.
Epiphany	Saturday,	Jan. 6.
Septuagesima Sunday	Sunday,	Jan. 28.
Quinquagesima (Shrove Sunday)	Sunday,	Feb. 11.
Lincoln's Birthday	Monday,	Feb. 12.
Ash Wednesday	Wednesday,	Feb. 14.
Washington's Birthday	Thursday,	Feb. 22.
Palm Sunday	Sunday,	Mar. 25.
Good Friday	Friday,	Mar. 30.
First Day of Passover	Sunday,	Apr. 1.
Easter Sunday	Sunday,	Apr. 1.
Rogation Sunday	Sunday,	May 6.
Ascension Day	Thursday,	May 10.
Pentecost (Whit Sunday)	Sunday,	May 20.
Hebrew Pentecost (Shebuoth)	Monday,	May 21.
Trinity Sunday	Sunday,	May 27.
Memorial Day	Wednesday,	May 30.
Corpus Christi	Thursday,	May 31.
Independence Day	Wednesday,	July 4.
Labor Day	Monday,	Sept. 3.
Hebrew New Year (Rosh Hashanah)	Tuesday,	Sept. 11.
Day of Atonement (Yom Kippur)	Thursday,	Sept. 20.
First Day of Feast of Tabernacles (Succoth)	Tuesday,	Sept. 25.
Columbus Day	Friday,	Oct. 12.
Election Day (in certain States)	Tuesday,	Nov. 6.
Thanksgiving Day	Thursday,	Nov. 29.
First Sunday in Advent	Sunday,	Dec. 2.
Christmas Day	Tuesday,	Dec. 25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

The year 1923 of the Christian era comprises the latter part of the 147th and the beginning of the 148th year of the independence of the United States of America, and corresponds to the year 6636 of the Julian period.

Of the peoples using the Christian era some employ the Gregorian calendar and some the Julian. January 1, 1923, Julian calendar, corresponds to January 14, 1923, Gregorian calendar.

The year 7432 of the Byzantine era begins on September 1, 1923, Julian calendar.

The year 5684 of the Jewish era begins at sunset on September 10, 1923, Gregorian calendar.

The year 2676 since the foundation of Rome, according to VARRO, begins on January 1, 1923, Julian calendar.

The year 2672 of the era of NABONASSAR begins on April 30, 1923, Julian calendar.

The year 2583 of the Japanese era, being the 12th year of the period Taisho, begins on January 1, 1923, Gregorian calendar.

The year 2235 of the Grecian era, or the era of the SELEUCIDÆ, begins in the present-day usage of the Syrians on September 1, 1923, or on October 1, 1923, Julian calendar, according to different sects; but in the ancient usage of Damascus and Arabia Petræa the year began with the vernal equinox.

The year 1640 of the era of DIOCLETIAN begins on August 30, 1923, Julian calendar.

The year 1342 of the Mohammedan era, or the era of the Hegira, begins at sunset on August 13, 1923, Gregorian calendar.

2 423 421 is the Julian day number of January 1, 1923, Gregorian calendar.

CHRONOLOGICAL CYCLES.

Dominical Letter	G	Solar Cycle	28
Epact	13	Roman Indiction	6
Lunar Cycle or Golden Number	5	Julian Period	6636

ASTRONOMICAL CONSTANTS.

Solar Parallax	8.80″	Paris Conference.
Constant of Nutation	9.21	
Constant of Aberration	20.47	
General Precession	$50''.2564+0''.000\,222(t-1900)$	Newcomb.
Obliquity of the Ecliptic	$23°\ 27'\ 8''.26-0''.4684(t-1900)$	

Equatorial Horizontal Parallax of the Moon . . . . . 57′ 2″.70 (Brown).

Mean distance Earth to Moon 384 403 kilometers=238 857 statute miles, or 60.2665 radii.

Mean distance Earth to Sun 149 504 201 kilometers=92 897 416 statute miles.

Velocity of light 299 860 kilometers=186 324 statute miles per second (Newcomb and Michelson).

Light travels unit distance in 498ˢ.580.

Gaussian Gravitation Constant, *k=0.017 202 099=3 548″.187 61.

Acceleration in one second due to gravity, $g=\overset{m}{9.8060}-\overset{m}{0.0260}\cos 2\varphi-\frac{2h}{R}g$.†

Length of seconds pendulum, $l=\overset{m}{0.993\,549}-\overset{m}{0.002\,631}\cos 2\varphi-\frac{2h}{R}l$. †

Helmert.

Length of the year:

Tropical (ordinary)	$\overset{d}{365.242\,198\,79}-\overset{d}{0.000\,000\,0614}(t-1900)$	Newcomb.
Sidereal	$365.256\,360\,42+0.000\,000\,0011(t-1900)$	
Anomalistic	$365.259\,641\,34+0.000\,000\,0304(t-1900)$	
Eclipse	$346.620\,031\ \ +0.000\,000\,32\ \ (t-1900)$	

Length of the month:

Synodical (ordinary)	29.530 588=29 12 44 2.8	Brown.
Tropical	27.321 582=27 7 43 4.7	
Sidereal	27.321 661=27 7 43 11.5	
Anomalistic	27.554 550=27 13 18 33.1	
Nodical	27.212 220=27 5 5 35.8	

Length of the day:

Sidereal	23 56 4.091	of mean solar time.
Mean Solar	24 3 56.555	of sidereal time.

Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, $a=6378.388$ kilometers or 3963.34 statute miles.

Polar Radius, $b=6356.909$ " or 3949.99 " "

Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a}=\log e=8.913\,804$

Logarithm radius=$\log \rho=9.999\,2695+0.000\,7324\cos 2\varphi-0.000\,0019\cos 4\varphi$.

Reduction from geographic latitude φ to geocentric latitude φ',

$$\varphi'-\varphi=-11'\,35''.66\sin 2\varphi+1''.17\sin 4\varphi.$$

1 degree of latitude (in statute miles)=$69.0569-0.3494\cos 2\varphi+0.0007\cos 4\varphi$.

1 degree of longitude (in statute miles)=$69.2316\cos\varphi-0.0584\cos 3\varphi+0.0001\cos 5\varphi$.

1 meter=3.280 8333 feet. 1 foot=0.304 8006 meters.

1 statute mile=0.868 362 nautical or geographical miles.

1 nautical mile=1.151 594 statute miles.

* k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

† φ=latitude, h=elevation above sea level in meters, and log R=6.80416.

NOTE.—The above values of log ρ and $\varphi'-\varphi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly 1÷297.

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At Unit Distance.	At Mean Least Distance.†	In Kilometers.	In Statute Miles.	Authority.
	′ ″	″			
Sun	15 59.63	....	695 553.46	432 196.01	Auwers.
Moon	15 32.58*	....	1 737.99	1 079.93	Newcomb.
Mercury	3.34	5.45	2 420.89	1 504.27	Le Verrier.
Venus	8.41	30.40	6 095.71	3 787.69	Auwers.
Mars	4.68	8.94	3 392.14	2 107.78	Hartwig.
Jupiter (Equatorial)	1 38.47	23.43	71 372.71	44 348.86	Sampson.
Jupiter (Polar)	1 31.91	21.87	66 617.91	41 394.37	Sampson.
Saturn (Equatorial)	1 23.33	9.76	60 398.99	37 530.11	Struve.
Saturn (Polar)	1 14.57	8.73	54 049.59	33 584.79	Struve.
Uranus	34.28	1.88	24 846.72	15 439.00	Barnard, See, Wirtz.
Neptune	36.56	1.26	26 499.30	16 465.87	Barnard.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH JANUARY 0, 1923, G. M. N.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
			″		
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6189
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8097
⊕ Earth	1.000 000	1.000 04	3 548.193	....	0.016 7414
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3341
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3752
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8104
♅ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 1090
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5480

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.‡
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	
☿ Mercury	7 0 11.9	47 25 6.7	76 15 26.8	354 8 45.92	3.221 8487−10
♀ Venus	3 23 37.9	75 59 11.8	130 29 15.4	120 59 3.05	4.389 3398−10
⊕ Earth	.....	.....	101 36 58.4	99 8 3.52	4.482 2896−10
♂ Mars	1 51 0.6	48 57 49.4	334 38 29.6	15 56 43.51	3.509 5499−10
♃ Jupiter	1 18 26.8	99 40 13.5	13 4 55.4	216 20 13.28	6.979 9082−10
♄ Saturn	2 29 29.0	112 59 2.9	91 32 21.0	187 56 49.97	6.455 7335−10
♅ Uranus	0 46 22.0	73 36 21.4	169 25 0.9	342 13 52.65	5.640 7528−10
♆ Neptune	1 46 37.4	130 55 54.1	43 57 24.5	135 35 21.78	5.705 5338−10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, with the corrections for Mars given in Vol. IX, Part II, of the *Astronomical Papers* added, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1923 by applying LE VERRIER'S variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

* At mean distance. See *Ast. Papers Am. Eph.*, Vol. IX, p. 39. For the values of the semidiameter used in this volume see page xi.

† By mean least distance is meant the difference between the mean distance and unity.

‡ Mass includes satellite system, if any. Mass of Earth without Moon has the logarithm 4.476 9900−10.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing ±90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Jan. 1	Mo	18 43 47.86	11.043	−23 3 53.3	+11.55	16 17.90	8.95	− 3 20.52	−1.187	18 40 27.34
2	Tu	18 48 12.75	11.030	22 59 2.3	12.70	16 17.91	8.95	3 48.85	1.173	18 44 23.90
3	We	18 52 37.30	11.016	22 53 43.8	13.84	16 17.91	8.95	4 16.84	1.159	18 48 20.46
4	Th	18 57 1.49	11.000	22 47 57.9	14.98	16 17.90	8.95	4 44.48	1.144	18 52 17.02
5	Fr	19 1 25.30	10.984	22 41 44.8	16.11	16 17.89	8.95	5 11.73	1.127	18 56 13.57
6	Sa	19 5 48.70	10.966	−22 35 4.7	+17.23	16 17.87	8.95	− 5 38.57	−1.110	19 0 10.13
7	Su	19 10 11.67	10.947	22 27 57.8	18.34	16 17.84	8.95	6 4.98	1.091	19 4 6.69
8	Mo	19 14 34.18	10.928	22 20 24.3	19.45	16 17.81	8.95	6 30.94	1.072	19 8 3.24
9	Tu	19 18 56.21	10.907	22 12 24.4	20.54	16 17.78	8.95	6 56.41	1.051	19 11 59.80
10	We	19 23 17.73	10.886	22 3 58.3	21.63	16 17.73	8.95	7 21.38	1.029	19 15 56.36
11	Th	19 27 38.72	10.863	−21 55 6.4	+22.70	16 17.68	8.95	− 7 45.81	−1.007	19 19 52.91
12	Fr	19 31 59.16	10.840	21 45 48.7	23.76	16 17.63	8.95	8 9.69	0.983	19 23 49.47
13	Sa	19 36 19.02	10.815	21 36 5.7	24.81	16 17.58	8.95	8 32.99	0.958	19 27 46.03
14	Su	19 40 38.27	10.789	21 25 57.7	25.85	16 17.52	8.95	8 55.68	0.933	19 31 42.58
15	Mo	19 44 56.89	10.762	21 15 24.8	26.88	16 17.45	8.95	9 17.75	0.906	19 35 39.14
16	Tu	19 49 14.85	10.735	−21 4 27.4	+27.90	16 17.39	8.95	− 9 39.16	−0.878	19 39 35.70
17	We	19 53 32.14	10.706	20 53 5.9	28.90	16 17.31	8.94	9 59.89	0.849	19 43 32.25
18	Th	19 57 48.73	10.676	20 41 20.5	29.89	16 17.24	8.94	10 19.92	0.820	19 47 28.81
19	Fr	20 2 4.60	10.646	20 29 11.5	30.86	16 17.16	8.94	10 39.23	0.790	19 51 25.36
20	Sa	20 6 19.73	10.615	20 16 39.4	31.81	16 17.08	8.94	10 57.81	0.759	19 55 21.92
21	Su	20 10 34.11	10.583	−20 3 44.5	+32.76	16 17.00	8.94	−11 15.63	−0.727	19 59 18.48
22	Mo	20 14 47.71	10.551	19 50 27.0	33.69	16 16.91	8.94	11 32.68	0.694	20 3 15.03
23	Tu	20 19 0.54	10.518	19 36 47.5	34.60	16 16.81	8.94	11 48.95	0.661	20 7 11.59
24	We	20 23 12.57	10.485	19 22 46.2	35.50	16 16.71	8.94	12 4.43	0.628	20 11 8.14
25	Th	20 27 23.80	10.451	19 8 23.5	36.39	16 16.61	8.94	12 19.10	0.594	20 15 4.70
26	Fr	20 31 34.21	10.417	−18 53 39.8	+37.26	16 16.50	8.94	−12 32.95	−0.560	20 19 1.26
27	Sa	20 35 43.80	10.383	18 38 35.4	38.11	16 16.39	8.94	12 45.99	0.526	20 22 57.81
28	Su	20 39 52.57	10.348	18 23 10.8	38.94	16 16.27	8.94	12 58.20	0.492	20 26 54.37
29	Mo	20 44 0.51	10.314	18 7 26.3	39.76	16 16.15	8.93	13 9.59	0.457	20 30 50.92
30	Tu	20 48 7.62	10.279	17 51 22.4	40.57	16 16.02	8.93	13 20.15	0.423	20 34 47.48
31	We	20 52 13.91	10.245	−17 34 59.3	+41.35	16 15.89	8.93	−13 29.88	−0.388	20 38 44.03
Feb. 1	Th	20 56 19.37	10.210	17 18 17.6	42.12	16 15.75	8.93	13 38.78	0.354	20 42 40.59
2	Fr	21 0 24.00	10.176	17 1 17.5	42.88	16 15.60	8.93	13 46.86	0.320	20 46 37.14
3	Sa	21 4 27.82	10.142	16 43 59.5	43.62	16 15.45	8.93	13 54.13	0.286	20 50 33.70
4	Su	21 8 30.84	10.109	16 26 23.9	44.34	16 15.29	8.93	14 0.59	0.252	20 54 30.25
5	Mo	21 12 33.05	10.075	−16 8 31.2	+45.05	16 15.12	8.92	−14 6.24	−0.219	20 58 26.80
6	Tu	21 16 34.46	10.042	15 50 21.7	45.74	16 14.96	8.92	14 11.10	0.186	21 2 23.36
7	We	21 20 35.08	10.010	15 31 55.9	46.41	16 14.78	8.92	14 15.17	0.153	21 6 19.91
8	Th	21 24 34.93	9.977	15 13 14.2	47.06	16 14.61	8.92	14 18.46	0.121	21 10 16.47
9	Fr	21 28 33.99	9.945	14 54 16.9	47.70	16 14.43	8.92	14 20.97	0.089	21 14 13.02
10	Sa	21 32 32.28	9.913	−14 35 4.6	+48.32	16 14.24	8.92	−14 22.71	−0.057	21 18 9.58
11	Su	21 36 29.81	9.881	14 15 37.6	48.93	16 14.06	8.92	14 23.69	−0.025	21 22 6.13
12	Mo	21 40 26.58	9.850	13 55 56.3	49.51	16 13.87	8.91	14 23.90	+0.007	21 26 2.68
13	Tu	21 44 22.60	9.819	13 36 1.2	50.08	16 13.68	8.91	14 23.36	0.038	21 29 59.24
14	We	21 48 17.87	9.787	13 15 52.7	50.63	16 13.48	8.91	14 22.07	0.069	21 33 55.79
15	Th	21 52 12.39	9.756	−12 55 31.3	+51.16	16 13.28	8.91	−14 20.05	+0.100	21 37 52.34
16	Fr	21 56 6.18	9.726	−12 34 57.3	+51.67	16 13.08	8.91	−14 17.29	+0.130	21 41 48.90

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Jan. 1	1	280 4 13.5	152.85	−0.29	9.992 6562	− 1.7	0.02	−1.30	20.81	47.70	5 18 40.31
2	2	281 5 21.8	152.85	0.28	9.992 6534	− 0.6	0.15	1.27	20.81	47.71	5 14 44.40
3	3	282 6 30.1	152.85	0.24	9.992 6535	+ 0.6	0.29	1.24	20.81	47.71	5 10 48.48
4	4	283 7 38.4	152.85	0.17	9.992 6565	1.8	0.43	1.21	20.81	47.72	5 6 52.57
5	5	284 8 46.8	152.85	−0.08	9.992 6623	3.0	0.57	1.19	20.81	47.73	5 2 56.66
6	6	285 9 55.2	152.85	+0.04	9.992 6710	+ 4.2	0.70	−1.16	20.81	47.74	4 59 0.75
7	7	286 11 3.7	152.86	0.17	9.992 6824	5.3	0.84	1.13	20.81	47.75	4 55 4.84
8	8	287 12 12.3	152.86	0.31	9.992 6964	6.3	0.98	1.11	20.81	47.76	4 51 8.93
9	9	288 13 21.0	152.86	0.44	9.992 7128	7.3	1.12	1.09	20.81	47.77	4 47 13.02
10	10	289 14 29.7	152.86	0.56	9.992 7316	8.3	1.25	1.06	20.81	47.78	4 43 17.11
11	11	290 15 38.5	152.86	+0.67	9.992 7526	+ 9.2	1.39	−1.04	20.81	47.79	4 39 21.20
12	12	291 16 47.2	152.86	0.76	9.992 7756	10.0	1.53	1.02	20.81	47.81	4 35 25.28
13	13	292 17 55.9	152.86	0.81	9.992 8005	10.7	1.67	1.00	20.81	47.82	4 31 29.37
14	14	293 19 4.4	152.85	0.83	9.992 8271	11.4	1.80	0.98	20.81	47.84	4 27 33.46
15	15	294 20 12.6	152.83	0.81	9.992 8554	12.1	1.94	0.97	20.80	47.85	4 23 37.55
16	16	295 21 20.4	152.81	+0.77	9.992 8854	+12.8	2.08	−0.95	20.80	47.86	4 19 41.64
17	17	296 22 27.8	152.79	0.70	9.992 9169	13.5	2.22	0.94	20.80	47.88	4 15 45.73
18	18	297 23 34.5	152.77	0.61	9.992 9500	14.1	2.36	0.92	20.80	47.90	4 11 49.82
19	19	298 24 40.6	152.74	0.50	9.992 9847	14.8	2.49	0.91	20.80	47.91	4 7 53.91
20	20	299 25 46.0	152.71	0.38	9.993 0211	15.5	2.63	0.90	20.80	47.93	4 3 58.00
21	21	300 26 50.5	152.67	+0.25	9.993 0592	+16.2	2.77	−0.89	20.79	47.95	4 0 2.09
22	22	301 27 54.1	152.63	0.13	9.993 0990	17.0	2.91	0.88	20.79	47.96	3 56 6.18
23	23	302 28 56.8	152.59	+0.01	9.993 1408	17.8	3.04	0.88	20.79	47.98	3 52 10.27
24	24	303 29 58.4	152.55	−0.10	9.993 1844	18.6	3.18	0.87	20.79	48.00	3 48 14.36
25	25	304 30 59.0	152.50	0.19	9.993 2301	19.5	3.32	0.87	20.79	48.02	3 44 18.45
26	26	305 31 58.5	152.46	−0.27	9.993 2779	+20.4	3.46	−0.87	20.78	48.04	3 40 22.54
27	27	306 32 56.9	152.41	0.32	9.993 3279	21.3	3.59	0.87	20.78	48.06	3 36 26.63
28	28	307 33 54.1	152.36	0.34	9.993 3801	22.3	3.73	0.87	20.78	48.07	3 32 30.72
29	29	308 34 50.1	152.31	0.33	9.993 4347	23.3	3.87	0.87	20.78	48.09	3 28 34.82
30	30	309 35 44.9	152.26	0.29	9.993 4918	24.3	4.01	0.88	20.77	48.11	3 24 38.91
31	31	310 36 38.6	152.21	−0.23	9.993 5514	+25.4	4.14	−0.88	20.77	48.13	3 20 43.00
Feb. 1	32	311 37 31.2	152.17	0.14	9.993 6136	26.5	4.28	0.89	20.77	48.15	3 16 47.09
2	33	312 38 22.8	152.12	−0.03	9.993 6784	27.5	4.42	0.90	20.76	48.17	3 12 51.18
3	34	313 39 13.2	152.08	+0.10	9.993 7457	28.6	4.56	0.91	20.76	48.19	3 8 55.27
4	35	314 40 2.7	152.04	0.24	9.993 8156	29.6	4.69	0.93	20.76	48.21	3 4 59.36
5	36	315 40 51.2	152.00	+0.38	9.993 8879	+30.6	4.83	−0.94	20.75	48.23	3 1 3.45
6	37	316 41 38.8	151.96	0.50	9.993 9624	31.5	4.97	0.96	20.75	48.25	2 57 7.54
7	38	317 42 25.4	151.92	0.61	9.994 0390	32.3	5.11	0.97	20.75	48.27	2 53 11.64
8	39	318 43 11.1	151.88	0.71	9.994 1175	33.1	5.25	0.99	20.74	48.29	2 49 15.73
9	40	319 43 55.9	151.84	0.77	9.994 1978	33.8	5.38	1.02	20.74	48.31	2 45 19.82
10	41	320 44 39.6	151.80	+0.79	9.994 2797	+34.4	5.52	−1.04	20.74	48.33	2 41 23.91
11	42	321 45 22.2	151.75	0.78	9.994 3631	35.0	5.66	1.06	20.73	48.35	2 37 28.00
12	43	322 46 3.7	151.70	0.75	9.994 4477	35.5	5.80	1.09	20.73	48.37	2 33 32.10
13	44	323 46 44.0	151.65	0.69	9.994 5335	36.0	5.93	1.12	20.72	48.39	2 29 36.19
14	45	324 47 23.0	151.60	0.61	9.994 6204	36.4	6.07	1.14	20.72	48.41	2 25 40.28
15	46	325 48 0.6	151.54	+0.50	9.994 7084	+36.9	6.21	−1.17	20.72	48.43	2 21 44.37
16	47	326 48 36.7	151.47	+0.37	9.994 7974	+37.3	6.35	−1.21	20.71	48.45	2 17 48.47

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Feb. 16	Fr	21 56 6.18	9.726	−12 34 57.3	+51.67	16 13.08	8.91	−14 17.29	+0.130	21 41 48.90
17	Sa	21 59 59.25	9.696	12 14 11.2	52.17	16 12.88	8.90	14 13.80	0.160	21 45 45.45
18	Su	22 3 51.60	9.666	11 53 13.4	52.61	16 12.68	8.90	14 9.60	0.190	21 49 42.00
19	Mo	22 7 43.24	9.637	11 32 4.4	53.10	16 12.47	8.90	14 4.69	0.219	21 53 38.56
20	Tu	22 11 34.19	9.609	11 10 44.6	53.55	16 12.26	8.90	13 59.08	0.248	21 57 35.11
21	We	22 15 24.46	9.581	−10 49 14.3	+53.97	16 12.05	8.90	−13 52.80	+0.276	22 1 31.66
22	Th	22 19 14.06	9.553	10 27 34.1	54.38	16 11.84	8.89	13 45.84	0.304	22 5 28.22
23	Fr	22 23 3.00	9.526	10 5 44.3	54.77	16 11.62	8.89	13 38.23	0.331	22 9 24.77
24	Sa	22 26 51.30	9.499	9 43 45.3	55.14	16 11.41	8.89	13 29.97	0.357	22 13 21.32
25	Su	22 30 38.97	9.473	9 21 37.5	55.50	16 11.18	8.89	13 21.09	0.383	22 17 17.87
26	Mo	22 34 26.03	9.448	− 8 59 21.5	+55.84	16 10.96	8.89	−13 11.60	+0.408	22 21 14.43
27	Tu	22 38 12.50	9.424	8 36 57.4	56.16	16 10.73	8.88	13 1.52	0.432	22 25 10.98
28	We	22 41 58.40	9.401	8 14 25.8	56.47	16 10.50	8.88	12 50.87	0.456	22 29 7.53
Mar. 1	Th	22 45 43.75	9.378	7 51 47.1	56.76	16 10.26	8.88	12 39.66	0.478	22 33 4.08
2	Fr	22 49 28.56	9.356	7 29 1.6	57.03	16 10.02	8.88	12 27.93	0.499	22 37 0.64
3	Sa	22 53 12.87	9.336	− 7 6 9.6	+57.29	16 9.78	8.88	−12 15.69	+0.520	22 40 57.19
4	Su	22 56 56.70	9.317	6 43 11.6	57.54	16 9.53	8.87	12 2.96	0.540	22 44 53.74
5	Mo	23 0 40.07	9.298	6 20 8.0	57.77	16 9.28	8.87	11 49.77	0.559	22 48 50.29
6	Tu	23 4 23.00	9.280	5 56 59.0	57.98	16 9.03	8.87	11 36.15	0.576	22 52 46.84
7	We	23 8 5.51	9.263	5 33 45.1	58.18	16 8.77	8.87	11 22.12	0.593	22 56 43.40
8	Th	23 11 47.64	9.248	− 5 10 26.7	+58.36	16 8.51	8.86	−11 7.69	+0.609	23 0 39.95
9	Fr	23 15 29.40	9.232	4 47 4.1	58.53	16 8.25	8.86	10 52.90	0.624	23 4 36.50
10	Sa	23 19 10.80	9.218	4 23 37.6	58.68	16 7.98	8.86	10 37.75	0.638	23 8 33.05
11	Su	23 22 51.88	9.205	4 0 7.8	58.81	16 7.72	8.86	10 22.27	0.652	23 12 29.60
12	Mo	23 26 32.64	9.192	3 36 34.9	58.93	16 7.45	8.85	10 6.48	0.664	23 16 26.16
13	Tu	23 30 13.10	9.180	− 3 12 59.4	+59.03	16 7.18	8.85	− 9 50.39	+0.676	23 20 22.71
14	We	23 33 53.29	9.169	2 49 21.7	59.11	16 6.92	8.85	9 34.03	0.687	23 24 19.26
15	Th	23 37 33.22	9.158	2 25 42.1	59.18	16 6.65	8.85	9 17.41	0.698	23 28 15.81
16	Fr	23 41 12.90	9.149	2 2 1.0	59.24	16 6.38	8.84	9 0.54	0.708	23 32 12.36
17	Sa	23 44 52.36	9.140	1 38 18.8	59.28	16 6.11	8.84	8 43.45	0.717	23 36 8.92
18	Su	23 48 31.61	9.131	− 1 14 35.9	+59.30	16 5.84	8.84	− 8 26.15	+0.725	23 40 5.47
19	Mo	23 52 10.67	9.124	0 50 52.7	59.30	16 5.57	8.84	8 8.65	0.733	23 44 2.02
20	Tu	23 55 49.56	9.117	0 27 9.5	59.29	16 5.30	8.83	7 50.99	0.740	23 47 58.57
21	We	23 59 28.29	9.111	− 0 3 26.7	59.27	16 5.03	8.83	7 33.16	0.746	23 51 55.12
22	Th	0 3 6.88	9.105	+ 0 20 15.2	59.23	16 4.76	8.83	7 15.20	0.751	23 55 51.67
23	Fr	0 6 45.35	9.101	+ 0 43 56.0	+59.17	16 4.49	8.83	− 6 57.12	+0.756	23 59 48.22
24	Sa	0 10 23.72	9.097	1 7 35.3	59.10	16 4.22	8.82	6 38.94	0.759	0 3 44.78
25	Su	0 14 2.00	9.094	1 31 12.6	59.01	16 3.96	8.82	6 20.68	0.762	0 7 41.33
26	Mo	0 17 40.23	9.092	1 54 47.6	58.91	16 3.69	8.82	6 2.35	0.765	0 11 37.88
27	Tu	0 21 18.41	9.090	2 18 20.0	58.79	16 3.42	8.82	5 43.98	0.766	0 15 34.43
28	We	0 24 56.56	9.090	+ 2 41 49.5	+58.66	16 3.14	8.82	− 5 25.58	+0.767	0 19 30.98
29	Th	0 28 34.72	9.090	3 5 15.6	58.51	16 2.87	8.81	5 7.18	0.766	0 23 27.53
30	Fr	0 32 12.89	9.091	3 28 38.0	58.35	16 2.60	8.81	4 48.80	0.765	0 27 24.09
31	Sa	0 35 51.11	9.094	3 51 56.4	58.18	16 2.32	8.81	4 30.47	0.762	0 31 20.64
Apr. 1	Su	0 39 29.40	9.097	4 15 10.5	57.99	16 2.05	8.81	4 12.21	0.759	0 35 17.19
2	Mo	0 43 7.78	9.101	+ 4 38 19.9	+57.79	16 1.77	8.80	− 3 54.04	+0.755	0 39 13.74
3	Tu	0 46 46.28	9.107	+ 5 1 24.3	+57.58	16 1.49	8.80	− 3 35.99	+0.749	0 43 10.29

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Feb. 16	47	326 48 36.7	151.47	+0.37	9.994 7974	+37.3	6.35	−1.21	20.71	48.45	2 17 48.47
17	48	327 49 11.3	151.41	0.24	9.994 8874	37.7	6.48	1.24	20.71	48.46	2 13 52.56
18	49	328 49 44.3	151.34	+0.11	9.994 9784	38.1	6.62	1.28	20.70	48.48	2 9 56.65
19	50	329 50 15.5	151.27	−0.02	9.995 0704	38.6	6.76	1.31	20.70	48.50	2 6 0.74
20	51	330 50 45.1	151.19	0.13	9.995 1635	39.0	6.90	1.35	20.69	48.52	2 2 4.84
21	52	331 51 12.8	151.12	−0.23	9.995 2577	+39.5	7.03	−1.39	20.69	48.53	1 58 8.93
22	53	332 51 38.7	151.04	0.31	9.995 3530	40.0	7.17	1.43	20.69	48.55	1 54 13.02
23	54	333 52 2.7	150.96	0.37	9.995 4495	40.5	7.31	1.47	20.68	48.56	1 50 17.12
24	55	334 52 24.7	150.88	0.40	9.995 5473	41.0	7.45	1.52	20.68	48.58	1 46 21.21
25	56	335 52 44.8	150.80	0.40	9.995 6465	41.6	7.58	1.56	20.67	48.60	1 42 25.30
26	57	336 53 2.9	150.71	−0.37	9.995 7471	+42.2	7.72	−1.61	20.67	48.61	1 38 29.39
27	58	337 53 19.0	150.63	0.31	9.995 8492	42.9	7.86	1.65	20.66	48.62	1 34 33.49
28	59	338 53 33.1	150.55	0.23	9.995 9530	43.6	8.00	1.70	20.66	48.64	1 30 37.58
Mar. 1	60	339 53 45.2	150.47	−0.12	9.996 0584	44.3	8.14	1.75	20.65	48.65	1 26 41.67
2	61	340 53 55.5	150.39	+0.01	9.996 1656	45.0	8.27	1.80	20.65	48.66	1 22 45.77
3	62	341 54 3.9	150.31	+0.14	9.996 2746	+45.8	8.41	−1.85	20.64	48.68	1 18 49.86
4	63	342 54 10.5	150.24	0.28	9.996 3854	46 5	8.55	1.90	20.64	48.69	1 14 53.96
5	64	343 54 15.4	150.17	0.42	9.996 4978	47.2	8.69	1.96	20.63	48.70	1 10 58.05
6	65	344 54 18.6	150.10	0.54	9.996 6118	47.8	8.82	2.01	20.62	48.71	1 7 2.14
7	66	345 54 20.2	150.03	0.63	9.996 7272	48.1	8.96	2.06	20.62	48.72	1 3 6.24
8	67	346 54 20.2	149.97	+0.70	9.996 8439	+48.8	9.10	−2.12	20.61	48.73	0 59 10.33
9	68	347 54 18.6	149.90	0.74	9.996 9616	49.3	9.24	2.18	20.61	48.74	0 55 14.42
10	69	348 54 15.4	149.83	0.75	9.997 0803	49.6	9.37	2.23	20.60	48.74	0 51 18.52
11	70	349 54 10.5	149.76	0.72	9.997 1996	49.8	9.51	2.29	20.60	48.75	0 47 22.61
12	71	350 54 4.0	149.69	0.66	9.997 3195	50.0	9.65	2.35	20.59	48.76	0 43 26.71
13	72	351 53 55.8	149.62	+0.58	9.997 4398	+50.2	9.79	−2.40	20.59	48.76	0 39 30.80
14	73	352 53 45.8	149.55	0.47	9.997 5604	50.3	9.92	2.46	20.58	48.77	0 35 34.90
15	74	353 53 34.0	149.47	0.35	9.997 6813	50.4	10.06	2.52	20.57	48.77	0 31 38.99
16	75	354 53 20.4	149.39	0.23	9.997 8022	50.4	10.20	2.58	20.57	48.78	0 27 43.08
17	76	355 53 4.8	149.31	+0.10	9.997 9232	50.4	10.34	2.64	20.56	48.78	0 23 47.18
18	77	356 52 47.2	149.22	−0.03	9.998 0442	+50.4	10.47	−2.70	20.56	48.78	0 19 51.27
19	78	357 52 27.5	149.14	0.16	9.998 1653	50.4	10.61	2.76	20.55	48.79	0 15 55.37
20	79	358 52 5.8	149.05	0.27	9.998 2863	50.4	10.75	2.82	20.55	48.79	0 11 59.46
21	80	359 51 41.9	148.96	0.36	9.998 4073	50.4	10.89	2.88	20.54	48.79	0 8 3.56
22	81	0 51 15.8	148.86	0.43	9.998 5283	50.4	11.02	2.94	20.53	48.79	0 4 7.65
23	82	1 50 47.4	148.77	−0.47	9.998 6494	+50.5	11.16	−3.00	20.53	48.79	{0 0 11.74 23 56 15.84
24	83	2 50 16.8	148.68	0.47	9.998 7706	50.5	11.30	3.06	20.52	48.79	23 52 19.93
25	84	3 49 43.9	148.58	0.45	9.998 8919	50.6	11.44	3.12	20.52	48.78	23 48 24.03
26	85	4 49 8.6	148.48	0.41	9.999 0134	50.7	11.58	3.18	20.51	48.78	23 44 28.12
27	86	5 48 31.1	148.39	0.34	9.999 1352	50.9	11.71	3.24	20.51	48.78	23 40 32.21
28	87	6 47 51.2	148.29	−0.24	9.999 2575	+51.1	11.85	−3.30	20.50	48.77	23 36 36.31
29	88	7 47 8.9	148.19	−0.12	9.999 3803	51.3	11.99	3.36	20.49	48.77	23 32 40.40
30	89	8 46 24.4	148.10	+0.02	9.999 5037	51.6	12.13	3.42	20.49	48.76	23 28 44.50
31	90	9 45 37.8	148.01	0.15	9.999 6278	51.9	12.26	3.48	20.48	48.76	23 24 48.59
Apr. 1	91	10 44 49.0	147.92	0.28	9.999 7526	52.1	12.40	3.53	20.48	48.75	23 20 52.68
2	92	11 43 58.1	147.84	+0.41	9.999 8781	+52.4	12:54	−3.59	20.47	48.74	23 16 56.78
3	93	12 43 5.3	147.76	+0.52	0.000 0043	+52.7	12.68	−3.65	20.46	48.74	23 13 0.87

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Apr. 1	Su	0 39 29.40	9.097	+ 4 15 10.5	+57.99	16 2.05	8.81	−4 12.21	+0.759	0 35 17.19
2	Mo	0 43 7.78	9.101	4 38 19.9	57.79	16 1.77	8.80	3 54.04	0.755	0 39 13.74
3	Tu	0 46 46.28	9.107	5 1 24.3	57.58	16 1.49	8.80	3 35.99	0.749	0 43 10.29
4	We	0 50 24.93	9.113	5 24 23.5	57.35	16 1.21	8.80	3 18.08	0.743	0 47 6.85
5	Th	0 54 3.73	9.121	5 47 17.0	57.11	16 0.93	8.79	3 0.34	0.736	0 51 3.40
6	Fr	0 57 42.73	9.129	+ 6 10 4.5	+56.85	16 0.65	8.79	−2 42.78	+0.727	0 54 59.95
7	Sa	1 1 21.93	9.138	6 32 45.8	56.58	16 0.37	8.79	2 25.43	0.718	0 58 56.50
8	Su	1 5 1.35	9.148	6 55 20.4	56.30	16 0.08	8.79	2 8.30	0.709	1 2 53.06
9	Mo	1 8 41.02	9.158	7 17 48.0	56.00	15 59.80	8.78	1 51.41	0.698	1 6 49.61
10	Tu	1 12 20.95	9.169	7 40 8.3	55.69	15 59.53	8.78	1 34.79	0.687	1 10 46.16
11	We	1 16 1.15	9.181	+ 8 2 21.0	+55.36	15 59.25	8.78	−1 18.43	+0.676	1 14 42.71
12	Th	1 19 41.64	9.193	8 24 25.6	55.02	15 58.97	8.78	1 2.37	0.663	1 18 39.26
13	Fr	1 23 22.43	9.206	8 46 21.8	54.67	15 58.70	8.77	0 46.61	0.650	1 22 35.82
14	Sa	1 27 3.54	9.220	9 8 9.4	54.30	15 58.43	8.77	0 31.17	0.637	1 26 32.37
15	Su	1 30 44.98	9.234	9 29 47.9	53.91	15 58.16	8.77	0 16.06	0.623	1 30 28.92
16	Mo	1 34 26.76	9.248	+ 9 51 16.9	+53.51	15 57.89	8.77	−0 1.29	+0.608	1 34 25.47
17	Tu	1 38 8.90	9.263	10 12 36.2	53.10	15 57.62	8.76	+0 13.12	0.593	1 38 22.03
18	We	1 41 51.41	9.279	10 33 45.4	52.67	15 57.36	8.76	0 27.17	0.578	1 42 18.58
19	Th	1 45 34.30	9.295	10 54 44.1	52.22	15 57.10	8.76	0 40.84	0.561	1 46 15.13
20	Fr	1 49 17.57	9.311	11 15 32.0	51.76	15 56.84	8.76	0 54.11	0.545	1 50 11.69
21	Sa	1 53 1.25	9.329	+11 36 8.8	+51.29	15 56.58	8.76	+1 6.99	+0.528	1 54 8.24
22	Su	1 56 45.34	9.346	11 56 34.0	50.81	15 56.33	8.75	1 19.45	0.511	1 58 4.79
23	Mo	2 0 29.85	9.363	12 16 47.4	50.31	15 56.08	8.75	1 31.50	0.493	2 2 1.34
24	Tu	2 4 14.79	9.382	12 36 48.7	49.79	15 55.83	8.75	1 43.11	0.474	2 5 57.90
25	We	2 8 0.18	9.401	12 56 37.4	49.27	15 55.58	8.75	1 54.27	0.456	2 9 54.45
26	Th	2 11 46.03	9.420	+13 16 13.4	+48.73	15 55.34	8.74	+2 4.98	+0.437	2 13 51.00
27	Fr	2 15 32.34	9.439	13 35 36.1	48.17	15 55.09	8.74	2 15.22	0.417	2 17 47.56
28	Sa	2 19 19.13	9.460	13 54 45.4	47.60	15 54.85	8.74	2 24.98	0.397	2 21 44.11
29	Su	2 23 6.41	9.481	14 13 40.9	47.02	15 54.61	8.74	2 34.25	0.376	2 25 40.66
30	Mo	2 26 54.21	9.502	14 32 22.3	46.43	15 54.36	8.74	2 43.01	0.354	2 29 37.22
May 1	Tu	2 30 42.52	9.524	+14 50 49.4	+45.82	15 54.12	8.73	+2 51.25	+0.332	2 33 33.77
2	We	2 34 31.38	9.547	15 9 1.7	45.20	15 53.88	8.73	2 58.95	0.309	2 37 30.33
3	Th	2 38 20.78	9.570	15 26 59.1	44.57	15 53.64	8.73	3 6.10	0.286	2 41 26.88
4	Fr	2 42 10.73	9.593	15 44 41.2	43.93	15 53.41	8.73	3 12.70	0.263	2 45 23.44
5	Sa	2 46 1.26	9.617	16 2 7.7	43.28	15 53.17	8.72	3 18.73	0.239	2 49 19.99
6	Su	2 49 52.36	9.641	+16 19 18.4	+42.61	15 52.94	8.72	+3 24.19	+0.215	2 53 16.54
7	Mo	2 53 44.04	9.666	16 36 12.9	41.93	15 52.70	8.72	3 29.06	0.191	2 57 13.10
8	Tu	2 57 36.31	9.690	16 52 50.9	41.24	15 52.48	8.72	3 33.35	0.166	3 1 9.65
9	We	3 1 29.16	9.714	17 9 12.1	40.53	15 52.25	8.72	3 37.05	0.142	3 5 6.21
10	Th	3 5 22.60	9.739	17 25 16.2	39.81	15 52.02	8.71	3 40.16	0.118	3 9 2.76
11	Fr	3 9 16.63	9.763	+17 41 2.9	+39.08	15 51.80	8.71	+3 42.69	+0.093	3 12 59.32
12	Sa	3 13 11.24	9.788	17 56 31.9	38.34	15 51.59	8.71	3 44.63	0.069	3 16 55.87
13	Su	3 17 6.44	9.812	18 11 42.9	37.58	15 51.38	8.71	3 45.98	0.044	3 20 52.43
14	Mo	3 21 2.23	9.836	18 26 35.6	36.81	15 51.17	8.71	3 46.75	+0.020	3 24 48.98
15	Tu	3 24 58.59	9.860	18 41 9.8	36.03	15 50.96	8.70	3 46.95	−0.004	3 28 45.54
16	We	3 28 55.52	9.884	+18 55 25.0	+35.24	15 50.76	8.70	+3 46.57	−0.028	3 32 42.09
17	Th	3 32 53.01	9.907	+19 9 21.1	+34.44	15 50.57	8.70	+3 45.63	−0.051	3 36 38.64

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″		″	″	″	″	23° 26′ ″	h m s
Apr. 1	91	10 44 49.0	147.92	+0.28	9.999 7526	+52.1	12.40	−3.53	20.48	48.75	23 20 52.68
2	92	11 43 58.1	147.84	0.41	9.999 8781	52.4	12.54	3.59	20.47	48.74	23 16 56.78
3	93	12 43 5.3	147.76	0.52	0.000 0043	52.7	12.68	3.65	20.46	48.74	23 13 0.87
4	94	13 42 10.6	147.68	0.60	0.000 1309	52.9	12.81	3.70	20.46	48.73	23 9 4.97
5	95	14 41 14.0	147.61	0.64	0.000 2580	53.0	12.95	3.76	20.45	48.72	23 5 9.06
6	96	15 40 15.7	147.54	+0.66	0.000 3853	+53.1	13.09	−3.81	20.45	48.71	23 1 13.15
7	97	16 39 15.7	147.46	0.65	0.000 5126	53.0	13.23	3.87	20.44	48.70	22 57 17.25
8	98	17 38 13.9	147.39	0.60	0.000 6398	52.9	13.36	3.92	20.43	48.69	22 53 21.34
9	99	18 37 10.4	147.32	0.52	0.000 7667	52.8	13.50	3.97	20.43	48.68	22 49 25.43
10	100	19 36 5.2	147.25	0.42	0.000 8932	52.6	13.64	4.02	20.42	48.67	22 45 29.53
11	101	20 34 58.2	147.17	+0.30	0.001 0191	+52.3	13.78	−4.07	20.42	48.66	22 41 33.62
12	102	21 33 49.3	147.09	0.17	0.001 1442	52.0	13.91	4.12	20.41	48.64	22 37 37.71
13	103	22 32 38.7	147.02	+0.04	0.001 2686	51.6	14.05	4.17	20.40	48.63	22 33 41.81
14	104	23 31 26.2	146.94	−0.09	0.001 3920	51.2	14.19	4.21	20.40	48.62	22 29 45.90
15	105	24 30 11.8	146.86	0.22	0.001 5145	50.8	14.33	4.26	20.39	48.60	22 25 50.00
16	106	25 28 55.5	146.78	−0.33	0.001 6359	+50.4	14.47	−4.30	20.39	48.59	22 21 54.09
17	107	26 27 37.7	146.70	0.42	0.001 7563	49.9	14.60	4.35	20.38	48.57	22 17 58.18
18	108	27 26 16.9	146.61	0.49	0.001 8756	49.5	14.74	4.39	20.38	48.56	22 14 2.27
19	109	28 24 54.5	146.53	0.54	0.001 9938	49.0	14.88	4.43	20.37	48.54	22 10 6.37
20	110	29 23 30.1	146.44	0.56	0.002 1109	48.6	15.02	4.47	20.37	48.53	22 6 10.46
21	111	30 22 3.6	146.35	−0.55	0.002 2269	+48.1	15.15	−4.51	20.36	48.51	22 2 14.55
22	112	31 20 34.9	146.26	0.51	0.002 3419	47.7	15.29	4.55	20.35	48.50	21 58 18.65
23	113	32 19 4.1	146.17	0.45	0.002 4560	47.4	15.43	4.58	20.35	48.48	21 54 22.74
24	114	33 17 31.1	146.08	0.36	0.002 5692	47.0	15.57	4.62	20.34	48.46	21 50 26.83
25	115	34 15 55.9	145.99	0.25	0.002 6816	46.7	15.70	4.65	20.34	48.45	21 46 30.92
26	116	35 14 18.6	145.90	−0.12	0.002 7933	+46.4	15.84	−4.68	20.33	48.43	21 42 35.02
27	117	36 12 39.1	145.81	+0.02	0.002 9045	46.2	15.98	4.71	20.33	48.41	21 38 39.11
28	118	37 10 57.6	145.73	0.16	0.003 0153	46.1	16.12	4.74	20.32	48.39	21 34 43.20
29	119	38 9 14.1	145.65	0.28	0.003 1257	45.9	16.25	4.77	20.32	48.38	21 30 47.29
30	120	39 7 28.7	145.57	0.39	0.003 2357	45.8	16.39	4.79	20.31	48.36	21 26 51.38
May 1	121	40 5 41.6	145.50	+0.48	0.003 3455	+45.7	16.53	−4.82	20.31	48.34	21 22 55.48
2	122	41 3 52.7	145.43	0.53	0.003 4549	45.5	16.67	4.84	20.30	48.32	21 18 59.57
3	123	42 2 2.2	145.36	0.55	0.003 5639	45.3	16.80	4.87	20.30	48.30	21 15 3.66
4	124	43 0 10.1	145.30	0.54	0.003 6724	45.1	16.94	4.89	20.29	48.29	21 11 7.75
5	125	43 58 16.7	145.24	0.50	0.003 7802	44.7	17.08	4.91	20.29	48.27	21 7 11.84
6	126	44 56 21.7	145.18	+0.43	0.003 8871	+44.3	17.22	−4.92	20.28	48.25	21 3 15.94
7	127	45 54 25.4	145.13	0.34	0.003 9930	43.9	17.36	4.94	20.28	48.23	20 59 20.03
8	128	46 52 27.8	145.07	0.23	0.004 0977	43.4	17.49	4.95	20.27	48.21	20 55 24.12
9	129	47 50 28.8	145.01	+0.11	0.004 2011	42.8	17.63	4.97	20.27	48.19	20 51 28.21
10	130	48 48 28.5	144.96	−0.02	0.004 3030	42.1	17.77	4.98	20.26	48.18	20 47 32.30
11	131	49 46 26.8	144.90	−0.15	0.004 4033	+41.5	17.91	−4.99	20.26	48.16	20 43 36.39
12	132	50 44 23.7	144.84	0.27	0.004 5021	40.8	18.04	5.00	20.25	48.14	20 39 40.48
13	133	51 42 19.2	144.78	0.38	0.004 5990	40.0	18.18	5.01	20.25	48.13	20 35 44.57
14	134	52 40 13.3	144.72	0.48	0.004 6942	39.2	18.32	5.01	20.24	48.11	20 31 48.66
15	135	53 38 6.0	144.67	0.56	0.004 7874	38.4	18.46	5.02	20.24	48.09	20 27 52.76
16	136	54 35 57.3	144.61	−0.61	0.004 8787	+37.6	18.59	−5.02	20.24	48.07	20 23 56.35
17	137	55 33 47.1	144.54	−0.64	0.004 9680	+36.8	18.73	−5.02	20.23	48.06	20 20 0.94

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
May 17	Th	3 32 53.01	9.907	+19 9 21.1	+34.44	15 50.57	8.70	+3 45.63	−0.051	3 36 38.64
18	Fr	3 36 51.07	9.931	19 22 57.8	33.62	15 50.38	8.70	3 44.13	0.074	3 40 35.20
19	Sa	3 40 49.68	9.953	19 36 14.7	32.79	15 50.19	8.70	3 42.08	0.097	3 44 31.76
20	Su	3 44 48.82	9.975	19 49 11.6	31.95	15 50.01	8.70	3 39.49	0.119	3 48 28.31
21	Mo	3 48 48.50	9.998	20 1 48.3	31.10	15 49.83	8.69	3 36.37	0.141	3 52 24.87
22	Tu	3 52 48.71	10.019	+20 14 4.4	+30.24	15 49.66	8.69	+3 32.72	−0.163	3 56 21.42
23	We	3 56 49.42	10.040	20 25 59.7	29.37	15 49.49	8.69	3 28.56	0.184	4 0 17.98
24	Th	4 0 50.64	10.061	20 37 34.0	28.49	15 49.32	8.69	3 23.89	0.205	4 4 14.53
25	Fr	4 4 52.35	10.082	20 48 47.1	27.60	15 49.16	8.69	3 18.74	0.225	4 8 11.09
26	Sa	4 8 54.55	10.102	20 59 38.6	26.70	15 49.00	8.69	3 13.09	0.245	4 12 7.65
27	Su	4 12 57.23	10.121	+21 10 8.4	+25.79	15 48.84	8.68	+3 6.97	−0.265	4 16 4.20
28	Mo	4 17 0.37	10.140	21 20 16.2	24.87	15 48.68	8.68	3 0.39	0.284	4 20 0.76
29	Tu	4 21 3.97	10.160	21 30 1.9	23.94	15 48.53	8.68	2 53.34	0.303	4 23 57.31
30	We	4 25 8.03	10.178	21 39 25.3	23.01	15 48.38	8.68	2 45.84	0.322	4 27 53.87
31	Th	4 29 12.53	10.196	21 48 26.1	22.06	15 48.23	8.68	2 37.90	0.340	4 31 50.43
June 1	Fr	4 33 17.46	10.214	+21 57 4.2	+21.11	15 48.08	8.68	+2 29.52	−0.358	4 35 46.98
2	Sa	4 37 22.82	10.232	22 5 19.5	20.16	15 47.94	8.68	2 20.72	0.376	4 39 43.54
3	Su	4 41 28.59	10.249	22 13 11.7	19.19	15 47.80	8.68	2 11.50	0.392	4 43 40.10
4	Mo	4 45 34.76	10.265	22 20 40.6	18.22	15 47.66	8.67	2 1.89	0.408	4 47 36.65
5	Tu	4 49 41.31	10.280	22 27 46.2	17.24	15 47.53	8.67	1 51.90	0.424	4 51 33.21
6	We	4 53 48.22	10.295	+22 34 28.3	+16.26	15 47.40	8.67	+1 41.55	−0.439	4 55 29.76
7	Th	4 57 55.47	10 309	22 40 46.7	15.27	15 47.27	8.67	1 30.85	0.453	4 59 26.32
8	Fr	5 2 3.05	10 322	22 46 41.3	14.28	15 47.15	8.67	1 19.83	0.466	5 3 22.88
9	Sa	5 6 10.93	10.335	22 52 11.9	13.27	15 47.03	8.67	1 8.50	0.478	5 7 19.43
10	Su	5 10 19.10	10.346	22 57 18.4	12.27	15 46.92	8.67	0 56.89	0.489	5 11 15.99
11	Mo	5 14 27.52	10.356	+23 2 0.8	+11.26	15 46.81	8.67	+0 45.03	−0.499	5 15 12.55
12	Tu	5 18 36.17	10.365	23 6 18.9	10.25	15 46.71	8.67	0 32.93	0.508	5 19 9.10
13	We	5 22 45.03	10.373	23 10 12.6	9.23	15 46.62	8.66	0 20.63	0.517	5 23 5.66
14	Th	5 26 54.08	10.381	23 13 41.9	8.21	15 46.52	8.66	+0 8.14	0.524	5 27 2.22
15	Fr	5 31 3.29	10.387	23 16 46.6	7.18	15 46.44	8.66	−0 4.51	0.530	5 30 58.78
16	Sa	5 35 12.63	10.391	+23 19 26.7	+ 6.16	15 46.36	8.66	−0 17.29	−0.535	5 34 55.33
17	Su	5 39 22.06	10.395	23 21 42.1	5.13	15 46.28	8.66	0 30.18	0.539	5 38 51.89
18	Mo	5 43 31.58	10.398	23 23 32.8	4.10	15 46.21	8.66	0 43.14	0.541	5 42 48.44
19	Tu	5 47 41.15	10.399	23 24 58.7	3.07	15 46.15	8.66	0 56.15	0.543	5 46 45.00
20	We	5 51 50.74	10.400	23 25 59.9	2.03	15 46.09	8.66	1 9.18	0.543	5 50 41.56
21	Th	5 56 0.32	10.399	+23 26 36.2	+ 1.00	15 46.04	8.66	−1 22.21	−0.542	5 54 38.12
22	Fr	6 0 9.88	10.397	23 26 47.8	− 0.04	15 45.99	8.66	1 35.21	0.541	5 58 34.67
23	Sa	6 4 19.38	10.394	23 26 34.5	1.07	15 45.94	8.66	1 48.16	0.538	6 2 31.23
24	Su	6 8 28.81	10.391	23 25 56.4	2.10	15 45.90	8.66	2 1.03	0.534	6 6 27.79
25	Mo	6 12 38.15	10.387	23 24 53.6	3.13	15 45.86	8.66	2 13.81	0.530	6 10 24.34
26	Tu	6 16 47.37	10.381	+23 23 26.0	− 4.16	15 45.83	8.66	−2 26.47	−0.525	6 14 20.90
27	We	6 20 56.45	10.375	23 21 33.8	5.19	15 45.79	8.66	2 39.00	0.519	6 18 17.46
28	Th	6 25 5.39	10.369	23 19 16.9	6.22	15 45.76	8.66	2 51.37	0.512	6 22 14.01
29	Fr	6 29 14.15	10.361	23 16 35.4	7.24	15 45.74	8.66	3 3.58	0.505	6 26 10.57
30	Sa	6 33 22.72	10.353	23 13 29.4	8.26	15 45.72	8.66	3 15.60	0.497	6 30 7.13
July 1	Su	6 37 31.09	10.344	+23 9 59.0	− 9.27	15 45.70	8.66	−3 27.41	−0.488	6 34 3.68
2	Mo	6 41 39.24	10.335	+23 6 4.3	−10.29	15 45.68	8.66	−3 39.00	−0.478	6 38 0.24

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Lati-tude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliq-uity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
May 17	137	55 33 47.1	144.54	−0.64	0.004 9680	+36.8	18.73	−5.02	20.23	48.06	20 20 0.94
18	138	56 31 35.4	144.48	0.64	0.005 0553	36.0	18.87	5.03	20.23	48.04	20 16 5.03
19	139	57 29 22.2	144.42	0.60	0.005 1406	35.2	19.01	5.03	20.22	48.02	20 12 9.12
20	140	58 27 7.4	144.35	0.54	0.005 2240	34.4	19.14	5.02	20.22	48.01	20 8 13.21
21	141	59 24 51.0	144.29	0.46	0.005 3056	33.6	19.28	5.02	20.22	47.99	20 4 17.30
22	142	60 22 33.1	144.22	−0.35	0.005 3853	+32.9	19.42	−5.02	20.21	47.98	20 0 21.39
23	143	61 20 13.5	144.15	0.23	0.005 4633	32.1	19.56	5.01	20.21	47.96	19 56 25.48
24	144	62 17 52.4	144.09	−0.10	0.005 5396	31.5	19.69	5.01	20.20	47.95	19 52 29.57
25	145	63 15 29.7	144.02	+0.02	0.005 6145	30.9	19.83	5.00	20.20	47.93	19 48 33.66
26	146	64 13 5.6	143.96	0.14	0.005 6881	30.4	19.97	4.99	20.20	47.92	19 44 37.75
27	147	65 10 39.9	143.90	+0.26	0.005 7604	+29.9	20.11	−4.98	20.19	47.91	19 40 41.84
28	148	66 8 12.9	143.85	0.35	0.005 8315	29.4	20.24	4.97	20.19	47.89	19 36 45.93
29	149	67 5 44.6	143.80	0.41	0.005 9016	29.0	20.38	4.96	20.19	47.88	19 32 50.02
30	150	68 3 15.2	143.75	0.43	0.005 9707	28.6	20.52	4.95	20.18	47.87	19 28 54.11
31	151	69 0 44.7	143.71	0.42	0.006 0387	28.1	20.66	4.93	20.18	47.86	19 24 58.20
June 1	152	69 58 13.2	143.67	+0.38	0.006 1055	+27.6	20.80	−4.92	20.18	47.85	19 21 2.29
2	153	70 55 40.8	143.64	0.32	0.006 1712	27.1	20.93	4.90	20.18	47.84	19 17 6.38
3	154	71 53 7.7	143.61	0.23	0.006 2355	26.5	21.07	4.89	20.17	47.83	19 13 10.47
4	155	72 50 33.9	143.58	+0.11	0.006 2984	25.9	21.21	4.87	20.17	47.82	19 9 14.56
5	156	73 47 59.3	143.55	−0.01	0.006 3596	25.1	21.35	4.85	20.17	47.81	19 5 18.65
6	157	74 45 24.1	143.52	−0.13	0.006 4191	+24.4	21.48	−4.83	20.16	47.80	19 1 22.73
7	158	75 42 48.3	143.50	0.25	0.006 4767	23.6	21.62	4.82	20.16	47.79	18 57 26.82
8	159	76 40 11.9	143.47	0.37	0.006 5324	22 8	21.76	4.80	20.16	47.78	18 53 30.91
9	160	77 37 34.9	143.45	0.49	0.006 5860	21.9	21.90	4.78	20.16	47.77	18 49 35.00
10	161	78 34 57.3	143.42	0.58	0.006 6374	20.9	22.03	4.75	20.15	47.77	18 45 39.09
11	162	79 32 19.1	143.40	−0.65	0.006 6865	+20.0	22.17	−4.73	20.15	47.76	18 41 43.18
12	163	80 29 40.4	143.37	0.70	0.006 7333	19.0	22.31	4.71	20.15	47.76	18 37 47.27
13	164	81 27 1.0	143.35	0.73	0.006 7777	18.0	22.45	4.69	20.15	47.75	18 33 51.36
14	165	82 24 21.0	143.32	0.74	0.006 8196	16.9	22.58	4.67	20.15	47.75	18 29 55.45
15	166	83 21 40.4	143.29	0.71	0.006 8590	15.9	22.72	4.64	20.14	47.74	18 25 59.54
16	167	84 18 59.1	143.26	−0.65	0.006 8958	+14.8	22.86	−4.62	20.14	47.74	18 22 3.63
17	168	85 16 17.1	143.23	0.57	0.006 9302	13.8	23.00	4.60	20.14	47.74	18 18 7.72
18	169	86 13 34.4	143.20	0.47	0.006 9621	12.8	23.13	4.57	20.14	47.74	18 14 11.81
19	170	87 10 50.9	143.17	0.35	0.006 9916	11.8	23.27	4.55	20.14	47.74	18 10 15.90
20	171	88 8 6.7	143.14	0.22	0.007 0188	10.9	23.41	4.52	20.14	47.74	18 6 19.98
21	172	89 5 21.8	143.11	−0.09	0.007 0439	+10.0	23.55	−4.50	20.14	47.74	18 2 24.07
22	173	90 2 36.1	143.08	+0.03	0.007 0669	9.2	23.69	4.48	20.13	47.74	17 58 28.16
23	174	90 59 49.7	143.05	0.15	0.007 0879	8.4	23.82	4.45	20.13	47.74	17 54 32.25
24	175	91 57 2.7	143.03	0.24	0.007 1072	7.7	23.96	4.43	20.13	47.74	17 50 36.34
25	176	92 54 15.1	143.01	0.30	0.007 1249	7.0	24.10	4.40	20.13	47.74	17 46 40.43
26	177	93 51 27.0	142.99	+0.33	0.007 1410	+ 6.4	24.24	−4.38	20.13	47.75	17 42 44.52
27	178	94 48 38.4	142.97	0.32	0.007 1556	5.8	24.37	4.36	20.13	47.75	17 38 48.61
28	179	95 45 49.6	142.96	0.29	0.007 1689	5.2	24.51	4.33	20.13	47.75	17 34 52.70
29	180	96 43 0.5	142.95	0.23	0.007 1807	4.6	24.65	4.31	20.13	47.76	17 30 56.79
30	181	97 40 11.3	142.95	0.14	0.007 1912	4.0	24.79	4.29	20.13	47.76	17 27 0.88
July 1	182	98 37 22.2	142.95	+0.03	0.007 2001	+ 3.4	24.92	−4.27	20.13	47.77	17 23 4.96
2	183	99 34 33.1	142.96	−0.09	0.007 2075	+ 2.7	25.06	−4.24	20.13	47.78	17 19 9.05

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
July 1	Su	6 37 31.09	10.344	+23 9 59.0	− 9.27	15 45.70	8.66	−3 27.41	−0.488	6 34 3.68
2	Mo	6 41 39.24	10.335	23 6 4.3	10.29	15 45.68	8.66	3 39.00	0.478	6 38 0.24
3	Tu	6 45 47.14	10.324	23 1 45.3	11.30	15 45.67	8.66	3 50.34	0.467	6 41 56.80
4	We	6 49 54.78	10.312	22 57 2.2	12.30	15 45.66	8.66	4 1.42	0.456	6 45 53.35
5	Th	6 54 2.13	10.300	22 51 55.1	13.30	15 45.66	8.66	4 12.22	0.444	6 49 49.91
6	Fr	6 58 9.19	10.288	+22 46 24.1	−14.29	15 45.66	8.66	−4 22.72	−0.431	6 53 46.47
7	Sa	7 2 15.93	10.274	22 40 29.4	15.27	15 45.66	8.66	4 32.90	0.417	6 57 43.02
8	Su	7 6 22.32	10.259	22 34 11.1	16.25	15 45.67	8.66	4 42.74	0.402	7 1 39.58
9	Mo	7 10 28.35	10.243	22 27 29.3	17.23	15 45.68	8.66	4 52.21	0.387	7 5 36.14
10	Tu	7 14 34.00	10.227	22 20 24.2	18.20	15 45.70	8.66	5 1.30	0.371	7 9 32.69
11	We	7 18 39.24	10.210	+22 12 56.0	−19.16	15 45.73	8.66	−5 9.99	−0.354	7 13 29.25
12	Th	7 22 44.07	10.192	22 5 4.8	20.11	15 45.76	8.66	5 18.27	0.336	7 17 25.80
13	Fr	7 26 48.46	10.173	21 56 50.9	21.05	15 45.79	8.66	5 26.10	0.317	7 21 22.36
14	Sa	7 30 52.39	10.154	21 48 14.4	21.99	15 45.83	8.66	5 33.47	0.297	7 25 18.92
15	Su	7 34 55.84	10.134	21 39 15.6	22.91	15 45.88	8.66	5 40.37	0.277	7 29 15.47
16	Mo	7 38 58.80	10.113	+21 29 54.6	−23.83	15 45.94	8.66	−5 46.77	−0.256	7 33 12.03
17	Tu	7 43 1.24	10.091	21 20 11.7	21.74	15 45.99	8.66	5 52.65	0.234	7 37 8.59
18	We	7 47 3.15	10.068	21 10 7.0	25.64	15 46.06	8.66	5 58.00	0.212	7 41 5.14
19	Th	7 51 4.51	10.045	20 59 40.9	26.53	15 46.13	8.66	6 2.81	0.189	7 45 1.70
20	Fr	7 55 5.31	10.022	20 48 53.5	27.41	15 46.20	8.66	6 7.06	0.165	7 48 58.25
21	Sa	7 59 5.55	9.998	+20 37 45.1	−28.28	15 46.28	8.66	−6 10.74	−0.141	7 52 54.81
22	Su	8 3 5.21	9.974	20 26 15.9	29.15	15 46.36	8.66	6 13.84	0.117	7 56 51.36
23	Mo	8 7 4.28	9.949	20 14 26.2	30.00	15 46.45	8.66	6 16.36	0.093	8 0 47.92
24	Tu	8 11 2.76	9.924	20 2 16.2	30.83	15 46.54	8.66	6 18.28	0.068	8 4 44.48
25	We	8 15 0.64	9.899	19 49 46.2	31.66	15 46.63	8.66	6 19.61	0.043	8 8 41.03
26	Th	8 18 57.93	9.875	+19 36 56.4	−32.48	15 46.73	8.67	−6 20.34	−0.018	8 12 37.59
27	Fr	8 22 54.62	9.850	19 23 47.0	33.29	15 46.83	8.67	6 20.48	+0.007	8 16 34.14
28	Sa	8 26 50.71	9.825	19 10 18.3	34.09	15 46.93	8.67	6 20.01	0.032	8 20 30.70
29	Su	8 30 46.21	9.800	18 56 30.7	34.88	15 47.03	8.67	6 18.95	0.056	8 24 27.25
30	Mo	8 34 41.11	9.775	18 42 24.3	35.65	15 47.14	8.67	6 17.30	0.081	8 28 23.81
31	Tu	8 38 35.41	9.750	+18 27 59.4	−36.42	15 47.25	8.67	−6 15.05	+0.106	8 32 20.36
Aug. 1	We	8 42 29.13	9.726	18 13 16.3	37.17	15 47.37	8.67	6 12.21	0.131	8 36 16.92
2	Th	8 46 22.25	9.701	17 58 15.3	37.91	15 47.48	8.67	6 8.78	0.155	8 40 13.47
3	Fr	8 50 14.79	9.677	17 42 56.6	38.64	15 47.60	8.67	6 4.76	0.180	8 44 10.03
4	Sa	8 54 6.74	9.652	17 27 20.6	39.36	15 47.73	8.67	6 0.16	0.204	8 48 6.58
5	Su	8 57 58.10	9.628	+17 11 27.5	−40.06	15 47.86	8.68	−5 54.96	+0.229	8 52 3.14
6	Mo	9 1 48.88	9.604	16 55 17.7	40.75	15 47.99	8.68	5 49.19	0.253	8 55 59.69
7	Tu	9 5 39.08	9.580	16 38 51.4	41.43	15 48.13	8.68	5 42.84	0.277	8 59 56.24
8	We	9 9 28.71	9.556	16 22 8.9	42.10	15 48.27	8.68	5 35.90	0.301	9 3 52.80
9	Th	9 13 17.76	9.532	16 5 10.6	42.76	15 48.41	8.68	5 28.40	0.324	9 7 49.35
10	Fr	9 17 6.23	9.508	+15 47 56.7	−43.40	15 48.56	8.68	−5 20.33	+0.348	9 11 45.91
11	Sa	9 20 54.14	9.485	15 30 27.5	44.03	15 48.72	8.68	5 11.68	0.372	9 15 42.46
12	Su	9 24 41.49	9.461	15 12 43.5	44.65	15 48.88	8.69	5 2.47	0.395	9 19 39.02
13	Mo	9 28 28.27	9.437	14 54 44.8	45.25	15 49.05	8.69	4 52.70	0.419	9 23 35.57
14	Tu	9 32 14.49	9.414	14 36 31.9	45.83	15 49.22	8.69	4 42.37	0.442	9 27 32.12
15	We	9 36 0.16	9.391	+14 18 5.1	−46.40	15 49.39	8.69	−4 31.48	+0.465	9 31 28.68
16	Th	9 39 45.27	9.368	+13 59 24.6	−46.96	15 49.57	8.69	−4 20.04	+0.488	9 35 25.23

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
July 1	182	98 37 22.2	142.95	+0.03	0.007 2001	+ 3.4	24.92	−4.27	20.13	47.77	17 23 4.96
2	183	99 34 33.1	142.96	−0.09	0.007 2075	2.7	25.06	4.24	20.13	47.78	17 19 9.05
3	184	100 31 44.1	142.96	0.21	0.007 2132	2.0	25.20	4.22	20.13	47.79	17 15 13.14
4	185	101 28 55.3	142.97	0.33	0.007 2171	1.3	25.34	4.20	20.13	47.79	17 11 17.23
5	186	102 26 6.8	142.99	0.46	0.007 2192	+ 0.4	25.47	4.18	20.13	47.80	17 7 21.32
6	187	103 23 18.6	143.00	−0.58	0.007 2192	− 0.4	25.61	−4.16	20.13	47.81	17 3 25.41
7	188	104 20 30.7	143.01	0.68	0.007 2171	1.3	25.75	4.14	20.13	47.82	16 59 29.50
8	189	105 17 43.2	143.02	0.75	0.007 2128	2.2	25.89	4.12	20.13	47.83	16 55 33.59
9	190	106 14 55.9	143.04	0.80	0.007 2063	3.2	26.02	4.10	20.13	47.84	16 51 37.68
10	191	107 12 9.1	143.06	0.83	0.007 1973	4.2	26.16	4.09	20.13	47.85	16 47 41.77
11	192	108 9 22.6	143.07	−0.83	0.007 1860	− 5.2	26.30	−4.07	20.13	47.86	16 43 45.86
12	193	109 6 36.4	143.08	0.81	0.007 1721	6.3	26.44	4.06	20.13	47.88	16 39 49.95
13	194	110 3 50.6	143.10	0.75	0.007 1556	7.4	26.58	4.04	20.13	47.89	16 35 54.04
14	195	111 1 5.2	143.11	0.66	0.007 1365	8.5	26.71	4.03	20.13	47.90	16 31 58.13
15	196	111 58 20.0	143.12	0.56	0.007 1148	9.6	26.85	4.01	20.13	47.91	16 28 2.22
16	197	112 55 35.0	143.13	−0.45	0.007 0905	−10.7	26.99	−4.00	20.13	47.93	16 24 6.31
17	198	113 52 50.3	143.14	0.32	0.007 0636	11.7	27.13	3.99	20.13	47.95	16 20 10.40
18	199	114 50 5.8	143.15	0.19	0.007 0343	12.7	27.26	3.98	20.14	47.96	16 16 14.49
19	200	115 47 21.5	143.16	−0.06	0.007 0026	13.7	27.40	3.97	20.14	47.97	16 12 18.58
20	201	116 44 37.3	143.16	+0.06	0.006 9687	14.5	27.54	3.97	20.14	47.99	16 8 22.67
21	202	117 41 53.4	143.17	+0.16	0.006 9328	−15.4	27.68	−3.96	20.14	48.01	16 4 26.76
22	203	118 39 9.7	143.18	0.23	0.006 8949	16.2	27.81	3.95	20.14	48.02	16 0 30.85
23	204	119 36 26.2	143.20	0.27	0.006 8552	16.9	27.95	3.95	20.14	48.04	15 56 34.94
24	205	120 33 43.1	143.21	0.28	0.006 8140	17.5	28.09	3.95	20.15	48.06	15 52 39.03
25	206	121 31 0.4	143.23	0.26	0.006 7712	18.1	28.23	3.94	20.15	48.07	15 48 43.12
26	207	122 28 18.2	143.25	+0.20	0.006 7271	−18.7	28.36	−3.94	20.15	48.09	15 44 47.21
27	208	123 25 36.6	143.28	+0.11	0.006 6816	19.2	28.50	3.94	20.15	48.11	15 40 51.30
28	209	124 22 55.7	143.31	0.00	0.006 6348	19.8	28.64	3.95	20.15	48.13	15 36 55.39
29	210	125 20 15.6	143.35	−0.12	0.006 5867	20.3	28.78	3.95	20.16	48.15	15 32 59.48
30	211	126 17 36.4	143.39	0.25	0.006 5372	20.9	28.91	3.95	20.16	48.16	15 29 3.57
31	212	127 14 58.1	143.43	−0.37	0.006 4864	−21.5	29.05	−3.96	20.16	48.18	15 25 7.66
Aug. 1	213	128 12 20.9	143.47	0.50	0.006 4342	22.1	29.19	3.96	20.16	48.20	15 21 11.75
2	214	129 9 44.7	143.52	0.63	0.006 3804	22.8	29.33	3.97	20.17	48.22	15 17 15.84
3	215	130 7 9.7	143.57	0.73	0.006 3249	23.5	29.46	3.98	20.17	48.24	15 13 19.94
4	216	131 4 35.9	143.62	0.81	0.006 2678	24.2	29.60	3.99	20.17	48.26	15 9 24.03
5	217	132 2 3.3	143.67	−0.87	0.006 2089	−24.9	29.74	−4.01	20.17	48.28	15 5 28.12
6	218	132 59 31.9	143.72	0.91	0.006 1481	25.7	29.88	4.02	20.18	48.30	15 1 32.21
7	219	133 57 1.8	143.77	0.92	0.006 0854	26.6	30.02	4.04	20.18	48.32	14 57 36.30
8	220	134 54 33.0	143.82	0.89	0.006 0206	27.4	30.15	4.05	20.18	48.34	14 53 40.39
9	221	135 52 5.4	143.88	0.83	0.005 9538	28.3	30.29	4.07	20.19	48.36	14 49 44.48
10	222	136 49 39.2	143.93	−0.75	0.005 8847	−29.2	30.43	−4.09	20.19	48.38	14 45 48.58
11	223	137 47 14.2	143.98	0.66	0.005 8134	30.2	30.57	4.11	20.19	48.40	14 41 52.67
12	224	138 44 50.4	144.03	0.55	0.005 7399	31.1	30.70	4.13	20.20	48.42	14 37 56.76
13	225	139 42 27.8	144.08	0.41	0.005 6640	32.1	30.84	4.16	20.20	48.44	14 34 0.85
14	226	140 40 6.4	144.13	0.26	0.005 5858	33.0	30.98	4.18	20.20	48.46	14 30 4.94
15	227	141 37 46.0	144.17	−0.13	0.005 5055	−33.9	31.12	−4.21	20.21	48.48	14 26 9.04
16	228	142 35 26.7	144.22	−0.01	0.005 4230	−34.8	31.25	−4.23	20.21	48.50	14 22 13.13

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App. − Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Aug. 16	Th	9 39 45.27	9.368	+13 59 24.6	−46.96	15 49.57	8.69	− 4 20.04	+0.488	9 35 25.23
17	Fr	9 43 29.84	9.316	13 40 30.8	47.51	15 49.76	8.69	4 8.05	0.511	9 39 21.78
18	Sa	9 47 13.87	9.323	13 21 24.1	48.05	15 49.95	8.69	3 55.53	0.533	9 43 18.34
19	Su	9 50 57.37	9.302	13 2 4.7	48.57	15 50.14	8.70	3 42.48	0.555	9 47 14.89
20	Mo	9 54 40.36	9.281	12 42 33.0	49.08	15 50.33	8.70	3 28.91	0.576	9 51 11.44
21	Tu	9 58 22.84	9.260	+12 22 49.2	−49.57	15 50.53	8.70	− 3 14.84	+0.597	9 55 8.00
22	We	10 2 4.83	9.240	12 2 53.8	50.05	15 50.73	8.70	3 0.28	0.617	9 59 4.55
23	Th	10 5 46.35	9.220	11 42 46.9	50.52	15 50.94	8.70	2 45.24	0.636	10 3 1.10
24	Fr	10 9 27.41	9.202	11 22 29.0	50.98	15 51.14	8.71	2 29.75	0.655	10 6 57.66
25	Sa	10 13 8.03	9.184	11 2 0.2	51.42	15 51.35	8.71	2 13.82	0.673	10 10 54.21
26	Su	10 16 48.23	9.166	+10 41 21.0	−51.85	15 51.56	8.71	− 1 57.46	+0.690	10 14 50.76
27	Mo	10 20 28.02	9.150	10 20 31.7	52.26	15 51.77	8.71	1 40.70	0.706	10 18 47.32
28	Tu	10 24 7.43	9.134	9 59 32.4	52.67	15 51.98	8.71	1 23.56	0.722	10 22 43.87
29	We	10 27 46.47	9.119	9 38 23.6	53.06	15 52.20	8.72	1 6.05	0.737	10 26 40.42
30	Th	10 31 25.17	9.105	9 17 5.5	53.41	15 52.41	8.72	0 48.19	0.751	10 30 36.98
31	Fr	10 35 3.53	9.092	+ 8 55 38.5	−53.81	15 52.63	8.72	− 0 30.00	+0.764	10 34 33.53
Sept. 1	Sa	10 38 41.58	9.079	8 34 2.8	54.16	15 52.85	8.72	− 0 11.50	0.777	10 38 30.08
2	Su	10 42 19.34	9.067	8 12 18.9	54.50	15 53.07	8.72	+ 0 7.29	0.789	10 42 26.63
3	Mo	10 45 56.82	9.056	7 50 26.9	54.83	15 53.30	8.73	0 26.37	0.800	10 46 23.18
4	Tu	10 49 34.04	9.046	7 28 27.2	55.14	15 53.53	8.73	0 45.70	0.810	10 50 19.74
5	We	10 53 11.02	9.036	+ 7 6 20.2	−55.44	15 53.76	8.73	+ 1 5.27	+0.820	10 54 16.29
6	Th	10 56 47.77	9.027	6 44 6.2	55.73	15 53.99	8.73	1 25.07	0.829	10 58 12.84
7	Fr	11 0 24.32	9.019	6 21 45.5	56.00	15 54.23	8.73	1 45.07	0.838	11 2 9.39
8	Sa	11 4 0.68	9.011	5 59 18.4	56.26	15 54.47	8.74	2 5.27	0.845	11 6 5.95
9	Su	11 7 36.86	9.004	5 36 45.2	56.50	15 54.71	8.74	2 25.64	0.852	11 10 2.50
10	Mo	11 11 12.88	8.998	+ 5 14 6.4	−56.73	15 54.95	8.74	+ 2 46.17	+0.859	11 13 59.05
11	Tu	11 14 48.75	8.992	4 51 22.2	56.95	15 55.20	8.74	3 6.85	0.865	11 17 55.60
12	We	11 18 24.49	8.987	4 28 33.1	57.15	15 55.46	8.75	3 27.66	0.870	11 21 52.15
13	Th	11 22 0.11	8.982	4 5 39.3	57.33	15 55.71	8.75	3 48.59	0.875	11 25 48.71
14	Fr	11 25 35.63	8.978	3 42 41.2	57.50	15 55.97	8.75	4 9.63	0.878	11 29 45.26
15	Sa	11 29 11.06	8.975	+ 3 19 39.2	−57.66	15 56.24	8.75	+ 4 30.75	+0.882	11 33 41.81
16	Su	11 32 46.42	8.972	2 56 33.5	57.80	15 56.50	8.75	4 51.95	0.884	11 37 38.36
17	Mo	11 36 21.72	8.970	2 33 24.6	57.93	15 56.77	8.76	5 13.19	0.886	11 41 34.91
18	Tu	11 39 57.00	8.969	2 10 12.9	58.05	15 57.04	8.76	5 34.47	0.887	11 45 31.47
19	We	11 43 32.26	8.969	1 46 58.5	58.15	15 57.31	8.76	5 55.76	0.887	11 49 28.02
20	Th	11 47 7.54	8.970	+ 1 23 41.8	−58.24	15 57.58	8.76	+ 6 17.03	+0.886	11 53 24.57
21	Fr	11 50 42.85	8.972	1 0 23.2	58.31	15 57.85	8.77	6 38.27	0.884	11 57 21.12
22	Sa	11 54 18.22	8.975	0 37 3.0	58.37	15 58.12	8.77	6 59.46	0.881	12 1 17.67
23	Su	11 57 53.66	8.979	+ 0 13 41.6	58.42	15 58.39	8.77	7 20.56	0.877	12 5 14.22
24	Mo	12 1 29.21	8.984	− 0 9 40.9	58.45	15 58.66	8.77	7 41.56	0.872	12 9 10.78
25	Tu	12 5 4.89	8.990	− 0 33 3.9	−58.47	15 58.93	8.78	+ 8 2.43	+0.867	12 13 7.33
26	We	12 8 40.73	8.997	0 56 27.3	58.48	15 59.21	8.78	8 23.15	0.860	12 17 3.88
27	Th	12 12 16.74	9.005	1 19 50.6	58.47	15 59.48	8.78	8 43.70	0.852	12 21 0.43
28	Fr	12 15 52.95	9.013	1 43 13.6	58.45	15 59.75	8.78	9 4.04	0.843	12 24 56.98
29	Sa	12 19 29.38	9.023	2 6 35.9	58.41	16 0.02	8.79	9 24.16	0.833	12 28 53.54
30	Su	12 23 6.05	9.034	− 2 29 57.2	−58.36	16 0.29	8.79	+ 9 44.03	+0.823	12 32 50.09
Oct. 1	Mo	12 26 43.00	9.045	− 2 53 17.1	−58.30	16 0.56	8.79	+10 3.64	+0.811	12 36 46.64

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Aug. 16	228	142 35 26.7	144.22	−0.01	0.005 4230	−34.8	31.25	−4.23	20.21	48.50	14 22 13.13
17	229	143 33 8.5	144.26	+0.10	0.005 3385	35.6	31.39	4.26	20.22	48.52	14 18 17.22
18	230	144 30 51.3	144.30	0.18	0.005 2522	36.3	31.53	4.29	20.22	48.53	14 14 21.31
19	231	145 28 35.1	144.35	0.24	0.005 1643	36.9	31.67	4.33	20.22	48.55	14 10 25.41
20	232	146 26 19.9	144.39	0.26	0.005 0749	37.5	31.80	4.36	20.23	48.57	14 6 29.50
21	233	147 24 5.9	144.44	+0.24	0.004 9842	−38.0	31.94	−4.39	20.23	48.59	14 2 33.59
22	234	148 21 53.0	144.49	0.19	0.004 8923	38.5	32.08	4.43	20.24	48.61	13 58 37.68
23	235	149 19 41.3	144.54	0.11	0.004 7993	38.9	32.22	4.46	20.24	48.63	13 54 41.78
24	236	150 17 31.0	144.60	+0.01	0.004 7055	39.3	32.35	4.50	20.24	48.64	13 50 45.87
25	237	151 15 22.0	144.66	−0.11	0.004 6107	39.6	32.49	4.54	20.25	48.66	13 46 49.96
26	238	152 13 14.4	144.72	−0.24	0.004 5152	−40.0	32.63	−4.58	20.25	48.68	13 42 54.06
27	239	153 11 8.4	144.78	0.37	0.004 4189	40.3	32.77	4.62	20.26	48.69	13 38 58.15
28	240	154 9 4.0	144.85	0.50	0.004 3219	40.6	32.91	4.67	20.26	48.71	13 35 2.24
29	241	155 7 1.3	144.92	0.62	0.004 2240	40.9	33.04	4.71	20.27	48.73	13 31 6.34
30	242	156 5 0.3	145.00	0.73	0.004 1254	41.3	33.18	4.76	20.27	48.74	13 27 10.43
31	243	157 3 1.2	145.07	−0.82	0.004 0258	−41.7	33.32	−4.80	20.28	48.76	13 23 14.52
Sept. 1	244	158 1 3.9	145.15	0.89	0.003 9253	42.1	33.46	4.85	20.28	48.77	13 19 18.62
2	245	158 59 8.5	145.23	0.93	0.003 8239	42.5	33.59	4.90	20.28	48.79	13 15 22.71
3	246	159 57 15.0	145.31	0.94	0.003 7213	43.0	33.73	4.95	20.29	48.80	13 11 26.80
4	247	160 55 23.5	145.40	0.93	0.003 6176	43.4	33.87	5.00	20.29	48.81	13 7 30.90
5	248	161 53 34.0	145.48	−0.89	0.003 5128	−43.9	34.01	−5.05	20.30	48.83	13 3 34.99
6	249	162 51 46.4	145.56	0.82	0.003 4067	44.5	34.14	5.10	20.30	48.84	12 59 39.08
7	250	163 50 0.9	145.65	0.72	0.003 2992	45.1	34.28	5.15	20.31	48.85	12 55 43.18
8	251	164 48 17.4	145.73	0.60	0.003 1903	45.7	34.42	5.20	20.31	48.86	12 51 47.27
9	252	165 46 35.7	145.80	0.47	0.003 0798	46.4	34.56	5.26	20.32	48.87	12 47 51.36
10	253	166 44 56.0	145.88	−0.33	0.002 9678	−47.0	34.69	−5.31	20.32	48.88	12 43 55.46
11	254	167 43 18.2	145.96	0.19	0.002 8542	47.7	34.83	5.37	20.33	48.89	12 39 59.55
12	255	168 41 42.1	146.03	−0.05	0.002 7390	48.3	34.97	5.42	20.34	48.90	12 36 3.65
13	256	169 40 7.8	146.10	+0.07	0.002 6224	48.9	35.11	5.48	20.34	48.91	12 32 7.74
14	257	170 38 35.1	146.17	0.16	0.002 5044	49.4	35.24	5.54	20.35	48.92	12 28 11.83
15	258	171 37 4.1	146.24	+0.22	0.002 3852	−49.9	35.38	−5.60	20.35	48.93	12 24 15.93
16	259	172 35 34.6	146.31	0.25	0.002 2649	50.3	35.52	5.65	20.36	48.93	12 20 20.02
17	260	173 34 6.8	146.38	0.25	0.002 1437	50.6	35.66	5.71	20.36	48.94	12 16 24.12
18	261	174 32 40.6	146.44	0.21	0.002 0219	50.9	35.80	5.77	20.37	48.94	12 12 28.21
19	262	175 31 16.0	146.51	0.15	0.001 8995	51.1	35.93	5.83	20.37	48.95	12 8 32.30
20	263	176 29 53 1	146.58	+0.06	0.001 7767	−51.2	36.07	−5.89	20.38	48.95	12 4 36.40
21	264	177 28 31.9	146.65	−0.05	0.001 6537	51.3	36.21	5.95	20.39	48.96	12 0 40.49
22	265	178 27 12.5	146 73	0.17	0.001 5307	51.3	36.35	6.01	20.39	48.96	11 56 44.59
23	266	179 25 54.9	146.81	0.30	0.001 4076	51.3	36.48	6.07	20.40	48.96	11 52 48.68
24	267	180 24 39.3	146.89	0.43	0.001 2845	51.2	36.62	6.13	20.40	48.96	11 48 52.78
25	268	181 23 25.6	146.97	−0.55	0.001 1616	−51.2	36.76	−6.18	20.41	48.96	11 44 56.87
26	269	182 22 13.9	147.06	0.66	0.001 0388	51.1	36.90	6.24	20.42	48.97	11 41 0.96
27	270	183 21 4.3	147.14	0.75	0.000 9161	51.1	37.03	6.30	20.42	48.97	11 37 5.06
28	271	184 19 56.8	147.23	0.82	0.000 7936	51.0	37.17	6.36	20.43	48.96	11 33 9.15
29	272	185 18 51.5	147.33	0.87	0.000 6711	51.0	37.31	6.42	20.43	48.96	11 29 13.25
30	273	186 17 48.5	147.42	−0.88	0.000 5488	−51.0	37.45	−6.48	20.44	48.96	11 25 17.34
Oct. 1	274	187 16 47.7	147.51	−0.87	0.000 4265	−51.0	37.58	−6.54	20.44	48.96	11 21 21.43

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Oct. 1	Mo	12 26 43.00	9.045	− 2 53 17.1	−58.30	16 0.56	8.79	+10 3.64	+0.811	12 36 46.64
2	Tu	12 30 20.23	9.057	3 16 35.3	58.22	16 0.83	8.79	10 22.96	0.799	12 40 43.19
3	We	12 33 57.77	9.071	3 39 51.5	58.13	16 1.10	8.80	10 41.97	0.785	12 44 39.74
4	Th	12 37 35.65	9.086	4 3 5.2	58.02	16 1.37	8.80	11 0.64	0.771	12 48 36.29
5	Fr	12 41 13.88	9.101	4 26 16.2	57.89	16 1.64	8.80	11 18.97	0.756	12 52 32.84
6	Sa	12 44 52.48	9.116	− 4 49 24.0	−57.76	16 1.91	8.80	+11 36.92	+0.740	12 56 29.40
7	Su	12 48 31.47	9.133	5 12 28.4	57.61	16 2.19	8.81	11 54.48	0.723	13 0 25.95
8	Mo	12 52 10.86	9.150	5 35 28.9	57.44	16 2.46	8.81	12 11.64	0.706	13 4 22.50
9	Tu	12 55 50.68	9.168	5 58 25.1	57.25	16 2.74	8.81	12 28.37	0.688	13 8 19.05
10	We	12 59 30.94	9.187	6 21 16.7	57.05	16 3.02	8.81	12 44.67	0.670	13 12 15.61
11	Th	13 3 11.64	9.206	− 6 44 3.3	−56.83	16 3.30	8.82	+13 0.51	+0.651	13 16 12.16
12	Fr	13 6 52.82	9.226	7 6 44.5	56.60	16 3.58	8.82	13 15.89	0.631	13 20 8.71
13	Sa	13 10 34.47	9.246	7 29 19.8	56.35	16 3.86	8.82	13 30.79	0.611	13 24 5.26
14	Su	13 14 16.62	9.267	7 51 48.9	56.08	16 4.14	8.82	13 45.20	0.590	13 28 1.82
15	Mo	13 17 59.27	9.288	8 14 11.4	55.79	16 4.42	8.83	13 59.09	0.568	13 31 58.37
16	Tu	13 21 42.46	9.310	− 8 36 26.9	−55.49	16 4.70	8.83	+14 12.46	+0.546	13 35 54.92
17	We	13 25 26.18	9.333	8 58 35.0	55.18	16 4.98	8.83	14 25.29	0.523	13 39 51.47
18	Th	13 29 10.47	9.358	9 20 35.3	54.85	16 5.26	8.83	14 37.55	0.499	13 43 48.02
19	Fr	13 32 55.35	9.382	9 42 27.4	54.50	16 5.54	8.84	14 49.23	0.474	13 47 44.58
20	Sa	13 36 40.82	9.407	10 4 11.1	54.14	16 5.82	8.84	15 0.31	0.449	13 51 41.13
21	Su	13 40 26.91	9.434	−10 25 45.8	−53.75	16 6.09	8.84	+15 10.78	+0.423	13 55 37.68
22	Mo	13 44 13.64	9.461	10 47 11.2	53.36	16 6.36	8.84	15 20.60	0.395	13 59 34.24
23	Tu	13 48 1.03	9.488	11 8 26.9	52.95	16 6.63	8.85	15 29.76	0.368	14 3 30.79
24	We	13 51 49.09	9.517	11 29 32.6	52.52	16 6.90	8.85	15 38.26	0.340	14 7 27.34
25	Th	13 55 37.84	9.546	11 50 27.9	52.08	16 7.17	8.85	15 46.06	0.310	14 11 23.90
26	Fr	13 59 27.31	9.576	−12 11 12.3	−51.62	16 7.43	8.85	+15 53.14	+0.280	14 15 20.45
27	Sa	14 3 17.50	9.607	12 31 45.5	51.14	16 7.69	8.86	15 59.50	0.250	14 19 17.00
28	Su	14 7 8.44	9.638	12 52 7.1	50.65	16 7.95	8.86	16 5.12	0.218	14 23 13.56
29	Mo	14 11 0.13	9.670	13 12 16.7	50.15	16 8.20	8.86	16 9.98	0.186	14 27 10.11
30	Tu	14 14 52.60	9.703	13 32 14.0	49.62	16 8.45	8.86	16 14.06	0.154	14 31 6.66
31	We	14 18 45.86	9.736	−13 51 58.4	−49.08	16 8.70	8.87	+16 17.36	+0.121	14 35 3.22
Nov 1	Th	14 22 39.91	9.769	14 11 29.7	48.53	16 8.95	8.87	16 19.86	0.087	14 38 59.77
2	Fr	14 26 34.78	9.803	14 30 47.5	47.95	16 9.20	8.87	16 21.54	0.053	14 42 56.32
3	Sa	14 30 30.47	9.837	14 49 51.3	47.36	16 9.44	8.87	16 22.41	+0.019	14 46 52.88
4	Su	14 34 26.98	9.872	15 8 40.6	46.75	16 9.68	8.87	16 22.45	−0.016	14 50 49.43
5	Mo	14 38 24.33	9.907	−15 27 15.2	−46.13	16 9.92	8.88	+16 21.65	−0.051	14 54 45.99
6	Tu	14 42 22.53	9.942	15 45 34.6	45.49	16 10.16	8.88	16 20.02	0.086	14 58 42.54
7	We	14 46 21.56	9.977	16 3 38.4	44.83	16 10.39	8.88	16 17.54	0.121	15 2 39.10
8	Th	14 50 21.43	10.012	16 21 26.1	44.15	16 10.63	8.88	16 14.21	0.156	15 6 35.65
9	Fr	14 54 22.15	10.048	16 38 57.4	43.46	16 10.87	8.89	16 10.05	0.191	15 10 32.20
10	Sa	14 58 23.71	10.083	−16 56 11.8	−42.74	16 11.10	8.89	+16 5.05	−0.226	15 14 28.76
11	Su	15 2 26.11	10.117	17 13 8.8	42.01	16 11.33	8.89	15 59.21	0.261	15 18 25.31
12	Mo	15 6 29.34	10.152	17 29 48.1	41.26	16 11.56	8.89	15 52.53	0.295	15 22 21.87
13	Tu	15 10 33.40	10.186	17 46 9.2	40.50	16 11.79	8.89	15 45.03	0.330	15 26 18.42
14	We	15 14 38.29	10.221	18 2 11.8	39.72	16 12.02	8.90	15 36.69	0.365	15 30 14.98
15	Th	15 18 44.01	10.256	−18 17 55.4	−38.92	16 12.24	8.90	+15 27.52	−0.399	15 34 11.53
16	Fr	15 22 50.56	10.290	−18 33 19.7	−38.10	16 12.46	8.90	+15 17.53	−0.434	15 38 8.09

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Oct. 1	274	187 16 47.7	147.51	−0.87	0.000 4265	−51.0	37.58	−6.54	20.44	48.96	11 21 21.43
2	275	188 15 49.2	147.61	0.84	0.000 3041	51.0	37.72	6.60	20.45	48.95	11 17 25.53
3	276	189 14 52.9	147.70	0.78	0.000 1817	51.0	37.86	6.65	20.46	48.95	11 13 29.62
4	277	190 13 59.0	147.80	0.69	0.000 0592	51.1	38.00	6.71	20.46	48.95	11 9 33.72
5	278	191 13 7.5	147.90	0.58	9.999 9364	51.2	38.13	6.77	20.47	48.94	11 5 37.81
6	279	192 12 18.2	148.00	−0.45	9.999 8133	−51.4	38.27	−6.82	20.47	48.93	11 1 41.90
7	280	193 11 31.3	148.09	0.31	9.999 6897	51.6	38.41	6.88	20.48	48.93	10 57 46.00
8	281	194 10 46.6	148.18	0.17	9.999 5657	51.8	38.55	6.93	20.48	48.92	10 53 50.09
9	282	195 10 4.1	148.27	−0.04	9.999 4412	52.0	38.68	6.99	20.49	48.91	10 49 54.18
10	283	196 9 23.7	148.36	+0.08	9.999 3160	52.2	38.82	7.04	20.50	48.90	10 45 58.28
11	284	197 8 45.3	148.44	+0.19	9.999 1904	−52.5	38.96	−7.09	20.50	48.90	10 42 2.37
12	285	198 8 8.9	148.52	0.27	9.999 0642	52.7	39.10	7.14	20.51	48.89	10 38 6.47
13	286	199 7 34.4	148.60	0.31	9.998 9376	52.8	39.24	7.19	20.51	48.88	10 34 10.56
14	287	200 7 1.7	148.67	0.32	9.998 8108	52.8	39.37	7.24	20.52	48.86	10 30 14.65
15	288	201 6 30.7	148.75	0.29	9.998 6840	52.8	39.51	7.29	20.53	48.85	10 26 18.75
16	289	202 6 1.5	148.82	+0.24	9.998 5572	−52.7	39.65	−7.34	20.53	48.84	10 22 22.84
17	290	203 5 34.0	148.89	0.16	9.998 4308	52.6	39.79	7.38	20.54	48.83	10 18 26.93
18	291	204 5 8.3	148.96	+0.06	9.998 3048	52.3	39.92	7.43	20.54	48.82	10 14 31.03
19	292	205 4 44.3	149.04	−0.06	9.998 1795	52.0	40.06	7.47	20.55	48.80	10 10 35.12
20	293	206 4 22.1	149.11	0.19	9.998 0550	51.7	40.20	7.51	20.56	48.79	10 6 39.21
21	294	207 4 1.7	149.19	−0.31	9.997 9314	−51.3	40.34	−7.55	20.56	48.78	10 2 43.31
22	295	208 3 43.1	149.27	0.43	9.997 8088	50.9	40.47	7.59	20.57	48.76	9 58 47.40
23	296	209 3 26.4	149.35	0.54	9.997 6873	50.4	40.61	7.63	20.57	48.75	9 54 51.49
24	297	210 3 11.7	149.43	0.63	9.997 5669	49.9	40.75	7.67	20.58	48.73	9 50 55.58
25	298	211 2 58.9	149.51	0.70	9.997 4477	49.4	40.89	7.71	20.58	48.72	9 46 59.68
26	299	212 2 48.1	149.59	−0.75	9.997 3298	−48.9	41.02	−7.74	20.59	48.70	9 43 3.77
27	300	213 2 39.4	149.68	0.77	9.997 2131	48.4	41.16	7.77	20.60	48.69	9 39 7.86
28	301	214 2 32.8	149.77	0.77	9.997 0976	47.9	41.30	7.81	20.60	48.67	9 35 11.96
29	302	215 2 28.2	149.85	0.74	9.996 9834	47.4	41.44	7.84	20.61	48.65	9 31 16.05
30	303	216 2 25.8	149.94	0.68	9.996 8703	46.9	41.57	7.86	20.61	48.64	9 27 20.14
31	304	217 2 25.5	150.03	−0.59	9.996 7584	−46.4	41.71	−7.89	20.62	48.62	9 23 24.23
Nov. 1	305	218 2 27.4	150.12	0.49	9.996 6476	46.0	41.85	7.92	20.62	48.60	9 19 28.32
2	306	219 2 31.4	150.21	0.37	9.996 5377	45.6	41.99	7.94	20.63	48.59	9 15 32.42
3	307	220 2 37.6	150.30	0.24	9.996 4288	45.2	42.13	7.96	20.63	48.57	9 11 36.51
4	308	221 2 46.0	150.39	−0.11	9.996 3207	44.9	42.26	7.98	20.64	48.55	9 7 40.60
5	309	222 2 56.4	150.48	+0.02	9.996 2133	−44.6	42.40	−8.00	20.64	48.54	9 3 44.69
6	310	223 3 8.9	150.56	0.15	9.996 1065	44.4	42.54	8.02	20.65	48.52	8 59 48.78
7	311	224 3 23.4	150.64	0.25	9.996 0003	44.2	42.68	8.04	20.65	48.50	8 55 52.87
8	312	225 3 39.7	150.72	0.33	9.995 8946	44.0	42.81	8.05	20.66	48.48	8 51 56.97
9	313	226 3 57.8	150.79	0.38	9.995 7893	43.8	42.95	8.06	20.66	48.46	8 48 1.06
10	314	227 4 17.6	150.86	+0.40	9.995 6846	−43.5	43.09	−8.07	20.67	48.45	8 44 5.15
11	315	228 4 38.9	150.92	0.39	9.995 5805	43.2	43.23	8.08	20.67	48.43	8 40 9.24
12	316	229 5 1.8	150.98	0.34	9.995 4772	42.9	43.36	8.09	20.68	48.41	8 36 13.33
13	317	230 5 26.0	151.04	0.26	9.995 3748	42.4	43.50	8.10	20.68	48.39	8 32 17.42
14	318	231 5 51.7	151.10	0.16	9.995 2736	41.9	43.64	8.10	20.69	43.38	8 28 21.51
15	319	232 6 18.6	151.15	+0.05	9.995 1736	−41.3	43.78	−8.10	20.69	48.36	8 24 25.60
16	320	233 6 46.9	151.21	−0.07	9.995 0751	−40.7	43.91	−8.11	20.70	48.34	8 20 29.69

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Nov. 16	Fr	15 22 50.56	10.290	−18 33 19.7	−38.10	16 12.46	8.90	+15 17.53	−0.434	15 38 8.09
17	Sa	15 26 57.93	10.324	18 48 24.2	37.27	16 12.68	8.90	15 6.71	0.468	15 42 4.64
18	Su	15 31 6.12	10.359	19 3 8.6	36.13	16 12.89	8.90	14 55.08	0.502	15 46 1.20
19	Mo	15 35 15.14	10.393	19 17 32.5	35.57	16 13.10	8.91	14 42.62	0.536	15 49 57.76
20	Tu	15 39 24.96	10.426	19 31 35.6	34.69	16 13.31	8.91	14 29.35	0.570	15 53 54.31
21	We	15 43 35.60	10.460	−19 45 17.4	−33.80	16 13.51	8.91	+14 15.27	−0.601	15 57 50.87
22	Th	15 47 47.04	10.493	19 58 37.7	32.89	16 13.70	8.91	14 0.38	0.637	16 1 47.42
23	Fr	15 51 59.27	10.526	20 11 36.0	31.97	16 13.89	8.91	13 44.70	0.670	16 5 43.98
24	Sa	15 56 12.30	10.559	20 24 12.0	31.03	16 14.08	8.92	13 28.24	0.702	16 9 40.53
25	Su	16 0 26.10	10.591	20 36 25.4	30.08	16 14.26	8.92	13 10.99	0.735	16 13 37.09
26	Mo	16 4 40.68	10 623	−20 48 15.9	−29.12	16 14.44	8.92	+12 52.97	−0.767	16 17 33.65
27	Tu	16 8 56.02	10.655	20 59 43.0	28.14	16 14.61	8.92	12 34.19	0.798	16 21 30.20
28	We	16 13 12.10	10.686	21 10 46.6	27.15	16 14.78	8.92	12 14.66	0.829	16 25 26.76
29	Th	16 17 28.92	10.716	21 21 26.2	26 15	16 14.94	8.92	11 54.40	0 859	16 29 23.32
30	Fr	16 21 46.45	10.745	21 31 41.6	25.13	16 15.09	8.92	11 33.42	0.889	16 33 19.87
Dec. 1	Sa	16 26 4.69	10.771	−21 41 32.5	−24.11	16 15.25	8.93	+11 11.74	−0.918	16 37 16.43
2	Su	16 30 23.60	10.802	21 50 58.6	23.07	16 15.40	8.93	10 49.38	0.946	16 41 12.98
3	Mo	16 34 43.18	10.829	21 59 59.6	22.01	16 15.55	8.93	10 26.36	0.973	16 45 9.54
4	Tu	16 39 3.39	10.855	22 8 35.2	20.95	16 15.69	8.93	10 2.70	0.999	16 49 6.10
5	We	16 43 24.22	10.880	22 16 45.2	19.88	16 15.83	8.93	9 38.43	1.023	16 53 2.66
6	Th	16 47 45.63	10.904	−22 24 29.3	−18.79	16 15.96	8.93	+ 9 13.58	−1.047	16 56 59.21
7	Fr	16 52 7.60	10.926	22 31 47.2	17.70	16 16.09	8.93	8 48.17	1.070	17 0 55.77
8	Sa	13 56 30.08	10.947	22 38 38.7	16.59	16 16.22	8.93	8 22.25	1.091	17 4 52.33
9	Su	17 0 53.05	10.967	22 45 3.6	15.18	16 16.34	8.94	7 55.83	1.110	17 8 48.88
10	Mo	17 5 16.48	10.985	22 51 1.7	14.36	16 16.46	8.94	7 28.96	1.128	17 12 45.44
11	Tu	17 9 40.33	11 002	−22 56 32.7	−13.23	16 16.58	8.94	+ 7 1.67	−1.145	17 16 42.00
12	We	17 14 4.57	11.018	23 1 36.5	12.09	16 16.70	8.94	6 33.99	1.161	17 20 38.55
13	Th	17 18 29.16	11.032	23 6 12.9	10.94	16 16.81	8.94	6 5.95	1.175	17 24 35.11
14	Fr	17 22 54.08	11.045	23 10 21.7	9.79	16 16.92	8.94	5 37.59	1.188	17 28 31.67
15	Sa	17 27 19.29	11.056	23 14 2.9	8.64	16 17.02	8.94	5 8.94	1.199	17 32 28.23
16	Su	17 31 44.76	11.066	−23 17 16.2	− 7.47	16 17.12	8.94	+ 4 40.03	−1.210	17 36 24.78
17	Mo	17 36 10.45	11.075	23 20 1.6	6.31	16 17.21	8.94	4 10.89	1.219	17 40 21.34
18	Tu	17 40 36.34	11.083	23 22 18.9	5.14	16 17.30	8.94	3 41.55	1.226	17 44 17.90
19	We	17 45 2.40	11.089	23 24 8.1	3.97	16 17.38	8.95	3 12.05	1.232	17 48 14.46
20	Th	17 49 28.60	11.094	23 25 29.2	2.79	16 17.45	8.95	2 42.42	1.237	17 52 11.01
21	Fr	17 53 54.90	11.097	−23 26 22.0	− 1.61	16 17.52	8.95	+ 2 12.68	−1.241	17 56 7.57
22	Sa	17 58 21.26	11.100	23 26 46.6	− 0.44	16 17.59	8.95	1 42.87	1.243	18 0 4.13
23	Su	18 2 47.67	11.101	23 26 42.9	+ 0.74	16 17.64	8.95	1 13.02	1.244	18 4 0.69
24	Mo	18 7 14.09	11.101	23 26 10.9	1.92	16 17.69	8.95	0 43.15	1.244	18 7 57.24
25	Tu	18 11 40.49	11.099	23 25 10.6	3.10	16 17.74	8.95	+ 0 13.31	1.242	18 11 53.80
26	We	18 16 6.84	11.096	−23 23 42.1	+ 4.28	16 17.78	8.95	− 0 16.48	−1.240	18 15 50.36
27	Th	18 20 33.10	11.092	23 21 45.3	5.45	16 17.81	8.95	0 46.19	1.236	18 19 46.92
28	Fr	18 24 59.26	11.087	23 19 20.4	6.62	16 17.84	8.95	1 15.79	1.230	18 23 43.47
29	Sa	18 29 25.27	11.081	23 16 27.4	7.79	16 17.86	8.95	1 45.24	1.224	18 27 40.03
30	Su	18 33 51.12	11.073	23 13 6.4	8.96	16 17.87	8.95	2 14.53	1.216	18 31 36.59
31	Mo	18 38 16.75	11.063	−23 9 17.4	+10.12	16 17.88	8.95	− 2 43.61	−1.207	18 35 33.14
32	Tu	18 42 42.15	11.053	−23 5 0.7	+11.28	16 17.89	8.95	− 3 12.45	−1.196	18 39 29.70

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Nov. 16	320	233 6 46.9	151.21	−0.07	9.995 0751	−40.7	43.91	−8.11	20.70	48.34	8 20 29.69
17	321	234 7 16.5	151.26	0.19	9.994 9782	40.0	44.05	8.11	20.70	48.32	8 16 33.78
18	322	235 7 47.4	151.32	0.31	9.994 8830	39.3	44.19	8.10	20.71	48.31	8 12 37.87
19	323	236 8 19.7	151.37	0.42	9.994 7896	38.5	44.33	8.10	20.71	48.29	8 8 41.96
20	324	237 8 53.2	151.43	0.51	9.994 6982	37.7	44.46	8.09	20.72	48.28	8 4 46.05
21	325	238 9 28.2	151.48	−0.58	9.994 6088	−36.8	44.60	−8.09	20.72	48.26	8 0 50.14
22	326	239 10 4.4	151.54	0.63	9.994 5215	35.9	44.74	8.08	20.72	48.24	7 56 54.24
23	327	240 10 42.1	151.60	0.65	9.994 4364	35.0	44.88	8.07	20.73	48.23	7 52 58.33
24	328	241 11 21.2	151.66	0.65	9.994 3535	34.1	45.02	8.06	20.73	48.21	7 49 2.42
25	329	242 12 1.7	151.72	0.62	9.994 2728	33.1	45.15	8.05	20.74	48.20	7 45 6.50
26	330	243 12 43.7	151.78	−0.57	9.994 1944	−32.2	45.29	−8.03	20.74	48.19	7 41 10.59
27	331	244 13 27.1	151.84	0.49	9.994 1182	31.3	45.43	8.02	20.74	48.17	7 37 14.68
28	332	245 14 12.0	151.90	0.39	9.994 0441	30.4	45.57	8.00	20.75	48.16	7 33 18.77
29	333	246 14 58.4	151.96	0.27	9.993 9722	29.5	45.70	7.98	20.75	48.15	7 29 22.86
30	334	247 15 46.3	152.03	−0.14	9.993 9023	28.7	45.84	7.97	20.75	48.14	7 25 26.95
Dec. 1	335	248 16 35.7	152.09	0.00	9.993 8345	−27.9	45.98	−7.95	20.76	48.12	7 21 31.04
2	336	249 17 26.6	152.15	+0.13	9.993 7685	27.1	46.12	7.92	20.76	48.11	7 17 35.13
3	337	250 18 19.0	152.21	0.26	9.993 7042	26.5	46.25	7.90	20.76	48.10	7 13 39.22
4	338	251 19 12.7	152.26	0.37	9.993 6415	25.8	46.39	7.88	20.77	48.09	7 9 43.31
5	339	252 20 7.7	152.32	0.45	9.993 5803	25.2	46.53	7.86	20.77	48.08	7 5 47.40
6	340	253 21 4.1	152.37	+0.50	9.993 5205	−24.6	46.67	−7.83	20.77	48.07	7 1 51.49
7	341	254 22 1.5	152.41	0.52	9.993 4621	24.1	46.80	7.80	20.77	48.06	6 57 55.58
8	342	255 23 0.0	152.46	0.50	9.993 4050	23.5	46.94	7.78	20.78	48.06	6 53 59.67
9	343	256 23 59.4	152.49	0.46	9.993 3492	23.0	47.08	7.75	20.78	48.05	6 50 3.75
10	344	257 24 59.6	152.52	0.39	9.993 2948	22.4	47.22	7.72	20.78	48.04	6 46 7.84
11	345	258 26 0.5	152.55	+0.29	9.993 2419	−21.7	47.35	−7.69	20.79	48.04	6 42 11.93
12	346	259 27 2.0	152.57	0.18	9.993 1906	21.0	47.49	7.66	20.79	48.03	6 38 16.02
13	347	260 28 4.1	152.60	+0.05	9.993 1411	20.2	47.63	7.63	20.79	48.03	6 34 20.11
14	348	261 29 6.7	152.62	−0.08	9.993 0935	19.4	47.77	7.60	20.79	48.02	6 30 24.20
15	349	262 30 9.7	152.63	0.19	9.993 0479	18.5	47.90	7.57	20.79	48.02	6 26 28.29
16	350	263 31 13.1	152.65	−0.29	9.993 0046	−17.6	48.04	−7.53	20.80	48.02	6 22 32.37
17	351	264 32 17.0	152.67	0.39	9.992 9635	16.6	48.18	7.50	20.80	48.02	6 18 36.46
18	352	265 33 21.2	152.68	0.46	9.992 9248	15.6	48.32	7.47	20.80	48.02	6 14 40.55
19	353	266 34 25.8	152.70	0.51	9.992 8887	14.5	48.46	7.44	20.80	48.02	6 10 44.64
20	354	267 35 30.9	152.72	0.53	9.992 8551	13.4	48.59	7.40	20.80	48.02	6 6 48.73
21	355	268 36 36.3	152.73	−0.53	9.992 8242	−12.3	48.73	−7.37	20.81	48.02	6 2 52.82
22	356	269 37 42.1	152.75	0.50	9.992 7960	11.2	48.87	7.34	20.81	48.02	5 58 56.91
23	357	270 38 48.3	152.77	0.45	9.992 7706	10.0	49.01	7.30	20.81	48.02	5 55 0.99
24	358	271 39 54.9	152.78	0.37	9.992 7480	8.9	49.14	7.27	20.81	48.03	5 51 5.08
25	359	272 41 1.9	152.80	0.27	9.992 7281	7.7	49.28	7.23	20.81	48.03	5 47 9.17
26	360	273 42 9.4	152.82	−0.14	9.992 7110	− 6.5	49.42	−7.20	20.81	48.03	5 43 13.26
27	361	274 43 17.4	152.84	−0.01	9.992 6967	5.4	49.56	7.17	20.81	48.04	5 39 17.35
28	362	275 44 25.8	152.86	+0.13	9.992 6850	4.3	49.69	7.14	20.81	48.05	5 35 21.44
29	363	276 45 34.7	152.88	0.27	9.992 6759	3.3	49.83	7.10	20.81	48.05	5 31 25.52
30	364	277 46 44.1	152.90	0.40	9.992 6692	2.3	49.97	7.07	20.81	48.06	5 27 29.61
31	365	278 47 53.9	152.92	+0.50	9.992 6648	− 1.4	50.11	−7.04	20.81	48.07	5 23 33.70
32	366	279 49 4.2	152.94	+0.58	9.992 6626	− 0.5	50.24	−7.01	20.81	48.08	5 19 37.79

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 1	+0.171 9264	+0.180 5272	+ 60	−0.888 1505	−0.886 7093	+193	−0.385 1962	−0.384 5711	−417
2	0.189 1140	0.197 6861	52	0.885 1994	0.883 6210	191	0.383 9162	0.383 2315	416
3	0.206 2429	0.214 7838	44	0.881 9742	0.880 2592	190	0.382 5172	0.381 7732	414
4	0.223 3081	0.231 8152	36	0.878 4760	0.876 6248	188	0.380 9997	0.380 1966	412
5	0.240 3046	0.248 7756	29	0.874 7056	0.872 7187	186	0.379 3641	0.378 5021	411
6	+0.257 2276	+0.265 6599	+ 21	−0.870 6641	−0.868 5420	+184	−0.377 6107	−0.376 6900	−409
7	0.274 0720	0.282 4631	13	0.866 3524	0.864 0955	181	0.375 7401	0.374 7610	407
8	0.290 8327	0.299 1801	+ 6	0.861 7715	0.859 3804	178	0.373 7527	0.372 7153	405
9	0.307 5046	0.315 8057	− 1	0.856 9224	0.854 3977	174	0.371 6490	0.370 5537	403
10	0.324 0826	0.332 3347	9	0.851 8064	0.849 1486	171	0.369 4296	0.368 2767	401
11	+0.340 5613	+0.348 7618	− 16	−0.846 4246	−0.843 6345	+167	−0.367 0950	−0.365 8847	−399
12	0.356 9354	0.365 0815	23	0.840 7784	0.837 8566	163	0.364 6458	0.363 3785	397
13	0.373 1995	0.381 2886	29	0.834 8693	0.831 8167	158	0.362 0828	0.360 7588	395
14	0.389 3482	0.397 3776	36	0.828 6991	0.825 5166	154	0.359 4067	0.358 0265	393
15	0.405 3761	0.413 3431	43	0.822 2695	0.818 9581	149	0.356 6183	0.355 1823	391
16	+0.421 2778	+0.429 1797	− 49	−0.815 5827	−0.812 1435	+144	−0.353 7185	−0.352 2271	−389
17	0.437 0481	0.444 8823	55	0.808 6409	0.805 0751	138	0.350 7082	0.349 1620	387
18	0.452 6817	0.460 4457	61	0.801 4465	0.797 7553	132	0.347 5885	0.345 9879	384
19	0.468 1736	0.475 8648	66	0.794 0020	0.790 1868	126	0.344 3604	0.342 7061	382
20	0.483 5187	0.491 1347	72	0.786 3100	0.782 3721	120	0.341 0251	0.339 3176	379
21	+0.498 7122	+0.506 2506	− 77	−0.778 3734	−0.774 3142	+114	−0.337 5837	−0.335 8235	−377
22	0.513 7494	0.521 2080	82	0.770 1949	0.766 0158	108	0.334 0373	0.332 2252	375
23	0.528 6257	0.536 0021	87	0.761 7774	0.757 4800	101	0.330 3873	0.328 5238	372
24	0.543 3366	0.550 6286	92	0.753 1239	0.748 7096	94	0.326 6348	0.324 7206	369
25	0.557 8776	0.565 0830	96	0.744 2374	0.739 7077	87	0.322 7813	0.320 8170	367
26	+0.572 2444	+0.579 3612	−101	−0.735 1210	−0.730 4776	+ 80	−0.318 8280	−0.316 8143	−364
27	0.586 4328	0.593 4588	105	0.725 7778	0.721 0221	72	0.314 7761	0.312 7136	362
28	0.600 4387	0.607 3720	108	0.716 2110	0.711 3448	65	0.310 6271	0.308 5166	359
29	0.614 2582	0.621 0969	112	0.706 4239	0.701 4487	57	0.306 3824	0.304 2246	356
30	0.627 8875	0.634 6296	115	0.696 4196	0.691 3370	49	0.302 0433	0.299 8388	353
31	+0.641 3228	+0.647 9665	−118	−0.686 2013	−0.681 0129	+ 41	−0.297 6113	−0.295 3609	−350
Feb. 1	0.654 5604	0.661 1039	121	0.675 7722	0.670 4796	33	0.293 0878	0.290 7921	347
2	0.667 5966	0.674 0381	124	0.665 1354	0.659 7401	25	0.288 4740	0.286 1337	344
3	0.680 4279	0.686 7655	126	0.654 2940	0.648 7975	17	0.283 7714	0.281 3872	341
4	0.693 0506	0.699 2827	128	0.643 2509	0.637 6548	+ 9	0.278 9813	0.276 5539	338
5	+0.705 4612	+0.711 5857	−130	−0.632 0094	−0.626 3152	0	−0.274 1051	−0.271 6352	−335
6	0.717 6557	0.723 6708	132	0.620 5726	0.614 7819	− 8	0.269 1444	0.266 6327	332
7	0.729 6304	0.735 5341	133	0.608 9437	0.603 0583	17	0.264 1003	0.261 5475	329
8	0.741 3815	0.747 1720	134	0.597 1261	0.591 1476	25	0.258 9745	0.256 3814	326
9	0.752 9052	0.758 5806	135	0.585 1232	0.579 0533	34	0.253 7685	0.251 1359	322
10	+0.764 1978	+0.769 7562	−136	−0.572 9385	−0.566 7792	− 43	−0.248 4839	−0.245 8126	−319
11	0.775 2555	0.780 6951	136	0.560 5759	0.554 3291	51	0.243 1222	0.240 4130	316
12	0.786 0747	0.791 3937	136	0.548 0393	0.541 7070	60	0.237 6852	0.234 9390	312
13	0.796 6517	0.801 8484	136	0.535 3327	0.528 9169	69	0.232 1746	0.229 3923	309
14	0.806 9832	0.812 0558	136	0.522 4602	0.515 9631	78	0.226 5922	0.223 7746	305
15	+0.817 0658	+0.822 0128	−136	−0.509 4261	−0.502 8498	− 86	−0.220 9398	−0.218 0879	−302
16	+0.826 8964	+0.831 7163	−135	−0.496 2347	−0.489 5814	− 95	−0.215 2193	−0.212 3341	−298

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 16	+0.826 8964	+0.831 7163	−135	−0.496 2347	−0.489 5814	− 95	−0.215 2193	−0.212 3341	−298
17	0.836 4720	0.841 1633	134	0.482 8905	0.476 1625	104	0.209 4325	0.206 5149	295
18	0.845 7897	0.850 3509	133	0.469 3980	0.462 5975	113	0.203 5814	0.200 6324	291
19	0.854 8467	0.859 2767	131	0.455 7617	0.448 8910	121	0.197 6680	0.194 6884	287
20	0.863 6406	0.867 9381	129	0.441 9860	0.435 0474	130	0.191 6940	0.188 6849	283
21	+0.872 1689	+0.876 3327	−128	−0.428 0757	−0.421 0715	−139	−0.185 6615	−0.182 6239	−280
22	0.880 4292	0.884 4582	126	0.414 0353	0.406 9677	147	0.179 5725	0.176 5074	276
23	0.888 4195	0.892 3127	123	0.399 8693	0.392 7408	156	0.173 4289	0.170 3373	272
24	0.896 1377	0.899 8941	121	0.385 5826	0.378 3953	165	0.167 2329	0.164 1158	268
25	0.903 5818	0.907 2006	118	0.371 1796	0.363 9359	173	0.160 9862	0.157 8445	264
26	+0.910 7503	+0.914 2306	−115	−0.356 6649	−0.349 3671	−182	−0.154 6909	−0.151 5256	−260
27	0.917 6413	0.920 9824	112	0.342 0431	0.334 6934	190	0.148 3490	0.145 1612	256
28	0.924 2535	0.927 4545	109	0.327 3187	0.319 9194	198	0.141 9625	0.138 7531	252
Mar. 1	0.930 5853	0.933 6457	106	0.312 4961	0.305 0493	207	0.135 5332	0.132 3031	248
2	0.936 6356	0.939 5547	102	0.297 5795	0.290 0873	215	0.129 0631	0.125 8134	243
3	+0.942 4029	+0.945 1800	− 98	−0.282 5733	−0.275 0379	−223	−0.122 5541	−0.119 2856	−239
4	0.947 8858	0.950 5202	94	0.267 4817	0.259 9052	231	0.116 0080	0.112 7216	235
5	0.953 0830	0.955 5740	90	0.252 3089	0.244 6934	239	0.109 4267	0.106 1234	231
6	0.957 9930	0.960 3398	85	0.237 0591	0.229 4066	247	0.102 8121	0.099 4929	226
7	0.962 6143	0.964 8162	81	0.221 7365	0.214 0493	255	0.096 1660	0.092 8318	222
8	+0.966 9455	+0.969 0019	− 76	−0.206 3455	−0.198 6258	−262	−0.089 4905	−0.086 1423	−217
9	0.970 9852	0.972 8952	71	0.190 8908	0.183 1409	270	0.082 7874	0.079 4262	213
10	0.974 7318	0.976 4949	66	0.175 3768	0.167 5990	278	0.076 0588	0.072 6856	208
11	0.978 1842	0.979 7997	61	0.159 8082	0.152 0050	285	0.069 3067	0.065 9225	204
12	0.981 3412	0.982 8086	56	0.144 1899	0.136 3636	292	0.062 5332	0.059 1390	199
13	+0.984 2018	+0.985 5206	− 50	−0.128 5267	−0.120 6798	−300	−0.055 7403	−0.052 3373	−194
14	0.986 7649	0.987 9347	45	0.112 8236	0.104 9587	307	0.048 9303	0.045 5195	190
15	0.989 0299	0.990 0504	39	0.097 0856	0.089 2051	314	0.042 1052	0.038 6877	185
16	0.990 9962	0.991 8672	33	0.081 3177	0.073 4241	321	0.035 2672	0.031 8440	180
17	0.992 6633	0.993 3846	27	0.065 5250	0.057 6209	328	0.028 4184	0.024 9906	175
18	+0.994 0310	+0.994 6024	− 20	−0.049 7125	−0.041 8004	−334	−0.021 5610	−0.018 1298	−170
19	0.995 0990	0.995 5207	14	0.033 8853	0.025 9677	341	0.014 6972	0.011 2636	165
20	0.995 8675	0.996 1394	8	0.018 0484	−0.010 1279	348	0.007 8292	−0.004 3942	160
21	0.996 3365	0.996 4588	− 1	−0.002 2068	+0.005 7142	354	−0.000 9590	+0.002 4762	155
22	0.996 5063	0.996 4791	+ 6	+0.013 6345	0.021 5535	360	+0.005 9112	0.009 3456	150
23	+0.996 3773	+0.996 2009	+ 13	+0.029 4706	+0.037 3851	−367	+0.012 7792	+0.016 2118	−145
24	0.995 9501	0.995 6248	20	0.045 2965	0.053 2042	373	0.019 6431	0.023 0728	140
25	0.995 2253	0.994 7516	27	0.061 1075	0.069 0059	379	0.026 5006	0.029 9263	135
26	0.994 2038	0.993 5821	34	0.076 8987	0.084 7854	385	0.033 3496	0.036 7703	130
27	0.992 8865	0.992 1172	41	0.092 6655	0.100 5383	391	0.040 1882	0.043 6029	124
28	+0.991 2744	+0.990 3582	+ 49	+0.108 4032	+0.116 2598	−396	+0.047 0143	+0.050 4221	−119
29	0.989 3687	0.988 3061	57	0.124 1074	0.131 9456	402	0.053 8260	0.057 2259	113
30	0.987 1705	0.985 9620	64	0.139 7738	0.147 5915	407	0.060 6215	0.064 0124	108
31	0.984 6808	0.983 3271	72	0.155 3982	0.163 1933	413	0.067 3986	0.070 7798	103
Apr. 1	0.981 9009	0.980 4024	80	0.170 9764	0.178 7468	418	0.074 1557	0.077 5261	97
2	+0.978 8318	+0.977 1891	+ 88	+0.186 5042	+0.194 2480	−423	+0.080 8909	+0.084 2498	− 92
3	+0.975 4745	+0.973 6881	+ 96	+0.201 9776	+0.209 6926	−428	+0.087 6025	+0.090 9488	− 86

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.981 9009	+0.980 4024	+ 80	+0.170 9764	+0.178 7468	−418	+0.074 1557	+0.077 5261	− 97
2	0.978 8318	0.977 1891	88	0.186 5042	0.194 2480	423	0.080 8909	0.084 2498	92
3	0.975 4745	0.973 6881	96	0.201 9776	0.209 6926	428	0.087 6025	0.090 9488	86
4	0.971 8300	0.969 9003	105	0.217 3924	0.225 0765	433	0.094 2884	0.097 6212	80
5	0.967 8991	0.965 8266	113	0.232 7443	0.240 3953	438	0.100 9469	0.104 2653	75
6	+0.963 6829	+0.961 4682	+122	+0.248 0290	+0.255 6448	−443	+0.107 5762	+0.110 8792	− 69
7	0.959 1825	0.956 8261	130	0.263 2422	0.270 8206	447	0.114 1742	0.117 4609	63
8	0.954 3991	0.951 9016	139	0.278 3794	0.285 9181	451	0.120 7391	0.124 0085	57
9	0.949 3339	0.946 6961	148	0.293 4361	0.300 9328	456	0.127 2689	0.130 5200	52
10	0.943 9884	0.941 2110	157	0.308 4077	0.315 8601	460	0.133 7616	0.136 9935	46
11	+0.938 3642	+0.935 4481	+166	+0.323 2895	+0.330 6954	−464	+0.140 2154	+0.143 4270	− 40
12	0.932 4630	0.929 4090	175	0.338 0771	0.345 4341	468	0.146 6282	0.149 8187	34
13	0.926 2865	0.923 0957	184	0.352 7659	0.360 0719	472	0.152 9982	0.156 1665	28
14	0.919 8369	0.916 5103	194	0.367 3515	0.374 6042	475	0.159 3234	0.162 4686	22
15	0.913 1162	0.909 6549	203	0.381 8293	0.389 0264	479	0.165 6018	0.168 7229	16
16	+0.906 1267	+0.902 5319	+213	+0.396 1949	+0.403 3342	−482	+0.171 8317	+0.174 9278	− 10
17	0.898 8708	0.895 1437	222	0.410 4439	0.417 5234	486	0.178 0111	0.181 0813	− 4
18	0.891 3509	0.887 4928	232	0.424 5721	0.431 5895	489	0.184 1382	0.187 1815	+ 2
19	0.883 5698	0.879 5821	242	0.438 5751	0.445 5284	491	0.190 2111	0.193 2267	9
20	0.875 5301	0.871 4142	252	0.452 4488	0.459 3359	494	0.196 2281	0.199 2151	15
21	+0.867 2347	+0.862 9920	+262	+0.466 1892	+0.473 0081	−497	+0.202 1875	+0.205 1450	+ 21
22	0.858 6865	0.854 3185	272	0.479 7922	0.486 5410	499	0.208 0874	0.211 0145	27
23	0.849 8885	0.845 3968	283	0.493 2540	0.499 9308	502	0.213 9262	0.216 8222	33
24	0.840 8439	0.836 2301	293	0.506 5709	0.513 1739	504	0.219 7023	0.222 5663	40
25	0.831 5559	0.826 8216	304	0.519 7393	0.526 2667	506	0.225 4141	0.228 2454	46
26	+0.822 0277	+0.817 1745	+314	+0.532 7556	+0.539 2057	−508	+0.231 0600	+0.233 8578	+ 53
27	0.812 2625	0.807 2920	325	0.545 6166	0.551 9878	509	0.236 6386	0.239 4022	59
28	0.802 2635	0.797 1773	336	0.558 3190	0.564 6098	511	0.242 1484	0.244 8771	65
29	0.792 0338	0.786 8334	347	0.570 8598	0.577 0686	512	0.247 5880	0.250 2811	72
30	0.781 5765	0.776 2634	358	0.583 2358	0.589 3611	513	0.252 9561	0.255 6129	78
May 1	+0.770 8946	+0.765 4703	+369	+0.595 4441	+0.601 4844	−514	+0.258 2514	+0.260 8713	+ 85
2	0.759 9910	0.754 4570	380	0.607 4816	0.613 4352	514	0.263 4724	0.266 0546	91
3	0.748 8687	0.743 2264	391	0.619 3450	0.625 2105	515	0.268 6177	0.271 1616	98
4	0.737 5305	0.731 7814	402	0.631 0314	0.636 8072	515	0.273 6860	0.276 1909	105
5	0.725 9794	0.720 1250	413	0.642 5375	0.648 2218	515	0.278 6760	0.281 1411	111
6	+0.714 2186	+0.708 2605	+425	+0.653 8598	+0.659 4510	−515	+0.283 5861	+0.286 0108	+118
7	0.702 2512	0.696 1910	436	0.664 9951	0.670 4916	515	0.288 4150	0.290 7986	124
8	0.690 0805	0.683 9200	448	0.675 9401	0.681 3402	514	0.293 1613	0.295 5030	131
9	0.677 7100	0.671 4510	460	0.686 6915	0.691 9936	513	0.297 8236	0.300 1228	138
10	0.665 1433	0.658 7875	471	0.697 2460	0.702 4484	512	0.302 4004	0.304 6563	144
11	+0.652 3841	+0.645 9334	+483	+0.707 6005	+0.712 7017	−511	+0.306 8904	+0.309 1025	+151
12	0.639 4361	0.632 8926	495	0.717 7518	0.722 7503	509	0.311 2924	0.313 4600	158
13	0.626 3033	0.619 6688	507	0.727 6969	0.732 5912	507	0.315 6050	0.317 7274	165
14	0.612 9896	0.606 2662	519	0.737 4328	0.742 2214	505	0.319 8269	0.321 9035	171
15	0.599 4991	0.592 6889	530	0.746 9566	0.751 6381	503	0.323 9570	0.325 9872	178
16	+0.585 8360	+0.578 9410	+542	+0.756 2655	+0.760 8385	−500	+0.327 9940	+0.329 9771	+185
17	+0.572 0045	+0.565 0269	+554	+0.765 3568	+0.769 8200	−497	+0.331 9366	+0.333 8723	+192

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.572 0045	+0.565 0269	+ 554	+0.765 3568	+0.769 8200	−497	+0.331 9366	+0.333 8723	+192
18	0.558 0089	0.550 9510	566	0.774 2279	0.778 5800	494	0.335 7840	0.337 6716	198
19	0.543 8538	0.536 7178	578	0.782 8762	0.787 1161	491	0.339 5350	0.341 3739	205
20	0.529 5436	0.522 3317	590	0.791 2994	0.795 4259	487	0.343 1884	0.344 9783	212
21	0.515 0827	0.507 7973	603	0.799 4953	0.803 5074	483	0.346 7434	0.348 4837	219
22	+0.500 4759	+0.493 1192	+615	+0.807 4619	+0.811 3586	−479	+0.350 1991	+0.351 8894	+226
23	0.485 7276	0.478 3018	627	0.815 1972	0.818 9775	474	0.353 5545	0.355 1943	233
24	0.470 8423	0.463 3497	639	0.822 6993	0.826 3624	469	0.356 8088	0.358 3978	239
25	0.455 8246	0.448 2675	651	0.829 9667	0.833 5119	464	0.359 9613	0.361 4992	246
26	0.440 6790	0.433 0596	663	0.836 9978	0.840 4243	458	0.363 0113	0.364 4977	253
27	+0.425 4098	+0.417 7302	+ 675	+0.843 7912	+0.847 0983	−453	+0.365 9582	+0.367 3928	+260
28	0.410 0212	0.402 2834	686	0.850 3454	0.853 5324	446	0.368 8013	0.370 1837	266
29	0.394 5174	0.386 7236	698	0.856 6591	0.859 7254	440	0.371 5398	0.372 8697	273
30	0.378 9026	0.371 0548	710	0.862 7310	0.865 6758	433	0.374 1732	0.375 4503	280
31	0.363 1807	0.355 2809	722	0.868 5595	0.871 3820	426	0.376 7010	0.377 9250	287
June 1	+0.347 3558	+0.339 4060	+ 733	+0.874 1431	+0.876 8426	−419	+0.379 1224	+0.380 2930	+294
2	0.331 4321	0.323 4344	745	0.879 4804	0.882 0562	411	0.381 4368	0.382 5536	300
3	0.315 4136	0.307 3702	757	0.884 5698	0.887 0210	403	0.383 6435	0.384 7063	307
4	0.299 3047	0.291 2177	768	0.889 4097	0.891 7356	395	0.385 7419	0.386 7504	314
5	0.283 1098	0.274 9815	779	0.893 9985	0.896 1983	386	0.387 7315	0.388 6852	321
6	+0.266 8333	+0.258 6659	+ 790	+0.898 3347	+0.900 4076	−377	+0.389 6114	+0.390 5101	+327
7	0.250 4798	0.242 2756	801	0.902 4169	0.904 3624	367	0.391 3812	0.392 2246	334
8	0.234 0539	0.225 8153	812	0.906 2139	0.908 0612	358	0.393 0402	0.393 8281	341
9	0.217 5603	0.209 2897	823	0.909 8142	0.911 5027	348	0.394 5881	0.395 3201	347
10	0.201 0039	0.192 7036	834	0.913 1267	0.914 6859	337	0.396 0242	0.396 7003	354
11	+0.184 3895	+0.176 0620	+ 844	+0.916 1803	+0.917 6097	−326	+0.397 3482	+0.397 9679	+361
12	0.167 7219	0.159 3697	855	0.918 9741	0.920 2732	315	0.398 5595	0.399 1228	367
13	0.151 0061	0.142 6317	865	0.921 5071	0.922 6755	304	0.399 6579	0.400 1646	373
14	0.134 2471	0.125 8530	875	0.923 7785	0.924 8158	292	0.400 6429	0.401 0929	380
15	0.117 4500	0.109 0387	884	0.925 7875	0.926 6935	280	0.401 5144	0.401 9075	387
16	+0.100 6198	+0.092 1940	+ 894	+0.927 5338	+0.928 3083	−267	+0.402 2721	+0.402 6082	+393
17	0.083 7618	0.075 3239	903	0.929 0169	0.929 6596	255	0.402 9157	0.403 1947	399
18	0.066 8810	0.058 4336	913	0.930 2365	0.930 7475	242	0.403 4452	0.403 6671	406
19	0.049 9825	0.041 5282	921	0.931 1927	0.931 5720	228	0.403 8605	0.404 0254	412
20	0.033 0713	0.024 6125	930	0.931 8855	0.932 1332	214	0.404 1617	0.404 2695	418
21	+0.016 1524	+0.007 6916	+ 938	+0.932 3151	+0.932 4312	−200	+0.404 3487	+0.404 3994	+425
22	−0.000 7693	−0.009 2297	947	0.932 4817	0.932 4665	186	0.404 4216	0.404 4153	431
23	0.017 6890	0.026 1467	955	0.932 3857	0.932 2394	172	0.404 3806	0.404 3174	437
24	0.034 6021	0.043 0548	962	0.932 0276	0.931 7505	157	0.404 2258	0.404 1058	443
25	0.051 5041	0.059 9495	969	0.931 4081	0.931 0004	141	0.403 9575	0.403 7808	449
26	−0.068 3904	−0.076 8263	+ 976	+0.930 5275	+0.929 9895	−126	+0.403 5758	+0.403 3424	+455
27	0.085 2567	0.093 6810	983	0.929 3864	0.928 7182	110	0.403 0808	0.402 7910	461
28	0.102 0987	0.110 5092	990	0.927 9851	0.927 1871	94	0.402 4729	0.402 1266	467
29	0.118 9120	0.127 3066	996	0.926 3242	0.925 3965	78	0.401 7522	0.401 3497	473
30	0.135 6924	0.144 0689	1001	0.924 4040	0.923 3467	61	0.400 9190	0.400 4602	479
July 1	−0.152 4356	−0.160 7918	+1007	+0.922 2248	+0.921 0382	− 44	+0.399 9734	+0.399 4585	+485
2	−0.169 1370	−0.177 4706	+1012	+0.919 7870	+0.918 4712	− 27	+0.398 9155	+0.398 3445	+490

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.152 4356	−0.160 7918	+1007	+0.922 2248	+0.921 0382	− 44	+0.399 9734	+0.399 4585	+485
2	0.169 1370	0.177 4706	1012	0.919 7870	0.918 4712	27	0.398 9155	0.398 3445	490
3	0.185 7921	0.194 1009	1017	0.917 0909	0.915 6462	− 9	0.397 7456	0.397 1187	496
4	0.202 3965	0.210 6781	1021	0.914 1371	0.912 5637	+ 8	0.396 4639	0.395 7812	502
5	0.218 9453	0.227 1975	1025	0.910 9261	0.909 2243	26	0.395 0706	0.394 3322	507
6	−0.235 4341	−0.243 6544	+1029	+0.907 4584	+0.905 6285	+ 45	+0.393 5661	+0.392 7722	+513
7	0.251 8579	0.260 0440	1032	0.903 7348	0.901 7773	63	0.391 9506	0.391 1014	518
8	0.268 2120	0.276 3614	1035	0.899 7561	0.897 6713	81	0.390 2247	0.389 3204	523
9	0.284 4917	0.292 6022	1037	0.895 5231	0.893 3115	100	0.388 3886	0.387 4294	529
10	0.300 6922	0.308 7612	1039	0.891 0368	0.888 6990	119	0.386 4428	0.385 4289	534
11	−0.316 8087	−0.324 8339	+1041	+0.886 2983	+0.883 8348	+138	+0.384 3877	+0.383 3193	+539
12	0.332 8363	0.340 8152	1042	0.881 3087	0.878 7202	158	0.382 2239	0.381 1014	544
13	0.348 7701	0.356 7003	1043	0.876 0694	0.873 3566	177	0.379 9520	0.378 7756	549
14	0.364 6053	0.372 4844	1044	0.870 5819	0.867 7456	197	0.377 5725	0.376 3427	554
15	0.380 3370	0.388 1626	1044	0.864 8478	0.861 8888	217	0.375 0862	0.373 8032	559
16	−0.395 9605	−0.403 7302	+1043	+0.858 8688	+0.855 7880	+237	+0.372 4938	+0.371 1580	+563
17	0.411 4710	0.419 1825	1042	0.852 6468	0.849 4453	257	0.369 7960	0.368 4079	568
18	0.426 8640	0.434 5150	1041	0.846 1839	0.842 8628	277	0.366 9938	0.365 5538	573
19	0.442 1349	0.449 7232	1039	0.839 4823	0.836 0427	297	0.364 0881	0.362 5967	577
20	0.457 2793	0.464 8028	1037	0.832 5442	0.828 9871	318	0.361 0797	0.359 5373	581
21	−0.472 2932	−0.479 7499	+1034	+0.825 3718	+0.821 6985	+338	+0.357 9696	+0.356 3767	+586
22	0.487 1724	0.494 5602	1031	0.817 9675	0.814 1791	358	0.354 7587	0.353 1158	590
23	0.501 9129	0.509 2299	1028	0.810 3337	0.806 4315	379	0.351 4482	0.349 7559	594
24	0.516 5109	0.523 7553	1024	0.802 4727	0.798 4577	400	0.348 0390	0.346 2977	598
25	0.530 9626	0.538 1324	1019	0.794 3868	0.790 2601	420	0.344 5320	0.342 7422	602
26	−0.545 2643	−0.552 3578	+1015	+0.786 0781	+0.781 8410	+441	+0.340 9283	+0.339 0905	+605
27	0.559 4124	0.566 4277	1009	0.777 5490	0.773 2024	462	0.337 2288	0.335 3434	609
28	0.573 4032	0.580 3385	1003	0.768 8016	0.764 3467	483	0.333 4344	0.331 5020	613
29	0.587 2331	0.594 0865	997	0.759 8381	0.755 2760	503	0.329 5463	0.327 5674	616
30	0.600 8983	0.607 6679	990	0.750 6606	0.745 9923	524	0.325 5654	0.323 5404	619
31	−0.614 3949	−0.621 0788	+ 983	+0.741 2713	+0.736 4980	+545	+0.321 4926	+0.319 4220	+623
Aug. 1	0.627 7192	0.634 3155	975	0.731 6726	0.726 7954	565	0.317 3289	0.315 2133	626
2	0.640 8673	0.647 3741	967	0.721 8666	0.716 8866	586	0.313 0754	0.310 9153	629
3	0.653 8354	0.660 2507	959	0.711 8558	0.706 7744	607	0.308 7332	0.306 5292	632
4	0.666 6195	0.672 9414	950	0.701 6428	0.696 4612	627	0.304 3034	0.302 0560	635
5	−0.679 2159	−0.685 4425	+ 940	+0.691 2301	+0.685 9497	+647	+0.299 7871	+0.297 4969	+637
6	0.691 6207	0.697 7500	930	0.680 6203	0.675 2424	668	0.295 1855	0.292 8530	640
7	0.703 8300	0.709 8601	920	0.669 8163	0.664 3423	688	0.290 4997	0.288 1256	642
8	0.715 8400	0.721 7691	909	0.658 8207	0.653 2520	708	0.285 7310	0.283 3160	644
9	0.727 6470	0.733 4732	897	0.647 6367	0.641 9750	728	0.280 8808	0.278 4255	647
10	−0.739 2471	−0.744 9683	+ 886	+0.636 2673	+0.630 5140	+747	+0.275 9503	+0.273 4553	+649
11	0.750 6364	0.756 2509	873	0.624 7156	0.618 8725	767	0.270 9408	0.268 4069	651
12	0.761 8114	0.767 3174	861	0.612 9850	0.607 0536	787	0.265 8538	0.263 2817	652
13	0.772 7684	0.778 1641	848	0.601 0789	0.595 0613	806	0.260 6909	0.258 0814	654
14	0.783 5040	0.788 7877	834	0.589 0012	0.582 8991	825	0.255 4535	0.252 8073	656
15	−0.794 0147	−0.799 1847	+ 820	+0.576 7554	+0.570 5706	+844	+0.250 1431	+0.247 4611	+657
16	−0.804 2974	−0.809 3523	+ 806	+0.564 3453	+0.558 0799	+863	+0.244 7615	+0.242 0444	+658

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.804 2974	−0.809 3523	+806	+0.564 3453	+0.558 0799	+ 863	+0.244 7615	+0.242 0444	+658
17	0.814 3491	0.819 2874	791	0.551 7749	0.545 4308	882	0.239 3102	0.236 5590	659
18	0.824 1670	0.828 9875	776	0.539 0480	0.532 6271	900	0.233 7910	0.231 0064	660
19	0.833 7485	0.838 4498	760	0.526 1685	0.519 6727	918	0.228 2054	0.225 3882	661
20	0.843 0910	0.847 6719	744	0.513 1402	0.506 5714	936	0.222 5550	0.219 7061	662
21	−0.852 1921	−0.856 6514	+728	+0.499 9668	+0.493 3269	+ 953	+0.216 8416	+0.213 9617	+662
22	0.861 0494	0.865 3859	711	0.486 6521	0.479 9429	971	0.211 0667	0.208 1567	663
23	0.869 6606	0.873 8733	694	0.473 1998	0.466 4232	988	0.205 2319	0.202 2926	663
24	0.878 0236	0.882 1113	677	0.459 6135	0.452 7712	1005	0.199 3389	0.196 3711	663
25	0.886 1360	0.890 0975	659	0.445 8968	0.438 9906	1021	0.193 3893	0.190 3937	663
26	−0.893 9956	−0.897 8299	+640	+0.432 0532	+0.425 0850	+1037	+0.187 3845	+0.184 3620	+663
27	0.901 6002	0.905 3062	622	0.418 0864	0.411 0579	1053	0.181 3263	0.178 2776	663
28	0.908 9476	0.912 5241	603	0.403 9999	0.396 9129	1069	0.175 2162	0.172 1422	662
29	0.916 0354	0.919 4813	584	0.389 7974	0.382 6538	1085	0.169 0558	0.165 9573	662
30	0.922 8615	0.926 1756	564	0.375 4827	0.368 2844	1100	0.162 8468	0.159 7246	661
31	−0.929 4235	−0.932 6048	+544	+0.361 0594	+0.353 8082	+1114	+0.156 5908	+0.153 4457	+660
Sept. 1	0.935 7192	0.938 7665	524	0.346 5313	0.339 2292	1129	0.150 2895	0.147 1224	659
2	0.941 7464	0.944 6586	503	0.331 9025	0.324 5515	1143	0.143 9446	0.140 7564	658
3	0.947 5029	0.950 2790	482	0.317 1768	0.309 7789	1157	0.137 5579	0.134 3494	656
4	0.952 9867	0.955 6257	461	0.302 3583	0.294 9155	1170	0.131 1311	0.127 9032	655
5	−0.958 1957	−0.960 6965	+440	+0.287 4511	+0.279 9655	+1183	+0.124 6659	+0.121 4195	+653
6	0.963 1279	0.965 4895	418	0.272 4594	0.264 9332	1196	0.118 1642	0.114 9003	651
7	0.967 7812	0.970 0027	396	0.257 3874	0.249 8227	1208	0.111 6279	0.108 3473	649
8	0.972 1538	0.974 2342	374	0.242 2396	0.234 6387	1220	0.105 0588	0.101 7625	647
9	0.976 2437	0.978 1821	352	0.227 0206	0.219 3858	1231	0.098 4588	0.095 1479	645
10	−0.980 0493	−0.981 8451	+329	+0.211 7349	+0.204 0685	+1243	+0.091 8300	+0.088 5054	+642
11	0.983 5692	0.985 2215	306	0.196 3873	0.188 6918	1254	0.085 1743	0.081 8371	639
12	0.986 8018	0.988 3100	283	0.180 9826	0.173 2604	1265	0.078 4939	0.075 1450	636
13	0.989 7460	0.991 1097	259	0.165 5258	0.157 7793	1275	0.071 7907	0.068 4312	633
14	0.992 4010	0.993 6198	235	0.150 0216	0.142 2533	1285	0.065 0669	0.061 6979	630
15	−0.994 7660	−0.995 8396	+212	+0.134 4750	+0.126 6872	+1294	+0.058 3245	+0.054 9469	+627
16	0.996 8404	0.997 7685	188	0.118 8906	0.111 0857	1303	0.051 5655	0.048 1804	623
17	0.998 6238	0.999 4062	163	0.103 2731	0.095 4534	1312	0.044 7920	0.041 4004	620
18	1.000 1157	1.000 7523	139	0.087 6272	0.079 7950	1320	0.038 0060	0.034 6089	616
19	1.001 3160	1.001 8067	114	0.071 9573	0.064 1148	1328	0.031 2095	0.027 8079	612
20	−1.002 2245	−1.002 5693	+ 90	+0.056 2679	+0.048 4172	+1335	+0.024 4043	+0.020 9991	+607
21	1.002 8410	1.003 0396	65	0.040 5632	0.032 7066	1342	0.017 5925	0.014 1847	603
22	1.003 1652	1.003 2177	40	0.024 8479	0.016 9876	1349	0.010 7759	0.007 3664	599
23	1.003 1970	1.003 1032	+ 15	+0.009 1261	+0.001 2640	1355	+0.003 9565	+0.000 5463	594
24	1.002 9363	1.002 6962	− 11	−0.006 5981	−0.014 4597	1361	−0.002 8639	−0.006 2739	589
25	−1.002 3830	−1.001 9966	− 36	−0.022 3202	−0.030 1791	+1366	−0.009 6834	−0.013 0922	+584
26	1.001 5370	1.001 0042	62	0.038 0359	0.045 8901	1371	0.016 5001	0.019 9068	579
27	1.000 3981	0.999 7188	87	0.053 7410	0.061 5881	1376	0.023 3121	0.026 7157	573
28	0.998 9663	0.998 1405	113	0.069 4309	0.077 2689	1380	0.030 1174	0.033 5169	568
29	0.997 2415	0.996 2693	139	0.085 1014	0.092 9280	1384	0.036 9141	0.040 3086	562
30	−0.995 2239	−0.994 1053	−165	−0.100 7480	−0.108 5609	+1387	−0.043 7002	−0.047 0887	+556
Oct. 1	−0.992 9135	−0.991 6485	−191	−0.116 3662	−0.124 1632	+1390	−0.050 4739	−0.053 8555	+550

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.992 9135	−0.991 6485	− 191	−0.116 3662	−0.124 1632	+1390	−0.050 4739	−0.053 8555	+550
2	0.990 3104	0.988 8992	217	0.131 9514	0.139 7302	1393	0.057 2333	0.060 6069	544
3	0.987 4149	0.985 8576	243	0.147 4991	0.155 2575	1395	0.063 9762	0.067 3409	538
4	0.984 2273	0.982 5241	270	0.163 0047	0.170 7402	1397	0.070 7007	0.074 0554	531
5	0.980 7479	0.978 8988	296	0.178 4634	0.186 1737	1398	0.077 4047	0.080 7484	524
6	−0.976 9770	−0.974 9825	− 322	−0.193 8705	−0.201 5532	+1399	−0.084 0862	−0.087 4179	+517
7	0.972 9154	0.970 7757	349	0.209 2212	0.216 8739	1400	0.090 7433	0.094 0620	510
8	0.968 5636	0.966 2792	375	0.224 5106	0.232 1307	1400	0.097 3737	0.100 6782	503
9	0.963 9226	0.961 4939	402	0.239 7336	0.247 3186	1400	0.103 9753	0.107 2647	496
10	0.958 9934	0.956 4211	428	0.254 8852	0.262 4327	1399	0.110 5461	0.113 8193	488
11	−0.953 7773	−0.951 0621	− 455	−0.269 9605	−0.277 4679	+1398	−0.117 0839	−0.120 3397	+480
12	0.948 2758	0.945 4186	481	0.284 9544	0.292 4193	1396	0.123 5865	0.126 8240	472
13	0.942 4907	0.939 4924	508	0.299 8621	0.307 2821	1394	0.130 0519	0.133 2700	464
14	0.936 4239	0.933 2854	534	0.314 6788	0.322 0516	1392	0.136 4780	0.139 6757	456
15	0.930 0772	0.926 7996	561	0.329 4000	0.336 7233	1389	0.142 8628	0.146 0391	448
16	−0.923 4529	−0.920 0373	− 587	−0.344 0211	−0.351 2928	+1386	−0.149 2044	−0.152 3584	+439
17	0.916 5531	0.913 0006	614	0.358 5378	0.365 7557	1383	0.155 5009	0.158 6316	431
18	0.909 3800	0.905 6917	641	0.372 9459	0.380 1080	1379	0.161 7503	0.164 8569	422
19	0.901 9358	0.898 1127	667	0.387 2413	0.394 3454	1374	0.167 9510	0.171 0324	413
20	0.894 2226	0.890 2658	693	0.401 4198	0.408 4640	1369	0.174 1010	0.177 1564	404
21	−0.886 2426	−0.882 1533	− 720	−0.415 4774	−0.422 4596	+1364	−0.180 1985	−0.183 2271	+394
22	0.877 9982	0.873 7774	746	0.429 4101	0.436 3284	1359	0.186 2419	0.189 2427	385
23	0.869 4914	0.865 1404	772	0.443 2139	0.450 0662	1353	0.192 2293	0.195 2014	375
24	0.860 7247	0.856 2445	799	0.456 8848	0.463 6692	1346	0.198 1589	0.201 1015	365
25	0.851 7002	0.847 0920	825	0.470 4190	0.477 1335	1339	0.204 0291	0.206 9414	356
26	−0.842 4203	−0.837 6853	− 851	−0.483 8124	−0.490 4550	+1332	−0.209 8382	−0.212 7192	+346
27	0.832 8874	0.828 0268	877	0.497 0610	0.503 6298	1324	0.215 5843	0.218 4333	335
28	0.823 1039	0.818 1190	903	0.510 1609	0.516 6539	1316	0.221 2659	0.224 0819	325
29	0.813 0724	0.807 9644	929	0.523 1082	0.529 5234	1307	0.226 8810	0.229 6632	314
30	0.802 7952	0.797 5653	955	0.535 8989	0.542 2343	1298	0.232 4281	0.235 1755	303
31	−0.792 2750	−0.786 9246	− 980	−0.548 5290	−0.554 7825	+1289	−0.237 9053	−0.240 6172	+293
Nov 1	0.781 5145	0.776 0450	1006	0.560 9944	0.567 1641	1279	0.243 3111	0.245 9867	282
2	0.770 5165	0.764 9293	1032	0.573 2911	0.579 3750	1269	0.248 6437	0.251 2820	271
3	0.759 2837	0.753 5802	1057	0.585 4152	0.591 4113	1258	0.253 9013	0.256 5014	260
4	0.747 8191	0.742 0008	1082	0.597 3626	0.603 2687	1247	0.259 0822	0.261 6434	249
5	−0.736 1257	−0.730 1943	−1107	−0.609 1290	−0.614 9431	+1235	−0.264 1847	−0.266 7059	+237
6	0.724 2070	0.718 1642	1132	0.620 7105	0.626 4306	1223	0.269 2069	0.271 6874	226
7	0.712 0664	0.705 9140	1157	0.632 1029	0.637 7269	1211	0.274 1473	0.276 5862	214
8	0.699 7074	0.693 4472	1182	0.643 3021	0.648 8281	1198	0.279 0040	0.281 4005	202
9	0.687 1340	0.680 7682	1206	0.654 3043	0.659 7303	1184	0.283 7754	0.286 1286	190
10	−0.674 3504	−0.667 8810	−1231	−0.665 1056	−0.670 4298	+1170	−0.288 4599	−0.290 7690	+178
11	0.661 3605	0.654 7896	1255	0.675 7024	0.680 9231	1156	0.293 0558	0.295 3201	166
12	0.648 1688	0.641 4986	1279	0.686 0914	0.691 2069	1141	0.297 5618	0.299 7806	154
13	0.634 7795	0.628 0122	1303	0.696 2692	0.701 2780	1126	0.301 9764	0.304 1489	142
14	0.621 1971	0.614 3348	1326	0.706 2328	0.711 1334	1111	0.306 2981	0.308 4237	129
15	−0.607 4259	−0.600 4708	−1350	−0.715 9793	−0.720 7703	+1095	−0.310 5257	−0.312 6038	+117
16	−0.593 4701	−0.586 4243	−1373	−0.725 5059	−0.730 1858	+1078	−0.314 6580	−0.316 6880	+104

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov.16	−0.593 4701	−0.586 4243	−1373	−0.725 5059	−0.730 1858	+1078	−0.314 6580	−0.316 6880	+104
17	0.579 3340	0.572 1997	1396	0.734 8097	0.739 3773	1061	0.318 6937	0.320 6750	91
18	0.565 0219	0.557 8012	1419	0.743 8882	0.748 3421	1044	0.322 6317	0.324 5636	78
19	0.550 5381	0.543 2332	1441	0.752 7387	0.757 0776	1026	0.326 4707	0.328 3527	66
20	0.535 8870	0.528 4999	1463	0.761 3585	0.765 5811	1007	0.330 2096	0.332 0412	53
21	−0.521 0726	−0.513 6055	−1485	−0.769 7452	−0.773 8504	+ 988	−0.333 8473	−0.335 6279	+ 39
22	0.506 0993	0.498 5544	1507	0.777 8964	0.781 8829	969	0.337 3827	0.339 1117	26
23	0.490 9715	0.483 3510	1529	0.785 8095	0.789 6761	949	0.340 8147	0.342 4917	13
24	0.475 6935	0.467 9995	1550	0.793 4822	0.797 2276	929	0.344 1424	0.345 7667	+ 0
25	0.460 2695	0.452 5041	1571	0.800 9121	0.804 5352	908	0.347 3645	0.348 9357	− 14
26	−0.444 7039	−0.436 8695	−1591	−0.808 0968	−0.811 5965	+ 887	−0.350 4802	−0.351 9978	− 27
27	0.429 0013	0.421 0999	1611	0.815 0340	0.818 4091	866	0.353 4885	0.354 9520	41
28	0.413 1659	0.405 1998	1631	0.821 7215	0.824 9708	844	0.356 3883	0.357 7972	54
29	0.397 2023	0.389 1739	1651	0.828 1568	0.831 2792	821	0.359 1787	0.360 5326	68
30	0.381 1151	0.373 0266	1670	0.834 3377	0.837 3321	798	0.361 8587	0.363 1570	82
Dec. 1	−0.364 9089	−0.356 7626	−1689	−0.840 2620	−0.843 1272	+ 775	−0.364 4273	−0.365 6695	− 95
2	0.348 5884	0.340 3868	1707	0.845 9274	0.848 6623	751	0.366 8836	0.368 0694	109
3	0.332 1585	0.323 9040	1725	0.851 3315	0.853 9349	727	0.369 2267	0.370 3555	123
4	0.315 6241	0.307 3194	1743	0.856 4722	0.858 9431	702	0.371 4557	0.372 5271	137
5	0.298 9905	0.290 6381	1760	0.861 3474	0.863 6849	677	0.373 5696	0.374 5832	151
6	−0.282 2629	−0.273 8656	−1777	−0.865 9552	−0.868 1581	+ 651	−0.375 5677	−0.376 5230	−165
7	0.265 4468	0.257 0073	1794	0.870 2935	0.872 3611	625	0.377 4491	0.378 3459	179
8	0.248 5477	0.240 0689	1810	0.874 3608	0.876 2923	598	0.379 2132	0.380 0510	193
9	0.231 5714	0.223 0560	1825	0.878 1556	0.879 9503	571	0.380 8592	0.381 6378	207
10	0.214 5234	0.205 9744	1840	0.881 6765	0.883 3340	544	0.382 3866	0.383 1057	221
11	−0.197 4096	−0.188 8298	−1855	−0.884 9226	−0.886 4423	+ 516	−0.383 7949	−0.384 4543	−235
12	0.180 2356	0.171 6277	1869	0.887 8929	0.889 2744	487	0.385 0837	0.385 6832	249
13	0.163 0069	0.154 3738	1883	0.890 5867	0.891 8298	459	0.386 2527	0.386 7921	263
14	0.145 7291	0.137 0735	1896	0.893 0035	0.894 1079	430	0.387 3015	0.387 7808	277
15	0.128 4076	0.119 7322	1908	0.895 1428	0.896 1082	400	0.388 2299	0.388 6489	291
16	−0.111 0478	−0.102 3552	−1920	−0.897 0041	−0.897 8304	+ 370	−0.389 0377	−0.389 3963	−305
17	0.093 6550	0.084 9479	1932	0.898 5870	0.899 2739	340	0.389 7247	0.390 0228	319
18	0.076 2345	0.067 5155	1943	0.899 8912	0.900 4388	309	0.390 2907	0.390 5283	333
19	0.058 7915	0.050 0632	1953	0.900 9166	0.901 3247	278	0.390 7357	0.390 9127	347
20	0.041 3312	0.032 5962	1963	0.901 6631	0.901 9316	247	0.391 0595	0.391 1760	361
21	−0.023 8589	−0.015 1199	−1972	−0.902 1303	−0.902 2592	+ 215	−0.391 2622	−0.391 3181	−375
22	−0.006 3798	+0.002 3607	1980	0.902 3183	0.902 3076	183	0.391 3436	0.391 3389	389
23	+0.011 1011	0.019 8406	1988	0.902 2270	0.902 0767	150	0.391 3038	0.391 2384	403
24	0.028 5786	0.037 3145	1996	0.901 8566	0.901 5667	117	0.391 1427	0.391 0167	417
25	0.046 0476	0.054 7773	2002	0.901 2070	0.900 7775	84	0.390 8604	0.390 6738	430
26	+0.063 5030	+0.072 2240	−2008	−0.900 2783	−0.899 7093	+ 51	−0.390 4570	−0.390 2099	−444
27	0.080 9397	0.089 6494	2014	0.899 0705	0.898 3620	+ 17	0.389 9325	0.389 6249	458
28	0.098 3524	0.107 0482	2019	0.897 5838	0.896 7359	− 17	0.389 2870	0.388 9190	471
29	0.115 7361	0.124 4154	2023	0.895 8183	0.894 8311	51	0.388 5207	0.388 0922	485
30	0.133 0854	0.141 7455	2026	0.893 7743	0.892 6478	85	0.387 6335	0.387 1447	499
31	+0.150 3950	+0.159 0332	−2029	−0.891 4518	−0.890 1862	− 120	−0.386 6257	−0.386 0766	−512
32	+0.167 6595	+0.176 2730	−2031	−0.888 8512	−0.887 4468	− 155	−0.385 4975	−0.384 8883	−525

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 1.					JANUARY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 19 16.12	2.2802	+18 5 11.1	+2.134	0	7 11 31.75	2.3755	+17 47 16.8	−2.974
1	5 21 33.03	2.2834	18 7 16.2	2.036	1	7 13 54.30	2.3760	17 44 15.1	3.084
2	5 23 50.13	2.2866	18 9 15.4	1.937	2	7 16 16.87	2.3765	17 41 6.7	3.193
3	5 26 7.42	2.2897	18 11 8.7	1.838	3	7 18 39.48	2.3770	17 37 51.9	3.302
4	5 28 24.90	2.2928	18 12 55.9	1.738	4	7 21 2.11	2.3773	17 34 30.5	3.411
5	5 30 42.56	2.2958	18 14 37.2	1.638	5	7 23 24.75	2.3775	17 31 2.6	3.518
6	5 33 0.40	2.2988	18 16 12.5	1.537	6	7 25 47.41	2.3777	17 27 28.3	3.627
7	5 35 18.42	2.3018	18 17 41.7	1.436	7	7 28 10.08	2.3780	17 23 47.4	3.736
8	5 37 36.62	2.3048	18 19 4.8	1.335	8	7 30 32.77	2.3781	17 20 0.0	3.813
9	5 39 54.99	2.3076	18 20 21.9	1.232	9	7 32 55.45	2.3781	17 16 6.2	3.950
10	5 42 13.53	2.3104	18 21 32.6	1.128	10	7 35 18.14	2.3782	17 12 6.0	4.057
11	5 44 32.24	2.3132	18 22 37.2	1.026	11	7 37 40.83	2.3781	17 7 59.3	4.165
12	5 46 51.11	2.3158	18 23 35.7	0.923	12	7 40 3.51	2.3779	17 3 46.2	4.271
13	5 49 10.14	2.3186	18 24 28.0	0 818	13	7 42 26.18	2.3778	16 59 26.8	4.378
14	5 51 29.34	2.3212	18 25 13.9	0.714	14	7 44 48.85	2.3776	16 55 0.9	4.483
15	5 53 48.68	2.3237	18 25 53.7	0.610	15	7 47 11.49	2.3773	16 50 28.8	4.588
16	5 56 8.18	2.3263	18 26 27.1	0.504	16	7 49 34.13	2.3770	16 45 50.3	4.693
17	5 58 27.83	2.3287	18 26 54.2	0.398	17	7 51 56.73	2.3766	16 41 5.6	4.798
18	6 0 47.62	2.3310	18 27 14.9	0.292	18	7 54 19.32	2.3762	16 36 14.5	4.903
19	6 3 7.55	2.3333	18 27 29.3	0.188	19	7 56 41.88	2.3757	16 31 17.3	5.006
20	6 5 27.62	2.3357	18 27 37.4	+0.081	20	7 59 4.40	2.3752	16 26 13.8	5.109
21	6 7 47.83	2.3379	18 27 39.0	−0.027	21	8 1 26.90	2.3746	16 21 4.2	5.212
22	6 10 8.17	2.3401	18 27 34.2	0.134	22	8 3 49.35	2.3739	16 15 48.4	5.315
23	6 12 28.64	2.3423	+18 27 22.9	−0.212	23	8 6 11.77	2.3733	+16 10 26.4	−5.417
	JANUARY 2.					JANUARY 4.			
0	6 14 49.24	2.3443	+18 27 5.2	−0.349	0	8 8 34.14	2.3725	+16 4 58.4	−5.518
1	6 17 9.96	2.3463	18 26 41.0	0.457	1	8 10 56.47	2.3717	15 59 24.3	5.618
2	6 19 30.79	2.3482	18 26 10.4	0.565	2	8 13 18.75	2.3709	15 53 44.2	5.718
3	6 21 51.74	2.3501	18 25 33.2	0.674	3	8 15 40.98	2.3701	15 47 58.1	5.818
4	6 24 12.80	2.3519	18 24 49.5	0.783	4	8 18 3.16	2.3692	15 42 6.0	5.917
5	6 26 33.97	2.3537	18 23 59.3	0.892	5	8 20 25.28	2.3682	15 36 8.1	6.015
6	6 28 55.24	2.3554	18 23 2.5	1.000	6	8 22 47.34	2.3672	15 30 4.2	6.113
7	6 31 16.62	2.3570	18 21 59.3	1.109	7	8 25 9.35	2.3662	15 23 54.5	6.210
8	6 33 38.08	2.3586	18 20 49.4	1.219	8	8 27 31.28	2.3651	15 17 39.0	6.307
9	6 35 59.65	2.3602	18 19 33.0	1.328	9	8 29 53.16	2.3641	15 11 17.7	6.403
10	6 38 21.30	2.3616	18 18 10.1	1.438	10	8 32 14.97	2.3628	15 4 50.7	6.498
11	6 40 43.04	2.3630	18 16 40.5	1.548	11	8 34 36.70	2.3617	14 58 18.0	6.593
12	6 43 4.86	2.3643	18 15 4.4	1.657	12	8 36 58.37	2.3605	14 51 39.6	6.686
13	6 45 26.76	2.3656	18 13 21.7	1.767	13	8 39 19.96	2.3592	14 44 55.7	6.779
14	6 47 48.73	2.3668	18 11 32.4	1.877	14	8 41 41.47	2.3579	14 38 6.1	6.872
15	6 50 10.78	2.3680	18 9 36.5	1.987	15	8 44 2.91	2.3566	14 31 11.1	6.963
16	6 52 32.89	2.3690	18 7 34.0	2.097	16	8 46 24.26	2.3552	14 24 10.6	7.053
17	6 54 55.06	2.3701	18 5 24.9	2.206	17	8 48 45.54	2.3539	14 17 4.7	7.143
18	6 57 17.30	2.3711	18 3 9.3	2.316	18	8 51 6.73	2.3525	14 9 53.4	7.233
19	6 59 39.59	2.3719	18 0 47.0	2.427	19	8 53 27.84	2.3511	14 2 36.8	7.321
20	7 2 1.93	2.3728	17 58 18.1	2.537	20	8 55 48.86	2.3496	13 55 14.9	7.409
21	7 4 24.32	2.3736	17 55 42.6	2.646	21	8 58 9.79	2.3481	13 47 47.7	7.496
22	7 6 46.76	2.3743	17 53 0.6	2.755	22	9 0 30.63	2.3466	13 40 15.4	7.581
23	7 9 9.24	2.3749	17 50 12.0	2.865	23	9 2 51.38	2.3451	13 32 38.0	7.667
24	7 11 31.75	2.3755	+17 47 16.8	−2.974	24	9 5 12.04	2.3436	+13 24 55.4	−7.752

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 5.			
	h m s	s	° ′ ″	″
0	9 5 12.04	2.3436	+13 24 55.4	7.752
1	9 7 32.61	2.3420	13 17 7.8	7.834
2	9 9 53.08	2.3404	13 9 15.3	7.917
3	9 12 13.46	2.3388	13 1 17.7	7.999
4	9 14 33.74	2.3372	12 53 15.4	8.079
5	9 16 53.92	2.3355	12 45 8.2	8.160
6	9 19 14.00	2.3339	12 36 56.2	8.239
7	9 21 33.99	2.3322	12 28 39.5	8.317
8	9 23 53.87	2.3305	12 20 18.2	8.394
9	9 26 13.65	2.3289	12 11 52.2	8.471
10	9 28 33.34	2.3272	12 3 21.7	8.546
11	9 30 52.91	2.3254	11 54 46.7	8.620
12	9 33 12.39	2.3237	11 46 7.3	8.693
13	9 35 31.76	2.3220	11 37 23.5	8.766
14	9 37 51.03	2.3202	11 28 35.4	8.838
15	9 40 10.19	2.3185	11 19 43.0	8.908
16	9 42 29.25	2.3168	11 10 46.4	8.977
17	9 44 48.21	2.3151	11 1 45.7	9.046
18	9 47 7.06	2.3133	10 52 40.9	9.113
19	9 49 25.81	2.3117	10 43 32.1	9.180
20	9 51 44.46	2.3099	10 34 19.3	9.246
21	9 54 3.00	2.3082	10 25 2.6	9.310
22	9 56 21.44	2.3064	10 15 42.1	9.373
23	9 58 39.77	2.3047	+10 6 17.8	9.436
	JANUARY 6.			
0	10 0 58.00	2.3030	+ 9 56 49.8	9.497
1	10 3 16.13	2.3013	9 47 18.1	9.557
2	10 5 34.15	2.2996	9 37 42.9	9.617
3	10 7 52.08	2.2979	9 28 4.1	9.675
4	10 10 9.90	2.2962	9 18 21.9	9.732
5	10 12 27.63	2.2946	9 8 36.3	9.788
6	10 14 45.25	2.2928	8 58 47.3	9.843
7	10 17 2.77	2.2912	8 48 55.1	9.897
8	10 19 20.20	2.2896	8 38 59.7	9.950
9	10 21 37.52	2.2879	8 29 1.1	10.002
10	10 23 54.75	2.2863	8 18 59.4	10.053
11	10 26 11.88	2.2848	8 8 54.7	10.103
12	10 28 28.92	2.2832	7 58 47.1	10.151
13	10 30 45.86	2.2816	7 48 36.6	10.198
14	10 33 2.71	2.2801	7 38 23.3	10.245
15	10 35 19.47	2.2786	7 28 7.2	10.290
16	10 37 36.14	2.2770	7 17 48.5	10.334
17	10 39 52.71	2.2756	7 7 27.1	10.378
18	10 42 9.21	2.2742	6 57 3.1	10.420
19	10 44 25.61	2.2727	6 46 36.7	10.460
20	10 46 41.93	2.2713	6 36 7.9	10.500
21	10 48 58.16	2.2699	6 25 36.7	10.539
22	10 51 14.32	2.2686	6 15 3.2	10.577
23	10 53 30.39	2.2672	6 4 27.5	10.613
24	10 55 46.38	2.2658	+ 5 53 49.7	10.648

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 7.			
	h m s	s	° ′ ″	″
0	10 55 46.38	2.2658	+5 53 49.7	10.648
1	10 58 2.29	2.2646	5 43 9.8	10.682
2	11 0 18.13	2.2634	5 32 27.8	10.716
3	11 2 33.90	2.2622	5 21 43.9	10.748
4	11 4 49.59	2.2609	5 10 58.1	10.778
5	11 7 5.21	2.2597	5 0 10.5	10.808
6	11 9 20.76	2.2586	4 49 21.1	10.837
7	11 11 36.24	2.2575	4 38 30.0	10.865
8	11 13 51.66	2.2564	4 27 37.3	10.891
9	11 16 7.01	2.2553	4 16 43.1	10.917
10	11 18 22.30	2.2544	4 5 47.3	10.941
11	11 20 37.54	2.2534	3 54 50.2	10.963
12	11 22 52.71	2.2524	3 43 51.7	10.986
13	11 25 7.83	2.2515	3 32 51.9	11 007
14	11 27 22.89	2.2506	3 21 50.9	11.026
15	11 29 37.90	2.2498	3 10 48.8	11.045
16	11 31 52.87	2.2491	2 59 45.5	11.062
17	11 34 7.79	2.2483	2 48 41.3	11.078
18	11 36 22.66	2.2475	2 37 36.1	11.093
19	11 38 37.49	2.2468	2 26 30.1	11.108
20	11 40 52.27	2.2461	2 15 23.2	11.122
21	11 43 7.02	2.2455	2 4 15.5	11.133
22	11 45 21.73	2.2449	1 53 7.2	11.143
23	11 47 36.41	2.2443	+1 41 58.3	11.153
	JANUARY 8.			
0	11 49 51.05	2 2438	+1 30 48.8	11.162
1	11 52 5.66	2 2433	1 19 38.8	11.169
2	11 54 20.25	2.2429	1 8 28.5	11.176
3	11 56 34.81	2 2425	0 57 17.7	11.181
4	11 58 49.35	2.2422	0 46 6.8	11.184
5	12 1 3.87	2.2418	0 34 55.6	11.188
6	12 3 18.37	2.2415	0 23 44.2	11.190
7	12 5 32.85	2.2412	0 12 32.8	11.190
8	12 7 47.32	2.2411	+0 1 21.4	11.190
9	12 10 1.78	2.2409	−0 9 50.0	11.188
10	12 12 16.23	2.2408	0 21 1.2	11.186
11	12 14 30.67	2.2407	0 32 12.3	11.183
12	12 16 45.11	2.2406	0 43 23.1	11.178
13	12 18 59.54	2.2406	0 54 33.6	11.172
14	12 21 13.98	2.2407	1 5 43.7	11.164
15	12 23 28.42	2.2407	1 16 53.3	11.156
16	12 25 42.86	2.2408	1 28 2.4	11.147
17	12 27 57.31	2.2409	1 39 10.9	11.137
18	12 30 11.77	2.2411	1 50 18.8	11.126
19	12 32 26.24	2.2413	2 1 26.0	11.113
20	12 34 40.73	2.2416	2 12 32.4	11.099
21	12 36 55.23	2.2419	2 23 37.9	11.084
22	12 39 9.76	2.2422	2 34 42.5	11.069
23	12 41 24.30	2.2426	2 45 46.2	11.052
24	12 43 38.87	2.2431	−2 56 48.8	11.034

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 9.			
	h m s	s	° ′ ″	″
0	12 43 38.87	2.2431	− 2 56 48.8	−11.034
1	12 45 53.47	2.2435	3 7 50.3	11.015
2	12 48 8.09	2.2440	3 18 50.6	10.995
3	12 50 22.75	2.2445	3 29 49.7	10.974
4	12 52 37.43	2.2451	3 40 47.5	10.952
5	12 54 52.16	2.2457	3 51 43.9	10.928
6	12 57 6.92	2.2463	4 2 38.9	10.904
7	12 59 21.72	2.2470	4 13 32.4	10.878
8	13 1 36.56	2.2477	4 24 24.3	10.852
9	13 3 51.44	2.2185	4 35 14.7	10.825
10	13 6 6.38	2.2493	4 46 3.3	10.795
11	13 8 21.36	2.2501	4 56 50.1	10.766
12	13 10 36.39	2.2509	5 7 35.2	10.736
13	13 12 51.47	2.2518	5 18 18.4	10.703
14	13 15 6.61	2.2527	5 28 59.6	10.670
15	13 17 21.80	2.2537	5 39 38.8	10.636
16	13 19 37.06	2.2547	5 50 15.9	10.602
17	13 21 52.37	2 2557	6 0 51.0	10.566
18	13 24 7.75	2.2568	6 11 23.8	10.528
19	13 26 23.19	2.2579	6 21 54.3	10.490
20	13 28 38.70	2.2590	6 32 22.6	10.451
21	13 30 54.27	2.2602	6 42 48.4	10.410
22	13 33 9.92	2.2614	6 53 11.8	10.369
23	13 35 25.64	2.2627	− 7 3 32.7	−10.327
	JANUARY 10.			
0	13 37 41.44	2.2639	− 7 13 51.0	−10.283
1	13 39 57.31	2.2652	7 24 6.7	10.239
2	13 42 13.26	2.2665	7 34 19.7	10.193
3	13 44 29.29	2.2679	7 44 29.9	10.147
4	13 46 45.41	2.2693	7 54 37.3	10.100
5	13 49 1.60	2.2706	8 4 41.9	10.052
6	13 51 17.88	2.2720	8 14 43.5	10.002
7	13 53 34.24	2.2734	8 24 42.1	9.951
8	13 55 50.69	2.2749	8 34 37.6	9.899
9	13 58 7.23	2.2764	8 44 30.0	9.847
10	14 0 23.86	2.2779	8 54 19.3	9.793
11	14 2 40.58	2.2794	9 4 5.2	9.738
12	14 4 57.39	2.2809	9 13 47.9	9.683
13	14 7 14.29	2.2825	9 23 27.2	9.627
14	14 9 31.29	2.2842	9 33 3.1	9.569
15	14 11 48.39	2.2858	9 42 35.5	9.511
16	14 14 5.59	2.2875	9 52 4.4	9.452
17	14 16 22.89	2.2890	10 1 29.7	9.391
18	14 18 40.27	2.2906	10 10 51.3	9.328
19	14 20 57.76	2.2923	10 20 9.2	9.267
20	14 23 15.35	2.2941	10 29 23.4	9.204
21	14 25 33.05	2.2958	10 38 33.7	9.139
22	14 27 50.85	2.2975	10 47 40.1	9.073
23	14 30 8.75	2.2992	10 56 42.5	9.007
24	14 32 26.75	2 3009	−11 5 41.0	− 8.941

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 11.			
	h m s	s	° ′ ″	″
0	14 32 26.75	2.3009	−11 5 41.0	−8.941
1	14 34 44.86	2.3027	11 14 35.4	8.872
2	14 37 3.08	2.3045	11 23 25.7	8.803
3	14 39 21.40	2.3063	11 32 11.8	8.733
4	14 41 39.83	2.3080	11 40 53.7	8.662
5	14 43 58.36	2.3098	11 49 31.3	8.591
6	14 46 17.00	2.3116	11 58 4.6	8.518
7	14 48 35.75	2.3134	12 6 33.5	8.445
8	14 50 54.61	2.3152	12 14 58.0	8.371
9	14 53 13.57	2.3170	12 23 18.0	8.295
10	14 55 32.65	2.3188	12 31 33.4	8.218
11	14 57 51.83	2.3206	12 39 44.2	8.142
12	15 0 11.12	2.3224	12 47 50.4	8.064
13	15 2 30.52	2.3242	12 55 51.9	7.985
14	15 4 50.02	2.3259	13 3 48.6	7.905
15	15 7 9.63	2.3277	13 11 40.5	7.824
16	15 9 29.35	2.3296	13 19 27.5	7.743
17	15 11 49.18	2.3313	13 27 9.7	7.662
18	15 14 9.11	2.3330	13 34 46.9	7.578
19	15 16 29.14	2.3348	13 42 19.1	7.494
20	15 18 49.28	2.3366	13 49 46.2	7.409
21	15 21 9.53	2.3383	13 57 8.2	7.323
22	15 23 29.88	2.3400	14 4 25.0	7.238
23	15 25 50.33	2.3417	−14 11 36.7	−7.151
	JANUARY 12.			
0	15 28 10.88	2.3433	−14 18 43.1	−7.062
1	15 30 31.53	2.3450	14 25 44.2	6.974
2	15 32 52.28	2.3467	14 32 40.0	6.885
3	15 35 13.13	2.3483	14 39 30.4	6.795
4	15 37 34.08	2.3500	14 46 15.4	6.704
5	15 39 55.13	2.3516	14 52 54.9	6.612
6	15 42 16.27	2.3531	14 59 28.8	6.520
7	15 44 37.50	2.3547	15 5 57.3	6.427
8	15 46 58.83	2.3562	15 12 20.1	6.333
9	15 49 20.24	2.3577	15 18 37.3	6.239
10	15 51 41.75	2.3592	15 24 48.8	6.144
11	15 54 3.34	2.3606	15 30 54.6	6.049
12	15 56 25.02	2.3620	15 36 54.7	5.953
13	15 58 46.78	2.3634	15 42 48.9	5.855
14	16 1 8.63	2.3648	15 48 37.3	5.758
15	16 3 30.56	2.3661	15 54 19.9	5.660
16	16 5 52.56	2.3674	15 59 56.5	5.561
17	16 8 14.65	2.3687	16 5 27.2	5.462
18	16 10 36.81	2.3698	16 10 52.0	5.362
19	16 12 59.03	2.3710	16 16 10.7	5.261
20	16 15 21.33	2.3723	16 21 23.3	5.161
21	16 17 43.71	2.3734	16 26 30.0	5.059
22	16 20 6.14	2.3743	16 31 30.4	4.956
23	16 22 28.63	2.3754	16 36 24.7	4.853
24	16 24 51.19	2.3765	−16 41 12.8	−4.751

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 13.					JANUARY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 24 51.19	2.3765	−16 41 12.8	−4.751	0	18 19 5.03	2.3610	−18 24 36.8	+0.484
1	16 27 13.81	2.3773	16 45 54.8	4.648	1	18 21 26.64	2.3592	18 24 4.5	0.593
2	16 29 36.47	2.3783	16 50 30.5	4.543	2	18 23 48.13	2.3573	18 23 25.6	0.702
3	16 31 59.20	2.3792	16 54 59.9	4.438	3	18 26 9.52	2.3555	18 22 40.3	0.809
4	16 34 21.97	2.3799	16 59 23.1	4.333	4	18 28 30.79	2.3535	18 21 48.5	0.918
5	16 36 44.79	2.3807	17 3 39.9	4.228	5	18 30 51.94	2.3515	18 20 50.2	1.025
6	16 39 7.66	2.3814	17 7 50.4	4.123	6	18 33 12.97	2.3495	18 19 45.5	1.131
7	16 41 30.56	2.3821	17 11 54.6	4.017	7	18 35 33.88	2.3473	18 18 34.5	1.237
8	16 43 53.51	2.3827	17 15 52.4	3.909	8	18 37 54.65	2.3451	18 17 17.0	1.344
9	16 46 16.48	2.3832	17 19 43.7	3.802	9	18 40 15.29	2.3428	18 15 53.2	1.449
10	16 48 39.50	2.3838	17 23 28.7	3.696	10	18 42 35.79	2.3406	18 14 23.1	1.555
11	16 51 2.54	2.3843	17 27 7.2	3.588	11	18 44 56.16	2.3382	18 12 46.6	1.660
12	16 53 25.61	2.3847	17 30 39.2	3.480	12	18 47 16.38	2.3358	18 11 3.9	1.764
13	16 55 48.70	2.3850	17 34 4.8	3.372	13	18 49 36.46	2.3334	18 9 14.9	1.868
14	16 58 11.81	2.3854	17 37 23.8	3.263	14	18 51 56.39	2.3308	18 7 19.7	1.972
15	17 0 34.95	2.3857	17 40 36.3	3.154	15	18 54 16.16	2.3283	18 5 18.3	2.074
16	17 2 58.09	2.3858	17 43 42.3	3.045	16	18 56 35.78	2.3257	18 3 10.8	2.177
17	17 5 21.24	2.3860	17 46 41.7	2.935	17	18 58 55.24	2.3230	18 0 57.0	2.280
18	17 7 44.41	2.3861	17 49 34.5	2.826	18	19 1 14.54	2.3203	17 58 37.2	2.381
19	17 10 7.57	2.3861	17 52 20.8	2.717	19	19 3 33.68	2.3176	17 56 11.3	2.482
20	17 12 30.74	2.3861	17 55 0.5	2.607	20	19 5 52.65	2.3147	17 53 39.4	2.583
21	17 14 53.90	2.3860	17 57 33.6	2.496	21	19 8 11.44	2.3118	17 51 1.4	2.683
22	17 17 17.06	2.3859	18 0 0.0	2.386	22	19 10 30.07	2.3090	17 48 17.5	2.782
23	17 19 40.21	2.3857	−18 2 19.9	−2.276	23	19 12 48.52	2.3060	−17 45 27.6	+2.881
	JANUARY 14.					JANUARY 16.			
0	17 22 3.34	2.3854	−18 4 33.1	−2.165	0	19 15 6.79	2.3030	−17 42 31.8	+2.979
1	17 24 26.46	2.3851	18 6 39.7	2.054	1	19 17 24.88	2.2999	17 39 30.1	3.077
2	17 26 49.55	2.3847	18 8 39.6	1.943	2	19 19 42.78	2.2968	17 36 22.6	3.173
3	17 29 12.62	2.3843	18 10 32.9	1.832	3	19 22 0.50	2.2937	17 33 9.3	3.270
4	17 31 35.67	2.3838	18 12 19.5	1.722	4	19 24 18.03	2.2906	17 29 50.2	3.365
5	17 33 58.68	2.3833	18 13 59.5	1.611	5	19 26 35.37	2.2874	17 26 25.5	3.460
6	17 36 21.66	2.3827	18 15 32.8	1.499	6	19 28 52.52	2.2842	17 22 55.0	3.555
7	17 38 44.60	2.3820	18 16 59.4	1.388	7	19 31 9.48	2.2809	17 19 18.9	3.649
8	17 41 7.50	2.3812	18 18 19.4	1.277	8	19 33 26.23	2.2776	17 15 37.1	3.742
9	17 43 30.34	2.3803	18 19 32.7	1.167	9	19 35 42.79	2.2742	17 11 49.8	3.834
10	17 45 53.14	2.3796	18 20 39.4	1.056	10	19 37 59.14	2.2708	17 7 57.0	3.927
11	17 48 15.89	2.3787	18 21 39.4	0.945	11	19 40 15.29	2.2674	17 3 58.6	4.018
12	17 50 38.58	2.3777	18 22 32.8	0.834	12	19 42 31.23	2.2639	16 59 54.8	4.108
13	17 53 1.21	2.3766	18 23 19.5	0.723	13	19 44 46.96	2.2605	16 55 45.6	4.198
14	17 55 23.77	2.3755	18 23 59.6	0.612	14	19 47 2.49	2.2570	16 51 31.0	4.287
15	17 57 46.27	2.3743	18 24 33.0	0.502	15	19 49 17.80	2.2534	16 47 11.1	4.375
16	18 0 8.69	2.3731	18 24 59.8	0.392	16	19 51 32.90	2.2499	16 42 46.0	4.462
17	18 2 31.04	2.3718	18 25 20.0	0.281	17	19 53 47.79	2.2463	16 38 15.6	4.549
18	18 4 53.31	2.3704	18 25 33.5	0.171	18	19 56 2.45	2.2426	16 33 40.1	4.636
19	18 7 15.49	2.3690	18 25 40.5	−0.062	19	19 58 16.90	2.2390	16 28 59.3	4.722
20	18 9 37.59	2.3675	18 25 40.9	+0.048	20	20 0 31.13	2.2354	16 24 13.5	4.805
21	18 11 59.59	2.3660	18 25 34.7	0.158	21	20 2 45.15	2.2317	16 19 22.7	4.889
22	18 14 21.51	2.3644	18 25 21.9	0.267	22	20 4 58.93	2.2279	16 14 26.8	4.973
23	18 16 43.32	2.3627	18 25 2.6	0.376	23	20 7 12.50	2.2242	16 9 26.0	5.055
24	18 19 5.03	2.3610	−18 24 36.8	+0.484	24	20 9 25.84	2.2204	−16 4 20.2	+5.138

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 17.			
	h m s	s	° ′ ″	″
0	20 9 25.84	2.2204	−16 4 20.2	+5.138
1	20 11 38.95	2.2167	15 59 9.6	5.218
2	20 13 51.84	2.2129	15 53 54.1	5.298
3	20 16 4.50	2.2091	15 48 33.9	5.376
4	20 18 16.93	2.2052	15 43 9.0	5.454
5	20 20 29.13	2.2013	15 37 39.4	5.532
6	20 22 41.09	2.1975	15 32 5.1	5.609
7	20 24 52.83	2.1937	15 26 26.3	5.685
8	20 27 4.33	2.1898	15 20 42.9	5.761
9	20 29 15.61	2.1859	15 14 55.0	5.835
10	20 31 26.64	2.1820	15 9 2.7	5.908
11	20 33 37.45	2.1782	15 3 6.0	5.981
12	20 35 48.02	2.1743	14 57 5.0	6.053
13	20 37 58.36	2.1703	14 50 59.7	6.124
14	20 40 8.46	2.1663	14 44 50.1	6.194
15	20 42 18.32	2.1624	14 38 36.4	6.263
16	20 44 27.95	2.1586	14 32 18.5	6.332
17	20 46 37.35	2.1547	14 25 56.5	6.401
18	20 48 46.51	2.1508	14 19 30.4	6.468
19	20 50 55.44	2.1468	14 13 0.4	6.533
20	20 53 4.13	2.1429	14 6 26.4	6.599
21	20 55 12.59	2.1390	13 59 48.5	6.663
22	20 57 20.81	2.1350	13 53 6.8	6.727
23	20 59 28.79	2.1311	−13 46 21.3	+6.790
	JANUARY 18.			
0	21 1 36.54	2.1272	−13 39 32.0	+6.852
1	21 3 44.06	2.1233	13 32 39.0	6.913
2	21 5 51.34	2.1194	13 25 42.4	6.973
3	21 7 58.39	2.1156	13 18 42.2	7.033
4	21 10 5.21	2.1117	13 11 38.4	7.092
5	21 12 11.79	2.1078	13 4 31.2	7.149
6	21 14 18.15	2.1040	12 57 20.5	7.207
7	21 16 24.27	2.1002	12 50 6.3	7.263
8	21 18 30.17	2.0963	12 42 48.9	7.318
9	21 20 35.83	2.0925	12 35 28.1	7.374
10	21 22 41.27	2.0887	12 28 4.0	7.428
11	21 24 46.48	2.0849	12 20 36.8	7.480
12	21 26 51.46	2.0811	12 13 6.4	7.533
13	21 28 56.21	2.0773	12 5 32.9	7.584
14	21 31 0.74	2.0737	11 57 56.3	7.634
15	21 33 5.05	2.0700	11 50 16.8	7.683
16	21 35 9.14	2.0662	11 42 34.3	7.733
17	21 37 13.00	2.0625	11 34 48.8	7.782
18	21 39 16.64	2.0589	11 27 0.5	7.828
19	21 41 20.07	2.0552	11 19 9.4	7.875
20	21 43 23.27	2.0517	11 11 15.5	7.921
21	21 45 26.27	2.0481	11 3 18.9	7.966
22	21 47 29.04	2.0444	10 55 19.6	8.011
23	21 49 31.60	2.0409	10 47 17.6	8.054
24	21 51 33.95	2.0374	−10 39 13.1	+8.096

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 19.			
	h m s	s	° ′ ″	″
0	21 51 33.95	2.0374	−10 39 13.1	+8.096
1	21 53 36.09	2.0340	10 31 6.1	8.137
2	21 55 38.03	2.0305	10 22 56.6	8.175
3	21 57 39.75	2.0270	10 14 44.6	8.219
4	21 59 41.27	2.0237	10 6 30.3	8.259
5	22 1 42.59	2.0203	9 58 13.5	8.298
6	22 3 43.71	2.0169	9 49 54.5	8.335
7	22 5 44.62	2.0136	9 41 33.3	8.372
8	22 7 45.34	2.0103	9 33 9.8	8.410
9	22 9 45.86	2.0070	9 24 44.1	8.446
10	22 11 46.18	2.0038	9 16 16.3	8.480
11	22 13 46.31	2.0006	9 7 46.5	8.514
12	22 15 46.25	1.9974	8 59 14.6	8.548
13	22 17 46.00	1.9942	8 50 40.7	8.581
14	22 19 45.56	1.9912	8 42 4.9	8.613
15	22 21 44.94	1.9881	8 33 27.2	8.644
16	22 23 44.13	1.9851	8 24 47.6	8.675
17	22 25 43.15	1.9821	8 16 6.2	8.705
18	22 27 41.98	1.9790	8 7 23.0	8.734
19	22 29 40.63	1.9762	7 58 38.1	8.762
20	22 31 39.12	1.9733	7 49 51.5	8.790
21	22 33 37.42	1.9703	7 41 3.3	8.818
22	22 35 35.56	1.9676	7 32 13.4	8.844
23	22 37 33.53	1.9648	− 7 23 22.0	+8.869
	JANUARY 20.			
0	22 39 31.33	1.9620	− 7 14 29.1	+8.894
1	22 41 28.97	1.9593	7 5 34.7	8.918
2	22 43 26.45	1.9566	6 56 38.9	8.942
3	22 45 23.76	1.9540	6 47 41.6	8.966
4	22 47 20.93	1.9514	6 38 43.0	8.988
5	22 49 17.93	1.9488	6 29 43.1	9.009
6	22 51 14.79	1.9463	6 20 41.9	9.030
7	22 53 11.49	1.9438	6 11 39.5	9.051
8	22 55 8.05	1.9414	6 2 35.8	9.071
9	22 57 4.46	1.9391	5 53 31.0	9.089
10	22 59 0.74	1.9367	5 44 25.1	9.107
11	23 0 56.87	1.9343	5 35 18.1	9.125
12	23 2 52.86	1.9321	5 26 10.1	9.142
13	23 4 48.72	1.9298	5 17 1.1	9.158
14	23 6 44.44	1.9277	5 7 51.1	9.174
15	23 8 40.04	1.9255	4 58 40.2	9.189
16	23 10 35.50	1.9234	4 49 28.4	9.204
17	23 12 30.85	1.9214	4 40 15.7	9.218
18	23 14 26.07	1.9193	4 31 2.2	9.232
19	23 16 21.17	1.9173	4 21 47.9	9.244
20	23 18 16.15	1.9155	4 12 32.9	9.256
21	23 20 11.03	1.9137	4 3 17.2	9.268
22	23 22 5.78	1.9118	3 54 0.8	9.278
23	23 24 0.43	1.9099	3 44 43.8	9.288
24	23 25 54.97	1.9082	− 3 35 26.2	+9.296

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 21.			
	h m s	s	° ′ ″	″
0	23 25 54.97	1.9082	−3 35 26.2	+9.298
1	23 27 49.41	1.9064	3 26 8.0	9.307
2	23 29 43.74	1.9048	3 16 49.3	9.316
3	23 31 37.98	1.9032	3 7 30.1	9.323
4	23 33 32.12	1.9016	2 58 10.5	9.331
5	23 35 26.17	1.9001	2 48 50.4	9 338
6	23 37 20.13	1.8987	2 39 30.0	9.343
7	23 39 14.01	1.8973	2 30 9.2	9.350
8	23 41 7.80	1.8958	2 20 48.0	9.355
9	23 43 1.50	1.8944	2 11 26.6	9.359
10	23 44 55.13	1.8932	2 2 4.9	9.363
11	23 46 48.68	1.8918	1 52 43.1	9.366
12	23 48 42.15	1.8906	1 43 21.0	9.369
13	23 50 35.55	1.8895	1 33 58.8	9.371
14	23 52 28.89	1.8884	1 24 36.5	9.373
15	23 54 22.16	1.8873	1 15 14.1	9.374
16	23 56 15.37	1.8863	1 5 51.6	9.374
17	23 58 8.52	1.8854	0 56 29.2	9 374
18	0 0 1.62	1.8844	0 47 6.7	9 374
19	0 1 54.65	1.8835	0 37 44.3	9 373
20	0 3 47.64	1.8827	0 28 22.0	9 371
21	0 5 40.58	1.8820	0 18 59.8	9.369
22	0 7 33.48	1.8812	0 9 37.7	9.366
23	0 9 26.33	1.8805	−0 0 15.9	+9.362
	JANUARY 22.			
0	0 11 19.14	1.8798	+0 9 5.8	+9 359
1	0 13 11.91	1.8793	0 18 27.2	9 355
2	0 15 4.65	1.8788	0 27 48.4	9.351
3	0 16 57.36	1.8783	0 37 9.3	9.345
4	0 18 50.05	1.8778	0 46 29.8	9.339
5	0 20 42.70	1.8774	0 55 50.0	9.333
6	0 22 35.34	1.8771	1 5 9.8	9 326
7	0 24 27.95	1.8768	1 14 29.1	9.318
8	0 26 20.55	1.8765	1 23 48.0	9.311
9	0 28 13.13	1.8763	1 33 6.4	9.303
10	0 30 5.71	1.8762	1 42 24.3	9.294
11	0 31 58.27	1.8760	1 51 41.7	9.284
12	0 33 50.83	1.8760	2 0 58.4	9.273
13	0 35 43.39	1.8760	2 10 14.5	9.261
14	0 37 35.95	1.8760	2 19 30.1	9.253
15	0 39 28.51	1.8761	2 28 44.9	9 241
16	0 41 21.08	1.8762	2 37 59.0	9.228
17	0 43 13.65	1.8764	2 47 12.3	9.217
18	0 45 6.25	1.8767	2 56 25.0	9.204
19	0 46 58.85	1.8768	3 5 36.8	9.190
20	0 48 51.47	1.8772	3 14 47.8	9.176
21	0 50 44.12	1.8777	3 23 57.9	9.162
22	0 52 36.79	1.8780	3 33 7.2	9.147
23	0 54 29.48	1.8785	3 42 15.5	9.131
24	0 56 22.21	1.8791	+3 51 22.9	+9.115

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 23.			
	h m s	s	° ′ ″	″
0	0 56 22.21	1.8791	+ 3 51 22.9	+9.115
1	0 58 14.97	1.8796	4 0 29.3	9.098
2	1 0 7.76	1.8802	4 9 34.7	9.082
3	1 2 0.59	1.8808	4 18 39.1	9.064
4	1 3 53.46	1.8816	4 27 42.4	9.046
5	1 5 46.38	1.8824	4 36 44.6	9.027
6	1 7 39.35	1.8832	4 45 45.7	9.008
7	1 9 32.36	1.8840	4 54 45.6	8.989
8	1 11 25.43	1.8849	5 3 44.4	8.969
9	1 13 18.55	1.8858	5 12 41.9	8.948
10	1 15 11.73	1.8868	5 21 38.2	8.927
11	1 17 4.96	1.8878	5 30 33.2	8.906
12	1 18 58.27	1.8890	5 39 26.9	8.883
13	1 20 51.64	1.8901	5 48 19.2	8.861
14	1 22 45.08	1.8912	5 57 10.2	8.838
15	1 24 38.59	1.8924	6 5 59.8	8.814
16	1 26 32.17	1.8937	6 14 47.9	8.790
17	1 28 25.84	1.8951	6 23 34.6	8.766
18	1 30 19.58	1.8964	6 32 19.8	8.741
19	1 32 13.41	1.8979	6 41 3.5	8.715
20	1 34 7.33	1.8993	6 49 45.6	8.689
21	1 36 1.33	1.9008	6 58 26.2	8.662
22	1 37 55.43	1.9024	7 7 5.1	8.635
23	1 39 49.62	1.9040	+ 7 15 42.4	+8.607
	JANUARY 24.			
0	1 41 43.91	1.9057	+ 7 24 18.0	+8.579
1	1 43 38.30	1.9073	7 32 51.9	8.550
2	1 45 32.79	1.9091	7 41 24.0	8.521
3	1 47 27.39	1.9108	7 49 54.4	8.492
4	1 49 22.09	1.9127	7 58 23.0	8.461
5	1 51 16.91	1.9147	8 6 49.7	8.430
6	1 53 11.85	1.9165	8 15 14.6	8.399
7	1 55 6.89	1.9184	8 23 37.6	8.368
8	1 57 2.06	1.9205	8 31 58.7	8.335
9	1 58 57.35	1.9226	8 40 17.8	8.302
10	2 0 52.77	1.9247	8 48 34.9	8.268
11	2 2 48.31	1.9268	8 56 50.0	8.234
12	2 4 43.98	1.9289	9 5 3.0	8.199
13	2 6 39.78	1.9312	9 13 13.9	8.164
14	2 8 35.72	1.9335	9 21 22.7	8.129
15	2 10 31.80	1.9358	9 29 29.4	8.093
16	2 12 28.02	1.9382	9 37 33.9	8.056
17	2 14 24.38	1.9405	9 45 36.1	8.018
18	2 16 20.88	1.9429	9 53 36.1	7.981
19	2 18 17.53	1.9454	10 1 33.8	7.943
20	2 20 14.33	1.9480	10 9 29.2	7.903
21	2 22 11.29	1.9505	10 17 22.2	7.863
22	2 24 8.39	1.9531	10 25 12.8	7.823
23	2 26 5.66	1.9557	10 33 1.0	7.782
24	2 28 3.08	1.9584	+10 40 46.7	+7.741

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 25.			
	h m s	s	° ′ ″	″
0	2 28 3.08	1.9584	+10 40 46.7	+7.741
1	2 30 0.67	1.9612	10 48 29.9	7.699
2	2 31 58.42	1.9638	10 56 10.6	7.657
3	2 33 56.33	1.9667	11 3 48.8	7.614
4	2 35 54.42	1.9695	11 11 24.3	7.570
5	2 37 52.67	1.9723	11 18 57.2	7.526
6	2 39 51.10	1.9753	11 26 27.4	7.481
7	2 41 49.71	1.9783	11 33 54.9	7.436
8	2 43 48.49	1.9812	11 41 19.7	7.390
9	2 45 47.45	1.9842	11 48 41.7	7.343
10	2 47 46.60	1.9873	11 56 0.8	7.296
11	2 49 45.93	1.9904	12 3 17.2	7.248
12	2 51 45.45	1.9935	12 10 30.6	7.199
13	2 53 45.15	1.9967	12 17 41.1	7.151
14	2 55 45.05	1.9999	12 24 48.7	7.101
15	2 57 45.14	2.0032	12 31 53.2	7.050
16	2 59 45.43	2.0064	12 38 54.7	7.000
17	3 1 45.91	2.0097	12 45 53.2	6.949
18	3 3 46.59	2.0130	12 52 48.6	6.897
19	3 5 47.47	2.0164	12 59 40.8	6.843
20	3 7 48.56	2.0198	13 6 29.8	6.790
21	3 9 49.85	2.0233	13 13 15.6	6.736
22	3 11 51.35	2.0267	13 19 58.1	6.682
23	3 13 53.05	2.0301	+13 26 37.4	+6.627
	JANUARY 26.			
0	3 15 54.96	2.0336	+13 33 13.3	+6.570
1	3 17 57.08	2.0372	13 39 45.8	6.513
2	3 19 59.42	2.0408	13 46 14.9	6.457
3	3 22 1.97	2.0443	13 52 40.6	6.399
4	3 24 4.73	2.0479	13 59 2.8	6.341
5	3 26 7.72	2.0516	14 5 21.5	6.282
6	3 28 10.92	2.0552	14 11 36.6	6.221
7	3 30 14.34	2.0589	14 17 48.0	6.161
8	3 32 17.99	2.0627	14 23 55.9	6.100
9	3 34 21.86	2.0663	14 30 0.0	6.038
10	3 36 25.96	2.0701	14 36 0.4	5.975
11	3 38 30.27	2.0739	14 41 57.0	5.912
12	3 40 34.82	2.0777	14 47 49.8	5.848
13	3 42 39.59	2.0815	14 53 38.8	5.784
14	3 44 44.60	2.0853	14 59 23.9	5.718
15	3 46 49.83	2.0892	15 5 5.0	5.652
16	3 48 55.30	2.0931	15 10 42.1	5.586
17	3 51 1.00	2.0970	15 16 15.3	5.519
18	3 53 6.94	2.1008	15 21 44.4	5.451
19	3 55 13.10	2.1047	15 27 9.4	5.383
20	3 57 19.51	2.1087	15 32 30.3	5.313
21	3 59 26.15	2.1126	15 37 46.9	5.243
22	4 1 33.02	2.1166	15 42 59.4	5.172
23	4 3 40.14	2.1206	15 48 7.6	5.100
24	4 5 47.49	2.1245	+15 53 11.5	+5.029

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 27.			
	h m s	s	° ′ ″	″
0	4 5 47.49	2.1245	+15 53 11.5	+5.029
1	4 7 55.08	2.1285	15 58 11.1	4.957
2	4 10 2.91	2.1326	16 3 6.3	4.883
3	4 12 10.99	2.1366	16 7 57.0	4.808
4	4 14 19.30	2.1405	16 12 43.3	4.734
5	4 16 27.85	2.1446	16 17 25.1	4.658
6	4 18 36.65	2.1486	16 22 2.3	4.582
7	4 20 45.68	2.1526	16 26 35.0	4.506
8	4 22 54.96	2.1567	16 31 3.0	4.428
9	4 25 4.48	2.1607	16 35 26.3	4.349
10	4 27 14.24	2.1647	16 39 44.9	4.271
11	4 29 24.24	2.1687	16 43 58.8	4.192
12	4 31 34.49	2.1728	16 48 7.9	4.111
13	4 33 44.98	2.1768	16 52 12.1	4.030
14	4 35 55.71	2.1808	16 56 11.5	3.948
15	4 38 6.68	2.1848	17 0 5.9	3.866
16	4 40 17.89	2.1889	17 3 55.4	3.783
17	4 42 29.35	2.1929	17 7 39.8	3.698
18	4 44 41.04	2.1968	17 11 19.2	3.614
19	4 46 52.97	2.2009	17 14 53.5	3.529
20	4 49 5.15	2.2049	17 18 22.7	3.443
21	4 51 17.56	2.2088	17 21 46.7	3.357
22	4 53 30.21	2.2128	17 25 5.6	3.270
23	4 55 43.10	2.2168	+17 28 19.1	+3.182
	JANUARY 28.			
0	4 57 56.23	2.2207	+17 31 27.4	+3.094
1	5 0 9.59	2.2247	17 34 30.4	3.005
2	5 2 23.19	2.2286	17 37 28.0	2.915
3	5 4 37.02	2.2325	17 40 20.2	2.824
4	5 6 51.09	2.2363	17 43 6.9	2.733
5	5 9 5.38	2.2402	17 45 48.2	2.642
6	5 11 19.91	2.2440	17 48 23.9	2.549
7	5 13 34.66	2.2478	17 50 54.1	2.457
8	5 15 49.64	2.2516	17 53 18.8	2.363
9	5 18 4.85	2.2554	17 55 37.7	2.268
10	5 20 20.29	2.2592	17 57 51.0	2.174
11	5 22 35.95	2.2628	17 59 58.6	2.079
12	5 24 51.83	2.2665	18 2 0.5	1.983
13	5 27 7.93	2.2702	18 3 56.6	1.887
14	5 29 24.26	2.2739	18 5 46.9	1.790
15	5 31 40.80	2.2775	18 7 31.4	1.692
16	5 33 57.56	2.2811	18 9 9.9	1.593
17	5 36 14.53	2.2846	18 10 42.6	1.495
18	5 38 31.71	2.2881	18 12 9.3	1.395
19	5 40 49.10	2.2916	18 13 30.0	1.295
20	5 43 6.70	2.2951	18 14 44.7	1.195
21	5 45 24.51	2.2985	18 15 53.4	1.094
22	5 47 42.52	2.3018	18 16 56.0	0.992
23	5 50 0.73	2.3052	18 17 52.5	0.890
24	5 52 19.14	2.3085	+18 18 42.8	+0.788

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 29.			
	h m s	s	° ′ ″	″
0	5 52 19.14	2.3085	+18 18 42.8	+0.788
1	5 54 37.75	2.3118	18 19 27.0	0.684
2	5 56 56.55	2.3150	18 20 4.9	0.581
3	5 59 15.55	2.3182	18 20 36.7	0.478
4	6 1 34.73	2.3213	18 21 2.2	0.373
5	6 3 54.10	2.3244	18 21 21.4	0.267
6	6 6 13.66	2.3274	18 21 34.3	0.162
7	6 8 33.39	2.3304	18 21 40.9	+0.057
8	6 10 53.31	2.3334	18 21 41.1	−0.049
9	6 13 13.40	2.3363	18 21 35.0	0.156
10	6 15 33.67	2.3392	18 21 22.4	0.263
11	6 17 54.10	2.3420	18 21 3.4	0.370
12	6 20 14.71	2.3448	18 20 38.0	0.478
13	6 22 35.48	2.3475	18 20 6.1	0.586
14	6 24 56.41	2.3502	18 19 27.7	0.694
15	6 27 17.50	2.3528	18 18 42.8	0.803
16	6 29 38.74	2.3553	18 17 51.4	0.912
17	6 32 0.14	2.3579	18 16 53.4	1.021
18	6 34 21.69	2.3603	18 15 48.9	1.131
19	6 36 43.38	2.3627	18 14 37.7	1.241
20	6 39 5.21	2.3650	18 13 20.0	1.350
21	6 41 27.18	2.3673	18 11 55.7	1.460
22	6 43 49.29	2.3697	18 10 24.8	1.571
23	6 46 11.54	2.3718	+18 8 47.2	−1.682
	JANUARY 30.			
0	6 48 33.91	2.3739	+18 7 3.0	-1.792
1	6 50 56.41	2.3760	18 5 12.1	1.903
2	6 53 19.03	2.3781	18 3 14.6	2.014
3	6 55 41.78	2.3800	18 1 10.4	2.126
4	6 58 4.63	2.3819	17 58 59.5	2.238
5	7 0 27.61	2.3838	17 56 41.9	2.349
6	7 2 50.69	2.3855	17 54 17.6	2.461
7	7 5 13.87	2.3872	17 51 46.6	2.572
8	7 7 37.16	2.3889	17 49 8.9	2.683
9	7 10 0.54	2.3906	17 46 24.6	2.795
10	7 12 24.03	2.3922	17 43 33.5	2.907
11	7 14 47.60	2.3936	17 40 35.7	3.019
12	7 17 11.26	2.3950	17 37 31.2	3.131
13	7 19 35.00	2.3964	17 34 20.0	3.242
14	7 21 58.83	2.3978	17 31 2.1	3.354
15	7 24 22.73	2.3990	17 27 37.5	3.465
16	7 26 46.71	2.4002	17 24 6.3	3.577
17	7 29 10.75	2.4013	17 20 28.3	3.688
18	7 31 34.87	2.4024	17 16 43.7	3.799
19	7 33 59.04	2.4034	17 12 52.4	3.910
20	7 36 23.28	2.4044	17 8 54.5	4.021
21	7 38 47.57	2.4053	17 4 49.9	4.132
22	7 41 11.92	2.4062	17 0 38.7	4.242
23	7 43 36.31	2.4069	16 56 20.9	4.353
24	7 46 0.75	2.4077	+16 51 56.4	−4.463

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 31.			
	h m s	s	° ′ ″	″
0	7 46 0.75	2.4077	+16 51 56.4	−4.463
1	7 48 25.23	2.4083	16 47 25.4	4.572
2	7 50 49.75	2.4090	16 42 47.8	4.682
3	7 53 14.31	2.4096	16 38 3.6	4.791
4	7 55 38.90	2.4100	16 33 12.9	4.899
5	7 58 3.51	2.4104	16 28 15.7	5.008
6	8 0 28.15	2.4108	16 23 11.9	5.117
7	8 2 52.81	2.4112	16 18 1.7	5.223
8	8 5 17.49	2.4114	16 12 45.1	5.330
9	8 7 42.18	2.4116	16 7 22.1	5.437
10	8 10 6.88	2.4118	16 1 52.6	5.544
11	8 12 31.60	2.4120	15 56 16.8	5.650
12	8 14 56.32	2.4120	15 50 34.6	5.756
13	8 17 21.04	2.4120	15 44 46.1	5.860
14	8 19 45.76	2.4120	15 38 51.4	5.964
15	8 22 10.48	2.4119	15 32 50.4	6.069
16	8 24 35.19	2.4117	15 26 43.1	6.172
17	8 26 59.89	2.4115	15 20 29.7	6.275
18	8 29 24.57	2.4112	15 14 10.1	6.377
19	8 31 49.24	2.4110	15 7 44.4	6.479
20	8 34 13.89	2.4107	15 1 12.6	6.580
21	8 36 38.53	2.4103	14 54 34.8	6.680
22	8 39 3.13	2.4098	14 47 51.0	6.779
23	8 41 27.71	2.4094	+14 41 1.3	−6.878
	FEBRUARY 1.			
0	8 43 52.26	2.4089	+14 34 5.6	−6.978
1	8 46 16.78	2.4083	14 27 4.0	7.075
2	8 48 41.26	2.4077	14 19 56.6	7.172
3	8 51 5.70	2.4070	14 12 43.4	7.268
4	8 53 30.10	2.4064	14 5 24.5	7.362
5	8 55 54.47	2.4057	13 57 59.8	7.458
6	8 58 18.78	2.4048	13 50 29.5	7.552
7	9 0 43.05	2.4041	13 42 53.6	7.644
8	9 3 7.27	2.4033	13 35 12.2	7.736
9	9 5 31.45	2.4024	13 27 25.3	7.828
10	9 7 55.56	2.4015	13 19 32.9	7.918
11	9 10 19.63	2.4006	13 11 35.1	8.008
12	9 12 43.63	2.3996	13 3 32.0	8.096
13	9 15 7.58	2.3986	12 55 23.6	8.184
14	9 17 31.46	2.3975	12 47 9.9	8.271
15	9 19 55.28	2.3965	12 38 51.1	8.356
16	9 22 19.04	2.3954	12 30 27.2	8.441
17	9 24 42.73	2.3943	12 21 58.2	8.525
18	9 27 6.35	2.3932	12 13 24.2	8.608
19	9 29 29.91	2.3920	12 4 45.3	8.690
20	9 31 53.39	2.3908	11 56 1.4	8.771
21	9 34 16.80	2.3896	11 47 12.8	8.850
22	9 36 40.14	2.3883	11 38 19.4	8.929
23	9 39 3.40	2.3871	11 29 21.3	9.007
24	9 41 26.59	2.3858	+11 20 18.5	−9.085

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var per Min.	Declination.	Var. per Min.
	FEBRUARY 2.			
	h m s	s	° ′ ″	″
0	9 41 26.59	2.3858	+11 20 18.5	− 9.085
1	9 43 49.70	2.3845	11 11 11.1	9.160
2	9 46 12.73	2.3832	11 1 59.3	9.234
3	9 48 35.68	2.3818	10 52 43.0	9.308
4	9 50 58.55	2.3805	10 43 22.3	9.380
5	9 53 21.34	2.3792	10 33 57.4	9.451
6	9 55 44.05	2.3778	10 24 28.2	9.522
7	9 58 6.68	2.3764	10 14 54.8	9.591
8	10 0 29.22	2.3750	10 5 17.3	9.658
9	10 2 51.68	2.3736	9 55 35.8	9.725
10	10 5 14.05	2.3722	9 45 50.3	9.791
11	10 7 36.34	2.3707	9 36 0.9	9.856
12	10 9 58.54	2.3692	9 26 7.6	9.919
13	10 12 20.65	2.3678	9 16 10.6	9.981
14	10 14 42.68	2.3665	9 6 9.9	10.042
15	10 17 4.63	2.3650	8 56 5.6	10.100
16	10 19 26.48	2.3635	8 45 57.8	10.159
17	10 21 48.25	2.3621	8 35 46.5	10.217
18	10 24 9.93	2.3607	8 25 31.8	10.273
19	10 26 31.53	2.3592	8 15 13.7	10.328
20	10 28 53.04	2.3577	8 4 52.4	10.381
21	10 31 14.46	2.3562	7 54 28.0	10.432
22	10 33 35.79	2.3548	7 44 0.5	10.484
23	10 35 57.04	2.3534	+ 7 33 29.9	−10.534
	FEBRUARY 3.			
0	10 38 18.20	2.3519	+ 7 22 56.4	−10.583
1	10 40 39.27	2.3505	7 12 20.0	10.629
2	10 43 0.26	2.3492	7 1 40.9	10.675
3	10 45 21.17	2.3477	6 50 59.0	10.720
4	10 47 41.98	2.3462	6 40 14.5	10.763
5	10 50 2.71	2.3449	6 29 27.4	10.806
6	10 52 23.37	2.3435	6 18 37.8	10.847
7	10 54 43.93	2.3420	6 7 45.8	10.886
8	10 57 4.41	2.3407	5 56 51.5	10.923
9	10 59 24.81	2.3393	5 45 55.0	10.960
10	11 1 45.13	2.3380	5 34 56.3	10.997
11	11 4 5.37	2.3367	5 23 55.4	11.031
12	11 6 25.53	2.3353	5 12 52.6	11.063
13	11 8 45.61	2.3340	5 1 47.8	11.095
14	11 11 5.61	2.3327	4 50 41.2	11.125
15	11 13 25.53	2.3314	4 39 32.8	11.155
16	11 15 45.38	2.3302	4 28 22.6	11.183
17	11 18 5.15	2.3289	4 17 10.9	11.208
18	11 20 24.85	2.3277	4 5 57.6	11.233
19	11 22 44.48	2.3265	3 54 42.9	11.257
20	11 25 4.03	2.3253	3 43 26.7	11.280
21	11 27 23.51	2.3242	3 32 9.3	11.301
22	11 29 42.93	2.3230	3 20 50.6	11.321
23	11 32 2.27	2.3218	3 9 30.8	11.339
24	11 34 21.55	2.3207	+ 2 58 9.9	−11.357

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 4.			
	h m s	s	° ′ ″	″
0	11 34 21.55	2.3207	+2 58 9.9	−11.357
1	11 36 40.76	2.3197	2 46 48.0	11.372
2	11 38 59.91	2.3187	2 35 25.2	11.387
3	11 41 19.00	2.3176	2 24 1.5	11.401
4	11 43 38.02	2.3166	2 12 37.1	11.413
5	11 45 56.99	2.3156	2 1 12.0	11.423
6	11 48 15.89	2.3146	1 49 46.3	11.432
7	11 50 34.74	2.3137	1 38 20.2	11.440
8	11 52 53.54	2.3129	1 26 53.5	11.447
9	11 55 12.29	2.3119	1 15 26.5	11.453
10	11 57 30.97	2.3109	1 3 59.2	11.457
11	11 59 49.60	2.3102	0 52 31.7	11.459
12	12 2 8.19	2.3094	0 41 4.1	11.461
13	12 4 26.73	2.3086	0 29 36.4	11.462
14	12 6 45.22	2.3078	0 18 8.7	11.460
15	12 9 3.67	2.3071	+0 6 41.2	11.457
16	12 11 22.07	2.3063	−0 4 46.2	11.454
17	12 13 40.43	2.3057	0 16 13.3	11.449
18	12 15 58.76	2.3052	0 27 40.1	11.443
19	12 18 17.05	2.3045	0 39 6.5	11.435
20	12 20 35.30	2.3038	0 50 32.3	11.426
21	12 22 53.51	2.3033	1 1 57.6	11.417
22	12 25 11.69	2.3028	1 13 22.4	11.407
23	12 27 29.84	2.3023	−1 24 46.4	−11.394
	FEBRUARY 5.			
0	12 29 47.96	2.3018	−1 36 9.7	−11.381
1	12 32 6.05	2.3013	1 47 32.1	11.365
2	12 34 24.12	2.3009	1 58 53.5	11.349
3	12 36 42.16	2.3005	2 10 14.0	11.332
4	12 39 0.18	2.3001	2 21 33.3	11.313
5	12 41 18.17	2.2997	2 32 51.5	11.293
6	12 43 36.15	2.2995	2 44 8.5	11.272
7	12 45 54.11	2.2993	2 55 24.2	11.250
8	12 48 12.06	2.2990	3 6 38.5	11.227
9	12 50 29.99	2.2987	3 17 51.4	11.202
10	12 52 47.91	2.2986	3 29 2.7	11.176
11	12 55 5.82	2.2984	3 40 12.5	11.148
12	12 57 23.72	2.2983	3 51 20.6	11.121
13	12 59 41.61	2.2982	4 2 27.0	11.092
14	13 1 59.50	2.2981	4 13 31.6	11.061
15	13 4 17.38	2.2981	4 24 34.3	11.029
16	13 6 35.27	2.2981	4 35 35.1	10.997
17	13 8 53.15	2.2980	4 46 33.9	10.963
18	13 11 11.03	2.2980	4 57 30.6	10.927
19	13 13 28.91	2.2981	5 8 25.1	10.891
20	13 15 46.80	2.2982	5 19 17.5	10.854
21	13 18 4.69	2.2983	5 30 7.6	10.815
22	13 20 22.59	2.2985	5 40 55.3	10.775
23	13 22 40.51	2.2987	5 51 40.6	10.734
24	13 24 58.43	2.2988	−6 2 23.4	−10.693

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 6.			
	h m s	s	° ′ ″	″
0	13 24 58.43	2.2988	− 6 2 23.4	−10.693
1	13 27 16.36	2.2990	6 13 3.7	10.650
2	13 29 34.31	2.2993	6 23 41.4	10.606
3	13 31 52.28	2.2996	6 34 16.4	10.561
4	13 34 10.26	2.2998	6 44 48.7	10.515
5	13 36 28.26	2.3001	6 55 18.2	10.468
6	13 38 46.27	2.3004	7 5 44.8	10.418
7	13 41 4.31	2.3008	7 16 8.4	10.369
8	13 43 22.37	2.3013	7 26 29.1	10.319
9	13 45 40.46	2.3017	7 36 46.7	10.268
10	13 47 58.57	2.3021	7 47 1.2	10.215
11	13 50 16.71	2.3025	7 57 12.5	10.162
12	13 52 34.87	2.3029	8 7 20.6	10.108
13	13 54 53.06	2.3034	8 17 25.4	10.052
14	13 57 11.28	2.3039	8 27 26.8	9 995
15	13 59 29.53	2.3045	8 37 24.8	9.937
16	14 1 47.82	2.3050	8 47 19.3	9.878
17	14 4 6.13	2.3055	8 57 10.2	9.819
18	14 6 24.48	2.3062	9 6 57.6	9.759
19	14 8 42.87	2.3068	9 16 41.3	9.698
20	14 11 1.29	2.3075	9 26 21.3	9.636
21	14 13 19.75	2.3080	9 35 57.6	9.573
22	14 15 38.25	2.3086	9 45 30.0	9.508
23	14 17 56.78	2.3093	− 9 54 58.5	− 9.443
	FEBRUARY 7.			
0	14 20 15.36	2.3100	−10 4 23.1	− 9.377
1	14 22 33.98	2.3107	10 13 43.7	9.310
2	14 24 52.64	2.3113	10 23 0.3	9.242
3	14 27 11.34	2.3121	10 32 12.7	9.173
4	14 29 30.09	2.3128	10 41 21.0	9.103
5	14 31 48.88	2.3135	10 50 25.1	9.032
6	14 34 7.71	2.3142	10 59 24.9	8.961
7	14 36 26.58	2.3149	11 8 20.4	8.889
8	14 38 45.50	2.3157	11 17 11.6	8.816
9	14 41 4.47	2.3165	11 25 58.3	8.742
10	14 43 23.48	2.3173	11 34 40.6	8.667
11	14 45 42.54	2.3181	11 43 18.4	8.592
12	14 48 1.65	2.3188	11 51 51.6	8.515
13	14 50 20.80	2.3196	12 0 20.2	8.438
14	14 52 40.00	2.3204	12 8 44.2	8.360
15	14 54 59.25	2.3212	12 17 3.4	8.281
16	14 57 18.54	2.3219	12 25 17.9	8.202
17	14 59 37.88	2.3227	12 33 27.6	8.121
18	15 1 57.27	2.3236	12 41 32.4	8.040
19	15 4 16.71	2.3243	12 49 32.4	7.958
20	15 6 36.19	2.3251	12 57 27.4	7.876
21	15 8 55.72	2.3259	13 5 17.5	7.793
22	15 11 15.30	2.3267	13 13 2.5	7.708
23	15 13 34.93	2.3275	13 20 42.4	7.623
24	15 15 54.60	2.3282	−13 28 17.3	− 7.538

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 8.			
	h m s	s	° ′ ″	″
0	15 15 54.60	2.3282	−13 28 17.3	−7.538
1	15 18 14.32	2.3291	13 35 47.0	7.452
2	15 20 34.09	2.3298	13 43 11.5	7.366
3	15 22 53.90	2.3306	13 50 30.9	7.278
4	15 25 13.76	2.3314	13 57 44.9	7.189
5	15 27 33.67	2.3322	14 4 53.6	7.101
6	15 29 53.62	2.3328	14 11 57.0	7.012
7	15 32 13.61	2 3336	14 18 55.0	6.921
8	15 34 33.65	2.3343	14 25 47.5	6.831
9	15 36 53.73	2.3350	14 32 34.7	6.740
10	15 39 13.85	2.3357	14 39 16.3	6.648
11	15 41 34.01	2.3363	14 45 52.4	6.555
12	15 43 54.21	2.3370	14 52 22.9	6.462
13	15 46 14.45	2.3377	14 58 47.9	6.369
14	15 48 34.73	2.3383	15 5 7.2	6.274
15	15 50 55.05	2.3389	15 11 20.8	6.180
16	15 53 15.40	2 3395	15 17 28.8	6.085
17	15 55 35.79	2.3401	15 23 31.0	5.989
18	15 57 56.21	2.3406	15 29 27.5	5.893
19	16 0 16.66	2.3412	15 35 18.2	5.796
20	16 2 37.15	2.3417	15 41 3.0	5.698
21	16 4 57.66	2.3121	15 46 42.0	5.602
22	16 7 18.20	2.3426	15 52 15.2	5.504
23	16 9 38.77	2.3431	−15 57 42.5	−5.405
	FEBRUARY 9.			
0	16 11 59.37	2.3435	−16 3 3.8	−5.306
1	16 14 19.99	2.3138	16 8 19.2	5.207
2	16 16 40.63	2.3143	16 13 28.6	5.107
3	16 19 1.30	2.3147	16 18 32.0	5.006
4	16 21 21.99	2.3449	16 23 29.3	4.905
5	16 23 42.69	2.3452	16 28 20.6	4.804
6	16 26 3.41	2.3154	16 33 5.8	4.703
7	16 28 24.14	2.3457	16 37 45.0	4.602
8	16 30 44.89	2.3159	16 42 18.0	4.499
9	16 33 5.65	2.3160	16 46 44.9	4.397
10	16 35 26.41	2.3462	16 51 5.6	4.293
11	16 37 47.19	2.3163	16 55 20.1	4.191
12	16 40 7.97	2.3163	16 59 28.5	4.088
13	16 42 28.75	2.3464	17 3 30.7	3.984
14	16 44 49.54	2.3164	17 7 26.6	3.880
15	16 47 10.32	2.3463	17 11 16.3	3.776
16	16 49 31.10	2.3464	17 14 59.7	3.671
17	16 51 51.89	2.3463	17 18 36.8	3.567
18	16 54 12.65	2.3460	17 22 7.7	3.462
19	16 56 33.41	2.3459	17 25 32.3	3.357
20	16 58 54.16	2.3457	17 28 50.5	3.252
21	17 1 14.89	2.3454	17 32 2.5	3.147
22	17 3 35.61	2.3452	17 35 8.1	3.041
23	17 5 56.31	2.3448	17 38 7.4	2.935
24	17 8 16.99	2.3445	−17 41 0.3	−2.829

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 10.			
	h m s	s	° ′ ″	″
0	17 8 16.99	2.3445	−17 41 0.3	−2.829
1	17 10 37.65	2.3441	17 43 46.9	2.723
2	17 12 58.28	2.3436	17 46 27.1	2.617
3	17 15 18.88	2.3431	17 49 0.9	2.511
4	17 17 39.45	2.3426	17 51 28.4	2.404
5	17 19 59.99	2.3420	17 53 49.4	2.298
6	17 22 20.49	2.3414	17 56 4.1	2.192
7	17 24 40.96	2.3408	17 58 12.4	2.086
8	17 27 1.39	2.3401	18 0 14.4	1.979
9	17 29 21.77	2.3393	18 2 9.9	1.872
10	17 31 42.11	2.3385	18 3 59.0	1.766
11	17 34 2.39	2.3377	18 5 41.8	1.659
12	17 36 22.63	2.3368	18 7 18.1	1.552
13	17 38 42.81	2.3359	18 8 48.0	1.446
14	17 41 2.94	2.3350	18 10 11.6	1.340
15	17 43 23.01	2.3340	18 11 28.8	1.233
16	17 45 43.02	2.3329	18 12 39.5	1.126
17	17 48 2.96	2.3318	18 13 43.9	1.020
18	17 50 22.84	2.3307	18 14 41.9	0.913
19	17 52 42.65	2.3295	18 15 33.5	0.807
20	17 55 2.38	2.3283	18 16 18.8	0.702
21	17 57 22.05	2.3271	18 16 57.7	0.596
22	17 59 41.63	2.3258	18 17 30.3	0.490
23	18 2 1.14	2.3244	−18 17 56.5	−0.381
	FEBRUARY 11.			
0	18 4 20.56	2.3230	−18 18 16.4	−0.279
1	18 6 39.90	2.3216	18 18 30.0	0.173
2	18 8 59.15	2.3201	18 18 37.2	−0.068
3	18 11 18.31	2.3186	18 18 38.2	+0.036
4	18 13 37.38	2.3170	18 18 32.9	0.141
5	18 15 56.35	2.3154	18 18 21.3	0.246
6	18 18 15.23	2.3137	18 18 3.4	0.350
7	18 20 34.00	2.3120	18 17 39.3	0.453
8	18 22 52.67	2.3103	18 17 9.0	0.557
9	18 25 11.24	2.3085	18 16 32.5	0.660
10	18 27 29.69	2.3067	18 15 49.8	0.763
11	18 29 48.04	2.3048	18 15 0.9	0.867
12	18 32 6.27	2.3029	18 14 5.8	0.969
13	18 34 24.39	2.3010	18 13 4.6	1.071
14	18 36 42.39	2.2989	18 11 57.3	1.172
15	18 39 0.26	2.2969	18 10 43.9	1.274
16	18 41 18.02	2.2949	18 9 24.4	1.376
17	18 43 35.65	2.2928	18 7 58.8	1.478
18	18 45 53.15	2.2906	18 6 27.1	1.578
19	18 48 10.52	2.2884	18 4 49.5	1.677
20	18 50 27.76	2.2862	18 3 5.9	1.777
21	18 52 44.86	2.2839	18 1 16.3	1.876
22	18 55 1.83	2.2816	17 59 20.8	1.975
23	18 57 18.65	2.2793	17 57 19.3	2.073
24	18 59 35.34	2.2769	−17 55 12.0	+2.171

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 12.			
	h m s	s	° ′ ″	″
0	18 59 35.34	2.2769	−17 55 12.0	+2.171
1	19 1 51.88	2.2744	17 52 58.8	2.269
2	19 4 8.27	2.2720	17 50 39.7	2.366
3	19 6 24.52	2.2696	17 48 14.9	2.463
4	19 8 40.62	2.2670	17 45 44.2	2.559
5	19 10 56.56	2.2644	17 43 7.8	2.654
6	19 13 12.35	2.2619	17 40 25.7	2.749
7	19 15 27.99	2.2593	17 37 37.9	2.843
8	19 17 43.46	2.2566	17 34 44.5	2.937
9	19 19 58.78	2.2539	17 31 45.4	3.032
10	19 22 13.93	2.2512	17 28 40.7	3.125
11	19 24 28.92	2.2484	17 25 30.4	3.217
12	19 26 43.74	2.2456	17 22 14.6	3.309
13	19 28 58.39	2.2428	17 18 53.3	3.401
14	19 31 12.88	2.2401	17 15 26.5	3.492
15	19 33 27.20	2.2372	17 11 54.3	3.582
16	19 35 41.34	2.2342	17 8 16.7	3.672
17	19 37 55.31	2.2313	17 4 33.7	3.761
18	19 40 9.10	2.2284	17 0 45.4	3.850
19	19 42 22.72	2.2255	16 56 51.7	3.937
20	19 44 36.16	2.2225	16 52 52.9	4.024
21	19 46 49.42	2.2194	16 48 48.8	4.112
22	19 49 2.49	2.2164	16 44 39.5	4.198
23	19 51 15.39	2.2134	−16 40 25.1	+4.283
	FEBRUARY 13.			
0	19 53 28.10	2.2103	−16 36 5.5	+4.368
1	19 55 40.63	2.2072	16 31 40.9	4.452
2	19 57 52.97	2.2041	16 27 11.2	4.536
3	20 0 5.12	2.2010	16 22 36.6	4.618
4	20 2 17.09	2.1978	16 17 57.0	4.702
5	20 4 28.86	2.1947	16 13 12.4	4.783
6	20 6 40.45	2.1915	16 8 23.0	4.863
7	20 8 51.84	2.1883	16 3 28.8	4.944
8	20 11 3.04	2.1851	15 58 29.7	5.024
9	20 13 14.05	2.1819	15 53 25.9	5.103
10	20 15 24.87	2.1787	15 48 17.4	5.181
11	20 17 35.49	2.1754	15 43 4.2	5.258
12	20 19 45.92	2.1722	15 37 46.4	5.335
13	20 21 56.15	2.1688	15 32 24.0	5.412
14	20 24 6.18	2.1656	15 26 57.0	5.488
15	20 26 16.02	2.1622	15 21 25.5	5.562
16	20 28 25.65	2.1589	15 15 49.6	5.636
17	20 30 35.09	2.1557	15 10 9.2	5.709
18	20 32 44.33	2.1524	15 4 24.5	5.782
19	20 34 53.38	2.1491	14 58 35.4	5.853
20	20 37 2.22	2.1458	14 52 42.1	5.994
21	20 39 10.87	2.1424	14 46 44.5	5.995
22	20 41 19.31	2.1390	14 40 42.7	6.065
23	20 43 27.55	2.1357	14 34 36.7	6.134
24	20 45 35.60	2.1325	−14 28 26.6	+6.202

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 14.			
	h m s	s	° ′ ″	″
0	20 45 35.60	2.1325	−14 28 26.6	+6.202
1	20 47 43.45	2.1291	14 22 12.4	6.270
2	20 49 51.09	2.1257	14 15 54.2	6.336
3	20 51 58.53	2.1224	14 9 32.1	6.403
4	20 54 5.78	2.1191	14 3 5.9	6.468
5	20 56 12.82	2.1157	13 56 35.9	6.532
6	20 58 19.66	2.1124	13 50 2.1	6.596
7	21 0 26.31	2.1091	13 43 24.4	6.659
8	21 2 32.75	2.1058	13 36 43.0	6.721
9	21 4 39.00	2.1024	13 29 57.9	6.783
10	21 6 45.04	2.0991	13 23 9.1	6.844
11	21 8 50.89	2.0958	13 16 16.6	6.904
12	21 10 56.54	2.0925	13 9 20.6	6.963
13	21 13 1.99	2.0892	13 2 21.1	7.022
14	21 15 7.24	2.0858	12 55 18.0	7.079
15	21 17 12.29	2.0826	12 48 11.6	7.136
16	21 19 17.15	2.0794	12 41 1.7	7.192
17	21 21 21.82	2.0762	12 33 48.5	7.248
18	21 23 26.29	2.0728	12 26 31.9	7.303
19	21 25 30.56	2.0696	12 19 12.1	7.357
20	21 27 34.64	2.0664	12 11 49.1	7.410
21	21 29 38.53	2.0632	12 4 22.9	7.463
22	21 31 42.22	2.0599	11 56 53.5	7.515
23	21 33 45.72	2.0567	−11 49 21.1	+7.565
	FEBRUARY 15.			
0	21 35 49.03	2.0536	−11 41 45.7	+7.615
1	21 37 52.15	2.0504	11 34 7.3	7.665
2	21 39 55.08	2.0473	11 26 25.9	7.713
3	21 41 57.83	2.0442	11 18 41.7	7.762
4	21 44 0.39	2.0411	11 10 54.5	7.809
5	21 46 2.76	2.0379	11 3 4.6	7.855
6	21 48 4.94	2.0348	10 55 11.9	7.901
7	21 50 6.94	2.0318	10 47 16.5	7.946
8	21 52 8.76	2.0288	10 39 18.4	7.990
9	21 54 10.40	2.0258	10 31 17.7	8.034
10	21 56 11.86	2.0228	10 23 14.3	8.077
11	21 58 13.14	2.0198	10 15 8.5	8.118
12	22 0 14.24	2.0169	10 7 0.2	8.159
13	22 2 15.17	2.0139	9 58 49.4	8.199
14	22 4 15.91	2.0110	9 50 36.3	8.239
15	22 6 16.49	2.0082	9 42 20.7	8.278
16	22 8 16.89	2.0053	9 34 2.9	8.317
17	22 10 17.13	2.0025	9 25 42.7	8.354
18	22 12 17.19	1.9996	9 17 20.4	8.391
19	22 14 17.08	1.9968	9 8 55.8	8.428
20	22 16 16.81	1.9942	9 0 29.1	8.463
21	22 18 16.38	1.9914	8 52 0.3	8.497
22	22 20 15.78	1.9886	8 43 29.5	8.531
23	22 22 15.01	1.9859	8 34 56.6	8.564
24	22 24 14.09	1.9833	− 8 26 21.8	+8.596

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 16.			
	h m s	s	° ′ ″	″
0	22 24 14.09	1.9833	−8 26 21.8	+8.596
1	22 26 13.01	1.9807	8 17 45.1	8.628
2	22 28 11.77	1.9780	8 9 6.5	8.659
3	22 30 10.37	1.9754	8 0 26.0	8.689
4	22 32 8.82	1.9729	7 51 43.8	8.718
5	22 34 7.12	1.9704	7 42 59.8	8.748
6	22 36 5.27	1.9679	7 34 14.0	8.777
7	22 38 3.27	1.9654	7 25 26.6	8.803
8	22 40 1.12	1.9630	7 16 37.6	8.830
9	22 41 58.83	1.9606	7 7 47.0	8.856
10	22 43 56.39	1.9583	6 58 54.9	8.882
11	22 45 53.82	1.9559	6 50 1.2	8.907
12	22 47 51.10	1.9536	6 41 6.1	8.930
13	22 49 48.25	1.9513	6 32 9.6	8.953
14	22 51 45.26	1.9490	6 23 11.7	8.977
15	22 53 42.13	1.9468	6 14 12.4	8.998
16	22 55 38.88	1.9447	6 5 11.9	9.019
17	22 57 35.49	1.9425	5 56 10.1	9.040
18	22 59 31.98	1.9404	5 47 7.1	9.060
19	23 1 28.34	1.9383	5 38 2.9	9.079
20	23 3 24.57	1.9363	5 28 57.6	9.097
21	23 5 20.69	1.9343	5 19 51.2	9.115
22	23 7 16.68	1.9323	5 10 43.8	9.132
23	23 9 12.56	1.9303	−5 1 35.3	+9.149
	FEBRUARY 17.			
0	23 11 8.32	1.9284	−4 52 25.9	+9.165
1	23 13 3.97	1.9265	4 43 15.5	9.180
2	23 14 59.50	1.9247	4 34 4.3	9.195
3	23 16 54.93	1.9229	4 24 52.1	9.209
4	23 18 50.25	1.9211	4 15 39.2	9.222
5	23 20 45.46	1.9193	4 6 25.5	9.234
6	23 22 40.57	1.9177	3 57 11.1	9.247
7	23 24 35.58	1.9160	3 47 55.9	9.258
8	23 26 30.49	1.9143	3 38 40.1	9.268
9	23 28 25.30	1.9128	3 29 23.7	9.278
10	23 30 20.02	1.9113	3 20 6.7	9.288
11	23 32 14.65	1.9097	3 10 49.1	9.297
12	23 34 9.18	1.9082	3 1 31.0	9.305
13	23 36 3.63	1.9068	2 52 12.5	9.312
14	23 37 57.99	1.9053	2 42 53.5	9.320
15	23 39 52.27	1.9040	2 33 34.1	9.327
16	23 41 46.47	1.9027	2 24 14.3	9.333
17	23 43 40.59	1.9013	2 14 54.2	9.338
18	23 45 34.63	1.9002	2 5 33.8	9.342
19	23 47 28.61	1.8990	1 56 13.2	9.345
20	23 49 22.51	1.8977	1 46 52.4	9.348
21	23 51 16.33	1.8965	1 37 31.4	9.352
22	23 53 10.09	1.8955	1 28 10.2	9.354
23	23 55 3.79	1.8944	1 18 48.9	9.355
24	23 56 57.42	1.8933	−1 9 27.6	+9.356

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 18.			
	h m s	s	° ′ ″	″
0	23 56 57.42	1.8933	−1 9 27.6	+9.356
1	23 58 50.99	1.8924	1 0 6.2	9.357
2	0 0 44.51	1.8915	0 50 44.8	9.357
3	0 2 37.97	1.8906	0 41 23.4	9.356
4	0 4 31.38	1.8897	0 32 2.1	9.354
5	0 6 24.73	1.8888	0 22 40.9	9.352
6	0 8 18.04	1.8881	0 13 19.9	9.349
7	0 10 11.30	1.8873	−0 3 59.0	9.347
8	0 12 4.52	1.8867	+0 5 21.7	9.343
9	0 13 57.70	1.8859	0 14 42.1	9.338
10	0 15 50.83	1.8853	0 24 2.3	9.334
11	0 17 43.93	1.8848	0 33 22.2	9.328
12	0 19 37.00	1.8842	0 42 41.7	9.322
13	0 21 30.03	1.8837	0 52 0.8	9.315
14	0 23 23.04	1.8832	1 1 19.5	9.308
15	0 25 16.02	1.8827	1 10 37.8	9.301
16	0 27 8.97	1.8824	1 19 55.6	9.293
17	0 29 1.91	1.8820	1 29 12.9	9.283
18	0 30 54.81	1.8817	1 38 29.6	9.274
19	0 32 47.71	1.8816	1 47 45.8	9.265
20	0 34 40.60	1.8813	1 57 1.4	9.254
21	0 36 33.47	1.8810	2 6 16.3	9.243
22	0 38 26.32	1.8808	2 15 30.5	9.231
23	0 40 19.17	1.8808	+2 24 44.0	+9.219
	FEBRUARY 19.			
0	0 42 12.02	1.8808	+2 33 56.8	+9.207
1	0 44 4.86	1.8807	2 43 8.8	9.193
2	0 45 57.71	1.8807	2 52 20.0	9.180
3	0 47 50.55	1.8808	3 1 30.4	9.166
4	0 49 43.40	1.8809	3 10 39.9	9.150
5	0 51 36.26	1.8811	3 19 48.4	9.135
6	0 53 29.13	1.8813	3 28 56.1	9.120
7	0 55 22.01	1.8815	3 38 2.8	9.103
8	0 57 14.91	1.8818	3 47 8.4	9.086
9	0 59 7.82	1.8820	3 56 13.1	9.069
10	1 1 0.75	1.8823	4 5 16.7	9.050
11	1 2 53.70	1.8827	4 14 19.1	9.032
12	1 4 46.68	1.8832	4 23 20.5	9.013
13	1 6 39.68	1.8837	4 32 20.7	8.993
14	1 8 32.72	1.8842	4 41 19.7	8.973
15	1 10 25.78	1.8847	4 50 17.5	8.952
16	1 12 18.88	1.8853	4 59 14.0	8.932
17	1 14 12.02	1.8859	5 8 9.3	8.910
18	1 16 5.19	1.8866	5 17 3.2	8.888
19	1 17 58.41	1.8873	5 25 55.8	8.865
20	1 19 51.67	1.8880	5 34 47.0	8.842
21	1 21 44.97	1.8888	5 43 36.8	8.818
22	1 23 38.33	1.8897	5 52 25.1	8.793
23	1 25 31.73	1.8905	6 1 12.0	8.769
24	1 27 25.19	1.8914	+6 9 57.4	+8.743

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 20.			
	h m s	s	° ′ ″	″
0	1 27 25.19	1.8914	+ 6 9 57.4	+8.743
1	1 29 18.70	1.8924	6 18 41.2	8.717
2	1 31 12.28	1.8934	6 27 23.5	8.691
3	1 33 5.91	1.8944	6 36 4.1	8.663
4	1 34 59.61	1.8955	6 44 43.1	8.637
5	1 36 53.37	1.8966	6 53 20.5	8.609
6	1 38 47.20	1.8977	7 1 56.2	8.581
7	1 40 41.10	1.8990	7 10 30.2	8.552
8	1 42 35.08	1.9003	7 19 2.4	8.522
9	1 44 29.13	1.9014	7 27 32.8	8.492
10	1 46 23.25	1.9027	7 36 1.4	8.461
11	1 48 17.46	1.9042	7 44 28.1	8.430
12	1 50 11.75	1.9055	7 52 53.0	8.398
13	1 52 6.12	1.9069	8 1 15.9	8.367
14	1 54 0.58	1.9084	8 9 37.0	8.334
15	1 55 55.13	1.9100	8 17 56.0	8.301
16	1 57 49.78	1.9115	8 26 13.1	8.268
17	1 59 44.51	1.9130	8 34 28.1	8.233
18	2 1 39.34	1.9147	8 42 41.0	8.198
19	2 3 34.27	1.9163	8 50 51.8	8.163
20	2 5 29.30	1.9180	8 59 0.5	8.128
21	2 7 24.43	1.9198	9 7 7.1	8.092
22	2 9 19.67	1.9216	9 15 11.5	8.054
23	2 11 15.02	1.9233	+ 9 23 13.6	+8.017
	FEBRUARY 21.			
0	2 13 10.47	1.9252	+ 9 31 13.5	+7.979
1	2 15 6.04	1.9271	9 39 11.1	7.941
2	2 17 1.72	1.9289	9 47 6.4	7.902
3	2 18 57.51	1.9309	9 54 59.3	7.862
4	2 20 53.43	1.9330	10 2 49.8	7.822
5	2 22 49.47	1.9350	10 10 37.9	7.782
6	2 24 45.63	1.9370	10 18 23.6	7.741
7	2 26 41.91	1.9392	10 26 6.8	7.699
8	2 28 38.33	1.9413	10 33 47.5	7.657
9	2 30 34.87	1.9434	10 41 25.6	7.613
10	2 32 31.54	1.9457	10 49 1.1	7.571
11	2 34 28.35	1.9479	10 56 34.1	7.528
12	2 36 25.29	1.9502	11 4 4.4	7.483
13	2 38 22.37	1.9525	11 11 32.1	7.438
14	2 40 19.59	1.9548	11 18 57.0	7.393
15	2 42 16.95	1.9572	11 26 19.2	7.348
16	2 44 14.45	1.9597	11 33 38.7	7.301
17	2 46 12.11	1.9622	11 40 55.3	7.253
18	2 48 9.91	1.9645	11 48 9.1	7.207
19	2 50 7.85	1.9670	11 55 20.1	7.158
20	2 52 5.95	1.9697	12 2 28.1	7.109
21	2 54 4.21	1.9723	12 9 33.2	7.060
22	2 56 2.62	1.9748	12 16 35.3	7.011
23	2 58 1.19	1.9775	12 23 34.5	6.961
24	2 59 59.92	1.9802	+12 30 30.6	+6.909

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 22.			
	h m s	s	° ′ ″	″
0	2 59 59.92	1.9802	+12 30 30.6	+6.909
1	3 1 58.81	1.9828	12 37 23.6	6.858
2	3 3 57.86	1.9856	12 44 13.6	6.807
3	3 5 57.08	1.9884	12 51 0.4	6.753
4	3 7 56.47	1.9912	12 57 44.0	6.701
5	3 9 56.02	1.9939	13 4 24.5	6.648
6	3 11 55.74	1.9968	13 11 1.7	6.593
7	3 13 55.64	1.9997	13 17 35.7	6.538
8	3 15 55.70	2.0026	13 24 6.3	6.483
9	3 17 55.95	2.0056	13 30 33.6	6.428
10	3 19 56.37	2.0085	13 36 57.6	6.371
11	3 21 56.97	2.0115	13 43 18.1	6.313
12	3 23 57.75	2.0145	13 49 35.2	6.256
13	3 25 58.71	2.0176	13 55 48.8	6.198
14	3 27 59.86	2.0207	14 1 59.0	6.140
15	3 30 1.19	2.0237	14 8 5.6	6.080
16	3 32 2.70	2.0268	14 14 8.6	6.020
17	3 34 4.41	2.0300	14 20 8.0	5.959
18	3 36 6.30	2.0331	14 26 3.7	5.898
19	3 38 8.38	2.0363	14 31 55.8	5.837
20	3 40 10.66	2.0396	14 37 44.2	5.775
21	3 42 13.13	2.0428	14 43 28.8	5.712
22	3 44 15.79	2.0460	14 49 9.6	5.648
23	3 46 18.65	2.0493	+14 54 46.6	+5.585
	FEBRUARY 23.			
0	3 48 21.71	2.0526	+15 0 19.8	+5.521
1	3 50 24.96	2.0559	15 5 49.1	5.455
2	3 52 28.42	2.0592	15 11 14.4	5.389
3	3 54 32.07	2.0626	15 16 35.8	5.323
4	3 56 35.93	2.0660	15 21 53.2	5.256
5	3 58 39.99	2.0694	15 27 6.5	5.188
6	4 0 44.26	2.0728	15 32 15.8	5.121
7	4 2 48.73	2.0762	15 37 21.0	5.052
8	4 4 53.40	2.0796	15 42 22.0	4.983
9	4 6 58.28	2.0831	15 47 18.9	4.913
10	4 9 3.37	2.0866	15 52 11.6	4.842
11	4 11 8.67	2.0901	15 57 0.0	4.771
12	4 13 14.18	2.0936	16 1 44.1	4.699
13	4 15 19.90	2.0971	16 6 23.9	4.627
14	4 17 25.83	2.1006	16 10 59.4	4.555
15	4 19 31.97	2.1041	16 15 30.5	4.481
16	4 21 38.32	2.1077	16 19 57.1	4.407
17	4 23 44.89	2.1113	16 24 19.3	4.333
18	4 25 51.67	2.1148	16 28 37.0	4.257
19	4 27 58.66	2.1183	16 32 50.1	4.181
20	4 30 5.87	2.1219	16 36 58.7	4.105
21	4 32 13.29	2.1255	16 41 2.7	4.028
22	4 34 20.93	2.1291	16 45 2.0	3.949
23	4 36 28.78	2.1327	16 48 56.6	3.872
24	4 38 36.85	2.1363	+16 52 46.6	+3.793

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 24.			
	h m s	s	° ′ ″	″
0	4 38 36.85	2.1363	+16 52 46.6	+3.793
1	4 40 45.14	2.1399	16 56 31.8	3.713
2	4 42 53.64	2.1435	17 0 12.2	3.633
3	4 45 2.36	2.1471	17 3 47.8	3.553
4	4 47 11.29	2.1507	17 7 18.6	3.472
5	4 49 20.45	2.1544	17 10 44.4	3.389
6	4 51 29.82	2.1580	17 14 5.3	3.307
7	4 53 39.41	2.1616	17 17 21.3	3.225
8	4 55 49.21	2.1652	17 20 32.3	3.142
9	4 57 59.23	2.1688	17 23 38.3	3.057
10	5 0 9.47	2.1724	17 26 39.1	2.972
11	5 2 19.92	2.1760	17 29 34.9	2.887
12	5 4 30.59	2.1796	17 32 25.6	2.802
13	5 6 41.47	2.1832	17 35 11.1	2.714
14	5 8 52.58	2.1868	17 37 51.3	2.628
15	5 11 3.89	2.1904	17 40 26.4	2.541
16	5 13 15.43	2.1940	17 42 56.2	2.452
17	5 15 27.17	2.1975	17 45 20.7	2.363
18	5 17 39.13	2.2012	17 47 39.8	2.274
19	5 19 51.31	2.2047	17 49 53.6	2.185
20	5 22 3.69	2.2082	17 52 2.0	2.094
21	5 24 16.29	2.2117	17 54 4.9	2.003
22	5 26 29.10	2.2152	17 56 2.4	1.912
23	5 28 42.12	2.2187	+17 57 54.3	+1.819
	FEBRUARY 25.			
0	5 30 55.35	2.2222	+17 59 40.7	+1.728
1	5 33 8.79	2.2257	18 1 21.6	1.634
2	5 35 22.44	2.2292	18 2 56.8	1.541
3	5 37 36.29	2.2326	18 4 26.5	1.447
4	5 39 50.35	2.2361	18 5 50.4	1.352
5	5 42 4.62	2.2395	18 7 8.7	1.257
6	5 44 19.09	2.2428	18 8 21.2	1.161
7	5 46 33.76	2.2462	18 9 28.0	1.065
8	5 48 48.63	2.2496	18 10 29.0	0.968
9	5 51 3.71	2.2529	18 11 24.2	0.871
10	5 53 18.98	2.2562	18 12 13.5	0.773
11	5 55 34.45	2.2595	18 12 57.0	0.676
12	5 57 50.12	2.2628	18 13 34.6	0.578
13	6 0 5.98	2.2660	18 14 6.3	0.478
14	6 2 22.04	2.2692	18 14 32.0	0.378
15	6 4 38.29	2.2724	18 14 51.7	0.279
16	6 6 54.73	2.2756	18 15 5.5	0.179
17	6 9 11.36	2.2787	18 15 13.2	+0.078
18	6 11 28.17	2.2818	18 15 14.8	−0.024
19	6 13 45.17	2.2849	18 15 10.3	0.125
20	6 16 2.36	2.2880	18 14 59.8	0.227
21	6 18 19.73	2.2909	18 14 43.1	0.329
22	6 20 37.27	2.2939	18 14 20.3	0.432
23	6 22 55.00	2.2969	18 13 51.3	0.535
24	6 25 12.90	2.2998	+18 13 16.1	−0.638

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 26.			
	h m s	s	° ′ ″	″
0	6 25 12.90	2.2998	+18 13 16.1	−0.638
1	6 27 30.98	2.3027	18 12 34.7	0.742
2	6 29 49.23	2.3056	18 11 47.0	0.847
3	6 32 7.65	2.3084	18 10 53.1	0.951
4	6 34 26.24	2.3112	18 9 52.9	1.056
5	6 36 44.99	2.3139	18 8 46.4	1.161
6	6 39 3.91	2.3167	18 7 33.6	1.266
7	6 41 22.99	2.3193	18 6 14.5	1.372
8	6 43 42.23	2.3220	18 4 49.0	1.478
9	6 46 1.63	2.3247	18 3 17.1	1.585
10	6 48 21.19	2.3273	18 1 38.8	1.691
11	6 50 40.90	2.3298	17 59 54.2	1.797
12	6 53 0.76	2.3323	17 58 3.1	1.905
13	6 55 20.77	2.3348	17 56 5.6	2.012
14	6 57 40.93	2.3372	17 54 1.7	2.119
15	7 0 1.23	2.3395	17 51 51.3	2.227
16	7 2 21.67	2.3418	17 49 34.5	2.335
17	7 4 42.25	2.3442	17 47 11.1	2.443
18	7 7 2.97	2.3465	17 44 41.3	2.550
19	7 9 23.83	2.3487	17 42 5.1	2.658
20	7 11 44.81	2.3508	17 39 22.3	2.767
21	7 14 5.93	2.3531	17 36 33.0	2.876
22	7 16 27.18	2.3552	17 33 37.2	2.984
23	7 18 48.55	2.3572	+17 30 34.9	−3.093
	FEBRUARY 27.			
0	7 21 10.04	2.3592	+17 27 26.0	−3.203
1	7 23 31.65	2.3611	17 24 10.6	3.311
2	7 25 53.37	2.3630	17 20 48.7	3.419
3	7 28 15.21	2.3650	17 17 20.3	3.528
4	7 30 37.17	2.3668	17 13 45.3	3.637
5	7 32 59.23	2.3686	17 10 3.8	3.746
6	7 35 21.40	2.3703	17 6 15.8	3.854
7	7 37 43.67	2.3721	17 2 21.3	3.963
8	7 40 6.05	2.3738	16 58 20.2	4.073
9	7 42 28.52	2.3753	16 54 12.6	4.181
10	7 44 51.09	2.3769	16 49 58.5	4.290
11	7 47 13.75	2.3785	16 45 37.8	4.398
12	7 49 36.51	2.3800	16 41 10.7	4.506
13	7 51 59.35	2.3814	16 36 37.1	4.614
14	7 54 22.28	2.3829	16 31 57.0	4.722
15	7 56 45.30	2.3843	16 27 10.5	4.829
16	7 59 8.39	2.3856	16 22 17.5	4.938
17	8 1 31.57	2.3868	16 17 18.0	5.045
18	8 3 54.81	2.3880	16 12 12.1	5.152
19	8 6 18.13	2.3892	16 6 59.7	5.259
20	8 8 41.52	2.3904	16 1 41.0	5.365
21	8 11 4.98	2.3916	15 56 15.9	5.472
22	8 13 28.51	2.3926	15 50 44.4	5.578
23	8 15 52.09	2.3936	15 45 6.5	5.684
24	8 18 15.74	2.3947	+15 39 22.3	−5.789

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 28.			
	h m s	s	° ′ ″	″
0	8 18 15.74	2.3947	+15 39 22.3	− 5.789
1	8 20 39.45	2.3956	15 33 31.8	5.894
2	8 23 3.21	2.3964	15 27 35.0	5.999
3	8 25 27.02	2.3973	15 21 31.9	6.103
4	8 27 50.88	2.3981	15 15 22.6	6.207
5	8 30 14.79	2.3989	15 9 7.1	6.311
6	8 32 38.75	2.3997	15 2 45.3	6.414
7	8 35 2.75	2.4004	14 56 17.4	6.516
8	8 37 26.80	2.4011	14 49 43.4	6.618
9	8 39 50.88	2.4017	14 43 3.3	6.720
10	8 42 15.00	2.4023	14 36 17.0	6.821
11	8 44 39.15	2.4028	14 29 24.8	6.921
12	8 47 3.34	2.4034	14 22 26.5	7.021
13	8 49 27.56	2.4038	14 15 22.3	7.120
14	8 51 51.80	2.4042	14 8 12.1	7.220
15	8 54 16.07	2.4047	14 0 55.9	7.318
16	8 56 40.36	2.4051	13 53 33.9	7.415
17	8 59 4.68	2.4054	13 46 6.1	7.512
18	9 1 29.01	2.4057	13 38 32.5	7.608
19	9 3 53.36	2.4060	13 30 53.2	7.703
20	9 6 17.73	2.4063	13 23 8.1	7.798
21	9 8 42.11	2.4065	13 15 17.4	7.892
22	9 11 6.51	2.4067	13 7 21.1	7.985
23	9 13 30.91	2.4068	+12 59 19.2	− 8.078
	MARCH 1.			
0	9 15 55.32	2.4069	+12 51 11.7	− 8.170
1	9 18 19.74	2.4070	12 42 58.8	8.261
2	9 20 44.16	2.4070	12 34 40.4	8.351
3	9 23 8.58	2.4071	12 26 16.7	8.440
4	9 25 33.01	2.4071	12 17 47.6	8.529
5	9 27 57.43	2.4070	12 9 13.2	8.617
6	9 30 21.85	2.4071	12 0 33.6	8.703
7	9 32 46.28	2.4071	11 51 48.9	8.789
8	9 35 10.70	2.4069	11 42 58.9	8.874
9	9 37 35.11	2.4068	11 34 4.0	8.958
10	9 39 59.52	2.4067	11 25 4.0	9.041
11	9 42 23.91	2.4065	11 15 59.1	9.122
12	9 44 48.30	2.4063	11 6 49.3	9.203
13	9 47 12.67	2.4061	10 57 34.7	9.284
14	9 49 37.03	2.4059	10 48 15.2	9.363
15	9 52 1.38	2.4057	10 38 51.1	9.441
16	9 54 25.71	2.4055	10 29 22.3	9.518
17	9 56 50.04	2.4052	10 19 48.9	9.594
18	9 59 14.34	2.4049	10 10 11.0	9.668
19	10 1 38.63	2.4047	10 0 28.7	9.742
20	10 4 2.90	2.4043	9 50 41.9	9.815
21	10 6 27.15	2.4039	9 40 50.9	9.887
22	10 8 51.37	2.4036	9 30 55.5	9.958
23	10 11 15.58	2.4032	9 20 56.0	10.026
24	10 13 39.76	2.4028	+ 9 10 52.4	−10.094

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 2.			
	h m s	s	° ′ ″	″
0	10 13 39.76	2.4028	+9 10 52.4	−10.094
1	10 16 3.92	2.4025	9 0 44.7	10.161
2	10 18 28.06	2.4022	8 50 33.1	10.227
3	10 20 52.18	2.4018	8 40 17.5	10.291
4	10 23 16.28	2.4014	8 29 58.2	10.354
5	10 25 40.35	2.4009	8 19 35.0	10.417
6	10 28 4.39	2.4005	8 9 8.2	10.478
7	10 30 28.41	2.4001	7 58 37.7	10.537
8	10 32 52.40	2.3997	7 48 3.8	10.594
9	10 35 16.37	2.3993	7 37 26.4	10.652
10	10 37 40.31	2.3988	7 26 45.5	10.708
11	10 40 4.22	2.3983	7 16 1.4	10.762
12	10 42 28.11	2.3979	7 5 14.1	10.815
13	10 44 51.97	2.3974	6 54 23.6	10.867
14	10 47 15.80	2.3969	6 43 30.1	10.917
15	10 49 39.60	2.3965	6 32 33.6	10.967
16	10 52 3.38	2.3960	6 21 34.1	11.014
17	10 54 27.12	2.3955	6 10 31.9	11.060
18	10 56 50.84	2.3952	5 59 26.9	11.106
19	10 59 14.54	2.3947	5 48 19.2	11.149
20	11 1 38.20	2.3942	5 37 9.0	11.191
21	11 4 1.84	2.3938	5 25 56.3	11.232
22	11 6 25.45	2.3933	5 14 41.1	11.272
23	11 8 49.03	2.3928	+5 3 23.7	−11.309
	MARCH 3.			
0	11 11 12.59	2.3924	+4 52 4.0	−11.346
1	11 13 36.12	2.3919	4 40 42.2	11.381
2	11 15 59.62	2.3915	4 29 18.3	11.415
3	11 18 23.10	2.3912	4 17 52.4	11.448
4	11 20 46.56	2.3908	4 6 24.6	11.478
5	11 23 9.99	2.3903	3 54 55.0	11.507
6	11 25 33.39	2.3898	3 43 23.7	11.535
7	11 27 56.77	2.3895	3 31 50.8	11.562
8	11 30 20.13	2.3891	3 20 16.3	11.587
9	11 32 43.46	2.3887	3 8 40.4	11.610
10	11 35 6.77	2.3883	2 57 3.1	11.632
11	11 37 30.06	2.3879	2 45 24.5	11.653
12	11 39 53.32	2.3875	2 33 44.7	11.672
13	11 42 16.56	2.3873	2 22 3.8	11.690
14	11 44 39.79	2.3869	2 10 21.9	11.707
15	11 47 2.99	2.3866	1 58 39.0	11.722
16	11 49 26.18	2.3863	1 46 55.3	11.734
17	11 51 49.34	2.3859	1 35 10.9	11.746
18	11 54 12.49	2.3857	1 23 25.8	11.757
19	11 56 35.62	2.3854	1 11 40.1	11.765
20	11 58 58.74	2.3852	0 59 54.0	11.772
21	12 1 21.84	2.3848	0 48 7.5	11.778
22	12 3 44.92	2.3846	0 36 20.6	11.782
23	12 6 7.99	2.3843	0 24 33.6	11.785
24	12 8 31.04	2.3842	+0 12 46.4	−11.787

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 4.			
	h m s	s	° ′ ″	″
0	12 8 31.04	2.3842	+0 12 46.4	−11.787
1	12 10 54.09	2.3840	+0 0 59.2	11.787
2	12 13 17.12	2.3838	−0 10 48.0	11.785
3	12 15 40.14	2.3836	0 22 35.0	11.781
4	12 18 3.15	2.3834	0 34 21.7	11.777
5	12 20 26.15	2.3832	0 46 8.2	11.771
6	12 22 49.13	2.3830	0 57 54.2	11.763
7	12 25 12.11	2.3830	1 9 39.7	11.754
8	12 27 35.09	2.3829	1 21 24.7	11.743
9	12 29 58.06	2.3828	1 33 8.9	11.731
10	12 32 21.02	2.3827	1 44 52.4	11.718
11	12 34 43.98	2.3826	1 56 35.1	11.703
12	12 37 6.93	2.3825	2 8 16.8	11.687
13	12 39 29.88	2.3825	2 19 57.5	11.669
14	12 41 52.83	2.3825	2 31 37.1	11.649
15	12 44 15.78	2.3824	2 43 15.4	11.628
16	12 46 38.72	2.3823	2 54 52.5	11.607
17	12 49 1.67	2.3822	3 6 28.2	11.583
18	12 51 24.61	2.3824	3 18 2.4	11.558
19	12 53 47.56	2.3825	3 29 35.1	11.531
20	12 56 10.51	2.3826	3 41 6.1	11.503
21	12 58 33.47	2.3827	3 52 35.5	11.474
22	13 0 56.43	2.3828	4 4 3.0	11.443
23	13 3 19.40	2.3828	−4 15 28.7	−11.412
	MARCH 5.			
0	13 5 42.37	2.3828	−4 26 52.4	−11.378
1	13 8 5.34	2.3829	4 38 14.1	11.343
2	13 10 28.32	2.3831	4 49 33.6	11.307
3	13 12 51.31	2.3832	5 0 50.9	11.269
4	13 15 14.31	2.3834	5 12 5.9	11.230
5	13 17 37.32	2.3835	5 23 18.5	11.190
6	13 20 0.33	2.3837	5 34 28.7	11.149
7	13 22 23.36	2.3839	5 45 36.4	11.106
8	13 24 46.40	2.3841	5 56 41.4	11.061
9	13 27 9.45	2.3843	6 7 43.7	11.016
10	13 29 32.51	2.3845	6 18 43.3	10.969
11	13 31 55.59	2.3847	6 29 40.0	10.921
12	13 34 18.67	2.3848	6 40 33.8	10.872
13	13 36 41.77	2.3851	6 51 24.6	10.821
14	13 39 4.88	2.3853	7 2 12.3	10.769
15	13 41 28.01	2.3857	7 12 56.9	10.716
16	13 43 51.16	2.3858	7 23 38.2	10.661
17	13 46 14.31	2.3861	7 34 16.2	10.606
18	13 48 37.49	2.3864	7 44 50.9	10.549
19	13 51 0.68	2.3866	7 55 22.1	10.491
20	13 53 23.88	2.3868	8 5 49.8	10.432
21	13 55 47.10	2.3872	8 16 13.9	10.371
22	13 58 10.34	2.3875	8 26 34.3	10.309
23	14 0 33.60	2.3877	8 36 51.0	10.247
24	14 2 56.87	2.3880	−8 47 3.9	−10.183

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 6.			
	h m s	s	° ′ ″	″
0	14 2 56.87	2.3880	− 8 47 3.9	−10.183
1	14 5 20.16	2.3883	8 57 12.9	10.117
2	14 7 43.47	2.3886	9 7 18.0	10.052
3	14 10 6.79	2.3888	9 17 19.1	9.984
4	14 12 30.13	2.3892	9 27 16.1	9.916
5	14 14 53.49	2.3895	9 37 9.0	9.847
6	14 17 16.87	2.3897	9 46 57.7	9.777
7	14 19 40.26	2.3900	9 56 42.2	9.705
8	14 22 3.67	2.3903	10 6 22.3	9.632
9	14 24 27.10	2.3907	10 15 58.0	9.558
10	14 26 50.55	2.3909	10 25 29.3	9.484
11	14 29 14.01	2.3912	10 34 56.1	9.408
12	14 31 37.49	2.3915	10 44 18.3	9.332
13	14 34 0.99	2.3917	10 53 35.9	9.254
14	14 36 24.50	2.3920	11 2 48.8	9.175
15	14 38 48.03	2.3923	11 11 56.9	9.096
16	14 41 11.57	2.3925	11 21 0.3	9.016
17	14 43 35.13	2.3927	11 29 58.8	8.933
18	14 45 58.70	2.3929	11 38 52.3	8.852
19	14 48 22.28	2.3932	11 47 41.0	8.769
20	14 50 45.88	2.3934	11 56 24.6	8.684
21	14 53 9.49	2.3936	12 5 3.1	8.600
22	14 55 33.11	2.3938	12 13 36.6	8.515
23	14 57 56.75	2.3940	−12 22 4.9	− 8.428
	MARCH 7.			
0	15 0 20.39	2.3942	−12 30 27.9	− 8.340
1	15 2 44.05	2.3943	12 38 45.7	8.252
2	15 5 7.71	2.3944	12 46 58.1	8.163
3	15 7 31.38	2.3946	12 55 5.2	8.073
4	15 9 55.06	2.3948	13 3 6.9	7.983
5	15 12 18.75	2.3949	13 11 3.2	7.892
6	15 14 42.45	2.3949	13 18 54.0	7.800
7	15 17 6.14	2.3949	13 26 39.2	7.707
8	15 19 29.84	2.3950	13 34 18.9	7.614
9	15 21 53.54	2.3951	13 41 52.9	7.520
10	15 24 17.25	2.3951	13 49 21.3	7.426
11	15 26 40.95	2.3950	13 56 44.0	7.330
12	15 29 4.65	2.3950	14 4 0.9	7.234
13	15 31 28.35	2.3950	14 11 12.1	7.137
14	15 33 52.05	2.3949	14 18 17.4	7.040
15	15 36 15.74	2.3948	14 25 16.9	6.943
16	15 38 39.42	2.3947	14 32 10.6	6.845
17	15 41 3.10	2.3946	14 38 58.3	6.745
18	15 43 26.77	2.3944	14 45 40.0	6.646
19	15 45 50.43	2.3942	14 52 15.8	6.545
20	15 48 14.07	2.3939	14 58 45.6	6.446
21	15 50 37.70	2.3937	15 5 9.3	6.345
22	15 53 1.32	2.3935	15 11 27.0	6.243
23	15 55 24.92	2.3932	15 17 38.5	6.141
24	15 57 48.50	2.3928	−15 23 43.9	− 6.038

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 8.			
	h m s	s	° ′ ″	″
0	15 57 48.50	2.3928	−15 23 43.9	−6.038
1	16 0 12.06	2.3926	15 29 43.1	5.936
2	16 2 35.61	2.3922	15 35 36.2	5.833
3	16 4 59.12	2.3917	15 41 23.1	5.729
4	16 7 22.61	2.3913	15 47 3.7	5.624
5	16 9 46.08	2.3909	15 52 38.0	5.520
6	16 12 9.52	2.3903	15 58 6.1	5.416
7	16 14 32.92	2.3898	16 3 27.9	5.311
8	16 16 56.30	2.3893	16 8 43.4	5.205
9	16 19 19.64	2.3887	16 13 52.5	5.099
10	16 21 42.94	2.3881	16 18 55.3	4.993
11	16 24 6.21	2.3874	16 23 51.7	4.887
12	16 26 29.43	2.3867	16 28 41.7	4.780
13	16 28 52.61	2.3860	16 33 25.3	4.673
14	16 31 15.75	2.3853	16 38 2.5	4.567
15	16 33 38.85	2.3845	16 42 33.3	4.459
16	16 36 1.89	2.3837	16 46 57.6	4.352
17	16 38 24.89	2.3828	16 51 15.5	4.243
18	16 40 47.83	2.3818	16 55 26.8	4.135
19	16 43 10.71	2.3809	16 59 31.7	4.028
20	16 45 33.54	2.3800	17 3 30.2	3.920
21	16 47 56.31	2.3790	17 7 22.1	3.811
22	16 50 19.02	2.3780	17 11 7.5	3.702
23	16 52 41.67	2.3769	−17 14 46.4	−3.593
	MARCH 9.			
0	16 55 4.25	2.3758	−17 18 18.7	−3.484
1	16 57 26.76	2.3747	17 21 44.5	3.376
2	16 59 49.21	2.3735	17 25 3.8	3.268
3	17 2 11.58	2.3722	17 28 16.6	3.159
4	17 4 33.87	2.3710	17 31 22.9	3.050
5	17 6 56.10	2.3697	17 34 22.6	2.940
6	17 9 18.24	2.3683	17 37 15.7	2.832
7	17 11 40.30	2.3669	17 40 2.4	2.723
8	17 14 2.27	2.3656	17 42 42.5	2.613
9	17 16 24.17	2.3642	17 45 16.0	2.504
10	17 18 45.97	2.3626	17 47 43.0	2.396
11	17 21 7.68	2.3611	17 50 3.5	2.287
12	17 23 29.30	2.3595	17 52 17.4	2.178
13	17 25 50.82	2.3579	17 54 24.8	2.069
14	17 28 12.25	2.3563	17 56 25.7	1.961
15	17 30 33.58	2.3547	17 58 20.1	1.852
16	17 32 54.81	2.3529	18 0 7.9	1.743
17	17 35 15.93	2.3512	18 1 49.3	1.636
18	17 37 36.95	2.3494	18 3 24.2	1.528
19	17 39 57.86	2.3476	18 4 52.6	1.419
20	17 42 18.66	2.3457	18 6 14.5	1.311
21	17 44 39.34	2.3438	18 7 29.9	1.203
22	17 46 59.91	2.3418	18 8 38.9	1.097
23	17 49 20.36	2.3399	18 9 41.5	0.989
24	17 51 40.70	2.3379	−18 10 37.6	−0.882

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 10.					MARCH 12.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 51 40.70	2.3379	−18 10 37.6	−0.882	0	19 40 58.25	2.2060	−16 56 6.9	+3.814
1	17 54 0.91	2.3358	18 11 27.3	0.775	1	19 43 10.51	2.2028	16 52 15.5	3.900
2	17 56 21.00	2.3337	18 12 10.6	0.668	2	19 45 22.59	2.1996	16 48 18.9	3.985
3	17 58 40.96	2.3316	18 12 47.5	0.562	3	19 47 34.46	2.1962	16 44 17.3	4.068
4	18 1 0.79	2.3294	18 13 18.0	0.456	4	19 49 46.13	2.1929	16 40 10.7	4.152
5	18 3 20.49	2.3272	18 13 42.2	0.350	5	19 51 57.61	2.1897	16 35 59.0	4.236
6	18 5 40.06	2.3250	18 14 0.0	0.244	6	19 54 8.89	2.1864	16 31 42.4	4.318
7	18 7 59.49	2.3228	18 14 11.5	0.139	7	19 56 19.98	2.1831	16 27 20.9	4.399
8	18 10 18.79	2.3205	18 14 16.7	−0.035	8	19 58 30.86	2.1797	16 22 54.5	4.481
9	18 12 37.95	2.3182	18 14 15.7	+0.070	9	20 0 41.54	2.1764	16 18 23.2	4.561
10	18 14 56.97	2.3158	18 14 8.3	0.175	10	20 2 52.03	2.1731	16 13 47.2	4.640
11	18 17 15.85	2.3134	18 13 54.7	0.278	11	20 5 2.31	2.1697	16 9 6.4	4.720
12	18 19 34.58	2.3110	18 13 34.9	0.382	12	20 7 12.39	2.1663	16 4 20.8	4.798
13	18 21 53.17	2.3086	18 13 8.9	0.485	13	20 9 22.27	2.1630	15 59 30.6	4.876
14	18 24 11.61	2.3060	18 12 36.7	0.588	14	20 11 31.95	2.1597	15 54 35.7	4.953
15	18 26 29.89	2.3034	18 11 58.3	0.692	15	20 13 41.43	2.1563	15 49 36.2	5.030
16	18 28 48.02	2.3009	18 11 13.7	0.793	16	20 15 50.71	2.1530	15 44 32.1	5.106
17	18 31 6.00	2.2983	18 10 23.1	0.894	17	20 17 59.79	2.1497	15 39 23.5	5.181
18	18 33 23.82	2.2957	18 9 26.4	0.996	18	20 20 8.67	2.1463	15 34 10.4	5.256
19	18 35 41.49	2.2931	18 8 23.6	1.097	19	20 22 17.34	2.1429	15 28 52.8	5.330
20	18 37 58.99	2.2904	18 7 14.7	1.198	20	20 24 25.82	2.1397	15 23 30.8	5.402
21	18 40 16.34	2.2877	18 5 59.9	1.298	21	20 26 34.10	2.1363	15 18 4.5	5.475
22	18 42 33.52	2.2850	18 4 39.0	1.398	22	20 28 42.17	2.1329	15 12 33.8	5.547
23	18 44 50.54	2.2822	−18 3 12.2	+1.497	23	20 30 50.05	2.1296	−15 6 58.8	+5.618
	MARCH 11.					MARCH 13.			
0	18 47 7.39	2.2794	−18 1 39.4	+1.596	0	20 32 57.72	2.1263	−15 1 19.6	+5.689
1	18 49 24.07	2.2766	18 0 0.7	1.694	1	20 35 5.20	2.1229	14 55 36.1	5.759
2	18 51 40.58	2.2738	17 58 16.1	1.792	2	20 37 12.47	2.1196	14 49 48.5	5.828
3	18 53 56.92	2.2709	17 56 25.7	1.889	3	20 39 19.55	2.1163	14 43 56.8	5.897
4	18 56 13.09	2.2681	17 54 29.4	1.987	4	20 41 26.43	2.1130	14 38 0.9	5.965
5	18 58 29.09	2.2652	17 52 27.3	2.083	5	20 43 33.11	2.1097	14 32 1.0	6.032
6	19 0 44.91	2.2622	17 50 19.5	2.178	6	20 45 39.59	2.1063	14 25 57.1	6.098
7	19 3 0.55	2.2592	17 48 5.9	2.274	7	20 47 45.87	2.1031	14 19 49.3	6.163
8	19 5 16.01	2.2562	17 45 46.6	2.369	8	20 49 51.96	2.0998	14 13 37.5	6.229
9	19 7 31.30	2.2532	17 43 21.6	2.464	9	20 51 57.85	2.0965	14 7 21.8	6.293
10	19 9 46.40	2.2502	17 40 50.9	2.558	10	20 54 3.54	2.0933	14 1 2.3	6.357
11	19 12 1.32	2.2472	17 38 14.7	2.651	11	20 56 9.04	2.0901	13 54 38.9	6.421
12	19 14 16.06	2.2441	17 35 32.8	2.744	12	20 58 14.35	2.0868	13 48 11.8	6.483
13	19 16 30.61	2.2410	17 32 45.4	2.836	13	21 0 19.46	2.0836	13 41 41.0	6.544
14	19 18 44.98	2.2380	17 29 52.5	2.927	14	21 2 24.38	2.0803	13 35 6.5	6.606
15	19 20 59.17	2.2348	17 26 54.1	3.019	15	21 4 29.10	2.0772	13 28 28.3	6.666
16	19 23 13.16	2.2316	17 23 50.2	3.110	16	21 6 33.64	2.0740	13 21 46.6	6.725
17	19 25 26.96	2.2285	17 20 40.9	3.200	17	21 8 37.98	2.0708	13 15 1.3	6.784
18	19 27 40.58	2.2254	17 17 26.2	3.289	18	21 10 42.13	2.0677	13 8 12.5	6.842
19	19 29 54.01	2.2222	17 14 6.2	3.378	19	21 12 46.10	2.0646	13 1 20.3	6.899
20	19 32 7.24	2.2189	17 10 40.8	3.467	20	21 14 49.88	2.0614	12 54 24.6	6.957
21	19 34 20.28	2.2157	17 7 10.2	3.554	21	21 16 53.47	2.0583	12 47 25.5	7.013
22	19 36 33.13	2.2126	17 3 34.3	3.642	22	21 18 56.87	2.0552	12 40 23.1	7.068
23	19 38 45.79	2.2093	16 59 53.2	3.728	23	21 21 0.09	2.0521	12 33 17.3	7.123
24	19 40 58.25	2.2060	−16 56 6.9	+3.814	24	21 23 3.12	2.0490	−12 26 8.3	+7.177

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 14.			
	h m s	s	° ′ ″	″
0	21 23 3.12	2.0490	−12 26 8.3	+7.177
1	21 25 5.97	2.0460	12 18 56.1	7.230
2	21 27 8.64	2.0429	12 11 40.7	7.283
3	21 29 11.12	2.0399	12 4 22.1	7.336
4	21 31 13.43	2.0370	11 57 0.4	7.387
5	21 33 15.56	2.0340	11 49 35.7	7.437
6	21 35 17.51	2.0310	11 42 8.0	7.487
7	21 37 19.28	2.0281	11 34 37.3	7.536
8	21 39 20.88	2.0252	11 27 3.7	7.584
9	21 41 22.30	2.0223	11 19 27.2	7.632
10	21 43 23.55	2.0194	11 11 47.9	7.679
11	21 45 24.63	2.0166	11 4 5.7	7.727
12	21 47 25.54	2.0138	10 56 20.7	7.772
13	21 49 26.28	2.0109	10 48 33.1	7.817
14	21 51 26.85	2.0082	10 40 42.7	7.862
15	21 53 27.26	2.0054	10 32 49.7	7.905
16	21 55 27.50	2.0027	10 24 54.1	7.947
17	21 57 27.58	2.0000	10 16 56.0	7.990
18	21 59 27.50	1.9973	10 8 55.3	8.032
19	22 1 27.26	1.9947	10 0 52.2	8.073
20	22 3 26.86	1.9920	9 52 46.6	8.113
21	22 5 26.30	1.9894	9 44 38.6	8.153
22	22 7 25.59	1.9868	9 36 28.2	8.192
23	22 9 24.72	1.9843	− 9 28 15.5	+8.230
	MARCH 15.			
0	22 11 23.70	1.9818	− 9 20 0.6	+8.268
1	22 13 22.53	1.9793	9 11 43.4	8.304
2	22 15 21.21	1.9768	9 3 24.1	8.340
3	22 17 19.75	1.9743	8 55 2.6	8.376
4	22 19 18.13	1.9718	8 46 39.0	8.411
5	22 21 16.37	1.9695	8 38 13.3	8.445
6	22 23 14.47	1.9672	8 29 45.6	8.478
7	22 25 12.43	1.9649	8 21 15.9	8.511
8	22 27 10.26	1.9626	8 12 44.3	8.543
9	22 29 7.94	1.9603	8 4 10.7	8.575
10	22 31 5.49	1.9580	7 55 35.3	8.606
11	22 33 2.90	1.9558	7 46 58.0	8.636
12	22 35 0.18	1.9536	7 38 19.0	8.665
13	22 36 57.33	1.9514	7 29 38.2	8.694
14	22 38 54.35	1.9493	7 20 55.7	8.722
15	22 40 51.24	1.9472	7 12 11.6	8.749
16	22 42 48.01	1.9452	7 3 25.8	8.777
17	22 44 44.66	1.9431	6 54 38.4	8.803
18	22 46 41.18	1.9411	6 45 49.4	8.828
19	22 48 37.59	1.9392	6 36 59.0	8.853
20	22 50 33.88	1.9372	6 28 7.1	8.878
21	22 52 30.05	1.9352	6 19 13.7	8.902
22	22 54 26.10	1.9333	6 10 18.9	8.924
23	22 56 22.05	1.9315	6 1 22.8	8.946
24	22 58 17.88	1.9297	− 5 52 25.4	+8.968

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 16.			
	h m s	s	° ′ ″	″
0	22 58 17.88	1.9297	−5 52 25.4	+8.968
1	23 0 13.61	1.9279	5 43 26.7	8.989
2	23 2 9.23	1.9262	5 34 26.7	9.009
3	25 4 4.75	1.9244	5 25 25.6	9.028
4	23 6 0.16	1.9227	5 16 23.3	9.047
5	23 7 55.47	1.9211	5 7 19.9	9.066
6	23 9 50.69	1.9195	4 58 15.4	9.084
7	23 11 45.81	1.9178	4 49 9.8	9.101
8	23 13 40.83	1.9163	4 40 3.3	9.117
9	23 15 35.76	1.9148	4 30 55.8	9.133
10	23 17 30.60	1.9133	4 21 47.3	9.149
11	23 19 25.35	1.9118	4 12 37.9	9.163
12	23 21 20.02	1.9104	4 3 27.7	9.177
13	23 23 14.60	1.9090	3 54 16.7	9.190
14	23 25 9.10	1.9077	3 45 4.9	9.203
15	23 27 3.52	1.9063	3 35 52.3	9.215
16	23 28 57.86	1.9050	3 26 39.1	9.226
17	23 30 52.12	1.9038	3 17 25.2	9.237
18	23 32 46.31	1.9026	3 8 10.7	9.248
19	23 34 40.43	1.9013	2 58 55.5	9.258
20	23 36 34.47	1.9001	2 49 39.8	9.266
21	23 38 28.44	1.8991	2 40 23.6	9.274
22	23 40 22.36	1.8981	2 31 6.9	9.282
23	23 42 16.21	1.8970	−2 21 49.8	+9.288
	MARCH 17.			
0	23 44 10.00	1.8960	−2 12 32.3	+9.295
1	23 46 3.73	1.8950	2 3 14.4	9.301
2	23 47 57.40	1.8940	1 53 56.2	9.306
3	23 49 51.01	1.8930	1 44 37.7	9.311
4	23 51 44.56	1.8922	1 35 18.9	9.315
5	23 53 38.07	1.8914	1 25 59.9	9.318
6	23 55 31.53	1.8906	1 16 40.7	9.322
7	23 57 24.94	1.8898	1 7 21.3	9.323
8	23 59 18.30	1.8890	0 58 1.9	9.325
9	0 1 11.62	1.8883	0 48 42.3	9.327
10	0 3 4.90	1.8877	0 39 22.7	9.326
11	0 4 58.14	1.8870	0 30 3.2	9.326
12	0 6 51.34	1.8864	0 20 43.6	9.326
13	0 8 44.51	1.8858	0 11 24.1	9.324
14	0 10 37.64	1.8853	−0 2 4.7	9.322
15	0 12 30.75	1.8849	+0 7 14.5	9.319
16	0 14 23.83	1.8844	0 16 33.6	9.317
17	0 16 16.88	1.8840	0 25 52.5	9.313
18	0 18 9.91	1.8836	0 35 11.1	9.308
19	0 20 2.91	1.8832	0 44 29.4	9.303
20	0 21 55.89	1.8829	0 53 47.4	9.298
21	0 23 48.86	1.8827	1 3 5.1	9.291
22	0 25 41.81	1.8824	1 12 22.3	9.284
23	0 27 34.75	1.8822	1 21 39.2	9.277
24	0 29 27.67	1.8819	+1 30 55.6	+9.269

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 18.					MARCH 20.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 29 27.67	1.8819	+1 30 55.6	+9.269	0	2 0 14.40	1.9133	+ 8 35 53.4	+8.223
1	0 31 20.58	1.8818	1 40 11.5	9.261	1	2 2 9.24	1.9148	8 44 5.7	8.187
2	0 33 13.49	1.8817	1 49 26.9	9.252	2	2 4 4.17	1.9163	8 52 15.8	8.151
3	0 35 6.39	1.8817	1 58 41.7	9.242	3	2 5 59.19	1.9178	9 0 23.8	8.114
4	0 36 59.29	1.8816	2 7 55.9	9.232	4	2 7 54.30	1.9193	9 8 29.5	8.077
5	0 38 52.18	1.8816	2 17 9.5	9.222	5	2 9 49.50	1.9208	9 16 33.0	8.040
6	0 40 45.08	1.8817	2 26 22.5	9.210	6	2 11 44.80	1.9225	9 24 34.3	8.002
7	0 42 37.98	1.8817	2 35 34.7	9.197	7	2 13 40.20	1.9241	9 32 33.2	7.963
8	0 44 30.88	1.8818	2 44 46.2	9.185	8	2 15 35.69	1.9257	9 40 29.8	7.923
9	0 46 23.79	1.8819	2 53 56.9	9.172	9	2 17 31.28	1.9274	9 48 24.0	7.883
10	0 48 16.71	1.8821	3 3 6.8	9.158	10	2 19 26.98	1.9292	9 56 15.8	7.843
11	0 50 9.64	1.8823	3 12 15.9	9.144	11	2 21 22.78	1.9308	10 4 5.2	7.802
12	0 52 2.58	1.8825	3 21 24.1	9.129	12	2 23 18.68	1.9326	10 11 52.1	7.761
13	0 53 55.54	1.8827	3 30 31.4	9.113	13	2 25 14.69	1.9344	10 19 36.5	7.719
14	0 55 48.51	1.8831	3 39 37.7	9.097	14	2 27 10.81	1.9362	10 27 18.4	7.677
15	0 57 41.51	1.8835	3 48 43.1	9.082	15	2 29 7.04	1.9381	10 34 57.7	7.633
16	0 59 34.53	1.8838	3 57 47.5	9.065	16	2 31 3.38	1.9399	10 42 34.4	7.590
17	1 1 27.57	1.8842	4 6 50.9	9.047	17	2 32 59.83	1.9417	10 50 8.5	7.546
18	1 3 20.63	1.8846	4 15 53.1	9.028	18	2 34 56.39	1.9437	10 57 39.9	7.501
19	1 5 13.72	1.8851	4 24 54.3	9.010	19	2 36 53.08	1.9457	11 5 8.6	7.456
20	1 7 6.84	1.8857	4 33 54.3	8.990	20	2 38 49.88	1.9477	11 12 34.6	7.410
21	1 9 0.00	1.8862	4 42 53.1	8.970	21	2 40 46.80	1.9497	11 19 57.8	7.364
22	1 10 53.19	1.8867	4 51 50.7	8.949	22	2 42 43.85	1.9518	11 27 18.3	7.317
23	1 12 46.41	1.8873	+5 0 47.0	+8.928	23	2 44 41.02	1.9538	+11 34 35.9	+7.269
	MARCH 19.					MARCH 21.			
0	1 14 39.67	1.8880	+5 9 42.1	+8.907	0	2 46 38.31	1.9559	+11 41 50.6	+7.222
1	1 16 32.97	1.8887	5 18 35.9	8.885	1	2 48 35.73	1.9580	11 49 2.5	7.173
2	1 18 26.31	1.8894	5 27 28.3	8.862	2	2 50 33.27	1.9602	11 56 11.4	7.124
3	1 20 19.70	1.8902	5 36 19.3	8.838	3	2 52 30.95	1.9623	12 3 17.4	7.075
4	1 22 13.13	1.8909	5 45 8.9	8.815	4	2 54 28.75	1.9645	12 10 20.4	7.024
5	1 24 6.61	1.8917	5 53 57.1	8.791	5	2 56 26.69	1.9667	12 17 20.3	6.974
6	1 26 0.14	1.8926	6 2 43.8	8.766	6	2 58 24.76	1.9690	12 24 17.3	6.923
7	1 27 53.72	1.8935	6 11 29.0	8.741	7	3 0 22.97	1.9712	12 31 11.1	6.871
8	1 29 47.36	1.8944	6 20 12.7	8.715	8	3 2 21.31	1.9734	12 38 1.8	6.818
9	1 31 41.05	1.8953	6 28 54.8	8.687	9	3 4 19.78	1.9757	12 44 49.3	6.766
10	1 33 34.80	1.8963	6 37 35.2	8.660	10	3 6 18.40	1.9781	12 51 33.7	6.713
11	1 35 28.61	1.8973	6 46 14.0	8.632	11	3 8 17.15	1.9804	12 58 14.9	6.659
12	1 37 22.48	1.8983	6 54 51.1	8.604	12	3 10 16.05	1.9828	13 4 52.8	6.604
13	1 39 16.41	1.8994	7 3 26.5	8.575	13	3 12 15.09	1.9852	13 11 27.4	6.550
14	1 41 10.41	1.9006	7 12 0.1	8.546	14	3 14 14.27	1.9876	13 17 58.8	6.494
15	1 43 4.48	1.9017	7 20 32.0	8.517	15	3 16 13.60	1.9900	13 24 26.7	6.438
16	1 44 58.61	1.9028	7 29 2.1	8.486	16	3 18 13.07	1.9924	13 30 51.3	6.382
17	1 46 52.82	1.9041	7 37 30.3	8.454	17	3 20 12.69	1.9949	13 37 12.5	6.325
18	1 48 47.10	1.9053	7 45 56.6	8.422	18	3 22 12.46	1.9974	13 43 30.3	6.267
19	1 50 41.45	1.9065	7 54 21.0	8.391	19	3 24 12.38	1.9999	13 49 44.6	6.209
20	1 52 35.88	1.9078	8 2 43.5	8.358	20	3 26 12.45	2.0024	13 55 55.4	6.150
21	1 54 30.39	1.9092	8 11 4.0	8.325	21	3 28 12.67	2.0050	14 2 2.6	6.091
22	1 56 24.98	1.9105	8 19 22.5	8.292	22	3 30 13.05	2.0076	14 8 6.3	6.032
23	1 58 19.65	1.9118	8 27 39.0	8.258	23	3 32 13.58	2.0101	14 14 6.4	5.971
24	2 0 14.40	1.9133	+8 35 53.4	+8.223	24	3 34 14.26	2.0127	+14 20 2.8	+5.910

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 22.			
	h m s	s	° ′ ″	″
0	3 34 14.26	2.0127	+14 20 2.8	+5.910
1	3 36 15.10	2.0152	14 25 55.6	5.848
2	3 38 16.09	2.0179	14 31 44.6	5.787
3	3 40 17.25	2.0206	14 37 30.0	5.724
4	3 42 18.56	2.0232	14 43 11.5	5.661
5	3 44 20.04	2.0259	14 48 49.3	5.598
6	3 46 21.67	2.0286	14 54 23.3	5.534
7	3 48 23.47	2.0313	14 59 53.4	5.469
8	3 50 25.43	2.0340	15 5 19.6	5.404
9	3 52 27.55	2.0367	15 10 41.9	5.338
10	3 54 29.84	2.0395	15 16 0.2	5.272
11	3 56 32.29	2.0423	15 21 14.6	5.206
12	3 58 34.91	2.0450	15 26 24.9	5.138
13	4 0 37.69	2.0478	15 31 31.2	5.071
14	4 2 40.65	2.0507	15 36 33.4	5.002
15	4 4 43.77	2.0533	15 41 31.5	4.933
16	4 6 47.05	2.0562	15 46 25.4	4.864
17	4 8 50.51	2.0590	15 51 15.2	4.795
18	4 10 54.13	2.0618	15 56 0.8	4.724
19	4 12 57.93	2.0647	16 0 42.1	4.653
20	4 15 1.89	2.0675	16 5 19.2	4.582
21	4 17 6.03	2.0704	16 9 52.0	4.510
22	4 19 10.34	2.0732	16 14 20.4	4.438
23	4 21 14.82	2.0761	+16 18 44.5	+4.365
	MARCH 23.			
0	4 23 19.47	2.0790	+16 23 4.2	+4.292
1	4 25 24.30	2.0819	16 27 19.5	4.217
2	4 27 29.30	2.0848	16 31 30.3	4.142
3	4 29 34.47	2.0876	16 35 36.6	4.067
4	4 31 39.81	2.0905	16 39 38.4	3.992
5	4 33 45.33	2.0934	16 43 35.6	3.916
6	4 35 51.02	2.0963	16 47 28.3	3.840
7	4 37 56.89	2.0992	16 51 16.4	3.763
8	4 40 2.93	2.1022	16 54 59.8	3.685
9	4 42 9.15	2.1051	16 58 38.6	3.607
10	4 44 15.54	2.1080	17 2 12.7	3.528
11	4 46 22.11	2.1109	17 5 42.0	3.449
12	4 48 28.85	2.1138	17 9 6.6	3.370
13	4 50 35.76	2.1167	17 12 26.4	3.290
14	4 52 42.85	2.1197	17 15 41.4	3.209
15	4 54 50.12	2.1226	17 18 51.5	3.128
16	4 56 57.56	2.1255	17 21 56.8	3.047
17	4 59 5.18	2.1284	17 24 57.2	2.966
18	5 1 12.97	2.1312	17 27 52.7	2.883
19	5 3 20.93	2.1342	17 30 43.1	2.799
20	5 5 29.07	2.1371	17 33 28.6	2.717
21	5 7 37.38	2.1400	17 36 9.1	2.633
22	5 9 45.87	2.1429	17 38 44.6	2.548
23	5 11 54.53	2.1458	17 41 14.9	2.463
24	5 14 3.36	2.1486	+17 43 40.2	+2.378

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 24.			
	h m s	s	° ′ ″	″
0	5 14 3.36	2.1486	+17 43 40.2	+2.378
1	5 16 12.36	2.1515	17 46 0.3	2.293
2	5 18 21.54	2.1544	17 48 15.3	2.207
3	5 20 30.89	2.1573	17 50 25.1	2.120
4	5 22 40.42	2.1602	17 52 29.7	2.033
5	5 24 50.11	2.1629	17 54 29.1	1.945
6	5 26 59.97	2.1658	17 56 23.1	1.857
7	5 29 10.01	2.1687	17 58 11.9	1.769
8	5 31 20.21	2.1714	17 59 55.4	1.680
9	5 33 30.58	2.1742	18 1 33.5	1.591
10	5 35 41.12	2.1771	18 3 6.3	1.502
11	5 37 51.83	2.1798	18 4 33.7	1.411
12	5 40 2.70	2.1826	18 5 55.6	1.320
13	5 42 13.74	2.1853	18 7 12.1	1.229
14	5 44 24.94	2.1881	18 8 23.1	1.138
15	5 46 36.31	2.1909	18 9 28.7	1.047
16	5 48 47.85	2.1936	18 10 28.7	0.954
17	5 50 59.54	2.1963	18 11 23.2	0.862
18	5 53 11.40	2.1990	18 12 12.1	0.768
19	5 55 23.42	2.2017	18 12 55.4	0.676
20	5 57 35.60	2.2043	18 13 33.2	0.583
21	5 59 47.94	2.2069	18 14 5.3	0.488
22	6 2 0.43	2.2096	18 14 31.7	0.393
23	6 4 13.09	2.2123	+18 14 52.5	+0.299
	MARCH 25.			
0	6 6 25.90	2.2148	+18 15 7.6	+0.204
1	6 8 38.86	2.2174	18 15 17.0	0.108
2	6 10 51.99	2.2200	18 15 20.6	+0.013
3	6 13 5.26	2.2225	18 15 18.5	−0.083
4	6 15 18.69	2.2251	18 15 10.6	0.180
5	6 17 32.27	2.2275	18 14 56.9	0.277
6	6 19 45.99	2.2300	18 14 37.4	0.373
7	6 21 59.87	2.2325	18 14 12.1	0.471
8	6 24 13.89	2.2350	18 13 40.9	0.568
9	6 26 28.07	2.2374	18 13 3.9	0.666
10	6 28 42.38	2.2397	18 12 21.0	0.765
11	6 30 56.84	2.2422	18 11 32.1	0.863
12	6 33 11.44	2.2445	18 10 37.4	0.962
13	6 35 26.18	2.2469	18 9 36.7	1.061
14	6 37 41.07	2.2492	18 8 30.1	1.160
15	6 39 56.09	2.2515	18 7 17.5	1.260
16	6 42 11.25	2.2537	18 5 58.9	1.360
17	6 44 26.54	2.2560	18 4 34.3	1.460
18	6 46 41.97	2.2583	18 3 3.7	1.561
19	6 48 57.54	2.2606	18 1 27.0	1.661
20	6 51 13.24	2.2627	17 59 44.4	1.761
21	6 53 29.06	2.2648	17 57 55.7	1.862
22	6 55 45.02	2.2671	17 56 0.9	1.963
23	6 58 1.11	2.2691	17 54 0.1	2.064
24	7 0 17.31	2.2711	+17 51 53.2	−2.166

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 26.					MARCH 28.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 0 17.31	2.2711	+17 51 53.2	−2.166	0	8 51 14.83	2.3430	+14 10 33.3	− 7.011
1	7 2 33.64	2.2732	17 49 40.2	2.268	1	8 53 35.44	2.3440	14 3 29.8	7.106
2	7 4 50.10	2.2753	17 47 21.1	2.369	2	8 55 56.11	2.3449	13 56 20.6	7.201
3	7 7 6.68	2.2773	17 44 55.9	2.471	3	8 58 16.83	2.3458	13 49 5.7	7.295
4	7 9 23.37	2.2793	17 42 24.6	2.573	4	9 0 37.61	2.3467	13 41 45.2	7.389
5	7 11 40.19	2.2813	17 39 47.2	2.675	5	9 2 58.44	2.3477	13 34 19.0	7.482
6	7 13 57.12	2.2832	17 37 3.6	2.777	6	9 5 19.33	2.3485	13 26 47.3	7.574
7	7 16 14.17	2.2852	17 34 13.9	2.879	7	9 7 40.26	2.3493	13 19 10.1	7.667
8	7 18 31.34	2.2871	17 31 18.1	2.982	8	9 10 1.25	2.3503	13 11 27.3	7.759
9	7 20 48.62	2.2890	17 28 16.1	3.084	9	9 12 22.30	2.3512	13 3 39.0	7.850
10	7 23 6.02	2.2908	17 25 8.0	3.187	10	9 14 43.39	2.3519	12 55 45.3	7.941
11	7 25 23.52	2.2926	17 21 53.7	3.289	11	9 17 4.53	2.3527	12 47 46.1	8.031
12	7 27 41.13	2.2944	17 18 33.3	3.391	12	9 19 25.72	2.3536	12 39 41.6	8.120
13	7 29 58.85	2.2962	17 15 6.8	3.493	13	9 21 46.96	2.3543	12 31 31.7	8.208
14	7 32 16.67	2.2978	17 11 34.1	3.597	14	9 24 8.24	2.3551	12 23 16.6	8.296
15	7 34 34.59	2.2996	17 7 55.2	3.700	15	9 26 29.57	2.3559	12 14 56.2	8.384
16	7 36 52.62	2.3013	17 4 10.1	3.803	16	9 28 50.95	2.3567	12 6 30.5	8.471
17	7 39 10.74	2.3029	17 0 18.9	3.905	17	9 31 12.37	2.3574	11 57 59.7	8.557
18	7 41 28.97	2.3047	16 56 21.5	4.007	18	9 33 33.84	2.3582	11 49 23.7	8.642
19	7 43 47.30	2.3063	16 52 18.0	4.110	19	9 35 55.35	2.3588	11 40 42.6	8.727
20	7 46 5.72	2.3078	16 48 8.3	4.213	20	9 38 16.90	2.3596	11 31 56.5	8.810
21	7 48 24.23	2.3094	16 43 52.4	4.315	21	9 40 38.50	2.3603	11 23 5.4	8.893
22	7 50 42.85	2.3110	16 39 30.5	4.417	22	9 43 0.14	2.3610	11 14 9.3	8.975
23	7 53 1.55	2.3124	+16 35 2.4	−4.520	23	9 45 21.82	2.3617	+11 5 8.4	− 9.056
	MARCH 27.					MARCH 29.			
0	7 55 20.34	2.3139	+16 30 28.1	−4.622	0	9 47 43.54	2.3623	+10 56 2.6	− 9.137
1	7 57 39.22	2.3154	16 25 47.7	4.724	1	9 50 5.30	2.3631	10 46 51.9	9.218
2	7.59 58.19	2.3168	16 21 1.2	4.826	2	9 52 27.11	2.3638	10 37 36.4	9.297
3	8 2 17.24	2.3183	16 16 8.6	4.928	3	9 54 48.95	2.3644	10 28 16.3	9.374
4	8 4 36.38	2.3197	16 11 9.8	5.030	4	9 57 10.84	2.3652	10 18 51.5	9.451
5	8 6 55.60	2.3210	16 6 5.0	5.131	5	9 59 32.77	2.3658	10 9 22.2	9.527
6	8 9 14.90	2.3223	16 0 54.1	5.232	6	10 1 54.73	2.3664	9 59 48.2	9.603
7	8 11 34.28	2.3237	15 55 37.1	5.334	7	10 4 16.74	2.3672	9 50 9.8	9.677
8	8 13 53.75	2.3251	15 50 14.0	5.435	8	10 6 38.79	2.3678	9 40 27.0	9.750
9	8 16 13.29	2.3263	15 44 44.9	5.535	9	10 9 0.88	2.3684	9 30 39.8	9.823
10	8 18 32.90	2.3275	15 39 9.8	5.636	10	10 11 23.00	2.3691	9 20 48.2	9.895
11	8 20 52.59	2.3288	15 33 28.6	5.737	11	10 13 45.17	2.3698	9 10 52.4	9.965
12	8 23 12.36	2.3301	15 27 41.4	5.836	12	10 16 7.37	2.3703	9 0 52.4	10.035
13	8 25 32.20	2.3313	15 21 48.3	5.936	13	10 18 29.61	2.3711	8 50 48.2	10.103
14	8 27 52.11	2.3324	15 15 49.1	6.036	14	10 20 51.90	2.3718	8 40 40.0	10.171
15	8 30 12.09	2.3335	15 9 44.0	6.135	15	10 23 14.22	2.3723	8 30 27.7	10.238
16	8 32 32.13	2.3347	15 3 32.9	6.233	16	10 25 36.58	2.3730	8 20 11.4	10.303
17	8 34 52.25	2.3358	14 57 16.0	6.332	17	10 27 58.98	2.3737	8 9 51.3	10.367
18	8 37 12.43	2.3368	14 50 53.1	6.431	18	10 30 21.42	2.3743	7 59 27.3	10.431
19	8 39 32.67	2.3379	14 44 24.3	6.528	19	10 32 43.90	2.3750	7 48 59.6	10.493
20	8 41 52.98	2.3390	14 37 49.7	6.625	20	10 35 6.42	2.3757	7 38 28.2	10.554
21	8 44 13.35	2.3401	14 31 9.3	6.722	21	10 37 28.98	2.3763	7 27 53.1	10.614
22	8 46 33.79	2.3411	14 24 23.1	6.818	22	10 39 51.58	2.3770	7 17 14.5	10.673
23	8 48 54.28	2.3420	14 17 31.1	6.915	23	10 42 14.22	2.3777	7 6 32.4	10.730
24	8 51 14.83	2.3430	+14 10 33.3	−7.011	24	10 44 36.90	2.3783	+ 6 55 46.9	−10.787

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 30.					APRIL 1.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 44 36.90	2.3783	+6 55 46.9	−10.787	0	12 39 42.96	2.4213	− 2 21 37.5	−11.880
1	10 46 59.62	2.3791	6 44 58.0	10.842	1	12 42 8.27	2.4224	2 33 29.9	11.865
2	10 49 22.39	2.3797	6 34 5.9	10.896	2	12 44 33.65	2.4236	2 45 21.3	11.849
3	10 51 45.19	2.3803	6 23 10.5	10.949	3	12 46 59.10	2.4247	2 57 11.8	11.832
4	10 54 8.03	2.3811	6 12 12.0	11.000	4	12 49 24.62	2.4258	3 9 1.2	11.813
5	10 56 30.92	2.3818	6 1 10.5	11.051	5	12 51 50.20	2.4270	3 20 49.4	11.792
6	10 58 53.85	2.3826	5 50 5.9	11.100	6	12 54 15.86	2.4282	3 32 36.3	11.770
7	11 1 16.83	2.3833	5 38 58.5	11.147	7	12 56 41.58	2.4293	3 44 21.8	11.747
8	11 3 39.85	2.3840	5 27 48.3	11.193	8	12 59 7.38	2.4306	3 56 5.9	11.722
9	11 6 2.91	2.3847	5 16 35.3	11.239	9	13 1 33.25	2.4317	4 7 48.4	11.694
10	11 8 26.02	2.3855	5 5 19.6	11.283	10	13 3 59.18	2.4328	4 19 29.2	11.666
11	11 10 49.17	2.3862	4 54 1.3	11.326	11	13 6 25.19	2.4341	4 31 8.3	11.636
12	11 13 12.37	2.3871	4 42 40.5	11.367	12	13 8 51.27	2.4353	4 42 45.5	11.604
13	11 15 35.62	2.3878	4 31 17.3	11.407	13	13 11 17.42	2.4364	4 54 20.8	11.571
14	11 17 58.91	2.3886	4 19 51.7	11.445	14	13 13 43.64	2.4376	5 5 54.0	11.536
15	11 20 22.25	2.3893	4 8 23.9	11.482	15	13 16 9.93	2.4388	5 17 25.1	11.500
16	11 22 45.63	2.3902	3 56 53.9	11.518	16	13 18 36.30	2.4401	5 28 54.0	11.462
17	11 25 9.07	2.3911	3 45 21.7	11.552	17	13 21 2.74	2.4412	5 40 20.6	11.423
18	11 27 32.56	2.3918	3 33 47.6	11.585	18	13 23 29.24	2.4423	5 51 44.8	11.382
19	11 29 56.09	2.3927	3 22 11.5	11.617	19	13 25 55.82	2.4436	6 3 6.5	11.340
20	11 32 19.68	2.3935	3 10 33.6	11.646	20	13 28 22.47	2.4448	6 14 25.6	11.296
21	11 34 43.31	2.3943	2 58 54.0	11.675	21	13 30 49.20	2.4460	6 25 42.0	11.250
22	11 37 7.00	2.3952	2 47 12.6	11.703	22	13 33 15.99	2.4471	6 36 55.6	11.202
23	11 39 30.74	2.3961	+2 35 29.7	−11.728	23	13 35 42.85	2.4483	− 6 48 6.3	−11.154
	MARCH 31.					APRIL 2.			
0	11 41 54.53	2.3969	+2 23 45.2	−11.753	0	13 38 9.79	2.4496	− 6 59 14.1	−11.105
1	11 44 18.37	2.3978	2 11 59.3	11.776	1	13 40 36.80	2.4507	7 10 18.9	11.053
2	11 46 42.27	2.3988	2 0 12.1	11.797	2	13 43 3.87	2.4518	7 21 20.5	11.000
3	11 49 6.23	2.3997	1 48 23.7	11.817	3	13 45 31.02	2.4530	7 32 18.9	10.945
4	11 51 30.24	2.4006	1 36 34.1	11.836	4	13 47 58.23	2.4542	7 43 13.9	10.889
5	11 53 54.30	2.4015	1 24 43.4	11.852	5	13 50 25.52	2.4553	7 54 5.6	10.832
6	11 56 18.42	2.4025	1 12 51.8	11.867	6	13 52 52.87	2.4564	8 4 53.8	10.774
7	11 58 42.60	2.4034	1 0 59.3	11.882	7	13 55 20.29	2.4575	8 15 38.5	10.714
8	12 1 6.83	2.4044	0 49 6.0	11.893	8	13 57 47.77	2.4586	8 26 19.5	10.652
9	12 3 31.13	2.4054	0 37 12.1	11.904	9	14 0 15.32	2.4597	8 36 56.7	10.589
10	12 5 55.48	2.4063	0 25 17.5	11.914	10	14 2 42.94	2.4608	8 47 30.2	10.525
11	12 8 19.89	2.4073	0 13 22.4	11.922	11	14 5 10.62	2.4619	8 57 59.7	10.459
12	12 10 44.36	2.4083	+0 1 26.9	11.928	12	14 7 38.37	2.4630	9 8 25.3	10.392
13	12 13 8.89	2.4094	−0 10 28.9	11.932	13	14 10 6.18	2.4640	9 18 46.8	10.323
14	12 15 33.49	2.4105	0 22 25.0	11.936	14	14 12 34.05	2.4651	9 29 4.1	10.254
15	12 17 58.15	2.4115	0 34 21.2	11.937	15	14 15 1.99	2.4661	9 39 17.3	10.183
16	12 20 22.87	2.4125	0 46 17.4	11.937	16	14 17 29.98	2.4670	9 49 26.1	10.110
17	12 22 47.65	2.4136	0 58 13.6	11.935	17	14 19 58.03	2.4681	9 59 30.5	10.037
18	12 25 12.50	2.4147	1 10 9.6	11.932	18	14 22 26.15	2.4690	10 9 30.5	9.962
19	12 27 37.41	2.4157	1 22 5.4	11.928	19	14 24 54.31	2.4699	10 19 25.9	9.885
20	12 30 2.39	2.4168	1 34 0.9	11.921	20	14 27 22.54	2.4709	10 29 16.7	9.808
21	12 32 27.43	2.4179	1 45 55.9	11.912	21	14 29 50.82	2.4718	10 39 2.9	9.730
22	12 34 52.54	2.4191	1 57 50.4	11.903	22	14 32 19.15	2.4726	10 48 44.3	9.649
23	12 37 17.72	2.4202	2 9 44.3	11.892	23	14 34 47.53	2.4735	10 58 20.8	9.568
24	12 39 42.96	2.4213	−2 21 37.5	−11.880	24	14 37 15.97	2.4743	−11 7 52.5	− 9.487

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 3.			
	h m s	s	° ′ ″	″
0	14 37 15.97	2.4743	−11 7 52.5	−9.487
1	14 39 44.45	2.4751	11 17 19.2	9.402
2	14 42 12.98	2.4759	11 26 40.8	9.317
3	14 44 41.56	2.4767	11 35 57.3	9.232
4	14 47 10.18	2.4773	11 45 8.7	9.146
5	14 49 38.84	2.4781	11 54 14.8	9.057
6	14 52 7.55	2.4787	12 3 15.5	8.967
7	14 54 36.29	2.4793	12 12 10.9	8.878
8	14 57 5.07	2.4799	12 21 0.9	8.787
9	14 59 33.88	2.4805	12 29 45.4	8.695
10	15 2 2.73	2.4811	12 38 24.3	8.602
11	15 4 31.61	2.4816	12 46 57.6	8.508
12	15 7 0.52	2.4821	12 55 25.2	8.413
13	15 9 29.46	2.4825	13 3 47.1	8.316
14	15 11 58.42	2.4829	13 12 3.1	8.218
15	15 14 27.41	2.4832	13 20 13.3	8.121
16	15 16 56.41	2.4835	13 28 17.6	8.022
17	15 19 25.43	2.4838	13 36 15.9	7.922
18	15 21 54.47	2.4841	13 44 8.3	7.822
19	15 24 23.52	2.4843	13 51 54.5	7.720
20	15 26 52.59	2.4845	13 59 34.7	7.618
21	15 29 21.66	2.4845	14 7 8.7	7.515
22	15 31 50.73	2.4847	14 14 36.5	7.412
23	15 34 19.82	2.4848	−14 21 58.1	−7.307
	APRIL 4.			
0	15 36 48.90	2.4847	−14 29 13.3	−7.201
1	15 39 17.98	2.4847	14 36 22.2	7.096
2	15 41 47.06	2.4846	14 43 24.8	6.989
3	15 44 16.13	2.4844	14 50 20.9	6.882
4	15 46 45.19	2.4842	14 57 10.6	6.773
5	15 49 14.23	2.4839	15 3 53.7	6.665
6	15 51 43.26	2.4837	15 10 30.4	6.557
7	15 54 12.27	2.4833	15 17 0.5	6.446
8	15 56 41.26	2.4830	15 23 23.9	6.336
9	15 59 10.23	2.4826	15 29 40.8	6.226
10	16 1 39.17	2.4820	15 35 51.0	6.114
11	16 4 8.07	2.4815	15 41 54.5	6.002
12	16 6 36.95	2.4810	15 47 51.2	5.889
13	16 9 5.79	2.4803	15 53 41.2	5.777
14	16 11 34.59	2.4797	15 59 24.4	5.663
15	16 14 3.35	2.4790	16 5 0.8	5.550
16	16 16 32.07	2.4782	16 10 30.4	5.437
17	16 19 0.73	2.4773	16 15 53.2	5.322
18	16 21 29.34	2.4764	16 21 9.0	5.207
19	16 23 57.90	2.4754	16 26 18.0	5.093
20	16 26 26.39	2.4744	16 31 20.1	4.978
21	16 28 54.83	2.4734	16 36 15.3	4.862
22	16 31 23.20	2.4723	16 41 3.5	4.745
23	16 33 51.50	2.4711	16 45 44.7	4.628
24	16 36 19.73	2.4699	−16 50 18.9	−4.513

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 5.			
	h m s	s	° ′ ″	″
0	16 36 19.73	2.4699	−16 50 18.9	−4.513
1	16 38 47.89	2.4687	16 54 46.2	4.396
2	16 41 15.97	2.4673	16 59 6.4	4.279
3	16 43 43.96	2.4659	17 3 19.7	4.162
4	16 46 11.88	2.4645	17 7 25.9	4.045
5	16 48 39.70	2.4629	17 11 25.1	3.928
6	16 51 7.43	2.4614	17 15 17.3	3.812
7	16 53 35.07	2.4598	17 19 2.5	3.694
8	16 56 2.61	2.4582	17 22 40.6	3.577
9	16 58 30.06	2.4565	17 26 11.7	3.459
10	17 0 57.39	2.4547	17 29 35.7	3.342
11	17 3 24.62	2.4529	17 32 52.7	3.224
12	17 5 51.74	2.4510	17 36 2.6	3.107
13	17 8 18.74	2.4491	17 39 5.5	2.990
14	17 10 45.63	2.4471	17 42 1.4	2.872
15	17 13 12.39	2.4451	17 44 50.2	2.754
16	17 15 39.04	2.4430	17 47 31.9	2.637
17	17 18 5.55	2.4408	17 50 6.7	2.521
18	17 20 31.93	2.4387	17 52 34.4	2.403
19	17 22 58.19	2.4364	17 54 55.1	2.287
20	17 25 24.30	2.4340	17 57 8.8	2.170
21	17 27 50.27	2.4317	17 59 15.5	2.054
22	17 30 16.11	2.4293	18 1 15.3	1.938
23	17 32 41.79	2.4268	−18 3 8.0	−1.821
	APRIL 6.			
0	17 35 7.33	2.4244	−18 4 53.8	−1.706
1	17 37 32.72	2.4218	18 6 32.7	1.590
2	17 39 57.95	2.4192	18 8 4.6	1.473
3	17 42 23.02	2.4165	18 9 29.5	1.358
4	17 44 47.93	2.4138	18 10 47.6	1.244
5	17 47 12.68	2.4111	18 11 58.8	1.130
6	17 49 37.26	2.4083	18 13 3.2	1.016
7	17 52 1.67	2.4054	18 14 0.7	0.901
8	17 54 25.91	2.4026	18 14 51.3	0.788
9	17 56 49.98	2.3996	18 15 35.2	0.675
10	17 59 13.86	2.3966	18 16 12.3	0.562
11	18 1 37.57	2.3936	18 16 42.7	0.450
12	18 4 1.09	2.3905	18 17 6.3	0.337
13	18 6 24.43	2.3874	18 17 23.2	0.226
14	18 8 47.58	2.3842	18 17 33.4	0.115
15	18 11 10.54	2.3810	18 17 37.0	−0.004
16	18 13 33.30	2.3778	18 17 33.9	+0.107
17	18 15 55.87	2.3746	18 17 24.2	0.216
18	18 18 18.25	2.3713	18 17 8.0	0.325
19	18 20 40.42	2.3678	18 16 45.2	0.435
20	18 23 2.39	2.3644	18 16 15.8	0.543
21	18 25 24.15	2.3610	18 15 40.0	0.650
22	18 27 45.71	2.3576	18 14 57.8	0.757
23	18 30 7.06	2.3541	18 14 9.1	0.865
24	18 32 28.20	2.3506	−18 13 14.0	+0.972

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 7.			
	h m s	s	° ′ ″	″
0	18 32 28.20	2.3506	−18 13 14.0	+0.972
1	18 34 49.13	2.3470	18 12 12.5	1.077
2	18 37 9.84	2.3433	18 11 4.8	1.182
3	18 39 30.33	2.3397	18 9 50.7	1.287
4	18 41 50.60	2.3361	18 8 30.3	1.392
5	18 44 10.66	2.3324	18 7 3.7	1.494
6	18 46 30.49	2.3287	18 5 31.0	1.597
7	18 48 50.10	2.3249	18 3 52.1	1.700
8	18 51 9.48	2.3212	18 2 7.0	1.802
9	18 53 28.64	2.3174	18 0 15.8	1.903
10	18 55 47.57	2.3136	17 58 18.6	2.003
11	18 58 6.27	2.3097	17 56 15.4	2.103
12	19 0 24.73	2.3058	17 54 6.2	2.202
13	19 2 42.97	2.3020	17 51 51.1	2.301
14	19 5 0.97	2.2980	17 49 30.1	2.399
15	19 7 18.73	2.2940	17 47 3.2	2.497
16	19 9 36.25	2.2902	17 44 30.4	2.594
17	19 11 53.55	2.2863	17 41 51.9	2.689
18	19 14 10.60	2.2822	17 39 7.7	2.785
19	19 16 27.41	2.2782	17 36 17.7	2.880
20	19 18 43.98	2.2742	17 33 22.1	2.973
21	19 21 0.31	2.2702	17 30 20.9	3.067
22	19 23 16.40	2.2662	17 27 14.1	3.160
23	19 25 32.25	2.2621	−17 24 1.7	+3.252
	APRIL 8.			
0	19 27 47.85	2.2580	−17 20 43.8	+3.343
1	19 30 3.21	2.2539	17 17 20.5	3.434
2	19 32 18.32	2.2498	17 13 51.7	3.524
3	19 34 33.19	2.2457	17 10 17.6	3.613
4	19 36 47.81	2.2417	17 6 38.1	3.702
5	19 39 2.19	2.2375	17 2 53.4	3.789
6	19 41 16.31	2.2333	16 59 3.4	3.877
7	19 43 30.19	2.2293	16 55 8.2	3.963
8	19 45 43.83	2.2252	16 51 7.8	4.049
9	19 47 57.22	2.2211	16 47 2.3	4.133
10	19 50 10.36	2.2169	16 42 51.8	4.218
11	19 52 23.25	2.2128	16 38 36.2	4.302
12	19 54 35.89	2.2087	16 34 15.6	4.384
13	19 56 48.29	2.2045	16 29 50.1	4.466
14	19 59 0.43	2.2003	16 25 19.7	4.547
15	20 1 12.33	2.1963	16 20 44.4	4.628
16	20 3 23.99	2.1922	16 16 4.3	4.708
17	20 5 35.39	2.1880	16 11 19.5	4.787
18	20 7 46.55	2.1840	16 6 29.9	4.866
19	20 9 57.47	2.1798	16 1 35.6	4.943
20	20 12 8.13	2.1757	15 56 36.7	5.020
21	20 14 18.55	2.1717	15 51 33.2	5.097
22	20 16 28.73	2.1676	15 46 25.1	5.173
23	20 18 38.66	2.1634	15 41 12.5	5.247
24	20 20 48.34	2.1593	−15 35 55.5	+5.321

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 9.			
	h m s	s	° ′ ″	″
0	20 20 48.34	2.1593	−15 35 55.5	+5.321
1	20 22 57.78	2.1553	15 30 34.0	5.394
2	20 25 6.98	2.1513	15 25 8.2	5.467
3	20 27 15.93	2.1473	15 19 38.0	5.539
4	20 29 24.65	2.1433	15 14 3.5	5.610
5	20 31 33.12	2.1392	15 8 24.8	5.680
6	20 33 41.35	2.1352	15 2 41.9	5.750
7	20 35 49.34	2.1312	14 56 54.8	5.819
8	20 37 57.10	2.1273	14 51 3.6	5.887
9	20 40 4.62	2.1233	14 45 8.3	5.955
10	20 42 11.90	2.1194	14 39 9.0	6.022
11	20 44 18.95	2.1155	14 33 5.7	6.088
12	20 46 25.76	2.1116	14 26 58.5	6.153
13	20 48 32.34	2.1077	14 20 47.4	6.217
14	20 50 38.69	2.1038	14 14 32.4	6.281
15	20 52 44.80	2.1000	14 8 13.7	6.344
16	20 54 50.69	2.0962	14 1 51.1	6.407
17	20 56 56.35	2.0924	13 55 24.9	6.468
18	20 59 1.78	2.0887	13 48 54.9	6.530
19	21 1 6.99	2.0849	13 42 21.3	6.590
20	21 3 11.97	2.0812	13 35 44.1	6.649
21	21 5 16.73	2.0775	13 29 3.4	6.708
22	21 7 21.27	2.0738	13 22 19.1	6.767
23	21 9 25.58	2.0701	−13 15 31.4	+6.823
	APRIL 10.			
0	21 11 29.68	2.0665	−13 8 40.3	+6.880
1	21 13 33.56	2.0628	13 1 45.8	6.937
2	21 15 37.22	2.0592	12 54 47.9	6.993
3	21 17 40.67	2.0557	12 47 46.7	7.047
4	21 19 43.91	2.0522	12 40 42.3	7.100
5	21 21 46.94	2.0487	12 33 34.7	7.153
6	21 23 49.75	2.0452	12 26 23.9	7.206
7	21 25 52.36	2.0417	12 19 10.0	7.258
8	21 27 54.76	2.0383	12 11 53.0	7.309
9	21 29 56.96	2.0350	12 4 32.9	7.360
10	21 31 58.96	2.0316	11 57 9.8	7.409
11	21 34 0.75	2.0283	11 49 43.8	7.458
12	21 36 2.35	2.0250	11 42 14.8	7.507
13	21 38 3.75	2.0217	11 34 42.9	7.554
14	21 40 4.96	2.0185	11 27 8.3	7.601
15	21 42 5.97	2.0153	11 19 30.8	7.648
16	21 44 6.79	2.0121	11 11 50.5	7.694
17	21 46 7.42	2.0089	11 4 7.5	7.738
18	21 48 7.86	2.0058	10 56 21.9	7.783
19	21 50 8.12	2.0027	10 48 33.5	7.827
20	21 52 8.19	1.9997	10 40 42.6	7.866
21	21 54 8.08	1.9967	10 32 49.2	7.912
22	21 56 7.79	1.9937	10 24 53.2	7.954
23	21 58 7.32	1.9907	10 16 54.7	7.995
24	22 0 6.68	1.9878	−10 8 53.8	+8.036

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 11.					APRIL 13.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 0 6.68	1.9878	−10 8 53.8	+8.035	0	23 32 51.64	1.8913	−3 8 47.8	+9.233
1	22 2 5.86	1.9850	10 0 50.5	8.075	1	23 34 45.08	1.8901	2 59 33.5	9.242
2	22 4 4.88	1.9822	9 52 44.8	8.114	2	23 36 38.45	1.8891	2 50 18.7	9.252
3	22 6 3.72	1.9793	9 44 36.8	8.152	3	23 38 31.77	1.8881	2 41 3.3	9.262
4	22 8 2.39	1.9765	9 36 26.5	8.190	4	23 40 25.02	1.8871	2 31 47.3	9.270
5	22 10 0.90	1.9738	9 28 14.0	8.227	5	23 42 18.22	1.8862	2 22 30.9	9.277
6	22 11 59.25	1.9711	9 19 59.3	8.263	6	23 44 11.37	1.8853	2 13 14.1	9.284
7	22 13 57.43	1.9684	9 11 42.4	8.299	7	23 46 4.46	1.8844	2 3 56.8	9.292
8	22 15 55.46	1.9658	9 3 23.4	8.334	8	23 47 57.50	1.8837	1 54 39.1	9.298
9	22 17 53.33	1.9633	8 55 2.3	8.369	9	23 49 50.50	1.8829	1 45 21.1	9.303
10	22 19 51.05	1.9607	8 46 39.1	8.403	10	23 51 43.45	1.8821	1 36 2.8	9.308
11	22 21 48.61	1.9581	8 38 14.0	8.436	11	23 53 36.35	1.8814	1 26 44.1	9.312
12	22 23 46.02	1.9556	8 29 46.8	8.469	12	23 55 29.22	1.8808	1 17 25.3	9.315
13	22 25 43.28	1.9532	8 21 17.7	8.501	13	23 57 22.05	1.8802	1 8 6.3	9.318
14	22 27 40.40	1.9507	8 12 46.7	8.532	14	23 59 14.84	1.8796	0 58 47.1	9.322
15	22 29 37.37	1.9483	8 4 13.9	8.562	15	0 1 7.60	1.8791	0 49 27.7	9.324
16	22 31 34.20	1.9460	7 55 39.2	8.593	16	0 3 0.33	1.8786	0 40 8.2	9.325
17	22 33 30.89	1.9437	7 47 2.7	8.623	17	0 4 53.03	1.8781	0 30 48.7	9.326
18	22 35 27.45	1.9415	7 38 24.5	8.651	18	0 6 45.70	1.8777	0 21 29.1	9.326
19	22 37 23.87	1.9392	7 29 44.6	8.679	19	0 8 38.35	1.8772	0 12 9.6	9.325
20	22 39 20.15	1.9370	7 21 3.0	8.707	20	0 10 30.97	1.8768	−0 2 50.1	9.325
21	22 41 16.31	1.9349	7 12 19.7	8.734	21	0 12 23.57	1.8766	+0 6 29.4	9.323
22	22 43 12.34	1.9328	7 3 34.9	8.760	22	0 14 16.16	1.8763	0 15 48.7	9.321
23	22 45 8.24	1.9307	− 6 54 48.5	+8.786	23	0 16 8.73	1.8761	+0 25 7.9	+9.318
	APRIL 12.					APRIL 14.			
0	22 47 4.02	1.9287	− 6 46 0.6	+8.811	0	0 18 1.29	1.8759	+0 34 26.9	+9.315
1	22 48 59.68	1.9267	6 37 11.2	8.836	1	0 19 53.84	1.8757	0 43 45.7	9.312
2	22 50 55.22	1.9247	6 28 20.3	8.859	2	0 21 46.37	1.8755	0 53 4.3	9.308
3	22 52 50.64	1.9228	6 19 28.1	8.882	3	0 23 38.90	1.8755	1 2 22.6	9.303
4	22 54 45.95	1.9209	6 10 34.4	8.906	4	0 25 31.43	1.8754	1 11 40.6	9.297
5	22 56 41.15	1.9190	6 1 39.4	8.928	5	0 27 23.95	1.8753	1 20 58.2	9.291
6	22 58 36.23	1.9172	5 52 43.1	8.949	6	0 29 16.47	1.8754	1 30 15.5	9.284
7	23 0 31.21	1.9154	5 43 45.5	8.970	7	0 31 9.00	1.8755	1 39 32.3	9.277
8	23 2 26.08	1.9137	5 34 46.7	8.990	8	0 33 1.53	1.8755	1 48 48.7	9.270
9	23 4 20.85	1.9120	5 25 46.7	9.009	9	0 34 54.06	1.8757	1 58 4.7	9.262
10	23 6 15.52	1.9103	5 16 45.6	9.028	10	0 36 46.61	1.8758	2 7 20.1	9.252
11	23 8 10.09	1.9087	5 7 43.3	9.047	11	0 38 39.16	1.8760	2 16 34.9	9.242
12	23 10 4.57	1.9072	4 58 40.0	9.064	12	0 40 31.73	1.8762	2 25 49.1	9.232
13	23 11 58.95	1.9056	4 49 35.6	9.082	13	0 42 24.31	1.8765	2 35 2.7	9.222
14	23 13 53.24	1.9042	4 40 30.2	9.098	14	0 44 16.91	1.8768	2 44 15.7	9.210
15	23 15 47.45	1.9027	4 31 23.8	9.115	15	0 46 9.53	1.8772	2 53 27.9	9.198
16	23 17 41.56	1.9012	4 22 16.4	9.131	16	0 48 2.17	1.8775	3 2 39.5	9.187
17	23 19 35.59	1.8998	4 13 8.1	9.145	17	0 49 54.83	1.8779	3 11 50.3	9.173
18	23 21 29.54	1.8985	4 3 59.0	9.158	18	0 51 47.52	1.8784	3 21 0.3	9.159
19	23 23 23.41	1.8972	3 54 49.1	9.172	19	0 53 40.24	1.8788	3 30 9.4	9.145
20	23 25 17.20	1.8959	3 45 38.3	9.187	20	0 55 32.98	1.8793	3 39 17.7	9.131
21	23 27 10.92	1.8947	3 36 26.7	9.199	21	0 57 25.76	1.8799	3 48 25.1	9.116
22	23 29 4.56	1.8934	3 27 14.4	9.210	22	0 59 18.57	1.8805	3 57 31.6	9.100
23	23 30 58.13	1.8923	3 18 1.5	9.222	23	1 1 11.42	1.8811	4 6 37.1	9.083
24	23 32 51.64	1.8913	− 3 8 47.8	+9.233	24	1 3 4.30	1.8817	+4 15 41.6	+9.067

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 15.					APRIL 17.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 3 4.30	1.8817	+ 4 15 41.6	+9.067	0	2 34 43.46	1.9478	+11 0 21.2	+7.573
1	1 4 57.23	1.8824	4 24 45.1	9.049	1	2 36 40.39	1.9498	11 7 54.2	7.527
2	1 6 50.19	1.8831	4 33 47.5	9.030	2	2 38 37.44	1.9518	11 15 24.4	7.481
3	1 8 43.20	1.8839	4 42 48.7	9.012	3	2 40 34.61	1.9539	11 22 51.9	7.435
4	1 10 36.26	1.8847	4 51 48.9	8.99[illegible]	4	2 42 31.91	1.9560	11 30 16.6	7.388
5	1 12 29.36	1.8854	5 0 47.9	8.973	5	2 44 29.33	1.9580	11 37 38.4	7.340
6	1 14 22.51	1.8863	5 9 45.6	8.952	6	2 46 26.87	1.9602	11 44 57.4	7.292
7	1 16 15.71	1.8872	5 18 42.1	8.932	7	2 48 24.55	1.9623	11 52 13.5	7.243
8	1 18 8.97	1.8881	5 27 37.4	8.910	8	2 50 22.35	1.9643	11 59 26.6	7.193
9	1 20 2.28	1.8890	5 36 31.3	8.888	9	2 52 20.27	1.9665	12 6 36.7	7.143
10	1 21 55.65	1.8900	5 45 23.9	8.865	10	2 54 18.33	1.9687	12 13 43.8	7.093
11	1 23 49.08	1.8910	5 54 15.1	8.842	11	2 56 16.52	1.9709	12 20 47.9	7.042
12	1 25 42.57	1.8920	6 3 4.9	8.818	12	2 58 14.84	1.9731	12 27 48.9	6.991
13	1 27 36.12	1.8931	6 11 53.2	8.793	13	3 0 13.29	1.9753	12 34 46.8	6.939
14	1 29 29.74	1.8942	6 20 40.1	8.768	14	3 2 11.88	1.9776	12 41 41.6	6.886
15	1 31 23.42	1.8953	6 29 25.4	8.743	15	3 4 10.60	1.9798	12 48 33.1	6.832
16	1 33 17.17	1.8964	6 38 9.2	8.717	16	3 6 9.46	1.9822	12 55 21.5	6.779
17	1 35 10.99	1.8977	6 46 51.4	8.690	17	3 8 8.46	1.9844	13 2 6.6	6.725
18	1 37 4.89	1.8988	6 55 32.0	8.662	18	3 10 7.59	1.9867	13 8 48.5	6.670
19	1 38 58.85	1.9000	7 4 10.9	8.634	19	3 12 6.86	1.9890	13 15 27.0	6.614
20	1 40 52.89	1.9013	7 12 48.1	8.606	20	3 14 6.27	1.9913	13 22 2.2	6.558
21	1 42 47.01	1.9027	7 21 23.6	8.577	21	3 16 5.82	1.9937	13 28 34.0	6.502
22	1 44 41.21	1.9040	7 29 57.3	8.547	22	3 18 5.51	1.9960	13 35 2.4	6.444
23	1 46 35.49	1.9053	+ 7 38 29.2	+8.517	23	3 20 5.34	1.9983	+13 41 27.3	+6.386
	APRIL 16.					APRIL 18.			
0	1 48 29.85	1.9067	+ 7 46 59.3	+8.486	0	3 22 5.31	2.0007	+13 47 48.7	+6.327
1	1 50 24.30	1.9082	7 55 27.5	8.454	1	3 24 5.43	2.0032	13 54 6.6	6.269
2	1 52 18.83	1.9096	8 3 53.8	8.422	2	3 26 5.69	2.0055	14 0 21.0	6.210
3	1 54 13.45	1.9111	8 12 18.2	8.390	3	3 28 6.09	2.0078	14 6 31.8	6.149
4	1 56 8.16	1.9126	8 20 40.6	8.357	4	3 30 6.63	2.0102	14 12 38.9	6.088
5	1 58 2.96	1.9141	8 29 1.0	8.323	5	3 32 7.32	2.0127	14 18 42.4	6.028
6	1 59 57.85	1.9156	8 37 19.4	8.289	6	3 34 8.16	2.0152	14 24 42.3	5.967
7	2 1 52.83	1.9172	8 45 35.7	8.253	7	3 36 9.14	2.0176	14 30 38.4	5.903
8	2 3 47.91	1.9188	8 53 49.8	8.218	8	3 38 10.27	2.0200	14 36 30.7	5.841
9	2 5 43.09	1.9205	9 2 1.9	8.182	9	3 40 11.54	2.0225	14 42 19.3	5.778
10	2 7 38.37	1.9222	9 10 11.7	8.145	10	3 42 12.97	2.0250	14 48 4.1	5.714
11	2 9 33.75	1.9238	9 18 19.3	8.108	11	3 44 14.54	2.0274	14 53 45.0	5.650
12	2 11 29.23	1.9255	9 26 24.7	8.071	12	3 46 16.26	2.0299	14 59 22.1	5.585
13	2 13 24.81	1.9273	9 34 27.8	8.033	13	3 48 18.13	2.0323	15 4 55.2	5.519
14	2 15 20.50	1.9291	9 42 28.6	7.993	14	3 50 20.14	2.0348	15 10 24.4	5.453
15	2 17 16.30	1.9308	9 50 27.0	7.954	15	3 52 22.31	2.0373	15 15 49.6	5.387
16	2 19 12.20	1.9326	9 58 23.1	7.914	16	3 54 24.62	2.0398	15 21 10.8	5.320
17	2 21 8.21	1.9344	10 6 16.7	7.873	17	3 56 27.09	2.0423	15 26 28.0	5.253
18	2 23 4.33	1.9363	10 14 7.8	7.832	18	3 58 29.70	2.0448	15 31 41.1	5.184
19	2 25 0.57	1.9382	10 21 56.5	7.790	19	4 0 32.46	2.0473	15 36 50.1	5.116
20	2 26 56.91	1.9400	10 29 42.6	7.747	20	4 2 35.38	2.0498	15 41 55.0	5.047
21	2 28 53.37	1.9420	10 37 26.2	7.705	21	4 4 38.44	2.0523	15 46 55.8	4.977
22	2 30 49.95	1.9440	10 45 7.2	7.661	22	4 6 41.66	2.0548	15 51 52.3	4.907
23	2 32 46.65	1.9459	10 52 45.5	7.617	23	4 8 45.02	2.0573	15 56 44.6	4.836
24	2 34 43.46	1.9478	+11 0 21.2	+7.573	24	4 10 48.54	2.0599	+16 1 32.6	+4.765

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 19.			
	h m s	s	° ′ ″	″
0	4 10 48.54	2.0599	+16 1 32.6	+4.765
1	4 12 52.21	2.0623	16 6 16.4	4.693
2	4 14 56.02	2.0648	16 10 55.8	4.621
3	4 16 59.99	2.0674	16 15 30.9	4.548
4	4 19 4.11	2.0698	16 20 1.6	4.475
5	4 21 8.37	2.0723	16 24 27.9	4.402
6	4 23 12.79	2.0749	16 28 49.8	4.328
7	4 25 17.36	2.0773	16 33 7.2	4.253
8	4 27 22.07	2.0798	16 37 20.1	4.178
9	4 29 26.94	2.0824	16 41 28.5	4.102
10	4 31 31.96	2.0848	16 45 32.3	4.026
11	4 33 37.12	2.0872	16 49 31.6	3.949
12	4 35 42.43	2.0897	16 53 26.2	3.872
13	4 37 47.89	2.0922	16 57 16.2	3.794
14	4 39 53.50	2.0947	17 1 1.5	3.717
15	4 41 59.26	2.0972	17 4 42.2	3.638
16	4 44 5.16	2.0996	17 8 18.1	3.559
17	4 46 11.21	2.1021	17 11 49.3	3.479
18	4 48 17.41	2.1045	17 15 15.6	3.399
19	4 50 23.75	2.1069	17 18 37.2	3.320
20	4 52 30.24	2.1093	17 21 54.0	3.239
21	4 54 36.87	2.1117	17 25 5.9	3.157
22	4 56 43.65	2.1142	17 28 12.9	3.076
23	4 58 50.57	2.1165	+17 31 15.0	+2.994
	APRIL 20.			
0	5 0 57.63	2.1188	+17 34 12.2	+2.912
1	5 3 4.83	2.1212	17 37 4.4	2.828
2	5 5 12.18	2.1236	17 39 51.6	2.745
3	5 7 19.66	2.1259	17 42 33.8	2.662
4	5 9 27.29	2.1282	17 45 11.0	2.578
5	5 11 35.05	2.1305	17 47 43.1	2.493
6	5 13 42.95	2.1328	17 50 10.2	2.408
7	5 15 50.99	2.1352	17 52 32.1	2.322
8	5 17 59.17	2.1375	17 54 48.9	2.237
9	5 20 7.49	2.1397	17 57 0.6	2.152
10	5 22 15.93	2.1418	17 59 7.1	2.064
11	5 24 24.51	2.1442	18 1 8.3	1.977
12	5 26 33.23	2.1464	18 3 4.4	1.891
13	5 28 42.08	2.1486	18 4 55.2	1.803
14	5 30 51.06	2.1507	18 6 40.8	1.716
15	5 33 0.17	2.1529	18 8 21.1	1.627
16	5 35 9.41	2.1551	18 9 56.0	1.538
17	5 37 18.78	2.1572	18 11 25.7	1.450
18	5 39 28.27	2.1593	18 12 50.0	1.360
19	5 41 37.90	2.1615	18 14 8.9	1.270
20	5 43 47.65	2.1635	18 15 22.4	1.181
21	5 45 57.52	2.1655	18 16 30.6	1.091
22	5 48 7.51	2.1676	18 17 33.3	0.999
23	5 50 17.63	2.1697	18 18 30.5	0.908
24	5 52 27.87	2.1717	+18 19 22.3	+0.817

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 21.			
	h m s	s	° ′ ″	″
0	5 52 27.87	2.1717	+18 19 22.3	+0.817
1	5 54 38.23	2.1736	18 20 8.6	0.726
2	5 56 48.70	2.1755	18 20 49.4	0.634
3	5 58 59.29	2.1775	18 21 24.7	0.542
4	6 1 10.00	2.1795	18 21 54.5	0.450
5	6 3 20.83	2.1814	18 22 18.7	0.357
6	6 5 31.77	2.1832	18 22 37.3	0.264
7	6 7 42.82	2 1851	18 22 50.4	0.172
8	6 9 53.98	2.1869	18 22 57.9	+0.078
9	6 12 5.25	2.1887	18 22 59.8	−0.016
10	6 14 16.63	2.1905	18 22 56.0	0.110
11	6 16 28.11	2.1923	18 22 46.6	0.203
12	6 18 39.71	2.1942	18 22 31.6	0.297
13	6 20 51.41	2.1958	18 22 10.9	0.392
14	6 23 3.21	2.1976	18 21 44.5	0.487
15	6 25 15.12	2.1993	18 21 12.5	0.582
16	6 27 27.12	2.2009	18 20 34.7	0.677
17	6 29 39.23	2.2026	18 19 51.2	0.772
18	6 31 51.43	2.2042	18 19 2.1	0.867
19	6 34 3.73	2.2058	18 18 7.2	0.963
20	6 36 16.13	2.2074	18 17 6.5	1.059
21	6 38 28.62	2.2089	18 16 0.1	1.154
22	6 40 41.20	2.2105	18 14 48.0	1.251
23	6 42 53.88	2.2121	+18 13 30.0	−1.347
	APRIL 22.			
0	6 45 6.65	2.2136	+18 12 6.3	−1.443
1	6 47 19.51	2.2150	18 10 36.8	1.540
2	6 49 32.45	2.2165	18 9 1.5	1.637
3	6 51 45.49	2.2179	18 7 20.4	1.733
4	6 53 58.60	2.2193	18 5 33.5	1.830
5	6 56 11.80	2 2208	18 3 40.8	1.927
6	6 58 25.09	2.2221	18 1 42.3	2.023
7	7 0 38.45	2.2234	17 59 38.0	2.121
8	7 2 51.90	2.2247	17 57 27.8	2.218
9	7 5 5.42	2.2260	17 55 11.8	2.315
10	7 7 19.02	2.2273	17 52 50.0	2.412
11	7 9 32.70	2.2286	17 50 22.3	2.510
12	7 11 46.45	2.2298	17 47 48.8	2.607
13	7 14 0.28	2.2311	17 45 9.5	2.704
14	7 16 14.18	2.2323	17 42 24.3	2.802
15	7 18 28.15	2.2334	17 39 33.2	2.900
16	7 20 42.19	2.2346	17 36 36.3	2.997
17	7 22 56.30	2.2357	17 33 33.6	3.094
18	7 25 10.47	2.2368	17 30 25.0	3.192
19	7 27 24.71	2.2379	17 27 10.6	3.288
20	7 29 39.02	2.2390	17 23 50.4	3.386
21	7 31 53.39	2.2401	17 20 24.3	3.483
22	7 34 7.83	2.2411	17 16 52.4	3.580
23	7 36 22.32	2.2421	17 13 14.7	3.677
24	7 38 36.88	2.2432	+17 9 31.1	−3.774

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 23.			
	h m s	s	° ′ ″	″
0	7 38 36.88	2.2432	+17 9 31.1	−3.774
1	7 40 51.50	2.2441	17 5 41.8	3.871
2	7 43 6.17	2.2451	17 1 46.6	3.968
3	7 45 20.91	2.2461	16 57 45.6	4.066
4	7 47 35.70	2.2470	16 53 38.7	4.163
5	7 49 50.55	2 2479	16 49 26.1	4.258
6	7 52 5.45	2 2488	16 45 7.7	4.355
7	7 54 20.40	2.2497	16 40 43.5	4.451
8	7 56 35.41	2.2506	16 36 13.6	4.547
9	7 58 50.47	2.2514	16 31 37.9	4.643
10	8 1 5.58	2.2522	16 26 56.4	4.739
11	8 3 20.74	2.2531	16 22 9.2	4.835
12	8 5 35.95	2.2539	16 17 16.2	4.931
13	8 7 51.21	2.2547	16 12 17.5	5.026
14	8 10 6.51	2.2555	16 7 13.1	5.121
15	8 12 21.87	2.2563	16 2 3.0	5.215
16	8 14 37.27	2.2570	15 56 47.3	5.310
17	8 16 52.71	2.2577	15 51 25.8	5.405
18	8 19 8.20	2.2585	15 45 58.7	5.498
19	8 21 23.73	2.2592	15 40 26.0	5.592
20	8 23 39.31	2.2600	15 34 47.6	5.687
21	8 25 54.93	2.2607	15 29 3.6	5.780
22	8 28 10.60	2.2614	15 23 14.0	5.873
23	8 30 26.30	2.2621	+15 17 18.8	−5.966
	APRIL 24.			
0	8 32 42.05	2.2628	+15 11 18.1	−6.058
1	8 34 57.84	2.2635	15 5 11.8	6.151
2	8 37 13.67	2.2641	14 59 0.0	6.243
3	8 39 29.53	2.2648	14 52 42.7	6.334
4	8 41 45.44	2.2655	14 46 19.9	6.425
5	8 44 1.39	2.2661	14 39 51.7	6.516
6	8 46 17.37	2.2667	14 33 18.0	6.607
7	8 48 33.39	2.2674	14 26 38.9	6.697
8	8 50 49.46	2.2681	14 19 54.4	6.787
9	8 53 5.56	2.2686	14 13 4.5	6.876
10	8 55 21.69	2.2693	14 6 9.3	6.965
11	8 57 37.87	2.2699	13 59 8.7	7.053
12	8 59 54.08	2.2705	13 52 2.9	7.141
13	9 2 10.33	2.2712	13 44 51.8	7.228
14	9 4 26.62	2.2718	13 37 35.5	7.316
15	9 6 42.94	2.2724	13 30 13.9	7.403
16	9 8 59.31	2.2731	13 22 47.1	7.489
17	9 11 15.71	2.2737	13 15 15.2	7.575
18	9 13 32.15	2.2743	13 7 38.1	7.661
19	9 15 48.62	2.2748	12 59 55.9	7.745
20	9 18 5.13	2.2755	12 52 8.7	7.828
21	9 20 21.68	2.2762	12 44 16.5	7.912
22	9 22 38.27	2.2768	12 36 19.2	7.996
23	9 24 54.90	2.2774	12 28 17.0	8.078
24	9 27 11.56	2.2780	+12 20 9.8	−8.161

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 25.			
	h m s	s	° ′ ″	″
0	9 27 11.56	2.2780	+12 20 9.8	− 8.161
1	9 29 28.26	2.2788	12 11 57.7	8.242
2	9 31 45.01	2.2794	12 3 40.7	8.323
3	9 34 1.79	2.2800	11 55 18.9	8.403
4	9 36 18.61	2.2807	11 46 52.3	8.482
5	9 38 35.47	2.2813	11 38 21.0	8.562
6	9 40 52.37	2.2820	11 29 44.9	8.641
7	9 43 9.31	2.2827	11 21 4.1	8.718
8	9 45 26.30	2.2835	11 12 18.7	8.795
9	9 47 43.33	2.2842	11 3 28.7	8.872
10	9 50 0.40	2.2818	10 54 34.1	8.948
11	9 52 17.51	2.2856	10 45 35.0	9.023
12	9 54 34.67	2.2863	10 36 31.4	9.098
13	9 56 51.87	2.2871	10 27 23.3	9.171
14	9 59 9.12	2.2879	10 18 10.9	9.243
15	10 1 26.42	2.2887	10 8 54.1	9.316
16	10 3 43.76	2.2894	9 59 33.0	9.388
17	10 6 1.15	2.2902	9 50 7.6	9.458
18	10 8 18.58	2.2910	9 40 38.1	9.528
19	10 10 36.07	2.2919	9 31 4.3	9.597
20	10 12 53.61	2.2927	9 21 26.4	9.665
21	10 15 11.19	2.2935	9 11 44.5	9.732
22	10 17 28.83	2.2944	9 1 58.5	9.799
23	10 19 46.52	2.2953	+ 8 52 8.6	− 9.865
	APRIL 26.			
0	10 22 4.27	2.2962	+ 8 42 14.7	− 9.930
1	10 24 22.07	2.2972	8 32 17.0	9.994
2	10 26 39.93	2.2981	8 22 15.4	10.057
3	10 28 57.84	2.2990	8 12 10.1	10.120
4	10 31 15.81	2.3001	8 2 1.0	10.182
5	10 33 33.85	2.3011	7 51 48.3	10.242
6	10 35 51.94	2.3020	7 41 32.0	10.302
7	10 38 10.09	2.3031	7 31 12.1	10.360
8	10 40 28.31	2.3042	7 20 48.8	10.418
9	10 42 46.59	2.3052	7 10 22.0	10.474
10	10 45 4.93	2.3063	6 59 51.9	10.530
11	10 47 23.34	2.3074	6 49 18.4	10.585
12	10 49 41.82	2.3086	6 38 41.7	10.638
13	10 52 0.37	2.3097	6 28 1.8	10.691
14	10 54 18.98	2.3108	6 17 18.8	10.743
15	10 56 37.67	2.3121	6 6 32.6	10.794
16	10 58 56.43	2.3133	5 55 43.5	10.843
17	11 1 15.27	2.3146	5 44 51.4	10.892
18	11 3 34.18	2.3158	5 33 56.5	10.939
19	11 5 53.16	2.3171	5 22 58.7	10.986
20	11 8 12.23	2.3185	5 11 58.2	11.031
21	11 10 31.38	2.3198	5 0 55.0	11.075
22	11 12 50.61	2.3211	4 49 49.2	11.118
23	11 15 9.91	2.3225	4 38 40.8	11.160
24	11 17 29.31	2.3240	+ 4 27 30.0	−11.200

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 27.			
	h m s	s	° ′ ″	″
0	11 17 29.31	2.3240	+4 27 30.0	−11.200
1	11 19 48.79	2.3253	4 16 16.8	11.240
2	11 22 8.35	2.3268	4 5 1.2	11.279
3	11 24 28.01	2.3283	3 53 43.3	11.317
4	11 26 47.75	2.3298	3 42 23.2	11.353
5	11 29 7.59	2.3313	3 31 1.0	11.387
6	11 31 27.51	2.3328	3 19 36.8	11.421
7	11 33 47.53	2.3345	3 8 10.5	11.453
8	11 36 7.65	2.3361	2 56 42.4	11.483
9	11 38 27.86	2.3377	2 45 12.5	11.513
10	11 40 48.17	2.3394	2 33 40.8	11.542
11	11 43 8.59	2.3411	2 22 7.4	11.570
12	11 45 29.10	2.3427	2 10 32.4	11.596
13	11 47 49.71	2.3444	1 58 55.9	11.621
14	11 50 10.43	2.3462	1 47 17.9	11.644
15	11 52 31.26	2.3480	1 35 38.6	11.666
16	11 54 52.19	2.3498	1 23 58.0	11.686
17	11 57 13.23	2.3516	1 12 16.3	11.706
18	11 59 34.38	2.3535	1 0 33.3	11.724
19	12 1 55.65	2.3553	0 48 49.4	11.740
20	12 4 17.02	2.3572	0 37 4.5	11.756
21	12 6 38.51	2.3592	0 25 18.7	11.770
22	12 9 0.12	2.3611	0 13 32.1	11.782
23	12 11 21.84	2.3630	+0 1 44.8	−11.793
	APRIL 28.			
0	12 13 43.68	2.3650	−0 10 3.1	−11.803
1	12 16 5.64	2.3670	0 21 51.5	11.811
2	12 18 27.72	2.3691	0 33 40.4	11 818
3	12 20 49.93	2.3712	0 45 29.7	11.824
4	12 23 12.26	2.3732	0 57 19.3	11.828
5	12 25 34.71	2.3752	1 9 9.0	11.829
6	12 27 57.28	2.3773	1 20 58.8	11.830
7	12 30 19.99	2.3796	1 32 48.6	11.830
8	12 32 42.83	2.3817	1 44 38.4	11.828
9	12 35 5.79	2.3838	1 56 28.0	11.825
10	12 37 28.89	2.3861	2 8 17.4	11.820
11	12 39 52.12	2.3883	2 20 6.4	11.813
12	12 42 15.48	2.3905	2 31 55.0	11.806
13	12 44 38.98	2.3927	2 43 43.1	11.796
14	12 47 2.61	2.3949	2 55 30.5	11.785
15	12 49 26.37	2.3972	3 7 17.3	11.773
16	12 51 50.27	2.3996	3 19 3.2	11.758
17	12 54 14.32	2.4019	3 30 48.3	11.742
18	12 56 38.50	2.4042	3 42 32.3	11.725
19	12 59 2.82	2.4065	3 54 15.3	11.706
20	13 1 27.28	2.4088	4 5 57.1	11.687
21	13 3 51.88	2.4112	4 17 37.7	11.665
22	13 6 16.62	2.4136	4 29 16.9	11.642
23	13 8 41.51	2.4160	4 40 54.7	11.617
24	13 11 6.54	2.4183	−4 52 30.9	−11.590

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 29.			
	h m s	s	° ′ ″	″
0	13 11 6.54	2.4183	− 4 52 30.9	−11.590
1	13 13 31.71	2.4207	5 4 5.5	11.562
2	13 15 57.03	2.4232	5 15 38.4	11.532
3	13 18 22.49	2.4256	5 27 9.4	11.501
4	13 20 48.10	2.4280	5 38 38.5	11.468
5	13 23 13.85	2.4304	5 50 5.6	11.434
6	13 25 39.75	2.4329	6 1 30.6	11.398
7	13 28 5.80	2.4353	6 12 53.4	11.361
8	13 30 31.99	2.4377	6 24 13.9	11.323
9	13 32 58.33	2.4402	6 35 32.1	11.282
10	13 35 24.82	2.4427	6 46 47.7	11.239
11	13 37 51.45	2.4451	6 58 0.8	11.196
12	13 40 18.23	2.4475	7 9 11.2	11.150
13	13 42 45.15	2.4499	7 20 18.8	11.103
14	13 45 12.22	2.4523	7 31 23.6	11.056
15	13 47 39.44	2.4549	7 42 25.5	11.006
16	13 50 6.81	2.4573	7 53 24.3	10.953
17	13 52 34.31	2.4597	8 4 19.9	10.901
18	13 55 1.97	2.4622	8 15 12.4	10.847
19	13 57 29.77	2.4645	8 26 1.5	10.790
20	13 59 57.71	2.4669	8 36 47.2	10.732
21	14 2 25.80	2.4693	8 47 29.4	10.673
22	14 4 54.03	2.4717	8 58 8.0	10.612
23	14 7 22.40	2.4740	− 9 8 42.9	−10.550
	APRIL 30.			
0	14 9 50.91	2.4763	− 9 19 14.0	−10.487
1	14 12 19.56	2.4787	9 29 41.3	10.422
2	14 14 48.35	2.4810	9 40 4.6	10.355
3	14 17 17.28	2.4833	9 50 23.9	10.287
4	14 19 46.35	2.4856	10 0 39.0	10.218
5	14 22 15.55	2.4878	10 10 50.0	10.147
6	14 24 44.89	2.4901	10 20 56.6	10.073
7	14 27 14.36	2.4923	10 30 58.8	10.000
8	14 29 43.96	2.4944	10 40 56.6	9.925
9	14 32 13.69	2.4965	10 50 49.8	9.848
10	14 34 43.54	2.4986	11 0 38.4	9.771
11	14 37 13.52	2.5007	11 10 22.3	9.691
12	14 39 43.63	2.5029	11 20 1.3	9.610
13	14 42 13.87	2.5050	11 29 35.5	9.528
14	14 44 44.23	2.5070	11 39 4.7	9.444
15	14 47 14.71	2.5089	11 48 28.8	9.359
16	14 49 45.30	2.5107	11 57 47.8	9.272
17	14 52 16.00	2.5127	12 7 1.5	9.185
18	14 54 46.82	2.5146	12 16 10.0	9.097
19	14 57 17.75	2.5164	12 25 13.2	9.008
20	14 59 48.79	2.5182	12 34 10.9	8.916
21	15 2 19.93	2.5198	12 43 3.1	8.823
22	15 4 51.17	2.5216	12 51 49.7	8.729
23	15 7 22.52	2.5233	13 0 30.6	8.634
24	15 9 53.96	2.5248	−13 9 5.8	− 8.538

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 1.			
	h m s	s	° ′ ″	″
0	15 9 53.96	2.5248	−13 9 5.8	−8.538
1	15 12 25.50	2.5264	13 17 35.2	8.442
2	15 14 57.13	2.5279	13 25 58.8	8.343
3	15 17 28.85	2.5294	13 34 16.4	8.243
4	15 20 0.66	2.5308	13 42 27.9	8.143
5	15 22 32.55	2.5321	13 50 33.5	8.042
6	15 25 4.51	2.5333	13 58 32.9	7.938
7	15 27 36.55	2.5347	14 6 26.0	7.834
8	15 30 8.67	2.5359	14 14 13.0	7.730
9	15 32 40.86	2.5370	14 21 53.6	7.624
10	15 35 13.11	2.5380	14 29 27.9	7.518
11	15 37 45.42	2.5391	14 36 55.7	7.409
12	15 40 17.80	2.5401	14 44 17.0	7.301
13	15 42 50.23	2.5409	14 51 31.8	7.192
14	15 45 22.71	2.5417	14 58 40.0	7.081
15	15 47 55.24	2.5425	15 5 41.5	6.970
16	15 50 27.81	2.5432	15 12 36.4	6.858
17	15 53 0.42	2.5438	15 19 24.5	6.745
18	15 55 33.07	2.5444	15 26 5.8	6.631
19	15 58 5.75	2.5449	15 32 40.2	6.517
20	16 0 38.46	2.5453	15 39 7.8	6.403
21	16 3 11.19	2.5457	15 45 28.5	6.287
22	16 5 43.94	2.5459	15 51 42.2	6.169
23	16 8 16.70	2.5462	−15 57 48.8	−6.052
	MAY 2.			
0	16 10 49.48	2.5463	−16 3 48.4	−5.934
1	16 13 22.26	2.5464	16 9 40.9	5.816
2	16 15 55.05	2.5464	16 15 26.3	5.697
3	16 18 27.83	2.5463	16 21 4.6	5.577
4	16 21 0.61	2.5462	16 26 35.6	5.457
5	16 23 33.38	2.5460	16 31 59.4	5.337
6	16 26 6.13	2.5457	16 37 16.0	5.216
7	16 28 38.86	2.5453	16 42 25.3	5.094
8	16 31 11.57	2.5449	16 47 27.3	4.972
9	16 33 44.25	2.5443	16 52 22.0	4.851
10	16 36 16.89	2.5437	16 57 9.4	4.728
11	16 38 49.50	2.5431	17 1 49.3	4.603
12	16 41 22.06	2.5423	17 6 21.8	4.480
13	16 43 54.57	2.5415	17 10 46.9	4.357
14	16 46 27.04	2.5406	17 15 4.6	4.233
15	16 48 59.44	2.5395	17 19 14.8	4.108
16	16 51 31.78	2.5384	17 23 17.5	3.983
17	16 54 4.05	2.5373	17 27 12.8	3.859
18	16 56 36.26	2.5361	17 31 0.6	3.734
19	16 59 8.38	2.5347	17 34 40.9	3.609
20	17 1 40.42	2.5333	17 38 13.7	3.483
21	17 4 12.38	2.5319	17 41 38.9	3.358
22	17 6 44.25	2.5303	17 44 56.7	3.233
23	17 9 16.02	2.5287	17 48 6.9	3.108
24	17 11 47.69	2.5269	−17 51 9.6	−2.983

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 3.			
	h m s	s	° ′ ″	″
0	17 11 47.69	2.5269	−17 51 9.6	−2.983
1	17 14 19.25	2.5252	17 54 4.8	2.858
2	17 16 50.71	2.5233	17 56 52.5	2.733
3	17 19 22.05	2.5213	17 59 32.7	2.607
4	17 21 53.27	2.5193	18 2 5.3	2.481
5	17 24 24.37	2.5172	18 4 30.4	2.356
6	17 26 55.34	2.5151	18 6 48.0	2.231
7	17 29 26.18	2.5128	18 8 58.1	2.107
8	17 31 56.88	2.5105	18 11 0.8	1.983
9	17 34 27.44	2.5081	18 12 56.0	1.858
10	17 36 57.85	2.5056	18 14 43.7	1.733
11	17 39 28.11	2.5030	18 16 23.9	1.608
12	17 41 58.21	2.5003	18 17 56.7	1.485
13	17 44 28.15	2.4977	18 19 22.1	1.361
14	17 46 57.93	2.4949	18 20 40.0	1.237
15	17 49 27.54	2.4921	18 21 50.6	1.115
16	17 51 56.98	2.4892	18 22 53.8	0.992
17	17 54 26.24	2.4862	18 23 49.6	0.869
18	17 56 55.32	2.4831	18 24 38.1	0.748
19	17 59 24.21	2.4799	18 25 19.3	0.627
20	18 1 52.91	2.4767	18 25 53.3	0.506
21	18 4 21.42	2.4735	18 26 20.0	0.385
22	18 6 49.73	2.4702	18 26 39.5	0.264
23	18 9 17.85	2.4668	−18 26 51.7	−0.144
	MAY 4.			
0	18 11 45.75	2.4633	−18 26 56.8	−0.026
1	18 14 13.45	2.4598	18 26 54.8	+0.093
2	18 16 40.93	2.4563	18 26 45.6	0.212
3	18 19 8.20	2.4527	18 26 29.4	0.329
4	18 21 35.25	2.4489	18 26 6.1	0.447
5	18 24 2.07	2.4452	18 25 35.8	0.563
6	18 26 28.67	2.4414	18 24 58.6	0.678
7	18 28 55.04	2.4376	18 24 14.4	0.794
8	18 31 21.18	2.4337	18 23 23.3	0.909
9	18 33 47.08	2.4297	18 22 25.3	1.023
10	18 36 12.74	2.4257	18 21 20.5	1.137
11	18 38 38.16	2.4216	18 20 8.9	1.250
12	18 41 3.33	2.4174	18 18 50.5	1.363
13	18 43 28.25	2.4133	18 17 25.4	1.474
14	18 45 52.93	2.4092	18 15 53.6	1.585
15	18 48 17.35	2.4048	18 14 15.2	1.695
16	18 50 41.51	2.4005	18 12 30.2	1.804
17	18 53 5.41	2.3962	18 10 38.7	1.913
18	18 55 29.06	2.3919	18 8 40.7	2.022
19	18 57 52.44	2.3874	18 6 36.1	2.129
20	19 0 15.55	2.3830	18 4 25.2	2.235
21	19 2 38.40	2.3786	18 2 7.9	2.341
22	19 5 0.98	2.3740	17 59 44.3	2.446
23	19 7 23.28	2.3694	17 57 14.4	2.550
24	19 9 45.31	2.3648	−17 54 38.3	+2.653

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 5.					MAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 9 45.31	2.3648	−17 54 38.3	+2.653	0	20 57 42.02	2.1331	−14 3 58.0	+6.628
1	19 12 7.06	2.3602	17 51 56.0	2.757	1	20 59 49.87	2.1285	13 57 18.5	6.689
2	19 14 28.54	2.3556	17 49 7.5	2.858	2	21 1 57.44	2.1239	13 50 35.3	6.751
3	19 16 49.73	2.3509	17 46 13.0	2.959	3	21 4 4.74	2.1194	13 43 48.4	6.811
4	19 19 10.65	2.3462	17 43 12.4	3.060	4	21 6 11.77	2.1149	13 36 58.0	6.870
5	19 21 31.28	2.3414	17 40 5.8	3.159	5	21 8 18.53	2.1105	13 30 4.0	6.929
6	19 23 51.62	2.3367	17 36 53.3	3.257	6	21 10 25.03	2.1060	13 23 6.5	6.987
7	19 26 11.68	2.3320	17 33 34.9	3.355	7	21 12 31.25	2.1016	13 16 5.6	7.043
8	19 28 31.46	2.3272	17 30 10.7	3.452	8	21 14 37.22	2.0972	13 9 1.3	7.100
9	19 30 50.95	2.3223	17 26 40.6	3 549	9	21 16 42.92	2.0928	13 1 53.6	7.156
10	19 33 10.14	2.3175	17 23 4.8	3.644	10	21 18 48.36	2.0885	12 54 42.6	7.211
11	19 35 29.05	2.3127	17 19 23.3	3.738	11	21 20 53.54	2.0842	12 47 28.3	7.264
12	19 37 47.66	2.3078	17 15 36.2	3.832	12	21 22 58.46	2.0799	12 40 10.9	7.317
13	19 40 5.99	2.3030	17 11 43.5	3.925	13	21 25 3.13	2.0757	12 32 50.3	7.369
14	19 42 24.02	2.2980	17 7 45.2	4.017	14	21 27 7.55	2.0716	12 25 26.6	7.421
15	19 44 41.75	2.2931	17 3 41.4	4.108	15	21 29 11.72	2.0674	12 17 59.8	7.472
16	19 46 59.19	2.2882	16 59 32.2	4.198	16	21 31 15.64	2.0632	12 10 30.0	7.522
17	19 49 16.34	2.2833	16 55 17.6	4.287	17	21 33 19.31	2.0592	12 2 57.2	7.571
18	19 51 33.19	2.2784	16 50 57.7	4.376	18	21 35 22.74	2.0552	11 55 21.5	7.619
19	19 53 49.75	2.2735	16 46 32.5	4.463	19	21 37 25.93	2.0512	11 47 42.9	7.667
20	19 56 6.01	2.2685	16 42 2.1	4.550	20	21 39 28.88	2.0472	11 40 1.4	7.714
21	19 58 21.97	2.2636	16 37 26.5	4.637	21	21 41 31.59	2.0432	11 32 17.2	7.760
22	20 0 37.64	2.2587	16 32 45.7	4.722	22	21 43 34.06	2.0393	11 24 30.2	7.806
23	20 2 53.01	2.2537	−16 27 59.9	+4.805	23	21 45 36.31	2.0355	−11 16 40.5	+7.851
	MAY 6.					MAY 8.			
0	20 5 8.09	2.2488	−16 23 9.1	+4.888	0	21 47 38.32	2.0317	−11 8 48.1	+7.895
1	20 7 22.87	2.2438	16 18 13.3	4.971	1	21 49 40.11	2.0279	11 0 53.1	7.938
2	20 9 37.35	2.2388	16 13 12.6	5.052	2	21 51 41.67	2.0241	10 52 55.6	7.980
3	20 11 51.53	2.2339	16 8 7.0	5.133	3	21 53 43.00	2.0204	10 44 55.5	8.022
4	20 14 5.42	2.2290	16 2 56.6	5.213	4	21 55 44.12	2.0167	10 36 52.9	8.064
5	20 16 19.01	2.2241	15 57 41.5	5.292	5	21 57 45.01	2.0131	10 28 47.8	8.104
6	20 18 32.31	2.2192	15 52 21.6	5.370	6	21 59 45.69	2.0096	10 20 40.4	8.144
7	20 20 45.31	2.2142	15 46 57.1	5.447	7	22 1 46.16	2.0061	10 12 30.5	8.183
8	20 22 58.01	2.2093	15 41 28.0	5.523	8	22 3 46.42	2.0026	10 4 18.4	8.221
9	20 25 10.43	2.2045	15 35 54.3	5.599	9	22 5 46.47	1.9991	9 56 4.0	8.259
10	20 27 22.55	2.1996	15 30 16.1	5.673	10	22 7 46.31	1.9957	9 47 47.3	8.296
11	20 29 34.38	2.1947	15 24 33.5	5.747	11	22 9 45.95	1.9923	9 39 28.5	8.332
12	20 31 45.92	2.1899	15 18 46.5	5.820	12	22 11 45.39	1.9890	9 31 7.5	8.367
13	20 33 57.17	2.1851	15 12 55.1	5.892	13	22 13 44.63	1.9857	9 22 44.4	8.402
14	20 36 8.13	2.1802	15 6 59.4	5.963	14	22 15 43.68	1.9825	9 14 19.2	8.437
15	20 38 18.80	2.1754	15 0 59.5	6.033	15	22 17 42.53	1.9793	9 5 52.0	8.471
16	20 40 29.18	2.1706	14 54 55.5	6.102	16	22 19 41.19	1.9762	8 57 22.7	8.504
17	20 42 39.27	2.1658	14 48 47.3	6.172	17	22 21 39.67	1.9731	8 48 51.5	8.536
18	20 44 49.08	2.1612	14 42 34.9	6.239	18	22 23 37.96	1.9700	8 40 18.4	8.567
19	20 46 58.61	2.1564	14 36 18.6	6.305	19	22 25 36.07	1.9670	8 31 43.4	8.598
20	20 49 7.85	2.1517	14 29 58.3	6.372	20	22 27 34.00	1.9640	8 23 6.6	8.628
21	20 51 16.81	2.1470	14 23 34.0	6.437	21	22 29 31.75	1.9611	8 14 28.0	8.658
22	20 53 25.49	2.1424	14 17 5.8	6.502	22	22 31 29.33	1.9582	8 5 47.6	8.687
23	20 55 33.90	2.1377	14 10 33.8	6.565	23	22 33 26.74	1.9554	7 57 5.5	8.716
24	20 57 42.02	2.1331	−14 3 58.0	+6.628	24	22 35 23.98	1.9526	− 7 48 21.7	+8.743

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 9.			
	h m s	s	° ′ ″	″
0	22 35 23.98	1.9526	−7 48 21.7	+8.743
1	22 37 21.05	1.9498	7 39 36.3	8.771
2	22 39 17.96	1.9472	7 30 49.2	8.797
3	22 41 14.71	1.9445	7 22 0.6	8.823
4	22 43 11.30	1.9419	7 13 10.4	8.849
5	22 45 7.74	1.9394	7 4 18.7	8.873
6	22 47 4.03	1.9368	6 55 25.6	8.897
7	22 49 0.16	1.9343	6 46 31.1	8.921
8	22 50 56.15	1.9320	6 37 35.1	8.944
9	22 52 52.00	1.9297	6 28 37.8	8.966
10	22 54 47.71	1.9273	6 19 39.2	8.987
11	22 56 43.27	1.9250	6 10 39.3	9.008
12	22 58 38.71	1.9228	6 1 38.2	9.028
13	23 0 34.01	1.9207	5 52 35.9	9.048
14	23 2 29.19	1.9185	5 43 32.4	9.067
15	23 4 24.23	1.9163	5 34 27.8	9.086
16	23 6 19.15	1.9143	5 25 22.1	9.104
17	23 8 13.95	1.9123	5 16 15.3	9.122
18	23 10 8.63	1.9104	5 7 7.5	9.138
19	23 12 3.20	1.9086	4 57 58.7	9.155
20	23 13 57.66	1.9067	4 48 48.9	9.171
21	23 15 52.00	1.9048	4 39 38.2	9.185
22	23 17 46.24	1.9032	4 30 26.7	9.200
23	23 19 40.38	1.9014	−4 21 14.2	+9.214
	MAY 10.			
0	23 21 34.41	1.8997	−4 12 1.0	+9.227
1	23 23 28.35	1.8982	4 2 47.0	9.240
2	23 25 22.19	1.8965	3 53 32.2	9.252
3	23 27 15.93	1.8950	3 44 16.7	9.264
4	23 29 9.59	1.8935	3 35 0.5	9.276
5	23 31 3.15	1.8921	3 25 43.6	9.286
6	23 32 56.64	1.8907	3 16 26.2	9.296
7	23 34 50.04	1.8893	3 7 8.1	9.306
8	23 36 43.36	1.8880	2 57 49.5	9.315
9	23 38 36.60	1.8868	2 48 30.3	9.323
10	23 40 29.77	1.8857	2 39 10.7	9.330
11	23 42 22.88	1.8845	2 29 50.7	9.337
12	23 44 15.91	1.8833	2 20 30.2	9.345
13	23 46 8.88	1.8823	2 11 9.3	9.351
14	23 48 1.79	1.8812	2 1 48.1	9.357
15	23 49 54.63	1.8802	1 52 26.5	9.362
16	23 51 47.42	1.8794	1 43 4.7	9.366
17	23 53 40.16	1.8786	1 33 42.6	9.370
18	23 55 32.85	1.8778	1 24 20.3	9.373
19	23 57 25.49	1.8769	1 14 57.8	9.376
20	23 59 18.08	1.8762	1 5 35.2	9.378
21	0 1 10.63	1.8755	0 56 12.4	9.380
22	0 3 3.14	1.8748	0 46 49.6	9.381
23	0 4 55.61	1.8742	0 37 26.7	9.382
24	0 6 48.04	1.8736	−0 28 3.7	+9.383

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 11.			
	h m s	s	° ′ ″	″
0	0 6 48.04	1.8736	−0 28 3.7	+9.383
1	0 8 40.44	1.8731	0 18 40.8	9.382
2	0 10 32.81	1.8727	−0 9 17.9	9.382
3	0 12 25.16	1.8722	+0 0 5.0	9.380
4	0 14 17.48	1.8718	0 9 27.7	9.378
5	0 16 9.78	1.8715	0 18 50.3	9.375
6	0 18 2.06	1.8713	0 28 12.7	9.372
7	0 19 54.33	1.8710	0 37 34.9	9.368
8	0 21 46.58	1.8707	0 46 56.9	9.364
9	0 23 38.82	1.8706	0 56 18.6	9.359
10	0 25 31.05	1.8705	1 5 40.0	9.354
11	0 27 23.28	1.8704	1 15 1.1	9.348
12	0 29 15.50	1.8703	1 24 21.8	9.342
13	0 31 7.72	1.8704	1 33 42.1	9.335
14	0 32 59.95	1.8704	1 43 2.0	9.328
15	0 34 52.17	1.8705	1 52 21.5	9.320
16	0 36 44.41	1.8707	2 1 40.4	9.311
17	0 38 36.65	1.8708	2 10 58.8	9.302
18	0 40 28.91	1.8711	2 20 16.6	9.292
19	0 42 21.18	1.8713	2 29 33.9	9.282
20	0 44 13.47	1.8716	2 38 50.5	9.272
21	0 46 5.77	1.8719	2 48 6.5	9.260
22	0 47 58.10	1.8724	2 57 21.7	9.248
23	0 49 50.46	1.8728	+3 6 36.3	+9.237
	MAY 12.			
0	0 51 42.84	1.8732	+3 15 50.1	+9.223
1	0 53 35.25	1.8737	3 25 3.1	9.210
2	0 55 27.69	1.8743	3 34 15.3	9.197
3	0 57 20.17	1.8749	3 43 26.7	9.182
4	0 59 12.68	1.8755	3 52 37.1	9.166
5	1 1 5.23	1.8762	4 1 46.6	9.151
6	1 2 57.82	1.8769	4 10 55.2	9.135
7	1 4 50.46	1.8777	4 20 2.8	9.117
8	1 6 43.14	1.8784	4 29 9.3	9.101
9	1 8 35.87	1.8792	4 38 14.9	9.083
10	1 10 28.65	1.8801	4 47 19.3	9.064
11	1 12 21.48	1.8810	4 56 22.6	9.046
12	1 14 14.37	1.8819	5 5 24.8	9.027
13	1 16 7.31	1.8828	5 14 25.8	9.006
14	1 18 0.31	1.8839	5 23 25.5	8.985
15	1 19 53.38	1.8850	5 32 24.0	8.964
16	1 21 46.51	1.8861	5 41 21.2	8.942
17	1 23 39.71	1.8872	5 50 17.1	8.920
18	1 25 32.97	1.8883	5 59 11.6	8.897
19	1 27 26.31	1.8896	6 8 4.8	8.874
20	1 29 19.72	1.8908	6 16 56.5	8.850
21	1 31 13.20	1.8919	6 25 46.8	8.826
22	1 33 6.75	1.8933	6 34 35.6	8.800
23	1 35 0.39	1.8947	6 43 22.8	8.774
24	1 36 54.11	1.8960	+6 52 8.5	+8.748

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 13.			
	h m s	s	° ′ ″	″
0	1 36 54.11	1.8960	+ 6 52 8.5	+8.748
1	1 38 47.91	1.8974	7 0 52.6	8.722
2	1 40 41.80	1.8988	7 9 35.1	8.694
3	1 42 35.77	1.9003	7 18 15.9	8.666
4	1 44 29.83	1.9018	7 26 55.0	8.637
5	1 46 23.99	1.9033	7 35 32.4	8.608
6	1 48 18.23	1.9048	7 44 8.0	8.579
7	1 50 12.57	1.9065	7 52 41.9	8.549
8	1 52 7.01	1.9082	8 1 13.9	8.518
9	1 54 1.55	1.9098	8 9 44.0	8.486
10	1 55 56.18	1.9114	8 18 12.2	8.454
11	1 57 50.92	1.9132	8 26 38.5	8.422
12	1 59 45.77	1.9150	8 35 2.8	8.388
13	2 1 40.72	1.9168	8 43 25.1	8.355
14	2 3 35.78	1.9185	8 51 45.4	8.321
15	2 5 30.94	1.9203	9 0 3.6	8.286
16	2 7 26.22	1.9222	9 8 19.7	8.250
17	2 9 21.61	1.9241	9 16 33.6	8.213
18	2 11 17.11	1.9260	9 24 45.3	8.177
19	2 13 12.73	1.9280	9 32 54.8	8.140
20	2 15 8.47	1.9300	9 41 2.1	8.102
21	2 17 4.33	1.9319	9 49 7.0	8.063
22	2 19 0.30	1.9339	9 57 9.7	8.024
23	2 20 56.40	1.9361	+10 5 9.9	+7.984
	MAY 14.			
0	2 22 52.68	1.9382	+10 13 7.8	+7.944
1	2 24 48.98	1.9403	10 21 3.2	7.903
2	2 26 45.46	1.9423	10 28 56.2	7.862
3	2 28 42.06	1.9445	10 36 46.7	7.820
4	2 30 38.80	1.9467	10 44 34.6	7.777
5	2 32 35.66	1.9488	10 52 19.9	7.733
6	2 34 32.66	1.9511	11 0 2.6	7.690
7	2 36 29.79	1.9533	11 7 42.7	7.646
8	2 38 27.06	1.9556	11 15 20.1	7.600
9	2 40 24.46	1.9578	11 22 54.7	7.555
10	2 42 22.00	1.9601	11 30 26.7	7.509
11	2 44 19.67	1.9624	11 37 55.8	7.462
12	2 46 17.49	1.9648	11 45 22.1	7.414
13	2 48 15.45	1.9672	11 52 45.5	7.367
14	2 50 13.55	1.9695	12 0 6.1	7.318
15	2 52 11.79	1.9719	12 7 23.6	7.268
16	2 54 10.18	1.9743	12 14 38.2	7.218
17	2 56 8.71	1.9768	12 21 49.8	7.168
18	2 58 7.39	1.9793	12 28 58.3	7.117
19	3 0 6.22	1.9817	12 36 3.8	7.065
20	3 2 5.19	1.9841	12 43 6.1	7.012
21	3 4 4.31	1.9866	12 50 5.3	6.960
22	3 6 3.58	1.9892	12 57 1.3	6.907
23	3 8 3.01	1.9917	13 3 54.1	6.853
24	3 10 2.58	1.9942	+13 10 43.6	+6.798

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 15.			
	h m s	s	° ′ ″	″
0	3 10 2.58	1.9942	+13 10 43.6	+6.798
1	3 12 2.31	1.9968	13 17 29.8	6.743
2	3 14 2.19	1.9993	13 24 12.7	6.687
3	3 16 2.22	2.0018	13 30 52.2	6.630
4	3 18 2.41	2.0044	13 37 28.3	6.572
5	3 20 2.75	2.0070	13 44 0.9	6.515
6	3 22 3.25	2.0096	13 50 30.1	6.457
7	3 24 3.90	2.0122	13 56 55.7	6.398
8	3 26 4.71	2.0148	14 3 17.8	6.338
9	3 28 5.68	2.0174	14 9 36.3	6.278
10	3 30 6.80	2.0201	14 15 51.2	6.217
11	3 32 8.09	2.0228	14 22 2.4	6.156
12	3 34 9.53	2.0253	14 28 9.9	6.094
13	3 36 11.13	2.0280	14 34 13.7	6.032
14	3 38 12.89	2.0306	14 40 13.7	5.969
15	3 40 14.80	2.0333	14 46 10.0	5.906
16	3 42 16.88	2.0360	14 52 2.4	5.841
17	3 44 19.12	2.0386	14 57 50.9	5.776
18	3 46 21.51	2.0412	15 3 35.5	5.710
19	3 48 24.07	2.0439	15 9 16.1	5.644
20	3 50 26.78	2.0465	15 14 52.8	5.578
21	3 52 29.65	2.0493	15 20 25.5	5.512
22	3 54 32.69	2.0519	15 25 54.2	5.444
23	3 56 35.88	2.0545	+15 31 18.8	+5.375
	MAY 16.			
0	3 58 39.23	2.0572	+15 36 39.2	+5.306
1	4 0 42.74	2.0598	15 41 55.5	5.237
2	4 2 46.41	2.0625	15 47 7.7	5.167
3	4 4 50.24	2.0652	15 52 15.6	5.096
4	4 6 54.23	2.0678	15 57 19.2	5.025
5	4 8 58.38	2.0704	16 2 18.6	4.954
6	4 11 2.68	2.0730	16 7 13.7	4.882
7	4 13 7.14	2.0757	16 12 4.4	4.809
8	4 15 11.76	2.0783	16 16 50.8	4.736
9	4 17 16.54	2.0809	16 21 32.7	4.662
10	4 19 21.47	2.0835	16 26 10.2	4.588
11	4 21 26.56	2.0862	16 30 43.3	4.513
12	4 23 31.81	2.0888	16 35 11.8	4.437
13	4 25 37.21	2.0913	16 39 35.8	4.362
14	4 27 42.77	2.0939	16 43 55.2	4.286
15	4 29 48.48	2.0964	16 48 10.1	4.209
16	4 31 54.34	2.0989	16 52 20.3	4.131
17	4 34 0.35	2.1015	16 56 25.8	4.052
18	4 36 6.52	2.1040	17 0 26.6	3.974
19	4 38 12.83	2.1065	17 4 22.7	3.896
20	4 40 19.30	2.1091	17 8 14.1	3.816
21	4 42 25.92	2.1115	17 12 0.6	3.736
22	4 44 32.68	2.1139	17 15 42.4	3.656
23	4 46 39.59	2.1164	17 19 19.3	3.575
24	4 48 46.65	2.1188	+17 22 51.4	+3.494

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 17.					MAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 48 46.65	2.1188	+17 22 51.4	+3.494	0	6 32 50.74	2.2069	+18 29 19.2	−0.842
1	4 50 53.85	2.1212	17 26 18.6	3.412	1	6 35 3.19	2.2080	18 28 25.8	0.938
2	4 53 1.20	2.1237	17 29 40.8	3.329	2	6 37 15.70	2.2090	18 27 26.7	1.034
3	4 55 8.69	2.1260	17 32 58.1	3.247	3	6 39 28.27	2.2100	18 26 21.7	1.131
4	4 57 16.32	2.1283	17 36 10.4	3.163	4	6 41 40.90	2.2111	18 25 11.0	1.227
5	4 59 24.09	2.1307	17 39 17.7	3.080	5	6 43 53.60	2.2121	18 23 54.5	1.323
6	5 1 32.00	2.1331	17 42 20.0	2.996	6	6 46 6.35	2.2130	18 22 32.2	1.420
7	5 3 40.05	2.1353	17 45 17.2	2.911	7	6 48 19.16	2.2140	18 21 4.1	1.517
8	5 5 48.24	2.1376	17 48 9.3	2.826	8	6 50 32.03	2.2148	18 19 30.2	1.613
9	5 7 56.56	2.1398	17 50 56.3	2.741	9	6 52 44.94	2.2157	18 17 50.5	1.709
10	5 10 5.02	2.1421	17 53 38.2	2.655	10	6 54 57.91	2.2166	18 16 5.1	1.806
11	5 12 13.61	2.1443	17 56 14.9	2.568	11	6 57 10.93	2.2174	18 14 13.8	1.903
12	5 14 22.33	2.1464	17 58 46.4	2.482	12	6 59 24.00	2.2182	18 12 16.7	2.000
13	5 16 31.18	2.1486	18 1 12.7	2.395	13	7 1 37.11	2.2189	18 10 13.8	2.097
14	5 18 40.16	2.1508	18 3 33.8	2.308	14	7 3 50.27	2.2196	18 8 5.1	2.193
15	5 20 49.27	2.1529	18 5 49.7	2.220	15	7 6 3.46	2.2203	18 5 50.6	2.290
16	5 22 58.51	2.1550	18 8 0.2	2.132	16	7 8 16.70	2.2209	18 3 30.3	2.387
17	5 25 7.87	2.1570	18 10 5.5	2.043	17	7 10 29.97	2.2215	18 1 4.2	2.483
18	5 27 17.35	2.1590	18 12 5.4	1.954	18	7 12 43.28	2.2222	17 58 32.3	2.580
19	5 29 26.95	2.1610	18 14 0.0	1.866	19	7 14 56.63	2.2228	17 55 54.6	2.676
20	5 31 36.67	2.1631	18 15 49.3	1.776	20	7 17 10.02	2.2233	17 53 11.2	2.772
21	5 33 46.52	2.1651	18 17 33.1	1.686	21	7 19 23.43	2.2238	17 50 21.9	2.869
22	5 35 56.48	2.1669	18 19 11.6	1.596	22	7 21 36.87	2.2243	17 47 26.9	2.965
23	5 38 6.55	2.1688	+18 20 44.6	+1.505	23	7 23 50.34	2.2248	+17 44 26.1	−3.062
	MAY 18.					MAY 20.			
0	5 40 16.74	2.1707	+18 22 12.2	+1.414	0	7 26 3.84	2.2252	+17 41 19.5	−3.158
1	5 42 27.04	2.1726	18 23 34.3	1.323	1	7 28 17.36	2.2256	17 38 7.2	3.253
2	5 44 37.45	2.1744	18 24 51.0	1.232	2	7 30 30.91	2.2260	17 34 49.1	3.349
3	5 46 47.97	2.1762	18 26 2.1	1.140	3	7 32 44.48	2.2263	17 31 25.3	3.445
4	5 48 58.60	2.1780	18 27 7.8	1.048	4	7 34 58.07	2.2267	17 27 55.7	3.541
5	5 51 9.33	2.1797	18 28 7.9	0.955	5	7 37 11.68	2.2270	17 24 20.4	3.636
6	5 53 20.17	2.1814	18 29 2.4	0.862	6	7 39 25.31	2.2272	17 20 39.4	3.731
7	5 55 31.10	2.1831	18 29 51.4	0.770	7	7 41 38.95	2.2276	17 16 52.7	3.826
8	5 57 42.14	2.1847	18 30 34.8	0.677	8	7 43 52.62	2.2278	17 13 0.3	3.921
9	5 59 53.27	2.1863	18 31 12.6	0.583	9	7 46 6.29	2.2280	17 9 2.2	4.016
10	6 2 4.50	2.1879	18 31 44.8	0.490	10	7 48 19.98	2.2282	17 4 58.4	4.110
11	6 4 15.82	2.1895	18 32 11.4	0.395	11	7 50 33.67	2.2283	17 0 49.0	4.204
12	6 6 27.24	2.1911	18 32 32.2	0.301	12	7 52 47.38	2.2286	16 56 33.9	4.298
13	6 8 38.75	2.1925	18 32 47.5	0.208	13	7 55 1.10	2.2287	16 52 13.2	4.392
14	6 10 50.34	2.1939	18 32 57.1	0.113	14	7 57 14.82	2.2287	16 47 46.8	4.486
15	6 13 2.02	2.1954	18 33 1.0	+0.017	15	7 59 28.55	2.2289	16 43 14.9	4.579
16	6 15 13.79	2.1968	18 32 59.2	−0.078	16	8 1 42.29	2.2290	16 38 37.3	4.673
17	6 17 25.64	2.1982	18 32 51.7	0.172	17	8 3 56.03	2.2290	16 33 54.2	4.765
18	6 19 37.57	2.1994	18 32 38.6	0.267	18	8 6 9.77	2.2291	16 29 5.5	4.857
19	6 21 49.57	2.2007	18 32 19.7	0.362	19	8 8 23.52	2.2291	16 24 11.3	4.950
20	6 24 1.66	2.2021	18 31 55.1	0.458	20	8 10 37.26	2.2291	16 19 11.5	5.042
21	6 26 13.82	2.2033	18 31 24.7	0.554	21	8 12 51.01	2.2292	16 14 6.2	5.133
22	6 28 26.06	2.2045	18 30 48.6	0.649	22	8 15 4.76	2.2292	16 8 55.5	5.225
23	6 30 38.36	2.2057	18 30 6.8	0.745	23	8 17 18.51	2.2291	16 3 39.2	5.317
24	6 32 50.74	2.2069	+18 29 19.2	−0.842	24	8 19 32.25	2.2290	+15 58 17.5	−5.407

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 21.					MAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 19 32.25	2.2290	+15 58 17.5	−5.407	0	10 6 24.73	2.2259	+10 2 20.7	− 9.221
1	8 21 45.99	2.2290	15 52 50.4	5.498	1	10 8 38.29	2.2262	9 53 5.5	9.286
2	8 23 59.73	2.2289	15 47 17.8	5.588	2	10 10 51.87	2.2263	9 43 46.4	9.350
3	8 26 13.46	2.2288	15 41 39.9	5.678	3	10 13 5.45	2.2266	9 34 23.5	9.413
4	8 28 27.19	2.2288	15 35 56.5	5.767	4	10 15 19.06	2.2269	9 24 56.9	9.475
5	8 30 40.92	2.2287	15 30 7.9	5.855	5	10 17 32.68	2.2272	9 15 26.5	9.537
6	8 32 54.64	2.2286	15 24 13.9	5.945	6	10 19 46.32	2.2275	9 5 52.4	9.598
7	8 35 8.35	2.2285	15 18 14.5	6.033	7	10 21 59.98	2.2278	8 56 14.7	9.658
8	8 37 22.06	2.2284	15 12 9.9	6.120	8	10 24 13.66	2.2282	8 46 33.4	9.718
9	8 39 35.76	2.2283	15 6 0.1	6.207	9	10 26 27.36	2.2286	8 36 48.5	9.777
10	8 41 49.45	2.2281	14 59 45.0	6.295	10	10 28 41.09	2.2290	8 27 0.1	9.835
11	8 44 3.13	2.2279	14 53 24.7	6.382	11	10 30 54.84	2.2294	8 17 8.3	9.892
12	8 46 16.80	2.2278	14 46 59.2	6.468	12	10 33 8.62	2.2299	8 7 13.1	9.948
13	8 48 30.47	2.2278	14 40 28.5	6.553	13	10 35 22.43	2.2304	7 57 14.5	10.004
14	8 50 44.13	2.2276	14 33 52.8	6.638	14	10 37 36.27	2.2309	7 47 12.6	10.058
15	8 52 57.78	2.2274	14 27 11.9	6.724	15	10 39 50.14	2.2314	7 37 7.5	10.112
16	8 55 11.42	2.2272	14 20 25.9	6.808	16	10 42 4.04	2.2320	7 26 59.1	10.166
17	8 57 25.05	2.2271	14 13 34.9	6.892	17	10 44 17.98	2.2327	7 16 47.6	10.218
18	8 59 38.67	2.2269	14 6 38.8	6.976	18	10 46 31.97	2.2334	7 6 33.0	10.268
19	9 1 52.28	2.2268	13 59 37.8	7.058	19	10 48 45.99	2.2340	6 56 15.4	10.319
20	9 4 5.89	2.2267	13 52 31.8	7.142	20	10 51 0.05	2.2347	6 45 54.7	10.369
21	9 6 19.48	2.2265	13 45 20.8	7.223	21	10 53 14.15	2.2354	6 35 31.1	10.417
22	9 8 33.07	2.2263	13 38 5.0	7.304	22	10 55 28.30	2.2362	6 25 4.7	10.465
23	9 10 46.64	2.2262	+13 30 44.3	−7.386	23	10 57 42.50	2.2371	+ 6 14 35.3	−10.512
	MAY 22.					MAY 24.			
0	9 13 0.21	2.2261	+13 23 18.7	−7.467	0	10 59 56.75	2.2379	+ 6 4 3.2	−10.558
1	9 15 13.77	2.2259	13 15 48.3	7.547	1	11 2 11.05	2.2388	5 53 28.3	10.603
2	9 17 27.32	2.2258	13 8 13.1	7.626	2	11 4 25.40	2.2397	5 42 50.8	10.647
3	9 19 40.87	2.2257	13 0 33.2	7.704	3	11 6 39.81	2.2406	5 32 10.7	10.691
4	9 21 54.41	2.2256	12 52 48.6	7.783	4	11 8 54.27	2.2416	5 21 27.9	10.733
5	9 24 7.94	2.2254	12 44 59.3	7.861	5	11 11 8.80	2.2427	5 10 42.7	10.773
6	9 26 21.46	2.2253	12 37 5.3	7.938	6	11 13 23.39	2.2437	4 59 55.1	10.813
7	9 28 34.98	2.2253	12 29 6.7	8.014	7	11 15 38.04	2.2448	4 49 5.1	10.853
8	9 30 48.50	2.2252	12 21 3.6	8.090	8	11 17 52.76	2.2459	4 38 12.7	10.892
9	9 33 2.01	2.2252	12 12 55.9	8.166	9	11 20 7.55	2.2470	4 27 18.1	10.929
10	9 35 15.52	2.2252	12 4 43.7	8.241	10	11 22 22.40	2.2482	4 16 21.2	10.966
11	9 37 29.03	2.2251	11 56 27.0	8.315	11	11 24 37.33	2.2494	4 5 22.2	11.001
12	9 39 42.53	2.2250	11 48 5.9	8.388	12	11 26 52.33	2.2507	3 54 21.1	11.035
13	9 41 56.03	2.2250	11 39 40.4	8.462	13	11 29 7.41	2.2519	3 43 18.0	11.068
14	9 44 9.53	2.2250	11 31 10.5	8.534	14	11 31 22.56	2.2532	3 32 12.9	11.101
15	9 46 23.03	2.2251	11 22 36.3	8.605	15	11 33 37.80	2.2547	3 21 5.9	11.132
16	9 48 36.54	2.2251	11 13 57.9	8.677	16	11 35 53.12	2.2561	3 9 57.1	11.162
17	9 50 50.04	2.2251	11 5 15.1	8.748	17	11 38 8.53	2.2575	2 58 46.5	11.190
18	9 53 3,55	2.2252	10 56 28.2	8.817	18	11 40 24.02	2.2589	2 47 34.3	11.218
19	9 55 17.06	2.2252	10 47 37.1	8.886	19	11 42 39.60	2.2605	2 36 20.3	11.246
20	9 57 30.58	2.2253	10 38 41.9	8.953	20	11 44 55.28	2.2621	2 25 4.8	11.271
21	9 59 44.10	2.2255	10 29 42.7	9.022	21	11 47 11.05	2.2637	2 13 47.8	11.296
22	10 1 57.64	2.2257	10 20 39.3	9.089	22	11 49 26.92	2.2652	2 2 29.3	11.319
23	10 4 11.18	2.2258	10 11 32.0	9.155	23	11 51 42.88	2.2669	1 51 9.5	11.342
24	10 6 24.73	2.2259	+10 2 20.7	−9.221	24	11 53 58.95	2.2687	+ 1 39 48.3	−11.363

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 25.			
	h m s	s	° ′ ″	″
0	11 53 58.95	2.2687	+1 39 48.3	−11.363
1	11 56 15.12	2.2704	1 28 25.9	11.383
2	11 58 31.40	2.2722	1 17 2.3	11.402
3	12 0 47.79	2.2740	1 5 37.6	11.421
4	12 3 4.28	2.2758	0 54 11.8	11.438
5	12 5 20.89	2.2777	0 42 45.1	11.453
6	12 7 37.61	2.2797	0 31 17.5	11.467
7	12 9 54.45	2.2817	0 19 49.0	11.481
8	12 12 11.41	2.2837	+0 8 19.8	11.493
9	12 14 28.49	2.2857	−0 3 10.1	11.503
10	12 16 45.70	2.2878	0 14 40.6	11.512
11	12 19 3.03	2.2899	0 26 11.6	11.521
12	12 21 20.49	2.2921	0 37 43.1	11.528
13	12 23 38.08	2.2942	0 49 15.0	11.534
14	12 25 55.80	2.2964	1 0 47.2	11.539
15	12 28 13.65	2.2987	1 12 19.7	11.543
16	12 30 31.64	2.3010	1 23 52.3	11.545
17	12 32 49.77	2.3033	1 35 25.1	11.546
18	12 35 8.04	2.3057	1 46 57.8	11.545
19	12 37 26.45	2.3081	1 58 30.5	11.544
20	12 39 45.01	2.3106	2 10 3.1	11.542
21	12 42 3.72	2.3130	2 21 35.5	11.537
22	12 44 22.57	2.3154	2 33 7.5	11.531
23	12 46 41.57	2.3180	−2 44 39.2	−11.524
	MAY 26.			
0	12 49 0.73	2.3206	−2 56 10.4	−11.516
1	12 51 20.04	2.3232	3 7 41.1	11.506
2	12 53 39.51	2.3258	3 19 11.1	11.495
3	12 55 59.14	2.3285	3 30 40.5	11.483
4	12 58 18.93	2.3312	3 42 9.1	11.469
5	13 0 38.88	2.3338	3 53 36.8	11.453
6	13 2 58.99	2.3366	4 5 3.5	11.437
7	13 5 19.27	2.3394	4 16 29.3	11.420
8	13 7 39.72	2.3422	4 27 53.9	11.401
9	13 10 0.33	2.3450	4 39 17.4	11.381
10	13 12 21.12	2.3479	4 50 39.6	11.358
11	13 14 42.08	2.3508	5 2 0.4	11.335
12	13 17 3.21	2.3536	5 13 19.8	11.311
13	13 19 24.51	2.3566	5 24 37.7	11.284
14	13 21 46.00	2.3596	5 35 53.9	11.257
15	13 24 7.66	2.3624	5 47 8.5	11.228
16	13 26 29.49	2.3654	5 58 21.3	11.198
17	13 28 51.51	2.3685	6 9 32.3	11.167
18	13 31 13.71	2.3715	6 20 41.3	11.133
19	13 33 36.09	2.3745	6 31 48.3	11.099
20	13 35 58.65	2.3776	6 42 53.2	11.062
21	13 38 21.40	2.3807	6 53 55.8	11.025
22	13 40 44.33	2.3838	7 4 56.2	10.987
23	13 43 7.45	2.3869	7 15 54.2	10.946
24	13 45 30.76	2.3900	−7 26 49.7	−10.904

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 27.			
	h m s	s	° ′ ″	″
0	13 45 30.76	2.3900	− 7 26 49.7	−10.904
1	13 47 54.25	2.3931	7 37 42.7	10.862
2	13 50 17.93	2.3963	7 48 33.1	10.817
3	13 52 41.81	2.3995	7 59 20.7	10.770
4	13 55 5.87	2.4025	8 10 5.5	10.722
5	13 57 30.11	2.4057	8 20 47.4	10.674
6	13 59 54.55	2.4090	8 31 26.4	10.624
7	14 2 19.19	2.4122	8 42 2.3	10.572
8	14 4 44.01	2.4153	8 52 35.0	10.518
9	14 7 9.02	2.4184	9 3 4.5	10.463
10	14 9 34.22	2.4216	9 13 30.6	10.407
11	14 11 59.61	2.4248	9 23 53.4	10.350
12	14 14 25.20	2.4281	9 34 12.6	10.291
13	14 16 50.98	2.4313	9 44 28.3	10.231
14	14 19 16.95	2.4344	9 54 40.3	10.168
15	14 21 43.11	2.4376	10 4 48.5	10.105
16	14 24 9.46	2.4408	10 14 52.9	10.040
17	14 26 36.00	2.4439	10 24 53.3	9.973
18	14 29 2.73	2.4471	10 34 49.7	9.907
19	14 31 29.65	2.4502	10 44 42.1	9.838
20	14 33 56.75	2.4533	10 54 30.2	9.767
21	14 36 24.04	2.4564	11 4 14.1	9.696
22	14 38 51.52	2.4595	11 13 53.7	9.623
23	14 41 19.18	2.4626	−11 23 28.8	− 9.548
	MAY 28.			
0	14 43 47.03	2.4657	−11 32 59.4	− 9.472
1	14 46 15.06	2.4687	11 42 25.4	9.395
2	14 48 43.27	2.4717	11 51 46.8	9.316
3	14 51 11.66	2.4747	12 1 3.3	9.236
4	14 53 40.23	2.4777	12 10 15.1	9.155
5	14 56 8.98	2.4806	12 19 21.9	9.072
6	14 58 37.90	2.4834	12 28 23.7	8.988
7	15 1 6.99	2.4863	12 37 20.5	8.903
8	15 3 36.26	2.4892	12 46 12.1	8.816
9	15 6 5.69	2.4919	12 54 58.4	8.728
10	15 8 35.29	2.4947	13 3 39.5	8.639
11	15 11 5.06	2.4975	13 12 15.1	8.548
12	15 13 34.99	2.5002	13 20 45.3	8.457
13	15 16 5.08	2.5028	13 29 10.0	8.364
14	15 18 35.33	2.5055	13 37 29.0	8.270
15	15 21 5.74	2.5081	13 45 42.4	8.175
16	15 23 36.30	2.5106	13 53 50.0	8.079
17	15 26 7.01	2.5131	14 1 51.7	7.980
18	15 28 37.87	2.5155	14 9 47.6	7.882
19	15 31 8.87	2.5178	14 17 37.5	7.782
20	15 33 40.01	2.5202	14 25 21.4	7.681
21	15 36 11.30	2.5225	14 32 59.2	7.578
22	15 38 42.71	2.5247	14 40 30.8	7.475
23	15 41 14.26	2.5269	14 47 56.2	7.371
24	15 43 45.94	2.5290	−14 55 15.3	− 7.266

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 29.					MAY 31.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 43 45.94	2.5290	−14 55 15.3	−7.266	0	17 46 10.83	2.5388	−18 27 58.2	−1.421
1	15 46 17.74	2.5311	15 2 28.1	7.159	1	17 48 43.10	2.5368	18 29 19.6	1.293
2	15 48 49.67	2.5331	15 9 34.4	7.052	2	17 51 15.25	2.5347	18 30 33.3	1.165
3	15 51 21.71	2.5350	15 16 34.3	6.943	3	17 53 47.27	2.5325	18 31 39.4	1.038
4	15 53 53.87	2.5368	15 23 27.6	6.833	4	17 56 19.15	2.5302	18 32 37.9	0.912
5	15 56 26.13	2.5386	15 30 14.3	6.723	5	17 58 50.90	2.5280	18 33 28.8	0.784
6	15 58 58.50	2.5403	15 36 54.4	6.612	6	18 1 22.51	2.5256	18 34 12.0	0.657
7	16 1 30.97	2.5420	15 43 27.7	6.500	7	18 3 53.97	2.5230	18 34 47.7	0.532
8	16 4 3.54	2.5436	15 49 54.4	6.387	8	18 6 25.27	2.5204	18 35 15.8	0.406
9	16 6 36.20	2.5451	15 56 14.2	6.273	9	18 8 56.42	2.5177	18 35 36.4	0.281
10	16 9 8.95	2.5466	16 2 27.1	6.158	10	18 11 27.40	2.5149	18 35 49.5	0.155
11	16 11 41.79	2.5480	16 8 33.2	6.042	11	18 13 58.21	2.5121	18 35 55.0	−0.030
12	16 14 14.71	2.5493	16 14 32.2	5.926	12	18 16 28.85	2.5092	18 35 53.1	+0.094
13	16 16 47.70	2.5505	16 20 24.3	5.809	13	18 18 59.31	2.5062	18 35 43.7	0.217
14	16 19 20.77	2.5517	16 26 9.3	5.691	14	18 21 29.59	2.5031	18 35 27.0	0.341
15	16 21 53.90	2.5527	16 31 47.2	5.572	15	18 23 59.68	2.4998	18 35 2.8	0.464
16	16 24 27.09	2.5537	16 37 17.9	5.453	16	18 26 29.57	2.4966	18 34 31.3	0.587
17	16 27 0.35	2.5547	16 42 41.5	5.333	17	18 28 59.27	2.4933	18 33 52.4	0.708
18	16 29 33.65	2.5553	16 47 57.9	5.213	18	18 31 28.77	2.4899	18 33 6.3	0.829
19	16 32 6.99	2.5561	16 53 7.0	5.091	19	18 33 58.06	2.4863	18 32 12.9	0.950
20	16 34 40.38	2.5568	16 58 8.8	4.969	20	18 36 27.13	2.4828	18 31 12.3	1.070
21	16 37 13.81	2.5574	17 3 3.3	4.847	21	18 38 56.00	2.4793	18 30 4.5	1.189
22	16 39 47.27	2.5579	17 7 50.4	4.723	22	18 41 24.64	2.4755	18 28 49.6	1.308
23	16 42 20.76	2.5583	−17 12 30.1	−4.600	23	18 43 53.06	2.4717	−18 27 27.5	+1.427
	MAY 30.					JUNE 1.			
0	16 44 54.27	2.5586	−17 17 2.4	−4.477	0	18 46 21.25	2.4678	−18 25 58.4	+1.544
1	16 47 27.79	2.5588	17 21 27.3	4.352	1	18 48 49.20	2.4639	18 24 22.2	1.661
2	16 50 1.33	2.5590	17 25 44.6	4.227	2	18 51 16.92	2.4600	18 22 39.1	1.777
3	16 52 34.87	2.5590	17 29 54.5	4.102	3	18 53 44.40	2.4560	18 20 49.0	1.893
4	16 55 8.41	2.5590	17 33 56.8	3.975	4	18 56 11.64	2.4519	18 18 51.9	2.008
5	16 57 41.95	2.5588	17 37 51.5	3.849	5	18 58 38.63	2.4477	18 16 48.0	2.122
6	17 0 15.47	2.5586	17 41 38.7	3.723	6	19 1 5.36	2.4434	18 14 37.3	2.234
7	17 2 48.98	2.5583	17 45 18.3	3.597	7	19 3 31.84	2.4392	18 12 19.9	2.347
8	17 5 22.47	2.5579	17 48 50.3	3.469	8	19 5 58.06	2.4349	18 9 55.7	2.459
9	17 7 55.93	2.5574	17 52 14.6	3.342	9	19 8 24.03	2.4305	18 7 24.8	2.571
10	17 10 29.36	2.5568	17 55 31.3	3.214	10	19 10 49.73	2.4260	18 4 47.2	2.681
11	17 13 2.75	2.5562	17 58 40.3	3.087	11	19 13 15.15	2.4215	18 2 3.1	2.789
12	17 15 36.10	2.5554	18 1 41.7	2.959	12	19 15 40.31	2.4170	17 59 12.5	2.897
13	17 18 9.40	2.5545	18 4 35.4	2.831	13	19 18 5.19	2.4124	17 56 15.4	3.006
14	17 20 42.64	2.5536	18 7 21.4	2.703	14	19 20 29.80	2.4078	17 53 11.8	3.113
15	17 23 15.83	2.5525	18 9 59.7	2.574	15	19 22 54.13	2.4032	17 50 1.9	3.218
16	17 25 48.94	2.5513	18 12 30.3	2.446	16	19 25 18.18	2.3984	17 46 45.6	3.323
17	17 28 21.99	2.5502	18 14 53.2	2.317	17	19 27 41.94	2.3937	17 43 23.1	3.427
18	17 30 54.96	2.5488	18 17 8.4	2.190	18	19 30 5.42	2.3889	17 39 54.3	3.531
19	17 33 27.84	2.5473	18 19 16.0	2.062	19	19 32 28.61	2.3840	17 36 19.4	3.633
20	17 36 0.64	2.5458	18 21 15.8	1.933	20	19 34 51.50	2.3792	17 32 38.3	3.735
21	17 38 33.34	2.5442	18 23 7.9	1.805	21	19 37 14.11	2.3743	17 28 51.2	3.835
22	17 41 5.94	2.5425	18 24 52.4	1.677	22	19 39 36.42	2.3693	17 24 58.1	3.935
23	17 43 38.44	2.5407	18 26 29.1	1.548	23	19 41 58.43	2.3643	17 20 59.0	4.034
24	17 46 10.83	2.5388	−18 27 58.2	−1.421	24	19 44 20.14	2.3593	−17 16 54.0	+4.132

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 2.			
	h m s	s	° ′ ″	″
0	19 44 20.14	2.3593	−17 16 54.0	+4.132
1	19 46 41.55	2.3543	17 12 43.2	4.228
2	19 49 2.66	2.3492	17 8 26.6	4.324
3	19 51 23.46	2.3442	17 4 4.8	4.419
4	19 53 43.96	2.3391	16 59 36.3	4.513
5	19 56 4.15	2.3339	16 55 2.7	4.607
6	19 58 24.03	2.3288	16 50 23.5	4.698
7	20 0 43.61	2.3237	16 45 38.9	4.789
8	20 3 2.87	2.3184	16 40 48.8	4.880
9	20 5 21.82	2.3132	16 35 53.3	4.969
10	20 7 40.46	2.3081	16 30 52.5	5.057
11	20 9 58.79	2.3028	16 25 46.5	5.144
12	20 12 16.80	2.2976	16 20 35.2	5.231
13	20 14 34.50	2.2924	16 15 18.8	5.316
14	20 16 51.89	2.2872	16 9 57.3	5.401
15	20 19 8.96	2.2818	16 4 30.7	5.484
16	20 21 25.71	2.2766	15 58 59.2	5.566
17	20 23 42.15	2.2713	15 53 22.8	5.647
18	20 25 58.27	2.2661	15 47 41.6	5.727
19	20 28 14.08	2.2609	15 41 55.6	5.807
20	20 30 29.58	2.2557	15 36 4.8	5.886
21	20 32 44.76	2.2503	15 30 9.3	5.963
22	20 34 59.62	2.2451	15 24 9.3	6.039
23	20 37 14.17	2.2398	−15 18 4.6	+6.115
	JUNE 3.			
0	20 39 28.40	2.2346	−15 11 55.5	+6.189
1	20 41 42.32	2.2293	15 5 41.9	6.262
2	20 43 55.92	2.2242	14 59 24.0	6.335
3	20 46 9.22	2.2190	14 53 1.7	6.407
4	20 48 22.20	2.2137	14 46 35.2	6.478
5	20 50 34.87	2.2085	14 40 4.4	6.548
6	20 52 47.22	2.2033	14 33 29.5	6.615
7	20 54 59.27	2.1982	14 26 50.6	6.683
8	20 57 11.01	2.1932	14 20 7.5	6.751
9	20 59 22.45	2.1880	14 13 20.5	6.816
10	21 1 33.57	2.1828	14 6 29.6	6.880
11	21 3 44.39	2.1778	13 59 34.9	6.944
12	21 5 54.91	2.1727	13 52 36.3	7.007
13	21 8 5.12	2.1677	13 45 34.0	7.069
14	21 10 15.03	2.1627	13 38 28.0	7.131
15	21 12 24.65	2.1578	13 31 18.3	7.191
16	21 14 33.96	2.1527	13 24 5.1	7.250
17	21 16 42.97	2.1477	13 16 48.3	7.308
18	21 18 51.69	2.1429	13 9 28.1	7.366
19	21 21 0.12	2.1380	13 2 4.4	7.423
20	21 23 8.25	2.1332	12 54 37.4	7.478
21	21 25 16.10	2.1283	12 47 7.0	7.533
22	21 27 23.66	2.1236	12 39 33.4	7.587
23	21 29 30.93	2.1188	12 31 56.6	7.639
24	21 31 37.91	2.1140	−12 24 16.7	+7.692

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 4.			
	h m s	s	° ′ ″	″
0	21 31 37.91	2.1140	−12 24 16.7	+7.692
1	21 33 44.61	2.1094	12 16 33.6	7.743
2	21 35 51.04	2.1047	12 8 47.5	7.793
3	21 37 57.18	2.1001	12 0 58.5	7.842
4	21 40 3.05	2.0955	11 53 6.5	7.892
5	21 42 8.64	2.0909	11 45 11.5	7.939
6	21 44 13.96	2.0864	11 37 13.8	7.985
7	21 46 19.01	2.0819	11 29 13.3	8.032
8	21 48 23.79	2.0775	11 21 10.0	8.078
9	21 50 28.31	2.0732	11 13 4.0	8.122
10	21 52 32.57	2.0688	11 4 55.4	8.165
11	21 54 36.56	2.0644	10 56 44.2	8.208
12	21 56 40.30	2.0602	10 48 30.4	8.251
13	21 58 43.78	2.0559	10 40 14.1	8.291
14	22 0 47.01	2.0517	10 31 55.5	8.331
15	22 2 49.98	2.0475	10 23 34.4	8.372
16	22 4 52.71	2.0434	10 15 10.9	8.410
17	22 6 55.19	2.0393	10 6 45.2	8.447
18	22 8 57.43	2.0353	9 58 17.2	8.485
19	22 10 59.43	2.0313	9 49 47.0	8.521
20	22 13 1.19	2.0274	9 41 14.7	8.557
21	22 15 2.72	2.0235	9 32 40.2	8.592
22	22 17 4.01	2.0196	9 24 3.6	8.626
23	22 19 5.07	2.0158	− 9 15 25.1	+8.659
	JUNE 5.			
0	22 21 5.91	2.0121	− 9 6 44.5	+8.693
1	22 23 6.52	2.0084	8 58 2.0	8.723
2	22 25 6.92	2.0047	8 49 17.7	8.754
3	22 27 7.09	2.0011	8 40 31.5	8.785
4	22 29 7.05	1.9975	8 31 43.5	8.815
5	22 31 6.79	1.9940	8 22 53.7	8.845
6	22 33 6.33	1.9906	8 14 2.1	8.873
7	22 35 5.66	1.9871	8 5 8.9	8.900
8	22 37 4.78	1.9837	7 56 14.1	8.927
9	22 39 3.71	1.9804	7 47 17.7	8.953
10	22 41 2.43	1.9771	7 38 19.8	8.978
11	22 43 0.96	1.9739	7 29 20.3	9.003
12	22 44 59.30	1.9707	7 20 19.4	9.027
13	22 46 57.45	1.9676	7 11 17.0	9.051
14	22 48 55.41	1.9645	7 2 13.3	9.074
15	22 50 53.19	1.9615	6 53 8.1	9.097
16	22 52 50.79	1.9585	6 44 1.7	9.118
17	22 54 48.21	1.9556	6 34 54.0	9.138
18	22 56 45.46	1.9527	6 25 45.1	9.158
19	22 58 42.54	1.9499	6 16 35.0	9.178
20	23 0 39.45	1.9471	6 7 23.7	9.197
21	23 2 36.19	1.9443	5 58 11.3	9.215
22	23 4 32.77	1.9417	5 48 57.9	9.233
23	23 6 29.20	1.9392	5 39 43.3	9.251
24	23 8 25.47	1.9366	− 5 30 27.8	+9.267

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 6.			
	h m s	s	° ′ ″	″
0	23 8 25.47	1.9366	−5 30 27.8	+9.267
1	23 10 21.59	1.9340	5 21 11.3	9.283
2	23 12 17.55	1.9315	5 11 53.9	9.298
3	23 14 13.37	1.9292	5 2 35.6	9.313
4	23 16 9.05	1.9268	4 53 16.4	9.327
5	23 18 4.59	1.9245	4 43 56.4	9.339
6	23 19 59.99	1.9222	4 34 35.7	9.352
7	23 21 55.25	1.9200	4 25 14.1	9.365
8	23 23 50.39	1.9179	4 15 51.9	9.376
9	23 25 45.40	1.9157	4 6 29.0	9.387
10	23 27 40.28	1.9137	3 57 5.4	9.397
11	23 29 35.04	1.9117	3 47 41.3	9.408
12	23 31 29.69	1.9098	3 38 16.5	9.418
13	23 33 24.22	1.9079	3 28 51.2	9.425
14	23 35 18.64	1.9061	3 19 25.5	9.433
15	23 37 12.95	1.9043	3 9 59.2	9.442
16	23 39 7.15	1.9025	3 0 32.5	9.448
17	23 41 1.25	1.9008	2 51 5.4	9.455
18	23 42 55.25	1.8992	2 41 37.9	9.461
19	23 44 49.16	1.8977	2 32 10.1	9.466
20	23 46 42.97	1.8961	2 22 42.0	9.471
21	23 48 36.69	1.8946	2 13 13.6	9.475
22	23 50 30.32	1.8932	2 3 45.0	9.478
23	23 52 23.87	1.8918	−1 54 16.2	+9.482
	JUNE 7.			
0	23 54 17.34	1.8905	−1 44 47.2	+9.484
1	23 56 10.73	1.8893	1 35 18.1	9.487
2	23 58 4.05	1.8881	1 25 48.8	9.488
3	23 59 57.30	1.8869	1 16 19.5	9.489
4	0 1 50.48	1.8857	1 6 50.1	9.489
5	0 3 43.59	1.8847	0 57 20.8	9.489
6	0 5 36.64	1.8837	0 47 51.4	9.489
7	0 7 29.63	1.8827	0 38 22.1	9.488
8	0 9 22.56	1.8817	0 28 52.9	9.486
9	0 11 15.44	1.8809	0 19 23.8	9.484
10	0 13 8.27	1.8802	0 9 54.8	9.481
11	0 15 1.06	1.8794	−0 0 26.1	9.478
12	0 16 53.80	1.8787	+0 9 2.5	9.474
13	0 18 46.50	1.8780	0 18 30.8	9.469
14	0 20 39.16	1.8774	0 27 58.8	9.464
15	0 22 31.79	1.8769	0 37 26.5	9.459
16	0 24 24.39	1.8763	0 46 53.9	9.453
17	0 26 16.95	1.8759	0 56 20.9	9.448
18	0 28 9.50	1.8756	1 5 47.6	9.441
19	0 30 2.02	1.8752	1 15 13.8	9.433
20	0 31 54.52	1.8748	1 24 39.5	9.425
21	0 33 47.00	1.8746	1 34 4.8	9.417
22	0 35 39.47	1.8743	1 43 29.5	9.408
23	0 37 31.92	1.8742	1 52 53.7	9.398
24	0 39 24.37	1.8741	+2 2 17.3	+9.388

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 8.			
	h m s	s	° ′ ″	″
0	0 39 24.37	1.8741	+2 2 17.3	+9.388
1	0 41 16.81	1.8740	2 11 40.3	9.377
2	0 43 9.25	1.8741	2 21 2.6	9.367
3	0 45 1.70	1.8741	2 30 24.3	9.355
4	0 46 54.14	1.8741	2 39 45.2	9.343
5	0 48 46.59	1.8743	2 49 5.5	9.332
6	0 50 39.06	1.8745	2 58 25.0	9.318
7	0 52 31.53	1.8747	3 7 43.7	9.304
8	0 54 24.02	1.8749	3 17 1.5	9.290
9	0 56 16.52	1.8752	3 26 18.5	9.275
10	0 58 9.05	1.8757	3 35 34.5	9.260
11	1 0 1.60	1.8761	3 44 49.7	9.245
12	1 1 54.18	1.8765	3 54 3.9	9.228
13	1 3 46.78	1.8770	4 3 17.1	9.212
14	1 5 39.42	1.8776	4 12 29.3	9.194
15	1 7 32.09	1.8782	4 21 40.4	9.177
16	1 9 24.80	1.8788	4 30 50.5	9.159
17	1 11 17.55	1.8796	4 39 59.5	9.140
18	1 13 10.35	1.8803	4 49 7.3	9.120
19	1 15 3.19	1.8810	4 58 13.9	9.100
20	1 16 56.07	1.8818	5 7 19.3	9.080
21	1 18 49.01	1.8827	5 16 23.5	9.060
22	1 20 42.00	1.8837	5 25 26.5	9.038
23	1 22 35.05	1.8846	+5 34 28.1	+9.016
	JUNE 9.			
0	1 24 28.15	1.8855	+5 43 28.4	+8.993
1	1 26 21.31	1.8866	5 52 27.3	8.971
2	1 28 14.54	1.8877	6 1 24.9	8.947
3	1 30 7.84	1.8888	6 10 21.0	8.923
4	1 32 1.20	1.8900	6 19 15.7	8.899
5	1 33 54.64	1.8912	6 28 8.9	8.873
6	1 35 48.15	1.8925	6 37 0.5	8.848
7	1 37 41.74	1.8937	6 45 50.7	8.822
8	1 39 35.40	1.8951	6 54 39.2	8.795
9	1 41 29.15	1.8965	7 3 26.1	8.768
10	1 43 22.98	1.8979	7 12 11.3	8.740
11	1 45 16.90	1.8993	7 20 54.9	8.712
12	1 47 10.90	1.9008	7 29 36.8	8.683
13	1 49 5.00	1.9024	7 38 16.9	8.653
14	1 50 59.19	1.9039	7 46 55.2	8.623
15	1 52 53.47	1.9055	7 55 31.7	8.593
16	1 54 47.85	1.9072	8 4 6.4	8.562
17	1 56 42.33	1.9088	8 12 39.2	8.531
18	1 58 36.91	1.9106	8 21 10.1	8.498
19	2 0 31.60	1.9123	8 29 39.0	8.465
20	2 2 26.39	1.9142	8 38 5.9	8.432
21	2 4 21.30	1.9160	8 46 30.9	8.398
22	2 6 16.31	1.9178	8 54 53.7	8.363
23	2 8 11.44	1.9197	9 3 14.5	8.329
24	2 10 6.68	1.9217	+9 11 33.2	+8.293

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 10.			
	h m s	s	° ′ ″	″
0	2 10 6.68	1.9217	+ 9 11 33.2	+8.293
1	2 12 2.04	1.9237	9 19 49.7	8.257
2	2 13 57.52	1.9257	9 28 4.1	8.221
3	2 15 53.12	1.9277	9 36 16.2	8.183
4	2 17 48.84	1.9298	9 44 26.1	8.146
5	2 19 44.69	1.9319	9 52 33.7	8.108
6	2 21 40.67	1.9340	10 0 39.0	8.068
7	2 23 36.77	1.9362	10 8 41.9	8.028
8	2 25 33.01	1.9383	10 16 42.4	7.988
9	2 27 29.37	1.9406	10 24 40.5	7.948
10	2 29 25.88	1.9429	10 32 36.2	7.907
11	2 31 22.52	1.9452	10 40 29.3	7.864
12	2 33 19.30	1.9475	10 48 19.9	7.822
13	2 35 16.22	1.9498	10 56 8.0	7.779
14	2 37 13.28	1.9522	11 3 53.4	7.735
15	2 39 10.48	1.9546	11 11 36.2	7.691
16	2 41 7.83	1.9571	11 19 16.3	7.646
17	2 43 5.33	1.9596	11 26 53.7	7.601
18	2 45 2.98	1.9621	11 34 28.4	7.555
19	2 47 0.78	1.9646	11 42 0.3	7.508
20	2 48 58.73	1.9670	11 49 29.4	7.461
21	2 50 56.82	1.9696	11 56 55.6	7.413
22	2 52 55.08	1.9722	12 4 18.9	7.364
23	2 54 53.49	1.9748	+12 11 39.3	+7.316
	JUNE 11.			
0	2 56 52.06	1.9775	+12 18 56.8	+7.267
1	2 58 50.79	1.9801	12 26 11.3	7.216
2	3 0 49.67	1.9828	12 33 22.7	7.164
3	3 2 48.72	1.9855	12 40 31.0	7.113
4	3 4 47.93	1.9882	12 47 36.3	7.062
5	3 6 47.30	1.9908	12 54 38.4	7.008
6	3 8 46.83	1.9937	13 1 37.3	6.955
7	3 10 46.54	1.9965	13 8 33.0	6.902
8	3 12 46.41	1.9993	13 15 25.5	6.848
9	3 14 46.45	2.0020	13 22 14.7	6.792
10	3 16 46.65	2.0048	13 29 0.5	6.736
11	3 18 47.03	2.0077	13 35 43.0	6.680
12	3 20 47.58	2.0106	13 42 22.1	6.623
13	3 22 48.30	2.0134	13 48 57.7	6.565
14	3 24 49.19	2,0163	13 55 29.9	6.507
15	3 26 50.26	2.0192	14 1 58.5	6.448
16	3 28 51.50	2.0222	14 8 23.6	6.388
17	3 30 52.92	2.0251	14 14 45.1	6.328
18	3 32 54.51	2.0279	14 21 3.0	6.268
19	3 34 56.27	2.0308	14 27 17.3	6.207
20	3 36 58.21	2.0338	14 33 27.8	6.144
21	3 39 0.33	2.0368	14 39 34.6	6.082
22	3 41 2.63	2.0398	14 45 37.6	6.018
23	3 43 5.11	2.0427	14 51 36.8	5.955
24	3 45 7.76	2.0457	+14 57 32.2	+5.891

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 12.			
	h m s	s	° ′ ″	″
0	3 45 7.76	2.0457	+14 57 32.2	+5.891
1	3 47 10.59	2.0487	15 3 23.7	5.825
2	3 49 13.60	2.0517	15 9 11.2	5.759
3	3 51 16.79	2.0547	15 14 54.8	5.694
4	3 53 20.16	2.0577	15 20 34.5	5.628
5	3 55 23.71	2.0607	15 26 10.1	5.559
6	3 57 27.44	2.0637	15 31 41.6	5.491
7	3 59 31.35	2.0667	15 37 9.0	5.423
8	4 1 35.44	2.0697	15 42 32.3	5.354
9	4 3 39.71	2.0727	15 47 51.5	5.284
10	4 5 44.16	2.0757	15 53 6.4	5.213
11	4 7 48.79	2.0787	15 58 17.0	5.142
12	4 9 53.60	2.0817	16 3 23.4	5.070
13	4 11 58.59	2.0846	16 8 25.4	4.998
14	4 14 3.75	2.0876	16 13 23.1	4.925
15	4 16 9.10	2.0907	16 18 16.4	4.852
16	4 18 14.63	2.0936	16 23 5.3	4.778
17	4 20 20.33	2.0965	16 27 49.7	4.703
18	4 22 26.21	2.0995	16 32 29.7	4.628
19	4 24 32.27	2.1025	16 37 5.1	4.552
20	4 26 38.51	2.1054	16 41 35.9	4.475
21	4 28 44.92	2.1083	16 46 2.1	4.398
22	4 30 51.51	2.1112	16 50 23.7	4.322
23	4 32 58.27	2.1142	+16 54 40.7	+4.243
	JUNE 13.			
0	4 35 5.21	2.1171	+16 58 52.9	+4.164
1	4 37 12.32	2.1199	17 3 0.4	4.086
2	4 39 19.60	2.1228	17 7 3.2	4.006
3	4 41 27.05	2.1257	17 11 1.1	3.925
4	4 43 34.68	2.1285	17 14 54.2	3.845
5	4 45 42.47	2.1313	17 18 42.5	3.763
6	4 47 50.43	2.1341	17 22 25.8	3.681
7	4 49 58.56	2.1369	17 26 4.2	3.599
8	4 52 6.86	2.1397	17 29 37.7	3.516
9	4 54 15.32	2.1423	17 33 6.1	3.432
10	4 56 23.94	2.1451	17 36 29.5	3.348
11	4 58 32.73	2.1478	17 39 47.9	3.264
12	5 0 41.68	2.1505	17 43 1.2	3.179
13	5 2 50.79	2.1531	17 46 9.4	3.093
14	5 5 0.05	2.1558	17 49 12.4	3.007
15	5 7 9.48	2.1584	17 52 10.3	2.921
16	5 9 19.06	2.1609	17 55 2.9	2.833
17	5 11 28.79	2.1635	17 57 50.3	2.747
18	5 13 38.68	2.1661	18 0 32.5	2.658
19	5 15 48.72	2.1686	18 3 9.3	2.570
20	5 17 58.91	2.1710	18 5 40.9	2.482
21	5 20 9.24	2.1735	18 8 7.1	2.393
22	5 22 19.73	2.1759	18 10 28.0	2.303
23	5 24 30.35	2.1782	18 12 43.5	2.213
24	5 26 41.12	2.1807	+18 14 53.5	+2.122

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 14.					JUNE 16.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 26 41.12	2.1807	+18 14 53.5	+2.122	0	7 13 22.70	2.2494	+18 6 42.7	−2.532
1	5 28 52.03	2.1830	18 16 58.1	2.032	1	7 15 37.68	2.2499	18 4 7.8	2.632
2	5 31 3.08	2.1852	18 18 57.3	1.941	2	7 17 52.69	2.2503	18 1 26.9	2.731
3	5 33 14.26	2.1875	18 20 51.0	1.848	3	7 20 7.72	2.2506	17 58 40.1	2.829
4	5 35 25.58	2.1898	18 22 39.1	1.756	4	7 22 22.76	2.2509	17 55 47.4	2.927
5	5 37 37.03	2.1920	18 24 21.7	1.663	5	7 24 37.83	2.2512	17 52 48.8	3.027
6	5 39 48.62	2.1942	18 25 58.7	1.571	6	7 26 52.91	2.2515	17 49 44.2	3.126
7	5 42 0.33	2.1963	18 27 30.2	1.478	7	7 29 8.01	2.2517	17 46 33.7	3.223
8	5 44 12.17	2.1983	18 28 56.1	1.384	8	7 31 23.11	2.2518	17 43 17.4	3.322
9	5 46 24.13	2.2003	18 30 16.3	1.290	9	7 33 38.23	2.2520	17 39 55.1	3.420
10	5 48 36.21	2.2024	18 31 30.9	1.196	10	7 35 53.35	2.2520	17 36 27.0	3.517
11	5 50 48.42	2.2044	18 32 39.8	1.102	11	7 38 8.47	2.2521	17 32 53.1	3.615
12	5 53 0.74	2.2063	18 33 43.1	1.007	12	7 40 23.60	2.2522	17 29 13.2	3.713
13	5 55 13.18	2.2082	18 34 40.7	0.912	13	7 42 38.73	2.2522	17 25 27.5	3.810
14	5 57 25.73	2.2101	18 35 32.5	0.816	14	7 44 53.85	2.2521	17 21 36.0	3.907
15	5 59 38.39	2.2120	18 36 18.6	0.720	15	7 47 8.97	2.2519	17 17 38.7	4.003
16	6 1 51.17	2.2138	18 36 58.9	0.624	16	7 49 24.08	2.2518	17 13 35.6	4.100
17	6 4 4.05	2.2155	18 37 33.5	0.528	17	7 51 39.18	2.2517	17 9 26.7	4.196
18	6 6 17.03	2.2172	18 38 2.2	0.431	18	7 53 54.28	2.2515	17 5 12.1	4.292
19	6 8 30.11	2.2189	18 38 25.2	0.335	19	7 56 9.36	2.2513	17 0 51.7	4.387
20	6 10 43.30	2.2206	18 38 42.4	0.238	20	7 58 24.43	2.2510	16 56 25.7	4.482
21	6 12 56.58	2.2221	18 38 53.7	0.140	21	8 0 39.48	2.2507	16 51 53.9	4.577
22	6 15 9.95	2.2237	18 38 59.2	+0.042	22	8 2 54.52	2.2504	16 47 16.4	4.672
23	6 17 23.42	2.2253	+18 38 58.8	−0.055	23	8 5 9.53	2.2501	+16 42 33.2	−4.767
	JUNE 15.					JUNE 17.			
0	6 19 36.98	2.2268	+18 38 52.6	−0.153	0	8 7 24.53	2.2498	+16 37 44.4	−4.860
1	6 21 50.63	2.2282	18 38 40.5	0.251	1	8 9 39.50	2.2493	16 32 50.0	4.954
2	6 24 4.36	2.2295	18 38 22.5	0.349	2	8 11 54.45	2.2490	16 27 49.9	5 047
3	6 26 18.17	2.2308	18 37 58.6	0.448	3	8 14 9.38	2.2485	16 22 44.3	5.140
4	6 28 32.06	2.2322	18 37 28.7	0.547	4	8 16 24.27	2.2480	16 17 33.1	5.232
5	6 30 46.03	2.2334	18 36 53.0	0.645	5	8 18 39.14	2.2476	16 12 16.4	5.325
6	6 33 0.07	2.2347	18 36 11.3	0.744	6	8 20 53.98	2.2471	16 6 54.1	5.417
7	6 35 14.19	2.2358	18 35 23.7	0.843	7	8 23 8.79	2.2466	16 1 26.4	5.508
8	6 37 28.37	2.2369	18 34 30.2	0.942	8	8 25 23.57	2.2460	15 55 53.2	5.598
9	6 39 42.62	2.2381	18 33 30.7	1.042	9	8 27 38.31	2.2453	15 50 14.6	5.688
10	6 41 56.94	2.2391	18 32 25.2	1.140	10	8 29 53.01	2.2448	15 44 30.6	5.778
11	6 44 11.31	2.2401	18 31 13.9	1.239	11	8 32 7.68	2.2442	15 38 41.2	5.867
12	6 46 25.75	2.2412	18 29 56.5	1.339	12	8 34 22.31	2.2435	15 32 46.5	5.957
13	6 48 40.25	2.2420	18 28 33.2	1.438	13	8 36 36.90	2.2428	15 26 46.4	6.045
14	6 50 54.79	2.2428	18 27 3.9	1.538	14	8 38 51.45	2.2422	15 20 41.1	6.133
15	6 53 9.39	2.2437	18 25 28.6	1.637	15	8 41 5.96	2.2415	15 14 30.4	6.222
16	6 55 24.04	2.2446	18 23 47.4	1.737	16	8 43 20.43	2.2408	15 8 14.5	6.308
17	6 57 38.74	2.2453	18 22 0.2	1.837	17	8 45 34.86	2.2401	15 1 53.5	6.394
18	6 59 53.47	2.2459	18 20 7.0	1.936	18	8 47 49.24	2.2393	14 55 27.2	6.481
19	7 2 8.25	2.2467	18 18 7.9	2.035	19	8 50 3.58	2.2387	14 48 55.8	6.566
20	7 4 23.07	2.2473	18 16 2.8	2.135	20	8 52 17.88	2.2379	14 42 19.3	6.651
21	7 6 37.93	2.2479	18 13 51.7	2.234	21	8 54 32.13	2.2371	14 35 37.7	6.735
22	7 8 52.82	2.2485	18 11 34.7	2.333	22	8 56 46.33	2.2363	14 28 51.1	6.819
23	7 11 7.75	2.2490	18 9 11.7	2.433	23	8 59 0.48	2.2355	14 21 59.4	6.902
24	7 13 22.70	2.2494	+18 6 42.7	−2.532	24	9 1 14.59	2.2348	+14 15 2.8	−6.985

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 18.			
	h m s	s	° ′ ″	″
0	9 1 14.59	2.2348	+14 15 2.8	− 6.985
1	9 3 28.65	2.2339	14 8 1.2	7.067
2	9 5 42.66	2.2332	14 0 54.7	7.148
3	9 7 56.63	2.2323	13 53 43.4	7.230
4	9 10 10.54	2.2315	13 46 27.1	7.311
5	9 12 24.41	2.2307	13 39 6.1	7.389
6	9 14 38.22	2.2298	13 31 40.4	7.468
7	9 16 51.99	2.2291	13 24 9.9	7.547
8	9 19 5.71	2.2282	13 16 34.7	7.626
9	9 21 19.37	2.2273	13 8 54.8	7.703
10	9 23 32.99	2.2266	13 1 10.4	7.778
11	9 25 46.56	2.2257	12 53 21.4	7.855
12	9 28 0.08	2.2249	12 45 27.8	7.930
13	9 30 13.55	2.2241	12 37 29.8	8.004
14	9 32 26.97	2.2233	12 29 27.3	8.078
15	9 34 40.35	2.2225	12 21 20.4	8.152
16	9 36 53.67	2.2217	12 13 9.1	8.224
17	9 39 6.95	2.2209	12 4 53.5	8.296
18	9 41 20.18	2.2201	11 56 33.6	8.368
19	9 43 33.36	2.2193	11 48 9.4	8.438
20	9 45 46.50	2.2186	11 39 41.1	8.507
21	9 47 59.59	2.2178	11 31 8.6	8.576
22	9 50 12.64	2.2171	11 22 32.0	8.644
23	9 52 25.64	2.2163	+11 13 51.3	− 8.712
	JUNE 19.			
0	9 54 38.60	2.2157	+11 5 6.6	− 8.778
1	9 56 51.52	2.2149	10 56 17.9	8.844
2	9 59 4.39	2.2142	10 47 25.3	8.910
3	10 1 17.23	2.2136	10 38 28.7	8.974
4	10 3 30.02	2.2128	10 29 28.4	9.038
5	10 5 42.77	2.2122	10 20 24.2	9.101
6	10 7 55.49	2.2117	10 11 16.3	9.163
7	10 10 8.17	2.2110	10 2 4.7	9.224
8	10 12 20.81	2.2104	9 52 49.4	9.285
9	10 14 33.42	2.2098	9 43 30.5	9.345
10	10 16 45.99	2.2093	9 34 8.0	9.403
11	10 18 58.54	2.2088	9 24 42.1	9.462
12	10 21 11.05	2.2083	9 15 12.6	9.519
13	10 23 23.53	2.2078	9 5 39.8	9.575
14	10 25 35.99	2.2073	8 56 3.6	9.631
15	10 27 48.41	2.2068	8 46 24.1	9.686
16	10 30 0.81	2.2065	8 36 41.3	9.740
17	10 32 13.19	2.2062	8 26 55.3	9.793
18	10 34 25.55	2.2057	8 17 6.1	9.846
19	10 36 37.88	2.2053	8 7 13.8	9.898
20	10 38 50.19	2.2051	7 57 18.4	9.948
21	10 41 2.49	2.2048	7 47 20.1	9.998
22	10 43 14.77	2.2046	7 37 18.7	10.047
23	10 45 27.04	2.2044	7 27 14.5	10.094
24	10 47 39.30	2.2042	+ 7 17 7.4	−10.142

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 20.			
	h m s	s	° ′ ″	″
0	10 47 39.30	2.2042	+7 17 7.4	−10.142
1	10 49 51.55	2.2041	7 6 57.5	10.188
2	10 52 3.79	2.2039	6 56 44.9	10.233
3	10 54 16.02	2.2038	6 46 29.5	10.278
4	10 56 28.25	2.2037	6 36 11.5	10.321
5	10 58 40.47	2.2037	6 25 51.0	10.364
6	11 0 52.69	2.2037	6 15 27.8	10.407
7	11 3 4.92	2.2038	6 5 2.2	10.447
8	11 5 17.15	2.2038	5 54 34.2	10.487
9	11 7 29.38	2.2040	5 44 3.8	10.526
10	11 9 41.63	2.2042	5 33 31.1	10.563
11	11 11 53.88	2.2043	5 22 56.2	10.601
12	11 14 6.14	2.2045	5 12 19.0	10.637
13	11 16 18.42	2.2047	5 1 39.7	10.673
14	11 18 30.71	2.2050	4 50 58.3	10.708
15	11 20 43.02	2.2054	4 40 14.8	10.741
16	11 22 55.36	2.2058	4 29 29.4	10.773
17	11 25 7.72	2.2062	4 18 42.0	10.805
18	11 27 20.10	2.2066	4 7 52.8	10.835
19	11 29 32.51	2.2071	3 57 1.8	10.864
20	11 31 44.95	2.2077	3 46 9.1	10.893
21	11 33 57.43	2.2082	3 35 14.7	10.921
22	11 36 9.93	2.2088	3 24 18.6	10.948
23	11 38 22.48	2.2095	+3 13 20.9	−10.973
	JUNE 21.			
0	11 40 35.07	2.2102	+3 2 21.8	−10.998
1	11 42 47.70	2.2108	2 51 21.2	11.022
2	11 45 0.37	2.2116	2 40 19.2	11.044
3	11 47 13.09	2.2124	2 29 15.9	11.065
4	11 49 25.86	2.2133	2 18 11.4	11.086
5	11 51 38.69	2.2142	2 7 5.6	11.106
6	11 53 51.56	2.2151	1 55 58.7	11.124
7	11 56 4.50	2.2161	1 44 50.7	11.142
8	11 58 17.49	2.2171	1 33 41.7	11.158
9	12 0 30.55	2.2182	1 22 31.7	11.173
10	12 2 43.67	2.2193	1 11 20.9	11.187
11	12 4 56.86	2.2204	1 0 9.2	11.202
12	12 7 10.12	2.2216	0 48 56.7	11.214
13	12 9 23.45	2.2228	0 37 43.5	11.225
14	12 11 36.86	2.2241	0 26 29.7	11.235
15	12 13 50.34	2.2254	0 15 15.3	11.244
16	12 16 3.91	2.2267	+0 4 0.4	11.252
17	12 18 17.55	2.2281	−0 7 14.9	11.259
18	12 20 31.28	2.2296	0 18 30.7	11.265
19	12 22 45.10	2.2311	0 29 46.7	11.269
20	12 24 59.01	2.2327	0 41 3.0	11.273
21	12 27 13.02	2.2343	0 52 19.5	11.276
22	12 29 27.12	2.2358	1 3 36.1	11.278
23	12 31 41.31	2.2374	1 14 52.8	11.278
24	12 33 55.61	2.2392	−1 26 9.4	−11.277

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 22.					JUNE 24.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 33 55.61	2.2392	− 1 26 9.4	−11.277	0	14 24 5.14	2.3627	−10 4 16.5	−9.844
1	12 36 10.01	2.2409	1 37 26.0	11.275	1	14 26 26.99	2.3658	10 14 5.4	9.784
2	12 38 24.52	2.2427	1 48 42.4	11.272	2	14 28 49.04	2.3691	10 23 50.6	9.722
3	12 40 39.13	2.2445	1 59 58.6	11.268	3	14 31 11.28	2.3723	10 33 32.1	9.659
4	12 42 53.86	2.2464	2 11 14.5	11.263	4	14 33 33.71	2.3754	10 43 9.7	9.596
5	12 45 8.70	2.2483	2 22 30.1	11.256	5	14 35 56.33	2.3786	10 52 43.6	9.532
6	12 47 23.66	2.2502	2 33 45.2	11.248	6	14 38 19.14	2.3818	11 2 13.5	9.464
7	12 49 38.73	2.2522	2 44 59.9	11.240	7	14 40 42.15	2.3850	11 11 39.3	9.397
8	12 51 53.92	2.2542	2 56 14.0	11.230	8	14 43 5.34	2.3882	11 21 1.1	9.328
9	12 54 9.24	2.2563	3 7 27.5	11.219	9	14 45 28.73	2.3914	11 30 18.7	9.258
10	12 56 24.68	2.2584	3 18 40.3	11.207	10	14 47 52.31	2.3946	11 39 32.1	9.187
11	12 58 40.25	2.2606	3 29 52.3	11.193	11	14 50 16.08	2.3978	11 48 41.1	9.114
12	13 0 55.95	2.2628	3 41 3.5	11.179	12	14 52 40.04	2.4009	11 57 45.8	9.041
13	13 3 11.78	2.2650	3 52 13.8	11.163	13	14 55 4.19	2.4041	12 6 46.0	8.966
14	13 5 27.75	2.2672	4 3 23.1	11.146	14	14 57 28.53	2.4073	12 15 41.7	8.890
15	13 7 43.85	2.2696	4 14 31.3	11.128	15	14 59 53.07	2.4105	12 24 32.8	8.813
16	13 10 0.10	2.2720	4 25 38.5	11.109	16	15 2 17.79	2.4136	12 33 19.2	8.734
17	13 12 16.49	2.2743	4 36 44.4	11.088	17	15 4 42.70	2.4167	12 42 0.9	8.654
18	13 14 33.01	2.2767	4 47 49.1	11.067	18	15 7 7.79	2.4198	12 50 37.7	8.573
19	13 16 49.69	2.2792	4 58 52.4	11.043	19	15 9 33.08	2.4230	12 59 9.6	8.491
20	13 19 6.51	2.2817	5 9 54.3	11.019	20	15 11 58.55	2.4260	13 7 36.6	8.408
21	13 21 23.49	2.2842	5 20 54.7	10.994	21	15 14 24.20	2.4291	13 15 58.6	8.324
22	13 23 40.61	2.2867	5 31 53.6	10.968	22	15 16 50.04	2.4322	13 24 15.5	8.238
23	13 25 57.89	2.2893	− 5 42 50.9	−10.940	23	15 19 16.06	2.4352	−13 32 27.1	−8.151
	JUNE 23.					JUNE 25.			
0	13 28 15.33	2.2920	− 5 53 46.4	−10.911	0	15 21 42.26	2.4382	−13 40 33.6	−8.063
1	13 30 32.93	2.2946	6 4 40.2	10.881	1	15 24 8.64	2.4412	13 48 34.7	7.974
2	13 32 50.68	2.2973	6 15 32.1	10.849	2	15 26 35.20	2.4441	13 56 30.5	7.885
3	13 35 8.60	2.3001	6 26 22.1	10.817	3	15 29 1.93	2.4470	14 4 20.9	7.793
4	13 37 26.69	2.3028	6 37 10.1	10.783	4	15 31 28.84	2.4499	14 12 5.7	7.701
5	13 39 44.93	2.3055	6 47 56.0	10.748	5	15 33 55.92	2.4528	14 19 45.0	7.608
6	13 42 3.35	2.3084	6 58 39.8	10.712	6	15 36 23.17	2.4556	14 27 18.6	7.513
7	13 44 21.94	2.3112	7 9 21.4	10.674	7	15 38 50.59	2.4583	14 34 46.5	7.417
8	13 46 40.69	2.3140	7 20 0.7	10.635	8	15 41 18.17	2.4611	14 42 8.7	7.322
9	13 48 59.62	2.3169	7 30 37.6	10.595	9	15 43 45.92	2.4638	14 49 25.1	7.224
10	13 51 18.72	2.3198	7 41 12.1	10.553	10	15 46 13.83	2.4665	14 56 35.6	7.125
11	13 53 38.00	2.3228	7 51 44.0	10.511	11	15 48 41.90	2.4692	15 3 40.1	7.025
12	13 55 57.46	2.3257	8 2 13.4	10.468	12	15 51 10.13	2.4718	15 10 38.6	6.925
13	13 58 17.09	2.3287	8 12 40.1	10.423	13	15 53 38.51	2.4743	15 17 31.1	6.823
14	14 0 36.90	2.3317	8 23 4.1	10.377	14	15 56 7.04	2.4768	15 24 17.4	6.721
15	14 2 56.89	2.3348	8 33 25.3	10.328	15	15 58 35.72	2.4793	15 30 57.6	6.618
16	14 5 17.07	2.3378	8 43 43.5	10.279	16	16 1 4.55	2.4817	15 37 31.5	6.513
17	14 7 37.43	2.3408	8 53 58.8	10.230	17	16 3 33.52	2.4839	15 43 59.1	6.408
18	14 9 57.97	2.3438	9 4 11.1	10.178	18	16 6 2.62	2.4862	15 50 20.4	6.302
19	14 12 18.69	2.3470	9 14 20.2	10.125	19	16 8 31.86	2.4885	15 56 35.3	6.194
20	14 14 39.61	2.3502	9 24 26.1	10.072	20	16 11 1.24	2.4907	16 2 43.7	6.086
21	14 17 0.71	2.3533	9 34 28.8	10.017	21	16 13 30.74	2.4928	16 8 45.6	5.977
22	14 19 22.00	2.3563	9 44 28.2	9.961	22	16 16 0.37	2.4948	16 14 41.0	5.868
23	14 21 43.47	2.3595	9 54 24.1	9.903	23	16 18 30.12	2.4968	16 20 29.8	5.758
24	14 24 5.14	2.3627	−10 4 16.5	− 9.844	24	16 20 59.99	2.4987	−16 26 11.9	−5.646

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 26.			
	h m s	s	° ′ ″	″
0	16 20 59.99	2.4987	−16 26 11.9	−5.646
1	16 23 29.97	2.5007	16 31 47.3	5.534
2	16 26 0.07	2.5025	16 37 16.0	5.421
3	16 28 30.27	2.5042	16 42 37.8	5.308
4	16 31 0.57	2.5059	16 47 52.9	5.193
5	16 33 30.98	2.5076	16 53 1.0	5.078
6	16 36 1.48	2.5091	16 58 2.2	4.963
7	16 38 32.07	2.5106	17 2 56.5	4.847
8	16 41 2.75	2.5119	17 7 43.8	4.730
9	16 43 33.50	2.5133	17 12 24.1	4.612
10	16 46 4.34	2.5145	17 16 57.2	4.493
11	16 48 35.24	2.5157	17 21 23.3	4.375
12	16 51 6.22	2.5168	17 25 42.2	4.255
13	16 53 37.26	2.5178	17 29 53.9	4.136
14	16 56 8.36	2.5187	17 33 58.5	4.016
15	16 58 39.51	2.5196	17 37 55.8	3.894
16	17 1 10.71	2.5204	17 41 45.8	3.772
17	17 3 41.96	2.5212	17 45 28.5	3.651
18	17 6 13.25	2.5218	17 49 3.9	3.529
19	17 8 44.57	2.5223	17 52 32.0	3.407
20	17 11 15.92	2.5227	17 55 52.7	3.283
21	17 13 47.29	2.5230	17 59 6.0	3.161
22	17 16 18.68	2.5233	18 2 12.0	3.037
23	17 18 50.09	2.5236	−18 5 10.5	−2.913
	JUNE 27.			
0	17 21 21.51	2.5237	−18 8 1.5	−2.788
1	17 23 52.93	2.5237	18 10 45.1	2.664
2	17 26 24.35	2.5236	18 13 21.2	2.540
3	17 28 55.76	2.5234	18 15 49.9	2.415
4	17 31 27.16	2.5232	18 18 11.0	2.289
5	17 33 58.54	2.5228	18 20 24.6	2.164
6	17 36 29.89	2.5223	18 22 30.7	2.039
7	17 39 1.22	2.5219	18 24 29.3	1.914
8	17 41 32.52	2.5213	18 26 20.4	1.788
9	17 44 3.77	2.5205	18 28 3.9	1.662
10	17 46 34.98	2.5197	18 29 39.9	1.537
11	17 49 6.14	2.5188	18 31 8.4	1.412
12	17 51 37.24	2.5178	18 32 29.3	1.286
13	17 54 8.28	2.5168	18 33 42.7	1.161
14	17 56 39.26	2.5157	18 34 48.6	1.035
15	17 59 10.16	2.5143	18 35 46.9	0.909
16	18 1 40.98	2.5131	18 36 37.7	0.784
17	18 4 11.73	2.5117	18 37 21.0	0.659
18	18 6 42.38	2.5101	18 37 56.8	0.535
19	18 9 12.94	2.5085	18 38 25.2	0.410
20	18 11 43.40	2.5068	18 38 46.0	0.285
21	18 14 13.75	2.5050	18 38 59.4	0.162
22	18 16 44.00	2.5032	18 39 5.4	−0.037
23	18 19 14.13	2.5012	18 39 3.9	+0.087
24	18 21 44.14	2.4992	−18 38 55.0	+0.210

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 28.			
	h m s	s	° ′ ″	″
0	18 21 44.14	2.4992	−18 38 55.0	+0.210
1	18 24 14.03	2.4970	18 38 38.7	0.333
2	18 26 43.78	2.4947	18 38 15.0	0.456
3	18 29 13.40	2.4925	18 37 44.0	0.578
4	18 31 42.88	2.4901	18 37 5.6	0.701
5	18 34 12.21	2.4876	18 36 19.9	0.822
6	18 36 41.39	2.4851	18 35 26.9	0.943
7	18 39 10.42	2.4825	18 34 26.7	1.063
8	18 41 39.29	2.4798	18 33 19.3	1.183
9	18 44 7.99	2.4769	18 32 4.7	1.303
10	18 46 36.52	2.4740	18 30 42.9	1.422
11	18 49 4.87	2.4711	18 29 14.0	1.542
12	18 51 33.05	2.4681	18 27 37.9	1.660
13	18 54 1.04	2.4650	18 25 54.8	1.777
14	18 56 28.85	2.4618	18 24 4.6	1.894
15	18 58 56.46	2.4585	18 22 7.5	2.010
16	19 1 23.87	2.4552	18 20 3.4	2.127
17	19 3 51.09	2.4518	18 17 52.3	2.242
18	19 6 18.09	2.4483	18 15 34.4	2.355
19	19 8 44.89	2.4449	18 13 9.7	2.469
20	19 11 11.48	2.4413	18 10 38.1	2.582
21	19 13 37.85	2.4376	18 7 59.8	2.694
22	19 16 3.99	2.4338	18 5 14.8	2.806
23	19 18 29.91	2.4301	−18 2 23.1	+2.917
	JUNE 29.			
0	19 20 55.60	2.4263	−17 59 24.7	+3.028
1	19 23 21.06	2.4223	17 56 19.8	3.137
2	19 25 46.28	2.4183	17 53 8.3	3.245
3	19 28 11.26	2.4143	17 49 50.4	3.352
4	19 30 36.00	2.4103	17 46 26.0	3.459
5	19 33 0.50	2.4062	17 42 55.3	3.565
6	19 35 24.74	2.4019	17 39 18.2	3.671
7	19 37 48.73	2.3977	17 35 34.8	3.775
8	19 40 12.47	2.3935	17 31 45.2	3.878
9	19 42 35.95	2.3892	17 27 49.4	3.981
10	19 44 59.17	2.3848	17 23 47.5	4.083
11	19 47 22.13	2.3804	17 19 39.5	4.184
12	19 49 44.82	2.3759	17 15 25.4	4.284
13	19 52 7.24	2.3715	17 11 5.4	4.383
14	19 54 29.40	2.3669	17 6 39.5	4.481
15	19 56 51.27	2.3622	17 2 7.7	4.578
16	19 59 12.87	2.3577	16 57 30.1	4.675
17	20 1 34.20	2.3531	16 52 46.7	4.770
18	20 3 55.24	2.3484	16 47 57.7	4.864
19	20 6 16.01	2.3437	16 43 3.0	4.958
20	20 8 36.49	2.3389	16 38 2.7	5.050
21	20 10 56.68	2.3342	16 32 57.0	5.142
22	20 13 16.59	2.3294	16 27 45.7	5.233
23	20 15 36.21	2.3246	16 22 29.1	5.322
24	20 17 55.54	2.3198	−16 17 7.1	+5.411

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 30.					JULY 2.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 17 55.54	2.3198	−16 17 7.1	+5.411	0	22 3 36.71	2.0882	−10 34 20.1	+8.494
1	20 20 14.58	2.3149	16 11 39.8	5.498	1	22 5 41.87	2.0838	10 25 49.2	8.535
2	20 22 33.33	2.3100	16 6 7.3	5.584	2	22 7 46.76	2.0794	10 17 15.9	8.576
3	20 24 51.78	2.3051	16 0 29.7	5.670	3	22 9 51.40	2.0752	10 8 40.1	8.615
4	20 27 9.94	2.3002	15 54 46.9	5.756	4	22 11 55.79	2.0710	10 0 2.1	8.653
5	20 29 27.80	2.2953	15 48 59.0	5.839	5	22 13 59.92	2.0668	9 51 21.8	8.690
6	20 31 45.37	2.2904	15 43 6.2	5.922	6	22 16 3.80	2.0627	9 42 39.3	8.726
7	20 34 2.65	2.2854	15 37 8.4	6.003	7	22 18 7.44	2.0586	9 33 54.7	8.762
8	20 36 19.62	2.2804	15 31 5.8	6.083	8	22 20 10.83	2.0544	9 25 7.9	8.798
9	20 38 36.30	2.2754	15 24 58.4	6.163	9	22 22 13.97	2.0504	9 16 19.0	8.832
10	20 40 52.67	2.2704	15 18 46.2	6.242	10	22 24 16.88	2.0465	9 7 28.1	8.865
11	20 43 8.75	2.2655	15 12 29.4	6.319	11	22 26 19.55	2.0425	8 58 35.2	8.898
12	20 45 24.53	2.2605	15 6 7.9	6.396	12	22 28 21.98	2.0386	8 49 40.4	8.929
13	20 47 40.01	2.2555	14 59 41.9	6.472	13	22 30 24.18	2.0347	8 40 43.7	8.959
14	20 49 55.19	2.2505	14 53 11.3	6.546	14	22 32 26.14	2.0308	8 31 45.3	8.989
15	20 52 10.07	2.2455	14 46 36.4	6.619	15	22 34 27.88	2.0272	8 22 45.0	9.019
16	20 54 24.65	2.2405	14 39 57.0	6.692	16	22 36 29.40	2.0234	8 13 43.0	9.048
17	20 56 38.93	2.2355	14 33 13.3	6.763	17	22 38 30.69	2.0197	8 4 39.3	9.075
18	20 58 52.91	2.2305	14 26 25.4	6.834	18	22 40 31.76	2.0161	7 55 34.0	9.102
19	21 1 6.59	2.2255	14 19 33.2	6.901	19	22 42 32.62	2.0125	7 46 27.1	9.128
20	21 3 19.97	2.2205	14 12 36.9	6.972	20	22 44 33.26	2.0088	7 37 18.7	9.153
21	21 5 33.05	2.2156	14 5 36.6	7.039	21	22 46 33.68	2.0053	7 28 8.8	9.178
22	21 7 45.84	2.2106	13 58 32.2	7.107	22	22 48 33.90	2.0019	7 18 57.4	9.202
23	21 9 58.32	2.2056	−13 51 23.8	+7.172	23	22 50 33.91	1.9985	− 7 9 44.6	+9.225
	JULY 1.					JULY 3.			
0	21 12 10.51	2.2007	−13 44 11.6	+7.236	0	22 52 33.72	1.9952	− 7 0 30.4	+9.247
1	21 14 22.40	2.1958	13 36 55.5	7.299	1	22 54 33.33	1.9918	6 51 14.9	9.268
2	21 16 34.00	2.1908	13 29 35.7	7.362	2	22 56 32.74	1.9885	6 41 58.2	9.289
3	21 18 45.30	2.1859	13 22 12.1	7.423	3	22 58 31.95	1.9853	6 32 40.2	9.309
4	21 20 56.31	2.1810	13 14 44.9	7.484	4	23 0 30.98	1.9822	6 23 21.1	9.328
5	21 23 7.02	2.1762	13 7 14.0	7.543	5	23 2 29.81	1.9790	6 14 0.8	9.347
6	21 25 17.45	2.1713	12 59 39.7	7.602	6	23 4 28.46	1.9759	6 4 39.4	9.365
7	21 27 27.58	2.1664	12 52 1.8	7.660	7	23 6 26.92	1.9728	5 55 17.0	9.382
8	21 29 37.42	2.1616	12 44 20.5	7.717	8	23 8 25.20	1.9699	5 45 53.5	9.399
9	21 31 46.97	2.1568	12 36 35.8	7.772	9	23 10 23.31	1.9669	5 36 29.1	9.415
10	21 33 56.24	2.1521	12 28 47.9	7.827	10	23 12 21.23	1.9640	5 27 3.7	9.431
11	21 36 5.22	2.1473	12 20 56.6	7.881	11	23 14 18.99	1.9613	5 17 37.4	9.445
12	21 38 13.92	2.1426	12 13 2.2	7.933	12	23 16 16.58	1.9584	5 8 10.3	9.459
13	21 40 22.33	2.1379	12 5 4.6	7.985	13	23 18 14.00	1.9557	4 58 42.3	9.472
14	21 42 30.47	2.1333	11 57 4.0	8.036	14	23 20 11.26	1.9530	4 49 13.6	9.484
15	21 44 38.32	2.1286	11 49 0.3	8.087	15	23 22 8.36	1.9504	4 39 44.2	9.496
16	21 46 45.90	2.1240	11 40 53.6	8.135	16	23 24 5.31	1.9478	4 30 14.1	9.508
17	21 48 53.20	2.1193	11 32 44.1	8.183	17	23 26 2.09	1.9452	4 20 43.3	9.519
18	21 51 0.22	2.1148	11 24 31.6	8.231	18	23 27 58.73	1.9428	4 11 11.8	9.529
19	21 53 6.97	2.1103	11 16 16.4	8.277	19	23 29 55.22	1.9403	4 1 39.8	9.538
20	21 55 13.46	2.1058	11 7 58.4	8.323	20	23 31 51.57	1.9379	3 52 7.3	9.546
21	21 57 19.67	2.1013	10 59 37.7	8.367	21	23 33 47.77	1.9356	3 42 34.3	9.554
22	21 59 25.61	2.0968	10 51 14.4	8.410	22	23 35 43.84	1.9333	3 33 0.8	9.562
23	22 1 31.29	2.0925	10 42 48.5	8.453	23	23 37 39.77	1.9311	3 23 26.8	9.569
24	22 3 36.71	2.0882	−10 34 20.1	+8.494	24	23 39 35.57	1.9289	− 3 13 52.5	+9.575

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 4.					JULY 6.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 39 35.57	1.9289	−3 13 52.5	+9.575	0	1 10 39.52	1.8852	+ 4 22 6.1	+9.218
1	23 41 31.24	1.9268	3 4 17.8	9.581	1	1 12 32.64	1.8856	4 31 18.6	9.198
2	23 43 26.78	1.9248	2 54 42.8	9.585	2	1 14 25.79	1.8860	4 40 29.9	9.178
3	23 45 22.21	1.9228	2 45 7.6	9.589	3	1 16 18.96	1.8864	4 49 40.0	9.157
4	23 47 17.51	1.9208	2 35 32.1	9.594	4	1 18 12.16	1.8868	4 58 48.7	9.135
5	23 49 12.70	1.9188	2 25 56.3	9.597	5	1 20 5.38	1.8873	5 7 56.2	9.113
6	23 51 7.77	1.9169	2 16 20.4	9.599	6	1 21 58.64	1.8880	5 17 2.3	9.090
7	23 53 2.73	1.9151	2 6 44.4	9.602	7	1 23 51.94	1.8886	5 26 7.0	9.067
8	23 54 57.58	1.9133	1 57 8.2	9.603	8	1 25 45.27	1.8893	5 35 10.3	9.043
9	23 56 52.33	1.9117	1 47 32.0	9.604	9	1 27 38.65	1.8900	5 44 12.1	9.019
10	23 58 46.98	1.9100	1 37 55.7	9.605	10	1 29 32.07	1.8907	5 53 12.6	8.995
11	0 0 41.53	1.9084	1 28 19.4	9.604	11	1 31 25.53	1.8915	6 2 11.5	8.969
12	0 2 35.99	1.9068	1 18 43.2	9.603	12	1 33 19.05	1.8924	6 11 8.9	8.943
13	0 4 30.35	1.9053	1 9 7.0	9.602	13	1 35 12.62	1.8933	6 20 4.7	8.917
14	0 6 24.63	1.9039	0 59 30.9	9.600	14	1 37 6.25	1.8943	6 28 59.0	8.892
15	0 8 18.82	1.9025	0 49 55.0	9.597	15	1 38 59.93	1.8953	6 37 51.7	8.861
16	0 10 12.93	1.9012	0 40 19.3	9.594	16	1 40 53.68	1.8963	6 46 42.7	8.836
17	0 12 6.96	1.8998	0 30 43.7	9.592	17	1 42 47.49	1.8974	6 55 32.0	8.808
18	0 14 0.91	1.8986	0 21 8.3	9.587	18	1 44 41.37	1.8985	7 4 19.6	8.779
19	0 15 54.79	1.8974	0 11 33.3	9.582	19	1 46 35.31	1.8997	7 13 5.5	8.750
20	0 17 48.60	1.8963	−0 1 58.5	9.577	20	1 48 29.33	1.9009	7 21 49.6	8.720
21	0 19 42.35	1.8952	+0 7 35.9	9.571	21	1 50 23.42	1.9022	7 30 31.9	8.690
22	0 21 36.03	1.8942	0 17 10.0	9.565	22	1 52 17.59	1.9035	7 39 12.4	8.659
23	0 23 29.65	1.8932	0 26 43.7	+9.558	23	1 54 11.84	1.9048	+ 7 47 51.0	+8.628
	JULY 5.					JULY 7.			
0	0 25 23.21	1.8923	+0 36 17.0	+9.551	0	1 56 6.17	1.9063	+ 7 56 27.7	+8.596
1	0 27 16.72	1.8914	0 45 49.8	9.543	1	1 58 0.59	1.9077	8 5 2.5	8.563
2	0 29 10.18	1.8906	0 55 22.1	9.534	2	1 59 55.09	1.9091	8 13 35.3	8.530
3	0 31 3.59	1.8898	1 4 53.9	9.525	3	2 1 49.68	1.9106	8 22 6.1	8.498
4	0 32 56.95	1.8890	1 14 25.1	9.515	4	2 3 44.36	1.9122	- 8 30 35.0	8.464
5	0 34 50.27	1.8884	1 23 55.7	9.506	5	2 5 39.14	1.9138	8 39 1.8	8.429
6	0 36 43.56	1.8878	1 33 25.8	9.496	6	2 7 34.02	1.9155	8 47 26.5	8.394
7	0 38 36.81	1.8872	1 42 55.2	9.484	7	2 9 29.00	1.9172	8 55 49.1	8.358
8	0 40 30.02	1.8867	1 52 23.9	9.472	8	2 11 24.08	1.9188	9 4 9.5	8.323
9	0 42 23.21	1.8863	2 1 51.9	9.460	9	2 13 19.26	1.9206	9 12 27.8	8.287
10	0 44 16.37	1.8858	2 11 19.1	9.448	10	2 15 14.55	1.9224	9 20 43.9	8.249
11	0 46 9.50	1.8854	2 20 45.6	9.435	11	2 17 9.95	1.9243	9 28 57.7	8.212
12	0 48 2.62	1.8852	2 30 11.3	9.422	12	2 19 5.47	1.9263	9 37 9.3	8.174
13	0 49 55.72	1.8849	2 39 36.2	9.408	13	2 21 1.10	1.9282	9 45 18.6	8.135
14	0 51 48.81	1.8847	2 49 0.2	9.393	14	2 22 56.85	1.9301	9 53 25.5	8.096
15	0 53 41.88	1.8845	2 58 23.3	9.378	15	2 24 52.71	1.9321	10 1 30.1	8.057
16	0 55 34.95	1.8844	3 7 45.5	9.362	16	2 26 48.70	1.9342	10 9 32.3	8.016
17	0 57 28.01	1.8843	3 17 6.7	9.345	17	2 28 44.81	1.9362	10 17 32.0	7.975
18	0 59 21.06	1.8843	3 26 26.9	9.329	18	2 30 41.04	1.9383	10 25 29.3	7.934
19	1 1 14.12	1.8843	3 35 46.2	9.312	19	2 32 37.40	1.9404	10 33 24.1	7.892
20	1 3 7.18	1.8844	3 45 4.4	9.294	20	2 34 33.89	1.9427	10 41 16.3	7.849
21	1 5 0.25	1.8846	3 54 21.5	9.276	21	2 36 30.52	1.9449	10 49 6.0	7.807
22	1 6 53.33	1.8848	4 3 37.5	9.257	22	2 38 27.28	1.9471	10 56 53.1	7.763
23	1 8 46.42	1.8849	4 12 52.4	9.238	23	2 40 24.17	1.9494	11 4 37.6	7.719
24	1 10 39.52	1.8852	+4 22 6.1	+9.218	24	2 42 21.21	1.9517	+11 12 19.4	+7.674

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 8.			
	h m s	s	° ′ ″	″
0	2 42 21.21	1.9517	+11 12 19.4	+7.674
1	2 44 18.38	1.9541	11 19 58.5	7.629
2	2 46 15.70	1.9565	11 27 34.9	7.583
3	2 48 13.16	1.9589	11 35 8.5	7.537
4	2 50 10.77	1.9614	11 42 39.3	7.490
5	2 52 8.53	1.9639	11 50 7.3	7.442
6	2 54 6.44	1.9664	11 57 32.4	7.394
7	2 56 4.50	1.9689	12 4 54.6	7.346
8	2 58 2.71	1.9715	12 12 13.9	7.297
9	3 0 1.08	1.9742	12 19 30.2	7.247
10	3 1 59.61	1.9768	12 26 43.5	7.197
11	3 3 58.29	1.9794	12 33 53.8	7.146
12	3 5 57.14	1.9822	12 41 1.0	7.094
13	3 7 56.15	1.9848	12 48 5.1	7.042
14	3 9 55.32	1.9876	12 55 6.1	6.990
15	3 11 54.66	1.9904	13 2 3.9	6.936
16	3 13 54.17	1.9932	13 8 58.4	6.882
17	3 15 53.84	1.9960	13 15 49.7	6.828
18	3 17 53.69	1.9989	13 22 37.8	6.773
19	3 19 53.71	2.0018	13 29 22.5	6.718
20	3 21 53.90	2.0047	13 36 3.9	6.662
21	3 23 54.27	2.0075	13 42 41.9	6.605
22	3 25 54.80	2.0104	13 49 16.5	6.547
23	3 27 55.52	2.0135	+13 55 47.6	+6.489
	JULY 9.			
0	3 29 56.42	2.0165	+14 2 15.2	+6.431
1	3 31 57.50	2.0195	14 8 39.3	6.372
2	3 33 58.76	2.0225	14 14 59.8	6.312
3	3 36 0.20	2.0255	14 21 16.7	6.252
4	3 38 1.82	2.0286	14 27 30.0	6.191
5	3 40 3.63	2.0317	14 33 39.6	6.129
6	3 42 5.62	2.0347	14 39 45.5	6.067
7	3 44 7.79	2.0378	14 45 47.6	6.003
8	3 46 10.15	2.0408	14 51 45.9	5.941
9	3 48 12.69	2.0439	14 57 40.5	5.877
10	3 50 15.42	2.0471	15 3 31.1	5.812
11	3 52 18.34	2.0503	15 9 17.9	5.747
12	3 54 21.45	2.0534	15 15 0.7	5.681
13	3 56 24.75	2.0567	15 20 39.6	5.614
14	3 58 28.25	2.0599	15 26 14.4	5.547
15	4 0 31.94	2.0631	15 31 45.2	5.480
16	4 2 35.82	2.0663	15 37 12.0	5.412
17	4 4 39.89	2.0694	15 42 34.6	5.343
18	4 6 44.15	2.0727	15 47 53.1	5.273
19	4 8 48.61	2.0759	15 53 7.4	5.203
20	4 10 53.26	2.0792	15 58 17.5	5.132
21	4 12 58.11	2.0824	16 3 23.3	5.061
22	4 15 3.15	2.0856	16 8 24.8	4.989
23	4 17 8.38	2.0888	16 13 22.0	4.917
24	4 19 13.81	2.0921	+16 18 14.8	+4.843

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 10.			
	h m s	s	° ′ ″	″
0	4 19 13.81	2.0921	+16 18 14.8	+4.843
1	4 21 19.43	2.0953	16 23 3.2	4.770
2	4 23 25.24	2.0985	16 27 47.2	4.696
3	4 25 31.25	2.1018	16 32 26.7	4.621
4	4 27 37.46	2.1050	16 37 1.7	4.545
5	4 29 43.85	2.1083	16 41 32.1	4.469
6	4 31 50.45	2.1116	16 45 58.0	4.392
7	4 33 57.24	2.1148	16 50 19.2	4.315
8	4 36 4.22	2.1180	16 54 35.8	4.237
9	4 38 11.40	2.1213	16 58 47.7	4.159
10	4 40 18.77	2.1244	17 2 54.9	4.080
11	4 42 26.33	2.1277	17 6 57.3	4.000
12	4 44 34.09	2.1308	17 10 54.9	3.920
13	4 46 42.03	2.1340	17 14 47.7	3.839
14	4 48 50.17	2.1372	17 18 35.6	3.758
15	4 50 58.49	2.1403	17 22 18.6	3.676
16	4 53 7.01	2.1435	17 25 56.7	3.594
17	4 55 15.71	2.1466	17 29 29.9	3.511
18	4 57 24.60	2.1497	17 32 58.0	3.427
19	4 59 33.67	2.1528	17 36 21.1	3.343
20	5 1 42.93	2.1559	17 39 39.1	3.258
21	5 3 52.38	2.1590	17 42 52.1	3.173
22	5 6 2.01	2.1620	17 45 59.9	3.088
23	5 8 11.82	2.1650	+17 49 2.6	+3.002
	JULY 11.			
0	5 10 21.81	2.1680	+17 52 0.1	+2.915
1	5 12 31.98	2.1710	17 54 52.4	2.827
2	5 14 42.33	2.1740	17 57 39.4	2.739
3	5 16 52.86	2.1770	18 0 21.1	2.651
4	5 19 3.57	2.1799	18 2 57.5	2.562
5	5 21 14.45	2.1828	18 5 28.5	2.473
6	5 23 25.51	2.1857	18 7 54.2	2.383
7	5 25 36.73	2.1885	18 10 14.5	2.293
8	5 27 48.13	2.1914	18 12 29.3	2.202
9	5 29 59.70	2.1942	18 14 38.7	2.110
10	5 32 11.43	2.1969	18 16 42.5	2.018
11	5 34 23.33	2.1997	18 18 40.9	1.927
12	5 36 35.39	2.2023	18 20 33.7	1.833
13	5 38 47.61	2.2051	18 22 20.9	1.740
14	5 41 0.00	2.2078	18 24 2.5	1.647
15	5 43 12.54	2.2103	18 25 38.5	1.553
16	5 45 25.24	2.2129	18 27 8.9	1.458
17	5 47 38.09	2.2154	18 28 33.5	1.363
18	5 49 51.09	2.2180	18 29 52.5	1.268
19	5 52 4.25	2.2205	18 31 5.7	1.173
20	5 54 17.55	2.2229	18 32 13.2	1.078
21	5 56 31.00	2.2253	18 33 15.0	0.981
22	5 58 44.59	2.2278	18 34 10.9	0.883
23	6 0 58.33	2.2301	18 35 1.0	0.787
24	6 3 12.20	2.2323	+18 35 45.3	+0.689

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 12.					JULY 14.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 3 12.20	2.2323	+18 35 45.3	+0.689	0	7 52 10.55	2.2905	+17 12 38.0	−4.175
1	6 5 26.21	2.2346	18 36 23.7	0.592	1	7 54 27.98	2.2906	17 8 24.4	4.275
2	6 7 40.35	2.2368	18 36 56.3	0.493	2	7 56 45.42	2.2906	17 4 5.0	4.373
3	6 9 54.62	2.2390	18 37 22.9	0.394	3	7 59 2.85	2.2906	16 59 39.7	4.471
4	6 12 9.03	2.2412	18 37 43.6	0.296	4	8 1 20.29	2.2906	16 55 8.5	4.570
5	6 14 23.56	2.2433	18 37 58.4	0.198	5	8 3 37.72	2.2905	16 50 31.3	4.670
6	6 16 38.22	2.2453	18 38 7.3	+0.098	6	8 5 55.15	2.2904	16 45 48.1	4.768
7	6 18 53.00	2.2473	18 38 10.2	−0.002	7	8 8 12.57	2.2903	16 40 59.1	4.865
8	6 21 7.90	2.2493	18 38 7.1	0.102	8	8 10 29.99	2.2902	16 36 4.3	4.963
9	6 23 22.92	2.2513	18 37 58.0	0.202	9	8 12 47.39	2.2898	16 31 3.5	5.061
10	6 25 38.05	2.2531	18 37 42.8	0.303	10	8 15 4.77	2.2896	16 25 57.0	5.158
11	6 27 53.29	2.2549	18 37 21.7	0.403	11	8 17 22.14	2.2893	16 20 44.6	5.254
12	6 30 8.64	2.2567	18 36 54.5	0.503	12	8 19 39.49	2.2890	16 15 26.5	5.350
13	6 32 24.09	2.2585	18 36 21.3	0.605	13	8 21 56.82	2.2886	16 10 2.6	5.446
14	6 34 39.66	2.2602	18 35 41.9	0.707	14	8 24 14.12	2.2882	16 4 33.0	5.541
15	6 36 55.32	2.2618	18 34 56.5	0.807	15	8 26 31.40	2.2877	15 58 57.7	5.636
16	6 39 11.08	2.2635	18 34 5.1	0.908	16	8 28 48.64	2.2872	15 53 16.7	5.730
17	6 41 26.94	2.2651	18 33 7.5	1.011	17	8 31 5.86	2.2868	15 47 30.1	5.824
18	6 43 42.89	2.2666	18 32 3.8	1.113	18	8 33 23.05	2.2863	15 41 37.8	5.917
19	6 45 58.93	2.2680	18 30 54.0	1.215	19	8 35 40.21	2.2857	15 35 40.0	6.009
20	6 48 15.05	2.2695	18 29 38.0	1.317	20	8 37 57.33	2.2850	15 29 36.7	6.102
21	6 50 31.27	2.2709	18 28 16.0	1.418	21	8 40 14.41	2.2844	15 23 27.8	6.194
22	6 52 47.56	2.2722	18 26 47.8	1.522	22	8 42 31.46	2.2838	15 17 13.4	6.285
23	6 55 3.93	2.2735	+18 25 13.4	−1.624	23	8 44 48.47	2.2831	+15 10 53.6	−6.376
	JULY 13.					JULY 15.			
0	6 57 20.38	2.2748	+18 23 32.9	−1.726	0	8 47 5.43	2.2823	+15 4 28.3	−6.466
1	6 59 36.90	2.2759	18 21 46.3	1.528	1	8 49 22.35	2.2817	14 57 57.7	6.555
2	7 1 53.49	2.2771	18 19 53.5	1.932	2	8 51 39.23	2.2808	14 51 21.7	6.644
3	7 4 10.15	2.2782	18 17 54.5	2.035	3	8 53 56.05	2.2800	14 44 40.4	6.733
4	7 6 26.87	2.2793	18 15 49.3	2.137	4	8 56 12.83	2.2793	14 37 53.8	6.821
5	7 8 43.66	2.2803	18 13 38.0	2.240	5	8 58 29.56	2.2784	14 31 1.9	6.908
6	7 11 0.50	2.2812	18 11 20.5	2.343	6	9 0 46.24	2.2776	14 24 4.9	6.993
7	7 13 17.40	2.2822	18 8 56.9	2.445	7	9 3 2.87	2.2767	14 17 2.7	7.079
8	7 15 34.36	2.2830	18 6 27.1	2.548	8	9 5 19.45	2.2758	14 9 55.4	7.165
9	7 17 51.36	2.2838	18 3 51.2	2.650	9	9 7 35.97	2.2749	14 2 42.9	7.249
10	7 20 8.41	2.2846	18 1 9.1	2.753	10	9 9 52.44	2.2740	13 55 25.5	7.333
11	7 22 25.51	2.2853	17 58 20.9	2.855	11	9 12 8.85	2.2731	13 48 3.0	7.417
12	7 24 42.64	2.2859	17 55 26.5	2.958	12	9 14 25.21	2.2722	13 40 35.5	7.499
13	7 26 59.82	2.2866	17 52 26.0	3.060	13	9 16 41.51	2.2712	13 33 3.1	7.580
14	7 29 17.03	2.2872	17 49 19.3	3.162	14	9 18 57.75	2.2701	13 25 25.9	7.661
15	7 31 34.28	2.2877	17 46 6.6	3.263	15	9 21 13.92	2.2691	13 17 43.8	7.742
16	7 33 51.55	2.2882	17 42 47.7	3.366	16	9 23 30.04	2.2682	13 9 56.9	7.821
17	7 36 8.86	2.2887	17 39 22.7	3.467	17	9 25 46.10	2.2672	13 2 5.3	7.899
18	7 38 26.19	2.2890	17 35 51.7	3.568	18	9 28 2.10	2.2661	12 54 9.0	7.977
19	7 40 43.54	2.2893	17 32 14.5	3.670	19	9 30 18.03	2.2650	12 46 8.0	8.055
20	7 43 0.91	2.2897	17 28 31.3	3.770	20	9 32 33.90	2.2640	12 38 2.4	8.132
21	7 45 18.30	2.2900	17 24 42.1	3.872	21	9 34 49.71	2.2630	12 29 52.2	8.208
22	7 47 35.71	2.2902	17 20 46.7	3.973	22	9 37 5.46	2.2619	12 21 37.5	8.283
23	7 49 53.12	2.2903	17 16 45.4	4.073	23	9 39 21.14	2.2608	12 13 18.3	8.357
24	7 52 10.55	2.2905	+17 12 38.0	−4.175	24	9 41 36.76	2.2598	+12 4 54.7	−8.430

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 16.			
	h m s	s	° ′ ″	″
0	9 41 36.76	2.2598	+12 4 54.7	− 8.430
1	9 43 52.31	2.2587	11 56 26.7	8.502
2	9 46 7.80	2.2576	11 47 54.4	8.573
3	9 48 23.22	2.2565	11 39 17.9	8.645
4	9 50 38.58	2.2554	11 30 37.0	8.716
5	9 52 53.87	2.2543	11 21 52.0	8.784
6	9 55 9.10	2.2532	11 13 2.9	8.852
7	9 57 24.26	2.2522	11 4 9.7	8.920
8	9 59 39.36	2.2512	10 55 12.5	8.987
9	10 1 54.40	2.2501	10 46 11.3	9.053
10	10 4 9.37	2.2490	10 37 6.2	9.118
11	10 6 24.28	2.2480	10 27 57.2	9.182
12	10 8 39.13	2.2469	10 18 44.4	9.245
13	10 10 53.91	2.2459	10 9 27.8	9.307
14	10 13 8.64	2.2449	10 0 7.5	9.368
15	10 15 23.30	2.2438	9 50 43.6	9.428
16	10 17 37.89	2.2428	9 41 16.1	9.488
17	10 19 52.43	2.2418	9 31 45.0	9.547
18	10 22 6.91	2.2408	9 22 10.5	9.604
19	10 24 21.33	2.2398	9 12 32.5	9.661
20	10 26 35.69	2.2389	9 2 51.2	9.717
21	10 28 50.00	2.2380	8 53 6.5	9.772
22	10 31 4.25	2.2370	8 43 18.6	9.825
23	10 33 18.44	2.2361	+ 8 33 27.5	− 9.878
	JULY 17.			
0	10 35 32.58	2.2353	+ 8 23 33.2	− 9.931
1	10 37 46.67	2.2343	8 13 35.8	9.981
2	10 40 0.70	2.2334	8 3 35.5	10.031
3	10 42 14.68	2.2326	7 53 32.1	10.081
4	10 44 28.61	2.2318	7 43 25.8	10.128
5	10 46 42.49	2.2309	7 33 16.7	10.175
6	10 48 56.32	2.2302	7 23 4.8	10.221
7	10 51 10.11	2.2294	7 12 50.2	10.266
8	10 53 23.85	2.2287	7 2 32.9	10.310
9	10 55 37.55	2.2280	6 52 13.0	10.353
10	10 57 51.21	2.2273	6 41 50.5	10.396
11	11 0 4.82	2.2266	6 31 25.5	10.437
12	11 2 18.40	2.2260	6 20 58.1	10.477
13	11 4 31.94	2.2253	6 10 28.3	10.516
14	11 6 45.44	2.2248	5 59 56.2	10.554
15	11 8 58.91	2.2243	5 49 21.8	10.591
16	11 11 12.35	2.2238	5 38 45.3	10.627
17	11 13 25.76	2.2233	5 28 6.6	10.662
18	11 15 39.14	2.2228	5 17 25.8	10.696
19	11 17 52.49	2.2223	5 6 43.1	10.728
20	11 20 5.82	2.2219	4 55 58.4	10.761
21	11 22 19.12	2.2215	4 45 11.8	10.792
22	11 24 32.40	2.2212	4 34 23.4	10.822
23	11 26 45.66	2.2208	4 23 33.2	10.851
24	11 28 58.90	2.2206	+ 4 12 41.3	−10.878

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 18.			
	h m s	s	° ′ ″	″
0	11 28 58.90	2.2206	+4 12 41.3	−10.878
1	11 31 12.13	2.2203	4 1 47.8	10.905
2	11 33 25.34	2.2200	3 50 52.7	10.931
3	11 35 38.53	2.2198	3 39 56.1	10.955
4	11 37 51.72	2.2197	3 28 58.1	10.978
5	11 40 4.90	2.2197	3 17 58.7	11.001
6	11 42 18.08	2.2196	3 6 58.0	11.023
7	11 44 31.25	2.2195	2 55 56.0	11.043
8	11 46 44.42	2.2195	2 44 52.9	11.062
9	11 48 57.59	2.2195	2 33 48.6	11.080
10	11 51 10.76	2.2196	2 22 43.3	11.097
11	11 53 23.94	2.2197	2 11 37.0	11.113
12	11 55 37.12	2.2198	2 0 29.7	11.128
13	11 57 50.31	2.2200	1 49 21.6	11.142
14	12 0 3.52	2.2202	1 38 12.6	11.155
15	12 2 16.74	2.2204	1 27 3.0	11.166
16	12 4 29.97	2.2207	1 15 52.7	11.177
17	12 6 43.22	2.2211	1 4 41.7	11.187
18	12 8 56.50	2.2215	0 53 30.3	11.195
19	12 11 9.80	2.2218	0 42 18.3	11.202
20	12 13 23.12	2.2222	0 31 6.0	11.208
21	12 15 36.46	2.2227	0 19 53.3	11.214
22	12 17 49.84	2.2233	+0 8 40.3	11.218
23	12 20 3.25	2.2238	−0 2 32.9	−11.222
	JULY 19.			
0	12 22 16.70	2.2244	−0 13 46.3	−11.223
1	12 24 30.18	2.2251	0 24 59.7	11.224
2	12 26 43.71	2.2258	0 36 13.2	11.225
3	12 28 57.27	2.2264	0 47 26.7	11.223
4	12 31 10.88	2.2272	0 58 40.0	11.220
5	12 33 24.53	2.2280	1 9 53.1	11.217
6	12 35 38.24	2.2289	1 21 6.0	11.212
7	12 37 52.00	2.2298	1 32 18.5	11.206
8	12 40 5.81	2.2306	1 43 30.7	11.200
9	12 42 19.67	2.2316	1 54 42.5	11.192
10	12 44 33.60	2.2326	2 5 53.7	11.183
11	12 46 47.58	2.2336	2 17 4.4	11.173
12	12 49 1.63	2.2348	2 28 14.4	11.161
13	12 51 15.75	2.2358	2 39 23.7	11.149
14	12 53 29.93	2.2369	2 50 32.3	11.136
15	12 55 44.18	2.2382	3 1 40.0	11.120
16	12 57 58.51	2.2394	3 12 46.7	11.104
17	13 0 12.91	2.2406	3 23 52.5	11.088
18	13 2 27.38	2.2419	3 34 57.3	11.070
19	13 4 41.94	2.2433	3 46 0.9	11.051
20	13 6 56.58	2.2447	3 57 3.4	11.031
21	13 9 11.30	2.2461	4 8 4.6	11.010
22	13 11 26.11	2.2476	4 19 4.6	10.988
23	13 13 41.01	2.2491	4 30 3.1	10.963
24	13 15 56.00	2.2506	−4 41 0.2	−10.939

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 20.					JULY 22.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 15 56.00	2.2506	− 4 41 0.2	−10.939	0	15 6 18.81	2.3569	−12 36 37.4	−8.457
1	13 18 11.08	2.2522	4 51 55.8	10.913	1	15 8 40.30	2.3595	12 45 2.5	8.380
2	13 20 26.26	2.2538	5 2 49.8	10.887	2	15 11 1.95	2.3621	12 53 23.0	8.302
3	13 22 41.53	2.2554	5 13 42.2	10.859	3	15 13 23.75	2.3647	13 1 38.7	8.221
4	13 24 56.91	2.2572	5 24 32.9	10.829	4	15 15 45.71	2.3672	13 9 49.5	8.139
5	13 27 12.39	2.2588	5 35 21.7	10.799	5	15 18 7.81	2.3697	13 17 55.4	8.057
6	13 29 27.97	2.2606	5 46 8.8	10.768	6	15 20 30.07	2.3723	13 25 56.4	7.975
7	13 31 43.66	2.2623	5 56 53.9	10.736	7	15 22 52.49	2.3748	13 33 52.4	7.891
8	13 33 59.45	2.2642	6 7 37.1	10.702	8	15 25 15.05	2.3773	13 41 43.3	7.806
9	13 36 15.36	2.2661	6 18 18.1	10.667	9	15 27 37.76	2.3798	13 49 29.1	7.721
10	13 38 31.38	2.2679	6 28 57.1	10.632	10	15 30 0.63	2.3823	13 57 9.8	7.634
11	13 40 47.51	2.2698	6 39 33.9	10.595	11	15 32 23.64	2.3848	14 4 45.2	7.546
12	13 43 3.76	2.2718	6 50 8.5	10.557	12	15 34 46.80	2.3873	14 12 15.3	7.457
13	13 45 20.13	2.2738	7 0 40.7	10.518	13	15 37 10.11	2.3898	14 19 40.1	7.367
14	13 47 36.61	2.2758	7 11 10.6	10.478	14	15 39 33.57	2.3922	14 26 59.4	7.277
15	13 49 53.22	2.2779	7 21 38.1	10.437	15	15 41 57.17	2.3945	14 34 13.3	7.186
16	13 52 9.96	2.2799	7 32 3.0	10.393	16	15 44 20.91	2.3969	14 41 21.7	7.093
17	13 54 26.81	2.2820	7 42 25.3	10.350	17	15 46 44.80	2.3993	14 48 24.5	7.000
18	13 56 43.80	2.2842	7 52 45.0	10.305	18	15 49 8.83	2.4016	14 55 21.7	6.907
19	13 59 0.91	2.2863	8 3 1.9	10.259	19	15 51 32.99	2.4039	15 2 13.3	6.812
20	14 1 18.15	2.2884	8 13 16.1	10.213	20	15 53 57.30	2.4063	15 8 59.1	6.716
21	14 3 35.52	2.2907	8 23 27.5	10.165	21	15 56 21.74	2.4085	15 15 39.2	6.619
22	14 5 53.03	2.2930	8 33 35.9	10.115	22	15 58 46.32	2.4108	15 22 13.4	6.522
23	14 8 10.68	2.2952	− 8 43 41.3	−10.065	23	16 1 11.03	2.4130	−15 28 41.8	−6.423
	JULY 21.					JULY 23.			
0	14 10 28.46	2.2974	− 8 53 43.7	−10.014	0	16 3 35.88	2.4152	−15 35 4.2	−6.324
1	14 12 46.37	2.2997	9 3 43.0	9.962	1	16 6 0.85	2.4173	15 41 20.7	6.224
2	14 15 4.43	2.3021	9 13 39.1	9.908	2	16 8 25.95	2.4193	15 47 31.1	6.123
3	14 17 22.62	2.3044	9 23 31.9	9.853	3	16 10 51.17	2.4214	15 53 35.5	6.022
4	14 19 40.96	2.3068	9 33 21.5	9.798	4	16 13 16.52	2.4235	15 59 33.8	5.920
5	14 21 59.44	2.3092	9 43 7.7	9.741	5	16 15 41.99	2.4254	16 5 25.9	5.817
6	14 24 18.06	2.3116	9 52 50.4	9.683	6	16 18 7.57	2.4273	16 11 11.9	5.714
7	14 26 36.83	2.3140	10 2 29.7	9.624	7	16 20 33.27	2.4293	16 16 51.6	5.609
8	14 28 55.74	2.3164	10 12 5.3	9.563	8	16 22 59.09	2.4312	16 22 25.0	5.504
9	14 31 14.80	2.3189	10 21 37.3	9.503	9	16 25 25.01	2.4330	16 27 52.1	5.398
10	14 33 34.01	2.3213	10 31 5.7	9.441	10	16 27 51.05	2.4348	16 33 12.8	5.292
11	14 35 53.36	2.3238	10 40 30.2	9.377	11	16 30 17.19	2.4365	16 38 27.1	5.184
12	14 38 12.87	2.3264	10 49 50.9	9.313	12	16 32 43.43	2.4382	16 43 34.9	5.077
13	14 40 32.53	2.3288	10 59 7.7	9.248	13	16 35 9.77	2.4398	16 48 36.3	4.968
14	14 42 52.33	2.3313	11 8 20.6	9.181	14	16 37 36.21	2.4414	16 53 31.1	4.859
15	14 45 12.29	2.3339	11 17 29.4	9.113	15	16 40 2.74	2.4429	16 58 19.4	4.750
16	14 47 32.40	2.3365	11 26 34.2	9.045	16	16 42 29.36	2.4444	17 3 1.1	4.640
17	14 49 52.67	2.3390	11 35 34.8	8.974	17	16 44 56.07	2.4459	17 7 36.2	4.529
18	14 52 13.08	2.3415	11 44 31.1	8.903	18	16 47 22.87	2.4473	17 12 4.6	4.417
19	14 54 33.65	2.3441	11 53 23.2	8.832	19	16 49 49.74	2.4485	17 16 26.3	4.306
20	14 56 54.37	2.3467	12 2 11.0	8.760	20	16 52 16.69	2.4498	17 20 41.3	4.193
21	14 59 15.25	2.3493	12 10 54.4	8.686	21	16 54 43.72	2.4510	17 24 49.5	4.080
22	15 1 36.29	2.3518	12 19 33.3	8.610	22	16 57 10.81	2.4521	17 28 50.9	3.967
23	15 3 57.47	2.3543	12 28 7.6	8.534	23	16 59 37.97	2.4532	17 32 45.5	3.853
24	15 6 18.81	2.3569	−12 36 37.4	− 8.457	24	17 2 5.20	2.4543	−17 36 33.3	−3.739

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 24.					JULY 26.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 2 5.20	2.4543	−17 36 33.3	−3.739	0	18 59 45.20	2.4206	−18 20 19.3	+1.903
1	17 4 32.48	2.4553	17 40 14.2	3.624	1	19 2 10.36	2.4181	18 18 21.8	2.015
2	17 6 59.83	2.4562	17 43 48.2	3.508	2	19 4 35.37	2.4155	18 16 17.5	2.128
3	17 9 27.22	2.4569	17 47 15.2	3.393	3	19 7 0.22	2.4129	18 14 6.4	2.240
4	17 11 54.66	2.4577	17 50 35.3	3.278	4	19 9 24.92	2.4102	18 11 48.7	2.351
5	17 14 22.15	2.4584	17 53 48.5	3.162	5	19 11 49.45	2.4075	18 9 24.3	2.462
6	17 16 49.67	2.4590	17 56 54.7	3.044	6	19 14 13.82	2.4048	18 6 53.3	2.572
7	17 19 17.23	2.4597	17 59 53.8	2.927	7	19 16 38.02	2.4019	18 4 15.7	2.681
8	17 21 44.83	2.4602	18 2 46.0	2.811	8	19 19 2.05	2.3991	18 1 31.6	2.790
9	17 24 12.45	2.4605	18 5 31.1	2.693	9	19 21 25.91	2.3961	17 58 40.9	2.898
10	17 26 40.09	2.4609	18 8 9.1	2.575	10	19 23 49.58	2.3930	17 55 43.8	3.006
11	17 29 7.76	2.4612	18 10 40.1	2.457	11	19 26 13.07	2.3899	17 52 40.2	3.113
12	17 31 35.44	2.4614	18 13 3.9	2.338	12	19 28 36.37	2.3868	17 49 30.2	3.220
13	17 34 3.13	2.4616	18 15 20.7	2.220	13	19 30 59.48	2.3836	17 46 13.8	3.326
14	17 36 30.83	2.4618	18 17 30.3	2.102	14	19 33 22.40	2.3803	17 42 51.1	3.430
15	17 38 58.54	2.4618	18 19 32.9	1.983	15	19 35 45.12	2.3771	17 39 22.2	3.534
16	17 41 26.24	2.4616	18 21 28.3	1.863	16	19 38 7.65	2.3738	17 35 47.0	3.638
17	17 43 53.93	2.4615	18 23 16.5	1.741	17	19 40 29.97	2.3703	17 32 5.6	3.741
18	17 46 21.62	2.4613	18 24 57.6	1.625	18	19 42 52.08	2.3668	17 28 18.1	3.843
19	17 48 49.29	2.4610	18 26 31.5	1.506	19	19 45 13.99	2.3634	17 24 24.4	3.943
20	17 51 16.94	2.4607	18 27 58.3	1.387	20	19 47 35.69	2.3598	17 20 24.7	4.045
21	17 53 44.57	2.4602	18 29 18.0	1.268	21	19 49 57.17	2.3562	17 16 19.0	4.145
22	17 56 12.16	2.4597	18 30 30.4	1.148	22	19 52 18.44	2.3526	17 12 7.3	4.244
23	17 58 39.73	2.4592	−18 31 35.7	−1.028	23	19 54 39.48	2.3489	−17 7 49.7	+4.342
	JULY 25.					JULY 27.			
0	18 1 7.26	2.4585	−18 32 33.8	−0.908	0	19 57 0.31	2.3452	−17 3 26.2	+4.440
1	18 3 34.75	2.4578	18 33 24.7	0.789	1	19 59 20.91	2.3414	16 58 56.9	4.537
2	18 6 2.19	2.4570	18 34 8.5	0.670	2	20 1 41.28	2.3377	16 54 21.8	4.633
3	18 8 29.59	2.4561	18 34 45.1	0.550	3	20 4 1.43	2.3338	16 49 40.9	4.728
4	18 10 56.92	2.4551	18 35 14.5	0.431	4	20 6 21.34	2.3299	16 44 54.4	4.822
5	18 13 24.20	2.4541	18 35 36.8	0.312	5	20 8 41.02	2.3261	16 40 2.3	4.915
6	18 15 51.41	2.4530	18 35 52.0	0.194	6	20 11 0.47	2.3222	16 35 4.6	5.007
7	18 18 18.56	2.4518	18 36 0.1	−0.075	7	20 13 19.68	2.3182	16 30 1.4	5.099
8	18 20 45.63	2.4505	18 36 1.0	+0.044	8	20 15 38.65	2.3141	16 24 52.7	5.190
9	18 23 12.62	2.4492	18 35 54.8	0.163	9	20 17 57.37	2.3101	16 19 38.6	5.280
10	18 25 39.53	2.4478	18 35 41.5	0.281	10	20 20 15.86	2.3061	16 14 19.1	5.369
11	18 28 6.35	2.4463	18 35 21.1	0.399	11	20 22 34.10	2.3019	16 8 54.3	5.457
12	18 30 33.09	2.4448	18 34 53.6	0.517	12	20 24 52.09	2.2978	16 3 24.3	5.544
13	18 32 59.73	2.4432	18 34 19.1	0.634	13	20 27 9.83	2.2937	15 57 49.0	5.631
14	18 35 26.27	2.4414	18 33 37.5	0.752	14	20 29 27.33	2.2895	15 52 8.6	5.716
15	18 37 52.70	2.4396	18 32 48.9	0.868	15	20 31 44.57	2.2853	15 46 23.1	5.801
16	18 40 19.02	2.4378	18 31 53.4	0.984	16	20 34 1.57	2.2812	15 40 32.5	5.884
17	18 42 45.23	2.4359	18 30 50.8	1.101	17	20 36 18.31	2.2768	15 34 37.0	5.967
18	18 45 11.33	2.4339	18 29 41.3	1.217	18	20 38 34.79	2.2727	15 28 36.5	6.048
19	18 47 37.30	2.4318	18 28 24.8	1.332	19	20 40 51.03	2.2684	15 22 31.2	6.128
20	18 50 3.14	2.4297	18 27 1.4	1.447	20	20 43 7.00	2.2641	15 16 21.1	6.209
21	18 52 28.86	2.4276	18 25 31.2	1.561	21	20 45 22.72	2.2598	15 10 6.1	6.288
22	18 54 54.45	2.4253	18 23 54.1	1.676	22	20 47 38.17	2.2554	15 3 46.5	6.365
23	18 57 19.89	2.4229	18 22 10.1	1.790	23	20 49 53.37	2.2512	14 57 22.3	6.442
24	18 59 45.20	2.4206	−18 20 19.3	+1.903	24	20 52 8.31	2.2468	−14 50 53.4	+6.519

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 28.					JULY 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 52 8.31	2.2468	−14 50 53.4	+6.519	0	22 35 4.01	2.0479	−8 28 35.7	+9.051
1	20 54 22.99	2.2425	14 44 20.0	6.593	1	22 37 6.78	2.0443	8 19 31.7	9.082
2	20 56 37.41	2.2382	14 37 42.2	6.667	2	22 39 9.33	2.0408	8 10 25.9	9.111
3	20 58 51.57	2 2338	14 30 59.9	6.741	3	22 41 11.67	2.0373	8 1 18.4	9.140
4	21 1 5.46	2.2294	14 24 13.3	6.813	4	22 43 13.80	2.0338	7 52 9.1	9.168
5	21 3 19.10	2.2251	14 17 22.3	6.885	5	22 45 15.72	2.0303	7 42 58.2	9.195
6	21 5 32.47	2.2207	14 10 27.1	6.955	6	22 47 17.43	2.0268	7 33 45.7	9.222
7	21 7 45.58	2.2163	14 3 27.7	7.023	7	22 49 18.94	2.0235	7 24 31.6	9.248
8	21 9 58.43	2.2120	13 56 24.3	7.092	8	22 51 20.25	2.0203	7 15 16.0	9.273
9	21 12 11.02	2.2077	13 49 16.7	7.160	9	22 53 21.37	2.0169	7 5 58.9	9.296
10	21 14 23.35	2.2033	13 42 5.1	7.227	10	22 55 22.28	2.0136	6 56 40.5	9.319
11	21 16 35.41	2.1988	13 34 49.5	7.292	11	22 57 23.00	2.0104	6 47 20.6	9.342
12	21 18 47.21	2.1945	13 27 30.1	7.356	12	22 59 23.53	2.0073	6 37 59.5	9.363
13	21 20 58.75	2.1902	13 20 6.8	7.419	13	23 1 23.87	2.0041	6 28 37.1	9.384
14	21 23 10.03	2.1858	13 12 39.8	7.482	14	23 3 24.02	2.0010	6 19 13.4	9.404
15	21 25 21.04	2.1813	13 5 9.0	7.543	15	23 5 23.99	1.9979	6 9 48.6	9.423
16	21 27 31.79	2.1771	12 57 34.6	7.604	16	23 7 23.77	1.9949	6 0 22.6	9.442
17	21 29 42.29	2.1728	12 49 56.5	7.664	17	23 9 23.38	1.9919	5 50 55.6	9.459
18	21 31 52.53	2.1684	12 42 14.9	7.722	18	23 11 22.80	1.9889	5 41 27.5	9.477
19	21 34 2.50	2.1641	12 34 29.8	7.780	19	23 13 22.05	1.9861	5 31 58.3	9.493
20	21 36 12.22	2.1598	12 26 41.3	7.837	20	23 15 21.13	1.9833	5 22 28.3	9.508
21	21 38 21.68	2.1556	12 18 49.4	7.893	21	23 17 20.04	1.9804	5 12 57.3	9.523
22	21 40 30.89	2.1513	12 10 54.2	7.948	22	23 19 18.78	1.9777	5 3 25.5	9.537
23	21 42 39.84	2.1470	−12 2 55.7	+8.002	23	23 21 17.36	1.9749	−4 53 52.8	+9.551
	JULY 29.					JULY 31.			
0	21 44 48.53	2.1428	−11 54 54.0	+8.054	0	23 23 15.77	1.9722	−4 44 19.4	+9.563
1	21 46 56.97	2.1386	11 46 49.2	8.107	1	23 25 14.02	1.9696	4 34 45.2	9.575
2	21 49 5.16	2.1343	11 38 41.2	8.158	2	23 27 12.12	1.9670	4 25 10.4	9.586
3	21 51 13.09	2.1302	11 30 30.3	8.208	3	23 29 10.06	1.9644	4 15 34.9	9.597
4	21 53 20.78	2.1260	11 22 16.3	8.257	4	23 31 7.85	1.9620	4 5 58.8	9.607
5	21 55 28.21	2.1218	11 13 59.4	8.305	5	23 33 5.50	1.9595	3 56 22.1	9.616
6	21 57 35.40	2.1178	11 5 39.7	8.352	6	23 35 2.99	1.9570	3 46 44.9	9.624
7	21 59 42.35	2.1137	10 57 17.1	8.399	7	23 37 0.34	1.9547	3 37 7.2	9.632
8	22 1 49.04	2.1095	10 48 51.8	8.444	8	23 38 57.55	1.9524	3 27 29.1	9.639
9	22 3 55.49	2.1055	10 40 23.8	8.489	9	23 40 54.63	1.9502	3 17 50.5	9.646
10	22 6 1.70	2.1015	10 31 53.1	8.533	10	23 42 51.57	1.9478	3 8 11.6	9.651
11	22 8 7.67	2.0974	10 23 19.8	8.576	11	23 44 48.37	1.9456	2 58 32.4	9.656
12	22 10 13.39	2.0934	10 14 44.0	8.618	12	23 46 45.04	1.9435	2 48 52.9	9.661
13	22 12 18.88	2.0895	10 6 5.7	8.658	13	23 48 41.59	1.9414	2 39 13.1	9.664
14	22 14 24.13	2.0855	9 57 25.0	8.698	14	23 50 38.01	1.9393	2 29 33.2	9.667
15	22 16 29.14	2.0817	9 48 41.9	8.737	15	23 52 34.30	1.9373	2 19 53.1	9.670
16	22 18 33.93	2.0778	9 39 56.5	8.776	16	23 54 30.48	1.9354	2 10 12.8	9.672
17	22 20 38.48	2.0739	9 31 8.8	8.813	17	23 56 26.55	1.9334	2 0 32.5	9.673
18	22 22 42.80	2.0701	9 22 18.9	8.850	18	23 58 22.49	1.9315	1 50 52.1	9.673
19	22 24 46.89	2.0663	9 13 26.8	8.886	19	0 0 18.33	1.9297	1 41 11.7	9.673
20	22 26 50.76	2.0627	9 4 32.6	8.921	20	0 2 14.06	1.9280	1 31 31.3	9.672
21	22 28 54.41	2.0589	8 55 36.3	8.954	21	0 4 9.69	1.9263	1 21 51.0	9.671
22	22 30 57.83	2.0552	8 46 38.1	8.987	22	0 6 5.21	1.9245	1 12 10.8	9.669
23	22 33 1.03	2.0515	8 37 37.8	9.020	23	0 8 0.63	1.9229	1 2 30.7	9.667
24	22 35 4.01	2.0479	− 8 28 35.7	+9.051	24	0 9 55.96	1.9213	−0 52 50.8	+9.663

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 1.					AUGUST 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 9 55.96	1.9213	−0 52 50.8	+9.663	0	1 41 13.49	1.9005	+ 6 36 35.5	+8.858
1	0 11 51.19	1.9198	0 43 11.1	9.660	1	1 43 7.54	1.9012	6 45 26.1	8.829
2	0 13 46.34	1.9183	0 33 31.6	9.655	2	1 45 1.64	1.9020	6 54 15.0	8.799
3	0 15 41.39	1.9168	0 23 52.5	9.650	3	1 46 55.78	1.9028	7 3 2.0	8.768
4	0 17 36.36	1.9154	0 14 13.6	9.645	4	1 48 49.97	1.9036	7 11 47.2	8.738
5	0 19 31.24	1.9141	−0 4 35.1	9.638	5	1 50 44.21	1.9045	7 20 30.6	8.707
6	0 21 26.05	1.9128	+0 5 3.0	9.632	6	1 52 38.51	1.9055	7 29 12.0	8.673
7	0 23 20.78	1.9115	0 14 40.7	9.624	7	1 54 32.87	1.9064	7 37 51.4	8.642
8	0 25 15.43	1.9103	0 24 17.9	9.617	8	1 56 27.28	1.9073	7 46 29.0	8.609
9	0 27 10.01	1.9092	0 33 54.7	9.608	9	1 58 21.75	1.9084	7 55 4.5	8.575
10	0 29 4.53	1.9080	0 43 30.9	9.598	10	2 0 16.29	1.9095	8 3 38.0	8.541
11	0 30 58.97	1.9069	0 53 6.5	9.589	11	2 2 10.89	1.9107	8 12 9.4	8.507
12	0 32 53.36	1.9060	1 2 41.6	9.580	12	2 4 5.57	1.9119	8 20 38.8	8.472
13	0 34 47.69	1.9050	1 12 16.1	9.568	13	2 6 0.32	1.9131	8 29 6.1	8.437
14	0 36 41.96	1.9040	1 21 49.8	9.557	14	2 7 55.14	1.9143	8 37 31.2	8.400
15	0 38 36.17	1.9032	1 31 22.9	9.546	15	2 9 50.03	1.9156	8 45 54.1	8.363
16	0 40 30.34	1.9023	1 40 55.3	9.533	16	2 11 45.01	1.9170	8 54 14.8	8.327
17	0 42 24.45	1.9015	1 50 26.8	9.519	17	2 13 40.07	1.9184	9 2 33.3	8.289
18	0 44 18.52	1.9008	1 59 57.6	9.507	18	2 15 35.22	1.9198	9 10 49.5	8.252
19	0 46 12.55	1.9002	2 9 27.6	9.493	19	2 17 30.45	1.9213	9 19 3.5	8.213
20	0 48 6.54	1.8995	2 18 56.7	9.478	20	2 19 25.77	1.9228	9 27 15.1	8.174
21	0 50 0.49	1.8989	2 28 24.9	9.463	21	2 21 21.18	1.9243	9 35 24.4	8.135
22	0 51 54.41	1.8983	2 37 52.2	9.447	22	2 23 16.69	1.9259	9 43 31.3	8.094
23	0 53 48.29	1.8978	+2 47 18.5	+9.431	23	2 25 12.29	1.9275	+ 9 51 35.7	+8.054
	AUGUST 2.					AUGUST 4.			
0	0 55 42.15	1.8974	+2 56 43.9	+9.414	0	2 27 7.99	1.9292	+ 9 59 37.8	+8.014
1	0 57 35.98	1.8970	3 6 8.2	9.397	1	2 29 3.79	1.9309	10 7 37.4	7.972
2	0 59 29.79	1.8967	3 15 31.5	9.379	2	2 30 59.70	1.9327	10 15 34.4	7.930
3	1 1 23.58	1.8963	3 24 53.7	9.361	3	2 32 55.71	1.9344	10 23 29.0	7.887
4	1 3 17.35	1.8961	3 34 14.8	9.342	4	2 34 51.83	1.9363	10 31 20.9	7.844
5	1 5 11.11	1.8959	3 43 34.8	9.323	5	2 36 48.07	1.9382	10 39 10.3	7.802
6	1 7 4.86	1.8957	3 52 53.5	9.303	6	2 38 44.41	1.9400	10 46 57.1	7.758
7	1 8 58.59	1.8955	4 2 11.1	9.283	7	2 40 40.87	1.9419	10 54 41.2	7.713
8	1 10 52.32	1.8955	4 11 27.5	9.262	8	2 42 37.44	1.9438	11 2 22.6	7.668
9	1 12 46.05	1.8955	4 20 42.5	9.240	9	2 44 34.13	1.9459	11 10 1.3	7.622
10	1 14 39.78	1.8955	4 29 56.3	9.218	10	2 46 30.95	1.9480	11 17 37.2	7.576
11	1 16 33.51	1.8956	4 39 8.7	9.196	11	2 48 27.89	1.9500	11 25 10.4	7.529
12	1 18 27.25	1.8957	4 48 19.8	9.173	12	2 50 24.95	1.9521	11 32 40.7	7.482
13	1 20 20.99	1.8958	4 57 29.5	9.150	13	2 52 22.14	1.9543	11 40 8.2	7.434
14	1 22 14.75	1.8961	5 6 37.8	9.126	14	2 54 19.47	1.9565	11 47 32.8	7.386
15	1 24 8.52	1.8963	5 15 44.6	9.101	15	2 56 16.92	1.9587	11 54 54.5	7.337
16	1 26 2.30	1.8966	5 24 49.9	9.076	16	2 58 14.51	1.9609	12 2 13.3	7.288
17	1 27 56.11	1.8969	5 33 53.7	9.051	17	3 0 12.23	1.9632	12 9 29.1	7.238
18	1 29 49.93	1.8973	5 42 56.0	9.025	18	3 2 10.09	1.9655	12 16 41.9	7.188
19	1 31 43.78	1.8978	5 51 56.7	8.998	19	3 4 8.09	1.9678	12 23 51.6	7.137
20	1 33 37.66	1.8983	6 0 55.7	8.971	20	3 6 6.23	1.9702	12 30 58.3	7.086
21	1 35 31.57	1.8988	6 9 53.2	8.944	21	3 8 4.52	1.9727	12 38 1.9	7.034
22	1 37 25.51	1.8993	6 18 49.0	8.916	22	3 10 2.95	1.9751	12 45 2.4	6.982
23	1 39 19.48	1.8998	6 27 43.1	8.887	23	3 12 1.53	1.9776	12 51 59.7	6.928
24	1 41 13.49	1.9005	+6 36 35.5	+8.858	24	3 14 0.26	1.9800	+12 58 53.8	+6.875

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 5.			
	h m s	s	° ′ ″	″
0	3 14 0.26	1.9800	+12 58 53.8	+6.875
1	3 15 59.13	1.9826	13 5 44.7	6.822
2	3 17 58.17	1.9852	13 12 32.4	6.767
3	3 19 57.36	1.9878	13 19 16.7	6.712
4	3 21 56.70	1.9903	13 25 57.8	6.657
5	3 23 56.19	1.9929	13 32 35.5	6.600
6	3 25 55.85	1.9957	13 39 9.8	6.542
7	3 27 55.67	1.9983	13 45 40.6	6.486
8	3 29 55.65	2.0010	13 52 8.1	6.428
9	3 31 55.79	2.0038	13 58 32.0	6.369
10	3 33 56.10	2.0066	14 4 52.4	6.311
11	3 35 56.58	2.0094	14 11 9.3	6.252
12	3 37 57.23	2.0122	14 17 22.6	6.192
13	3 39 58.05	2.0151	14 23 32.3	6.131
14	3 41 59.04	2.0179	14 29 38.3	6.069
15	3 44 0.20	2.0208	14 35 40.6	6.007
16	3 46 1.53	2.0237	14 41 39.2	5.945
17	3 48 3.04	2.0267	14 47 34.0	5.883
18	3 50 4.73	2.0296	14 53 25.1	5.820
19	3 52 6.59	2.0325	14 59 12.4	5.756
20	3 54 8.63	2.0355	15 4 55.8	5.691
21	3 56 10.85	2.0386	15 10 35.3	5.626
22	3 58 13.26	2.0416	15 16 10.9	5.560
23	4 0 15.84	2.0446	+15 21 42.5	+5.493
	AUGUST 6.			
0	4 2 18.61	2.0477	+15 27 10.1	+5.427
1	4 4 21.56	2.0508	15 32 33.7	5.360
2	4 6 24.70	2.0538	15 37 53.3	5.292
3	4 8 28.02	2.0569	15 43 8.8	5.224
4	4 10 31.53	2.0601	15 48 20.2	5.154
5	4 12 35.23	2.0632	15 53 27.3	5.084
6	4 14 39.11	2.0663	15 58 30.3	5.015
7	4 16 43.19	2.0695	16 3 29.1	4.945
8	4 18 47.45	2.0726	16 8 23.7	4.873
9	4 20 51.90	2.0757	16 13 13.9	4.801
10	4 22 56.54	2.0789	16 17 59.8	4.729
11	4 25 1.37	2.0822	16 22 41.4	4.656
12	4 27 6.40	2.0853	16 27 18.5	4.582
13	4 29 11.61	2.0885	16 31 51.2	4.508
14	4 31 17.02	2.0918	16 36 19.5	4.434
15	4 33 22.63	2.0950	16 40 43.3	4.358
16	4 35 28.42	2.0982	16 45 2.5	4.283
17	4 37 34.41	2.1014	16 49 17.2	4.207
18	4 39 40.59	2.1047	16 53 27.3	4.129
19	4 41 46.97	2.1079	16 57 32.7	4.052
20	4 43 53.54	2.1111	17 1 33.5	3.974
21	4 46 0.30	2.1143	17 5 29.6	3.895
22	4 48 7.26	2.1176	17 9 20.9	3.816
23	4 50 14.41	2.1208	17 13 7.5	3.737
24	4 52 21.75	2.1239	+17 16 49.3	+3.657

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 7.			
	h m s	s	° ′ ″	″
0	4 52 21.75	2.1239	+17 16 49.3	+3.657
1	4 54 29.28	2.1272	17 20 26.3	3.576
2	4 56 37.02	2.1305	17 23 58.4	3.493
3	4 58 44.94	2.1337	17 27 25.5	3.412
4	5 0 53.06	2.1369	17 30 47.8	3.330
5	5 3 1.37	2.1401	17 34 5.1	3.247
6	5 5 9.87	2.1433	17 37 17.4	3.163
7	5 7 18.56	2.1465	17 40 24.7	3.080
8	5 9 27.45	2.1497	17 43 27.0	2.995
9	5 11 36.52	2.1528	17 46 24.1	2.909
10	5 13 45.79	2.1560	17 49 16.1	2.824
11	5 15 55.24	2.1591	17 52 3.0	2.738
12	5 18 4.88	2.1623	17 54 44.7	2.652
13	5 20 14.71	2.1654	17 57 21.2	2.564
14	5 22 24.73	2.1685	17 59 52.4	2.477
15	5 24 34.93	2.1716	18 2 18.4	2.388
16	5 26 45.32	2.1747	18 4 39.0	2.299
17	5 28 55.90	2.1778	18 6 54.3	2.211
18	5 31 6.66	2.1808	18 9 4.3	2.121
19	5 33 17.60	2.1838	18 11 8.8	2.030
20	5 35 28.72	2.1869	18 13 7.9	1.940
21	5 37 40.03	2.1899	18 15 1.6	1.849
22	5 39 51.51	2.1928	18 16 49.8	1.757
23	5 42 3.16	2.1958	+18 18 32.5	+1.665
	AUGUST 8.			
0	5 44 15.00	2.1988	+18 20 9.6	+1.573
1	5 46 27.01	2.2017	18 21 41.2	1.480
2	5 48 39.20	2.2046	18 23 7.2	1.386
3	5 50 51.56	2.2074	18 24 27.5	1.292
4	5 53 4.09	2.2102	18 25 42.3	1.198
5	5 55 16.79	2.2131	18 26 51.3	1.103
6	5 57 29.66	2.2158	18 27 54.6	1.008
7	5 59 42.69	2.2186	18 28 52.2	0.913
8	6 1 55.89	2.2213	18 29 44.1	0.817
9	6 4 9.25	2.2241	18 30 30.3	0.721
10	6 6 22.78	2.2268	18 31 10.6	0.623
11	6 8 36.46	2.2293	18 31 45.1	0.527
12	6 10 50.30	2.2320	18 32 13.8	0.430
13	6 13 4.30	2.2346	18 32 36.7	0.332
14	6 15 18.45	2.2371	18 32 53.7	0.233
15	6 17 32.75	2.2396	18 33 4.7	0.134
16	6 19 47.20	2.2422	18 33 9.8	+0.036
17	6 22 1.81	2.2446	18 33 9.0	−0.063
18	6 24 16.55	2.2469	18 33 2.2	0.163
19	6 26 31.44	2.2494	18 32 49.4	0.263
20	6 28 46.48	2.2518	18 32 30.6	0.363
21	6 31 1.65	2.2540	18 32 5.8	0.463
22	6 33 16.96	2.2562	18 31 35.0	0.564
23	6 35 32.40	2.2585	18 30 58.1	0.665
24	6 37 47.98	2.2608	+18 30 15.2	−0.766

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 9.			
	h m s	s	° ′ ″	″
0	6 37 47.98	2.2608	+18 30 15.2	−0.766
1	6 40 3.69	2.2629	18 29 26.2	0.868
2	6 42 19.53	2.2651	18 28 31.1	0.970
3	6 44 35.50	2.2672	18 27 29.8	1.072
4	6 46 51.59	2.2691	18 26 22.5	1.173
5	6 49 7.79	2.2711	18 25 9.0	1.276
6	6 51 24.12	2.2732	18 23 49.4	1.378
7	6 53 40.57	2.2751	18 22 23.6	1.482
8	6 55 57.13	2.2769	18 20 51.6	1.584
9	6 58 13.80	2.2788	18 19 13.5	1.687
10	7 0 30.59	2.2807	18 17 29.2	1.791
11	7 2 47.48	2.2823	18 15 38.6	1.894
12	7 5 4.47	2.2840	18 13 41.9	1.997
13	7 7 21.56	2.2857	18 11 38.9	2.101
14	7 9 38.76	2.2874	18 9 29.8	2.204
15	7 11 56.05	2.2889	18 7 14.4	2.309
16	7 14 13.43	2.2905	18 4 52.7	2.413
17	7 16 30.91	2.2921	18 2 24.9	2.516
18	7 18 48.48	2.2935	17 59 50.8	2.620
19	7 21 6.13	2.2949	17 57 10.5	2.723
20	7 23 23.87	2.2963	17 54 24.0	2.827
21	7 25 41.69	2.2976	17 51 31.2	2.932
22	7 27 59.58	2.2988	17 48 32.2	3.036
23	7 30 17.55	2.3002	+17 45 26.9	−3.140
	AUGUST 10.			
0	7 32 35.60	2.3013	+17 42 15.4	−3.243
1	7 34 53.71	2.3025	17 38 57.7	3.347
2	7 37 11.90	2.3037	17 35 33.7	3.452
3	7 39 30.15	2.3047	17 32 3.5	3.555
4	7 41 48.46	2.3057	17 28 27.1	3.658
5	7 44 6.83	2.3067	17 24 44.5	3.762
6	7 46 25.26	2.3076	17 20 55.7	3.866
7	7 48 43.74	2.3085	17 17 0.6	3.969
8	7 51 2.28	2.3093	17 12 59.4	4.071
9	7 53 20.86	2.3101	17 8 52.1	4.174
10	7 55 39.49	2.3109	17 4 38.5	4.277
11	7 57 58.17	2.3117	17 0 18.8	4.379
12	8 0 16.89	2.3123	16 55 53.0	4.482
13	8 2 35.65	2.3129	16 51 21.0	4.583
14	8 4 54.44	2.3135	16 46 43.0	4.685
15	8 7 13.27	2.3141	16 41 58.8	4.787
16	8 9 32.13	2.3146	16 37 8.5	4.888
17	8 11 51.02	2.3151	16 32 12.2	4.989
18	8 14 9.94	2.3155	16 27 9.8	5.090
19	8 16 28.88	2.3158	16 22 1.4	5.190
20	8 18 47.84	2.3162	16 16 47.0	5.290
21	8 21 6.82	2.3165	16 11 26.6	5.390
22	8 23 25.82	2.3168	16 6 0.2	5.489
23	8 25 44.84	2.3171	16 0 27.9	5.588
24	8 28 3.87	2.3173	+15 54 49.7	−5.686

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 11.			
	h m s	s	° ′ ″	″
0	8 28 3.87	2.3173	+15 54 49.7	−5.686
1	8 30 22.91	2.3174	15 49 5.6	5.784
2	8 32 41.96	2.3176	15 43 15.6	5.882
3	8 35 1.02	2.3177	15 37 19.7	5.980
4	8 37 20.08	2.3177	15 31 18.0	6.076
5	8 39 39.14	2.3177	15 25 10.6	6.172
6	8 41 58.20	2.3177	15 18 57.4	6.268
7	8 44 17.26	2.3177	15 12 38.4	6.363
8	8 46 36.32	2.3176	15 6 13,8	6.458
9	8 48 55.37	2.3175	14 59 43.5	6.553
10	8 51 14.42	2.3173	14 53 7.5	6.647
11	8 53 33.45	2.3171	14 46 25.9	6.739
12	8 55 52.47	2.3169	14 39 38.8	6.832
13	8 58 11.48	2.3167	14 32 46.1	6.924
14	9 0 30.47	2.3164	14 25 47.9	7.015
15	9 2 49.45	2.3162	14 18 44.3	7.106
16	9 5 8.41	2.3158	14 11 35.2	7.197
17	9 7 27.35	2.3154	14 4 20.7	7.286
18	9 9 46.26	2.3150	13 57 0.9	7.375
19	9 12 5.15	2.3147	13 49 35.7	7.463
20	9 14 24.03	2.3143	13 42 5.3	7.550
21	9 16 42.87	2.3138	13 34 29.7	7.637
22	9 19 1.69	2.3133	13 26 48.9	7.723
23	9 21 20.47	2.3128	+13 19 2.9	−7.809
	AUGUST 12.			
0	9 23 39.23	2.3122	+13 11 11.8	−7.893
1	9 25 57.95	2.3118	13 3 15.7	7.977
2	9 28 16.65	2.3113	12 55 14.5	8.061
3	9 30 35.31	2.3107	12 47 8.4	8.143
4	9 32 53.93	2.3101	12 38 57.4	8.223
5	9 35 12.52	2.3095	12 30 41.6	8.304
6	9 37 31.07	2.3088	12 22 20.9	8.385
7	9 39 49.58	2.3082	12 13 55.4	8.464
8	9 42 8.06	2.3077	12 5 25.2	8.542
9	9 44 26.50	2.3069	11 56 50.4	8.619
10	9 46 44.89	2.3062	11 48 10.9	8.696
11	9 49 3.25	2.3056	11 39 26.9	8.772
12	9 51 21.56	2.3048	11 30 38.3	8.847
13	9 53 39.83	2.3042	11 21 45.3	8.920
14	9 55 58.06	2.3034	11 12 47.9	8.993
15	9 58 16.24	2.3027	11 3 46.1	9.066
16	10 0 34.38	2.3020	10 54 40.0	9.137
17	10 2 52.48	2.3012	10 45 29.7	9.207
18	10 5 10.53	2.3004	10 36 15.2	9.277
19	10 7 28.53	2.2997	10 26 56.5	9.345
20	10 9 46.50	2.2991	10 17 33.8	9.412
21	10 12 4.42	2.2983	10 8 7.1	9.478
22	10 14 22.29	2.2974	9 58 36.4	9.544
23	10 16 40.11	2.2967	9 49 1.8	9.608
24	10 18 57.89	2.2959	+ 9 39 23.4	−9.672

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 13.			
	h m s	s	° ′ ″	″
0	10 18 57.89	2.2959	+9 39 23.4	− 9.672
1	10 21 15.62	2.2952	9 29 41.2	9.734
2	10 23 33.31	2.2944	9 19 55.3	9.795
3	10 25 50.95	2.2936	9 10 5.8	9.856
4	10 28 8.54	2.2928	9 0 12.6	9.916
5	10 30 26.09	2.2922	8 50 15.9	9.973
6	10 32 43.60	2.2914	8 40 15.8	10.030
7	10 35 1.06	2.2906	8 30 12.3	10.087
8	10 37 18.47	2.2898	8 20 5.4	10.142
9	10 39 35.84	2.2892	8 9 55.2	10.196
10	10 41 53.17	2.2884	7 59 41.9	10.248
11	10 44 10.45	2.2876	7 49 25.4	10.301
12	10 46 27.68	2.2868	7 39 5.8	10.352
13	10 48 44.87	2.2862	7 28 43.2	10.401
14	10 51 2.03	2.2856	7 18 17.7	10.449
15	10 53 19.14	2.2848	7 7 49.3	10.497
16	10 55 36.21	2.2842	6 57 18.1	10.543
17	10 57 53.24	2.2835	6 46 44.2	10.588
18	11 0 10.23	2.2828	6 36 7.6	10.632
19	11 2 27.18	2.2822	6 25 28.3	10.675
20	11 4 44.09	2.2816	6 14 46.6	10.716
21	11 7 0.97	2.2811	6 4 2.4	10.757
22	11 9 17.82	2.2805	5 53 15.7	10.797
23	11 11 34.63	2.2798	+5 42 26.8	−10.834
	AUGUST 14.			
0	11 13 51.40	2.2792	+5 31 35.6	−10.872
1	11 16 8.14	2.2787	5 20 42.2	10.908
2	11 18 24.84	2.2782	5 9 46.7	10.943
3	11 20 41.52	2.2777	4 58 49.1	10.976
4	11 22 58.17	2.2773	4 47 49.6	11.008
5	11 25 14.79	2.2768	4 36 48.1	11.039
6	11 27 31.39	2.2764	4 25 44.9	11.069
7	11 29 47.96	2.2759	4 14 39.8	11.098
8	11 32 4.50	2.2755	4 3 33.1	11.126
9	11 34 21.02	2.2752	3 52 24.7	11.153
10	11 36 37.52	2.2748	3 41 14.8	11.178
11	11 38 53.99	2.2744	3 30 3.4	11.202
12	11 41 10.45	2.2741	3 18 50.6	11.224
13	11 43 26.88	2.2738	3 7 36.5	11.246
14	11 45 43.31	2.2737	2 56 21.1	11.266
15	11 47 59.72	2.2733	2 45 4.6	11.284
16	11 50 16.11	2.2732	2 33 47.0	11.302
17	11 52 32.50	2.2730	2 22 28.3	11.320
18	11 54 48.87	2.2728	2 11 8.6	11.335
19	11 57 5.23	2.2727	1 59 48.1	11.349
20	11 59 21.59	2.2726	1 48 26.7	11.362
21	12 1 37.94	2.2724	1 37 4.6	11.374
22	12 3 54.28	2.2723	1 25 41.8	11.385
23	12 6 10.62	2.2723	1 14 18.4	11.394
24	12 8 26.96	2.2723	+1 2 54.5	−11.403

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 15.			
	h m s	s	° ′ ″	″
0	12 8 26.96	2.2723	+1 2 54.5	−11.403
1	12 10 43.30	2.2724	0 51 30.1	11.409
2	12 12 59.65	2.2724	0 40 5.4	11.415
3	12 15 15.99	2.2725	0 28 40.3	11.419
4	12 17 32.35	2.2727	0 17 15.1	11.422
5	12 19 48.71	2.2728	+0 5 49.7	11.425
6	12 22 5.08	2.2729	−0 5 35.9	11.426
7	12 24 21.46	2.2732	0 17 1.4	11.425
8	12 26 37.86	2.2734	0 28 26.9	11.423
9	12 28 54.27	2.2736	0 39 52.2	11.420
10	12 31 10.69	2.2739	0 51 17.3	11.416
11	12 33 27.14	2.2742	1 2 42.1	11.409
12	12 35 43.60	2.2745	1 14 6.4	11.402
13	12 38 0.08	2.2749	1 25 30.4	11.396
14	12 40 16.59	2.2753	1 36 53.9	11.387
15	12 42 33.12	2.2758	1 48 16.8	11.376
16	12 44 49.68	2.2763	1 59 39.0	11.365
17	12 47 6.27	2.2768	2 11 0.6	11.352
18	12 49 22.89	2.2773	2 22 21.3	11.338
19	12 51 39.54	2.2778	2 33 41.1	11.323
20	12 53 56.23	2.2784	2 45 0.0	11.307
21	12 56 12.95	2.2789	2 56 17.9	11.289
22	12 58 29.70	2.2796	3 7 34.7	11.271
23	13 0 46.50	2.2803	−3 18 50.4	−11.251
	AUGUST 16.			
0	13 3 3.34	2.2810	−3 30 4.8	−11.229
1	13 5 20.22	2.2817	3 41 17.9	11.206
2	13 7 37.15	2.2825	3 52 29.5	11.182
3	13 9 54.12	2.2833	4 3 39.8	11.158
4	13 12 11.15	2.2842	4 14 48.5	11.132
5	13 14 28.22	2.2849	4 25 55.6	11.105
6	13 16 45.34	2.2858	4 37 1.1	11.077
7	13 19 2.52	2.2867	4 48 4.8	11.048
8	13 21 19.75	2.2877	4 59 6.8	11.017
9	13 23 37.04	2.2887	5 10 6.8	10.984
10	13 25 54.39	2.2897	5 21 4.9	10.952
11	13 28 11.80	2.2907	5 32 1.0	10.918
12	13 30 29.27	2.2917	5 42 55.1	10.882
13	13 32 46.81	2.2928	5 53 46.9	10.845
14	13 35 4.41	2.2938	6 4 36.5	10.807
15	13 37 22.07	2.2949	6 15 23.8	10.768
16	13 39 39.80	2.2962	6 26 8.7	10.728
17	13 41 57.61	2.2973	6 36 51.2	10.687
18	13 44 15.48	2.2985	6 47 31.2	10.645
19	13 46 33.43	2.2997	6 58 8.6	10.601
20	13 48 51.45	2.3009	7 8 43.3	10.557
21	13 51 9.54	2.3022	7 19 15.4	10.511
22	13 53 27.71	2.3035	7 29 44.6	10.463
23	13 55 45.96	2.3048	7 40 11.0	10.416
24	13 58 4.29	2.3062	−7 50 34.5	−10.367

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 17.			
	h m s	s	° ′ ″	″
0	13 58 4.29	2.3062	− 7 50 34.5	−10.367
1	14 0 22.70	2.3075	8 0 55.0	10.317
2	14 2 41.19	2.3088	8 11 12.5	10.265
3	14 4 59.76	2.3102	8 21 26.8	10.212
4	14 7 18.42	2.3117	8 31 38.0	10.159
5	14 9 37.16	2.3131	8 41 45.9	10.104
6	14 11 55.99	2.3145	8 51 50.5	10.048
7	14 14 14.90	2.3159	9 1 51.7	9.992
8	14 16 33.90	2.3174	9 11 49.5	9.934
9	14 18 52.99	2.3190	9 21 43.8	9.875
10	14 21 12.18	2.3205	9 31 34.5	9.815
11	14 23 31.45	2.3220	9 41 21.6	9.754
12	14 25 50.82	2.3236	9 51 5.0	9.692
13	14 28 10.28	2.3252	10 0 44.6	9.628
14	14 30 29.84	2.3268	10 10 20.4	9.565
15	14 32 49.49	2.3283	10 19 52.4	9.499
16	14 35 9.23	2.3298	10 29 20.3	9.433
17	14 37 29.07	2.3315	10 38 44.3	9.367
18	14 39 49.01	2.3331	10 48 4.3	9.298
19	14 42 9.04	2.3347	10 57 20.1	9.228
20	14 44 29.17	2.3363	11 6 31.7	9.158
21	14 46 49.40	2.3380	11 15 39.0	9.087
22	14 49 9.73	2.3396	11 24 42.1	9.014
23	14 51 30.15	2.3413	−11 33 40.7	8.941
	AUGUST 18.			
0	14 53 50.68	2.3430	−11 42 35.0	− 8.867
1	14 56 11.31	2.3446	11 51 24.8	8.792
2	14 58 32.03	2.3462	12 0 10.1	8.716
3	15 0 52.85	2.3479	12 8 50.7	8.638
4	15 3 13.78	2.3496	12 17 26.7	8.562
5	15 5 34.80	2.3512	12 25 58.1	8.483
6	15 7 55.92	2.3528	12 34 24.6	8.403
7	15 10 17.14	2.3545	12 42 46.4	8.322
8	15 12 38.46	2.3562	12 51 3.3	8.240
9	15 14 59.88	2.3578	12 59 15.2	8.157
10	15 17 21.40	2.3595	13 7 22.2	8.074
11	15 19 43.02	2.3612	13 15 24.1	7.990
12	15 22 4.74	2.3628	13 23 21.0	7.906
13	15 24 26.55	2.3644	13 31 12.8	7.819
14	15 26 48.47	2.3661	13 38 59.3	7.732
15	15 29 10.48	2.3676	13 46 40.7	7.645
16	15 31 32.58	2.3692	13 54 16.7	7.556
17	15 33 54.79	2.3708	14 1 47.4	7.467
18	15 36 17.08	2.3723	14 9 12.7	7.377
19	15 38 39.47	2.3740	14 16 32.6	7.287
20	15 41 1.96	2.3755	14 23 47.1	7.195
21	15 43 24.53	2.3770	14 30 56.0	7.102
22	15 45 47.20	2.3785	14 37 59.3	7.009
23	15 48 9.95	2.3800	14 44 57.1	6.916
24	15 50 32.80	2.3815	−14 51 49.2	− 6.821

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 19.			
	h m s	s	° ′ ″	″
0	15 50 32.80	2.3815	−14 51 49.2	−6.821
1	15 52 55.73	2.3830	14 58 35.6	6.725
2	15 55 18.76	2.3844	15 5 16.2	6.629
3	15 57 41.86	2.3858	15 11 51.1	6.532
4	16 0 5.05	2.3872	15 18 20.1	6.435
5	16 2 28.32	2.3886	15 24 43.3	6.337
6	16 4 51.68	2.3899	15 31 0.5	6.238
7	16 7 15.11	2.3912	15 37 11.8	6.138
8	16 9 38.62	2.3925	15 43 17.1	6.038
9	16 12 2.21	2.3938	15 49 16.4	5.937
10	16 14 25.87	2.3950	15 55 9.6	5.836
11	16 16 49.61	2.3962	16 0 56.7	5.734
12	16 19 13.42	2.3974	16 6 37.7	5.632
13	16 21 37.30	2.3985	16 12 12.5	5.528
14	16 24 1.24	2.3996	16 17 41.1	5.425
15	16 26 25.25	2.4007	16 23 3.5	5.320
16	16 28 49.33	2.4018	16 28 19.5	5.215
17	16 31 13.47	2.4028	16 33 29.3	5.110
18	16 33 37.66	2.4037	16 38 32.7	5.004
19	16 36 1.91	2.4047	16 43 29.8	4.898
20	16 38 26.22	2.4056	16 48 20.5	4.791
21	16 40 50.58	2.4063	16 53 4.7	4.683
22	16 43 14.98	2.4072	16 57 42.5	4.576
23	16 45 39.44	2.4080	−17 2 13.8	−4.468
	AUGUST 20.			
0	16 48 3.94	2.4087	−17 6 38.6	−4.359
1	16 50 28.48	2.4093	17 10 56.9	4.250
2	16 52 53.06	2.4100	17 15 8.6	4.140
3	16 55 17.68	2.4107	17 19 13.7	4.030
4	16 57 42.34	2.4112	17 23 12.2	3.920
5	17 0 7.02	2.4117	17 27 4.1	3.810
6	17 2 31.74	2.4122	17 30 49.4	3.700
7	17 4 56.48	2.4126	17 34 28.1	3.588
8	17 7 21.25	2.4130	17 38 0.0	3.476
9	17 9 46.04	2.4133	17 41 25.2	3.361
10	17 12 10.84	2.4135	17 44 43.7	3.252
11	17 14 35.66	2.4137	17 47 55.5	3.140
12	17 17 0.49	2.4139	17 51 0.5	3.027
13	17 19 25.33	2.4141	17 53 58.7	2.914
14	17 21 50.18	2.4141	17 56 50.2	2.802
15	17 24 15.02	2.4141	17 59 34.9	2.688
16	17 26 39.87	2.4142	18 2 12.7	2.574
17	17 29 4.72	2.4140	18 4 43.8	2.461
18	17 31 29.55	2.4138	18 7 8.0	2.347
19	17 33 54.38	2.4137	18 9 25.4	2.233
20	17 36 19.19	2.4134	18 11 36.0	2.119
21	17 38 43.99	2.4131	18 13 39.7	2.005
22	17 41 8.76	2.4127	18 15 36.6	1.891
23	17 43 33.51	2.4123	18 17 26.6	1.776
24	17 45 58.24	2.4118	−18 19 9.7	−1.662

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 21.					AUGUST 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 45 58.24	2.4118	−18 19 9.7	−1.662	0	19 40 8.02	2.3247	−17 29 47.5	+3.594
1	17 48 22.93	2.4113	18 20 46.0	1.548	1	19 42 27.41	2.3217	17 26 8.9	3.693
2	17 50 47.60	2.4107	18 22 15.4	1.433	2	19 44 46.62	2.3187	17 22 24.3	3.792
3	17 53 12.22	2.4101	18 23 37.9	1.318	3	19 47 5.65	2.3157	17 18 33.9	3.888
4	17 55 36.81	2.4094	18 24 53.6	1.204	4	19 49 24.50	2.3125	17 14 37.7	3.985
5	17 58 1.35	2.4087	18 26 2.4	1.089	5	19 51 43.15	2.3093	17 10 35.7	4.082
6	18 0 25.85	2.4078	18 27 4.3	0.975	6	19 54 1.62	2.3062	17 6 27.9	4.177
7	18 2 50.29	2.4069	18 27 59.4	0.861	7	19 56 19.89	2.3029	17 2 14.5	4.272
8	18 5 14.68	2.4061	18 28 47.6	0.746	8	19 58 37.97	2.2997	16 57 55.3	4.366
9	18 7 39.02	2.4051	18 29 28.9	0.632	9	20 0 55.86	2.2965	16 53 30.6	4.458
10	18 10 3.29	2.4040	18 30 3.5	0.518	10	20 3 13.55	2.2931	16 49 0.3	4.552
11	18 12 27.50	2.4029	18 30 31.1	0.403	11	20 5 31.03	2.2898	16 44 24.4	4.644
12	18 14 51.64	2.4018	18 30 51.9	0.290	12	20 7 48.32	2.2865	16 39 43.0	4.735
13	18 17 15.71	2.4006	18 31 5.9	0.177	13	20 10 5.41	2.2831	16 34 56.2	4.826
14	18 19 39.71	2.3993	18 31 13.1	−0.063	14	20 12 22.29	2.2796	16 30 3.9	4.915
15	18 22 3.62	2.3979	18 31 13.5	+0.051	15	20 14 38.96	2.2762	16 25 6.4	5.003
16	18 24 27.46	2.3966	18 31 7.0	0.164	16	20 16 55.43	2.2728	16 20 3.5	5.092
17	18 26 51.21	2.3952	18 30 53.8	0.276	17	20 19 11.69	2.2693	16 14 55.3	5.180
18	18 29 14.88	2.3937	18 30 33.9	0.389	18	20 21 27.74	2.2658	16 9 41.9	5.266
19	18 31 38.45	2.3921	18 30 7.1	0.502	19	20 23 43.58	2.2622	16 4 23.4	5.352
20	18 34 1.93	2.3905	18 29 33.7	0.613	20	20 25 59.20	2.2587	15 58 59.7	5.437
21	18 36 25.31	2.3888	18 28 53.5	0.726	21	20 28 14.62	2.2551	15 53 30.9	5.522
22	18 38 48.59	2.3872	18 28 6.6	0.838	22	20 30 29.81	2.2514	15 47 57.1	5.605
23	18 41 11.77	2.3853	−18 27 13.0	+0.949	23	20 32 44.79	2.2479	−15 42 18.3	+5.687
	AUGUST 22.					AUGUST 24.			
0	18 43 34.83	2.3835	−18 26 12.7	+1.060	0	20 34 59.56	2.2443	−15 36 34.6	+5.769
1	18 45 57.79	2.3817	18 25 5.8	1.171	1	20 37 14.11	2.2406	15 30 46.0	5.850
2	18 48 20.63	2.3797	18 23 52.2	1.281	2	20 39 28.43	2.2369	15 24 52.6	5.931
3	18 50 43.35	2.3777	18 22 32.1	1.391	3	20 41 42.54	2.2333	15 18 54.3	6.010
4	18 53 5.95	2.3756	18 21 5.3	1.502	4	20 43 56.43	2.2297	15 12 51.4	6.088
5	18 55 28.42	2.3735	18 19 31.9	1.610	5	20 46 10.10	2.2259	15 6 43.8	6.166
6	18 57 50.77	2.3714	18 17 52.1	1.718	6	20 48 23.54	2.2222	15 0 31.5	6.243
7	19 0 12.99	2.3692	18 16 5.7	1.827	7	20 50 36.76	2.2185	14 54 14.7	6.318
8	19 2 35.08	2.3670	18 14 12.8	1.936	8	20 52 49.76	2.2148	14 47 53.3	6.394
9	19 4 57.03	2.3647	18 12 13.4	2.043	9	20 55 2.54	2.2111	14 41 27.4	6.468
10	19 7 18.84	2.3623	18 10 7.7	2.149	10	20 57 15.09	2.2073	14 34 57.1	6.542
11	19 9 40.51	2.3600	18 7 55.5	2.257	11	20 59 27.42	2.2036	14 28 22.4	6.614
12	19 12 2.04	2.3575	18 5 36.9	2.363	12	21 1 39.52	2.1998	14 21 43.4	6.686
13	19 14 23.41	2.3550	18 3 12.0	2.468	13	21 3 51.40	2.1961	14 15 0.1	6.757
14	19 16 44.64	2.3525	18 0 40.7	2.573	14	21 6 3.05	2.1924	14 8 12.5	6.827
15	19 19 5.71	2.3499	17 58 3.2	2.678	15	21 8 14.49	2.1887	14 1 20.8	6.896
16	19 21 26.63	2.3473	17 55 19.4	2.783	16	21 10 25.69	2.1848	13 54 25.0	6.964
17	19 23 47.39	2.3446	17 52 29.3	2.886	17	21 12 36.67	2.1812	13 47 25.1	7.032
18	19 26 7.98	2.3418	17 49 33.1	2.988	18	21 14 47.43	2.1774	13 40 21.1	7.099
19	19 28 28.41	2.3392	17 46 30.7	3.091	19	21 16 57.96	2.1736	13 33 13.2	7.164
20	19 30 48.68	2.3363	17 43 22.2	3.193	20	21 19 8.26	2.1698	13 26 1.4	7.229
21	19 33 8.77	2.3335	17 40 7.5	3.294	21	21 21 18.34	2.1661	13 18 45.7	7.293
22	19 35 28.70	2.3307	17 36 46.9	3.394	22	21 23 28.19	2.1624	13 11 26.3	7.356
23	19 37 48.45	2.3277	17 33 20.2	3.495	23	21 25 37.83	2.1587	13 4 3.0	7.418
24	19 40 8.02	2.3247	−17 29 47.5	+3.594	24	21 27 47.23	2.1548	−12 56 36.1	+7.479

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 25.			
	h m s	s	° ′ ″	″
0	21 27 47.23	2.1548	−12 56 36.1	+7.479
1	21 29 56.41	2.1512	12 49 5.5	7.540
2	21 32 5.37	2.1475	12 41 31.3	7.599
3	21 34 14.11	2.1438	12 33 53.6	7.657
4	21 36 22.63	2.1401	12 26 12.4	7.715
5	21 38 30.92	2.1363	12 18 27.8	7.772
6	21 40 38.99	2.1327	12 10 39.8	7.828
7	21 42 46.85	2.1291	12 2 48.4	7.883
8	21 44 54.48	2.1253	11 54 53.8	7.937
9	21 47 1.89	2.1217	11 46 56.0	7.991
10	21 49 9.09	2.1182	11 38 54.9	8.043
11	21 51 16.07	2.1145	11 30 50.8	8.094
12	21 53 22.83	2.1109	11 22 43.6	8.145
13	21 55 29.38	2.1073	11 14 33.4	8.195
14	21 57 35.71	2.1037	11 6 20.2	8.244
15	21 59 41.83	2.1002	10 58 4.1	8.292
16	22 1 47.73	2.0967	10 49 45.1	8.339
17	22 3 53.43	2.0932	10 41 23.4	8.385
18	22 5 58.91	2.0897	10 32 58.9	8.431
19	22 8 4.19	2.0862	10 24 31.7	8.476
20	22 10 9.26	2.0828	10 16 1.8	8.520
21	22 12 14.12	2.0793	10 7 29.3	8.562
22	22 14 18.77	2.0758	9 58 54.3	8.604
23	22 16 23.22	2.0725	− 9 50 16.8	+8.645
	AUGUST 26.			
0	22 18 27.47	2.0692	− 9 41 36.9	+8.686
1	22 20 31.52	2.0658	9 32 54.5	8.725
2	22 22 35.37	2.0625	9 24 9.9	8.763
3	22 24 39.02	2.0592	9 15 22.9	8.802
4	22 26 42.47	2.0559	9 6 33.7	8.838
5	22 28 45.73	2.0527	8 57 42.3	8.874
6	22 30 48.79	2.0495	8 48 48.8	8.909
7	22 32 51.67	2.0463	8 39 53.2	8.943
8	22 34 54.35	2.0431	8 30 55.6	8.977
9	22 36 56.84	2.0399	8 21 55.9	9.010
10	22 38 59.14	2.0368	8 12 54.4	9.042
11	22 41 1.26	2.0337	8 3 50.9	9.073
12	22 43 3.19	2.0307	7 54 45.6	9.103
13	22 45 4.94	2.0277	7 45 38.5	9.132
14	22 47 6.51	2.0247	7 36 29.7	9.161
15	22 49 7.90	2.0217	7 27 19.2	9.189
16	22 51 9.12	2.0188	7 18 7.0	9.216
17	22 53 10.16	2.0158	7 8 53.3	9.242
18	22 55 11.02	2.0130	6 59 38.0	9.267
19	22 57 11.72	2.0102	6 50 21.3	9.292
20	22 59 12.24	2.0073	6 41 3.0	9.316
21	23 1 12.60	2.0047	6 31 43.4	9.338
22	23 3 12.80	2.0019	6 22 22.4	9.361
23	23 5 12.83	1.9992	6 13 0.1	9.383
24	23 7 12.70	1.9965	− 6 3 36.5	+9.403

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 27.			
	h m s	s	° ′ ″	″
0	23 7 12.70	1.9965	−6 3 36.5	+9.403
1	23 9 12.41	1.9938	5 54 11.7	9.423
2	23 11 11.96	1.9912	5 44 45.8	9.442
3	23 13 11.36	1.9887	5 35 18.7	9.461
4	23 15 10.60	1.9861	5 25 50.5	9.478
5	23 17 9.69	1.9836	5 16 21.3	9.494
6	23 19 8.63	1.9812	5 6 51.2	9.510
7	23 21 7.43	1.9788	4 57 20.1	9.526
8	23 23 6.08	1.9763	4 47 48.1	9.541
9	23 25 4.59	1.9739	4 38 15.2	9.555
10	23 27 2.95	1.9716	4 28 41.5	9.567
11	23 29 1.18	1.9693	4 19 7.1	9.579
12	23 30 59.27	1.9671	4 9 32.0	9.591
13	23 32 57.23	1.9648	3 59 56.2	9.602
14	23 34 55.05	1.9627	3 50 19.7	9.613
15	23 36 52.75	1.9606	3 40 42.7	9.622
16	23 38 50.32	1.9584	3 31 5.1	9.630
17	23 40 47.76	1.9563	3 21 27.1	9.638
18	23 42 45.08	1.9543	3 11 48.5	9.647
19	23 44 42.28	1.9523	3 2 9.5	9.653
20	23 46 39.36	1.9503	2 52 30.2	9.658
21	23 48 36.32	1.9484	2 42 50.5	9.663
22	23 50 33.17	1.9466	2 33 10.6	9.668
23	23 52 29.91	1.9447	−2 23 30.4	+9.672
	AUGUST 28.			
0	23 54 26.54	1.9429	−2 13 50.0	+9.675
1	23 56 23.06	1.9412	2 4 9.4	9.677
2	23 58 19.48	1.9394	1 54 28.7	9.679
3	0 0 15.79	1.9378	1 44 47.9	9.680
4	0 2 12.01	1.9362	1 35 7.1	9.681
5	0 4 8.13	1.9345	1 25 26.2	9.681
6	0 6 4.15	1.9329	1 15 45.4	9.680
7	0 8 0.08	1.9314	1 6 4.6	9.678
8	0 9 55.92	1.9299	0 56 24.0	9.676
9	0 11 51.67	1.9285	0 46 43.5	9.673
10	0 13 47.34	1.9271	0 37 3.2	9.669
11	0 15 42.92	1.9257	0 27 23.2	9.665
12	0 17 38.42	1.9243	0 17 43.4	9.661
13	0 19 33.84	1.9231	−0 8 3.9	9.655
14	0 21 29.19	1.9218	+0 1 35.2	9.649
15	0 23 24.46	1.9207	0 11 14.0	9.643
16	0 25 19.67	1.9196	0 20 52.3	9.636
17	0 27 14.81	1.9184	0 30 30.3	9.628
18	0 29 9.88	1.9173	0 40 7.7	9.618
19	0 31 4.88	1.9163	0 49 44.5	9.610
20	0 32 59.83	1.9153	0 59 20.9	9.601
21	0 34 54.71	1.9143	1 8 56.6	9.589
22	0 36 49.54	1.9133	1 18 31.6	9.578
23	0 38 44.31	1.9124	1 28 6.0	9.567
24	0 40 39.03	1.9116	+1 37 39.7	+9.555

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 29.			
	h m s	s	° ′ ″	″
0	0 40 39.03	1.9116	+1 37 39.7	+9.555
1	0 42 33.70	1.9107	1 47 12.6	9.542
2	0 44 28.32	1.9100	1 56 44.8	9.529
3	0 46 22.90	1.9093	2 6 16.1	9.515
4	0 48 17.44	1.9087	2 15 46.6	9.501
5	0 50 11.94	1.9081	2 25 16.2	9.486
6	0 52 6.41	1.9074	2 34 44.9	9.470
7	0 54 0.83	1.9068	2 44 12.6	9.453
8	0 55 55.23	1.9063	2 53 39.3	9.436
9	0 57 49.59	1.9058	3 3 4.9	9.419
10	0 59 43.93	1.9054	3 12 29.6	9.402
11	1 1 38.24	1.9050	3 21 53.1	9.383
12	1 3 32.53	1.9047	3 31 15.5	9.363
13	1 5 26.80	1.9043	3 40 36.7	9.343
14	1 7 21.05	1.9040	3 49 56.7	9.323
15	1 9 15.28	1.9038	3 59 15.5	9.303
16	1 11 9.51	1.9037	4 8 33.1	9.282
17	1 13 3.72	1.9034	4 17 49.3	9.259
18	1 14 57.92	1.9033	4 27 4.2	9.237
19	1 16 52.12	1.9033	4 36 17.8	9.215
20	1 18 46.31	1.9033	4 45 30.0	9.191
21	1 20 40.51	1.9033	4 54 40.7	9.167
22	1 22 34.70	1.9033	5 3 50.0	9.142
23	1 24 28.90	1.9033	+5 12 57.8	+9.117
	AUGUST 30.			
0	1 26 23.10	1.9034	+5 22 4.0	+9.091
1	1 28 17.31	1.9036	5 31 8.7	9.065
2	1 30 11.53	1.9038	5 40 11.8	9.038
3	1 32 5.77	1.9041	5 49 13.3	9.011
4	1 34 0.02	1.9043	5 58 13.1	8.983
5	1 35 54.29	1.9047	6 7 11.2	8.955
6	1 37 48.58	1.9051	6 16 7.7	8.926
7	1 39 42.90	1.9054	6 25 2.3	8.896
8	1 41 37.23	1.9058	6 33 55.2	8.867
9	1 43 31.60	1.9063	6 42 46.3	8.836
10	1 45 25.99	1.9068	6 51 35.5	8.805
11	1 47 20.42	1.9074	7 0 22.9	8.773
12	1 49 14.88	1.9080	7 9 8.3	8.741
13	1 51 9.38	1.9086	7 17 51.8	8.708
14	1 53 3.91	1.9093	7 26 33.3	8.676
15	1 54 58.49	1.9100	7 35 12.9	8.643
16	1 56 53.11	1.9107	7 43 50.4	8.608
17	1 58 47.77	1.9114	7 52 25.9	8.574
18	2 0 42.48	1.9122	8 0 59.3	8.538
19	2 2 37.24	1.9131	8 9 30.5	8.503
20	2 4 32.05	1.9140	8 17 59.7	8.467
21	2 6 26.92	1.9150	8 26 26.6	8.430
22	2 8 21.85	1.9159	8 34 51.3	8.393
23	2 10 16.83	1.9168	8 43 13.8	8.356
24	2 12 11.87	1.9179	+8 51 34.0	+8.318

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 31.			
	h m s	s	° ′ ″	″
0	2 12 11.87	1.9179	+ 8 51 34.0	+8.318
1	2 14 6.98	1.9190	8 59 51.9	8.279
2	2 16 2.15	1.9201	9 8 7.5	8.240
3	2 17 57.39	1.9212	9 16 20.7	8.200
4	2 19 52.70	1.9224	9 24 31.5	8.160
5	2 21 48.08	1.9236	9 32 39.9	8.119
6	2 23 43.53	1.9248	9 40 45.8	8.078
7	2 25 39.06	1.9262	9 48 49.3	8.037
8	2 27 34.67	1.9275	9 56 50.2	7.994
9	2 29 30.36	1.9288	10 4 48.6	7.952
10	2 31 26.13	1.9302	10 12 44.5	7.909
11	2 33 21.98	1.9316	10 20 37.7	7.865
12	2 35 17.92	1.9331	10 28 28.3	7.821
13	2 37 13.95	1.9316	10 36 16.2	7.777
14	2 39 10.07	1.9361	10 44 1.5	7.732
15	2 41 6.28	1.9377	10 51 44.0	7.685
16	2 43 2.59	1.9392	10 59 23.7	7.639
17	2 44 58.99	1.9408	11 7 0.7	7.593
18	2 46 55.49	1.9425	11 14 34.9	7.546
19	2 48 52.09	1.9442	11 22 6.2	7.498
20	2 50 48.79	1.9458	11 29 34.7	7.450
21	2 52 45.59	1.9476	11 37 0.2	7.401
22	2 54 42.50	1.9494	11 44 22.8	7.352
23	2 56 39.52	1.9512	+11 51 42.5	+7.303
	SEPTEMBER 1.			
0	2 58 36.65	1.9531	+11 58 59.2	+7.253
1	3 0 33.89	1.9549	12 6 12.9	7.202
2	3 2 31.24	1.9568	12 13 23.5	7.151
3	3 4 28.70	1.9587	12 20 31.0	7.099
4	3 6 26.28	1.9607	12 27 35.4	7.047
5	3 8 23.98	1.9627	12 34 36.7	6.995
6	3 10 21.80	1.9647	12 41 34.8	6.942
7	3 12 19.74	1.9667	12 48 29.7	6.888
8	3 14 17.81	1.9688	12 55 21.3	6.834
9	3 16 16.00	1.9708	13 2 9.8	6.780
10	3 18 14.31	1.9730	13 8 54.9	6.724
11	3 20 12.76	1.9752	13 15 36.7	6.669
12	3 22 11.33	1.9773	13 22 15.2	6.613
13	3 24 10.03	1.9795	13 28 50.3	6.557
14	3 26 8.87	1.9818	13 35 22.0	6.499
15	3 28 7.85	1.9840	13 41 50.2	6.442
16	3 30 6.95	1.9863	13 48 15.0	6.384
17	3 32 6.20	1.9887	13 54 36.3	6.325
18	3 34 5.59	1.9909	14 0 54.0	6.266
19	3 36 5.11	1.9932	14 7 8.2	6.207
20	3 38 4.78	1.9957	14 13 18.8	6.147
21	3 40 4.59	1.9980	14 19 25.8	6.086
22	3 42 4.54	2.0004	14 25 29.1	6.024
23	3 44 4.64	2.0029	14 31 28.7	5.963
24	3 46 4.89	2.0054	+14 37 24.7	+5.902

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 2.			
	h m s	s	° ′ ″	″
0	3 46 4.89	2.0054	+14 37 24.7	+5.902
1	3 48 5.29	2.0078	14 43 16.9	5.838
2	3 50 5.83	2.0103	14 49 5.3	5.776
3	3 52 6.53	2.0128	14 54 50.0	5.713
4	3 54 7.37	2.0153	15 0 30.8	5.648
5	3 56 8.37	2.0180	15 6 7.7	5.583
6	3 58 9.53	2.0205	15 11 40.8	5.518
7	4 0 10.83	2.0231	15 17 9.9	5.453
8	4 2 12.30	2.0257	15 22 35.1	5.387
9	4 4 13.92	2.0284	15 27 56.3	5.320
10	4 6 15.71	2.0311	15 33 13.5	5 253
11	4 8 17.65	2.0337	15 38 26.6	5.185
12	4 10 19.75	2.0363	15 43 35.7	5.117
13	4 12 22.01	2.0391	15 48 40.7	5.049
14	4 14 24.44	2.0418	15 53 41.6	4.980
15	4 16 27.03	2.0445	15 58 38.3	4.910
16	4 18 29.78	2.0472	16 3 30.8	4.839
17	4 20 32.70	2.0500	16 8 19.0	4.769
18	4 22 35.78	2.0528	16 13 3.1	4.698
19	4 24 39.03	2.0556	16 17 42.8	4.626
20	4 26 42.45	2.0583	16 22 18.2	4.554
21	4 28 46.03	2.0611	16 26 49.3	4.482
22	4 30 49.78	2.0639	16 31 16.1	4.409
23	4 32 53.70	2.0667	+16 35 38.4	+4.335
	SEPTEMBER 3.			
0	4 34 57.79	2.0696	+16 39 56.3	+4.261
1	4 37 2.05	2.0724	16 44 9.7	4.187
2	4 39 6.48	2.0752	16 48 18.7	4.112
3	4 41 11.08	2.0781	16 52 23.1	4.036
4	4 43 15.85	2.0809	16 56 23.0	3.960
5	4 45 20.79	2.0838	17 0 18.3	3.883
6	4 47 25.91	2.0867	17 4 9.0	3.806
7	4 49 31.19	2.0895	17 7 55.0	3.728
8	4 51 36.65	2.0924	17 11 36.4	3.650
9	4 53 42.28	2.0953	17 15 13.0	3.572
10	4 55 48.09	2.0982	17 18 45.0	3.493
11	4 57 54.07	2.1011	17 22 12.2	3.413
12	5 0 0.22	2.1040	17 25 34.6	3.333
13	5 2 6.55	2.1069	17 28 52.2	3.253
14	5 4 13.05	2.1097	17 32 4.9	3.172
15	5 6 19.72	2.1126	17 35 12.8	3.091
16	5 8 26.56	2.1155	17 38 15.8	3.009
17	5 10 33.58	2.1185	17 41 13.9	2.927
18	5 12 40.78	2.1213	17 44 7.0	2.843
19	5 14 48.14	2.1242	17 46 55.1	2.759
20	5 16 55 68	2.1271	17 49 38.1	2.676
21	5 19 3.39	2.1300	17 52 16.2	2.592
22	5 21 11.28	2.1329	17 54 49.2	2.508
23	5 23 19.34	2.1358	17 57 17.1	2.422
24	5 25 27.57	2.1386	+17 59 39.8	+2.336

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 4.			
	h m s	s	° ′ ″	″
0	5 25 27.57	2.1386	+17 59 39.8	+2.336
1	5 27 35.97	2.1115	18 1 57.4	2.250
2	5 29 44.55	2.1443	18 4 9.8	2.163
3	5 31 53.29	2.1472	18 6 17.0	2.077
4	5 34 2.21	2.1500	18 8 19.0	1.990
5	5 36 11.29	2.1528	18 10 15.8	1.902
6	5 38 20.55	2.1557	18 12 7.2	1.813
7	5 40 29.97	2.1584	18 13 53.3	1.724
8	5 42 39.56	2.1612	18 15 34.1	1.636
9	5 44 49.32	2.1641	18 17 9.6	1.547
10	5 46 59.25	2.1668	18 18 39.7	1.456
11	5 49 9.34	2.1696	18 20 4.3	1.365
12	5 51 19.60	2.1723	18 21 23.5	1.274
13	5 53 30.02	2.1751	18 22 37.2	1.183
14	5 55 40.61	2.1778	18 23 45.5	1.092
15	5 57 51.36	2.1805	18 24 48.2	1.000
16	6 0 2.27	2.1832	18 25 45.5	0.907
17	6 2 13.34	2.1858	18 26 37.1	0.814
18	6 4 24.57	2.1886	18 27 23.2	0.722
19	6 6 35.97	2.1913	18 28 3.7	0.628
20	6 8 47.52	2.1938	18 28 38.5	0.534
21	6 10 59.23	2.1964	18 29 7.8	0.440
22	6 13 11.09	2.1990	18 29 31.3	0.345
23	6 15 23.11	2.2016	+18 29 49.2	+0.250
	SEPTEMBER 5.			
0	6 17 35.28	2.2041	+18 30 1.3	+0.154
1	6 19 47.60	2.2067	18 30 7.7	+0.059
2	6 22 0.08	2.2092	18 30 8.4	−0.037
3	6 24 12.70	2.2117	18 30 3.3	0.133
4	6 26 25.48	2.2142	18 29 52.4	0.230
5	6 28 38.40	2.2166	18 29 35.7	0.327
6	6 30 51.47	2.2190	18 29 13.1	0.424
7	6 33 4.68	2.2213	18 28 44.8	0.522
8	6 35 18.03	2.2237	18 28 10.5	0.620
9	6 37 31.53	2.2261	18 27 30.4	0.718
10	6 39 45.16	2.2284	18 26 44.4	0.816
11	6 41 58.94	2.2307	18 25 52.5	0.915
12	6 44 12.85	2.2330	18 24 54.6	1.014
13	6 46 26.90	2.2353	18 23 50.8	1.113
14	6 48 41.08	2.2375	18 22 41.0	1.213
15	6 50 55.40	2.2397	18 21 25.3	1.312
16	6 53 9.84	2.2418	18 20 3.6	1.412
17	6 55 24.42	2 2440	18 18 35.9	1.512
18	6 57 39.12	2.2461	18 17 2.2	1.613
19	6 59 53.95	2.2482	18 15 22.4	1.713
20	7 2 8.91	2.2503	18 13 36.6	1.813
21	7 4 23.98	2.2523	18 11 44.8	1.913
22	7 6 39.18	2.2543	18 9 47.0	2.015
23	7 8 54.50	2.2563	18 7 43.0	2.117
24	7 11 9.93	2.2582	+18 5 33.0	−2.218

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 6.			
	h m s	s	° ′ ″	″
0	7 11 9.93	2.2582	+18 5 33.0	−2.218
1	7 13 25.48	2.2602	18 3 16.9	2.318
2	7 15 41.15	2.2621	18 0 54.8	2.420
3	7 17 56.93	2.2639	17 58 26.5	2.522
4	7 20 12.82	2.2657	17 55 52.1	2.624
5	7 22 28.81	2.2675	17 53 11.6	2.726
6	7 24 44.92	2.2693	17 50 25.0	2.828
7	7 27 1.13	2.2710	17 47 32.2	2.930
8	7 29 17.44	2.2727	17 44 33.4	3.032
9	7 31 33.85	2.2743	17 41 28.4	3.134
10	7 33 50.36	2.2760	17 38 17.3	3.236
11	7 36 6.97	2.2777	17 35 0.1	3.338
12	7 38 23.68	2.2793	17 31 36.7	3.441
13	7 40 40.48	2.2808	17 28 7.2	3.543
14	7 42 57.37	2.2823	17 24 31.6	3.644
15	7 45 14.35	2.2837	17 20 49.9	3.747
16	7 47 31.41	2.2852	17 17 2.0	3.850
17	7 49 48.57	2.2867	17 13 7.9	3.952
18	7 52 5.81	2.2880	17 9 7.8	4.053
19	7 54 23.13	2.2893	17 5 1.6	4.155
20	7 56 40.53	2.2907	17 0 49.2	4.257
21	7 58 58.01	2.2920	16 56 30.7	4.358
22	8 1 15.57	2.2933	16 52 6.2	4.460
23	8 3 33.20	2.2945	+16 47 35.5	−4.562
	SEPTEMBER 7.			
0	8 5 50.91	2.2957	+16 42 58.8	−4.663
1	8 8 8.69	2.2968	16 38 16.0	4.764
2	8 10 26.53	2.2980	16 33 27.1	4.865
3	8 12 44.45	2.2992	16 28 32.2	4.966
4	8 15 2.43	2.3002	16 23 31.2	5.067
5	8 17 20.47	2.3013	16 18 24.2	5.168
6	8 19 38.58	2.3023	16 13 11.1	5.268
7	8 21 56.75	2.3033	16 7 52.1	5.367
8	8 24 14.98	2.3043	16 2 27.1	5.467
9	8 26 33.26	2.3052	15 56 56.1	5.566
10	8 28 51.60	2.3061	15 51 19.2	5.665
11	8 31 9.99	2.3070	15 45 36.3	5.764
12	8 33 28.44	2.3079	15 39 47.5	5.862
13	8 35 46.94	2.3087	15 33 52.8	5.960
14	8 38 5.48	2.3094	15 27 52.3	6.058
15	8 40 24.07	2.3102	15 21 45.8	6.157
16	8 42 42.71	2.3110	15 15 33.5	6.253
17	8 45 1.39	2.3117	15 9 15.4	6.350
18	8 47 20.11	2.3123	15 2 51.5	6.447
19	8 49 38.87	2.3130	14 56 21.8	6.543
20	8 51 57.67	2.3137	14 49 46.4	6.638
21	8 54 16.51	2.3143	14 43 5.3	6.733
22	8 56 35.39	2.3149	14 36 18.5	6.828
23	8 58 54.30	2.3154	14 29 26.0	6.922
24	9 1 13.24	2.3160	+14 22 27.9	−7.015

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 8.			
	h m s	s	° ′ ″	″
0	9 1 13.24	2.3160	+14 22 27.9	− 7.015
1	9 3 32.22	2.3165	14 15 24.2	7.108
2	9 5 51.22	2.3170	14 8 14.9	7.202
3	9 8 10.26	2.3175	14 1 0.0	7.293
4	9 10 29.32	2.3179	13 53 39.7	7.385
5	9 12 48.41	2.3184	13 46 13.8	7.477
6	9 15 7.53	2.3188	13 38 42.5	7.566
7	9 17 26.67	2.3192	13 31 5.9	7.655
8	9 19 45.83	2.3195	13 23 23.9	7.745
9	9 22 5.01	2.3199	13 15 36.5	7.834
10	9 24 24.22	2.3203	13 7 43.8	7.922
11	9 26 43.45	2.3206	12 59 45.9	8.009
12	9 29 2.69	2.3208	12 51 42.7	8.096
13	9 31 21.95	2.3212	12 43 34.4	8.182
14	9 33 41.23	2.3214	12 35 20.9	8.267
15	9 36 0.52	2.3217	12 27 2.4	8.351
16	9 38 19.83	2.3220	12 18 38.8	8.435
17	9 40 39.16	2.3222	12 10 10.2	8.518
18	9 42 58.49	2.3223	12 1 36.6	8.600
19	9 45 17.84	2.3227	11 52 58.2	8.682
20	9 47 37.21	2.3228	11 44 14.8	8.763
21	9 49 56.58	2.3229	11 35 26.6	8.842
22	9 52 15.96	2.3231	11 26 33.7	8.921
23	9 54 35.35	2.3233	+11 17 36.1	− 9.000
	SEPTEMBER 9.			
0	9 56 54.75	2.3234	+11 8 33.7	− 9.078
1	9 59 14.16	2.3236	10 59 26.7	9.154
2	10 1 33.58	2.3237	10 50 15.2	9.230
3	10 3 53.01	2.3238	10 40 59.1	9.305
4	10 6 12.44	2.3239	10 31 38.6	9.378
5	10 8 31.88	2.3240	10 22 13.7	9.452
6	10 10 51.32	2.3241	10 12 44.4	9.524
7	10 13 10.77	2.3242	10 3 10.8	9.595
8	10 15 30.23	2.3243	9 53 33.0	9.665
9	10 17 49.69	2.3244	9 43 51.0	9.734
10	10 20 9.16	2.3245	9 34 4.9	9.803
11	10 22 28.63	2.3246	9 24 14.7	9.870
12	10 24 48.11	2.3247	9 14 20.5	9.937
13	10 27 7.59	2.3247	9 4 22.3	10.002
14	10 29 27.07	2.3248	8 54 20.3	10.065
15	10 31 46.56	2.3249	8 44 14.5	10.128
16	10 34 6.06	2.3250	8 34 4.9	10.192
17	10 36 25.56	2.3250	8 23 51.5	10.253
18	10 38 45.06	2.3251	8 13 34.6	10.312
19	10 41 4.57	2.3252	8 3 14.1	10.371
20	10 43 24.09	2.3253	7 52 50.1	10.428
21	10 45 43.60	2.3253	7 42 22.7	10.485
22	10 48 3.13	2.3255	7 31 51.9	10.541
23	10 50 22.66	2.3255	7 21 17.8	10.595
24	10 52 42.19	2.3256	+ 7 10 40.5	−10.648

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 10.			
	h m s	s	° ′ ″	″
0	10 52 42.19	2.3256	+7 10 40.5	−10.648
1	10 55 1.73	2.3257	7 0 0.0	10.701
2	10 57 21.28	2.3259	6 49 16.4	10.752
3	10 59 40.84	2.3260	6 38 29.8	10.802
4	11 2 0.40	2.3261	6 27 40.2	10.850
5	11 4 19.97	2.3262	6 16 47.8	10.897
6	11 6 39.55	2.3264	6 5 52.5	10.943
7	11 8 59.14	2.3265	5 54 54.6	10.988
8	11 11 18.73	2.3267	5 43 53.9	11.032
9	11 13 38.34	2.3268	5 32 50.7	11.075
10	11 15 57.95	2.3270	5 21 44.9	11.116
11	11 18 17.58	2.3272	5 10 36.8	11.156
12	11 20 37.22	2.3274	4 59 26.2	11.195
13	11 22 56.87	2.3276	4 48 13.4	11.232
14	11 25 16.53	2.3278	4 36 58.3	11.268
15	11 27 36.21	2.3281	4 25 41.2	11.303
16	11 29 55.90	2.3283	4 14 22.0	11.337
17	11 32 15.60	2.3285	4 3 0.8	11.369
18	11 34 35.32	2.3288	3 51 37.7	11.400
19	11 36 55.06	2.3291	3 40 12.8	11.430
20	11 39 14.81	2.3293	3 28 46.1	11.458
21	11 41 34.58	2.3297	3 17 17.8	11.485
22	11 43 54.37	2.3300	3 5 47.9	11.511
23	11 46 14.18	2.3303	+2 54 16.5	−11.535
	SEPTEMBER 11.			
0	11 48 34.01	2.3307	+2 42 43.7	−11.558
1	11 50 53.86	2.3311	2 31 9.5	11.580
2	11 53 13.74	2.3314	2 19 34.1	11.600
3	11 55 33.63	2.3318	2 7 57.5	11.619
4	11 57 53.56	2.3323	1 56 19.8	11.637
5	12 0 13.51	2.3327	1 44 41.1	11.653
6	12 2 33.48	2.3331	1 33 1.5	11.668
7	12 4 53.48	2.3336	1 21 21.0	11.681
8	12 7 13.51	2.3342	1 9 39.8	11.693
9	12 9 33.58	2.3347	0 57 57.8	11.704
10	12 11 53.67	2.3351	0 46 15.3	11.713
11	12 14 13.79	2.3356	0 34 32.3	11.721
12	12 16 33.94	2.3362	0 22 48.8	11.728
13	12 18 54.13	2.3367	+0 11 5.0	11.733
14	12 21 14.35	2.3373	−0 0 39.1	11.737
15	12 23 34.61	2.3379	0 12 23.4	11.738
16	12 25 54.90	2.3385	0 24 7.7	11.739
17	12 28 15.23	2.3392	0 35 52.1	11.739
18	12 30 35.61	2.3399	0 47 36.4	11.737
19	12 32 56.02	2.3405	0 59 20.5	11.733
20	12 35 16.47	2.3412	1 11 4.4	11.728
21	12 37 36.97	2.3420	1 22 47.9	11.722
22	12 39 57.51	2.3427	1 34 31.1	11.715
23	12 42 18.09	2.3434	1 46 13.7	11.706
24	12 44 38.72	2.3442	−1 57 55.8	−11.696

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 12.			
	h m s	s	° ′ ″	″
0	12 44 38.72	2.3442	− 1 57 55.8	−11.696
1	12 46 59.39	2.3450	2 9 37.2	11.683
2	12 49 20.12	2.3458	2 21 17.8	11.670
3	12 51 40.89	2.3466	2 32 57.6	11.656
4	12 54 1.71	2.3474	2 44 36.5	11.640
5	12 56 22.58	2.3483	2 56 14.4	11.622
6	12 58 43.51	2.3492	3 7 51.2	11.603
7	13 1 4.49	2.3501	3 19 26.8	11.583
8	13 3 25.52	2.3510	3 31 1.1	11.561
9	13 5 46.61	2.3519	3 42 34.1	11.538
10	13 8 7.75	2.3528	3 54 5.7	11.514
11	13 10 28.95	2.3537	4 5 35.8	11.488
12	13 12 50.20	2.3547	4 17 4.3	11.461
13	13 15 11.51	2.3557	4 28 31.1	11.432
14	13 17 32.89	2.3568	4 39 56.1	11.402
15	13 19 54.32	2.3578	4 51 19.3	11.371
16	13 22 15.82	2.3588	5 2 40.6	11.338
17	13 24 37.37	2.3598	5 13 59.9	11.303
18	13 26 58.99	2.3609	5 25 17.0	11.268
19	13 29 20.68	2.3620	5 36 32.0	11.232
20	13 31 42.43	2.3630	5 47 44.8	11.193
21	13 34 4.24	2.3641	5 58 55.2	11.153
22	13 36 26.12	2.3653	6 10 3.2	11.112
23	13 38 48.07	2.3664	− 6 21 8.7	−11.070
	SEPTEMBER 13.			
0	13 41 10.09	2.3675	− 6 32 11.6	−11.027
1	13 43 32.17	2.3687	6 43 11.9	10.982
2	13 45 54.33	2.3698	6 54 9.4	10.935
3	13 48 16.55	2.3709	7 5 4.1	10.888
4	13 50 38.84	2.3721	7 15 56.0	10.840
5	13 53 1.20	2.3733	7 26 44.9	10.789
6	13 55 23.63	2.3745	7 37 30.7	10.737
7	13 57 46.14	2.3757	7 48 13.4	10.685
8	14 0 8.71	2.3768	7 58 52.9	10.632
9	14 2 31.36	2.3781	8 9 29.2	10.576
10	14 4 54.08	2.3793	8 20 2.0	10.519
11	14 7 16.88	2.3806	8 30 31.5	10.462
12	14 9 39.75	2.3818	8 40 57.4	10.403
13	14 12 2.69	2.3830	8 51 19.8	10.343
14	14 14 25.71	2.3842	9 1 38.5	10.281
15	14 16 48.80	2.3854	9 11 53.5	10.218
16	14 19 11.96	2.3867	9 22 4.7	10.154
17	14 21 35.20	2.3879	9 32 12.0	10.089
18	14 23 58.51	2.3892	9 42 15.4	10.023
19	14 26 21.90	2.3904	9 52 14.8	9.956
20	14 28 45.36	2.3917	10 2 10.1	9.887
21	14 31 8.90	2.3929	10 12 1.2	9.817
22	14 33 32.51	2.3941	10 21 48.1	9.747
23	14 35 56.19	2.3953	10 31 30.8	9.675
24	14 38 19.95	2.3966	−10 41 9.1	− 9.602

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 14.			
	h m s	s	° ′ ″	″
0	14 38 19.95	2.3966	−10 41 9.1	−9.602
1	14 40 43.78	2.3978	10 50 43.0	9.528
2	14 43 7.68	2.3990	11 0 12.4	9.453
3	14 45 31.66	2.4003	11 9 37.3	9.376
4	14 47 55.71	2.4015	11 18 57.5	9.298
5	14 50 19.84	2.4027	11 28 13.0	9.219
6	14 52 44.03	2.4038	11 37 23.8	9.141
7	14 55 8.29	2.4050	11 46 29.9	9.060
8	14 57 32.63	2.4062	11 55 31.0	8.978
9	14 59 57.03	2.4073	12 4 27.2	8.895
10	15 2 21.51	2.4085	12 13 18.4	8.812
11	15 4 46.05	2.4096	12 22 4.6	8.728
12	15 7 10.66	2.4107	12 30 45.7	8.642
13	15 9 35.33	2.4118	12 39 21.6	8.555
14	15 12 0.08	2.4129	12 47 52.3	8.467
15	15 14 24.88	2.4139	12 56 17.7	8.378
16	15 16 49.75	2.4150	13 4 37.7	8.289
17	15 19 14.68	2.4161	13 12 52.4	8.200
18	15 21 39.68	2.4171	13 21 1.7	8.108
19	15 24 4.73	2.4181	13 29 5.4	8.016
20	15 26 29.85	2.4191	13 37 3.6	7.923
21	15 28 55.02	2.4200	13 44 56.2	7.830
22	15 31 20.25	2.4209	13 52 43.2	7.736
23	15 33 45.53	2.4218	−14 0 24.5	−7.640
	SEPTEMBER 15.			
0	15 36 10.87	2.4227	−14 8 0.0	−7.543
1	15 38 36.26	2.4236	14 15 29.7	7.447
2	15 41 1.70	2.4244	14 22 53.7	7.350
3	15 43 27.19	2.4253	14 30 11.7	7.250
4	15 45 52.73	2.4261	14 37 23.7	7.151
5	15 48 18.32	2.4268	14 44 29.8	7.052
6	15 50 43.95	2.4276	14 51 29.9	6.951
7	15 53 9.63	2.4282	14 58 23.9	6.849
8	15 55 35.34	2.4288	15 5 11.8	6.747
9	15 58 1.09	2.4295	15 11 53.6	6.646
10	16 0 26.88	2.4301	15 18 29.3	6.513
11	16 2 52.70	2.4307	15 24 58.7	6.438
12	16 5 18.57	2.4313	15 31 21.8	6.333
13	16 7 44.46	2.4318	15 37 38.7	6.228
14	16 10 10.38	2.4323	15 43 49.2	6.122
15	16 12 36.33	2.4327	15 49 53.3	6.016
16	16 15 2.30	2.4330	15 55 51.1	5.909
17	16 17 28.29	2.4334	16 1 42.4	5.802
18	16 19 54.31	2.4337	16 7 27.3	5.694
19	16 22 20.34	2.4340	16 13 5.7	5.586
20	16 24 46.39	2.4342	16 18 37.6	5.477
21	16 27 12.45	2.4344	16 24 2.9	5.367
22	16 29 38.52	2.4346	16 29 21.6	5.258
23	16 32 4.60	2.4347	16 34 33.8	5.148
24	16 34 30.69	2.4348	−16 39 39.3	−5.037

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 16.			
	h m s	s	° ′ ″	″
0	16 34 30.69	2.4348	−16 39 39.3	−5.037
1	16 36 56.78	2.4348	16 44 38.2	4.926
2	16 39 22.87	2.4348	16 49 30.4	4.814
3	16 41 48.96	2.4348	16 54 15.9	4.702
4	16 44 15.04	2.4347	16 58 54.7	4.590
5	16 46 41.12	2.4346	17 3 26.7	4.478
6	16 49 7.19	2.4343	17 7 52.0	4.365
7	16 51 33.24	2.4341	17 12 10.5	4.252
8	16 53 59.28	2.4338	17 16 22.2	4.138
9	16 56 25.30	2.4335	17 20 27.1	4.025
10	16 58 51.30	2.4332	17 24 25.2	3.911
11	17 1 17.28	2.4328	17 28 16.4	3.797
12	17 3 43.23	2.4323	17 32 0.8	3.683
13	17 6 9.15	2.4318	17 35 38.3	3.568
14	17 8 35.04	2.4313	17 39 8.9	3.453
15	17 11 0.90	2.4306	17 42 32.7	3.338
16	17 13 26.71	2.4299	17 45 49.5	3.223
17	17 15 52.49	2.4292	17 48 59.4	3.108
18	17 18 18.22	2.4284	17 52 2.4	2.993
19	17 20 43.90	2.4277	17 54 58.5	2.878
20	17 23 9.54	2.4268	17 57 47.7	2.762
21	17 25 35.12	2.4258	18 0 29.9	2.646
22	17 28 0.64	2.4249	18 3 5.2	2.531
23	17 30 26.11	2.4239	−18 5 33.6	−2.415
	SEPTEMBER 17.			
0	17 32 51.51	2.4228	−18 7 55.0	−2.299
1	17 35 16.85	2.4217	18 10 9.5	2.184
2	17 37 42.12	2.4205	18 12 17.1	2.068
3	17 40 7.31	2.4193	18 14 17.7	1.952
4	17 42 32.43	2.4181	18 16 11.3	1.837
5	17 44 57.48	2.4168	18 17 58.1	1.722
6	17 47 22.45	2.4154	18 19 37.9	1.606
7	17 49 47.33	2.4139	18 21 10.8	1.491
8	17 52 12.12	2.4125	18 22 36.8	1.376
9	17 54 36.83	2.4110	18 23 55.9	1.260
10	17 57 1.44	2.4094	18 25 8.0	1.145
11	17 59 25.96	2.4078	18 26 13.3	1.031
12	18 1 50.38	2.4062	18 27 11.7	0.916
13	18 4 14.70	2.4044	18 28 3.2	0.801
14	18 6 38.91	2.4027	18 28 47.8	0.687
15	18 9 3.02	2.4009	18 29 25.6	0.573
16	18 11 27.02	2.3990	18 29 56.5	0.458
17	18 13 50.90	2.3971	18 30 20.6	0.345
18	18 16 14.67	2.3952	18 30 37.9	0.232
19	18 18 38.32	2.3931	18 30 48.5	0.119
20	18 21 1.84	2.3911	18 30 52.2	−0.006
21	18 23 25.25	2.3890	18 30 49.2	+0.107
22	18 25 48.52	2.3868	18 30 39.4	0.219
23	18 28 11.67	2.3847	18 30 22.9	0.331
24	18 30 34.68	2.3823	−18 29 59.7	+0.442

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 18.			
	h m s	s	° ′ ″	″
0	18 30 34.68	2.3823	−18 29 59.7	+0.442
1	18 32 57.55	2.3801	18 29 29.8	0.553
2	18 35 20.29	2.3778	18 28 53.3	0.664
3	18 37 42.89	2.3754	18 28 10.1	0.776
4	18 40 5.34	2.3729	18 27 20.2	0.886
5	18 42 27.64	2.3705	18 26 23.8	0.994
6	18 44 49.80	2.3680	18 25 20.9	1.104
7	18 47 11.80	2.3655	18 24 11.3	1.211
8	18 49 33.66	2.3629	18 22 55.2	1.322
9	18 51 55.35	2.3602	18 21 32.7	1.430
10	18 54 16.89	2.3576	18 20 3.6	1.537
11	18 56 38.26	2 3548	18 18 28.2	1.644
12	18 58 59.47	2.3521	18 16 46.3	1.752
13	19 1 20.51	2.3493	18 14 58.0	1.858
14	19 3 41.39	2.3465	18 13 3.4	1.963
15	19 6 2.09	2.3437	18 11 2.5	2.068
16	19 8 22.63	2.3408	18 8 55.2	2.173
17	19 10 42.98	2.3378	18 6 41.7	2.277
18	19 13 3.16	2.3349	18 4 22.0	2.380
19	19 15 23.17	2.3319	18 1 56.1	2.483
20	19 17 42.99	2.3288	17 59 24.0	2.586
21	19 20 2.63	2.3257	17 56 45.8	2 688
22	19 22 22.08	2.3226	17 54 1.5	2.789
23	19 24 41.34	2.3195	−17 51 11.1	+2.890
	SEPTEMBER 19.			
0	19 27 0.42	2.3163	−17 48 14.7	+2.990
1	19 29 19.30	2.3132	17 45 12.3	3.090
2	19 31 38.00	2.3100	17 42 3.9	3.189
3	19 33 56.50	2.3067	17 38 49.6	3.287
4	19 36 14.81	2.3034	17 35 29.5	3.384
5	19 38 32.91	2.3001	17 32 3.5	3.482
6	19 40 50.82	2.2968	17 28 31.7	3 578
7	19 43 8.53	2.2935	17 24 54.1	3.673
8	19 45 26.04	2.2902	17 21 10.9	3.768
9	19 47 43.35	2.2868	17 17 21.9	3.863
10	19 50 0.45	2.2833	17 13 27.3	3.957
11	19 52 17.35	2.2799	17 9 27.0	4.051
12	19 54 34.04	2.2764	17 5 21.2	4.143
13	19 56 50.52	2.2730	17 1 9.9	4.234
14	19 59 6.80	2.2695	16 56 53.1	4.326
15	20 1 22.86	2.2660	16 52 30.8	4.417
16	20 3 38.72	2.2625	16 48 3.1	4.506
17	20 5 54.36	2.2589	16 43 30.1	4.594
18	20 8 9.79	2.2553	16 38 51.8	4.683
19	20 10 25.00	2.2518	16 34 8.2	4.771
20	20 12 40.01	2.2482	16 29 19.3	4.858
21	20 14 54.79	2.2446	16 24 25.3	4.943
22	20 17 9.36	2.2410	16 19 26.2	5.028
23	20 19 23.71	2.2374	16 14 21.9	5.113
24	20 21 37.85	2.2338	−16 9 12.6	+5.197

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 20.			
	h m s	s	° ′ ″	″
0	20 21 37.85	2.2338	−16 9 12.6	+5.197
1	20 23 51.77	2.2302	16 3 58.3	5.280
2	20 26 5.47	2.2265	15 58 39.0	5.362
3	20 28 18.95	2.2228	15 53 14.8	5.444
4	20 30 32.21	2.2192	15 47 45.7	5.525
5	20 32 45.25	2.2156	15 42 11.8	5.605
6	20 34 58.08	2.2119	15 36 33.1	5.684
7	20 37 10.68	2.2083	15 30 49.7	5.763
8	20 39 23.07	2.2046	15 25 1.5	5.841
9	20 41 35.23	2.2008	15 19 8.8	5.918
10	20 43 47.17	2.1972	15 13 11.4	5.993
11	20 45 58.90	2.1936	15 7 9.6	6.068
12	20 48 10.40	2.1898	15 1 3.2	6.144
13	20 50 21.68	2 1862	14 54 52.3	6.218
14	20 52 32.75	2 1826	14 48 37.1	6.290
15	20 54 43.59	2 1788	14 42 17.5	6.363
16	20 56 54.21	2 1752	14 35 53.5	6 435
17	20 59 4.62	2.1716	14 29 25.3	6 505
18	21 1 14.80	2.1679	14 22 52.9	6 574
19	21 3 24.77	2.1643	14 16 16.4	6 643
20	21 5 34.52	2.1607	14 9 35.7	6.712
21	21 7 44.05	2.1570	14 2 50.9	6.779
22	21 9 53.36	2.1533	13 56 2.2	6.846
23	21 12 2.45	2.1497	−13 49 9.4	+6.912
	SEPTEMBER 21.			
0	21 14 11.33	2.1462	−13 42 12.7	+6.978
1	21 16 19.99	2.1426	13 35 12.1	7 012
2	21 18 28.44	2.1390	13 28 7.7	7.105
3	21 20 36.67	2.1354	13 20 59.5	7.167
4	21 22 44.69	2.1318	13 13 47.6	7.229
5	21 24 52.49	2.1283	13 6 32.0	7.291
6	21 27 0.08	2.1248	12 59 12.7	7.351
7	21 29 7.46	2.1213	12 51 49.9	7.410
8	21 31 14.63	2.1178	12 44 23 5	7.469
9	21 33 21.59	2.1143	12 36 53.6	7.527
10	21 35 28.34	2 1108	12 29 20.3	7.583
11	21 37 34.88	2.1073	12 21 43.6	7.640
12	21 39 41.21	2.1038	12 14 3.5	7 696
13	21 41 47.34	2.1004	12 6 20.1	7.750
14	21 43 53.26	2.0970	11 58 33.5	7.803
15	21 45 58.98	2.0936	11 50 43.7	7.857
16	21 48 4.49	2.0902	11 42 50.7	7.909
17	21 50 9.81	2.0869	11 34 54.6	7.960
18	21 52 14.92	2.0835	11 26 55.5	8.011
19	21 54 19.83	2.0802	11 18 53.3	8.062
20	21 56 24.55	2 0770	11 10 48.1	8.110
21	21 58 29.07	2.0738	11 2 40.1	8.158
22	22 0 33.40	2.0705	10 54 29.1	8 206
23	22 2 37.53	2.0673	10 46 15.4	8.252
24	22 4 41.47	2.0641	−10 37 58.9	+8.298

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 22.					SEPTEMBER 24.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 4 41.47	2.0641	−10 37 58.9	+8.298	0	23 40 36.49	1.9445	−3 21 39.5	+9.593
1	22 6 45.22	2.0608	10 29 39.7	8.343	1	23 42 33.11	1.9428	3 12 3.6	9.602
2	22 8 48.77	2.0577	10 21 17.7	8.387	2	23 44 29.63	1.9412	3 2 27.2	9.611
3	22 10 52.14	2.0547	10 12 53.2	8.430	3	23 46 26.05	1.9395	2 52 50.3	9.618
4	22 12 55.33	2.0515	10 4 26.1	8.473	4	23 48 22.37	1.9379	2 43 13.0	9.626
5	22 14 58.32	2.0184	9 55 56.4	8.515	5	23 50 18.60	1.9364	2 33 35.2	9.633
6	22 17 1.14	2.0454	9 47 24.3	8.556	6	23 52 14.74	1.9349	2 23 57.1	9.638
7	22 19 3.77	2.0423	9 38 49.7	8.597	7	23 54 10.79	1.9335	2 14 18.7	9.642
8	22 21 6.22	2.0393	9 30 12.7	8.636	8	23 56 6.76	1.9320	2 4 40.1	9.647
9	22 23 8.49	2.0363	9 21 33.4	8.674	9	23 58 2.63	1.9306	1 55 1.1	9.651
10	22 25 10.58	2.0334	9 12 51.8	8.712	10	23 59 58.43	1.9293	1 45 22.0	9.653
11	22 27 12.50	2.0305	9 4 7.9	8.750	11	0 1 54.15	1.9279	1 35 42.8	9.655
12	22 29 14.24	2.0276	8 55 21.8	8.786	12	0 3 49.78	1.9266	1 26 3.4	9.657
13	22 31 15.81	2.0247	8 46 33.6	8.822	13	0 5 45.34	1.9253	1 16 24.0	9.658
14	22 33 17.21	2.0219	8 37 43.2	8.857	14	0 7 40.82	1.9241	1 6 44.5	9.658
15	22 35 18.44	2.0192	8 28 50.8	8.890	15	0 9 36.23	1.9230	0 57 5.1	9.658
16	22 37 19.51	2.0164	8 19 56.4	8.923	16	0 11 31.58	1.9218	0 47 25.6	9.657
17	22 39 20.41	2.0136	8 11 0.0	8.956	17	0 13 26.85	1.9207	0 37 46.3	9.654
18	22 41 21.14	2.0109	8 2 1.7	8.988	18	0 15 22.06	1.9197	0 28 7.1	9.652
19	22 43 21.72	2.0082	7 53 1.5	9.019	19	0 17 17.21	1.9186	0 18 28.0	9.650
20	22 45 22.13	2.0056	7 43 59.4	9.049	20	0 19 12.29	1.9176	−0 8 49.1	9.646
21	22 47 22.39	2.0030	7 34 55.6	9.078	21	0 21 7.32	1.9167	+0 0 49.5	9.641
22	22 49 22.49	2.0003	7 25 50.0	9.107	22	0 23 2.29	1.9157	0 10 27.8	9.636
23	22 51 22.43	1.9977	− 7 16 42.7	+9.135	23	0 24 57.20	1.9148	+0 20 5.8	+9.630
	SEPTEMBER 23.					SEPTEMBER 25.			
0	22 53 22.22	1.9952	− 7 7 33.8	+9.162	0	0 26 52.06	1.9139	+0 29 43.4	+9.624
1	22 55 21.86	1.9927	6 58 23.3	9.188	1	0 28 46.87	1.9131	0 39 20.7	9.617
2	22 57 21.35	1.9903	6 49 11.2	9.214	2	0 30 41.63	1.9123	0 48 57.5	9.609
3	22 59 20.70	1.9879	6 39 57.6	9.239	3	0 32 36.35	1.9116	0 58 33.8	9.601
4	23 1 19.90	1.9854	6 30 42.5	9.263	4	0 34 31.02	1.9108	1 8 9.6	9.592
5	23 3 18.95	1.9831	6 21 26.0	9.287	5	0 36 25.65	1.9102	1 17 44.9	9.583
6	23 5 17.87	1.9807	6 12 8.1	9.309	6	0 38 20.24	1.9095	1 27 19.6	9.573
7	23 7 16.64	1.9784	6 2 48.9	9.331	7	0 40 14.79	1.9088	1 36 53.7	9.562
8	23 9 15.28	1.9762	5 53 28.4	9.352	8	0 42 9.30	1.9083	1 46 27.1	9.551
9	23 11 13.78	1.9739	5 44 6.6	9.373	9	0 44 3.79	1.9078	1 55 59.8	9.538
10	23 13 12.15	1.9717	5 34 43.6	9.393	10	0 45 58.24	1.9073	2 5 31.7	9.526
11	23 15 10.39	1.9696	5 25 19.5	9 412	11	0 47 52.66	1.9068	2 15 2.9	9.513
12	23 17 8.50	1.9674	5 15 54.2	9.430	12	0 49 47.05	1.9063	2 24 33.3	9.500
13	23 19 6.48	1.9653	5 6 27.9	9.448	13	0 51 41.41	1.9059	2 34 2.9	9.485
14	23 21 4.34	1.9633	4 57 0.5	9.465	14	0 53 35.76	1.9057	2 43 31.5	9.470
15	23 23 2.07	1.9613	4 47 32.1	9.481	15	0 55 30.09	1.9053	2 52 59.3	9.454
16	23 24 59.69	1.9593	4 38 2.8	9.496	16	0 57 24.39	1.9049	3 2 26.0	9.438
17	23 26 57.18	1.9573	4 28 32.6	9.511	17	0 59 18.68	1.9047	3 11 51.8	9.422
18	23 28 54.56	1.9553	4 19 1.5	9.524	18	1 1 12.95	1.9045	3 21 16.6	9.404
19	23 30 51.82	1.9534	4 9 29.7	9.538	19	1 3 7.22	1.9043	3 30 40.3	9.386
20	23 32 48.97	1.9516	3 59 57.0	9.551	20	1 5 1.47	1.9041	3 40 2.9	9.367
21	23 34 46.01	1.9498	3 50 23.6	9.563	21	1 6 55.71	1.9040	3 49 24.3	9.348
22	23 36 42.94	1.9480	3 40 49.5	9.573	22	1 8 49.95	1.9039	3 58 44.6	9.328
23	23 38 39.77	1.9462	3 31 14.8	9.583	23	1 10 44.18	1.9038	4 8 3.7	9.308
24	23 40 36.49	1.9445	− 3 21 39.5	+9.593	24	1 12 38.41	1.9038	+4 17 21.6	+9.287

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 26.			
	h m s	s	° ′ ″	″
0	1 12 38.41	1.9038	+ 4 17 21.6	+9 287
1	1 14 32.64	1.9038	4 26 38.2	9.265
2	1 16 26.87	1.9039	4 35 53.4	9.243
3	1 18 21.11	1.9040	4 45 7.3	9.220
4	1 20 15.35	1.9041	4 54 19.8	9.197
5	1 22 9.60	1.9042	5 3 30.9	9.173
6	1 24 3.86	1.9044	5 12 40.6	9.149
7	1 25 58.13	1.9047	5 21 48.8	9.123
8	1 27 52.42	1.9049	5 30 55.4	9.097
9	1 29 46.72	1.9052	5 40 0.5	9.072
10	1 31 41.04	1.9056	5 49 4.0	9.045
11	1 33 35.39	1.9059	5 58 5.9	9.017
12	1 35 29.75	1.9063	6 7 6.1	8.989
13	1 37 24.14	1.9067	6 16 4.6	8.961
14	1 39 18.55	1.9071	6 25 1.4	8 932
15	1 41 12.99	1.9075	6 33 56.4	8.903
16	1 43 7.45	1.9080	6 42 49.7	8.873
17	1 45 1.95	1.9087	6 51 41.1	8.842
18	1 46 56.49	1.9092	7 0 30.7	8.810
19	1 48 51.05	1.9098	7 9 18.3	8.778
20	1 50 45.66	1.9105	7 18 4.1	8.747
21	1 52 40.31	1.9111	7 26 47.9	8.713
22	1 54 34.99	1.9118	7 35 29.7	8.679
23	1 56 29.72	1.9126	+ 7 44 9.4	+8.645
	SEPTEMBER 27.			
0	1 58 24.50	1.9133	+ 7 52 47.1	+8.611
1	2 0 19.32	1.9141	8 1 22.7	8.576
2	2 2 14.19	1.9149	8 9 56.2	8.540
3	2 4 9.11	1.9158	8 18 27.5	8.503
4	2 6 4.08	1.9167	8 26 56.6	8.467
5	2 7 59.11	1.9176	8 35 23.5	8.430
6	2 9 54.19	1.9184	8 43 48.2	8.392
7	2 11 49.32	1.9194	8 52 10.5	8.353
8	2 13 44.52	1.9204	9 0 30.6	8.315
9	2 15 39.77	1.9214	9 8 48.3	8.275
10	2 17 35.09	1.9225	9 17 3.6	8.235
11	2 19 30.47	1.9236	9 25 16.5	8.195
12	2 21 25.92	1.9247	9 33 27.0	8.154
13	2 23 21.43	1.9258	9 41 35.0	8.112
14	2 25 17.02	1.9270	9 49 40.4	8.070
15	2 27 12.67	1.9282	9 57 43.4	8.027
16	2 29 8.40	1.9294	10 5 43.7	7.984
17	2 31 4.20	1.9307	10 13 41.5	7.941
18	2 33 0.08	1.9320	10 21 36.6	7.897
19	2 34 56.04	1.9333	10 29 29.1	7.852
20	2 36 52.07	1.9346	10 37 18.9	7.807
21	2 38 48.19	1.9359	10 45 5.9	7.761
22	2 40 44.38	1.9373	10 52 50.2	7.715
23	2 42 40.66	1.9387	11 0 31.7	7.668
24	2 44 37.02	1.9401	+11 8 10.4	+7.621

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 28.			
	h m s	s	° ′ ″	″
0	2 44 37.02	1.9401	+11 8 10.4	+7.621
1	2 46 33.47	1.9416	11 15 46.2	7.573
2	2 48 30.01	1.9431	11 23 19.2	7.525
3	2 50 26.64	1.9446	11 30 49.2	7.476
4	2 52 23.36	1.9461	11 38 16.3	7.427
5	2 54 20.17	1.9476	11 45 40.4	7.377
6	2 56 17.07	1.9492	11 53 1.5	7.327
7	2 58 14.07	1.9508	12 0 19.6	7.276
8	3 0 11.17	1.9524	12 7 34.6	7.224
9	3 2 8.36	1.9540	12 14 46.5	7.173
10	3 4 5.65	1.9557	12 21 55.3	7.121
11	3 6 3.05	1.9574	12 29 1.0	7.068
12	3 8 0.54	1.9591	12 36 3.4	7.013
13	3 9 58.14	1.9608	12 43 2.6	6.960
14	3 11 55.84	1.9626	12 49 58.6	6.906
15	3 13 53.65	1.9643	12 56 51.3	6.851
16	3 15 51.56	1.9661	13 3 40.7	6.795
17	3 17 49.58	1.9679	13 10 26.7	6.739
18	3 19 47.71	1.9698	13 17 9.4	6.683
19	3 21 45.96	1.9717	13 23 48.7	6.627
20	3 23 44.31	1.9734	13 30 24.6	6.569
21	3 25 42.77	1.9753	13 36 57.0	6.512
22	3 27 41.35	1.9772	13 43 26.0	6.453
23	3 29 40.04	1.9792	+13 49 51.4	+6.394
	SEPTEMBER 29.			
0	3 31 38.85	1.9811	+13 56 13.3	+6.336
1	3 33 37.77	1.9831	14 2 31.7	6.276
2	3 35 36.82	1.9851	14 8 46.4	6.215
3	3 37 35.98	1.9870	14 14 57.5	6.155
4	3 39 35.26	1.9891	14 21 5.0	6.094
5	3 41 34.67	1.9911	14 27 8.8	6.032
6	3 43 34.19	1.9931	14 33 8.8	5.969
7	3 45 33.84	1.9952	14 39 5.1	5.907
8	3 47 33.61	1.9973	14 44 57.7	5.844
9	3 49 33.51	1.9993	14 50 46.4	5.780
10	3 51 33.53	2.0014	14 56 31.3	5.717
11	3 53 33.68	2.0036	15 2 12.4	5.652
12	3 55 33.96	2.0057	15 7 49.5	5.587
13	3 57 34.36	2.0078	15 13 22.8	5.522
14	3 59 34.90	2.0100	15 18 52.1	5.455
15	4 1 35.56	2.0121	15 24 17.4	5.389
16	4 3 36.35	2.0143	15 29 38.8	5.322
17	4 5 37.27	2.0165	15 34 56.1	5.255
18	4 7 38.33	2.0187	15 40 9.4	5.187
19	4 9 39.52	2.0209	15 45 18.6	5.119
20	4 11 40.84	2.0231	15 50 23.7	5.051
21	4 13 42.29	2.0253	15 55 24.7	4.982
22	4 15 43.87	2.0275	16 0 21.5	4.912
23	4 17 45.59	2.0298	16 5 14.1	4.842
24	4 19 47.45	2.0321	+16 10 2.5	+4.772

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 30.					OCTOBER 2.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 19 47.45	2.0321	+16 10 2.5	+1.772	0	5 59 58.97	2.1419	+18 29 45.9	+0.898
1	4 21 49.44	2.0343	16 14 46.7	4.700	1	6 2 7.55	2.1440	18 30 37.1	0.809
2	4 23 51.57	2.0366	16 19 26.5	4.628	2	6 4 16.25	2.1462	18 31 23.0	0.719
3	4 25 53.83	2.0388	16 24 2.1	4.557	3	6 6 25.09	2.1483	18 32 3.4	0.628
4	4 27 56.23	2.0411	16 28 33.4	4.485	4	6 8 34.05	2.1504	18 32 38.4	0.538
5	4 29 58.76	2.0434	16 33 0.3	4.412	5	6 10 43.14	2.1526	18 33 8.0	0.447
6	4 32 1.44	2.0457	16 37 22.9	4.339	6	6 12 52.36	2.1547	18 33 32.1	0.356
7	4 34 4.25	2.0479	16 41 41.0	4.265	7	6 15 1.70	2.1568	18 33 50.7	0.264
8	4 36 7.19	2.0502	16 45 54.7	4.191	8	6 17 11.17	2.1588	18 34 3.8	0.173
9	4 38 10.28	2.0526	16 50 3.9	4.117	9	6 19 20.76	2.1608	18 34 11.4	+0.081
10	4 40 13.50	2.0549	16 54 8.7	4.042	10	6 21 30.47	2.1629	18 34 13.5	−0.012
11	4 42 16.87	2.0572	16 58 9.0	3.967	11	6 23 40.31	2.1650	18 34 10.0	0.104
12	4 44 20.37	2.0595	17 2 4.7	3.891	12	6 25 50.27	2.1670	18 34 1.0	0.197
13	4 46 24.01	2.0618	17 5 55.9	3.814	13	6 28 0.35	2.1690	18 33 46.4	0.290
14	4 48 27.79	2.0642	17 9 42.4	3.737	14	6 30 10.55	2.1710	18 33 26.2	0.383
15	4 50 31.72	2.0666	17 13 24.4	3.661	15	6 32 20.87	2.1730	18 33 0.4	0.477
16	4 52 35.78	2.0688	17 17 1.7	3.583	16	6 34 31.31	2.1749	18 32 29.0	0.571
17	4 54 39.98	2.0712	17 20 34.4	3.506	17	6 36 41.86	2.1768	18 31 51.9	0.665
18	4 56 44.33	2.0736	17 24 2.4	3.428	18	6 38 52.53	2.1788	18 31 9.2	0.759
19	4 58 48.81	2.0758	17 27 25.7	3.349	19	6 41 3.31	2.1807	18 30 20.8	0.851
20	5 0 53.43	2.0782	17 30 44.3	3.270	20	6 43 14.21	2.1826	18 29 26.7	0.948
21	5 2 58.19	2.0805	17 33 58.1	3.190	21	6 45 25.22	2.1844	18 28 27.0	1.043
22	5 5 3.09	2.0829	17 37 7.1	3.110	22	6 47 36.34	2.1863	18 27 21.6	1.138
23	5 7 8.14	2.0852	+17 40 11.3	+3.029	23	6 49 47.57	2.1882	+18 26 10.5	−1.233
	OCTOBER 1.					OCTOBER 3.			
0	5 9 13.32	2.0875	+17 43 10.6	+2.948	0	6 51 58.92	2.1900	+18 24 53.6	−1.329
1	5 11 18.64	2.0898	17 46 5.1	2.868	1	6 54 10.37	2.1918	18 23 31.0	1.424
2	5 13 24.10	2.0922	17 48 54.7	2.787	2	6 56 21.94	2.1937	18 22 2.7	1.520
3	5 15 29.70	2.0945	17 51 39.5	2.705	3	6 58 33.61	2.1953	18 20 28.6	1.616
4	5 17 35.44	2.0968	17 54 19.3	2.622	4	7 0 45.38	2.1971	18 18 48.8	1.713
5	5 19 41.32	2.0992	17 56 54.1	2.539	5	7 2 57.26	2.1989	18 17 3.1	1.809
6	5 21 47.34	2.1014	17 59 24.0	2.457	6	7 5 9.25	2.2006	18 15 11.7	1.904
7	5 23 53.49	2.1037	18 1 48.9	2.373	7	7 7 21.33	2.2023	18 13 14.6	2.001
8	5 25 59.79	2.1061	18 4 8.7	2.288	8	7 9 33.52	2.2040	18 11 11.6	2.098
9	5 28 6.22	2.1083	18 6 23.5	2.205	9	7 11 45.81	2.2057	18 9 2.8	2.195
10	5 30 12.79	2.1107	18 8 33.3	2.120	10	7 13 58.20	2.2073	18 6 48.2	2.292
11	5 32 19.50	2.1129	18 10 37.9	2.035	11	7 16 10.69	2.2089	18 4 27.8	2.389
12	5 34 26.34	2.1152	18 12 37.5	1.950	12	7 18 23.27	2.2105	18 2 1.5	2.487
13	5 36 33.32	2.1175	18 14 31.9	1.864	13	7 20 35.95	2.2122	17 59 29.4	2.583
14	5 38 40.44	2.1198	18 16 21.2	1.778	14	7 22 48.73	2.2138	17 56 51.5	2.680
15	5 40 47.69	2.1220	18 18 5.3	1.692	15	7 25 1.60	2.2153	17 54 7.8	2.778
16	5 42 55.08	2.1242	18 19 44.2	1.605	16	7 27 14.57	2.2169	17 51 18.2	2.876
17	5 45 2.60	2.1264	18 21 17.9	1.518	17	7 29 27.63	2.2184	17 48 22.7	2.973
18	5 47 10.25	2.1287	18 22 46.3	1.430	18	7 31 40.78	2.2199	17 45 21.4	3.070
19	5 49 18.04	2.1310	18 24 9.5	1.342	19	7 33 54.02	2.2214	17 42 14.3	3.168
20	5 51 25.97	2.1332	18 25 27.4	1.254	20	7 36 7.35	2.2229	17 39 1.3	3.266
21	5 53 34.02	2.1353	18 26 40.0	1.166	21	7 38 20.77	2.2243	17 35 42.4	3.363
22	5 55 42.21	2.1375	18 27 47.3	1.077	22	7 40 34.27	2.2257	17 32 17.7	3.461
23	5 57 50.52	2.1397	18 28 49.3	0.988	23	7 42 47.86	2.2272	17 28 47.1	3.558
24	5 59 58.97	2.1419	+18 29 45.9	+0.898	24	7 45 1.54	2.2287	+17 25 10.7	−3.656

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 4.					OCTOBER 6.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 45 1.54	2.2287	+17 25 10.7	−3.656	0	9 33 20.49	2.2802	+12 39 39.2	− 8.139
1	7 47 15.30	2.2300	17 21 28.4	3.753	1	9 35 37.33	2.2811	12 31 28.3	8.223
2	7 49 29.14	2.2314	17 17 40.3	3.851	2	9 37 54.22	2.2819	12 23 12.4	8.307
3	7 51 43.07	2.2328	17 13 46.3	3.949	3	9 40 11.16	2.2828	12 14 51.5	8.390
4	7 53 57.07	2.2341	17 9 46.4	4.047	4	9 42 28.15	2.2837	12 6 25.6	8.472
5	7 56 11.16	2.2354	17 5 40.7	4.144	5	9 44 45.20	2.2846	11 57 54.8	8.554
6	7 58 25.32	2.2368	17 1 29.1	4.242	6	9 47 2.30	2.2854	11 49 19.1	8.636
7	8 0 39.57	2.2381	16 57 11.7	4.338	7	9 49 19.45	2.2863	11 40 38.5	8.717
8	8 2 53.89	2.2393	16 52 48.5	4.436	8	9 51 36.65	2.2872	11 31 53.1	8.797
9	8 5 8.28	2.2105	16 48 19.4	4.533	9	9 53 53.91	2.2881	11 23 2.9	8.876
10	8 7 22.75	2.2418	16 43 44.5	4.630	10	9 56 11.22	2.2889	11 14 8.0	8.955
11	8 9 37.30	2.2131	16 39 3.8	4.727	11	9 58 28.58	2.2898	11 5 8.3	9.033
12	8 11 51.92	2.2443	16 34 17.2	4.824	12	10 0 45.99	2.2906	10 56 4.0	9.110
13	8 14 6.61	2.2454	16 29 24.9	4.921	13	10 3 3.45	2.2915	10 46 55.1	9.187
14	8 16 21.37	2.2466	16 24 26.7	5.018	14	10 5 20.97	2.2925	10 37 41.6	9.263
15	8 18 36.20	2.2178	16 19 22.7	5.114	15	10 7 38.55	2.2933	10 28 23.5	9.338
16	8 20 51.11	2.2190	16 14 13.0	5.210	16	10 9 56.17	2.2942	10 19 1.0	9.413
17	8 23 6.08	2.2501	16 8 57.5	5.307	17	10 12 13.85	2.2952	10 9 34.0	9.487
18	8 25 21.12	2.2512	16 3 36.2	5.403	18	10 14 31.59	2.2961	10 0 2.6	9.559
19	8 27 36.22	2.2523	15 58 9.2	5.498	19	10 16 49.38	2.2969	9 50 26.9	9.631
20	8 29 51.39	2.2534	15 52 36.4	5.594	20	10 19 7.22	2.2978	9 40 46.9	9.702
21	8 32 6.63	2.2516	15 46 57.9	5.689	21	10 21 25.12	2.2988	9 31 2.7	9.772
22	8 34 21.94	2.2556	15 41 13.7	5.784	22	10 23 43.08	2.2998	9 21 14.2	9.842
23	8 36 37.30	2.2566	+15 35 23.8	−5.879	23	10 26 1.09	2.3007	+ 9 11 21.7	− 9.910
	OCTOBER 5.					OCTOBER 7.			
0	8 38 52.73	2.2577	+15 29 28.2	−5.974	0	10 28 19.16	2.3017	+ 9 1 25.0	− 9.978
1	8 41 8.22	2.2587	15 23 26.9	6.068	1	10 30 37.29	2.3026	8 51 24.3	10.046
2	8 43 23.78	2.2597	15 17 20.1	6.162	2	10 32 55.47	2.3035	8 41 19.5	10.112
3	8 45 39.39	2.2607	15 11 7.5	6.257	3	10 35 13.71	2.3015	8 31 10.9	10.176
4	8 47 55.07	2.2617	15 4 49.3	6.349	4	10 37 32.01	2.3056	8 20 58.4	10.240
5	8 50 10.80	2.2627	14 58 25.6	6.442	5	10 39 50.38	2.3066	8 10 42.1	10.333
6	8 52 26.60	2.2637	14 51 56.2	6.536	6	10 42 8.80	2.3075	8 0 22.0	10.365
7	8 54 42.45	2.2647	14 45 21.3	6.628	7	10 44 27.28	2.3086	7 49 58.3	10.426
8	8 56 58.36	2.2657	14 38 40.9	6.720	8	10 46 45.83	2.3097	7 39 30.9	10.486
9	8 59 14.33	2.2667	14 31 54.9	6.812	9	10 49 4.44	2.3107	7 29 0.0	10.545
10	9 1 30.36	2.2676	14 25 3.4	6.903	10	10 51 23.11	2.3117	7 18 25.5	10.603
11	9 3 46.44	2.2685	14 18 6.5	6.994	11	10 53 41.84	2.3128	7 7 47.6	10.660
12	9 6 2.58	2.2695	14 11 4.1	7.085	12	10 56 0.64	2.3138	6 57 6.3	10.717
13	9 8 18.78	2.2704	14 3 56.3	7.176	13	10 58 19.50	2.3149	6 46 21.6	10.772
14	9 10 35.03	2.2713	13 56 43.0	7.266	14	11 0 38.43	2.3161	6 35 33.7	10.826
15	9 12 51.33	2.2722	13 49 24.4	7.355	15	11 2 57.43	2.3172	6 24 42.5	10.878
16	9 15 7.69	2.2732	13 42 0.4	7.444	16	11 5 16.49	2.3183	6 13 48.3	10.930
17	9 17 24.11	2.2740	13 34 31.1	7.533	17	11 7 35.62	2.3195	6 2 50.9	10.981
18	9 19 40.57	2.2748	13 26 56.5	7.621	18	11 9 54.83	2.3207	5 51 50.6	11.030
19	9 21 57.09	2.2758	13 19 16.6	7.708	19	11 12 14.10	2.3218	5 40 47.3	11.079
20	9 24 13.67	2.2767	13 11 31.5	7.796	20	11 14 33.44	2.3230	5 29 41.1	11.126
21	9 26 30.29	2.2775	13 3 41.1	7.883	21	11 16 52.86	2.3242	5 18 32.2	11.172
22	9 28 46.97	2.2785	12 55 45.6	7.968	22	11 19 12.35	2.3254	5 7 20.5	11.217
23	9 31 3.71	2.2793	12 47 45.0	8.053	23	11 21 31.91	2.3267	4 56 6.2	11.260
24	9 33 20.49	2.2802	+12 39 39.2	−8.139	24	11 23 51.55	2.3280	+ 4 44 49.3	−11.302

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 8.			
	h m s	s	° ′ ″	″
0	11 23 51.55	2.3280	+4 44 49.3	−11.302
1	11 26 11.27	2.3293	4 33 29.9	11.343
2	11 28 31.06	2.3305	4 22 8.1	11.384
3	11 30 50.93	2.3318	4 10 43.8	11.423
4	11 33 10.88	2.3332	3 59 17.3	11.460
5	11 35 30.91	2.3345	3 47 48.6	11.497
6	11 37 51.02	2.3358	3 36 17.7	11.532
7	11 40 11.21	2.3372	3 24 44.8	11.564
8	11 42 31.48	2.3386	3 13 10.0	11.597
9	11 44 51.84	2.3100	3 1 33.2	11.628
10	11 47 12.28	2.3414	2 49 54.6	11.658
11	11 49 32.81	2.3429	2 38 14.2	11.687
12	11 51 53.43	2.3444	2 26 32.2	11.713
13	11 54 14.14	2.3458	2 14 48.6	11.739
14	11 56 34.93	2.3473	2 3 3.5	11.763
15	11 58 55.82	2.3489	1 51 17.0	11.787
16	12 1 16.80	2.3504	1 39 29.1	11.808
17	12 3 37.87	2.3519	1 27 40.1	11.828
18	12 5 59.03	2.3535	1 15 49.8	11.847
19	12 8 20.29	2.3551	1 3 58.5	11.864
20	12 10 41.64	2.3567	0 52 6.1	11.880
21	12 13 3.09	2.3583	0 40 12.9	11.894
22	12 15 24.64	2.3600	0 28 18.8	11.907
23	12 17 46.29	2.3617	+0 16 24.0	−11.919
	OCTOBER 9.			
0	12 20 8.04	2.3633	+0 4 28.5	−11.929
1	12 22 29.89	2.3650	−0 7 27.5	11.938
2	12 24 51.84	2.3668	0 19 24.0	11.945
3	12 27 13.90	2.3685	0 31 20.9	11.951
4	12 29 36.06	2.3703	0 43 18.1	11.954
5	12 31 58.33	2.3720	0 55 15.4	11.957
6	12 34 20.70	2.3737	1 7 12.9	11.958
7	12 36 43.17	2.3755	1 19 10.4	11.958
8	12 39 5.76	2.3773	1 31 7.9	11.957
9	12 41 28.45	2.3792	1 43 5.2	11.953
10	12 43 51.26	2.3810	1 55 2.2	11.948
11	12 46 14.17	2.3828	2 6 58.9	11.942
12	12 48 37.20	2.3847	2 18 55.2	11.934
13	12 51 0.34	2.3866	2 30 51.0	11.924
14	12 53 23.59	2.3884	2 42 46.1	11.913
15	12 55 46.95	2.3903	2 54 40.6	11.901
16	12 58 10.43	2.3923	3 6 34.2	11.886
17	13 0 34.03	2.3943	3 18 26.9	11.871
18	13 2 57.75	2.3962	3 30 18.7	11.854
19	13 5 21.57	2.3981	3 42 9.4	11.835
20	13 7 45.52	2.4002	3 53 58.9	11.814
21	13 10 9.59	2.4021	4 5 47.1	11.792
22	13 12 33.77	2.4040	4 17 34.0	11.769
23	13 14 58.07	2.4060	4 29 19.4	11.744
24	13 17 22.49	2.4080	−4 41 3.3	−11.718

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min
	OCTOBER 10.			
	h m s	s	° ′ ″	″
0	13 17 22.49	2.4080	− 4 41 3.3	−11.718
1	13 19 47.03	2.4101	4 52 45.5	11.689
2	13 22 11.70	2.4121	5 4 26.0	11.660
3	13 24 36.48	2.4141	5 16 4.7	11.629
4	13 27 1.39	2.4162	5 27 41.5	11.596
5	13 29 26.42	2.4182	5 39 16.2	11.561
6	13 31 51.57	2.4202	5 50 48.8	11.525
7	13 34 16.84	2.4222	6 2 19.2	11.487
8	13 36 42.23	2.4213	6 13 47.3	11.448
9	13 39 7.75	2.4263	6 25 13.0	11.408
10	13 41 33.39	2.4283	6 36 36.3	11.366
11	13 43 59.15	2.4304	6 47 56.9	11.322
12	13 46 25.04	2.4325	6 59 14.9	11.277
13	13 48 51.05	2.4346	7 10 30.1	11.230
14	13 51 17.19	2.4367	7 21 42.5	11.182
15	13 53 43.45	2.4387	7 32 51.9	11.131
16	13 56 9.83	2.4407	7 43 58.2	11.079
17	13 58 36.33	2.4427	7 55 1.4	11.027
18	14 1 2.95	2.4448	8 6 1.5	10.973
19	14 3 29.70	2.4468	8 16 58.2	10.917
20	14 5 56.57	2.4488	8 27 51.5	10.859
21	14 8 23.55	2.4508	8 38 41.3	10.801
22	14 10 50.66	2.4528	8 49 27.6	10.741
23	14 13 17.89	2.4548	− 9 0 10.2	−10.678
	OCTOBER 11.			
0	14 15 45.24	2.4568	− 9 10 49.0	−10.615
1	14 18 12.71	2.4588	9 21 24.0	10.551
2	14 20 40.29	2.4607	9 31 55.1	10.485
3	14 23 7.99	2.4627	9 42 22.2	10.417
4	14 25 35.81	2.4647	9 52 45.2	10.348
5	14 28 3.75	2.4666	10 3 4.0	10.278
6	14 30 31.80	2.4684	10 13 18.5	10.206
7	14 32 59.96	2.4703	10 23 28.7	10.133
8	14 35 28.23	2.4722	10 33 34.5	10.058
9	14 37 56.62	2.4740	10 43 35.7	9.982
10	14 40 25.11	2.4758	10 53 32.3	9.905
11	14 42 53.72	2.4777	11 3 24.3	9.827
12	14 45 22.43	2.4794	11 13 11.5	9.747
13	14 47 51.25	2.4812	11 22 53.9	9.666
14	14 50 20.17	2.4829	11 32 31.4	9.583
15	14 52 49.20	2.4846	11 42 3.8	9.498
16	14 55 18.32	2.4863	11 51 31.2	9.414
17	14 57 47.55	2.4879	12 0 53.5	9.328
18	15 0 16.87	2.4895	12 10 10.6	9.240
19	15 2 46.29	2.4911	12 19 22.3	9.152
20	15 5 15.80	2.4927	12 28 28.8	9.062
21	15 7 45.41	2.4942	12 37 29.8	8.971
22	15 10 15.10	2.4957	12 46 25.3	8.878
23	15 12 44.89	2.4972	12 55 15.2	8.785
24	15 15 14.76	2.4985	−13 3 59.5	− 8.691

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 12.					OCTOBER 14.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 15 14.76	2.4985	−13 3 59.5	−8.691	0	17 15 53.15	2.5058	−17 55 41.1	−3.232
1	15 17 44.71	2.4999	13 12 38.1	8.595	1	17 18 23.46	2.5044	17 58 51.3	3.108
2	15 20 14.75	2.5013	13 21 10.9	8.498	2	17 20 53.68	2.5030	18 1 54.0	2.983
3	15 22 44.87	2.5026	13 29 37.9	8.401	3	17 23 23.82	2.5015	18 4 49.2	2.858
4	15 25 15.06	2.5038	13 37 59.0	8.302	4	17 25 53.86	2.4998	18 7 37.1	2.736
5	15 27 45.33	2.5051	13 46 14.1	8.202	5	17 28 23.80	2.4982	18 10 17.5	2.611
6	15 30 15.67	2.5062	13 54 23.2	8.101	6	17 30 53.65	2.4966	18 12 50.4	2.487
7	15 32 46.07	2.5073	14 2 26.2	7.999	7	17 33 23.39	2.4948	18 15 15.9	2.363
8	15 35 16.55	2.5085	14 10 23.1	7.897	8	17 35 53.02	2.4929	18 17 34.0	2.240
9	15 37 47.09	2.5094	14 18 13.8	7.793	9	17 38 22.54	2.4910	18 19 44.7	2.117
10	15 40 17.68	2.5104	14 25 58.2	7.688	10	17 40 51.94	2.4890	18 21 48.0	1.993
11	15 42 48.34	2.5114	14 33 36.3	7.582	11	17 43 21.22	2.4869	18 23 43.8	1.868
12	15 45 19.05	2.5123	14 41 8.0	7.475	12	17 45 50.37	2.4848	18 25 32.2	1.746
13	15 47 49.81	2.5132	14 48 33.3	7.368	13	17 48 19.40	2.4827	18 27 13.3	1.623
14	15 50 20.63	2.5140	14 55 52.2	7.260	14	17 50 48.29	2.4804	18 28 47.0	1.500
15	15 52 51.49	2.5147	15 3 4.5	7.151	15	17 53 17.05	2.4782	18 30 13.3	1.377
16	15 55 22.39	2.5153	15 10 10.3	7.041	16	17 55 45.67	2.4758	18 31 32.2	1.255
17	15 57 53.33	2.5160	15 17 9.4	6.929	17	17 58 14.14	2.4733	18 32 43.9	1.133
18	16 0 24.31	2.5167	15 24 1.8	6.818	18	18 0 42.47	2.4709	18 33 48.2	1.011
19	16 2 55.33	2.5172	15 30 47.6	6.707	19	18 3 10.65	2.4683	18 34 45.2	0.889
20	16 5 26.37	2.5176	15 37 26.6	6.593	20	18 5 38.67	2.4657	18 35 34.9	0.768
21	16 7 57.44	2.5180	15 43 58.8	6.480	21	18 8 6.53	2.4630	18 36 17.4	0.647
22	16 10 28.53	2.5184	15 50 24.2	6.366	22	18 10 34.23	2.4603	18 36 52.6	0.527
23	16 12 59.65	2.5187	−15 56 42.7	−6.251	23	18 13 1.77	2.4575	−18 37 20.6	−0.407
	OCTOBER 13.					OCTOBER 15.			
0	16 15 30.78	2.5189	−16 2 54.3	−6.135	0	18 15 29.13	2.4546	−18 37 41.4	−0.287
1	16 18 1.92	2.5191	16 8 58.9	6.018	1	18 17 56.32	2.4517	18 37 55.0	0.167
2	16 20 33.07	2.5193	16 14 56.5	5.902	2	18 20 23.34	2.4488	18 38 1.5	−0.048
3	16 23 4.23	2.5194	16 20 47.1	5.785	3	18 22 50.18	2.4458	18 38 0.8	+0.071
4	16 25 35.40	2.5194	16 26 30.7	5.667	4	18 25 16.83	2.4427	18 37 53.0	0.188
5	16 28 6.56	2.5193	16 32 7.2	5.548	5	18 27 43.31	2.4397	18 37 38.2	0.306
6	16 30 37.71	2.5191	16 37 36.5	5.429	6	18 30 9.59	2.4364	18 37 16.3	0.423
7	16 33 8.85	2.5190	16 42 58.7	5.311	7	18 32 35.68	2.4332	18 36 47.4	0.540
8	16 35 39.99	2.5188	16 48 13.8	5.191	8	18 35 1.58	2.4299	18 36 11.5	0.656
9	16 38 11.11	2.5184	16 53 21.6	5.070	9	18 37 27.27	2.4266	18 35 28.7	0.772
10	16 40 42.20	2.5180	16 58 22.2	4.949	10	18 39 52.77	2.4232	18 34 38.9	0.888
11	16 43 13.27	2.5176	17 3 15.5	4.828	11	18 42 18.06	2.4198	18 33 42.2	1.002
12	16 45 44.31	2.5170	17 8 1.6	4.707	12	18 44 43.15	2.4164	18 32 38.7	1.116
13	16 48 15.31	2.5165	17 12 40.4	4.586	13	18 47 8.03	2.4128	18 31 28.3	1.229
14	16 50 46.29	2.5160	17 17 11.9	4.463	14	18 49 32.69	2.4092	18 30 11.2	1.342
15	16 53 17.23	2.5152	17 21 36.0	4.340	15	18 51 57.14	2.4057	18 28 47.3	1.454
16	16 55 48.11	2.5143	17 25 52.7	4.218	16	18 54 21.37	2.4021	18 27 16.7	1.567
17	16 58 18.95	2.5136	17 30 2.2	4.096	17	18 56 45.39	2.3984	18 25 39.3	1.678
18	17 0 49.74	2.5127	17 34 4.2	3.973	18	18 59 9.18	2.3946	18 23 55.4	1.788
19	17 3 20.47	2.5117	17 37 58.9	3.850	19	19 1 32.74	2.3908	18 22 4.8	1.898
20	17 5 51.15	2.5107	17 41 46.2	3.727	20	19 3 56.08	2.3871	18 20 7.6	2.007
21	17 8 21.75	2.5095	17 45 26.1	3.603	21	19 6 19.19	2.3833	18 18 3.9	2.116
22	17 10 52.29	2.5084	17 48 58.5	3.478	22	19 8 42.07	2.3794	18 15 53.7	2.223
23	17 13 22.76	2.5072	17 52 23.5	3.355	23	19 11 4.72	2.3755	18 13 37.1	2.331
24	17 15 53.15	2.5058	−17 55 41.1	−3.232	24	19 13 27.13	2.3715	−18 11 14.0	+2.438

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 16.			
	h m s	s	° ′ ″	″
0	19 13 27.13	2.3715	−18 11 14.0	+2.438
1	19 15 49.30	2.3676	18 8 44.6	2.543
2	19 18 11.24	2.3636	18 6 8.8	2.649
3	19 20 32.93	2.3594	18 3 26.7	2.753
4	19 22 54.37	2.3554	18 0 38.5	2.856
5	19 25 15.58	2.3513	17 57 44.0	2.960
6	19 27 36.53	2.3472	17 54 43.3	3.062
7	19 29 57.24	2.3431	17 51 36.5	3.163
8	19 32 17.70	2.3389	17 48 23.7	3.263
9	19 34 37.91	2.3347	17 45 4.9	3.364
10	19 36 57.86	2.3304	17 41 40.0	3.463
11	19 39 17.56	2.3262	17 38 9.3	3.562
12	19 41 37.01	2.3220	17 34 32.6	3.660
13	19 43 56.20	2.3177	17 30 50.1	3.756
14	19 46 15.13	2.3134	17 27 1.9	3.852
15	19 48 33.81	2.3092	17 23 7.8	3.948
16	19 50 52.23	2.3048	17 19 8.1	4.043
17	19 53 10.38	2.3004	17 15 2.7	4.137
18	19 55 28.28	2.2961	17 10 51.7	4.230
19	19 57 45.91	2.2917	17 6 35.1	4.322
20	20 0 3.28	2.2873	17 2 13.1	4.413
21	20 2 20.39	2.2830	16 57 45.6	4.503
22	20 4 37.24	2.2786	16 53 12.7	4.593
23	20 6 53.82	2.2742	−16 48 34.4	+4.682
	OCTOBER 17.			
0	20 9 10.14	2.2698	−16 43 50.8	+4.771
1	20 11 26.19	2.2654	16 39 1.9	4.858
2	20 13 41.99	2.2610	16 34 7.9	4.944
3	20 15 57.51	2.2565	16 29 8.6	5.030
4	20 18 12.77	2.2521	16 24 4.3	5.114
5	20 20 27.76	2.2177	16 18 54.9	5.199
6	20 22 42.49	2.2433	16 13 40.4	5.282
7	20 24 56.96	2.2390	16 8 21.0	5.364
8	20 27 11.17	2.2345	16 2 56.7	5.446
9	20 29 25.10	2.2300	15 57 27.5	5.527
10	20 31 38.77	2.2257	15 51 53.5	5.606
11	20 33 52.18	2.2213	15 46 14.8	5.685
12	20 36 5.32	2.2168	15 40 31.3	5.764
13	20 38 18.20	2.2125	15 34 43.1	5.841
14	20 40 30.82	2.2081	15 28 50.4	5.917
15	20 42 43.17	2.2037	15 22 53.1	5.993
16	20 44 55.26	2.1993	15 16 51.2	6.068
17	20 47 7.09	2.1950	15 10 44.9	6.142
18	20 49 18.66	2.1907	15 4 34.2	6.215
19	20 51 29.97	2.1863	14 58 19.1	6.287
20	20 53 41.02	2.1820	14 51 59.7	6.358
21	20 55 51.81	2.1777	14 45 36.1	6.429
22	20 58 2.34	2.1734	14 39 8.2	6.499
23	21 0 12.62	2.1692	14 32 36.2	6.568
24	21 2 22.64	2.1649	−14 26 0.0	+6.637

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 18.			
	h m s	s	° ′ ″	″
0	21 2 22.64	2.1649	−14 26 0.0	+6.637
1	21 4 32.41	2.1607	14 19 19.8	6.703
2	21 6 41.92	2.1564	14 12 35.6	6.770
3	21 8 51.18	2.1522	14 5 47.4	6.836
4	21 11 0.19	2.1481	13 58 55.3	6.901
5	21 13 8.95	2.1439	13 51 59.3	6.965
6	21 15 17.46	2.1398	13 44 59.5	7.028
7	21 17 25.72	2.1356	13 37 56.0	7.090
8	21 19 33.73	2.1315	13 30 48.7	7.152
9	21 21 41.50	2.1275	13 23 37.7	7.213
10	21 23 49.03	2.1235	13 16 23.2	7.272
11	21 25 56.32	2.1194	13 9 5.1	7.332
12	21 28 3.36	2.1153	13 1 43.4	7.390
13	21 30 10.16	2.1114	12 54 18.3	7.447
14	21 32 16.73	2.1075	12 46 49.7	7.504
15	21 34 23.06	2.1036	12 39 17.8	7.560
16	21 36 29.16	2.0997	12 31 42.5	7.615
17	21 38 35.02	2.0958	12 24 4.0	7.669
18	21 40 40.65	2.0920	12 16 22.2	7.723
19	21 42 46.06	2.0882	12 8 37.2	7.776
20	21 44 51.23	2.0843	12 0 49.1	7.828
21	21 46 56.18	2.0807	11 52 57.9	7.879
22	21 49 0.91	2.0770	11 45 3.6	7.929
23	21 51 5.42	2.0733	−11 37 6.4	+7.978
	OCTOBER 19.			
0	21 53 9.70	2.0695	−11 29 6.2	+8.027
1	21 55 13.76	2.0659	11 21 3.1	8.075
2	21 57 17.61	2.0624	11 12 57.2	8.122
3	21 59 21 25	2.0588	11 4 48.5	8.168
4	22 1 24.66	2.0552	10 56 37.0	8.214
5	22 3 27.87	2.0517	10 48 22.8	8.259
6	22 5 30.87	2.0483	10 40 5.9	8.304
7	22 7 33.67	2.0449	10 31 46.3	8.347
8	22 9 36.26	2.0414	10 23 24.2	8.389
9	22 11 38.64	2.0381	10 14 59.6	8.431
10	22 13 40.83	2.0318	10 6 32.5	8.472
11	22 15 42.82	2.0315	9 58 2.9	8.513
12	22 17 44.61	2.0282	9 49 31.0	8.552
13	22 19 46.21	2.0250	9 40 56.7	8.591
14	22 21 47.61	2.0218	9 32 20.1	8.629
15	22 23 48.83	2.0187	9 23 41.2	8.667
16	22 25 49.86	2.0156	9 15 0.1	8.703
17	22 27 50.70	2.0124	9 6 16.8	8.739
18	22 29 51.35	2.0094	8 57 31.4	8.774
19	22 31 51.83	2.0065	8 48 43.9	8.808
20	22 33 52.13	2.0036	8 39 54.4	8.842
21	23 35 52.26	2.0007	8 31 2.9	8.875
22	22 37 52.21	1.9977	8 22 9.4	8.907
23	22 39 51.98	1.9948	8 13 14.0	8.939
24	22 41 51.59	1.9921	− 8 4 16.7	+8.970

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 20.					OCTOBER 22.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 41 51.59	1.9921	−8 4 16.7	+8.970	0	0 15 0.08	1.9013	−0 31 19.8	+9.648
1	22 43 51.03	1.9893	7 55 17.6	9.000	1	0 16 54.31	1.9034	0 21 40.9	9.647
2	22 45 50.31	1.9866	7 46 16.7	9.029	2	0 18 48.49	1.9026	0 12 2.2	9.644
3	22 47 49.42	1.9838	7 37 14.1	9.058	3	0 20 42.62	1.9018	−0 2 23.6	9.642
4	22 49 48.37	1.9812	7 28 9.8	9.086	4	0 22 36.71	1.9011	+0 7 14.8	9.638
5	22 51 47.17	1.9787	7 19 3.8	9.113	5	0 24 30.75	1.9004	0 16 53.0	9.634
6	22 53 45.81	1.9760	7 9 56.2	9.140	6	0 26 24.76	1.8997	0 26 30.9	9.628
7	22 55 44.29	1.9735	7 0 47.0	9.166	7	0 28 18.72	1.8991	0 36 8.4	9.623
8	22 57 42.63	1.9711	6 51 36.3	9.190	8	0 30 12.65	1.8986	0 45 45.7	9.618
9	22 59 40.82	1.9686	6 42 24.2	9.215	9	0 32 6.55	1.8980	0 55 22.6	9.611
10	23 1 38.86	1.9661	6 33 10.5	9.239	10	0 34 0.41	1.8975	1 4 59.0	9.603
11	23 3 36.75	1.9637	6 23 55.5	9.262	11	0 35 54.25	1.8971	1 14 35.0	9.596
12	23 5 34.51	1.9615	6 14 39.1	9.284	12	0 37 48.06	1.8967	1 24 10.5	9.588
13	23 7 32.13	1.9592	6 5 21.4	9.307	13	0 39 41.85	1.8962	1 33 45.5	9.578
14	23 9 29.61	1.9568	5 56 2.3	9.328	14	0 41 35.61	1.8958	1 43 19.9	9.568
15	23 11 26.95	1.9547	5 46 42.1	9.347	15	0 43 29.35	1.8955	1 52 53.7	9.558
16	23 13 24.17	1.9526	5 37 20.7	9.367	16	0 45 23.07	1.8952	2 2 26.9	9.547
17	23 15 21.26	1.9504	5 27 58.0	9.387	17	0 47 16.78	1.8950	2 11 59.3	9.535
18	23 17 18.22	1.9483	5 18 34.3	9.404	18	0 49 10.47	1.8948	2 21 31.1	9.523
19	23 19 15.05	1.9463	5 9 9.5	9.422	19	0 51 4.15	1.8947	2 31 2.1	9.510
20	23 21 11.77	1.9443	4 59 43.7	9.439	20	0 52 57.83	1.8945	2 40 32.3	9.497
21	23 23 8.36	1.9423	4 50 16.8	9.455	21	0 54 51.49	1.8943	2 50 1.8	9.483
22	23 25 4.84	1.9403	4 40 49.1	9.470	22	0 56 45.15	1.8943	2 59 30.3	9.468
23	23 27 1.20	1.9384	−4 31 20.4	+9.486	23	0 58 38.81	1.8943	+3 8 58.0	+9.454
	OCTOBER 21.					OCTOBER 23.			
0	23 28 57.45	1.9366	−4 21 50.8	+9.500	0	1 0 32.47	1.8943	+3 18 24.8	+9.438
1	23 30 53.59	1.9348	4 12 20.4	9.513	1	1 2 26.13	1.8944	3 27 50.6	9.422
2	23 32 49.62	1.9330	4 2 49.2	9.527	2	1 4 19.80	1.8945	3 37 15.4	9.405
3	23 34 45.55	1.9313	3 53 17.2	9.539	3	1 6 13.47	1.8945	3 46 39.2	9.387
4	23 36 41.37	1.9296	3 43 44.5	9.550	4	1 8 7.14	1.8947	3 56 1.9	9.369
5	23 38 37.10	1.9280	3 34 11.2	9.561	5	1 10 0.83	1.8949	4 5 23.5	9.351
6	23 40 32.73	1.9263	3 24 37.2	9.572	6	1 11 54.53	1.8951	4 14 44.0	9.332
7	23 42 28.26	1.9247	3 15 2.6	9.581	7	1 13 48.24	1.8953	4 24 3.3	9.311
8	23 44 23.70	1.9232	3 5 27.5	9.590	8	1 15 41.97	1.8957	4 33 21.3	9.291
9	23 46 19.05	1.9217	2 55 51.8	9.599	9	1 17 35.72	1.8960	4 42 38.2	9.270
10	23 48 14.31	1.9203	2 46 15.6	9.607	10	1 19 29.49	1.8963	4 51 53.7	9.248
11	23 50 9.49	1.9189	2 36 39.0	9.613	11	1 21 23.28	1.8967	5 1 7.9	9.226
12	23 52 4.58	1.9175	2 27 2.0	9.620	12	1 23 17.09	1.8971	5 10 20.8	9.203
13	23 53 59.59	1.9162	2 17 24.6	9.626	13	1 25 10.93	1.8975	5 19 32.3	9.179
14	23 55 54.52	1.9149	2 7 46.9	9.631	14	1 27 4.79	1.8980	5 28 42.3	9.155
15	23 57 49.38	1.9137	1 58 8.9	9.636	15	1 28 58.69	1.8986	5 37 50.9	9.131
16	23 59 44.17	1.9125	1 48 30.6	9.640	16	1 30 52.62	1.8991	5 46 58.0	9.106
17	0 1 38.88	1.9113	1 38 52.1	9.643	17	1 32 46.58	1.8997	5 56 3.6	9.080
18	0 3 33.52	1.9102	1 29 13.5	9.645	18	1 34 40.58	1.9002	6 5 7.6	9.053
19	0 5 28.10	1.9092	1 19 34.7	9.648	19	1 36 34.61	1.9008	6 14 10.0	9.027
20	0 7 22.62	1.9081	1 9 55.7	9.650	20	1 38 28.68	1.9016	6 23 10.8	8.999
21	0 9 17.07	1.9070	1 0 16.7	9.650	21	1 40 22.80	1.9023	6 32 9.9	8.971
22	0 11 11.46	1.9061	0 50 37.7	9.650	22	1 42 16.95	1.9029	6 41 7.3	8.942
23	0 13 5.80	1.9052	0 40 58.7	9.649	23	1 44 11.15	1.9037	6 50 2.9	8.913
24	0 15 0.08	1.9043	−0 31 19.8	+9.648	24	1 46 5.40	1.9046	+6 58 56.8	+8.883

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 24.					OCTOBER 26.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 46 5.40	1.9046	+ 6 58 56.8	+8.883	0	3 18 54.64	1.9713	+13 20 9.9	+6.788
1	1 47 59.70	1.9053	7 7 48.9	8.853	1	3 20 52.97	1.9732	13 26 55.5	6.731
2	1 49 54.04	1.9062	7 16 39.1	8.822	2	3 22 51.42	1.9751	13 33 37.6	6.673
3	1 51 48.44	1.9071	7 25 27.5	8.790	3	3 24 49.98	1.9769	13 40 16.3	6.615
4	1 53 42.89	1.9080	7 34 13.9	8.758	4	3 26 48.65	1.9788	13 46 51.4	6.557
5	1 55 37.40	1.9089	7 42 58.4	8.725	5	3 28 47.43	1.9807	13 53 23.1	6.498
6	1 57 31.96	1.9099	7 51 40.9	8.692	6	3 30 46.33	1.9827	13 59 51.1	6.438
7	1 59 26.59	1.9109	8 0 21.5	8.658	7	3 32 45.35	1.9845	14 6 15.6	6.378
8	2 1 21.27	1.9118	8 8 59.9	8.623	8	3 34 44.47	1.9864	14 12 36.5	6.318
9	2 3 16.01	1.9129	8 17 36.3	8.589	9	3 36 43.72	1.9884	14 18 53.7	6.256
10	2 5 10.82	1.9141	8 26 10.6	8.553	10	3 38 43.08	1.9903	14 25 7.2	6.194
11	2 7 5.70	1.9152	8 34 42.7	8.517	11	3 40 42.56	1.9922	14 31 17.0	6.132
12	2 9 0.64	1.9163	8 43 12.6	8.480	12	3 42 42.15	1.9942	14 37 23.1	6.070
13	2 10 55.65	1.9174	8 51 40.3	8.443	13	3 44 41.86	1.9962	14 43 25.4	6.007
14	2 12 50.73	1.9186	9 0 5.7	8.405	14	3 46 41.69	1.9982	14 49 23.9	5.943
15	2 14 45.88	1.9198	9 8 28.9	8.367	15	3 48 41.64	2.0002	14 55 18.6	5.879
16	2 16 41.10	1.9210	9 16 49.7	8.328	16	3 50 41.71	2.0022	15 1 9.4	5.814
17	2 18 36.40	1.9222	9 25 8.2	8.288	17	3 52 41.90	2.0042	15 6 56.3	5.749
18	2 20 31.77	1.9235	9 33 24.3	8.248	18	3 54 42.21	2.0062	15 12 39.3	5.684
19	2 22 27.22	1.9248	9 41 38.0	8.207	19	3 56 42.64	2.0082	15 18 18.4	5.618
20	2 24 22.75	1.9262	9 49 49.2	8.166	20	3 58 43.19	2.0101	15 23 53.5	5.551
21	2 26 18.36	1.9275	9 57 57.9	8.123	21	4 0 43.85	2.0121	15 29 24.5	5.483
22	2 28 14.05	1.9288	10 6 4.0	8 081	22	4 2 44.64	2.0142	15 34 51.5	5.417
23	2 30 9.82	1.9302	+10 14 7.6	+8.039	23	4 4 45.55	2.0162	+15 40 14.5	+5.349
	OCTOBER 25.					OCTOBER 27.			
0	2 32 5.68	1 9317	+10 22 8.7	+7.996	0	4 6 46.58	2.0182	+15 45 33.4	+5.281
1	2 34 1.62	1 9331	10 30 7.1	7.952	1	4 8 47.73	2.0203	15 50 48.2	5.212
2	2 35 57.65	1.9346	10 38 2.9	7.907	2	4 10 49.01	2.0223	15 55 58.8	5.143
3	2 37 53.77	1.9361	10 45 55.9	7.862	3	4 12 50.40	2.0243	16 1 5.3	5.073
4	2 39 49.98	1.9376	10 53 46.3	7.817	4	4 14 51.92	2.0263	16 6 7.5	5.002
5	2 41 46.28	1.9391	11 1 33.9	7.769	5	4 16 53.56	2.0283	16 11 5.5	4.932
6	2 43 42.67	1.9406	11 9 18.6	7.722	6	4 18 55.32	2.0303	16 15 59.3	4.861
7	2 45 39.15	1.9422	11 17 0.6	7.676	7	4 20 57.20	2.0323	16 20 48.8	4.789
8	2 47 35.73	1.9438	11 24 39.7	7.628	8	4 22 59.20	2.0344	16 25 34.0	4.717
9	2 49 32.41	1.9453	11 32 15.9	7.578	9	4 25 1.33	2.0364	16 30 14.8	4.644
10	2 51 29.17	1.9469	11 39 49.1	7.530	10	4 27 3.57	2.0384	16 34 51.3	4.572
11	2 53 26.04	1.9487	11 47 19.5	7.481	11	4 29 5.94	2.0405	16 39 23.4	4.498
12	2 55 23.01	1.9503	11 54 46.8	7.430	12	4 31 8.43	2.0425	16 43 51.1	4.425
13	2 57 20.07	1.9519	12 2 11.1	7.380	13	4 33 11.04	2.0445	16 48 14.4	4.350
14	2 59 17.24	1.9536	12 9 32.4	7.328	14	4 35 13.77	2.0465	16 52 33.1	4.275
15	3 1 14.50	1.9553	12 16 50.5	7.277	15	4 37 16.62	2.0485	16 56 47.4	4.201
16	3 3 11.87	1.9571	12 24 5.6	7.225	16	4 39 19.59	2.0505	17 0 57.2	4.125
17	3 5 9.35	1.9588	12 31 17.5	7.172	17	4 41 22.68	2.0525	17 5 2.4	4.049
18	3 7 6.93	1.9605	12 38 26.2	7.118	18	4 43 25.89	2.0545	17 9 3.1	3.972
19	3 9 4.61	1.9623	12 45 31.7	7.065	19	4 45 29.22	2.0565	17 12 59.1	3.895
20	3 11 2.40	1.9641	12 52 34.0	7.011	20	4 47 32.67	2.0585	17 16 50.5	3.818
21	3 13 0.30	1.9658	12 59 33.0	6.955	21	4 49 36.24	2.0604	17 20 37.3	3.742
22	3 14 58.30	1.9676	13 6 28.6	6.899	22	4 51 39.92	2.0624	17 24 19.5	3.663
23	3 16 56.41	1.9695	13 13 20.9	6.844	23	4 53 43.73	2.0644	17 27 56.9	3.585
24	3 18 54.64	1.9713	+13 20 9.9	+6.788	24	4 55 47.65	2.0663	+17 31 29.7	+3.507

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 28.			
	h m s	s	° ′ ″	″
0	4 55 47.65	2.0663	+17 31 29.7	+3.507
1	4 57 51.69	2.0683	17 34 57.7	3.428
2	4 59 55.84	2.0702	17 38 21.0	3.348
3	5 2 0.11	2.0722	17 41 39.5	3.268
4	5 4 4.50	2.0741	17 44 53.1	3.187
5	5 6 9.00	2.0760	17 48 1.9	3.107
6	5 8 13.62	2.0779	17 51 5.9	3.026
7	5 10 18.35	2.0798	17 54 5.0	2.945
8	5 12 23.19	2.0817	17 56 59.3	2.863
9	5 14 28.15	2.0836	17 59 48.6	2.781
10	5 16 33.22	2.0854	18 2 33.0	2.698
11	5 18 38.40	2.0873	18 5 12.4	2.616
12	5 20 43.69	2.0891	18 7 46.9	2.533
13	5 22 49.09	2.0909	18 10 16.4	2.450
14	5 24 54.60	2.0928	18 12 40.9	2.366
15	5 27 0.22	2.0946	18 15 0.3	2.282
16	5 29 5.95	2.0963	18 17 14.7	2.198
17	5 31 11.78	2.0981	18 19 24.0	2.113
18	5 33 17.72	2.0999	18 21 28.3	2.028
19	5 35 23.77	2.1017	18 23 27.4	1.943
20	5 37 29.92	2.1033	18 25 21.4	1.858
21	5 39 36.17	2.1051	18 27 10.3	1.772
22	5 41 42.53	2.1068	18 28 54.0	1.685
23	5 43 48.98	2.1084	+18 30 32.5	+1.599
	OCTOBER 29.			
0	5 45 55.54	2.1102	+18 32 5.9	+1.512
1	5 48 2.20	2.1118	18 33 34.0	1.425
2	5 50 8.95	2.1134	18 34 56.9	1.338
3	5 52 15.81	2.1151	18 36 14.6	1.251
4	5 54 22.76	2.1167	18 37 27.0	1.163
5	5 56 29.81	2.1183	18 38 34.1	1.074
6	5 58 36.95	2.1198	18 39 35.9	0.986
7	6 0 44.19	2.1214	18 40 32.4	0.898
8	6 2 51.52	2.1229	18 41 23.6	0.809
9	6 4 58.94	2.1245	18 42 9.5	0.720
10	6 7 6.46	2.1260	18 42 50.0	0.631
11	6 9 14.06	2.1275	18 43 25.2	0.542
12	6 11 21.76	2.1290	18 43 55.0	0.452
13	6 13 29.54	2.1304	18 44 19.4	0.362
14	6 15 37.41	2.1319	18 44 38.4	0.272
15	6 17 45.37	2.1333	18 44 52.0	0.182
16	6 19 53.41	2.1348	18 45 0.2	0.092
17	6 22 1.54	2.1362	18 45 3.0	+0.001
18	6 24 9.75	2.1375	18 45 0.3	−0.091
19	6 26 18.04	2.1389	18 44 52.1	0.182
20	6 28 26.42	2.1402	18 44 38.5	0.272
21	6 30 34.87	2.1415	18 44 19.5	0.363
22	6 32 43.40	2.1428	18 43 54.9	0.455
23	6 34 52.01	2.1442	18 43 24.9	0.547
24	6 37 0.70	2.1454	+18 42 49.3	−0.638

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 30.			
	h m s	s	° ′ ″	″
0	6 37 0.70	2.1454	+18 42 49.3	−0.638
1	6 39 9.46	2.1467	18 42 8.3	0.730
2	6 41 18.30	2.1479	18 41 21.7	0.822
3	6 43 27.21	2.1491	18 40 29.6	0.914
4	6 45 36.19	2.1503	18 39 32.0	1.007
5	6 47 45.25	2.1515	18 38 28.8	1.099
6	6 49 54.37	2.1527	18 37 20.1	1.192
7	6 52 3.57	2.1538	18 36 5.8	1.284
8	6 54 12.83	2.1550	18 34 46.0	1.377
9	6 56 22.17	2.1561	18 33 20.6	1.469
10	6 58 31.56	2.1571	18 31 49.7	1.562
11	7 0 41.02	2.1582	18 30 13.1	1.656
12	7 2 50.55	2.1593	18 28 31.0	1.748
13	7 5 0.14	2.1603	18 26 43.3	1.842
14	7 7 9.79	2.1613	18 24 50.0	1.934
15	7 9 19.50	2.1624	18 22 51.2	2.028
16	7 11 29.28	2.1634	18 20 46.7	2.122
17	7 13 39.11	2.1643	18 18 36.6	2.214
18	7 15 49.00	2.1653	18 16 21.0	2.308
19	7 17 58.95	2.1663	18 13 59.7	2.401
20	7 20 8.95	2.1672	18 11 32.9	2.493
21	7 22 19.01	2.1681	18 9 0.5	2.587
22	7 24 29.12	2.1690	18 6 22.4	2.681
23	7 26 39.29	2.1699	+18 3 38.8	−2.773
	OCTOBER 31.			
0	7 28 49.51	2.1708	+18 0 49.6	−2.867
1	7 30 59.78	2.1716	17 57 54.7	2.961
2	7 33 10.10	2.1725	17 54 54.3	3.053
3	7 35 20.48	2.1733	17 51 48.3	3.147
4	7 37 30.90	2.1741	17 48 36.7	3.240
5	7 39 41.37	2.1749	17 45 19.5	3.333
6	7 41 51.89	2.1757	17 41 56.7	3.426
7	7 44 2.46	2.1765	17 38 28.4	3.518
8	7 46 13.07	2.1773	17 34 54.5	3.612
9	7 48 23.73	2.1780	17 31 15.0	3.705
10	7 50 34.43	2.1788	17 27 29.9	3.798
11	7 52 45.18	2.1795	17 23 39.2	3.891
12	7 54 55.97	2.1802	17 19 43.0	3.983
13	7 57 6.80	2.1809	17 15 41.2	4.076
14	7 59 17.68	2.1817	17 11 33.9	4.168
15	8 1 28.60	2.1823	17 7 21.1	4.260
16	8 3 39.56	2.1830	17 3 2.7	4.353
17	8 5 50.56	2.1837	16 58 38.7	4.445
18	8 8 1.60	2.1843	16 54 9.3	4.536
19	8 10 12.68	2.1849	16 49 34.4	4.628
20	8 12 23.79	2.1856	16 44 53.9	4.720
21	8 14 34.95	2.1863	16 40 8.0	4.811
22	8 16 46.15	2.1869	16 35 16.6	4.902
23	8 18 57.38	2.1875	16 30 19.7	4.993
24	8 21 8.65	2.1882	+16 25 17.4	−5.084

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 1.			
	h m s	s	° ′ ″	″
0	8 21 8.65	2.1882	+16 25 17.4	−5.084
1	8 23 19.96	2.1888	16 20 9.6	5.175
2	8 25 31.30	2.1893	16 14 56.4	5.266
3	8 27 42.68	2.1900	16 9 37.7	5.356
4	8 29 54.10	2.1907	16 4 13.7	5.446
5	8 32 5.56	2.1913	15 58 44.2	5.537
6	8 34 17.05	2.1918	15 53 9.3	5.626
7	8 36 28.57	2.1923	15 47 29.1	5.715
8	8 38 40.13	2.1930	15 41 43.5	5.804
9	8 40 51.73	2.1936	15 35 52.6	5.893
10	8 43 3.36	2.1942	15 29 56.3	5.982
11	8 45 15.03	2.1948	15 23 54.8	6.070
12	8 47 26.73	2.1953	15 17 47.9	6.159
13	8 49 38.47	2.1959	15 11 35.7	6.247
14	8 51 50.24	2.1965	15 5 18.3	6.333
15	8 54 2.05	2.1971	14 58 55.7	6.421
16	8 56 13.89	2.1977	14 52 27.8	6.508
17	8 58 25.77	2.1983	14 45 54.7	6.595
18	9 0 37.68	2.1988	14 39 16.4	6.681
19	9 2 49.63	2.1995	14 32 33.0	6.767
20	9 5 1.62	2.2001	14 25 44.4	6.852
21	9 7 13.64	2.2007	14 18 50.8	6.937
22	9 9 25.70	2.2013	14 11 52.0	7.022
23	9 11 37.79	2.2019	+14 4 48.1	−7.107
	NOVEMBER 2.			
0	9 13 49.93	2.2026	+13 57 39.2	−7.191
1	9 16 2.10	2.2032	13 50 25.2	7.274
2	9 18 14.31	2.2038	13 43 6.3	7.358
3	9 20 26.56	2.2044	13 35 42.3	7.441
4	9 22 38.84	2.2051	13 28 13.4	7.523
5	9 24 51.17	2.2058	13 20 39.5	7.606
6	9 27 3.53	2.2064	13 13 0.7	7.687
7	9 29 15.94	2.2072	13 5 17.1	7.768
8	9 31 28.39	2.2078	12 57 28.5	7.849
9	9 33 40.88	2.2085	12 49 35.2	7.929
10	9 35 53.41	2.2092	12 41 37.0	8.009
11	9 38 5.99	2.2100	12 33 34.1	8.088
12	9 40 18.61	2.2107	12 25 26.4	8.167
13	9 42 31.27	2.2114	12 17 14.0	8.246
14	9 44 43.98	2.2122	12 8 56.9	8.323
15	9 46 56.74	2.2131	12 0 35.2	8.401
16	9 49 9.55	2.2138	11 52 8.8	8.478
17	9 51 22.40	2.2147	11 43 37.8	8.554
18	9 53 35.31	2.2155	11 35 2.3	8.630
19	9 55 48.26	2.2163	11 26 22.2	8.705
20	9 58 1.27	2.2172	11 17 37.7	8.779
21	10 0 14.33	2.2181	11 8 48.7	8.853
22	10 2 27.44	2.2189	10 59 55.3	8.927
23	10 4 40.60	2.2198	10 50 57.5	9.000
24	10 6 53.82	2.2207	+10 41 55.3	−9.073
	NOVEMBER 3.			
	h m s	s	° ′ ″	″
0	10 6 53.82	2.2207	+10 41 55.3	− 9.073
1	10 9 7.09	2.2217	10 32 48.8	9.144
2	10 11 20.43	2.2227	10 23 38.0	9.215
3	10 13 33.82	2.2237	10 14 23.0	9.285
4	10 15 47.27	2.2247	10 5 3.8	9.355
5	10 18 0.78	2.2257	9 55 40.4	9.421
6	10 20 14.36	2.2268	9 46 12.9	9.492
7	10 22 28.00	2.2278	9 36 41.3	9.560
8	10 24 41.70	2.2289	9 27 5.7	9.627
9	10 26 55.47	2.2301	9 17 26.1	9.693
10	10 29 9.31	2.2312	9 7 42.6	9.758
11	10 31 23.22	2.2324	8 57 55.1	9.823
12	10 33 37.20	2.2336	8 48 3.8	9.887
13	10 35 51.25	2.2348	8 38 8.7	9.951
14	10 38 5.37	2.2360	8 28 9.7	10.013
15	10 40 19.57	2.2373	8 18 7.1	10.075
16	10 42 33.85	2.2386	8 8 0.7	10.137
17	10 44 48.20	2.2399	7 57 50.7	10.196
18	10 47 2.64	2.2412	7 47 37.2	10.255
19	10 49 17.15	2.2426	7 37 20.1	10.314
20	10 51 31.75	2.2440	7 26 59.5	10.372
21	10 53 46.43	2.2454	7 16 35.5	10.428
22	10 56 1.20	2.2469	7 6 8.1	10.485
23	10 58 16.06	2.2484	+ 6 55 37.3	−10.540
	NOVEMBER 4.			
0	11 0 31.01	2.2499	+ 6 45 3.3	−10.593
1	11 2 46.05	2.2514	6 34 26.1	10.647
2	11 5 1.18	2.2530	6 23 45.6	10.700
3	11 7 16.41	2.2546	6 13 2.1	10.751
4	11 9 31.73	2.2562	6 2 15.5	10.802
5	11 11 47.15	2.2578	5 51 25.8	10.852
6	11 14 2.67	2.2596	5 40 33.3	10.900
7	11 16 18.30	2.2613	5 29 37.8	10.948
8	11 18 34.03	2.2630	5 18 39.5	10.995
9	11 20 49.86	2.2648	5 7 38.4	11.041
10	11 23 5.80	2.2666	4 56 34.6	11.085
11	11 25 21.85	2.2684	4 45 28.2	11.129
12	11 27 38.01	2.2703	4 34 19.1	11.172
13	11 29 54.29	2.2722	4 23 7.5	11.214
14	11 32 10.68	2.2741	4 11 53.4	11.254
15	11 34 27.18	2.2761	4 0 37.0	11.293
16	11 36 43.81	2.2782	3 49 18.2	11.332
17	11 39 0.56	2.2801	3 37 57.1	11.369
18	11 41 17.42	2.2821	3 26 33.9	11.405
19	11 43 34.41	2.2843	3 15 8.5	11.441
20	11 45 51.53	2.2864	3 3 41.0	11.475
21	11 48 8.78	2.2886	2 52 11.5	11.507
22	11 50 26.16	2.2908	2 40 40.1	11.538
23	11 52 43.67	2.2929	2 29 6.9	11.569
24	11 55 1.31	2.2952	+ 2 17 31.8	−11.599

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 5.			
	h m s	s	° ′ ″	″
0	11 55 1.31	2.2952	+2 17 31.8	−11.599
1	11 57 19.09	2.2975	2 5 55.0	11.627
2	11 59 37.01	2.2998	1 54 16.6	11.653
3	12 1 55.06	2.3021	1 42 36.6	11.679
4	12 4 13.26	2.3046	1 30 55.1	11.704
5	12 6 31.61	2.3069	1 19 12.1	11.727
6	12 8 50.09	2.3093	1 7 27.8	11.748
7	12 11 8.73	2.3119	0 55 42.3	11.769
8	12 13 27.52	2.3143	0 43 55.5	11.789
9	12 15 46.45	2.3168	0 32 7.6	11.807
10	12 18 5.54	2.3194	0 20 18.7	11.823
11	12 20 24.78	2.3220	+0 8 28.8	11.839
12	12 22 44.18	2.3247	−0 3 22.0	11.853
13	12 25 3.74	2.3273	0 15 13.6	11.866
14	12 27 23.46	2.3300	0 27 5.9	11.877
15	12 29 43.34	2.3327	0 38 58.9	11.888
16	12 32 3.39	2.3355	0 50 52.4	11.896
17	12 34 23.60	2.3382	1 2 46.4	11.903
18	12 36 43.97	2.3410	1 14 40.7	11.908
19	12 39 4.52	2.3438	1 26 35.4	11.913
20	12 41 25.23	2.3467	1 38 30.3	11.917
21	12 43 46.12	2.3497	1 50 25.4	11.918
22	12 46 7.19	2.3525	2 2 20.5	11.918
23	12 48 28.42	2.3554	−2 14 15.5	−11.917
	NOVEMBER 6.			
0	12 50 49.84	2.3581	−2 26 10.5	−11.914
1	12 53 11.43	2.3613	2 38 5.2	11.909
2	12 55 33.20	2.3644	2 49 59.6	11.904
3	12 57 55.16	2.3674	3 1 53.7	11.897
4	13 0 17.29	2.3704	3 13 47.2	11.888
5	13 2 39.61	2.3736	3 25 40.2	11.877
6	13 5 2.12	2.3767	3 37 32.5	11.865
7	13 7 24.82	2.3798	3 49 24.0	11.852
8	13 9 47.70	2.3829	4 1 14.7	11.837
9	13 12 10.77	2.3861	4 13 4.5	11.821
10	13 14 34.03	2.3893	4 24 53.2	11.802
11	13 16 57.49	2.3925	4 36 40.7	11.782
12	13 19 21.13	2.3957	4 48 27.1	11.762
13	13 21 44.97	2.3989	5 0 12.2	11.739
14	13 24 9.00	2.4022	5 11 55.8	11.715
15	13 26 33.23	2.4055	5 23 38.0	11.689
16	13 28 57.66	2.4088	5 35 18.5	11.662
17	13 31 22.28	2.4121	5 46 57.4	11.633
18	13 33 47.11	2.4154	5 58 34.5	11.602
19	13 36 12.13	2.4187	6 10 9.7	11.570
20	13 38 37.35	2.4220	6 21 42.9	11.536
21	13 41 2.77	2.4253	6 33 14.0	11.501
22	13 43 28.39	2.4287	6 44 43.0	11.464
23	13 45 54.21	2.4320	6 56 9.7	11.425
24	13 48 20.23	2.4353	−7 7 34.0	−11.385

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 7.			
	h m s	s	° ′ ″	″
0	13 48 20.23	2.4353	− 7 7 34.0	−11.385
1	13 50 46.45	2.4387	7 18 55.9	11.343
2	13 53 12.87	2.4421	7 30 15.2	11.300
3	13 55 39.50	2.4455	7 41 31.9	11.255
4	13 58 6.33	2.4488	7 52 45.8	11.208
5	14 0 33.36	2.4522	8 3 56.8	11.159
6	14 3 0.59	2.4556	8 15 4.9	11.110
7	14 5 28.03	2.4590	8 26 10.0	11.058
8	14 7 55.67	2.4623	8 37 11.9	11.004
9	14 10 23.50	2.4656	8 48 10.5	10.949
10	14 12 51.54	2.4690	8 59 5.8	10.893
11	14 15 19.78	2.4723	9 9 57.7	10.836
12	14 17 48.22	2.4757	9 20 46.1	10.776
13	14 20 16.86	2.4790	9 31 30.8	10.714
14	14 22 45.70	2.4823	9 42 11.8	10.652
15	14 25 14.73	2.4856	9 52 49.0	10.587
16	14 27 43.97	2.4889	10 3 22.2	10.521
17	14 30 13.40	2.4921	10 13 51.5	10.453
18	14 32 43.02	2.4953	10 24 16.6	10.383
19	14 35 12.84	2.4986	10 34 37.5	10.313
20	14 37 42.85	2.5018	10 44 54.2	10.241
21	14 40 13.05	2.5050	10 55 6.4	10.167
22	14 42 43.45	2.5082	11 5 14.2	10.092
23	14 45 14.03	2.5113	−11 15 17.5	−10.015
	NOVEMBER 8.			
0	14 47 44.80	2.5143	−11 25 16.0	− 9.936
1	14 50 15.75	2.5174	11 35 9.8	9.856
2	14 52 46.89	2.5205	11 44 58.7	9.774
3	14 55 18.21	2.5234	11 54 42.7	9.692
4	14 57 49.70	2.5263	12 4 21.7	9.608
5	15 0 21.37	2.5294	12 13 55.6	9.521
6	15 2 53.23	2.5323	12 23 24.2	9.433
7	15 5 25.25	2.5351	12 32 47.6	9.345
8	15 7 57.44	2.5379	12 42 5.6	9.255
9	15 10 29.80	2.5407	12 51 18.2	9.163
10	15 13 2.33	2.5435	13 0 25.2	9.069
11	15 15 35.02	2.5462	13 9 26.5	8.975
12	15 18 7.87	2.5488	13 18 22.2	8.880
13	15 20 40.88	2.5514	13 27 12.1	8.783
14	15 23 14.04	2.5540	13 35 56.1	8.684
15	15 25 47.36	2.5565	13 44 34.2	8.584
16	15 28 20.82	2.5589	13 53 6.2	8.483
17	15 30 54.43	2.5613	14 1 32.1	8.381
18	15 33 28.17	2.5636	14 9 51.9	8.277
19	15 36 2.06	2.5659	14 18 5.3	8.172
20	15 38 36.08	2.5681	14 26 12.5	8.067
21	15 41 10.23	2.5702	14 34 13.3	7.959
22	15 43 44.51	2.5723	14 42 7.6	7.851
23	15 46 18.91	2.5743	14 49 55.4	7.741
24	15 48 53.43	2.5763	−14 57 36.5	− 7.630

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 9.			
	h m s	s	° ′ ″	″
0	15 48 53.43	2.5763	−14 57 36.5	−7.630
1	15 51 28.07	2.5782	15 5 11.0	7.518
2	15 54 2.81	2.5800	15 12 38.7	7.405
3	15 56 37.67	2.5818	15 19 59.6	7.291
4	15 59 12.63	2.5834	15 27 13.6	7.176
5	16 1 47.68	2.5850	15 34 20.7	7.061
6	16 4 22.83	2.5866	15 41 20.9	6.943
7	16 6 58.07	2.5881	15 48 13.9	6.825
8	16 9 33.40	2.5894	15 54 59.9	6.707
9	16 12 8.80	2.5907	16 1 38.7	6.588
10	16 14 44.28	2.5919	16 8 10.4	6.467
11	16 17 19.83	2.5931	16 14 34.7	6.344
12	16 19 55.45	2.5942	16 20 51.7	6.222
13	16 22 31.13	2.5951	16 27 1.4	6.099
14	16 25 6.86	2.5960	16 33 3.6	5.975
15	16 27 42.65	2.5968	16 38 58.4	5.851
16	16 30 18.48	2.5975	16 44 45.7	5.726
17	16 32 54.35	2.5981	16 50 25.5	5.600
18	16 35 30.25	2.5986	16 55 57.7	5.473
19	16 38 6.18	2.5991	17 1 22.3	5.346
20	16 40 42.14	2.5995	17 6 39.2	5.218
21	16 43 18.12	2.5997	17 11 48.5	5.090
22	16 45 54.11	2.5999	17 16 50.0	4.960
23	16 48 30.11	2.6000	−17 21 43.7	−4.831
	NOVEMBER 10.			
0	16 51 6.11	2.6000	−17 26 29.7	−4.702
1	16 53 42.11	2.5999	17 31 7.9	4.570
2	16 56 18.10	2.5997	17 35 38.1	4.438
3	16 58 54.07	2.5994	17 40 0.5	4.308
4	17 1 30.03	2.5991	17 44 15.1	4.177
5	17 4 5.96	2.5986	17 48 21.7	4.044
6	17 6 41.86	2.5980	17 52 20.4	3.912
7	17 9 17.72	2.5973	17 56 11.1	3.779
8	17 11 53.54	2.5966	17 59 53.9	3.647
9	17 14 29.31	2.5958	18 3 28.8	3.514
10	17 17 5.03	2.5948	18 6 55.6	3.380
11	17 19 40.68	2.5937	18 10 14.4	3.247
12	17 22 16.27	2.5926	18 13 25.2	3.113
13	17 24 51.79	2.5913	18 16 28.0	2.980
14	17 27 27.23	2.5900	18 19 22.8	2.846
15	17 30 2.59	2.5886	18 22 9.5	2.712
16	17 32 37.86	2.5870	18 24 48.3	2.579
17	17 35 13.03	2.5853	18 27 19.0	2.444
18	17 37 48.10	2.5837	18 29 41.6	2.311
19	17 40 23.07	2.5818	18 31 56.3	2.178
20	17 42 57.92	2.5799	18 34 3.0	2.044
21	17 45 32.66	2.5779	18 36 1.6	1.911
22	17 48 7.27	2.5758	18 37 52.3	1.778
23	17 50 41.76	2.5737	18 39 35.0	1.644
24	17 53 16.11	2.5713	−18 41 9.6	−1.511

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 11.			
	h m s	s	° ′ ″	″
0	17 53 16.11	2.5713	−18 41 9.6	−1.511
1	17 55 50.32	2.5630	18 42 36.3	1.378
2	17 58 24.39	2.5665	18 43 55.0	1.246
3	18 0 58.30	2.5639	18 45 5.8	1.114
4	18 3 32.06	2.5612	18 46 8.7	0.982
5	18 6 5.65	2.5586	18 47 3.6	0.850
6	18 8 39.09	2.5558	18 47 50.7	0.719
7	18 11 12.35	2.5528	18 48 29.9	0.588
8	18 13 45.43	2.5498	18 49 1.3	0.458
9	18 16 18.33	2.5468	18 49 24.9	0.328
10	18 18 51.05	2.5437	18 49 40.7	0.198
11	18 21 23.57	2.5403	18 49 48.7	−0.069
12	18 23 55.89	2.5370	18 49 49.0	+0.059
13	18 26 28.01	2.5337	18 49 41.6	0.187
14	18 28 59.93	2.5302	18 49 26.6	0.314
15	18 31 31.63	2.5266	18 49 3.9	0.442
16	18 34 3.12	2.5230	18 48 33.6	0.568
17	18 36 34.39	2.5193	18 47 55.7	0.694
18	18 39 5.43	2.5155	18 47 10.3	0.818
19	18 41 36.25	2.5117	18 46 17.5	0.942
20	18 44 6.83	2.5078	18 45 17.2	1.067
21	18 46 37.18	2.5038	18 44 9.5	1.190
22	18 49 7 28	2.4997	18 42 54.4	1.313
23	18 51 37.14	2.4956	−18 41 31.9	+1.435
	NOVEMBER 12.			
0	18 54 6.75	2.4914	−18 40 2.2	+1.556
1	18 56 36.11	2.4872	18 38 25.2	1.677
2	18 59 5.21	2.4828	18 36 41.0	1.796
3	19 1 34.05	2.4784	18 34 49.7	1.915
4	19 4 2.62	2.4740	18 32 51.2	2.033
5	19 6 30.93	2.4696	18 30 45.7	2.150
6	19 8 58.97	2.4650	18 28 33.2	2.267
7	19 11 26.73	2.4603	18 26 13.7	2.383
8	19 13 54.21	2.4557	18 23 47.3	2.498
9	19 16 21.42	2.4511	18 21 14.0	2.612
10	19 18 48.34	2.4463	18 18 33.9	2.724
11	19 21 14.98	2.4416	18 15 47.1	2.837
12	19 23 41.33	2.4368	18 12 53.5	2.948
13	19 26 7.39	2.4318	18 9 53.3	3.058
14	19 28 33.15	2.4269	18 6 46.5	3.168
15	19 30 58.62	2.4220	18 3 33.1	3.277
16	19 33 23.79	2.4170	18 0 13.2	3.385
17	19 35 48.66	2.4120	17 56 46.9	3.492
18	19 38 13.23	2.4069	17 53 14.2	3.598
19	19 40 37.49	2.4018	17 49 35.2	3.703
20	19 43 1.45	2.3967	17 45 49.9	3.806
21	19 45 25.10	2.3916	17 41 58.5	3.909
22	19 47 48.44	2.3864	17 38 0.8	4.012
23	19 50 11.47	2.3812	17 33 57.0	4.113
24	19 52 34.18	2.3759	−17 29 47.2	+4.213

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 13.			
	h m s	s	° ′ ″	″
0	19 52 34.18	2.3759	−17 29 47.2	+4.213
1	19 54 56.58	2.3707	17 25 31.4	4.312
2	19 57 18.67	2.3655	17 21 9.7	4.411
3	19 59 40.44	2.3602	17 16 42.1	4.508
4	20 2 1.89	2.3548	17 12 8.7	4.604
5	20 4 23.02	2.3495	17 7 29.6	4.699
6	20 6 43.83	2.3442	17 2 44.8	4.794
7	20 9 4.33	2.3389	16 57 54.3	4.887
8	20 11 24.50	2.3335	16 52 58.3	4.980
9	20 13 44.35	2.3282	16 47 56.7	5.071
10	20 16 3.88	2.3228	16 42 49.8	5.161
11	20 18 23.08	2.3173	16 37 37.4	5.251
12	20 20 41.96	2.3120	16 32 19.7	5 339
13	20 23 0.52	2.3066	16 26 56.7	5 426
14	20 25 18.75	2.3012	16 21 28.6	5.512
15	20 27 36.66	2.2958	16 15 55.3	5.598
16	20 29 54.24	2.2904	16 10 16.9	5.683
17	20 32 11.51	2.2851	16 4 33.4	5 766
18	20 34 28.45	2.2796	15 58 45.0	5 848
19	20 36 45.06	2.2742	15 52 51.7	5.929
20	20 39 1.36	2.2689	15 46 53.5	6.009
21	20 41 17.33	2.2635	15 40 50.6	6.088
22	20 43 32.98	2.2582	15 34 42.9	6.167
23	20 45 48.31	2.2528	−15 28 30.5	+6.244
	NOVEMBER 14.			
0	20 48 3.32	2.2475	−15 22 13.6	+6.320
1	20 50 18.01.	2.2422	15 15 52.1	6.396
2	20 52 32.38	2.2368	15 9 26.1	6.470
3	20 54 46.43	2.2316	15 2 55.7	6.543
4	20 57 0.17	2.2263	14 56 20.9	6.616
5	20 59 13.59	2.2211	14 49 41.8	6.687
6	21 1 26.70	2.2158	14 42 58.5	6.758
7	21 3 39.49	2.2106	14 36 10.9	6.828
8	21 5 51.97	2.2054	14 29 19.2	6.896
9	21 8 4.14	2.2002	14 22 23.4	6.963
10	21 10 16.00	2.1951	14 15 23.6	7.029
11	21 12 27.55	2.1899	14 8 19.9	7.095
12	21 14 38.79	2.1848	14 1 12.2	7.160
13	21 16 49.73	2.1797	13 54 0.7	7.223
14	21 19 0.36	2.1747	13 46 45.4	7.287
15	21 21 10.69	2.1697	13 39 26.3	7.348
16	21 23 20.72	2.1647	13 32 3.6	7.408
17	21 25 30.45	2.1597	13 24 37.3	7.469
18	21 27 39.88	2.1548	13 17 7.3	7.528
19	21 29 49.02	2.1499	13 9 33.9	7.586
20	21 31 57.87	2.1450	13 1 57.0	7.643
21	21 34 6.42	2.1401	12 54 16.7	7.699
22	21 36 14.68	2.1353	12 46 33.1	7.754
23	21 38 22.66	2.1306	12 38 46.2	7.809
24	21 40 30.35	2.1258	−12 30 56.0	+7.863

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 15.			
	h m s	s	° ′ ″	″
0	21 40 30.35	2.1258	−12 30 56.0	+7.863
1	21 42 37.76	2.1212	12 23 2.6	7.916
2	21 44 44.89	2.1165	12 15 6.1	7.967
3	21 46 51.74	2.1118	12 7 6.6	8.018
4	21 48 58.31	2.1072	11 59 4.0	8.068
5	21 51 4.61	2.1027	11 50 58.4	8.117
6	21 53 10.64	2.0983	11 42 49.9	8.166
7	21 55 16.40	2.0938	11 34 38.5	8.214
8	21 57 21.89	2.0893	11 26 24.2	8.261
9	21 59 27.12	2.0850	11 18 7.2	8.306
10	22 1 32.09	2.0806	11 9 47.5	8.350
11	22 3 36.79	2.0763	11 1 25.2	8.394
12	22 5 41.24	2.0721	10 53 0.2	8.438
13	22 7 45.44	2.0678	10 44 32.6	8.481
14	22 9 49.38	2.0636	10 36 2.5	8.522
15	22 11 53.07	2.0595	10 27 30.0	8.563
16	22 13 56.52	2.0555	10 18 55.0	8.603
17	22 15 59.73	2.0514	10 10 17.7	8.642
18	22 18 2.69	2.0473	10 1 38.0	8.680
19	22 20 5.41	2.0434	9 52 56.1	8.718
20	22 22 7.90	2.0395	9 44 11.9	8.755
21	22 24 10.15	2.0357	9 35 25.5	8.791
22	22 26 12.18	2.0318	9 26 37.0	8.826
23	22 28 13.97	2.0280	− 9 17 46.4	+8.861
	NOVEMBER 16.			
0	22 30 15.54	2.0243	− 9 8 53.7	+8.895
1	22 32 16.89	2.0206	8 59 59.0	8.928
2	22 34 18.01	2.0169	8 51 2.4	8.959
3	22 36 18.92	2.0134	8 42 3.9	8.991
4	22 38 19.62	2.0099	8 33 3.5	9.022
5	22 40 20.11	2.0064	8 24 1.3	9.052
6	22 42 20.39	2.0029	8 14 57.3	9.081
7	22 44 20.46	1.9995	8 5 51.6	9.109
8	22 46 20.33	1.9962	7 56 44.2	9.137
9	22 48 20.00	1.9929	7 47 35.2	9.164
10	22 50 19.48	1.9897	7 38 24.5	9.191
11	22 52 18.76	1.9864	7 29 12.3	9.216
12	22 54 17.85	1.9832	7 19 58.6	9.241
13	22 56 16.75	1.9802	7 10 43.4	9.265
14	22 58 15.47	1.9772	7 1 26.8	9.288
15	23 0 14.01	1.9742	6 52 8.8	9.312
16	23 2 12.37	1.9712	6 42 49.4	9.334
17	23 4 10.55	1.9683	6 33 28.7	9.355
18	23 6 8.57	1.9655	6 24 6.8	9.375
19	23 8 6.41	1.9626	6 14 43.7	9.396
20	23 10 4.08	1.9598	6 5 19.3	9.416
21	23 12 1.59	1.9572	5 55 53.8	9.434
22	23 13 58.94	1.9545	5 46 27.2	9.452
23	23 15 56.13	1.9519	5 36 59.5	9.470
24	23 17 53.17	1.9493	− 5 27 30.8	+9.487

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 17.			
	h m s	s	° ′ ″	″
0	23 17 53.17	1.9493	−5 27 30.8	+9.487
1	23 19 50.05	1.9468	5 18 1.1	9.503
2	23 21 46.79	1.9444	5 8 30.5	9.518
3	23 23 43.38	1.9420	4 58 58.9	9.533
4	23 25 39.83	1.9397	4 49 26.5	9.548
5	23 27 36.14	1.9374	4 39 53.2	9.561
6	23 29 32.32	1.9352	4 30 19.2	9.573
7	23 31 28.36	1.9329	4 20 44.4	9.587
8	23 33 24.27	1.9307	4 11 8.8	9.598
9	23 35 20.05	1.9286	4 1 32.6	9.608
10	23 37 15.70	1.9265	3 51 55.8	9.619
11	23 39 11.23	1.9216	3 42 18.3	9.629
12	23 41 6.65	1.9227	3 32 40.3	9.638
13	23 43 1.95	1.9207	3 23 1.8	9.647
14	23 44 57.13	1.9188	3 13 22.7	9.655
15	23 46 52.21	1.9170	3 3 43.2	9.662
16	23 48 47.17	1.9153	2 54 3.3	9.668
17	23 50 42.04	1.9136	2 44 23.0	9.674
18	23 52 36.80	1.9119	2 34 42.4	9.680
19	23 54 31.47	1.9103	2 25 1.4	9.685
20	23 56 26.04	1.9088	2 15 20.2	9.689
21	23 58 20.52	1.9073	2 5 38.7	9.693
22	0 0 14.91	1.9058	1 55 57.1	9.696
23	0 2 9.21	1.9043	−1 46 15.2	+9.699
	NOVEMBER 18.			
0	0 4 3.43	1.9030	−1 36 33.2	+9.701
1	0 5 57.57	1.9017	1 26 51.1	9.702
2	0 7 51.63	1.9004	1 17 9.0	9.703
3	0 9 45.62	1.8992	1 7 26.8	9.703
4	0 11 39.54	1.8980	0 57 44.7	9.703
5	0 13 33.38	1.8968	0 48 2.5	9.702
6	0 15 27.16	1.8958	0 38 20.5	9.699
7	0 17 20.88	1.8948	0 28 38.6	9.697
8	0 19 14.54	1.8938	0 18 56.8	9.695
9	0 21 8.13	1.8928	−0 9 15.2	9.692
10	0 23 1.68	1.8920	+0 0 26.2	9.688
11	0 24 55.17	1.8911	0 10 7.4	9.683
12	0 26 48.61	1.8903	0 19 48.2	9.678
13	0 28 42.00	1.8895	0 29 28.7	9.673
14	0 30 35.35	1.8888	0 39 8.9	9.667
15	0 32 28.66	1.8882	0 48 48.7	9.660
16	0 34 21.93	1.8876	0 58 28.1	9.652
17	0 36 15.17	1.8870	1 8 7.0	9.644
18	0 38 8.37	1.8865	1 17 45.4	9.636
19	0 40 1.55	1.8860	1 27 23.3	9.627
20	0 41 54.69	1.8855	1 37 0.7	9.618
21	0 43 47.81	1.8852	1 46 37.5	9.608
22	0 45 40.91	1.8848	1 56 13.6	9.596
23	0 47 33.99	1.8845	2 5 49.0	9.585
24	0 49 27.05	1.8843	+2 15 23.8	+9.573

Hour.	Right Ascension.	Var. per Min.	Declination.	Var per Min.
	NOVEMBER 19.			
	h m s	s	° ′ ″	″
0	0 49 27.05	1.8843	+2 15 23.8	+9.573
1	0 51 20.10	1.8840	2 24 57.8	9.561
2	0 53 13.13	1.8838	2 34 31.1	9.548
3	0 55 6.16	1.8837	2 44 3.6	9.535
4	0 56 59.18	1.8837	2 53 35.3	9.521
5	0 58 52.20	1.8836	3 3 6.1	9.506
6	1 0 45.21	1.8836	3 12 36.0	9.491
7	1 2 38.23	1.8836	3 22 5.0	9.476
8	1 4 31.25	1.8837	3 31 33.1	9.459
9	1 6 24.28	1.8838	3 41 0.1	9.442
10	1 8 17.31	1.8840	3 50 26.1	9.425
11	1 10 10.36	1.8842	3 59 51.1	9.407
12	1 12 3.42	1.8844	4 9 14.9	9.388
13	1 13 56.49	1.8847	4 18 37.6	9.369
14	1 15 49.59	1.8851	4 27 59.2	9.349
15	1 17 42.70	1.8854	4 37 19.5	9.329
16	1 19 35.84	1.8858	4 46 38.7	9.309
17	1 21 29.00	1.8863	4 55 56.6	9.288
18	1 23 22.20	1.8868	5 5 13.2	9.265
19	1 25 15.42	1.8873	5 14 28.4	9.243
20	1 27 8.67	1.8878	5 23 42.3	9.220
21	1 29 1.96	1.8885	5 32 54.8	9.197
22	1 30 55.29	1.8891	5 42 5.9	9.173
23	1 32 48.65	1.8898	+5 51 15.5	+9.148
	NOVEMBER 20.			
0	1 34 42.06	1.8905	+6 0 23.6	+9.123
1	1 36 35.51	1.8912	6 9 30.2	9.097
2	1 38 29.01	1.8920	6 18 35.2	9.070
3	1 40 22.55	1.8928	6 27 38.6	9.043
4	1 42 16.15	1.8937	6 36 40.3	9.016
5	1 44 9.79	1.8945	6 45 40.5	8.988
6	1 46 3.49	1.8955	6 54 38.9	8.959
7	1 47 57.25	1.8965	7 3 35.6	8.930
8	1 49 51.07	1.8974	7 12 30.5	8.900
9	1 51 44.94	1.8984	7 21 23.6	8.870
10	1 53 38.88	1.8995	7 30 14.9	8.839
11	1 55 32.88	1.9006	7 39 4.3	8.808
12	1 57 26.95	1.9017	7 47 51.8	8.776
13	1 59 21.09	1.9029	7 56 37.4	8.743
14	2 1 15.30	1.9041	8 5 21.0	8.710
15	2 3 9.58	1.9053	8 14 2.6	8.677
16	2 5 3.93	1.9066	8 22 42.2	8.643
17	2 6 58.37	1.9079	8 31 19.7	8.608
18	2 8 52.88	1.9092	8 39 55.1	8.573
19	2 10 47.47	1.9105	8 48 28.4	8.537
20	2 12 42.14	1.9119	8 56 59.5	8.499
21	2 14 36.90	1.9133	9 5 28.3	8.462
22	2 16 31.74	1.9147	9 13 55.0	8.425
23	2 18 26.66	1.9162	9 22 19.3	8.387
24	2 20 21.68	1.9178	+9 30 41.4	+8.348

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 21.			
	h m s	s	° ′ ″	″
0	2 20 21.68	1.9178	+ 9 30 41.4	+8.348
1	2 22 16.79	1.9192	9 39 1.1	8.309
2	2 24 11.98	1.9207	9 47 18.5	8.269
3	2 26 7.27	1.9223	9 55 33.4	8.228
4	2 28 2.66	1.9239	10 3 45.9	8.188
5	2 29 58.14	1.9255	10 11 55.9	8.147
6	2 31 53.72	1.9272	10 20 3.5	8.104
7	2 33 49.40	1.9288	10 28 8.4	8.061
8	2 35 45.18	1.9305	10 36 10.8	8.018
9	2 37 41.06	1.9322	10 44 10.6	7.974
10	2 39 37.05	1.9340	10 52 7.7	7.930
11	2 41 33.14	1.9358	11 0 2.2	7.885
12	2 43 29.34	1.9376	11 7 53.9	7.839
13	2 45 25.65	1.9393	11 15 42.9	7.793
14	2 47 22.06	1.9412	11 23 29.0	7.746
15	2 49 18.59	1.9430	11 31 12.4	7.699
16	2 51 15.22	1.9448	11 38 52.9	7.651
17	2 53 11.97	1.9467	11 46 30.5	7.602
18	2 55 8.83	1.9487	11 54 5.2	7.553
19	2 57 5.81	1.9506	12 1 36.9	7.504
20	2 59 2.90	1.9525	12 9 5.7	7.454
21	3 1 0.11	1.9545	12 16 31.4	7.403
22	3 2 57.44	1.9565	12 23 54.1	7.352
23	3 4 54.89	1.9585	+12 31 13.7	+7.300
	NOVEMBER 22.			
0	3 6 52.46	1.9605	+12 38 30.1	+7.248
1	3 8 50.15	1.9625	12 45 43.4	7.195
2	3 10 47.96	1.9646	12 52 53.5	7.142
3	3 12 45.90	1.9666	13 0 0.4	7.088
4	3 14 43.95	1.9686	13 7 4.0	7.033
5	3 16 42.13	1.9707	13 14 4.3	6.978
6	3 18 40.44	1.9728	13 21 1.3	6.923
7	3 20 38.87	1.9749	13 27 55.0	6.867
8	3 22 37.43	1.9771	13 34 45.3	6.809
9	3 24 36.12	1.9793	13 41 32.1	6.752
10	3 26 34.94	1.9813	13 48 15.5	6.694
11	3 28 33.88	1.9835	13 54 55.4	6.635
12	3 30 32.96	1.9857	14 1 31.7	6.576
13	3 32 32.16	1.9878	14 8 4.5	6.517
14	3 34 31.50	1.9901	14 14 33.7	6.457
15	3 36 30.97	1.9922	14 20 59.3	6.396
16	3 38 30.56	1.9943	14 27 21.2	6.334
17	3 40 30.29	1.9966	14 33 39.4	6.272
18	3 42 30.15	1.9988	14 39 53.9	6.211
19	3 44 30.15	2.0010	14 46 4.7	6.148
20	3 46 30.27	2.0032	14 52 11.6	6.084
21	3 48 30.53	2.0055	14 58 14.8	6.021
22	3 50 30.93	2.0077	15 4 14.1	5.956
23	3 52 31.45	2.0098	15 10 9.5	5.891
24	3 54 32.11	2.0122	+15 16 1.0	+5.825

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 23.			
	h m s	s	° ′ ″	″
0	3 54 32.11	2.0122	+15 16 1.0	+5.825
1	3 56 32.91	2.0143	15 21 48.5	5.759
2	3 58 33.83	2.0165	15 27 32.1	5.693
3	4 0 34.89	2.0188	15 33 11.7	5.626
4	4 2 36.09	2.0210	15 38 47.2	5.558
5	4 4 37.41	2.0232	15 44 18.7	5.490
6	4 6 38.87	2.0255	15 49 46.0	5.422
7	4 8 40.47	2.0277	15 55 9.3	5.353
8	4 10 42.20	2.0299	16 0 28.3	5.283
9	4 12 44.06	2.0321	16 5 43.2	5.213
10	4 14 46.05	2.0343	16 10 53.8	5.142
11	4 16 48.18	2.0366	16 16 0.2	5.071
12	4 18 50.44	2.0388	16 21 2.3	4.999
13	4 20 52.83	2.0110	16 26 0.1	4.927
14	4 22 55.36	2.0432	16 30 53.6	4.855
15	4 24 58.01	2.0453	16 35 42.7	4.781
16	4 27 0.80	2.0476	16 40 27.3	4.707
17	4 29 3.72	2.0497	16 45 7.6	4.634
18	4 31 6.76	2.0518	16 49 43.4	4.559
19	4 33 9.94	2.0541	16 54 14.7	4.484
20	4 35 13.25	2.0562	16 58 41.5	4.409
21	4 37 16.68	2.0583	17 3 3.8	4.333
22	4 39 20.24	2.0604	17 7 21.5	4.256
23	4 41 23.93	2.0626	+17 11 34.5	+4.179
	NOVEMBER 24.			
0	4 43 27.75	2.0647	+17 15 43.0	+4.102
1	4 45 31.69	2.0668	17 19 46.8	4.025
2	4 47 35.76	2.0688	17 23 46.0	3.947
3	4 49 39.95	2.0708	17 27 40.4	3.868
4	4 51 44.26	2.0729	17 31 30.2	3.789
5	4 53 48.70	2.0749	17 35 15.1	3.709
6	4 55 53.25	2.0769	17 38 55.3	3.630
7	4 57 57.93	2.0790	17 42 30.7	3.549
8	5 0 2.73	2.0810	17 46 1.2	3.468
9	5 2 7.65	2.0829	17 49 26.9	3.387
10	5 4 12.68	2.0848	17 52 47.7	3.307
11	5 6 17.83	2.0868	17 56 3.7	3.225
12	5 8 23.10	2.0888	17 59 14.7	3.143
13	5 10 28.48	2.0907	18 2 20.8	3.060
14	5 12 33.98	2.0926	18 5 21.9	2.977
15	5 14 39.59	2.0943	18 8 18.0	2.893
16	5 16 45.30	2.0962	18 11 9.1	2.810
17	5 18 51.13	2.0981	18 13 55.2	2.726
18	5 20 57.07	2.0998	18 16 36.2	2.642
19	5 23 3.11	2.1016	18 19 12.2	2.557
20	5 25 9.26	2.1034	18 21 43.0	2.472
21	5 27 15.52	2.1052	18 24 8.8	2.387
22	5 29 21.88	2.1068	18 26 29.4	2.300
23	5 31 28.34	2.1085	18 28 44.8	2.214
24	5 33 34.90	2.1102	+18 30 55.1	+2.128

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 25.					NOVEMBER 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 33 34.90	2.1102	+18 30 55.1	+2.128	0	7 16 17.66	2.1590	+18 29 18.5	−2.246
1	5 35 41.56	2.1118	18 33 0.2	2.042	1	7 18 27.21	2.1594	18 27 1.0	2.338
2	5 37 48.32	2.1134	18 35 0.1	1.954	2	7 20 36.79	2.1598	18 24 37.9	2.431
3	5 39 55.17	2.1150	18 36 54.7	1.867	3	7 22 46.39	2.1601	18 22 9.3	2.523
4	5 42 2.12	2.1167	18 38 44.1	1.779	4	7 24 56.00	2.1603	18 19 35.1	2.616
5	5 44 9.17	2.1182	18 40 28.2	1.692	5	7 27 5.63	2.1607	18 16 55.4	2.708
6	5 46 16.30	2.1196	18 42 7.1	1.603	6	7 29 15.28	2.1610	18 14 10.1	2.801
7	5 48 23.52	2.1212	18 43 40.6	1.515	7	7 31 24.95	2.1612	18 11 19.3	2.893
8	5 50 30.84	2.1227	18 45 8.9	1.427	8	7 33 34.62	2.1613	18 8 22.9	2.986
9	5 52 38.24	2.1211	18 46 31.8	1.338	9	7 35 44.31	2.1615	18 5 21.0	3.078
10	5 54 45.73	2.1255	18 47 49.4	1.218	10	7 37 54.00	2.1617	18 2 13.6	3.169
11	5 56 53.30	2.1268	18 49 1.6	1.159	11	7 40 3.71	2.1618	17 59 0.7	3.261
12	5 59 0.95	2.1282	18 50 8.5	1.070	12	7 42 13.42	2.1619	17 55 42.3	3.352
13	6 1 8.69	2.1296	18 51 10.0	0.980	13	7 44 23.14	2.1621	17 52 18.4	3.444
14	6 3 16.50	2.1308	18 52 6.1	0.890	14	7 46 32.87	2.1622	17 48 49.0	3.536
15	6 5 24.39	2.1322	18 52 56.8	0.799	15	7 48 42.60	2.1622	17 45 14.1	3.627
16	6 7 32.36	2.1335	18 53 42.0	0.708	16	7 50 52.33	2.1623	17 41 33.8	3.718
17	6 9 40.41	2.1347	18 54 21.8	0.618	17	7 53 2.07	2.1623	17 37 48.0	3.809
18	6 11 48.52	2.1358	18 54 56.2	0.528	18	7 55 11.81	2.1623	17 33 56.7	3.900
19	6 13 56.71	2.1371	18 55 25.2	0.437	19	7 57 21.55	2.1623	17 30 0.0	3.990
20	6 16 4.97	2.1383	18 55 48.6	0.345	20	7 59 31.28	2.1623	17 25 57.9	4.080
21	6 18 13.30	2.1393	18 56 6.6	0.254	21	8 1 41.02	2.1623	17 21 50.4	4.170
22	6 20 21.69	2.1403	18 56 19.1	0.163	22	8 3 50.75	2.1622	17 17 37.5	4.259
23	6 22 30.14	2.1414	+18 56 26.1	+0.071	23	8 6 0.48	2.1622	+17 13 19.3	−4.349
	NOVEMBER 26.					NOVEMBER 28.			
0	6 24 38.66	2.1425	+18 56 27.6	−0.021	0	8 8 10.21	2.1621	+17 8 55.6	−4.439
1	6 26 47.24	2.1435	18 56 23.6	0.113	1	8 10 19.93	2.1620	17 4 26.6	4.528
2	6 28 55.88	2.1445	18 56 14.0	0.205	2	8 12 29.65	2.1619	16 59 52.2	4.617
3	6 31 4.58	2.1454	18 55 59.0	0.297	3	8 14 39.36	2.1618	16 55 12.5	4.706
4	6 33 13.33	2.1463	18 55 38.4	0.389	4	8 16 49.06	2.1616	16 50 27.5	4.793
5	6 35 22.14	2.1472	18 55 12.3	0.482	5	8 18 58.75	2.1615	16 45 37.3	4.882
6	6 37 31.00	2.1482	18 54 40.6	0.575	6	8 21 8.44	2.1614	16 40 41.7	4.971
7	6 39 39.92	2.1490	18 54 3.3	0.667	7	8 23 18.12	2.1613	16 35 40.8	5.058
8	6 41 48.88	2.1498	18 53 20.6	0.759	8	8 25 27.79	2.1611	16 30 34.7	5.145
9	6 43 57.89	2.1506	18 52 32.2	0.852	9	8 27 37.45	2.1609	16 25 23.4	5.232
10	6 46 6.95	2.1513	18 51 38.3	0.944	10	8 29 47.10	2.1607	16 20 6.9	5.319
11	6 48 16.05	2.1520	18 50 38.9	1.037	11	8 31 56.73	2.1605	16 14 45.1	5.406
12	6 50 25.19	2.1527	18 49 33.8	1.131	12	8 34 6.36	2.1604	16 9 18.2	5.492
13	6 52 34.37	2.1534	18 48 23.2	1.223	13	8 36 15.98	2.1602	16 3 46.1	5.578
14	6 54 43.60	2.1541	18 47 7.0	1.316	14	8 38 25.58	2.1599	15 58 8.9	5.663
15	6 56 52.86	2.1547	18 45 45.3	1.409	15	8 40 35.17	2.1598	15 52 26.5	5.748
16	6 59 2.16	2.1553	18 44 17.9	1.502	16	8 42 44.75	2.1596	15 46 39.1	5.833
17	7 1 11.49	2.1558	18 42 45.0	1.595	17	8 44 54.32	2.1594	15 40 46.6	5.918
18	7 3 20.86	2.1563	18 41 6.5	1.688	18	8 47 3.88	2.1592	15 34 49.0	6.002
19	7 5 30.25	2.1568	18 39 22.5	1.781	19	8 49 13.42	2.1589	15 28 46.4	6.086
20	7 7 39.68	2.1574	18 37 32.8	1.874	20	8 51 22.95	2.1587	15 22 38.7	6.169
21	7 9 49.14	2.1578	18 35 37.6	1.967	21	8 53 32.47	2.1586	15 16 26.1	6.252
22	7 11 58.62	2.1582	18 33 36.8	2.059	22	8 55 41.98	2.1584	15 10 8.5	6.335
23	7 14 8.13	2.1587	18 31 30.5	2.152	23	8 57 51.48	2.1582	15 3 45.9	6.417
24	7 16 17.66	2.1590	+18 29 18.5	−2.246	24	9 0 0.96	2.1579	+14 57 18.4	−6.499

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination	Var. per Min.
	NOVEMBER 29.					DECEMBER 1.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 0 0.96	2.1579	+14 57 18.4	−6.499	0	10 43 34.81	2.1648	+8 19 46.9	− 9.856
1	9 2 10.43	2.1577	14 50 46.0	6.581	1	10 45 44.72	2.1656	8 9 53.9	9.911
2	9 4 19.89	2.1576	14 44 8.7	6.662	2	10 47 54.68	2.1664	7 59 57.6	9.965
3	9 6 29.34	2.1573	14 37 26.6	6.742	3	10 50 4.69	2.1672	7 49 58.1	10.019
4	9 8 38.77	2.1572	14 30 39.6	6.823	4	10 52 14.74	2.1680	7 39 55.3	10.072
5	9 10 48.20	2.1570	14 23 47.8	6.903	5	10 54 24.85	2.1690	7 29 49.4	10.124
6	9 12 57.61	2.1568	14 16 51.3	6.982	6	10 56 35.02	2.1699	7 19 40.4	10.176
7	9 15 7.01	2.1567	14 9 50.0	7.062	7	10 58 45.24	2.1708	7 9 28.3	10.227
8	9 17 16.41	2.1565	14 2 43.9	7.141	8	11 0 55.52	2.1718	6 59 13.2	10.277
9	9 19 25.79	2.1563	13 55 33.1	7.218	9	11 3 5.86	2.1728	6 48 55.1	10.326
10	9 21 35.17	2.1562	13 48 17.7	7.296	10	11 5 16.26	2.1739	6 38 34.1	10.375
11	9 23 44.54	2.1561	13 40 57.6	7.373	11	11 7 26.73	2.1751	6 28 10.1	10.422
12	9 25 53.90	2.1559	13 33 32.9	7.450	12	11 9 37.27	2.1763	6 17 43.4	10.469
13	9 28 3.25	2.1558	13 26 3.6	7.527	13	11 11 47.88	2.1775	6 7 13.8	10.516
14	9 30 12.60	2.1558	13 18 29.7	7.603	14	11 13 58.57	2.1787	5 56 41.5	10.561
15	9 32 21.95	2.1557	13 10 51.3	7.678	15	11 16 9.32	2.1799	5 46 6.5	10.605
16	9 34 31.29	2.1556	13 3 8.4	7.753	16	11 18 20.16	2.1813	5 35 28.9	10.649
17	9 36 40.62	2.1555	12 55 21.0	7.828	17	11 20 31.08	2.1827	5 24 48.6	10.692
18	9 38 49.95	2.1556	12 47 29.1	7.902	18	11 22 42.08	2.1840	5 14 5.8	10.734
19	9 40 59.29	2.1556	12 39 32.8	7.975	19	11 24 53.16	2.1855	5 3 20.5	10.775
20	9 43 8.62	2.1555	12 31 32.1	8.047	20	11 27 4.34	2.1870	4 52 32.8	10.815
21	9 45 17.95	2.1556	12 23 27.1	8.119	21	11 29 15.60	2.1885	4 41 42.7	10.855
22	9 47 27.29	2.1556	12 15 17.8	8.192	22	11 31 26.96	2.1901	4 30 50.2	10.893
23	9 49 36.62	2.1556	+12 7 4.1	−8.263	23	11 33 38.41	2.1917	+4 19 55.5	−10.931
	NOVEMBER 30.					DECEMBER 2.			
0	9 51 45.96	2.1557	+11 58 46.2	−8.333	0	11 35 49.96	2.1933	+4 8 58.5	−10.968
1	9 53 55.30	2.1558	11 50 24.1	8.404	1	11 38 1.61	2.1951	3 57 59.3	11.003
2	9 56 4.65	2.1559	11 41 57.7	8.474	2	11 40 13.37	2.1968	3 46 58.1	11.038
3	9 58 14.01	2.1560	11 33 27.2	8.543	3	11 42 25.23	2.1986	3 35 54.7	11.072
4	10 0 23.37	2.1562	11 24 52.6	8.612	4	11 44 37.20	2.2004	3 24 49.3	11.106
5	10 2 32.75	2.1563	11 16 13.8	8.680	5	11 46 49.28	2.2023	3 13 42.0	11.138
6	10 4 42.13	2.1565	11 7 31.0	8.747	6	11 49 1.47	2.2043	3 2 32.8	11.169
7	10 6 51.53	2.1568	10 58 44.2	8.813	7	11 51 13.79	2.2063	2 51 21.7	11.199
8	10 9 0.95	2.1570	10 49 53.4	8.880	8	11 53 26.22	2.2082	2 40 8.9	11.228
9	10 11 10.37	2.1573	10 40 58.6	8.946	9	11 55 38.77	2.2102	2 28 54.3	11.257
10	10 13 19.82	2.1577	10 31 59.9	9.011	10	11 57 51.45	2.2123	2 17 38.1	11.284
11	10 15 29.29	2.1579	10 22 57.3	9.075	11	12 0 4.25	2.2145	2 6 20.2	11.311
12	10 17 38.77	2.1582	10 13 50.9	9.138	12	12 2 17.19	2.2167	1 55 0.8	11.336
13	10 19 48.28	2.1587	10 4 40.7	9.202	13	12 4 30.25	2.2189	1 43 39.9	11.359
14	10 21 57.81	2.1590	9 55 26.6	9.266	14	12 6 43.46	2.2212	1 32 17.7	11.383
15	10 24 7.36	2.1595	9 46 8.8	9.328	15	12 8 56.80	2.2235	1 20 54.0	11.406
16	10 26 16.95	2.1600	9 36 47.3	9.388	16	12 11 10.28	2.2258	1 9 29.0	11.427
17	10 28 26.56	2.1604	9 27 22.2	9.449	17	12 13 23.90	2.2282	0 58 2.8	11.446
18	10 30 36.20	2.1610	9 17 53.4	9.510	18	12 15 37.67	2.2307	0 46 35.5	11.465
19	10 32 45.88	2.1616	9 8 21.0	9.569	19	12 17 51.59	2.2333	0 35 7.0	11.483
20	10 34 55.59	2.1622	8 58 45.1	9.627	20	12 20 5.67	2.2358	0 23 37.5	11.500
21	10 37 5.34	2.1627	8 49 5.7	9.685	21	12 22 19.89	2.2383	0 12 7.0	11.516
22	10 39 15.12	2.1633	8 39 22.9	9.743	22	12 24 34.27	2.2411	+0 0 35.6	11.530
23	10 41 24.94	2.1641	8 29 36.6	9.800	23	12 26 48.82	2.2438	−0 10 56.6	11.543
24	10 43 34.81	2.1648	+ 8 19 46.9	−9.856	24	12 29 3.52	2.2464	−0 22 29.6	−11.556

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 3.			
	h m s	s	° ′ ″	″
0	12 29 3.52	2.2464	−0 22 29.6	−11.556
1	12 31 18.39	2.2492	0 34 3.3	11.567
2	12 33 33.43	2.2521	0 45 37.6	11.577
3	12 35 48.64	2.2549	0 57 12.5	11.586
4	12 38 4.02	2.2578	1 8 47.9	11.593
5	12 40 19.57	2.2608	1 20 23.7	11.600
6	12 42 35.31	2.2638	1 31 59.9	11.605
7	12 44 51.23	2.2668	1 43 36.3	11.609
8	12 47 7.33	2.2698	1 55 13.0	11.612
9	12 49 23.61	2.2730	2 6 49.8	11.613
10	12 51 40.09	2.2762	2 18 26.6	11.613
11	12 53 56.75	2.2793	2 30 3.4	11.612
12	12 56 13.61	2.2827	2 41 40.1	11.610
13	12 58 30.67	2.2859	2 53 16.6	11.607
14	13 0 47.92	2.2892	3 4 52.9	11.603
15	13 3 5.37	2.2926	3 16 28.9	11.597
16	13 5 23.03	2.2960	3 28 4.5	11.589
17	13 7 40.89	2.2994	3 39 39.6	11.581
18	13 9 58.96	2.3029	3 51 14.2	11.571
19	13 12 17.24	2.3064	4 2 48.1	11.559
20	13 14 35.73	2.3099	4 14 21.3	11.547
21	13 16 54.43	2.3136	4 25 53.7	11.532
22	13 19 13.36	2.3172	4 37 25.1	11.517
23	13 21 32.50	2.3208	−4 48 55.7	−11.501
	DECEMBER 4.			
0	13 23 51.86	2.3245	−5 0 25.2	−11.483
1	13 26 11.44	2.3283	5 11 53.6	11.463
2	13 28 31.25	2.3321	5 23 20.7	11.442
3	13 30 51.29	2.3358	5 34 46.6	11.420
4	13 33 11.55	2.3397	5 46 11.1	11.397
5	13 35 32.05	2.3436	5 57 34.2	11.372
6	13 37 52.78	2.3474	6 8 55.7	11.344
7	13 40 13.74	2.3513	6 20 15.5	11.316
8	13 42 34.94	2.3553	6 31 33.6	11.287
9	13 44 56.37	2.3593	6 42 49.9	11.256
10	13 47 18.05	2.3633	6 54 4.3	11.223
11	13 49 39.96	2.3673	7 5 16.7	11.190
12	13 52 2.12	2.3713	7 16 27.1	11.155
13	13 54 24.52	2.3754	7 27 35.3	11.118
14	13 56 47.17	2.3795	7 38 41.3	11.079
15	13 59 10.06	2.3835	7 49 44.8	11.039
16	14 1 33.19	2.3877	8 0 46.0	10.998
17	14 3 56.58	2.3919	8 11 44.6	10.956
18	14 6 20.22	2.3960	8 22 40.7	10.912
19	14 8 44.10	2.4002	8 33 34.0	10.865
20	14 11 8.24	2.4043	8 44 24.5	10.818
21	14 13 32.62	2.4085	8 55 12.2	10.770
22	14 15 57.26	2.4127	9 5 56.9	10.719
23	14 18 22.15	2.4170	9 16 38.5	10.667
24	14 20 47.30	2.4213	−9 27 17.0	−10.614

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 5.			
	h m s	s	° ′ ″	″
0	14 20 47.30	2.4213	− 9 27 17.0	−10.614
1	14 23 12.70	2.1254	9 37 52.2	10.559
2	14 25 38.35	2.4296	9 48 24.1	10.502
3	14 28 4.25	2.4339	9 58 52.5	10.444
4	14 30 30.42	2.4382	10 9 17.4	10.385
5	14 32 56.84	2.4424	10 19 38.7	10.324
6	14 35 23.51	2.4466	10 29 56.3	10.262
7	14 37 50.43	2.4508	10 40 10.1	10.198
8	14 40 17.61	2.4551	10 50 20.0	10.133
9	14 42 45.04	2.4593	11 0 26.0	10.065
10	14 45 12.73	2.4636	11 10 27.8	9.996
11	14 47 40.67	2.4678	11 20 25.5	9.926
12	14 50 8.86	2.4719	11 30 18.9	9.854
13	14 52 37.30	2.4762	11 40 8.0	9.781
14	14 55 6.00	2.4803	11 49 52.6	9.706
15	14 57 34.94	2.4844	11 59 32.7	9.630
16	15 0 4.13	2.4886	12 9 8.2	9.552
17	15 2 33.57	2.4927	12 18 38.9	9.473
18	15 5 3.26	2.4968	12 28 4.9	9.392
19	15 7 33.19	2.5008	12 37 25.9	9.309
20	15 10 3.36	2.5049	12 46 42.0	9.226
21	15 12 33.78	2.5089	12 55 53.0	9.141
22	15 15 4.43	2.5129	13 4 58.9	9.054
23	15 17 35.33	2.5169	−13 13 59.5	− 8.965
	DECEMBER 6.			
0	15 20 6.46	2.5208	−13 22 54.7	− 8.875
1	15 22 37.82	2.5247	13 31 44.5	8.785
2	15 25 9.42	2.5285	13 40 28.9	8.693
3	15 27 41.24	2.5323	13 49 7.6	8.598
4	15 30 13.29	2.5361	13 57 40.6	8.503
5	15 32 45.57	2.5398	14 6 7.9	8.407
6	15 35 18.06	2.5433	14 14 29.4	8.308
7	15 37 50.77	2.5470	14 22 44.9	8.208
8	15 40 23.70	2.5506	14 30 54.4	8.107
9	15 42 56.84	2.5541	14 38 57.8	8.006
10	15 45 30.19	2.5576	14 46 55.1	7.903
11	15 48 3.75	2.5610	14 54 46.1	7.798
12	15 50 37.51	2.5643	15 2 30.8	7.692
13	15 53 11.47	2.5676	15 10 9.1	7.584
14	15 55 45.62	2.5708	15 17 40.9	7.475
15	15 58 19.97	2.5740	15 25 6.1	7.365
16	16 0 54.50	2.5771	15 32 24.7	7.254
17	16 3 29.22	2.5801	15 39 36.6	7.142
18	16 6 4.11	2.5830	15 46 41.8	7.029
19	16 8 39.18	2.5859	15 53 40.1	6.914
20	16 11 14.42	2.5887	16 0 31.5	6.799
21	16 13 49.83	2.5914	16 7 16.0	6.682
22	16 16 25.39	2.5940	16 13 53.4	6.564
23	16 19 1.11	2.5967	16 20 23.7	6.445
24	16 21 36.99	2.5992	−16 26 46.8	− 6.325

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 7.			
	h m s	s	° ′ ″	″
0	16 21 36.99	2.5992	−16 26 46.8	−6.325
1	16 24 13.01	2.6016	16 33 2.7	6.204
2	16 26 49.18	2.6039	16 39 11.3	6.082
3	16 29 25.48	2.6061	16 45 12.5	5.959
4	16 32 1.91	2.6082	16 51 6.4	5.835
5	16 34 38.46	2.6103	16 56 52.7	5.710
6	16 37 15.14	2.6123	17 2 31.6	5.585
7	16 39 51.93	2.6141	17 8 2.9	5.458
8	16 42 28.83	2.6158	17 13 26.6	5.331
9	16 45 5.83	2.6175	17 18 42.6	5.203
10	16 47 42.93	2.6191	17 23 50.9	5.074
11	16 50 20.12	2.6206	17 28 51.5	4.944
12	16 52 57.40	2.6220	17 33 44.2	4.813
13	16 55 34.76	2.6233	17 38 29.1	4.682
14	16 58 12.19	2.6244	17 43 6.1	4.550
15	17 0 49.69	2.6255	17 47 35.1	4.418
16	17 3 27.25	2.6264	17 51 56.2	4.285
17	17 6 4.86	2.6272	17 56 9.3	4.151
18	17 8 42.52	2.6280	18 0 14.3	4.017
19	17 11 20.22	2.6286	18 4 11.3	3.883
20	17 13 57.95	2.6292	18 8 0.3	3.748
21	17 16 35.72	2.6296	18 11 41.1	3.612
22	17 19 13.50	2.6298	18 15 13.7	3.476
23	17 21 51.30	2.6301	−18 18 38.2	−3.340
	DECEMBER 8.			
0	17 24 29.11	2.6302	−18 21 54.5	−3.203
1	17 27 6.92	2.6301	18 25 2.6	3.066
2	17 29 44.72	2.6300	18 28 2.4	2.928
3	17 32 22.52	2.6297	18 30 54.0	2.791
4	17 35 0.29	2.6293	18 33 37.3	2.653
5	17 37 38.04	2.6288	18 36 12.4	2.516
6	17 40 15.75	2.6282	18 38 39.2	2.378
7	17 42 53.43	2.6276	18 40 57.7	2.239
8	17 45 31.06	2.6267	18 43 7.9	2.101
9	17 48 8.63	2.6258	18 45 9.8	1.963
10	17 50 46.15	2.6248	18 47 3.4	1.824
11	17 53 23.60	2.6235	18 48 48.7	1.685
12	17 56 0.97	2.6222	18 50 25.6	1.547
13	17 58 38.26	2.6208	18 51 54.3	1.409
14	18 1 15.47	2.6193	18 53 14.7	1.271
15	18 3 52.58	2.6177	18 54 26.8	1.133
16	18 6 29.59	2.6159	18 55 30.6	0.994
17	18 9 6.49	2.6141	18 56 26.1	0.857
18	18 11 43.28	2.6122	18 57 13.4	0.720
19	18 14 19.95	2.6101	18 57 52.5	0.583
20	18 16 56.49	2.6078	18 58 23.3	0.445
21	18 19 32.89	2.6055	18 58 45.9	0.308
22	18 22 9.15	2.6032	18 59 0.3	0.172
23	18 24 45.27	2.6007	18 59 6.6	−0.037
24	18 27 21.23	2.5980	−18 59 4.7	+0.099

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 9.			
	h m s	s	° ′ ″	″
0	18 27 21.23	2.5980	−18 59 4.7	+0.099
1	18 29 57.03	2.5952	18 58 54.7	0.234
2	18 32 32.66	2.5924	18 58 36.6	0.369
3	18 35 8.12	2.5894	18 58 10.4	0.503
4	18 37 43.41	2.5865	18 57 36.2	0.637
5	18 40 18.50	2.5833	18 56 54.0	0.770
6	18 42 53.41	2.5802	18 56 3.8	0.903
7	18 45 28.12	2.5768	18 55 5.6	1.035
8	18 48 2.62	2.5733	18 53 59.6	1.166
9	18 50 36.92	2.5699	18 52 45.7	1.297
10	18 53 11.01	2.5663	18 51 24.0	1.427
11	18 55 44.87	2.5625	18 49 54.5	1.557
12	18 58 18.51	2.5587	18 48 17.2	1.686
13	19 0 51.92	2.5548	18 46 32.2	1.813
14	19 3 25.09	2.5508	18 44 39.6	1.940
15	19 5 58.02	2.5168	18 42 39.4	2.067
16	19 8 30.70	2.5427	18 40 31.6	2.193
17	19 11 3.14	2.5384	18 38 16.3	2.318
18	19 13 35.31	2.5341	18 35 53.5	2.442
19	19 16 7.23	2.5298	18 33 23.3	2.565
20	19 18 38.89	2.5253	18 30 45.7	2.687
21	19 21 10.27	2.5208	18 28 0.9	2.808
22	19 23 41.38	2.5162	18 25 8.8	2.929
23	19 26 12.21	2.5115	−18 22 9.4	+3.049
	DECEMBER 10.			
0	19 28 42.76	2.5068	−18 19 2.9	+3.168
1	19 31 13.03	2.5020	18 15 49.3	3.285
2	19 33 43.00	2.4970	18 12 28.7	3.402
3	19 36 12.67	2.4921	18 9 1.1	3.518
4	19 38 42.05	2.4872	18 5 26.6	3.633
5	19 41 11.13	2.4822	18 1 45.2	3.747
6	19 43 39.91	2.4770	17 57 57.0	3.859
7	19 46 8.37	2.4718	17 54 2.1	3.970
8	19 48 36.53	2.4667	17 50 0.6	4.081
9	19 51 4.37	2.4613	17 45 52.4	4.191
10	19 53 31.89	2.4561	17 41 37.7	4.299
11	19 55 59.10	2.4508	17 37 16.5	4.407
12	19 58 25.98	2.4453	17 32 48.8	4.514
13	20 0 52.54	2.4398	17 28 14.8	4.619
14	20 3 18.76	2.4343	17 23 34.5	4.723
15	20 5 44.66	2.4288	17 18 48.1	4.826
16	20 8 10.22	2.4233	17 13 55.4	4.928
17	20 10 35.45	2.4178	17 8 56.7	5.028
18	20 13 0.35	2.4122	17 3 52.0	5.128
19	20 15 24.91	2.4065	16 58 41.3	5.227
20	20 17 49.13	2.4008	16 53 24.7	5.325
21	20 20 13.00	2.3951	16 48 2.3	5.421
22	20 22 36.54	2.3894	16 42 34.2	5.517
23	20 24 59.73	2.3836	16 37 0.3	5.611
24	20 27 22.57	2.3778	−16 31 20.9	+5.703

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 11.			
	h m s	s	° ′ ″	″
0	20 27 22.57	2.3778	−16 31 20.9	+5.703
1	20 29 45.07	2.3721	16 25 35.9	5.795
2	20 32 7.22	2.3663	16 19 45.5	5.885
3	20 34 29.02	2.3604	16 13 49.7	5.975
4	20 36 50.47	2.3547	16 7 48.5	6.064
5	20 39 11.58	2.3488	16 1 42.0	6.151
6	20 41 32.33	2.3429	15 55 30.4	6.237
7	20 43 52.73	2.3372	15 49 13.6	6.322
8	20 46 12.79	2.3313	15 42 51.8	6.405
9	20 48 32.49	2.3254	15 36 25.0	6.487
10	20 50 51.84	2.3196	15 29 53.3	6.569
11	20 53 10.84	2.3138	15 23 16.7	6.649
12	20 55 29.49	2.3079	15 16 35.4	6.728
13	20 57 47.79	2.3020	15 9 49.4	6.806
14	21 0 5.73	2.2962	15 2 58.7	6.883
15	21 2 23.33	2.2903	14 56 3.5	6.958
16	21 4 40.57	2.2845	14 49 3.7	7.032
17	21 6 57.47	2.2787	14 41 59.6	7.106
18	21 9 14.02	2.2729	14 34 51.0	7.178
19	21 11 30.22	2.2672	14 27 38.2	7.249
20	21 13 46.08	2.2614	14 20 21.1	7.319
21	21 16 1.59	2.2556	14 12 59.9	7.388
22	21 18 16.75	2.2498	14 5 34.6	7.456
23	21 20 31.57	2.2442	−13 58 5.2	+7.523
	DECEMBER 12.			
0	21 22 46.05	2.2385	−13 50 31.9	+7.588
1	21 25 0.19	2.2328	13 42 54.7	7.652
2	21 27 13.98	2.2271	13 35 13.7	7.715
3	21 29 27.44	2.2215	13 27 28.9	7.777
4	21 31 40.56	2.2159	13 19 40.4	7.838
5	21 33 53.35	2.2103	13 11 48.3	7.898
6	21 36 5.80	2.2047	13 3 52.6	7.957
7	21 38 17.91	2.1992	12 55 53.4	8.016
8	21 40 29.70	2.1937	12 47 50.7	8.073
9	21 42 41.16	2.1883	12 39 44.7	8.128
10	21 44 52.29	2.1828	12 31 35.4	8.183
11	21 47 3.10	2.1774	12 23 22.8	8.237
12	21 49 13.58	2.1720	12 15 7.0	8.289
13	21 51 23.74	2.1667	12 6 48.1	8.341
14	21 53 33.59	2.1614	11 58 26.1	8.391
15	21 55 43.11	2.1562	11 50 1.2	8.440
16	21 57 52.33	2.1510	11 41 33.3	8.489
17	22 0 1.23	2.1458	11 33 2.5	8.537
18	22 2 9.82	2.1407	11 24 28.9	8.583
19	22 4 18.11	2.1356	11 15 52.5	8.628
20	22 6 26.09	2.1304	11 7 13.5	8.673
21	22 8 33.76	2.1254	10 58 31.7	8.717
22	22 10 41.14	2.1204	10 49 47.4	8.760
23	22 12 48.21	2.1155	10 41 0.5	8.802
24	22 14 55.00	2.1107	−10 32 11.2	+8.842

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 13.			
	h m s	s	° ′ ″	″
0	22 14 55.00	2.1107	−10 32 11.2	+8.842
1	22 17 1.49	2.1058	10 23 19.5	8.883
2	22 19 7.70	2.1011	10 14 25.3	8.922
3	22 21 13.62	2.0962	10 5 28.9	8.958
4	22 23 19.25	2.0915	9 56 30.3	8.996
5	22 25 24.60	2.0869	9 47 29.4	9.033
6	22 27 29.68	2.0823	9 38 26.4	9.068
7	22 29 34.47	2.0777	9 29 21.3	9.103
8	22 31 39.00	2.0732	9 20 14.1	9.136
9	22 33 43.26	2.0688	9 11 5.0	9.168
10	22 35 47.25	2.0643	9 1 53.9	9.200
11	22 37 50.97	2.0599	8 52 41.0	9.231
12	22 39 54.44	2.0557	8 43 26.2	9.261
13	22 41 57.65	2.0513	8 34 9.7	9.290
14	22 44 0.60	2.0472	8 24 51.4	9.319
15	22 46 3.31	2.0430	8 15 31.4	9.347
16	22 48 5.76	2.0388	8 6 9.8	9.373
17	22 50 7.97	2.0347	7 56 46.6	9.399
18	22 52 9.93	2.0307	7 47 21.9	9.424
19	22 54 11.66	2.0268	7 37 55.7	9.449
20	22 56 13.15	2.0229	7 28 28.0	9.473
21	22 58 14.41	2.0192	7 18 59.0	9.495
22	23 0 15.45	2.0153	7 9 28.6	9.517
23	23 2 16.25	2.0115	− 6 59 56.9	+9.538
	DECEMBER 14.			
0	23 4 16.83	2.0078	− 6 50 24.0	+9.558
1	23 6 17.19	2.0042	6 40 49.9	9.578
2	23 8 17.34	2.0007	6 31 14.6	9.597
3	23 10 17.27	1.9971	6 21 38.2	9.616
4	23 12 16.99	1.9937	6 12 0.7	9.633
5	23 14 16.51	1.9903	6 2 22.2	9.650
6	23 16 15.83	1.9869	5 52 42.7	9.666
7	23 18 14.94	1.9836	5 43 2.3	9.681
8	23 20 13.86	1.9803	5 33 21.0	9.696
9	23 22 12.58	1.9771	5 23 38.8	9.710
10	23 24 11.11	1.9740	5 13 55.8	9.723
11	23 26 9.46	1.9709	5 4 12.1	9.735
12	23 28 7.62	1.9678	4 54 27.6	9.747
13	23 30 5.60	1.9649	4 44 42.4	9.758
14	23 32 3.41	1.9620	4 34 56.6	9.769
15	23 34 1.04	1.9592	4 25 10.1	9.779
16	23 35 58.51	1.9563	4 15 23.1	9.788
17	23 37 55.80	1.9535	4 5 35.6	9.797
18	23 39 52.93	1.9509	3 55 47.5	9.805
19	23 41 49.91	1.9482	3 45 59.0	9.812
20	23 43 46.72	1.9456	3 36 10.1	9.818
21	23 45 43.38	1.9432	3 26 20.8	9.824
22	23 47 39.90	1.9407	3 16 31.2	9.829
23	23 49 36.27	1.9383	3 6 41.3	9.833
24	23 51 32.50	1.9360	− 2 56 51.2	+9.837

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 15.			
	h m s	s	° ′ ″	″
0	23 51 32.50	1.9360	−2 56 51.2	+9.837
1	23 53 28.59	1.9336	2 47 0.8	9.841
2	23 55 24.53	1.9313	2 37 10.3	9.844
3	23 57 20.35	1.9292	2 27 19.5	9.847
4	23 59 16.04	1.9271	2 17 28.7	9.847
5	0 1 11.60	1.9250	2 7 37.9	9.848
6	0 3 7.04	1.9229	1 57 46.9	9.849
7	0 5 2.35	1.9209	1 47 56.0	9.848
8	0 6 57.55	1.9191	1 38 5.1	9.848
9	0 8 52.64	1.9172	1 28 14.3	9.847
10	0 10 47.62	1.9154	1 18 23.5	9.845
11	0 12 42.49	1.9137	1 8 32.9	9.842
12	0 14 37.26	1.9120	0 58 42.5	9.838
13	0 16 31.93	1.9103	0 48 52.3	9.835
14	0 18 26.50	1.9088	0 39 2.3	9.831
15	0 20 20.98	1.9073	0 29 12.6	9.826
16	0 22 15.37	1.9058	0 19 23.2	9.821
17	0 24 9.67	1.9043	−0 9 34.1	9.815
18	0 26 3.89	1.9030	+0 0 14.6	9.808
19	0 27 58.03	1.9017	0 10 2.9	9.801
20	0 29 52.09	1.9003	0 19 50.7	9.793
21	0 31 46.07	1.8992	0 29 38.1	9.786
22	0 33 39.99	1.8981	0 39 25.0	9.777
23	0 35 33.84	1.8969	+0 49 11.3	+9.767
	DECEMBER 16.			
0	0 37 27.62	1.8958	+0 58 57.0	+9.757
1	0 39 21.34	1.8949	1 8 42.1	9.747
2	0 41 15.01	1.8940	1 18 26.6	9.736
3	0 43 8.62	1.8931	1 28 10.4	9.724
4	0 45 2.18	1.8922	1 37 53.5	9.712
5	0 46 55.69	1.8914	1 47 35.9	9.700
6	0 48 49.15	1.8907	1 57 17.5	9.687
7	0 50 42.57	1.8900	2 6 58.3	9.673
8	0 52 35.95	1.8894	2 16 38.3	9.659
9	0 54 29.30	1.8888	2 26 17.4	9.645
10	0 56 22.61	1.8883	2 35 55.7	9.630
11	0 58 15.89	1.8878	2 45 33.0	9.613
12	1 0 9.15	1.8874	2 55 9.3	9.597
13	1 2 2.38	1.8870	3 4 44.6	9.581
14	1 3 55.59	1.8867	3 14 19.0	9.564
15	1 5 48.79	1.8864	3 23 52.3	9.546
16	1 7 41.96	1.8862	3 33 24.5	9.527
17	1 9 35.13	1.8860	3 42 55.6	9.508
18	1 11 28.28	1.8858	3 52 25.5	9.489
19	1 13 21.43	1.8858	4 1 54.3	9.470
20	1 15 14.58	1.8858	4 11 21.9	9.449
21	1 17 7.72	1.8858	4 20 48.2	9.428
22	1 19 0.87	1.8858	4 30 13.3	9.407
23	1 20 54.02	1.8859	4 39 37.1	9.385
24	1 22 47.18	1.8861	+4 48 59.5	+9.363

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 17.			
	h m s	s	° ′ ″	″
0	1 22 47.18	1.8861	+ 4 48 59.5	+9.363
1	1 24 40.35	1.8862	4 58 20.6	9.339
2	1 26 33.53	1.8865	5 7 40.2	9.316
3	1 28 26.73	1.8868	5 16 58.5	9.292
4	1 30 19.95	1.8872	5 26 15.3	9.268
5	1 32 13.19	1.8876	5 35 30.6	9.243
6	1 34 6.46	1.8880	5 44 44.4	9.218
7	1 35 59.75	1.8884	5 53 56.7	9.192
8	1 37 53.07	1.8890	6 3 7.4	9.164
9	1 39 46.43	1.8896	6 12 16.4	9.137
10	1 41 39.82	1.8901	6 21 23.9	9.110
11	1 43 33.24	1.8907	6 30 29.6	9.082
12	1 45 26.71	1.8915	6 39 33.7	9.053
13	1 47 20.22	1.8922	6 48 36.0	9.024
14	1 49 13.77	1.8929	6 57 36.6	8.995
15	1 51 7.37	1.8937	7 6 35.4	8.964
16	1 53 1.02	1.8947	7 15 32.3	8.933
17	1 54 54.73	1.8956	7 24 27.4	8.902
18	1 56 48.49	1.8965	7 33 20.6	8.871
19	1 58 42.31	1.8975	7 42 11.9	8.839
20	2 0 36.19	1.8985	7 51 1.3	8.807
21	2 2 30.13	1.8996	7 59 48.7	8.773
22	2 4 24.14	1.9007	8 8 34.0	8.739
23	2 6 18.22	1.9018	+ 8 17 17.4	+8.705
	DECEMBER 18.			
0	2 8 12.36	1.9030	+ 8 25 58.6	+8.669
1	2 10 6.58	1.9042	8 34 37.7	8.634
2	2 12 0.87	1.9055	8 43 14.7	8.598
3	2 13 55.24	1.9068	8 51 49.5	8.562
4	2 15 49.69	1.9082	9 0 22.1	8.525
5	2 17 44.22	1.9095	9 8 52.5	8.488
6	2 19 38.83	1.9109	9 17 20.7	8.450
7	2 21 33.53	1.9123	9 25 46.5	8.411
8	2 23 28.31	1.9138	9 34 10.0	8.372
9	2 25 23.19	1.9154	9 42 31.1	8.333
10	2 27 18.16	1.9169	9 50 49.9	8.293
11	2 29 13.22	1.9185	9 59 6.2	8.252
12	2 31 8.38	1.9201	10 7 20.1	8.211
13	2 33 3.63	1.9217	10 15 31.5	8.168
14	2 34 58.99	1.9234	10 23 40.3	8.127
15	2 36 54.44	1.9251	10 31 46.7	8.084
16	2 38 50.00	1.9269	10 39 50.4	8.040
17	2 40 45.67	1.9287	10 47 51.5	7.996
18	2 42 41.44	1.9304	10 55 49.9	7.952
19	2 44 37.32	1.9322	11 3 45.7	7.907
20	2 46 33.31	1.9342	11 11 38.8	7.862
21	2 48 29.42	1.9361	11 19 29.1	7.816
22	2 50 25.64	1.9380	11 27 16.7	7.769
23	2 52 21.98	1.9399	11 35 1.4	7.722
24	2 54 18.43	1.9418	+11 42 43.3	+7.674

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 19.			
	h m s	s	° ′ ″	″
0	2 54 18.43	1.9418	+11 42 43.3	+7.674
1	2 56 15.00	1.9438	11 50 22.3	7.626
2	2 58 11.69	1.9459	11 57 58.4	7.577
3	3 0 8.51	1.9480	12 5 31.6	7.528
4	3 2 5.45	1.9500	12 13 1.8	7.478
5	3 4 2.51	1.9521	12 20 28.9	7.427
6	3 5 59.70	1.9542	12 27 53.0	7.377
7	3 7 57.02	1.9564	12 35 14.1	7.325
8	3 9 54.47	1.9586	12 42 32.0	7.273
9	3 11 52.05	1.9608	12 49 46.8	7.220
10	3 13 49.76	1.9630	12 56 58.4	7.167
11	3 15 47.61	1.9652	13 4 6.8	7.113
12	3 17 45.59	1.9675	13 11 12.0	7.059
13	3 19 43.71	1.9698	13 18 13.9	7.004
14	3 21 41.96	1.9720	13 25 12.5	6.948
15	3 23 40.35	1.9743	13 32 7.7	6.893
16	3 25 38.88	1.9767	13 38 59.6	6.837
17	3 27 37.55	1.9790	13 45 48.1	6.779
18	3 29 36.36	1.9813	13 52 33.1	6.722
19	3 31 35.31	1.9837	13 59 14.7	6.664
20	3 33 34.41	1.9862	14 5 52.8	6.605
21	3 35 33.65	1.9885	14 12 27.3	6.546
22	3 37 33.03	1.9909	14 18 58.3	6.486
23	3 39 32.56	1.9934	+14 25 25.6	+6.425
	DECEMBER 20.			
0	3 41 32.24	1.9958	+14 31 49.3	+6.364
1	3 43 32.06	1.9983	14 38 9.3	6.303
2	3 45 32.03	2.0008	14 44 25.7	6.241
3	3 47 32.15	2.0033	14 50 38.2	6.178
4	3 49 32.42	2.0057	14 56 47.0	6.115
5	3 51 32.83	2.0082	15 2 52.0	6.052
6	3 53 33.40	2.0107	15 8 53.2	5.988
7	3 55 34.11	2.0132	15 14 50.5	5.923
8	3 57 34.98	2.0157	15 20 43.9	5.857
9	3 59 36.00	2.0183	15 26 33.3	5.791
10	4 1 37.17	2.0208	15 32 18.8	5.725
11	4 3 38.49	2.0233	15 38 0.3	5.658
12	4 5 39.97	2.0259	15 43 37.7	5.590
13	4 7 41.60	2.0284	15 49 11.1	5.522
14	4 9 43.38	2.0309	15 54 40.3	5.453
15	4 11 45.31	2.0334	16 0 5.5	5.384
16	4 13 47.39	2.0359	16 5 26.4	5.314
17	4 15 49.62	2.0386	16 10 43.2	5.244
18	4 17 52.02	2.0412	16 15 55.7	5.173
19	4 19 54.56	2.0436	16 21 4.0	5.102
20	4 21 57.25	2.0462	16 26 8.0	5.031
21	4 24 0.10	2.0488	16 31 7.7	4.958
22	4 26 3.10	2.0513	16 36 3.0	4.885
23	4 28 6.25	2.0538	16 40 53.9	4.812
24	4 30 9.55	2.0563	+16 45 40.4	+4.738

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 21.			
	h m s	s	° ′ ″	″
0	4 30 9.55	2.0563	+16 45 40.4	+4.738
1	4 32 13.00	2.0588	16 50 22.5	4.664
2	4 34 16.60	2.0613	16 55 0.1	4.588
3	4 36 20.36	2.0638	16 59 33.1	4.513
4	4 38 24.26	2.0663	17 4 1.7	4.437
5	4 40 28.31	2.0688	17 8 25.6	4.361
6	4 42 32.51	2.0713	17 12 45.0	4.284
7	4 44 36.86	2.0737	17 16 59.7	4.207
8	4 46 41.35	2.0762	17 21 9.8	4.129
9	4 48 46.00	2.0787	17 25 15.2	4.050
10	4 50 50.79	2.0810	17 29 15.8	3.971
11	4 52 55.72	2.0834	17 33 11.7	3.892
12	4 55 0.80	2.0858	17 37 2.9	3.813
13	4 57 6.02	2.0882	17 40 49.3	3.733
14	4 59 11.38	2.0906	17 44 30.8	3.651
15	5 1 16.89	2.0929	17 48 7.4	3.570
16	5 3 22.53	2.0952	17 51 39.2	3.489
17	5 5 28.32	2.0976	17 55 6.1	3.407
18	5 7 34.24	2.0998	17 58 28.0	3.324
19	5 9 40.30	2.1022	18 1 45.0	3.242
20	5 11 46.50	2.1041	18 4 57.0	3.158
21	5 13 52.83	2.1066	18 8 3.9	3.074
22	5 15 59.29	2.1088	18 11 5.9	2.990
23	5 18 5.89	2.1111	+18 14 2.7	+2.905
	DECEMBER 22.			
0	5 20 12.62	2.1133	+18 16 54.5	+2.820
1	5 22 19.48	2.1153	18 19 41.1	2.734
2	5 24 26.46	2.1175	18 22 22.6	2.649
3	5 26 33.58	2.1197	18 24 59.0	2.563
4	5 28 40.82	2.1217	18 27 30.1	2.476
5	5 30 48.18	2.1238	18 29 56.1	2.389
6	5 32 55.67	2.1258	18 32 16.8	2.302
7	5 35 3.27	2.1278	18 34 32.3	2.214
8	5 37 11.00	2.1298	18 36 42.5	2.126
9	5 39 18.84	2.1317	18 38 47.4	2.037
10	5 41 26.80	2.1336	18 40 46.9	1.948
11	5 43 34.87	2.1354	18 42 41.1	1.859
12	5 45 43.05	2.1372	18 44 30.0	1.770
13	5 47 51.34	2.1391	18 46 13.5	1.679
14	5 49 59.74	2.1410	18 47 51.5	1.589
15	5 52 8.26	2.1428	18 49 24.2	1.500
16	5 54 16.88	2.1444	18 50 51.5	1.409
17	5 56 25.59	2.1461	18 52 13.3	1.318
18	5 58 34.41	2.1478	18 53 29.6	1.227
19	6 0 43.33	2.1495	18 54 40.5	1.135
20	6 2 52.35	2.1511	18 55 45.8	1.043
21	6 5 1.46	2.1526	18 56 45.6	0.951
22	6 7 10.66	2.1542	18 57 39.9	0.859
23	6 9 19.96	2.1557	18 58 28.7	0.767
24	6 11 29.34	2.1571	+18 59 11.9	+0.675

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 23.					DECEMBER 25.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 11 29.34	2.1571	+18 59 11.9	+0.673	0	7 56 1.80	2.1850	+17 42 29.5	−3.867
1	6 13 38.81	2.1586	18 59 49.5	0.580	1	7 58 12.89	2.1848	17 38 34.7	3.959
2	6 15 48.37	2.1600	19 0 21.5	0.487	2	8 0 23.97	2.1845	17 34 34.4	4.051
3	6 17 58.01	2.1613	19 0 48.0	0.394	3	8 2 35.03	2.1841	17 30 28.6	4.143
4	6 20 7.73	2.1627	19 1 8.8	0.300	4	8 4 46.06	2.1838	17 26 17.3	4.234
5	6 22 17.53	2.1639	19 1 24.0	0.206	5	8 6 57.08	2.1834	17 22 0.5	4.326
6	6 24 27.40	2.1652	19 1 33.5	0.112	6	8 9 8.07	2.1831	17 17 38.2	4.417
7	6 26 37.35	2.1664	19 1 37.4	+0.018	7	8 11 19.05	2.1827	17 13 10.4	4.508
8	6 28 47.37	2.1677	19 1 35.7	−0.076	8	8 13 29.99	2.1822	17 8 37.3	4.598
9	6 30 57.47	2.1688	19 1 28.3	0.171	9	8 15 40.91	2.1818	17 3 58.7	4.688
10	6 33 7.63	2.1698	19 1 15.2	0.266	10	8 17 51.81	2.1813	16 59 14.7	4.778
11	6 35 17.85	2.1708	19 0 56.4	0.360	11	8 20 2.67	2.1808	16 54 25.3	4.868
12	6 37 28.13	2.1719	19 0 32.0	0.454	12	8 22 13.50	2.1803	16 49 30.6	4.957
13	6 39 38.48	2.1729	19 0 1.9	0.549	13	8 24 24.30	2.1798	16 44 30.5	5.045
14	6 41 48.88	2.1739	18 59 26.1	0.645	14	8 26 35.07	2.1792	16 39 25.2	5.133
15	6 43 59.35	2.1748	18 58 44.5	0.740	15	8 28 45.80	2.1785	16 34 14.5	5.222
16	6 46 9.86	2.1757	18 57 57.3	0.835	16	8 30 56.49	2.1779	16 28 58.6	5.309
17	6 48 20.43	2.1766	18 57 4.3	0.931	17	8 33 7.15	2.1773	16 23 37.4	5.397
18	6 50 31.05	2.1774	18 56 5.6	1.026	18	8 35 17.77	2.1767	16 18 11.0	5.483
19	6 52 41.72	2.1782	18 55 1.2	1.121	19	8 37 28.36	2.1761	16 12 39.4	5.570
20	6 54 52.43	2.1788	18 53 51.1	1.217	20	8 39 38.90	2.1754	16 7 2.6	5.657
21	6 57 3.18	2.1795	18 52 35.2	1.313	21	8 41 49.41	2.1747	16 1 20.6	5.742
22	6 59 13.97	2.1802	18 51 13.6	1.408	22	8 43 59.87	2.1740	15 55 33.6	5.827
23	7 1 24.80	2.1808	+18 49 46.3	−1.503	23	8 46 10.29	2.1733	+15 49 41.4	−5.912
	DECEMBER 24.					DECEMBER 26.			
0	7 3 35.67	2.1814	+18 48 13.2	−1.599	0	8 48 20.67	2.1727	+15 43 44.1	−5.997
1	7 5 46.57	2.1820	18 46 34.4	1.694	1	8 50 31.01	2.1719	15 37 41.8	6.080
2	7 7 57.51	2.1825	18 44 49.9	1.790	2	8 52 41.30	2.1711	15 31 34.5	6.163
3	7 10 8.47	2.1829	18 42 59.6	1.886	3	8 54 51.54	2.1703	15 25 22.2	6.247
4	7 12 19.46	2.1834	18 41 3.6	1.981	4	8 57 1.74	2.1697	15 19 4.9	6.330
5	7 14 30.48	2.1838	18 39 1.9	2.076	5	8 59 11.90	2.1689	15 12 42.6	6.412
6	7 16 41.52	2.1842	18 36 54.5	2.171	6	9 1 22.01	2.1681	15 6 15.5	6.493
7	7 18 52.58	2.1845	18 34 41.4	2.267	7	9 3 32.07	2.1673	14 59 43.5	6.574
8	7 21 3.66	2.1848	18 32 22.5	2.362	8	9 5 42.08	2.1665	14 53 6.6	6.654
9	7 23 14.75	2.1850	18 29 58.0	2.457	9	9 7 52.05	2.1657	14 46 25.0	6.734
10	7 25 25.86	2.1853	18 27 27.7	2.552	10	9 10 1.97	2.1650	14 39 38.5	6.814
11	7 27 36.98	2.1855	18 24 51.8	2.647	11	9 12 11.85	2.1642	14 32 47.3	6.893
12	7 29 48.12	2.1857	18 22 10.1	2.742	12	9 14 21.67	2.1633	14 25 51.3	6.972
13	7 31 59.26	2.1858	18 19 22.8	2.836	13	9 16 31.44	2.1625	14 18 50.7	7.050
14	7 34 10.41	2.1858	18 16 29.8	2.931	14	9 18 41.17	2.1617	14 11 45.3	7.127
15	7 36 21.56	2.1859	18 13 31.1	3.026	15	9 20 50.85	2.1609	14 4 35.4	7.204
16	7 38 32.72	2.1859	18 10 26.7	3.120	16	9 23 0.48	2.1602	13 57 20.8	7.281
17	7 40 43.87	2.1858	18 7 16.7	3.213	17	9 25 10.07	2.1593	13 50 1.7	7.357
18	7 42 55.02	2.1858	18 4 1.1	3.307	18	9 27 19.60	2.1585	13 42 38.0	7.432
19	7 45 6.17	2.1858	18 0 39.8	3.402	19	9 29 29.09	2.1577	13 35 9.8	7.507
20	7 47 17.31	2.1857	17 57 12.9	3.495	20	9 31 38.53	2.1569	13 27 37.2	7.581
21	7 49 28.45	2.1856	17 53 40.4	3.588	21	9 33 47.92	2.1562	13 20 0.1	7.654
22	7 51 39.58	2.1853	17 50 2.4	3.681	22	9 35 57.27	2.1554	13 12 18.7	7.727
23	7 53 50.69	2.1852	17 46 18.7	3.774	23	9 38 6.57	2.1546	13 4 32.9	7.800
24	7 56 1.80	2.1850	+17 42 29.5	−3.867	24	9 40 15.82	2.1538	+12 56 42.7	−7.872

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 27.					DECEMBER 29.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 40 15.82	2.1538	+12 56 42.7	− 7.872	0	11 23 5.93	2.1411	+5 28 42.8	−10.518
1	9 42 25.03	2.1531	12 48 48.3	7.943	1	11 25 14.41	2.1417	5 18 10.6	10.555
2	9 44 34.19	2.1523	12 40 49.6	8.013	2	11 27 22.93	2.1422	5 7 36.2	10.591
3	9 46 43.31	2.1516	12 32 46.7	8.084	3	11 29 31.47	2.1428	4 56 59.7	10.626
4	9 48 52.38	2.1508	12 24 39.5	8.153	4	11 31 40.06	2.1434	4 46 21.1	10.660
5	9 51 1.41	2.1502	12 16 28.3	8.221	5	11 33 48.68	2.1441	4 35 40.5	10.693
6	9 53 10.40	2.1495	12 8 13.0	8.289	6	11 35 57.35	2.1448	4 24 58.0	10.725
7	9 55 19.35	2.1488	11 59 53.6	8.357	7	11 38 6.06	2.1456	4 14 13.5	10.757
8	9 57 28.25	2.1481	11 51 30.1	8.424	8	11 40 14.82	2.1464	4 3 27.2	10.787
9	9 59 37.12	2.1474	11 43 2.7	8.489	9	11 42 23.63	2.1473	3 52 39.1	10.817
10	10 1 45.94	2.1468	11 34 31.4	8.555	10	11 44 32.49	2.1482	3 41 49.1	10.847
11	10 3 54.73	2.1462	11 25 56.1	8.621	11	11 46 41.41	2.1491	3 30 57.5	10.873
12	10 6 3.48	2.1456	11 17 16.9	8.685	12	11 48 50.38	2.1501	3 20 4.3	10.900
13	10 8 12.20	2.1450	11 8 33.9	8.748	13	11 50 59.42	2.1512	3 9 9.5	10.927
14	10 10 20.88	2.1443	10 59 47.1	8.811	14	11 53 8.52	2.1522	2 58 13.1	10.953
15	10 12 29.52	2.1437	10 50 56.6	8.873	15	11 55 17.68	2.1533	2 47 15.2	10.977
16	10 14 38.13	2.1433	10 42 2.3	8.934	16	11 57 26.91	2.1545	2 36 15.9	11.000
17	10 16 46.72	2.1428	10 33 4.4	8.995	17	11 59 36.22	2.1557	2 25 15.2	11.023
18	10 18 55.27	2.1423	10 24 2.9	9.056	18	12 1 45.60	2.1570	2 14 13.1	11.045
19	10 21 3.79	2.1418	10 14 57.7	9.116	19	12 3 55.06	2.1583	2 3 9.8	11.065
20	10 23 12.29	2.1414	10 5 49.0	9.174	20	12 6 4.60	2.1597	1 52 5.3	11.085
21	10 25 20.76	2.1409	9 56 36.8	9.232	21	12 8 14.22	2.1611	1 40 59.6	11.103
22	10 27 29.20	2.1406	9 47 21.1	9.290	22	12 10 23.93	2.1625	1 29 52.9	11.122
23	10 29 37.63	2.1402	+ 9 38 2.0	− 9.347	23	12 12 33.72	2.1640	+1 18 45.0	−11.139
	DECEMBER 28.					DECEMBER 30.			
0	10 31 46.03	2.1398	+ 9 28 39.5	− 9.403	0	12 14 43.61	2.1656	+1 7 36.2	−11.154
1	10 33 54.41	2.1395	9 19 13.7	9.458	1	12 16 53.59	2.1672	0 56 26.5	11.170
2	10 36 2.77	2.1392	9 9 44.6	9.512	2	12 19 3.67	2.1688	0 45 15.8	11.184
3	10 38 11.12	2.1390	9 0 12.2	9.566	3	12 21 13.85	2.1705	0 34 4.4	11.197
4	10 40 19.45	2.1388	8 50 36.7	9.619	4	12 23 24.13	2.1723	0 22 52.2	11.209
5	10 42 27.77	2.1385	8 40 57.9	9.672	5	12 25 34.52	2.1741	0 11 39.3	11.221
6	10 44 36.07	2.1383	8 31 16.1	9.723	6	12 27 45.02	2.1759	+0 0 25.7	11.231
7	10 46 44.37	2.1382	8 21 31.2	9.774	7	12 29 55.63	2.1778	−0 10 48.4	11.239
8	10 48 52.66	2.1382	8 11 43.2	9.824	8	12 32 6.36	2.1798	0 22 3.0	11.247
9	10 51 0.95	2.1381	8 1 52.3	9.873	9	12 34 17.20	2.1818	0 33 18.1	11.255
10	10 53 9.23	2.1379	7 51 58.5	9.921	10	12 36 28.17	2.1838	0 44 33.6	11.262
11	10 55 17.50	2.1379	7 42 1.8	9.969	11	12 38 39.25	2.1858	0 55 49.5	11.267
12	10 57 25.78	2.1380	7 32 2.2	10.017	12	12 40 50.47	2.1881	1 7 5.6	11.270
13	10 59 34.06	2.1381	7 21 59.8	10.063	13	12 43 1.82	2.1902	1 18 21.9	11.274
14	11 1 42.35	2.1382	7 11 54.7	10.108	14	12 45 13.29	2.1924	1 29 38.5	11.277
15	11 3 50.64	2.1383	7 1 46.9	10.153	15	12 47 24.91	2.1947	1 40 55.1	11.277
16	11 5 58.94	2.1384	6 51 36.4	10.197	16	12 49 36.66	2.1971	1 52 11.7	11.276
17	11 8 7.25	2.1386	6 41 23.3	10.239	17	12 51 48.56	2.1994	2 3 28.2	11.275
18	11 10 15.57	2.1388	6 31 7.7	10.282	18	12 54 0.59	2.2018	2 14 44.7	11.273
19	11 12 23.91	2.1392	6 20 49.5	10.323	19	12 56 12.78	2.2044	2 26 1.0	11.270
20	11 14 32.27	2.1395	6 10 28.9	10.363	20	12 58 25.12	2.2069	2 37 17.1	11.266
21	11 16 40.65	2.1398	6 0 5.9	10.403	21	13 0 37.61	2.2094	2 48 32.9	11.260
22	11 18 49.05	2.1402	5 49 40.5	10.442	22	13 2 50.25	2.2120	2 59 48.3	11.253
23	11 20 57.48	2.1407	5 39 12.8	10.481	23	13 5 3.05	2.2147	3 11 3.3	11.246
24	11 23 5.93	2.1411	+ 5 28 42.8	−10.518	24	13 7 16.02	2.2175	−3 22 17.8	−11.238

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Dec'ination.	Var. per Min.
	DECEMBER 31.					DECEMBER 31.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 7 16.02	2.2175	−3 22 17.8	−11.238	12	13 34 5.22	2.2537	−5 36 9.2	−11.044
1	13 9 29.15	2.2203	3 33 31.8	11.228	13	13 36 20.54	2.2569	5 47 11.2	11.021
2	13 11 42.45	2.2230	3 44 45.1	11.216	14	13 38 36.05	2.2603	5 58 11.7	10.996
3	13 13 55.91	2.2258	3 55 57.7	11.204	15	13 40 51.77	2.2637	6 9 10.7	10.969
4	13 16 9.55	2.2288	4 7 9.6	11.192	16	13 43 7.69	2.2671	6 20 8.0	10.942
5	13 18 23.37	2.2318	4 18 20.7	11.178	17	13 45 23.82	2.2706	6 31 3.7	10.914
6	13 20 37.37	2.2348	4 29 30.9	11.162	18	13 47 40.16	2.2741	6 41 57.7	10.884
7	13 22 51.54	2.2378	4 40 40.1	11.145	19	13 49 56.71	2.2776	6 52 49.8	10.853
8	13 25 5.90	2.2408	4 51 48.3	11.127	20	13 52 13.47	2.2812	7 3 40.0	10.821
9	13 27 20.44	2.2440	5 2 55.3	11.108	21	13 54 30.45	2.2848	7 14 28.3	10.788
10	13 29 35.18	2.2472	5 14 1.2	11.088	22	13 56 47.65	2.2884	7 25 14.5	10.753
11	13 31 50.10	2.2503	5 25 5.9	11.067	23	13 59 5.06	2.2921	7 35 58.6	10.717
12	13 34 5.22	2.2537	−5 36 9.2	−11.044	24	14 1 22.70	2 2959	−7 46 40.5	−10.680

PHASES OF THE MOON.

		d h m		d h m		d h m		d h m
○ Full Moon	Jan.	2 14 33.4	Apr.	1 1 9.8	June	28 1 4.2	Sept.	24 13 15.8
☾ Last Quarter		9 12 54.5		7 17 22.5	July	5 13 56.4	Oct.	2 17 29.2
● New Moon		16 14 41.0		15 18 28.4		13 12 44.8		9 18 5.5
☽ First Quarter		24 15 59.3		23 17 20.3		20 13 31.9		16 8 53.6
○ Full Moon	Feb.	1 3 53.2		30 9 30.3		27 10 32.6		24 6 26.2
☾ Last Quarter		7 21 15.9	May	7 6 18.2	Aug.	4 7 22.3	Nov.	1 8 48.9
● New Moon		15 7 7.2		15 10 38.4		11 23 16.6		8 3 27.0
☽ First Quarter		23 12 6.2		23 2 25.0		18 18 6.9		14 21 41.1
○ Full Moon	Mar.	2 15 23.6		29 17 7.2		25 22 29.4		23 0 57.9
☾ Last Quarter		9 6 31.0	June	5 21 19.1	Sept.	3 0 47.3		30 22 9.2
● New Moon		17 0 51.3		14 0 42.1		10 8 52.6	Dec.	7 13 30.4
☽ First Quarter		25 4 41.5		21 8 45.9		17 0 4.0		14 14 37.9
○ Full Moon	Apr.	1 1 9.8		28 1 4.2		24 13 15.8		22 19 33.0
☾ Last Quarter		7 17 22.5	July	5 13 56.4	Oct.	2 17 29.2		30 9 7.1

APOGEE.				PERIGEE.			
	d h		d h		d h		d h
January	23 1.4	August	3 18.4	January	7 23.9	July	21 13.9
February	19 20.3	August	31 12.9	February	3 19.3	August	15 22.0
March	19 8.4	September	28 5.4	March	3 22.8	September	12 10.4
April	15 11.2	October	25 14.6	April	1 9.4	October	10 15.7
May	12 16.8	November	21 14.9	April	29 20.4	November	8 3.0
June	9 6.5	December	18 23.2	May	28 3.8	December	6 15.0
July	6 23.8			June	25 1.5		

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Jan. 1.0	80 17 15.7	−5 1 2.7	15 27.8	56 39.72	+1.629	14.0	Jan. 1	U	11 2.4	2.23
1.5	86 52 8.6	5 1 3.4	15 33.1	56 59.20	1.613	14.5	1	L	23 29.3	2.26
2.0	93 31 39.5	4 56 59.1	15 38.3	57 18.32	1.568	15.0	2	U	11 56.6	2.28
2.5	100 15 32.4	4 48 45.0	15 43.4	57 36.72	1.495	15.5			. . . . .	. . .
3.0	107 3 26.7	4 36 20.3	15 48.1	57 54.10	1.397	16.0	3	L	0 24.1	2.30
3.5	113 54 57.1	−4 19 49.4	15 52.5	58 10.17	+1.279	16.5	3	U	12 51.7	2.30
4.0	120 49 35.9	3 59 21.2	15 56.4	58 24.72	1.143	17.0	4	L	1 19.2	2.29
4.5	127 46 53.6	3 35 10.4	15 59.9	58 37.56	0.996	17.5	4	U	13 46.6	2.28
5.0	134 46 20.1	3 7 36.0	16 2.9	58 48.59	0.842	18.0	5	L	2 13.8	2.26
5.5	141 47 26.9	2 37 2.1	16 5.4	58 57.75	0.685	18.5	5	U	14 40.8	2.24
6.0	148 49 46.9	−2 3 56.6	16 7.4	59 5.05	+0.532	19.0	6	L	3 7.5	2.21
6.5	155 52 56.5	1 28 50.6	16 8.9	59 10.53	0.383	19.5	6	U	15 33.9	2.19
7.0	162 56 34.7	0 52 17.7	16 9.9	59 14.28	0.244	20.0	7	L	4 0.1	2.18
7.5	170 0 24.7	−0 14 53.4	16 10.5	59 16.43	+0.115	20.5	7	U	16 26.1	2.16
8.0	177 4 13.0	+0 22 46.3	16 10.7	59 17.09	−0.004	21.0	8	L	4 51.9	2.15
8.5	184 7 49.2	+1 0 5.2	16 10.5	59 16.39	−0.111	21.5	8	U	17 17.7	2.15
9.0	191 11 5.0	1 36 27.9	16 10.0	59 14.47	0.208	22.0	9	L	5 43.6	2.16
9.5	198 13 54.0	2 11 20.0	16 9.2	59 11.42	0.299	22.5	9	U	18 9.5	2.17
10.0	205 16 10.5	2 44 9.4	16 8.0	59 7.32	0.383	23.0	10	L	6 35.6	2.19
10.5	212 17 48.5	3 14 25.8	16 6.7	59 2.24	0.461	23.5	10	U	19 2.0	2.21
11.0	219 18 40.8	+3 41 42.1	16 5.0	58 56.19	−0.515	24.0	11	L	7 28.6	2.23
11.5	226 18 39.1	4 5 34.2	16 3.1	58 49.17	0.625	24.5	11	U	19 55.5	2.26
12.0	233 17 32.0	4 25 41.8	16 0.9	58 41.19	0.706	25.0	12	L	8 22.7	2.28
12.5	240 15 5.9	4 41 48.5	15 58.5	58 32.21	0.790	25.5	12	U	20 50.1	2.29
13.0	247 11 4.8	4 53 41.9	15 55.7	58 22.21	0.877	26.0	13	L	9 17.7	2.31
13.5	254 5 10.1	+5 1 14.6	15 52.7	58 11.16	−0.964	26.5	13	U	21 45.4	2.31
14.0	260 57 1.3	5 4 23.4	15 49.4	57 59.07	1.050	27.0	14	L	10 13.0	2.30
14.5	267 46 17.2	5 3 9.9	15 45.9	57 45.97	1.133	27.5	14	U	22 40.5	2.29
15.0	274 32 35.9	4 57 40.2	15 42.0	57 31.90	1.210	28.0	15	L	11 7.8	2.26
15.5	281 15 36.6	4 48 4.7	15 38.0	57 16.96	1.278	28.5	15	U	23 34.6	2.22
16.0	287 55 0.2	+4 34 37.5	15 33.7	57 1.28	−1.333	29.0	16	L	12 1.0	2.18
16.5	294 30 30.1	4 17 35.9	15 29.3	56 45.02	1.374	29.5			. . . . .	. . .
17.0	301 1 53.9	3 57 20.1	15 24.7	56 28.38	1.395	0.4	17	U	0 26.8	2.13
17.5	307 29 2.8	3 34 11.9	15 20.2	56 11.61	1.397	0.9	17	L	12 52.0	2.08
18.0	313 51 53.1	3 8 34.8	15 15.6	55 54.94	1.378	1.4	18	U	1 16.6	2.02
18.5	320 10 26.2	+2 40 52.4	15 11.2	55 38.64	−1.335	1.9	18	L	13 40.6	1.97
19.0	326 24 48.5	2 11 29.2	15 6.9	55 23.00	1.268	2.4	19	U	2 4.0	1.93
19.5	332 35 11.6	1 40 48.3	15 2.9	55 8.29	1.180	2.9	19	L	14 26.9	1.88
20.0	338 41 51.8	1 9 13.1	14 59.2	54 54.78	1.069	3.4	20	U	2 49.2	1.84
20.5	344 45 10.3	0 37 5.3	14 55.9	54 42.73	0.936	3.9	20	L	15 11.2	1.82
21.0	350 45 32.0	+0 4 45.7	14 53.1	54 32.40	−0.784	4.4	21	U	3 32.8	1.79
21.5	356 43 26.1	−0 27 26.0	14 50.8	54 23.98	0.615	4.9	21	L	15 54.2	1.77
22.0	2 39 24.1	0 59 11.1	14 49.1	54 17.70	0.430	5.4	22	U	4 15.4	1.76
22.5	8 34 1.4	1 30 12.3	14 48.0	54 13.71	0.233	5.9	22	L	16 36.5	1.76
23.0	14 27 54.7	2 0 12.8	14 47.6	54 12.14	−0.026	6.4	23	U	4 57.7	1.77
23.5	20 21 42.6	−2 28 56.5	14 47.9	54 13.11	+0.189	6.9	23	L	17 19.0	1.78
24.0	26 16 5.1	−2 56 7.9	14 48.8	54 16.70	+0.409	7.4	24	U	5 40.5	1.80

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Jan. 24.0	26 16 5.1	−2 56 7.9	14 48.8	54 16.70	+0.409	7.4	Jan. 24	U	5 40.5	1.80
24.5	32 11 42.4	3 21 31.6	14 50.5	54 22.92	0.628	7.9	24	L	18 2.3	1.83
25.0	38 9 14.9	3 44 52.2	14 53.0	54 31.77	0.847	8.4	25	U	6 24.5	1.87
25.5	44 9 22.3	4 5 54.7	14 56.1	54 43.22	1.060	8.9	25	L	18 47.2	1.91
26.0	50 12 43.2	4 24 23.7	14 59.9	54 57.17	1.262	9.4	26	U	7 10.4	1.96
26.5	56 19 53.7	−4 40 3.5	15 4.3	55 13.46	+1.451	9.9	26	L	19 34.2	2.01
27.0	62 31 27.2	4 52 38.7	15 9.3	55 31.92	1.622	10.4	27	U	7 58.6	2.06
27.5	68 47 53.6	5 1 54.2	15 14.9	55 52.30	1.770	10.9	27	L	20 23.6	2.11
28.0	75 9 37.8	5 7 35.2	15 20.9	56 14.29	1.890	11.4	28	U	8 49.3	2.17
28.5	81 36 59.2	5 9 28.3	15 27.2	56 37.53	1.979	11.9	28	L	21 15.6	2.21
29.0	88 10 11.0	−5 7 21.4	15 33.8	57 1.63	+2.031	12.4	29	U	9 42.4	2.25
29.5	94 49 19.2	5 1 5.2	15 40.5	57 26.11	2.013	12.9	29	L	22 9.7	2.29
30.0	101 34 21.9	4 50 33.5	15 47.1	57 50.50	2.013	13.4	30	U	10 37.4	2.31
30.5	108 25 9.1	4 35 44.1	15 53.6	58 14.25	1.938	13.9	30	L	23 5.2	2.33
31.0	115 21 22.7	4 16 40.0	15 59.7	58 36.85	1.821	14.4	31	U	11 33.2	2.33
31.5	122 22 37.0	−3 53 29.6	16 5.4	58 57.79	+1.662	14.9			. . . . .	. . .
Feb. 1.0	129 28 19.1	3 26 27.4	16 10.6	59 16.58	1.464	15.4	Feb. 1	L	0 1.2	2.34
1.5	136 37 50.3	2 55 54.6	16 15.0	59 32.80	1.234	15.9	1	U	12 29.2	2.32
2.0	143 50 27.2	2 22 18.0	16 18.6	59 46.11	0.980	16.4	2	L	0 56.9	2.30
2.5	151 5 23.7	1 46 10.3	16 21.4	59 56.26	0.710	16.9	2	U	13 24.5	2.29
3.0	158 21 52.9	−1 8 8.7	16 23.2	60 3.13	+0.434	17.4	3	L	1 51.8	2.27
3.5	165 39 8.2	−0 28 53.7	16 24.2	60 6.68	+0.160	17.9	3	U	14 18.9	2.25
4.0	172 56 25.3	+0 10 52.2	16 24.3	60 7.01	−0.103	18.4	4	L	2 45.8	2.23
4.5	180 13 3.6	0 50 25.7	16 23.6	60 4.28	0.347	18.9	4	U	15 12.5	2.22
5.0	187 28 26.8	1 29 5.2	16 22.1	59 58.77	0.566	19.4	5	L	3 39.2	2.22
5.5	194 42 3.6	+2 6 10.3	16 19.9	59 50.80	−0.757	19.9	5	U	16 5.7	2.21
6.0	201 53 28.2	2 41 4.6	16 17.1	59 40.72	0.918	20.4	6	L	4 32.3	2.22
6.5	209 2 20.0	3 13 15.4	16 13.9	59 28.90	1.047	20.9	6	U	16 58.9	2.22
7.0	216 8 23.1	3 42 14.4	16 10.3	59 15.70	1.147	21.4	7	L	5 25.6	2.23
7.5	223 11 25.8	4 7 38.3	16 6.4	59 1.47	1.220	21.9	7	U	17 52.4	2.24
8.0	230 11 20.4	+4 29 8.2	16 2.4	58 46.50	−1.270	22.4	8	L	6 19.3	2.25
8.5	237 8 1.7	4 46 30.4	15 58.2	58 31.06	1.300	22.9	8	U	18 46.4	2.26
9.0	244 1 26.7	4 59 35.2	15 53.9	58 15.36	1.314	23.4	9	L	7 13.5	2.26
9.5	250 51 33.9	5 8 17.5	15 49.6	57 59.57	1.315	23.9	9	U	19 40.7	2.26
10.0	257 38 22.8	5 12 36.5	15 45.3	57 43.83	1.308	24.4	10	L	8 7.8	2.26
10.5	264 21 53.5	+5 12 34.5	15 41.0	57 28.20	−1.295	24.9	10	U	20 34.9	2.25
11.0	271 2 5.6	5 8 17.9	15 36.8	57 12.76	1.278	25.4	11	L	9 1.7	2.22
11.5	277 38 59.6	4 59 56.0	15 32.7	56 57.53	1.259	25.9	11	U	21 28.2	2.20
12.0	284 12 35.3	4 47 40.9	15 28.6	56 42.55	1.239	26.4	12	L	9 54.4	2.16
12.5	290 42 52.8	4 31 47.7	15 24.6	56 27.81	1.217	26.9	12	U	22 20.1	2.12
13.0	297 9 51.9	+4 12 33.6	15 20.6	56 13.36	−1.192	27.4	13	L	10 45.3	2.08
13.5	303 33 33.5	3 50 17.7	15 16.8	55 59.21	1.166	27.9	13	U	23 10.0	2.04
14.0	309 53 58.9	3 25 20.7	15 13.0	55 45.39	1.135	28.4	14	L	11 34.2	2.00
14.5	316 11 10.6	2 58 4.8	15 9.4	55 31.98	1.100	28.9	14	U	23 57.9	1.95
15.0	322 25 12.1	2 28 52.6	15 5.8	55 19.03	1.057	29.4	15	L	12 21.0	1.91
15.5	328 36 9.0	+1 58 7.3	15 2.5	55 6.66	−1.003	0.2			. . . . .	. .
16.0	334 44 8.8	+1 26 12.4	14 59.3	54 54.99	−0.940	0.7	16	U	0 43.7	1.87

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Feb. 16.0	334 44 8.8	+1 26 12.4	14 59.3	54 54.99	−0.940	0.7	Feb. 16	U	0 43.7	1.87
16.5	340 49 21.4	0 53 30.7	14 56.3	54 44.14	0.865	1.2	16	L	13 6.0	1.85
17.0	346 51 58.7	+0 20 24.8	14 53.6	54 34.28	0.777	1.7	17	U	1 28.0	1.82
17.5	352 52 15.5	−0 12 43.6	14 51.3	54 25.55	0.675	2.2	17	L	13 49.6	1.79
18.0	358 50 29.2	0 45 33.8	14 49.2	54 18.14	0.558	2.7	18	U	2 11.0	1.78
18.5	4 46 59.8	−1 17 46.1	14 47.6	54 12.22	−0.426	3.2	18	L	14 32.3	1.77
19.0	10 42 10.0	1 49 1.8	14 46.5	54 7.97	0.280	3.7	19	U	2 53.5	1.76
19.5	16 36 24.8	2 19 3.3	14 45.8	54 5.55	−0.120	4.2	19	L	15 14.7	1.77
20.0	22 30 12.0	2 47 34.1	14 45.7	54 5.14	+0.053	4.7	20	U	3 36.1	1.79
20.5	28 24 1.3	3 14 18.4	14 46.2	54 6.87	0.237	5.2	20	L	15 57.6	1.80
21.0	34 18 24.3	−3 39 1.3	14 47.3	54 10.88	+0.432	5.7	21	U	4 19.3	1.82
21.5	40 13 54.7	4 1 28.5	14 49.0	54 17.28	0.634	6.2	21	L	16 41.3	1.85
22.0	46 11 7.2	4 21 26.2	14 51.4	54 26.13	0.842	6.7	22	U	5 3.8	1.89
22.5	52 10 37.7	4 38 40.8	14 54.5	54 37.51	1.053	7.2	22	L	17 26.6	1.92
23.0	58 13 2.3	4 52 59.1	14 58.3	54 51.41	1.263	7.7	23	U	5 50.0	1.97
23.5	64 18 57.2	−5 4 8.3	15 2.8	55 7.80	+1.468	8.2	23	L	18 13.9	2.02
24.0	70 28 57.9	5 11 55.9	15 7.9	55 26.60	1.664	8.7	24	U	6 38.4	2.07
24.5	76 43 38.4	5 16 9.4	15 13.6	55 47.68	1.847	9.2	24	L	19 3.5	2.11
25.0	83 3 30.3	5 16 37.7	15 19.9	56 10.84	2.010	9.7	25	U	7 29.1	2.16
25.5	89 29 1.8	5 13 10.5	15 26.8	56 35.82	2.148	10.2	25	L	19 55.3	2.20
26.0	96 0 37.0	−5 5 39.3	15 34.0	57 2.26	+2.254	10.7	26	U	8 21.9	2.24
26.5	102 38 34.4	4 53 57.7	15 41.5	57 29.77	2.324	11.2	26	L	20 49.0	2.27
27.0	109 23 5.9	4 38 2.6	15 49.1	57 57.86	2.350	11.7	27	U	9 16.4	2.30
27.5	116 14 15.9	4 17 55.1	15 56.8	58 25.97	2.326	12.2	27	L	21 44.1	2.31
28.0	123 12 0.3	3 53 40.7	16 4.3	58 53.47	2.249	12.7	28	U	10 11.9	2.33
28.5	130 16 5.7	−3 25 31.1	16 11.4	59 19.73	+2.117	13.2	28	L	22 39.9	2.33
Mar. 1.0	137 26 9.3	2 53 44.3	16 18.0	59 44.06	1.929	13.7	Mar. 1	U	11 7.8	2.33
1.5	144 41 38.5	2 18 45.2	16 24.0	60 5.81	1.688	14.2	1	L	23 35.8	2.33
2.0	152 1 51.8	1 41 5.2	16 29.0	60 24.37	1.398	14.7	2	U	12 3.6	2.32
2.5	159 25 59.7	1 1 22.5	16 33.1	60 39.20	1.069	15.2			.....	...
3.0	166 53 6.0	−0 20 20.3	16 36.0	60 49.91	+0.711	15.7	3	L	0 31.4	2.32
3.5	174 22 10.0	+0 21 14.6	16 37.7	60 56.21	+0.337	16.2	3	U	12 59.2	2.31
4.0	181 52 8.3	1 2 32.7	16 38.2	60 58.00	−0.038	16.7	4	L	1 26.8	2.30
4.5	189 21 57.5	1 42 45.4	16 37.5	60 55.35	0.401	17.2	4	U	13 54.5	2.30
5.0	196 50 36.1	2 21 5.8	16 35.6	60 48.47	0.741	17.7	5	L	2 22.1	2.30
5.5	204 17 6.9	+2 56 51.0	16 32.7	60 37.71	−1.046	18.2	5	U	14 49.8	2.31
6.0	211 40 38.5	3 29 23.6	16 28.8	60 23.54	1.308	18.7	6	L	3 17.5	2.31
6.5	219 0 26.5	3 58 12.4	16 24.2	60 6.50	1.524	19.2	6	U	15 45.2	2.31
7.0	226 15 54.9	4 22 53.4	16 18.9	59 47.15	1.692	19.7	7	L	4 13.0	2.32
7.5	233 26 35.7	4 43 9.3	16 13.2	59 26.08	1.812	20.2	7	U	16 40.8	2.32
8.0	240 32 9.4	+4 58 49.6	16 7.1	59 3.85	−1.887	20.7	8	L	5 8.6	2.31
8.5	247 32 23.8	5 9 49.9	16 0.9	58 40.96	1.920	21.2	8	U	17 36.3	2.30
9.0	254 27 14.5	5 16 10.9	15 54.6	58 17.90	1.919	21.7	9	L	6 3.9	2.29
9.5	261 16 42.6	5 17 57.8	15 48.3	57 55.03	1.888	22.2	9	U	18 31.2	2.26
10.0	268 0 54.4	5 15 19.6	15 42.3	57 32.68	1.833	22.7	10	L	6 58.2	2.24
10.5	274 40 0.5	+5 8 28.4	15 36.4	57 11.11	−1.760	23.2	10	U	19 24.9	2.21
11.0	281 14 14.6	+4 57 38.7	15 30.8	56 50.49	−1.674	23.7	11	L	7 51.2	2.17

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Mar. 10.0	268 0 54.4	+5 15 19.6	15 42.3	57 32.68	−1.833	22.7	Mar. 10	L	6 58.2	2.24
10.5	274 40 0.5	5 8 28.4	15 36.4	57 11.11	1.760	23.2	10	U	19 24.9	2.21
11.0	281 14 14.6	4 57 38.7	15 30.8	56 50.49	1.674	23.7	11	L	7 51.2	2.17
11.5	287 43 52.4	4 43 6.6	15 25.4	56 30.96	1.580	24.2	11	U	20 16.9	2.12
12.0	294 9 11.3	4 25 9.9	15 20.4	56 12.60	1.480	24.7	12	L	8 42.2	2.08
12.5	300 30 29.3	+4 4 7.7	15 15.8	55 55.45	−1.378	25.2	12	U	21 6.9	2.04
13.0	306 48 4.6	3 40 19.7	15 11.4	55 39.53	1.276	25.7	13	L	9 31.1	2.00
13.5	313 2 15.3	3 14 6.5	15 7.4	55 24.82	1.176	26.2	13	U	21 54.8	1.95
14.0	319 13 19.0	2 45 49.2	15 3.7	55 11.30	1.078	26.7	14	L	10 18.0	1.91
14.5	325 21 32.8	2 15 49.1	15 0.4	54 58.93	0.982	27.2	14	U	22 40.7	1.88
15.0	331 27 13.1	+1 44 28.1	14 57.3	54 47.71	−0.889	27.7	15	L	11 3.1	1.85
15.5	337 30 35.5	1 12 7.9	14 54.5	54 37.59	0.797	28.2	15	U	23 25.1	1.82
16.0	343 31 55.3	0 39 10.1	14 52.1	54 28.57	0.706	28.7	16	L	11 46.8	1.80
16.5	349 31 27.3	+0 5 56.3	14 49.9	54 20.65	0.614	29.2			. . . . .	. . .
17.0	355 29 26.0	−0 27 12.5	14 48.1	54 13.85	0.520	0.0	17	U	0 8.3	1.78
17.5	1 26 6.3	−0 59 55.8	14 46.5	54 8.19	−0.422	0.5	17	L	12 29.6	1.77
18.0	7 21 43.1	1 31 53.7	14 45.3	54 3.75	0.317	1.0	18	U	0 50.8	1.77
18.5	13 16 31.9	2 2 47.2	14 44.5	54 0.60	0.207	1.5	18	L	13 12.0	1.77
19.0	19 10 49.2	2 32 18.2	14 44.0	53 58.81	−0.089	2.0	19	U	1 33.3	1.78
19.5	25 4 52.8	3 0 9.5	14 43.9	53 58.50	+0.039	2.5	19	L	13 54.7	1.79
20.0	30 59 1.2	−3 26 5.0	14 44.2	53 59.77	+0.175	3.0	20	U	2 16.2	1.80
20.5	36 53 34.8	3 49 49.4	14 45.0	54 2.73	0.321	3.5	20	L	14 38.0	1.83
21.0	42 48 55.4	4 11 8.7	14 46.3	54 7.51	0.477	4.0	21	U	3 0.1	1.85
21.5	48 45 26.4	4 29 49.6	14 48.2	54 14.22	0.642	4.5	21	L	15 22.5	1.88
22.0	54 43 33.0	4 45 39.8	14 50.6	54 22.96	0.816	5.0	22	U	3 45.3	1.92
22.5	60 43 41.8	−4 58 27.8	14 53.5	54 33.83	+0.996	5.5	22	L	16 8.6	1.96
23.0	66 46 21.0	5 8 2.9	14 57.1	54 46.88	1.181	6.0	23	U	4 32.3	1.99
23.5	72 51 59.9	5 14 15.3	15 1.2	55 2.18	1.369	6.5	23	L	16 56.4	2.03
24.0	79 1 8.9	5 16 55.8	15 6.0	55 19.74	1.556	7.0	24	U	5 21.0	2.07
24.5	85 14 18.7	5 15 56.4	15 11.4	55 39.50	1.738	7.5	24	L	17 46.0	2.10
25.0	91 31 59.8	−5 11 10.3	15 17.4	56 1.41	+1.911	8.0	25	U	6 11.5	2.14
25.5	97 54 42.1	5 2 31.8	15 23.9	56 25.31	2.070	8.5	25	L	18 37.4	2.17
26.0	104 22 54.0	4 49 57.3	15 30.9	56 51.00	2.207	9.0	26	U	7 3.6	2.20
26.5	110 57 0.9	4 33 25.2	15 38.3	57 18.19	2.319	9.5	26	L	19 30.1	2.22
27.0	117 37 24.8	4 12 57.0	15 46.0	57 46.53	2.397	10.0	27	U	7 56.9	2.24
27.5	124 24 22.7	−3 48 38.0	15 53.9	58 15.55	+2.433	10.5	27	L	20 23.9	2.26
28.0	131 18 5.4	3 20 37.7	16 1.9	58 44.73	2.421	11.0	28	U	8 51.1	2.27
28.5	138 18 36.0	2 49 10.8	16 9.7	59 13.45	2.356	11.5	28	L	21 18.4	2.28
29.0	145 25 49.1	2 14 37.8	16 17.2	59 41.04	2.231	12.0	29	U	9 45.8	2.29
29.5	152 39 29.1	1 37 25.5	16 24.2	60 6.76	2.046	12.5	29	L	22 13.3	2.30
30.0	159 59 10.0	−0 58 7.2	16 30.5	60 29.90	+1.800	13.0	30	U	10 40.9	2.31
30.5	167 24 14.6	−0 17 22.3	16 35.9	60 49.73	1.496	13.5	30	L	23 8.7	2.32
31.0	174 53 55.3	+0 24 4.4	16 40.3	61 5.61	1.143	14.0	31	U	11 36.6	2.33
31.5	182 27 13.8	1 5 24.4	16 43.4	61 17.01	0.750	14.5			. . . . .	. . .
Apr. 1.0	190 3 3.9	1 45 46.9	16 45.1	61 23.52	+0.332	15.0	Apr. 1	L	0 4.6	2.35
1.5	197 40 13.3	+2 24 21.5	16 45.5	61 24.95	−0.094	15.5	1	U	12 32.9	2.36
2.0	205 17 25.7	+3 0 20.0	16 44.5	61 21.28	−0.515	16.0	2	L	1 1.3	2.37

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Apr. 1.0	190 3 3.9	+1 45 46.9	16 45.1	61 23.52	+0.332	15.0	Apr. 1	L	0 4.6	2.35
1.5	197 40 13.3	2 24 21.5	16 45.5	61 24.95	−0.094	15.5	1	U	12 32.9	2.36
2.0	205 17 25.7	3 0 20.0	16 44.5	61 21.28	0.515	16.0	2	L	1 1.3	2.37
2.5	212 53 24.7	3 32 59.1	16 42.2	61 12.68	0.913	16.5	2	U	13 29.9	2.39
3.0	220 26 56.6	4 1 42.3	16 38.6	60 59.50	1.276	17.0	3	L	1 58.7	2.40
3.5	227 56 53.1	+4 26 0.4	16 33.9	60 42.25	−1.590	17.5	3	U	14 27.6	2.41
4.0	235 22 14.0	4 45 33.5	16 28.3	60 21.55	1.851	18.0	4	L	2 56.5	2.41
4.5	242 42 9.4	5 0 9.6	16 21.9	59 58.06	2.053	18.5	4	U	15 25.5	2.41
5.0	249 56 0.3	5 9 45.1	16 14.9	59 32.52	2.196	19.0	5	L	3 54.3	2.39
5.5	257 3 19.2	5 14 23.4	16 7.6	59 5.59	2.282	19.5	5	U	16 22.8	2.36
6.0	264 3 50.2	+5 14 13.8	16 0.0	58 37.96	−2.316	20.0	6	L	4 51.0	2.33
6.5	270 57 27.7	5 9 30.4	15 52.5	58 10.20	2.303	20.5	6	U	17 18.8	2.30
7.0	277 44 15.6	5 0 30.5	15 45.0	57 42.84	2.251	21.0	7	L	5 46.1	2.25
7.5	284 24 25.9	4 47 33.9	15 37.8	57 16.31	2.166	21.5	7	U	18 12.7	2.19
8.0	290 58 16.8	4 31 1.8	15 30.9	56 50.96	2.055	22.0	8	L	6 38.7	2.14
8.5	297 26 12.0	+4 11 16.2	15 24.4	56 27.06	−1.925	22.5	8	U	19 4.1	2.09
9.0	303 48 38.6	3 48 39.3	15 18.3	56 4.81	1.781	23.0	9	L	7 28.8	2.03
9.5	310 6 6.1	3 23 33.5	15 12.7	55 44.35	1.628	23.5	9	U	19 52.9	1.98
10.0	316 19 5.5	2 56 20.6	15 7.7	55 25.75	1.471	24.0	10	L	8 16.3	1.93
10.5	322 28 8.1	2 27 22.1	15 3.1	55 9.04	1.313	24.5	10	U	20 39.3	1.90
11.0	328 33 45.0	+1 56 59.3	14 59.1	54 54.22	−1.157	25.0	11	L	9 1.8	1.85
11.5	334 36 26.2	1 25 32.9	14 55.5	54 41.25	1.005	25.5	11	U	21 23.8	1.82
12.0	340 36 40.6	0 53 23.3	14 52.5	54 30.07	0.858	26.0	12	L	9 45.5	1.80
12.5	346 34 55.5	+0 20 50.5	14 49.9	54 20.63	0.717	26.5	12	U	22 7.0	1.78
13.0	352 31 36.0	−0 11 45.7	14 47.8	54 12.83	0.584	27.0	13	L	10 28.3	1.77
13.5	358 27 5.5	−0 44 5.8	14 46.1	54 6.60	−0.456	27.5	13	U	22 49.5	1.76
14.0	4 21 45.4	1 15 50.8	14 44.8	54 1.87	0.334	28.0	14	L	11 10.6	1.76
14.5	10 15 55.3	1 46 42.0	14 43.9	53 58.57	0.216	28.5	14	U	23 31.8	1.77
15.0	16 9 53.2	2 16 21.1	14 43.4	53 56.66	−0.103	29.0	15	L	11 53.1	1.78
15.5	22 3 55.6	2 44 30.5	14 43.2	53 56.08	+0.007	29.5			. . . . .	. . .
16.0	27 58 17.4	−3 10 53.2	14 43.4	53 56.83	+0.117	0.2	16	U	0 14.5	1.80
16.5	33 53 13.1	3 35 13.2	14 44.0	53 58.88	0.227	0.7	16	L	12 36.2	1.82
17.0	39 48 56.6	3 57 15.3	14 44.9	54 2.28	0.339	1.2	17	U	0 58.1	1.84
17.5	45 45 41.2	4 16 45.4	14 46.2	54 7.02	0.453	1.7	17	L	13 20.3	1.87
18.0	51 43 40.8	4 33 30.3	14 47.9	54 13.16	0.572	2.2	18	U	1 42.9	1.90
18.5	57 43 9.4	−4 47 18.3	14 50.0	54 20.76	+0.696	2.7	18	L	14 5.9	1.93
19.0	63 44 22.2	4 57 58.9	14 52.4	54 29.88	0.825	3.2	19	U	2 29.3	1.97
19.5	69 47 35.1	5 5 22.9	14 55.4	54 40.58	0.960	3.7	19	L	14 53.1	2.00
20.0	75 53 5.7	5 9 22.4	14 58.7	54 52.93	1.099	4.2	20	U	3 17.2	2.02
20.5	82 1 12.5	5 9 51.1	15 2.6	55 6.98	1.244	4.7	20	L	15 41.7	2.06
21.0	88 12 16.3	−5 6 44.0	15 6.9	55 22.79	+1.391	5.2	21	U	4 6.6	2.09
21.5	94 26 38.5	4 59 57.8	15 11.6	55 40.36	1.537	5.7	21	L	16 31.8	2.11
22.0	100 44 42.3	4 49 30.9	15 16.9	55 59.68	1.682	6.2	22	U	4 57.2	2.13
22.5	107 6 51.8	4 35 23.5	15 22.6	56 20.71	1.822	6.7	22	L	17 22.9	2.15
23.0	113 33 31.2	4 17 38.2	15 28.8	56 43.36	1.950	7.2	23	U	5 48.7	2.16
23.5	120 5 4.9	−3 56 19.6	15 35.4	57 7.45	+2.063	7.7	23	L	18 14.7	2.17
24.0	126 41 56.3	−3 31 35.5	15 42.3	57 32.79	+2.155	8.2	24	U	6 40.8	2.18

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Apr. 24.0	126 41 56.3	−3 31 35.5	15 42.3	57 32.79	+2.155	8.2	Apr. 24	U	6 40.8	2.18
24.5	133 24 26.5	3 3 36.9	15 49.4	57 59.06	2 219	8.7	24	L	19 7.0	2.19
25.0	140 12 53.8	2 32 38.5	15 56.8	58 25.90	2.218	9.2	25	U	7 33.3	2.20
25.5	147 7 31.8	1 58 59.5	16 4.1	58 52.85	2.236	9.7	25	L	19 59.7	2.21
26.0	154 8 28.1	1 23 3.4	16 11.3	59 19.38	2.177	10.2	26	U	8 26.3	2.22
26.5	161 15 42.8	−0 45 19.3	16 18.3	59 44.88	+2.065	10.7	26	L	20 53.0	2.23
27.0	168 29 7.1	−0 6 20.9	16 24.8	60 8.71	1.897	11.2	27	U	9 19.9	2.25
27.5	175 48 21.9	+0 33 13.3	16 30.6	60 30.18	1.672	11.7	27	L	21 47.1	2.28
28.0	183 12 56.8	1 12 40.2	16 35.6	60 48.61	1.392	12.2	28	U	10 14.6	2.31
28.5	190 42 10.0	1 51 14.1	16 39.7	61 3.38	1.062	12.7	28	L	22 42.5	2.34
29.0	198 15 7.9	+2 28 7.9	16 42.5	61 13.93	+0.691	13.2	29	U	11 10.8	2.37
29.5	205 50 47.0	3 2 34.6	16 44.2	61 19.84	+0.290	13.7	29	L	23 39.4	2.40
30.0	213 27 55.0	3 33 50.4	16 44.4	61 20.83	−0.126	14.2	30	U	12 8.5	2.43
30.5	221 5 13.9	4 1 16.0	16 43.3	61 16.82	0.511	14.7			. . . . .	. . .
May 1.0	228 41 23.2	4 24 18.7	16 40.9	61 7.91	0.910	15.2	May 1	L	0 37.8	2.45
1.5	236 15 3.7	+4 42 34.5	16 37.2	60 54.37	−1.309	15.7	1	U	13 7.4	2.47
2.0	243 45 0.6	4 55 47.7	16 32.4	60 36.66	1.635	16.2	2	L	1 37.2	2.48
2.5	251 10 7.0	5 3 51.9	16 26.6	60 15.34	1.909	16.7	2	U	14 6.9	2.47
3.0	258 29 26.3	5 6 49.5	16 20.0	59 51.07	2.125	17.2	3	L	2 36.5	2.45
3.5	265 42 14.4	5 4 49.7	16 12.7	59 24.57	2.282	17.7	3	U	15 5.8	2.42
4.0	272 47 59.6	+4 58 8.6	16 5.1	58 56.53	−2.380	18.2	4	L	3 34.6	2.38
4.5	279 46 23.5	4 47 6.3	15 57.2	58 27.67	2.421	18.7	4	U	16 2.8	2.32
5.0	286 37 19.7	4 32 6.6	15 49.3	57 58.63	2.411	19.2	5	L	4 30.3	2.26
5.5	293 20 53.2	4 13 34.9	15 41.5	57 29.98	2.357	19.7	5	U	16 57.0	2.20
6.0	299 57 18.3	3 51 57.3	15 34.0	57 2.22	2.264	20.2	6	L	5 23.0	2.13
6.5	306 26 57.1	+3 27 40.2	15 26.7	56 35.77	−2.140	20.7	6	U	17 48.2	2.07
7.0	312 50 18.0	3 1 9.0	15 20.0	56 10.96	1.991	21.2	7	L	6 12.6	2.00
7.5	319 7 53.9	2 32 48.3	15 13.7	55 48.05	1.825	21.7	7	U	18 36.3	1.95
8.0	325 20 20.9	2 3 1.4	15 8.1	55 27.22	1.645	22.2	8	L	6 59.4	1.90
8.5	331 28 16.7	1 32 10.5	15 3.0	55 8.60	1.457	22.7	8	U	19 22.0	1.86
9.0	337 32 20.4	+1 0 36.7	14 58.5	54 52.26	−1.267	23.2	9	L	7 44.1	1.82
9.5	343 33 10.2	+0 28 40.1	14 54.7	54 38.20	1.076	23.7	9	U	20 5.7	1.79
10.0	349 31 23.9	−0 3 20.5	14 51.5	54 26.43	0.887	24.2	10	L	8 27.1	1.78
10.5	355 27 37.6	0 35 6.3	14 48.9	54 16.89	0.705	24.7	10	U	20 48.4	1.77
11.0	1 22 25.6	1 6 19.8	14 46.9	54 9.49	0.529	25.2	11	L	9 9.5	1.75
11.5	7 16 19.8	−1 36 43.4	14 45.4	54 4.16	−0.362	25.7	11	U	21 30.5	1.76
12.0	13 9 49.6	2 6 0.2	14 44.5	54 0.77	0.205	26.2	12	L	9 51.7	1.77
12.5	19 3 21.6	2 33 53.6	14 44.1	53 59.21	−0.056	26.7	12	U	22 12.9	1.78
13.0	24 57 19.6	3 0 7.3	14 44.1	53 59.38	+0.083	27.2	13	L	10 34.4	1.80
13.5	30 52 4.6	3 24 25.5	14 44.6	54 1.15	0.210	27.7	13	U	22 56.2	1.83
14.0	36 47 54.8	−3 46 33.0	14 45.5	54 4.39	+0.329	28.2	14	L	11 18.3	1.85
14.5	42 45 5.9	4 6 15.1	14 46.8	54 9.01	0.441	28.7	14	U	23 40.7	1.88
15.0	48 43 51.2	4 23 18.3	14 48.4	54 14.94	0.545	29.2	15	L	12 3.5	1.92
15.5	54 44 22.0	4 37 29.7	14 50.3	54 22.07	0.642	0.1			. . . . .	. . .
16.0	60 46 47.5	4 48 38.1	14 52.6	54 30.34	0.735	0.6	16	U	0 26.8	1.96
16.5	66 51 16.2	−4 56 33.4	14 55.1	54 39.71	+0.825	1.1	16	L	12 50.5	1.99
17.0	72 57 55.3	−5 1 7.2	14 58.0	54 50.14	+0.914	1.6	17	U	1 14.6	2.02

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
May 17.0	72 57 55.3	−5 1 7.2	14 58.0	54 50.14	+0.914	1.6	May 17	U	1 14.6	2.02
17.5	79 6 52.0	5 2 13.1	15 1.1	55 1.63	1.001	2.1	17	L	13 39.0	2.05
18.0	85 18 13.4	4 59 46.5	15 4.5	55 14.15	1.086	2.6	18	U	2 3.8	2.08
18.5	91 32 7.2	4 53 44.9	15 8.2	55 27.71	1.174	3.1	18	L	14 28.9	2.11
19.0	97 48 42.2	4 44 8.0	15 12.2	55 42.33	1.262	3.6	19	U	2 54.3	2.12
19.5	104 8 8.6	−4 30 57.9	15 16.4	55 58.00	+1.350	4.1	19	L	15 19.7	2.13
20.0	110 30 37.9	4 14 18.8	15 21.0	56 14.74	1.438	4.6	20	U	3 45.3	2.14
20.5	116 56 23.3	3 54 17.6	15 25.9	56 32.51	1.523	5.1	20	L	16 11.0	2.14
21.0	123 25 39.5	3 31 3.8	15 31.0	56 51.28	1.604	5.6	21	U	4 36.6	2.14
21.5	129 58 42.4	3 4 49.4	15 36.3	57 10.98	1.678	6.1	21	L	17 2.3	2.14
22.0	136 35 48.8	−2 35 49.4	15 41.9	57 31.50	+1.740	6.6	22	U	5 27.9	2.13
22.5	143 17 15.7	2 4 21.7	15 47.7	57 52.67	1.786	7.1	22	L	17 53.5	2.13
23.0	150 3 19.0	1 30 47.3	15 53.6	58 14.28	1.812	7.6	23	U	6 19.1	2.14
23.5	156 54 13.2	0 55 30.5	15 59.5	58 36.06	1.813	8.1	23	L	18 44.8	2.15
24.0	163 50 9.4	−0 18 59.2	16 5.4	58 57.67	1.783	8.6	24	U	7 10.6	2.16
24.5	170 51 14.5	+0 18 15.6	16 11.1	59 18.71	+1.717	9.1	24	L	19 36.6	2.17
25.0	177 57 29.2	0 55 39.5	16 16.6	59 38.72	1.611	9.6	25	U	8 2.8	2.19
25.5	185 8 46.9	1 32 35.3	16 21.6	59 57.21	1.462	10.1	25	L	20 29.3	2.23
26.0	192 24 52.2	2 8 23.6	16 26.1	60 13.64	1.270	10.6	26	U	8 56.3	2.27
26.5	199 45 19.8	2 42 23.9	16 29.9	60 27.51	1.034	11.1	26	L	21 23.7	2.30
27.0	207 9 34.0	+3 13 55.6	16 32.8	60 38.29	+0.758	11.6	27	U	9 51.5	2.34
27.5	214 36 48.8	3 42 19.8	16 34.8	60 45.56	0.448	12.1	27	L	22 19.9	2.39
28.0	222 6 8.6	4 7 0.6	16 35.7	60 48.94	+0.112	12.6	28	U	10 48.8	2.43
28.5	229 36 29.8	4 27 27.2	16 35.5	60 48.20	−0.238	13.1	28	L	23 18.2	2.46
29.0	237 6 43.1	4 43 15.2	16 34.2	60 43.23	0.590	13.6	29	U	11 47.8	2.48
29.5	244 35 36.2	+4 54 7.8	16 31.7	60 34.08	−0.933	14.1			. . . . .	. . .
30.0	252 1 57.6	4 59 56.2	16 28.1	60 20.92	1.254	14.6	30	L	0 17.7	2.49
30.5	259 24 39.1	5 0 40.2	16 23.5	60 4.11	1.542	15.1	30	U	12 47.6	2.49
31.0	266 42 39.5	4 56 27.7	16 18.0	59 44.07	1.789	15.6	31	L	1 17.4	2.47
31.5	273 55 6.4	4 47 33.0	16 11.9	59 21.36	1.988	16.1	31	U	13 46.8	2.44
June 1.0	281 1 18.7	+4 34 16.7	16 5.1	58 56.56	−2.135	16.6	June 1	L	2 15.8	2.39
1.5	288 0 46.9	4 17 3.4	15 58.0	58 30.32	2.230	17.1	1	U	14 44.1	2.33
2.0	294 53 13.7	3 56 20.6	15 50.6	58 3.24	2.274	17.6	2	L	3 11.6	2.26
2.5	301 38 33.2	3 32 37.3	15 43.1	57 35.94	2.269	18.1	2	U	15 38.3	2.19
3.0	308 16 50.4	3 6 22.7	15 35.8	57 8.96	2.221	18.6	3	L	4 4.2	2.12
3.5	314 48 19.5	+2 38 5.5	15 28.7	56 42.80	−2.133	19.1	3	U	16 29.2	2.05
4.0	321 13 22.6	2 8 13.3	15 21.9	56 17.90	2.013	19.6	4	L	4 53.5	2.00
4.5	327 32 28.2	1 37 12.0	15 15.5	55 54.60	1.865	20.1	4	U	17 17.1	1.94
5.0	333 46 9.7	1 5 25.8	15 9.7	55 33.23	1.695	20.6	5	L	5 40.0	1.88
5.5	339 55 4.1	0 33 17.2	15 4.5	55 13.98	1.510	21.1	5	U	18 2.3	1.84
6.0	345 59 50.7	+0 1 6.8	14 59.8	54 57.04	−1.312	21.6	6	L	6 24.2	1.81
6.5	352 1 10.1	−0 30 46.1	14 55.9	54 42.52	1.107	22.1	6	U	18 45.8	1.79
7.0	357 59 43.2	1 2 3.4	14 52.6	54 30.48	0.900	22.6	7	L	7 7.1	1.77
7.5	3 56 10.9	1 32 28.3	14 50.0	54 20.93	0.692	23.1	7	U	19 28.3	1.76
8.0	9 51 12.3	2 1 44.7	14 48.1	54 13.86	0.487	23.6	8	L	7 49.4	1.76
8.5	15 45 25.5	−2 29 37.0	14 46.8	54 9.21	−0.289	24.1	8	U	20 10.6	1.77
9.0	21 39 26.1	−2 55 50.4	14 46.2	54 6.90	−0.098	24.6	9	L	8 31.9	1.78

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
June 9.0	21 39 26.1	−2 55 50.4	14 46.2	54 6.90	−0.098	24.6	June 9	L	8 31.9	1.78
9.5	27 33 47.5	3 20 10.3	14 46.2	54 6.81	+0.082	25.1	9	U	20 53.4	1.80
10.0	33 28 59.9	3 42 22.5	14 46.7	54 8.82	0.251	25.6	10	L	9 15.2	1.83
10.5	39 25 30.6	4 2 13.2	14 47.8	54 12.79	0.408	26.1	10	U	21 37.4	1.86
11.0	45 23 43.4	4 19 29.0	14 49.4	54 18.56	0.551	26.6	11	L	9 59.9	1.89
11.5	51 23 58.8	−4 33 57.1	14 51.4	54 25.95	+0.679	27.1	11	U	22 22.9	1.94
12.0	57 26 33.7	4 45 25.6	14 53.8	54 34.79	0.793	27.6	12	L	10 46.4	1.98
12.5	63 31 41.3	4 53 43.7	14 56.5	54 44.92	0.892	28.1	12	U	23 10.4	2.02
13.0	69 39 31.9	4 58 41.9	14 59.6	54 56.14	0.977	28.6	13	L	11 34.8	2.05
13.5	75 50 12.2	5 0 12.2	15 2.9	55 8.31	1.049	29.1	13	U	23 59.6	2.09
14.0	82 3 46.5	−4 58 9.0	15 6.4	55 21.26	+1.108	0.0	14	L	12 24.9	2.12
14.5	88 20 16.7	4 52 28.4	15 10.1	55 34.85	1.155	0.5			. . . . .	. . .
15.0	94 39 42.8	4 43 9.5	15 14.0	55 48.95	1.193	1.0	15	U	0 50.4	2.13
15.5	101 2 3.6	4 30 14.2	15 17.9	56 3.46	1.224	1.5	15	L	13 16.1	2.15
16.0	107 27 17.4	4 13 47.0	15 22.0	56 18.29	1.246	2.0	16	U	1 42.0	2.16
16.5	113 55 22.8	−3 53 55.7	15 26.1	56 33.35	+1.263	2.5	16	L	14 8.0	2.16
17.0	120 26 18.3	3 30 51.3	15 30.2	56 48.59	1.276	3.0	17	U	2 33.9	2.16
17.5	127 0 4.2	3 4 47.6	15 34.4	57 3.96	1.284	3.5	17	L	14 59.8	2.15
18.0	133 36 41.5	2 36 1.8	15 38.6	57 19.40	1.289	4.0	18	U	3 25.5	2.14
18.5	140 16 13.0	2 4 53.9	15 42.9	57 34.88	1.290	4.5	18	L	15 51.2	2.13
19.0	146 58 43.0	−1 31 46.3	15 47.1	57 50.35	+1.287	5.0	19	U	4 16.7	2.12
19.5	153 44 17.0	0 57 4.6	15 51.2	58 5.73	1.275	5.5	19	L	16 42.1	2.12
20.0	160 33 1.0	−0 21 16.2	15 55.4	58 20.93	1.257	6.0	20	U	5 7.4	2.11
20.5	167 25 1.4	+0 15 9.0	15 59.5	58 35.86	1.228	6.5	20	L	17 32.8	2.12
21.0	174 20 23.5	0 51 39.1	16 3.4	58 50.33	1.182	7.0	21	U	5 58.2	2.12
21.5	181 19 11.0	+1 27 41.2	16 7.2	59 4.16	+1.121	7.5	21	L	18 23.7	2.14
22.0	188 21 24.3	2 2 40.7	16 10.7	59 17.15	1.039	8.0	22	U	6 49.6	2.17
22.5	195 26 59.9	2 36 2.7	16 13.9	59 29.01	0.934	8.5	22	L	19 15.7	2.19
23.0	202 35 48.8	3 7 12.5	16 16.8	59 39.47	0.804	9.0	23	U	7 42.2	2.23
23.5	209 47 35.7	3 35 36.1	16 19.2	59 48.20	0.648	9.5	23	L	20 9.2	2.27
24.0	217 1 58.3	+4 0 41.5	16 21.0	59 54.91	+0.466	10.0	24	U	8 36.7	2.31
24.5	224 18 26.8	4 21 59.6	16 22.2	59 59.28	0.259	10.5	24	L	21 4.7	2.35
25.0	231 36 24.0	4 39 5.1	16 22.7	60 1.05	+0.032	11.0	25	U	9 33.2	2.39
25.5	238 55 6.5	4 51 38.3	16 22.4	59 59.98	−0.212	11.5	25	L	22 2.1	2.42
26.0	246 13 45.1	4 59 24.8	16 21.3	59 55.94	0.464	12.0	26	U	10 31.3	2.44
26.5	253 31 26.9	+5 2 17.4	16 19.4	59 48.84	−0.719	12.5	26	L	23 0.7	2.46
27.0	260 47 17.9	5 0 15.7	16 16.6	59 38.70	0.968	13.0	27	U	11 30.2	2.45
27.5	268 0 24.1	4 53 26.2	16 13.0	59 25.67	1.202	13.5	27	L	23 59.5	2.43
28.0	275 9 55.0	4 42 2.1	16 8.8	59 9.94	1.415	14.0	28	U	12 28.4	2.39
28.5	282 15 4.8	4 26 22.2	16 3.8	58 51.83	1.599	14.5			. . . . .	. . .
29.0	289 15 15.0	+4 6 50.0	15 58.3	58 31.70	−1.749	15.0	29	L	0 56.9	2.35
29.5	296 9 55.0	3 43 52.7	15 52.4	58 10.00	1.862	15.5	29	U	13 24.7	2.29
30.0	302 58 43.2	3 17 59.6	15 46.2	57 47.18	1.934	16.0	30	L	1 51.8	2.23
30.5	309 41 27.3	2 49 41.1	15 39.8	57 23.75	1.965	16.5	30	U	14 18.1	2.16
July 1.0	316 18 4.1	2 19 27.8	15 33.4	57 0.17	1.958	17.0	July 1	L	2 43.7	2.10
1.5	322 48 38.8	+1 47 49.2	15 27.1	56 36.91	−1.912	17.5	1	U	15 8.4	2.03
2.0	329 13 24.6	+1 15 13.8	15 20.9	56 14.41	−1.833	18.0	2	L	3 32.4	1.97

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
July 1.0	316 18 4.1	+2 19 27.8	15 33.4	57 0.17	−1.958	17.0	July 1	L	2 43.7	2.10
1.5	322 48 38.8	1 47 49.2	15 27.1	56 36.91	1.912	17.5	1	U	15 8.4	2.03
2.0	329 13 24.6	1 15 13.8	15 20.9	56 14.41	1.833	18.0	2	L	3 32.4	1.97
2.5	335 32 41.0	0 42 7.7	15 15.1	55 53.05	1.722	18.5	2	U	15 55.7	1.92
3.0	341 46 53.6	+0 8 55.5	15 9.7	55 33.18	1.585	19.0	3	L	4 18.5	1.87
3.5	347 56 32.5	−0 24 0.5	15 4.8	55 15.11	−1.424	19.5	3	U	16 40.7	1.84
4.0	354 2 11.4	0 56 19.9	15 0.4	54 59.08	1.245	20.0	4	L	5 2.6	1.81
4.5	0 4 27.0	1 27 44.1	14 56.6	54 45.28	1.051	20.5	4	U	17 24.1	1.79
5.0	6 3 57.4	1 57 56.3	14 53.5	54 33.87	0.848	21.0	5	L	5 45.5	1.78
5.5	12 1 22.1	2 26 40.7	14 51.1	54 24.96	0.637	21.5	5	U	18 6.8	1.77
6.0	17 57 20.6	−2 53 42.7	14 49.4	54 18.60	−0.422	22.0	6	L	6 28.0	1.77
6.5	23 52 32.5	3 18 48.6	14 48.3	54 14.82	−0.208	22.5	6	U	18 49.4	1.79
7.0	29 47 36.4	3 41 45.4	14 48.0	54 13.60	+0.004	23.0	7	L	7 10.9	1.81
7.5	35 43 9.4	4 2 20.3	14 48.4	54 14.89	0.210	23.5	7	U	19 32.8	1.83
8.0	41 39 46.7	4 20 21.3	14 49.4	54 18.60	0.407	24.0	8	L	7 54.9	1.86
8.5	47 38 1.2	−4 35 36.6	14 51.0	54 24.62	+0.594	24.5	8	U	20 17.5	1.90
9.0	53 38 23.0	4 47 54.8	14 53.2	54 32.80	0.767	25.0	9	L	8 40.5	1.94
9.5	59 41 18.9	4 57 5.1	14 56.0	54 42.96	0.923	25.5	9	U	21 4.0	1.98
10.0	65 47 12.3	5 2 57.6	14 59.3	54 54.89	1.062	26.0	10	L	9 28.1	2.02
10.5	71 56 22.2	5 5 23.4	15 2.9	55 8.37	1.181	26.5	10	U	21 52.6	2.07
11.0	78 9 4.0	−5 4 14.9	15 7.0	55 23.15	+1.279	27.0	11	L	10 17.7	2.11
11.5	84 25 28.5	4 59 26.6	15 11.3	55 38.98	1.355	27.5	11	U	22 43.1	2.14
12.0	90 45 42.3	4 50 54.9	15 15.8	55 55.58	1.407	28.0	12	L	11 9.0	2.17
12.5	97 9 47.8	4 38 39.3	15 20.5	56 12.66	1.436	28.5	12	U	23 35.1	2.18
13.0	103 37 43.4	4 22 42.0	15 25.2	56 29.96	1.443	29.0	13	L	12 1.4	2.20
13.5	110 9 24.1	−4 3 9.1	15 29.9	56 47.21	+1.429	0.0			. . . . .	. . .
14.0	116 44 41.9	3 40 9.9	15 34.5	57 4.17	1.395	0.5	14	U	0 27.9	2.21
14.5	123 23 26.1	3 13 58.0	15 39.0	57 20.62	1.343	1.0	14	L	12 54.3	2.20
15.0	130 5 24.5	2 44 51.2	15 43.2	57 36.35	1.277	1.5	15	U	1 20.7	2.20
15.5	136 50 24.0	2 13 10.4	15 47.3	57 51.22	1.199	2.0	15	L	13 47.0	2.18
16.0	143 38 10.9	−1 39 20.5	15 51.1	58 5.08	+1.110	2.5	16	U	2 13.1	2.17
16.5	150 28 32.2	1 3 49.6	15 54.6	58 17.85	1.017	3.0	16	L	14 39.0	2.15
17.0	157 21 15.2	−0 27 8.5	15 57.7	58 29.48	0.921	3.5	17	U	3 4.8	2.14
17.5	164 16 8.5	+0 10 10.4	16 0.6	58 39.94	0.822	4.0	17	L	15 30.4	2.13
18.0	171 13 1.8	0 47 32.9	16 3.1	58 49.20	0.723	4.5	18	U	3 56.0	2.13
18.5	178 11 45.7	+1 24 24.0	16 5.3	58 57.29	+0.625	5.0	18	L	16 21.5	2.13
19.0	185 12 11.7	2 0 8.8	16 7.2	59 4.20	0.527	5.5	19	U	4 47.1	2.14
19.5	192 14 11.7	2 34 12.8	16 8.8	59 9.94	0.430	6.0	19	L	17 12.8	2.15
20.0	199 17 37.0	3 6 2.9	16 10.0	59 14.52	0.333	6.5	20	U	5 38.8	2.17
20.5	206 22 18.2	3 35 7.7	16 10.9	59 17.91	0.233	7.0	20	L	18 5.0	2.19
21.0	213 28 4.2	+4 0 58.3	16 11.5	59 20.08	+0.128	7.5	21	U	6 31.5	2.23
21.5	220 34 41.7	4 23 9.0	16 11.8	59 20.96	+0.018	8.0	21	L	18 58.5	2.26
22.0	227 41 54.4	4 41 17.3	16 11.6	59 20.50	−0.097	8.5	22	U	7 25.8	2.30
22.5	234 49 23.2	4 55 5.4	16 11.1	59 18.61	0.220	9.0	22	L	19 53.6	2.33
23.0	241 56 45.4	5 4 19.8	16 10.2	59 15.18	0.351	9.5	23	U	8 21.7	2.35
23.5	249 3 35.5	+5 8 52.0	16 8.8	59 10.15	−0.489	10.0	23	L	20 50.1	2.38
24.0	256 9 25.1	+5 8 39.0	16 7.0	59 3.43	−0.632	10.5	24	U	9 18.7	2.39

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
July 24.0	256 9 25.1	+5 8 39.0	16 7.0	59 3.43	−0.632	10.5	July 24	U	9 18.7	2.39
24.5	263 13 43.8	5 3 43.6	16 4.7	58 54.98	0.777	11.0	24	L	21 47.4	2.38
25.0	270 16 0.1	4 54 13.5	16 1.9	58 44.79	0.921	11.5	25	U	10 15.9	2.37
25.5	277 15 42.4	4 40 21.9	15 58.6	58 32.88	1.063	12.0	25	L	22 44.3	2.35
26.0	284 12 20.2	4 22 26.9	15 55.0	58 19.32	1.195	12.5	26	U	11 12.2	2.31
26.5	291 5 25.3	+4 0 50.4	15 50.8	58 4.25	−1.314	13.0	26	L	23 39.7	2.27
27.0	297 54 32.7	3 35 57.8	15 46.4	57 47.84	1.417	13.5	27	U	12 6.6	2.21
27.5	304 39 21.6	3 8 16.9	15 41.6	57 30.33	1.499	14.0			. . . . .	. . .
28.0	311 19 36.2	2 38 17.2	15 36.6	57 11.96	1.558	14.5	28	L	0 32.8	2.15
28.5	317 55 6.2	2 6 28.7	15 31.5	56 53.04	1.591	15.0	28	U	12 58.3	2.10
29.0	324 25 46.8	+1 33 21.4	15 26.2	56 33.88	−1.597	15.5	29	L	1 23.1	2.04
29.5	330 51 39.0	0 59 24.3	15 21.0	56 14.83	1.575	16.0	29	U	13 47.2	1.99
30.0	337 12 49.3	+0 25 4.9	15 16.0	55 56.20	1.525	16.5	30	L	2 10.8	1.94
30.5	343 29 29.8	−0 9 10.5	15 11.1	55 38.35	1.447	17.0	30	U	14 33.7	1.89
31.0	349 41 57.1	0 42 58.3	15 6.5	55 21.57	1.315	17.5	31	L	2 56.2	1.86
31.5	355 50 32.5	−1 15 56.5	15 2.3	55 6.16	−1.219	18.0	31	U	15 18.3	1.83
Aug. 1.0	1 55 40.9	1 47 45.4	14 58.6	54 52.39	1.072	18.5	Aug. 1	L	3 40.1	1.80
1.5	7 57 50.7	2 18 7.0	14 55.3	54 40.51	0.906	19.0	1	U	16 1.6	1.79
2.0	13 57 32.8	2 46 45.4	14 52.7	54 30.71	0.725	19.5	2	L	4 23.1	1.79
2.5	19 55 20.7	3 13 26.0	14 50.6	54 23.17	0.530	20.0	2	U	16 44.5	1.78
3.0	25 51 49.2	−3 37 55.4	14 49.2	54 18.02	−0.326	20.5	3	L	5 5.9	1.79
3.5	31 47 34.5	4 0 1.5	14 48.5	54 15.38	−0.114	21.0	3	U	17 27.5	1.81
4.0	37 43 13.1	4 19 33.0	14 48.5	54 15.30	+0.102	21.5	4	L	5 49.3	1.83
4.5	43 39 22.2	4 36 19.1	14 49.2	54 17.82	0.318	22.0	4	U	18 11.4	1.86
5.0	49 36 38.3	4 50 9.8	14 50.5	54 22.92	0.532	22.5	5	L	6 33.9	1.89
5.5	55 35 37.1	−5 0 55.4	14 52.6	54 30.57	+0.741	23.0	5	U	18 56.8	1.93
6.0	61 36 52.8	5 8 26.9	14 55.4	54 40.66	0.940	23.5	6	L	7 20.2	1.97
6.5	67 40 57.9	5 12 35.7	14 58.8	54 53.09	1.128	24.0	6	U	19 44.1	2.01
7.0	73 48 22.4	5 13 14.1	15 2.7	55 7.67	1.299	24.5	7	L	8 8.5	2.05
7.5	79 59 33.0	5 10 15.3	15 7.2	55 24.19	1.451	25.0	7	U	20 33.4	2.10
8.0	86 14 53.0	−5 3 34.2	15 12.2	55 42.41	+1.581	25.5	8	L	8 58.8	2.13
8.5	92 34 41.6	4 53 7.2	15 17.5	56 2.03	1.684	26.0	8	U	21 24.6	2.16
9.0	98 59 13.3	4 38 53.3	15 23.2	56 22.70	1.757	26.5	9	L	9 50.7	2.19
9.5	105 28 37.1	4 20 54.2	15 29.0	56 44.06	1.797	27.0	9	U	22 17.2	2.21
10.0	112 2 57.2	3 59 15.4	15 34.9	57 5.71	1.804	27.5	10	L	10 43.8	2.23
10.5	118 42 12.2	−3 34 5.9	15 40.8	57 27.22	+1.776	28.0	10	U	23 10.6	2.23
11.0	125 26 14.3	3 5 39.6	15 46.5	57 48.20	1.714	28.5	11	L	11 37.4	2.23
11.5	132 14 51.6	2 34 14.7	15 51.9	58 8.22	1.618	29.0			. . . . .	. . .
12.0	139 7 46.2	2 0 14.4	15 57.0	58 26.90	1.490	0.0	12	U	0 4.2	2.22
12.5	146 4 36.2	1 24 6.3	16 1.6	58 43.87	1.335	0.5	12	L	12 30.8	2.22
13.0	153 4 55.8	−0 46 22.5	16 5.7	58 58.85	+1.158	1.0	13	U	0 57.4	2.21
13.5	160 8 16.5	−0 7 38.4	16 9.2	59 11.60	0.965	1.5	13	L	13 23.9	2.20
14.0	167 14 7.6	+0 31 28.0	16 12.0	59 21.96	0.761	2.0	14	U	1 50.2	2.19
14.5	174 21 57.8	1 10 16.9	16 14.2	59 29.85	0.554	2.5	14	L	14 16.5	2.19
15.0	181 31 15.3	1 48 8.2	16 15.6	59 35.27	0.350	3.0	15	U	2 42.7	2.18
15.5	188 41 29.3	+2 24 22.8	16 16.5	59 38.27	+0.153	3.5	15	L	15 8.9	2.19
16.0	195 52 9.8	+2 58 23.3	16 16.7	59 38.98	−0.032	4.0	16	U	3 35.2	2.20

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Aug. 16.0	195 52 9.8	+2 58 23.3	16 16.7	59 38.98	−0.032	4.0	Aug. 16	U	3 35.2	2.20
16.5	203 2 49.3	3 29 35.0	16 16.3	59 37.56	0.202	4.5	16	L	16 1.7	2.21
17.0	210 13 2.2	3 57 27.3	16 15.4	59 34.21	0.354	5.0	17	U	4 28.3	2.23
17.5	217 22 25.1	4 21 33.8	16 14.0	59 29.14	0.487	5.5	17	L	16 55.2	2.25
18.0	224 30 36.9	4 41 32.8	16 12.2	59 22.58	0.604	6.0	18	U	5 22.3	2.27
18.5	231 37 18.9	+4 57 7.7	16 10.1	59 14.71	−0.705	6.5	18	L	17 49.6	2.29
19.0	238 42 14.2	5 8 7.0	16 7.6	59 5.73	0.790	7.0	19	U	6 17.3	2.31
19.5	245 45 7.7	5 14 24.2	16 4.9	58 55.80	0.863	7.5	19	L	18 45.1	2.33
20.0	252 45 45.7	5 15 58.0	16 2.0	58 45.06	0.927	8.0	20	U	7 13.1	2.33
20.5	259 43 55.9	5 12 51.5	15 58.8	58 33.58	0.984	8.5	20	L	19 41.1	2.33
21.0	266 39 26.8	+5 5 12.4	15 55.5	58 21.47	−1.034	9.0	21	U	8 9.1	2.33
21.5	273 32 7.8	4 53 12.5	15 52.1	58 8.77	1.081	9.5	21	L	20 37.0	2.31
22.0	280 21 49.0	4 37 7.5	15 48.5	57 55.54	1.124	10.0	22	U	9 4.6	2.28
22.5	287 8 21.4	4 17 16.2	15 44.7	57 41.81	1.164	10.5	22	L	21 31.8	2.25
23.0	293 51 36.9	3 54 0.4	15 40.9	57 27.62	1.201	11.0	23	U	9 58.5	2.20
23.5	300 31 28.2	+3 27 44.1	15 36.9	57 13.01	−1.233	11.5	23	L	22 24.7	2.16
24.0	307 7 49.4	2 58 53.4	15 32.8	56 58.06	1.259	12.0	24	U	10 50.4	2.11
24.5	313 40 35.8	2 27 55.7	15 28.7	56 42.83	1.278	12.5	24	L	23 15.4	2.06
25.0	320 9 44.7	1 55 18.8	15 24.5	56 27.43	1.287	13.0	25	U	11 39.9	2.01
25.5	326 35 15.1	1 21 30.9	15 20.3	56 11.99	1.285	13.5			. . . . .	. . .
26.0	332 57 8.0	+0 46 59.9	15 16.1	55 56.63	−1.271	14.0	26	L	0 3.7	1.97
26.5	339 15 27.3	+0 12 12.5	15 12.0	55 41.55	1.241	14.5	26	U	12 27.1	1.93
27.0	345 30 18.7	−0 22 25.3	15 8.0	55 26.92	1.194	15.0	27	L	0 50.0	1.89
27.5	351 41 51.3	0 56 29.4	15 4.2	55 12.95	1.131	15.5	27	U	13 12.4	1.85
28.0	357 50 16.2	1 29 37.2	15 0.6	54 59.84	1.050	16.0	28	L	1 34.5	1.83
28.5	3 55 47.7	−2 1 28.0	14 57.3	54 47.81	−0.952	16.5	28	U	13 56.4	1.81
29.0	9 58 42.8	2 31 43.0	14 54.4	54 37.07	0.835	17.0	29	L	2 18.0	1.79
29.5	15 59 21.0	3 0 5.6	14 51.9	54 27.84	0.701	17.5	29	U	14 39.5	1.79
30.0	21 58 4.6	3 26 20.4	14 49.8	54 20.31	0.551	18.0	30	L	3 1.0	1.80
30.5	27 55 18.1	3 50 14.1	14 48.3	54 14.68	0.385	18.5	30	U	15 22.6	1.80
31.0	33 51 28.3	−4 11 34.7	14 47.3	54 11.13	−0.206	19.0	31	L	3 44.2	1.81
31.5	39 47 3.9	4 30 11.4	14 47.0	54 9.78	−0.016	19.5	31	U	16 6.0	1.83
Sept. 1.0	45 42 35.6	4 45 54.8	14 47.2	54 10.78	+0.184	20.0	Sept. 1	L	4 28.1	1.85
1.5	51 38 35.5	4 58 36.0	14 48.2	54 14.23	0.392	20.5	1	U	16 50.5	1.88
2.0	57 35 36.9	5 8 7.3	14 49.8	54 20.20	0.604	21.0	2	L	5 13.3	1.92
2.5	63 34 13.8	−5 14 21.5	14 52.1	54 28.72	+0.816	21.5	2	U	17 36.5	1.95
3.0	69 35 0.7	5 17 12.1	14 55.1	54 39.79	1.029	22.0	3	L	6 0.1	1.98
3.5	75 38 32.1	5 16 33.3	14 58.8	54 53.39	1.236	22.5	3	U	18 24.1	2.02
4.0	81 45 21.7	5 12 20.3	15 3.2	55 9.41	1.433	23.0	4	L	6 48.6	2.06
4.5	87 56 2.2	5 4 29.3	15 8.2	55 27.73	1.618	23.5	4	U	19 13.6	2.10
5.0	94 11 4.4	−4 52 57.6	15 13.8	55 48.16	+1.784	24.0	5	L	7 39.0	2.13
5.5	100 30 56.3	4 37 44.5	15 19.8	56 10.44	1.926	24.5	5	U	20 4.8	2.16
6.0	106 56 2.4	4 18 51.5	15 26.3	56 34.26	2.039	25.0	6	L	8 30.8	2.18
6.5	113 26 43.5	3 56 22.8	15 33.1	56 59.25	2.120	25.5	6	U	20 57.2	2.21
7.0	120 3 14.5	3 30 26.3	15 40.2	57 24.99	2.162	26.0	7	L	9 23.8	2.22
7.5	126 45 44.7	−3 1 13.6	15 47.2	57 50.97	+2.160	26.5	7	U	21 50.5	2.23
8.0	133 34 16.5	−2 29 1.4	15 54.2	58 16.66	+2.113	27.0	8	L	10 17.3	2.23

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Sept. 8.0	133 34 16.5	−2 29 1.4	15 54.2	58 16.66	+2.113	27.0	Sept. 8	L	10 17.3	2.23
8.5	140 28 44.9	1 54 10.9	16 1.0	58 41.50	2.018	27.5	8	U	22 44.1	2.24
9.0	147 28 56.7	1 17 9.0	16 7.4	59 4.91	1.875	28.0	9	L	11 11.0	2.24
9.5	154 34 30.8	−0 38 27.7	16 13.2	59 26.32	1.686	28.5	9	U	23 37.9	2.24
10.0	161 44 58.0	+0 1 16.3	16 18.4	59 45.20	1.455	29.0	10	L	12 4.8	2.25
10.5	168 59 41.5	+0 41 22.3	16 22.7	60 1.09	+1.188	0.1			. . . . .	. . .
11.0	176 17 57.8	1 21 6.5	16 26.1	60 13.60	0.894	0.6	11	U	0 31.8	2.25
11.5	183 38 58.0	1 59 44.2	16 28.5	60 22.48	0.584	1.1	11	L	12 58.8	2.25
12.0	191 1 49.5	2 36 30.6	16 29.9	60 27.59	+0.268	1.6	12	U	1 25.9	2.26
12.5	198 25 37.2	3 10 43.3	16 30.3	60 28.93	−0.043	2.1	12	L	13 53.1	2.27
13.0	205 49 26.6	+3 41 42.6	16 29.6	60 26.62	−0.339	2.6	13	U	2 20.5	2.29
13.5	213 12 24.1	4 8 57.7	16 28.1	60 20.89	0.611	3.1	13	L	14 48.1	2.31
14.0	220 33 40.2	4 31 58.1	16 25.7	60 12.07	0.853	3.6	14	U	3 15.9	2.32
14.5	227 52 30.3	4 50 24.2	16 22.5	60 0.55	1.060	4.1	14	L	15 43.8	2.34
15.0	235 8 15.6	5 4 2.2	16 18.8	59 46.77	1.230	4.6	15	U	4 12.0	2.35
15.5	242 20 24.2	+5 12 45.1	16 14.5	59 31.18	−1.363	5.1	15	L	16 40.2	2.35
16.0	249 28 31.3	5 16 32.4	16 9.9	59 14.21	1.460	5.6	16	U	5 8.5	2.36
16.5	256 32 19.0	5 15 29.2	16 5.0	58 56.28	1.524	6.1	16	L	17 36.8	2.36
17.0	263 31 36.0	5 9 45.3	16 0.0	58 37.75	1.559	6.6	17	U	6 5.0	2.34
17.5	270 26 16.6	4 59 34.7	15 54.9	58 18.95	1.570	7.1	17	L	18 32.9	2.31
18.0	277 16 20.8	+4 45 15.1	15 49.7	58 0.14	−1.561	7.6	18	U	7 0.5	2.28
18.5	284 1 52.3	4 27 6.1	15 44.7	57 41.54	1.537	8.1	18	L	19 27.7	2.25
19.0	290 42 58.3	4 5 30.1	15 39.7	57 23.31	1.500	8.6	19	U	7 54.5	2.20
19.5	297 19 48.4	3 40 50.4	15 34.9	57 5.57	1.455	9.1	19	L	20 20.6	2.15
20.0	303 52 34.0	3 13 31.6	15 30.2	56 48.40	1.406	9.6	20	U	8 46.2	2.11
20.5	310 21 27.5	+2 43 59.2	15 25.7	56 31.85	−1.352	10.1	20	L	21 11.2	2.06
21.0	316 46 41.7	2 12 38.7	15 21.4	56 15.96	1.297	10.6	21	U	9 35.7	2.02
21.5	323 8 29.5	1 39 56.0	15 17.2	56 0.73	1.240	11.1	21	L	21 59.6	1.97
22.0	329 27 3.6	1 6 16.8	15 13.2	55 46.20	1.182	11.6	22	U	10 23.0	1.93
22.5	335 42 36.4	+0 32 6.4	15 9.5	55 32.36	1.124	12.1	22	L	22 45.9	1.89
23.0	341 55 19.7	−0 2 10.6	15 5.9	55 19.24	−1.062	12.6	23	U	11 8.4	1.86
23.5	348 5 25.1	0 36 10.4	15 2.5	55 6.88	0.998	13.1	23	L	23 30.6	1.84
24.0	354 13 3.8	1 9 30.1	14 59.4	54 55.31	0.929	13.6	24	U	11 52.5	1.82
24.5	0 18 27.1	1 41 48.4	14 56.5	54 44.60	0.855	14.1			. . . . .	. . .
25.0	6 21 46.4	2 12 45.1	14 53.8	54 34.82	0.773	14.6	25	L	0 14.2	1.80
25.5	12 23 13.3	−2 42 1.4	14 51.4	54 26.08	−0.683	15.1	25	U	12 35.7	1.79
26.0	18 23 0.4	3 9 20.5	14 49.3	54 18.47	0.584	15.6	26	L	0 57.2	1.79
26.5	24 21 21.3	3 34 27.1	14 47.6	54 12.12	0.472	16.1	26	U	13 18.7	1.79
27.0	30 18 30.9	3 57 7.4	14 46.3	54 7.18	0.350	16.6	27	L	1 40.3	1.80
27.5	36 14 45.2	4 17 9.5	14 45.3	54 3.77	0.216	17.1	27	U	14 2.0	1.82
28.0	42 10 22.4	−4 34 22.6	14 44.9	54 2.04	−0.071	17.6	28	L	2 23.9	1.84
28.5	48 5 42.5	4 48 37.9	14 44.9	54 2.13	+0.088	18.1	28	U	14 46.1	1.86
29.0	54 1 7.1	4 59 47.7	14 45.4	54 4.19	0.257	18.6	29	L	3 8.5	1.88
29.5	59 57 0.2	5 7 45.5	14 46.6	54 8.33	0.435	19.1	29	U	15 31.2	1.91
30.0	65 53 47.7	5 12 25.9	14 48.3	54 14.68	0.624	19.6	30	L	3 54.3	1.94
30.5	71 51 57.6	−5 13 44.7	14 50.7	54 23.33	+0.819	20.1	30	U	16 17.7	1.97
Oct. 1.0	77 51 59.5	−5 11 38.6	14 53.7	54 34.36	+1.019	20.6	Oct. 1	L	4 41.5	2.00

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Oct. 1.0	77 51 59.5	−5 11 38.6	14 53.7	54 34.36	+1.019	20.6	Oct. 1	L	4 41.5	2.00
1.5	83 54 24.5	5 6 5.2	14 57.3	54 47.79	1.220	21.1	1	U	17 5.7	2.03
2.0	89 59 45.3	4 57 3.1	15 1.7	55 3.65	1.422	21.6	2	L	5 30.2	2.05
2.5	96 8 35.0	4 44 32.3	15 6.6	55 21.90	1.618	22.1	2	U	17 55.0	2.08
3.0	102 21 27.3	4 28 34.0	15 12.2	55 42.45	1.805	22.6	3	L	6 20.2	2.11
3.5	108 38 55.3	−4 9 11.1	15 18.4	56 5.15	+1.976	23.1	3	U	18 45.6	2.13
4.0	115 1 31.0	3 46 28.5	15 25.1	56 29.79	2.128	23.6	4	L	7 11.3	2.15
4.5	121 29 44.3	3 20 33.6	15 32.3	56 56.11	2.253	24.1	4	U	19 37.2	2.16
5.0	128 4 2.0	2 51 37.3	15 39.8	57 23.73	2.341	24.6	5	L	8 3.2	2.17
5.5	134 44 46.0	2 19 53.6	15 47.6	57 52.21	2.396	25.1	5	U	20 29.4	2.19
6.0	141 32 13.1	−1 45 41.2	15 55.4	58 21.05	+2.402	25.6	6	L	8 55.8	2.20
6.5	148 26 32.2	1 9 23.1	16 3.2	58 49.65	2.356	26.1	6	U	21 22.3	2.21
7.0	155 27 43.9	−0 31 27.8	16 10.8	59 17.36	2.253	26.6	7	L	9 48.9	2.22
7.5	162 35 39.0	+0 7 31.2	16 17.9	59 43.49	2.092	27.1	7	U	22 15.7	2.24
8.0	169 49 57.2	0 46 55.8	16 24.4	60 7.33	1.872	27.6	8	L	10 42.7	2.26
8.5	177 10 6.9	+1 26 3.5	16 30.1	60 28.20	+1.597	28.1	8	U	23 10.0	2.28
9.0	184 35 24.6	2 4 8.9	16 34.8	60 45.47	1.274	28.6	9	L	11 37.5	2.30
9.5	192 4 56.2	2 40 25.4	16 38.4	60 58.62	0.912	29.1			. . . . .	. . .
10.0	199 37 37.8	3 14 6.9	16 40.7	61 7.26	0.521	0.2	10	U	0 5.3	2.33
10.5	207 12 18.6	3 44 30.3	16 41.8	61 11.15	+0.124	0.7	10	L	12 33.5	2.36
11.0	214 47 42.5	+4 10 57.2	16 41.5	61 10.24	−0.273	1.2	11	U	1 1.9	2.38
11.5	222 22 32.4	4 32 55.9	16 40.0	61 4.66	0.653	1.7	11	L	13 30.7	2.41
12.0	229 55 33.3	4 50 2.6	16 37.3	60 54.68	1.003	2.2	12	U	1 59.8	2.43
12.5	237 25 35.0	5 2 2.6	16 33.5	60 40.74	1.312	2.7	12	L	14 29.0	2.44
13.0	244 51 35.3	5 8 49.4	16 28.8	60 23.38	1.572	3.2	13	U	2 58.4	2.45
13.5	252 12 42.2	+5 10 25.2	16 23.3	60 3.22	−1.779	3.7	13	L	15 27.8	2.45
14.0	259 28 14.7	5 6 59.5	16 17.2	59 40.89	1.933	4.2	14	U	3 57.1	2.43
14.5	266 37 43.8	4 58 47.5	16 10.7	59 17.03	2.035	4.7	14	L	16 26.1	2.40
15.0	273 40 51.7	4 46 9.4	16 3.9	58 52.23	2.090	5.2	15	U	4 54.7	2.36
15.5	280 37 31.6	4 29 28.7	15 57.1	58 27.05	2.101	5.7	15	L	17 22.8	2.32
16.0	287 27 46.0	+4 9 11.0	15 50.2	58 1.96	−2.075	6.2	16	U	5 50.4	2.27
16.5	294 11 45.4	3 45 43.4	15 43.5	57 37.38	2.018	6.7	16	L	18 17.2	2.21
17.0	300 49 46.5	3 19 33.0	15 37.1	57 13.62	1.938	7.2	17	U	6 43.4	2.15
17.5	307 22 11.0	2 51 6.9	15 30.9	56 50.94	1.839	7.7	17	L	19 8.8	2.09
18.0	313 49 24.0	2 20 51.6	15 25.0	56 29.53	1.728	8.2	18	U	7 33.6	2.04
18.5	320 11 52.3	+1 49 13.2	15 19.6	56 9.51	−1.608	8.7	18	L	19 57.7	1.98
19.0	326 30 3.8	1 16 36.3	15 14.5	55 50.96	1.483	9.2	19	U	8 21.2	1.94
19.5	332 44 26.4	0 43 25.0	15 9.9	55 33.92	1.357	9.7	19	L	20 44.2	1.89
20.0	338 55 27.2	+0 10 2.5	15 5.7	55 18.38	1.233	10.2	20	U	9 6.7	1.86
20.5	345 3 32.0	−0 23 9.4	15 1.8	55 4.32	1.111	10.7	20	L	21 28.9	1.83
21.0	351 9 5.0	−0 55 49.4	14 58.4	54 51.71	−0.992	11.2	21	U	9 50.7	1.81
21.5	357 12 28.4	1 27 37.3	14 55.3	54 40.49	0.878	11.7	21	L	22 12.3	1.80
22.0	3 14 2.2	1 58 14.0	14 52.6	54 30.62	0.767	12.2	22	U	10 33.8	1.79
22.5	9 14 4.7	2 27 21.3	14 50.3	54 22.07	0.660	12.7	22	L	22 55.2	1.78
23.0	15 12 52.0	2 54 42.1	14 48.3	54 14.78	0.555	13.2	23	U	11 16.5	1.78
23.5	21 10 38.9	−3 20 0.8	14 46.7	54 8.74	−0.452	13.7	23	L	23 38.0	1.80
24.0	27 7 38.3	−3 43 2.8	14 45.4	54 3.93	−0.349	14.2	24	U	11 59.6	1.80

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Oct. 24.0	27 7 38.3	−3 43 2.8	14 45.4	54 3.93	−0.349	14.2	Oct. 24	U	11 59.6	1.80
24.5	33 4 2.5	4 3 34.8	14 44.4	54 0.37	0.214	14.7			. . . . .	. . .
25.0	39 0 2.9	4 21 25.2	14 43.8	53 58.08	0.136	15.2	25	L	0 21.3	1.82
25.5	44 55 51.0	4 36 24.0	14 43.5	53 57.11	−0.025	15.7	25	U	12 43.3	1.84
26.0	50 51 38.1	4 48 22.3	14 43.6	53 57.50	+0.092	16.2	26	L	1 5.5	1.87
26.5	56 47 36.7	−4 57 13.1	14 44.1	53 59.35	+0.216	16.7	26	U	13 28.1	1.89
27.0	62 44 0.2	5 2 51.2	14 45.0	54 2.72	0.347	17.2	27	L	1 50.9	1.92
27.5	68 41 3.2	5 5 12.2	14 46.4	54 7.72	0.487	17.7	27	U	14 14.1	1.95
28.0	74 39 2.5	5 4 13.7	14 48.2	54 14.45	0.635	18.2	28	L	2 37.6	1.97
28.5	80 38 16.9	4 59 54.8	14 50.6	54 23.00	0.791	18.7	28	U	15 1.4	1.99
29.0	86 39 7.3	−4 52 15.6	14 53.4	54 33.47	+0.954	19.2	29	L	3 25.4	2.02
29.5	92 41 56.8	4 41 17.8	14 56.8	54 45.93	1.123	19.7	29	U	15 49.8	2.04
30.0	98 47 11.5	4 27 4.6	15 0.8	55 0.45	1.297	20.2	30	L	4 14.3	2.05
30.5	104 55 18.8	4 9 40.3	15 5.3	55 17.06	1.472	20.7	30	U	16 39.1	2.07
31.0	111 6 48.6	3 49 10.9	15 10.4	55 35.77	1.645	21.2	31	L	5 4.0	2.08
31.5	117 22 12.2	−3 25 44.0	15 16.1	55 56.53	+1.814	21.7	31	U	17 29.0	2.09
Nov. 1.0	123 42 1.7	2 59 29.4	15 22.2	56 19.27	1.973	22.2	Nov. 1	L	5 54.1	2.10
1.5	130 6 49.6	2 30 38.9	15 28.9	56 43.82	2.115	22.7	1	U	18 19.3	2.11
2.0	136 37 7.5	1 59 27.1	15 36.1	57 9.96	2.238	23.2	2	L	6 44.7	2.12
2.5	143 13 25.1	1 26 11.5	15 43.5	57 37.41	2.332	23.7	2	U	19 10.1	2.13
3.0	149 56 9.1	−0 51 13.1	15 51.3	58 5.78	+2.390	24.2	3	L	7 35.7	2.14
3.5	156 45 40.8	−0 14 57.0	15 59.1	58 34.60	2.406	24.7	3	U	20 1.4	2.15
4.0	163 42 15.0	+0 22 8.1	16 6.9	59 3.32	2.371	25.2	4	L	8 27.4	2.18
4.5	170 45 58.2	0 59 28.8	16 14.6	59 31.29	2.282	25.7	4	U	20 53.7	2.20
5.0	177 56 46.2	1 36 28.0	16 21.8	59 57.85	2.133	26.2	5	L	9 20.3	2.23
5.5	185 14 23.0	+2 12 25.3	16 28.4	60 22.24	+1.922	26.7	5	U	21 47.3	2.27
6.0	192 38 19.1	2 46 37.7	16 34.3	60 43.74	1.651	27.2	6	L	10 14.8	2.31
6.5	200 7 51.3	3 18 21.5	16 39.2	61 1.64	1.324	27.7	6	U	22 42.8	2.35
7.0	207 42 2.5	3 46 53.6	16 42.9	61 15.32	0.949	28.2	7	L	11 11.3	2.40
7.5	215 19 43.3	4 11 34.2	16 45.3	61 24.28	0.539	28.7	7	U	23 40.4	2.45
8.0	222 59 34.1	+4 31 48.7	16 46.4	61 28.17	+0.108	29.2	8	L	12 10.0	2.48
8.5	230 40 8.5	4 47 9.6	16 46.1	61 26.85	−0.327	0.4			. . . . .	. . .
9.0	238 19 57.2	4 57 18.1	16 44.3	61 20.36	0.751	0.9	9	U	0 40.0	2.51
9.5	245 57 32.0	5 2 5.0	16 41.2	61 8.95	1.145	1.4	9	L	13 10.3	2.53
10.0	253 31 31.0	5 1 30.8	16 36.8	60 53.05	1.497	1.9	10	U	1 40.7	2.54
10.5	261 0 41.0	+4 55 45.1	16 31.4	60 33.23	−1.797	2.4	10	L	14 11.1	2.53
11.0	268 24 1.3	4 45 5.2	16 25.2	60 10.15	2.039	2.9	11	U	2 41.3	2.50
11.5	275 40 45.0	4 29 54.9	16 18.2	59 44.53	2.219	3.4	11	L	15 11.1	2.46
12.0	282 50 19.4	4 10 42.3	16 10.7	59 17.13	2.337	3.9	12	U	3 40.3	2.40
12.5	289 52 26.6	3 47 58.5	16 2.9	58 48.66	2.398	4.4	12	L	16 8.7	2.34
13.0	296 47 1.3	+3 22 15.8	15 55.1	58 19.78	−2.407	4.9	13	U	4 36.4	2.27
13.5	303 34 10.3	2 54 6.4	15 47.3	57 51.09	2.368	5.4	13	L	17 3.2	2.20
14.0	310 14 9.6	2 24 1.7	15 39.6	57 23.11	2.290	5.9	14	U	5 29.2	2.13
14.5	316 47 23.0	1 52 31.4	15 32.3	56 56.26	2.180	6.4	14	L	17 54.3	2.06
15.0	323 14 20.1	1 20 3.6	15 25.4	56 30.88	2.047	6.9	15	U	6 18.6	1.99
15.5	329 35 34.6	+0 47 4.3	15 19.0	56 7.22	−1.893	7.4	15	L	18 42.2	1.94
16.0	335 51 42.5	+0 13 57.3	15 13.0	55 45.49	−1.728	7.9	16	U	7 5.2	1.89

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Nov. 16.0	335 51 42.5	+0 13 57.3	15 13.0	55 45.49	−1.728	7.9	Nov. 16	U	7 5.2	1.89
16.5	342 3 20.8	−0 18 55.1	15 7.7	55 25.78	1.556	8.4	16	L	19 27.7	1.85
17.0	348 11 6.6	0 51 12.5	15 2.9	55 8.16	1.379	8.9	17	U	7 49.7	1.82
17.5	354 15 36.3	1 22 35.9	14 58.7	54 52.67	1.204	9.4	17	L	20 11.4	1.80
18.0	0 17 24.3	1 52 47.7	14 55.0	54 39.25	1.032	9.9	18	U	8 32.9	1.78
18.5	6 17 3.2	−2 21 31.2	14 51.9	54 27.88	−0.865	10.4	18	L	20 54.2	1.77
19.0	12 15 2.9	2 48 31.0	14 49.3	54 18.46	0.705	10.9	19	U	9 15.4	1.77
19.5	18 11 50.5	3 13 32.5	14 47.3	54 10.92	0.553	11.4	19	L	21 36.7	1.78
20.0	24 7 50.5	3 36 22.0	14 45.7	54 5.16	0.409	11.9	20	U	9 58.0	1.79
20.5	30 3 24.2	3 56 47.1	14 44.6	54 1.06	0.274	12.4	20	L	22 19.6	1.80
21.0	35 58 50.2	−4 14 35.8	14 43.9	53 58.55	−0.147	12.9	21	U	10 41.3	1.82
21.5	41 54 24.5	4 29 37.9	14 43.6	53 57.51	−0.027	13.4	21	L	23 3.4	1.85
22.0	47 50 20.7	4 41 44.1	14 43.7	53 57.87	+0.086	13.9	22	U	11 25.7	1.88
22.5	53 46 50.2	4 50 46.5	14 44.2	53 59.55	0.193	14.4	22	L	23 48.5	1.91
23.0	59 44 3.1	4 56 38.5	14 45.0	54 2.50	0.298	14.9	23	U	12 11.5	1.93
23.5	65 42 8.2	−4 59 15.6	14 46.1	54 6.69	+0.400	15.4			.....	...
24.0	71 41 13.8	4 58 34.5	14 47.6	54 12.09	0.501	15.9	24	L	0 34.9	1.96
24.5	77 41 28.2	4 54 34.1	14 49.4	54 18.71	0.603	16.4	24	U	12 58.6	1.99
25.0	83 43 0.0	4 47 14.8	14 51.5	54 26.56	0.706	16.9	25	L	1 22.6	2.01
25.5	89 45 59.0	4 36 39.0	14 54.0	54 35.66	0.812	17.4	25	U	13 46.9	2.03
26.0	95 50 36.3	−4 22 50.9	14 56.8	54 46.07	+0.924	17.9	26	L	2 11.4	2.05
26.5	101 57 5.2	4 5 56.6	15 0.1	54 57.84	1.038	18.4	26	U	14 36.1	2.06
27.0	108 5 40.7	3 46 4.0	15 3.7	55 11.00	1.157	18.9	27	L	3 0.8	2.06
27.5	114 16 40.6	3 23 22.7	15 7.6	55 25.62	1.280	19.4	27	U	15 25.6	2.07
28.0	120 30 25.0	2 58 4.3	15 12.0	55 41.72	1.404	19.9	28	L	3 50.4	2.07
28.5	126 47 16.2	−2 30 22.1	15 16.8	55 59.32	+1.530	20.4	28	U	16 15.2	2.06
29.0	133 7 38.9	2 0 31.5	15 22.0	56 18.42	1.653	20.9	29	L	4 39.9	2.06
29.5	139 31 59.2	1 28 49.7	15 27.6	56 38.96	1.770	21.4	29	U	17 4.7	2.06
30.0	146 0 44.4	0 55 36.3	15 33.6	57 0.86	1.877	21.9	30	L	5 29.4	2.06
30.5	152 34 21.8	−0 21 13.1	15 39.9	57 23.96	1.970	22.4	30	U	17 54.1	2.07
Dec. 1.0	159 13 18.1	+0 13 55.4	15 46.4	57 48.06	+2.042	22.9	Dec. 1	L	6 19.0	2.08
1.5	165 57 57.4	0 49 22.3	15 53.2	58 12.86	2.087	23.4	1	U	18 44.0	2.09
2.0	172 48 40.1	1 24 37.8	16 0.1	58 38.02	2.100	23.9	2	L	7 9.2	2.11
2.5	179 45 41.0	1 59 9.6	16 6.9	59 3.10	2.073	24.4	2	U	19 34.7	2.14
3.0	186 49 7.7	2 32 22.9	16 13.6	59 27.58	2.000	24.9	3	L	8 0.7	2.18
3.5	193 58 58.2	+3 3 41.1	16 19.9	59 50.89	+1.877	25.4	3	U	20 27.1	2.23
4.0	201 14 59.9	3 32 26.8	16 25.8	60 12.41	1.700	25.9	4	L	8 54.2	2.28
4.5	208 36 47.4	3 58 2.5	16 31.0	60 31.48	1.469	26.4	4	U	21 21.8	2.33
5.0	216 3 42.6	4 19 52.6	16 35.3	60 47.47	1.188	26.9	5	L	9 50.1	2.39
5.5	223 34 53.7	4 37 24.9	16 38.7	60 59.81	0.860	27.4	5	U	22 19.2	2.45
6.0	231 9 17.2	+4 50 12.3	16 40.9	61 7.96	+0.494	27.9	6	L	10 48.8	2.49
6.5	238 45 38.9	4 57 54.4	16 41.9	61 11.56	+0.102	28.4	6	U	23 19.0	2.54
7.0	246 22 37.8	5 0 19.5	16 41.6	61 10.37	−0.301	28.9	7	L	11 49.6	2.57
7.5	253 58 49.1	4 57 24.8	16 39.9	61 4.34	0.701	29.4			.....	...
8.0	261 32 48.3	4 49 16.8	16 37.0	60 53.61	1.083	0.4	8	U	0 20.5	2.57
8.5	269 3 15.7	+4 36 10.7	16 32.9	60 38.47	−1.433	0.9	8	L	12 51.3	2.56
9.0	276 28 59.7	+4 18 29.7	16 27.7	60 19.40	−1.738	1.4	9	U	1 21.9	2.53

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Dec. 9.0	276 28 59.7	+4 18 29.7	16 27.7	60 19.40	−1.738	1.4	Dec. 9	U	1 21.9	2.53
9.5	283 48 59.8	3 56 43.0	16 21.6	59 56.96	1.992	1.9	9	L	13 52.0	2.49
10.0	291 2 28.4	3 31 24.0	16 14.7	59 31.82	2.197	2.4	10	U	2 21.5	2.43
10.5	298 8 52.0	3 3 8.9	16 7.3	59 4.70	2.322	2.9	10	L	14 50.2	2.35
11.0	305 7 51.0	2 32 34.2	15 59.6	58 36.31	2.400	3.4	11	U	3 17.9	2.27
11.5	311 59 18.5	+2 0 16.0	15 51.7	58 7.32	−2.422	3.9	11	L	15 44.8	2.20
12.0	318 43 19.7	1 26 48.5	15 43.8	57 38.39	2.393	4.4	12	U	4 10.7	2.12
12.5	325 20 9.6	0 52 43.6	15 36.1	57 10.07	2.320	4.9	12	L	16 35.8	2.05
13.0	331 50 11.7	+0 18 30.2	15 28.7	56 42.85	2.210	5.4	13	U	5 0.0	1.99
13.5	338 13 55.4	−0 15 25.6	15 21.7	56 17.14	2.070	5.9	13	L	17 23.5	1.93
14.0	344 31 55.2	−0 48 40.4	15 15.2	55 53.27	−1.905	6.4	14	U	5 46.3	1.88
14.5	350 44 48.7	1 20 53.9	15 9.2	55 31.50	1.721	6.9	14	L	18 8.7	1.85
15.0	356 53 15.2	1 51 47.7	15 3.9	55 12.01	1.526	7.4	15	U	6 30.6	1.81
15.5	2 57 54.7	2 21 5.4	14 59.3	54 54.90	1.324	7.9	15	L	18 52.1	1.79
16.0	8 59 27.2	2 48 32.5	14 55.3	54 40.25	1.117	8.4	16	U	7 13.5	1.78
16.5	14 58 31.5	−3 13 55.7	14 52.0	54 28.08	−0.912	8.9	16	L	19 34.8	1.77
17.0	20 55 44.9	3 37 2.9	14 49.3	54 18.34	0.712	9.4	17	U	7 56.1	1.78
17.5	26 51 42.4	3 57 43.0	14 47.3	54 10.98	0.516	9.9	17	L	20 17.5	1.79
18.0	32 46 56.6	4 15 45.8	14 45.9	54 5.92	0.329	10.4	18	U	8 39.0	1.80
18.5	38 41 57.1	4 31 1.8	14 45.1	54 3.04	−0.153	10.9	18	L	21 0.8	1.82
19.0	44 37 10.8	−4 43 22.6	14 44.9	54 2.21	+0.012	11.4	19	U	9 22.8	1.85
19.5	50 33 1.2	4 52 40.3	14 45.2	54 3.29	0.165	11.9	19	L	21 45.3	1.88
20.0	56 29 48.6	4 58 48.3	14 46.0	54 6.13	0.306	12.4	20	U	10 8.0	1.91
20.5	62 27 50.3	5 1 41.3	14 47.2	54 10.58	0.133	12.9	20	L	22 31.2	1.95
21.0	68 27 20.7	5 1 15.1	14 48.8	54 16.48	0.548	13.4	21	U	10 54.8	1.98
21.5	74 28 31.3	−4 57 27.5	14 50.8	54 23.68	+0.650	13.9	21	L	23 18.8	2.01
22.0	80 31 31.2	4 50 17.5	14 53.0	54 32.03	0.741	14.4	22	U	11 43.1	2.04
22.5	86 36 27.7	4 39 46.6	14 55.6	54 41.43	0.823	14.9			. . . . .	. . .
23.0	92 43 26.6	4 25 58.4	14 58.4	54 51.74	0.895	15.4	23	L	0 7.7	2.06
23.5	98 52 32.3	4 8 58.4	15 1.4	55 2.88	0.960	15.9	23	U	12 32.6	2.08
24.0	105 3 49.2	−3 48 54.8	15 4.7	55 14.75	+1.019	16.4	24	L	0 57.6	2.09
24.5	111 17 21.5	3 25 58.1	15 8.1	55 27.32	1.075	16.9	24	U	13 22.7	2.09
25.0	117 33 14.3	3 0 21.4	15 11.7	55 40.54	1.127	17.4	25	L	1 47.8	2.09
25.5	123 51 33.6	2 32 19.8	15 15.5	55 54.37	1.178	17.9	25	U	14 12.8	2.08
26.0	130 12 26.9	2 2 10.8	15 19.4	56 8.82	1.229	18.4	26	L	2 37.8	2.08
26.5	136 36 3.4	−1 30 13.9	15 23.5	56 23.86	+1.279	18.9	26	U	15 2.6	2.07
27.0	143 2 34.2	0 56 50.9	15 27.8	56 39.51	1.329	19.4	27	L	3 27.4	2.06
27.5	149 32 12.0	−0 22 25.0	15 32.2	56 55.75	1.378	19.9	27	U	15 52.0	2.05
28.0	156 5 11.1	+0 12 38.5	15 36.8	57 12.56	1.423	20.4	28	L	4 16.5	2.04
28.5	162 41 47.0	0 47 52.8	15 41.5	57 29.88	1.463	20.9	28	U	16 41.0	2.04
29.0	169 22 15.4	+1 22 49.8	15 46.3	57 47.65	+1.497	21.4	29	L	5 5.5	2.04
29.5	176 6 51.7	1 57 0.0	15 51.3	58 5.75	1.518	21.9	29	U	17 30.1	2.06
30.0	182 55 49.9	2 29 53.0	15 56.2	58 24.01	1.523	22.4	30	L	5 55.0	2.08
30.5	189 49 20.9	3 0 57.5	16 1.2	58 42.23	1.509	22.9	30	U	18 20.1	2.11
31.0	196 47 32.1	3 29 41.9	16 6.1	59 0.12	1.470	23.4	31	L	6 45.7	2.15
31.5	203 50 25.3	+3 55 34.9	16 10.8	59 17.38	+1.401	23.9	31	U	19 11.7	2.19
32.0	210 57 55.3	+4 18 6.1	16 15.2	59 33.61	+1.299	24.4	32	L	7 38.3	2.24

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	19 47 48.12	+16.677	−23 14 36.5	+49.25	0.095 6717	−2513.6	2.68	7.06	1 7.5
2	19 54 25.59	16.439	22 54 11.1	52.85	0.089 4416	2679.6	2.71	7.16	1 10.2
3	20 0 56.89	16.162	22 32 20.8	56.32	0.082 8027	2854.3	2.75	7.27	1 12.7
4	20 7 21.01	15.840	22 9 9.1	59.62	0.075 7340	3037.8	2.80	7.39	1 15.2
5	20 13 36.77	15.465	21 44 40.5	62.72	0.068 2144	3230.1	2.86	7.52	1 17.5
6	20 19 42.84	+15.031	−21 19 0.3	+65.58	0.060 2227	−3431.0	2.91	7.66	1 19.7
7	20 25 37.74	14.532	20 52 15.2	68.13	0.051 7391	3640.0	2.96	7.81	1 21.6
8	20 31 19.79	13.959	20 24 33.0	70.32	0.042 7452	3855.9	3.02	7.97	1 23.4
9	20 36 47.10	13.302	19 56 3.4	72.08	0.033 2263	4077.3	3.09	8.15	1 24.9
10	20 41 57.55	12.553	19 26 57.5	73.32	0.023 1714	4302.0	3.17	8.34	1 26.1
11	20 46 48.82	+11.701	−18 57 28.6	+73.99	0.012 5764	−4526.9	3.25	8.55	1 27.0
12	20 51 18.33	10.739	18 27 51.5	73.98	0.001 4451	4748.2	3.33	8.77	1 27.5
13	20 55 23.31	9.656	17 58 23.5	73.22	9.989 7921	4960.7	3.42	9.01	1 27.6
14	20 59 0.79	8.446	17 29 23.8	71.61	9.977 6460	5158.0	3.52	9.27	1 27.3
15	21 2 7.65	7.104	17 1 13.5	69.09	9.965 0518	5332.6	3.62	9.54	1 26.4
16	21 4 40.70	+ 5.629	−16 34 15.4	+65.58	9.952 0747	−5475.5	3.73	9.83	1 25.0
17	21 6 36.82	4.027	16 8 53.6	61.06	9.938 8027	5576.7	3.84	10.13	1 22.9
18	21 7 53.06	2.308	15 45 32.8	55.50	9.925 3489	5625.0	3.96	10.45	1 20.2
19	21 8 26.84	+ 0.493	15 24 37.5	48.95	9.911 8542	5609.0	4.09	10.78	1 16.8
20	21 8 16.16	− 1.391	15 6 30.6	41.48	9.898 4863	5517.5	4.22	11.12	1 12.7
21	21 7 19.86	− 3.302	−14 51 32.9	+33.22	9.885 4387	−5340.6	4.35	11.46	1 7.8
22	21 5 37.84	5.192	14 40 0.9	24.37	9.872 9260	5070.7	4.47	11.79	1 2.1
23	21 3 11.30	7.001	14 32 6.2	15.16	9.861 1768	4704.1	4.59	12.11	0 55.7
24	21 0 2.94	8.666	14 27 53.8	+ 5.89	9.850 4232	4241.6	4.71	12.41	0 48.7
25	20 56 17.01	10.121	14 27 21.8	− 3.15	9.840 8884	3690.0	4.82	12.69	0 41.0
26	20 51 59.30	−11.305	−14 30 20.7	−11.64	9.832 7722	−3062.1	4.91	12.93	0 32.8
27	20 47 16.93	12.169	14 36 34.1	19.32	9.826 2371	2375.8	4.98	13.13	0 24.2
28	20 42 18.03	12.678	14 45 39.8	25.96	9.821 3967	1654.0	5.04	13.28	0 15.3
29	20 37 11.34	12.819	14 57 11.1	31.44	9.818 3069	921.1	5.08	13.37	{0 6.8 23 57.3
30	20 32 5.59	12.602	15 10 39.2	35.69	9.816 9644	− 201.8	5.10	13.41	23 48.5
31	20 27 9.10	−12.054	−15 25 34.4	−38.72	9.817 3092	+ 481.5	5.09	13.40	23 39.9
Feb. 1	20 22 29.32	11.218	15 41 28.5	40.61	9.819 2323	1110.8	5.07	13.34	23 31.7
2	20 18 12.50	10.149	15 57 55.5	41.49	9.822 5877	1673.5	5.03	13.24	23 24.0
3	20 14 23.56	8.905	16 14 32.8	41.48	9.827 2055	2161.9	4.98	13.10	23 16.8
4	20 11 6.00	7.542	16 31 0.9	40.75	9.832 9030	2573.4	4.91	12.93	23 10.2
5	20 8 22.08	− 6.111	−16 47 4.3	−39.44	9.839 4978	+2910.0	4.83	12.73	23 4.1
6	20 6 12.85	4.657	17 2 30.2	37.66	9.846 8145	3176.0	4.75	12.52	22 58.6
7	20 4 38.46	3.214	17 17 8.8	35.50	9.854 6914	3378.0	4.66	12.29	22 53.6
8	20 3 38.29	1.809	17 30 52.0	33.06	9.862 9839	3523.6	4.57	12.06	22 49.2
9	20 3 11.17	− 0.462	17 43 34.0	30.41	9.871 5657	3620.6	4.49	11.83	22 45.3
10	20 3 15.56	+ 0.815	−17 55 10.2	−27.58	9.880 3291	+3676.2	4.40	11.59	22 41.9
11	20 3 49.66	2.014	18 5 36.9	24.63	9.889 1842	3697.9	4.31	11.36	22 39.0
12	20 4 51.58	3.132	18 14 51.5	21.57	9.898 0567	3691.6	4.22	11.13	22 36.5
13	20 6 19.35	4.169	18 22 51.8	18.44	9.906 8865	3663.4	4.14	10.91	22 34.4
14	20 8 11.03	5.125	18 29 36.3	15.26	9.915 6268	3617.5	4.06	10.69	22 32.6
15	20 10 24.74	+ 6.005	−18 35 3.7	−12.02	9.924 2396	+3557.9	3.98	10.48	22 31.2
16	20 12 58.71	+ 6.814	−18 39 13.1	− 8.75	9.932 6967	+3488.2	3.90	10.28	22 30.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	20 12 58.71	+ 6.814	−18 39 13.1	− 8.75	9.932 6967	+3488.2	3.90	10.28	22 30.2
17	20 15 51.25	7.554	18 42 3.6	5.46	9.940 9767	3410.8	3.83	10.08	22 29.4
18	20 19 0.80	8.232	18 43 34.8	− 2.14	9.949 0642	3328.1	3.76	9.89	22 28.8
19	20 22 25.91	8.852	18 43 46.2	+ 1.19	9.956 9491	3242.1	3.69	9.72	22 28.5
20	20 26 5.25	9.418	18 42 37.4	4.54	9.964 6245	3153.8	3.63	9.55	22 28.4
21	20 29 57.58	+ 9.936	−18 40 8.3	+ 7.89	9.972 0865	+3064.5	3.56	9.39	22 28.5
22	20 34 1.82	10.409	18 36 18.7	11.21	9.979 3342	2975.3	3.50	9.23	22 28.8
23	20 38 16.89	10.842	18 31 8.7	14.59	9.986 3684	2886.7	3.45	9.08	22 29.3
24	20 42 41.93	11.239	18 24 38.3	17.94	9.993 1910	2799.0	3.40	8.94	22 29.9
25	20 47 16.07	11.601	18 16 47.4	21.30	9.999 8050	2713.0	3.34	8.80	22 30.7
26	20 51 58.55	+11.931	−18 7 36.1	+ 24.64	0.006 2148	+2628.8	3.29	8.67	22 31.6
27	20 56 48.69	12.210	17 57 4.7	27.98	0.012 4249	2546.6	3.24	8.55	22 32.6
28	21 1 45.87	12.521	17 45 13.2	31.31	0.018 4401	2466.4	3.20	8.43	22 33.7
Mar. 1	21 6 49.51	12.779	17 32 1.9	34.63	0.024 2656	2388.5	3.15	8.32	22 34.9
2	21 11 59.12	13.018	17 17 31.0	37.91	0.029 9067	2312.7	3.11	8.21	22 36.2
3	21 17 14.25	+13.239	−17 1 40.9	+ 41.21	0.035 3683	+2239.0	3.07	8.11	22 37.6
4	21 22 34.48	13.444	16 44 31.4	44.54	0.040 6557	2167.5	3.04	8.01	22 39.1
5	21 27 59.44	13.634	16 26 3.3	47.81	0.045 7737	2097.9	3.00	7.92	22 40.6
6	21 33 28.83	13.812	16 6 16.7	51.08	0.050 7269	2030.1	2.97	7.83	22 42.2
7	21 39 2.32	13.978	15 45 11.8	54.32	0.055 5197	1964.2	2.94	7.75	22 43.9
8	21 44 39.70	+14.134	−15 22 49.4	+ 57.55	0.060 1562	+1899.9	2.91	7.67	22 45.6
9	21 50 20.69	14.281	14 59 9.4	60.78	0.064 6403	1837.1	2.88	7.59	22 47.4
10	21 56 5.14	14.421	14 34 12.3	63.98	0.068 9755	1775.7	2.85	7.51	22 49.3
11	22 1 52.86	14.554	14 7 58.6	67.16	0.073 1648	1715.5	2.82	7.44	22 51.2
12	22 7 43.70	14.682	13 40 28.6	70.33	0.077 2109	1656.4	2.80	7.37	22 53.2
13	22 13 37.55	+14.805	−13 11 42.7	+ 73.49	0.081 1165	+1598.3	2.77	7.30	22 55.2
14	22 19 34.31	14.925	12 41 41.3	76.62	0.084 8834	1540.8	2.75	7.24	22 57.2
15	22 25 33.91	15.042	12 10 25.0	79.74	0.088 5127	1483.8	2.73	7.18	22 59.3
16	22 31 36.31	15.157	11 37 54.0	82.84	0.092 0061	1427.3	2.71	7.12	23 1.4
17	22 37 41.45	15.272	11 4 9.1	85.91	0.095 3638	1370.6	2.68	7.06	23 3.6
18	22 43 49.35	+15.387	−10 29 10.4	+ 88.97	0.098 5849	+1313.8	2.66	7.01	23 5.9
19	22 50 0.01	15.502	9 52 58.7	92.00	0.101 6696	1256.7	2.64	6.96	23 8.2
20	22 56 13.45	15.618	9 15 34.6	95.01	0.104 6165	1198.9	2.62	6.91	23 10.5
21	23 2 29.71	15.737	8 36 58.5	97.99	0.107 4237	1140.1	2.60	6.87	23 12.9
22	23 8 48.86	15.859	7 57 11.1	100.95	0.110 0880	1080.0	2.59	6.83	23 15.3
23	23 15 10.98	+15.985	− 7 16 13.2	+103.87	0.112 6065	+1018.3	2.57	6.79	23 17.8
24	23 21 36.15	16.114	6 34 5.5	106.76	0.114 9742	951.5	2.56	6.75	23 20.3
25	23 28 4.48	16.248	5 50 49.0	109.61	0.117 1864	888.5	2.55	6.72	23 22.9
26	23 34 36.07	16.386	5 6 24.7	112.41	0.119 2366	819.6	2.54	6.69	23 25.5
27	23 41 11.07	16.531	4 20 53.7	115.16	0.121 1177	747.4	2.52	6.66	23 28.2
28	23 47 49.61	+16.681	− 3 34 17.3	+117.86	0.122 8210	+ 671.5	2.51	6.63	23 31.0
29	23 54 31.81	16.837	2 46 37.0	120.48	0.124 3375	591.4	2.50	6.61	23 33.8
30	0 1 17.85	17.000	1 57 55.0	123.01	0.125 6559	506.5	2.50	6.59	23 36.7
31	0 8 7.84	17.168	1 8 13.0	125.47	0.126 7642	416.1	2.49	6.57	23 39.7
Apr. 1	0 15 1.95	17.342	− 0 17 33.4	127.81	0.127 6486	319.8	2.49	6.56	23 42.7
2	0 22 0.28	+17.521	+ 0 34 0.8	+130.02	0.128 2942	+ 217.0	2.48	6.55	23 45.8
3	0 29 2.98	+17.704	+ 1 26 26.4	+132.09	0.128 6844	+ 106.8	2.48	6.54	23 49.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	0 15 1.95	+17.342	− 0 17 33.4	+127.81	0.127 6486	+ 319.8	2.49	6.56	23 42.7
2	0 22 0.28	17.521	+ 0 34 0.8	130.02	0.128 2942	217.0	2.48	6.55	23 45.8
3	0 29 2.98	17.704	1 26 26.4	132.09	0.128 6844	+ 106.8	2.48	6.54	23 49.0
4	0 36 10.11	17.891	2 19 39.6	133.98	0.128 8008	− 11.1	2.48	6.54	23 52.3
5	0 43 21.75	18.079	3 13 35.8	135.67	0.128 6245	137.4	2.48	6.54	23 55.6
6	0 50 37.91	+18.267	+ 4 8 9.8	+137.13	0.128 1340	− 272.8	2.49	6.55	23 59.0
7	0 57 58.55	18.452	5 3 15.9	138.33	0.127 3078	417.3	2.49	6.56	. . . .
8	1 5 23.59	18.633	5 58 47.1	139.22	0.126 1231	571.6	2.50	6.58	0 2.5
9	1 12 52.86	18.804	6 54 35.9	139.78	0.124 5562	735.8	2.50	6.61	0 6.1
10	1 20 26.08	18.962	7 50 33.6	139.96	0.122 5837	909.7	2.51	6.64	0 9.7
11	1 28 2.92	+19.104	+ 8 46 30.7	+139.72	0.120 1823	−1093.0	2.53	6.67	0 13.4
12	1 35 42.90	19.224	9 42 16.8	139.04	0.117 3303	1285.1	2.55	6.72	0 17.1
13	1 43 25.46	19.318	10 37 40.6	137.87	0.114 0072	1485.3	2.57	6.77	0 20.9
14	1 51 9.91	19.380	11 32 30.3	136.18	0.110 1954	1692.2	2.59	6.83	0 24.7
15	1 58 55.40	19.405	12 26 33.0	133.96	0.105 8803	1904.4	2.62	6.90	0 28.5
16	2 6 41.05	+19.391	+13 19 36.0	+131.20	0.101 0514	−2120.1	2.65	6.98	0 32.3
17	2 14 25.80	19.331	14 11 26.6	127.92	0.095 7027	2337.1	2.68	7.06	0 36.1
18	2 22 8.56	19.224	15 1 52.0	124.11	0.089 8338	2553.4	2.72	7.16	0 39.9
19	2 29 48.14	19.066	15 50 40.2	119.82	0.083 4485	2766.9	2.76	7.26	0 43.7
20	2 37 23.33	18.858	16 37 39.8	115.08	0.076 5567	2975.3	2.80	7.38	0 47.3
21	2 44 52.88	+18.596	+17 22 40.8	+109.94	0.069 1727	−3176.6	2.85	7.50	0 50.9
22	2 52 15.55	18.285	18 5 34.0	104.45	0.061 3159	3369.1	2.90	7.64	0 54.3
23	2 59 30.15	17.923	18 46 12.2	98.69	0.053 0090	3551.4	2.96	7.79	0 57.6
24	3 6 35.50	17.515	19 24 29.1	92.69	0.044 2784	3722.0	3.01	7.95	1 0.7
25	3 13 30.49	17.060	20 0 20.2	86.54	0.035 1532	3880.3	3.07	8.11	1 3.7
26	3 20 14.06	+16.564	+20 33 42.3	+ 80.28	0.025 6635	−4025.5	3.14	8.29	1 6.5
27	3 26 45.25	16.028	21 4 33.4	73.97	0.015 8413	4157.4	3.22	8.48	1 9.1
28	3 33 3.12	15.455	21 32 52.8	67.65	0.005 7189	4275.6	3.30	8.69	1 11.4
29	3 39 6.83	14.848	21 58 40.6	61.35	9.995 3290	4380.4	3.38	8.90	1 13.5
30	3 44 55.58	14.210	22 21 57.9	55.11	9.984 7039	4471.5	3.46	9.12	1 15.4
May 1	3 50 28.66	+13.542	+22 42 46.4	+ 48.95	9.973 8763	−4549.3	3.55	9.35	1 17.0
2	3 55 45.36	12.846	23 1 8.3	42.89	9.962 8778	4613.8	3.64	9.59	1 18.3
3	4 0 45.05	12.124	23 17 6.1	36.95	9.951 7406	4665.1	3.73	9.83	1 19.3
4	4 5 27.11	11.378	23 30 42.8	31.13	9.940 4961	4703.1	3.83	10.09	1 20.1
5	4 9 50.99	10.609	23 42 1.4	25.44	9.929 1765	4727.8	3.93	10.36	1 20.5
6	4 13 56.15	+ 9.818	+23 51 4.9	+ 19.88	9.917 8138	−4738.9	4.04	10.64	1 20.6
7	4 17 42.09	9.007	23 57 56.5	14.45	9.906 4412	4736.0	4.15	10.92	1 20.4
8	4 21 8.34	8.178	24 2 39.3	9.14	9.895 0926	4718.8	4.25	11.21	1 19.9
9	4 24 14.48	7.332	24 5 16.3	+ 3.96	9.883 8031	4686.5	4.36	11.50	1 19.1
10	4 27 0.15	6.472	24 5 50.5	− 1.09	9.872 6099	4638.5	4.47	11.80	1 17.9
11	4 29 25.03	+ 5.600	+24 4 24.9	− 6.02	9.861 5515	−4574.0	4.59	12.10	1 16.3
12	4 31 28.89	4.720	24 1 2.6	10.82	9.850 6689	4491.9	4.71	12.41	1 14.4
13	4 33 11.57	3.836	23 55 46.4	15.51	9.840 0049	4391.5	4.83	12.72	1 12.2
14	4 34 33.03	2.952	23 48 39.4	20.06	9.829 6051	4271.6	4.94	13.03	1 9.6
15	4 35 33.33	2.074	23 39 44.9	24.46	9.819 5173	4131.3	5.06	13.33	1 6.6
16	4 36 12.67	+ 1.207	+23 29 6.6	− 28.71	9.809 7917	−3969.8	5.18	13.63	1 3.3
17	4 36 31.43	+ 0.360	+23 16 48.4	− 32.78	9.800 4799	−3786.3	5.29	13.93	0 59.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
May 17	4 36 31.43	+ 0.360	+23 16 48.4	−32.78	9.800 4799	−3786.3	5.29	13.93	0 59.7
18	4 36 30.14	− 0.462	23 2 54.8	36.65	9.791 6356	3580.2	5.40	14.21	0 55.7
19	4 36 9.52	1.250	22 47 31.0	40.29	9.783 3135	3351.0	5.50	14.49	0 51.5
20	4 35 30.50	1.994	22 30 43.0	43.66	9.775 5687	3099.3	5.60	14.75	0 46.9
21	4 34 34.23	2.686	22 12 37.8	46.72	9.768 4549	2825.2	5.69	15.00	0 42.0
22	4 33 22.07	− 3.317	+21 53 23.4	−49.42	9.762 0249	−2529.8	5.77	15.22	0 36.9
23	4 31 55.59	3.878	21 33 8.8	51.72	9.756 3280	2214.4	5.85	15.42	0 31.5
24	4 30 16.57	4.361	21 12 4.6	53.56	9.751 4104	1881.0	5.93	15.60	0 25.9
25	4 28 26.95	4.759	20 50 22.0	54.90	9.747 3115	1532.4	5.98	15.75	0 20.2
26	4 26 28.87	5.066	20 28 13.7	55.70	9.744 0651	1171.2	6.02	15.87	0 14.3
27	4 24 24.55	− 5.278	+20 5 53.2	−55.92	9.741 6970	− 801.1	6.05	15.95	0 8.3
28	4 22 16.31	5.392	19 43 34.5	55.54	9.740 2241	425.8	6.07	16.01	{0 23 / 23 56.2}
29	4 20 6.50	5.409	19 21 32.3	54.54	9.739 6545	− 49.0	6.08	16.03	23 50.1
30	4 17 57.47	5.328	19 0 1.3	52.94	9.739 9869	+ 325.2	6.08	16.02	23 44.1
31	4 15 51.50	5.154	18 39 16.0	50.74	9.741 2100	692.7	6.06	15.97	23 38.1
June 1	4 13 50.77	− 4.892	+18 19 30.3	−47.98	9.743 3039	+1050.3	6.03	15.89	23 32.3
2	4 11 57.33	4.548	18 0 57.3	44.69	9.746 2407	1394.5	5.99	15.78	23 26.7
3	4 10 13.07	4.129	17 43 48.8	40.94	9.749 9845	1722.5	5.94	15.65	23 21.2
4	4 8 39.66	3.644	17 28 15.2	36.79	9.754 4942	2032.4	5.88	15.49	23 15.9
5	4 7 18.61	3.101	17 14 25.5	32.30	9.759 7238	2322.1	5.81	15.31	23 10.9
6	4 6 11.18	− 2.510	+17 2 26.9	−27.55	9.765 6234	+2590.6	5.73	15.10	23 6.1
7	4 5 18.47	1.877	16 52 24.9	22.59	9.772 1414	2837.4	5.64	14.87	23 1.5
8	4 4 41.35	1.211	16 44 23.6	17.51	9.779 2252	3062.1	5.55	14.63	22 57.2
9	4 4 20.54	− 0.519	16 38 25.1	12.36	9.786 8219	3264.9	5.45	14.38	22 53.2
10	4 4 16.58	+ 0.192	16 34 30.4	7.21	9.794 8797	3446.4	5.35	14.11	22 49.5
11	4 4 29.85	+ 0.916	+16 32 38.8	− 2.10	9.803 3481	+3607.3	5.25	13.84	22 46.0
12	4 5 0.63	1.650	16 32 48.8	+ 2.91	9.812 1792	3748.7	5.14	13.56	22 42.9
13	4 5 49.10	2.389	16 34 57.2	7.77	9.821 3272	3871.7	5.04	13.28	22 40.0
14	4 6 55.32	3.130	16 39 0.6	12.48	9.830 7493	3977.2	4.93	12.99	22 37.5
15	4 8 19.33	3.870	16 44 54.7	16.98	9.840 4049	4066.7	4.83	12.70	22 35.2
16	4 10 1.07	+ 4.608	+16 52 34.0	+21.26	9.850 2573	+4141.2	4.72	12.42	22 33.3
17	4 12 0.48	5.342	17 1 53.1	25.29	9.860 2715	4201.8	4.61	12.14	22 31.6
18	4 14 17.46	6.072	17 12 45.8	29.06	9.870 4156	4249.6	4.50	11.86	22 30.2
19	4 16 51.92	6.798	17 25 5.6	32.55	9.880 6600	4285.6	4.39	11.58	22 29.1
20	4 19 43.75	7.520	17 38 45.8	35.75	9.890 9775	4310.5	4.29	11.31	22 28.3
21	4 22 52.86	+ 8.238	+17 53 39.3	+38.66	9.901 3422	+4325.1	4.19	11.04	22 27.8
22	4 26 19.15	8.952	18 9 38.8	41.25	9.911 7302	4330.1	4.09	10.78	22 27.5
23	4 30 2.55	9.664	18 26 36.7	43.52	9.922 1192	4325.9	3.99	10.53	22 27.6
24	4 34 3.02	10.375	18 44 25.3	45.47	9.932 4872	4312.8	3.90	10.28	22 27.9
25	4 38 20.52	11.084	19 2 56.5	47.08	9.942 8136	4291.1	3.81	10.04	22 28.5
26	4 42 55.04	+11.793	+19 22 2.2	+48.34	9.953 0779	+4261.1	3.72	9.80	22 29.4
27	4 47 46.57	12.502	19 41 33.7	49.23	9.963 2600	4222.6	3.63	9.58	22 30.6
28	4 52 55.12	13.211	20 1 22.3	49.75	9.973 3395	4175.6	3.55	9.36	22 32.1
29	4 58 20.69	13.920	20 21 18.5	49.87	9.983 2959	4119.9	3.47	9.15	22 33.8
30	5 4 3.28	14.629	20 41 13.0	49.60	9.993 1079	4055.2	3.40	8.94	22 35.9
July 1	5 10 2.88	+15.337	+21 0 55.8	+48.90	0.002 7538	+3981.5	3.32	8.74	22 38.2
2	5 16 19.45	+16.042	+21 20 16.4	+47.75	0.012 2114	+3898.0	3.25	8.55	22 40.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	5 10 2.88	+15.337	+21 0 55.8	+ 48.90	0.002 7538	+3981.5	3.32	8.74	22 38.2
2	5 16 19.45	16.042	21 20 16.4	47.75	0.012 2114	3898.0	3.25	8.55	22 40.8
3	5 22 52.87	16.742	21 39 4.0	46.14	0.021 4563	3804.5	3.18	8.37	22 43.7
4	5 29 43.00	17.434	21 57 7.4	44.06	0.030 4645	3700.6	3.11	8.20	22 46.8
5	5 36 49.59	18.113	22 14 15.1	41.50	0.039 2104	3585.8	3.05	8.04	22 50.3
6	5 44 12.31	+18.777	+22 30 15.2	+ 38.42	0.047 6677	+3460.0	2.99	7.88	22 54.0
7	5 51 50.69	19.418	22 44 55.5	34.85	0.055 8096	3323.0	2.93	7.74	22 57.9
8	5 59 44.13	20.030	22 58 4.1	30.78	0.063 6089	3174.6	2.88	7.60	23 2.1
9	6 7 51.85	20.607	23 9 29.0	26.21	0.071 0387	3015.1	2.83	7.47	23 6.5
10	6 16 12.93	21.142	23 18 58.4	21.17	0.078 0728	2844.9	2.79	7.35	23 11.1
11	6 24 46.26	+21.627	+23 26 21.5	+ 15.69	0.084 6865	+2664.9	2.75	7.24	23 15.9
12	6 33 30.55	22.054	23 31 28.1	9.80	0.090 8575	2476.2	2.72	7.14	23 20.9
13	6 42 24.35	22.418	23 34 9.4	+ 3.59	0.096 5663	2279.9	2.68	7.05	23 26.0
14	6 51 26.07	22.713	23 34 18.0	− 2.91	0.101 7966	2077.9	2.64	6.96	23 31.2
15	7 0 34.01	22.936	23 31 48.0	9.61	0.106 5369	1871.9	2.61	6.89	23 36.5
16	7 9 46.40	+23.084	+23 26 35.6	− 16.43	0.110 7803	+1664.1	2.59	6.82	23 41.8
17	7 19 1.42	23.156	23 18 39.0	23.29	0.114 5245	1456.3	2.56	6.76	23 47.2
18	7 28 17.31	23.156	23 7 58.0	30.11	0.117 7723	1250.7	2.54	6.71	23 52.5
19	7 37 32.34	23.085	22 54 34.7	36.81	0.120 5310	1049.1	2.52	6.67	23 57.8
20	7 46 44.88	22.950	22 38 32.8	43.32	0.122 8123	853.0	2.51	6.63	. . . . .
21	7 55 53.46	+22.756	+22 19 57.4	− 49.58	0.124 6313	+ 664.1	2.50	6.60	0 3.0
22	8 4 56.74	22.510	21 58 55.1	55.56	0.126 0065	483.3	2.49	6.58	0 8.1
23	8 13 53.58	22.220	21 35 33.3	61.20	0.126 9581	311.3	2.49	6.57	0 13.1
24	8 22 42.99	21.892	21 10 0.4	66.49	0.127 5081	+ 148.6	2.49	6.56	0 18.0
25	8 31 24.17	21.535	20 42 25.0	71.40	0.127 6792	− 4.4	2.49	6.56	0 22.8
26	8 39 56.49	+21.155	+20 12 56.2	− 75.94	0.127 4944	− 148.0	2.49	6.56	0 27.4
27	8 48 19.48	20.758	19 41 43.1	80.10	0.126 9762	282.3	2.49	6.57	0 31.8
28	8 56 32.78	20.350	19 8 54.5	83.89	0.126 1467	407.6	2.49	6.58	0 36.1
29	9 4 36.21	19.935	18 34 39.2	87.32	0.125 0267	524.4	2.50	6.60	0 40.3
30	9 12 29.62	19.516	17 59 5.8	90.41	0.123 6361	633.2	2.51	6.62	0 44.2
31	9 20 13.00	+19.099	+17 22 22.2	− 93.17	0.121 9931	− 734.8	2.52	6.64	0 48.0
Aug. 1	9 27 46.41	18.686	16 44 36.1	95.62	0.120 1145	829.6	2.53	6.67	0 51.6
2	9 35 9.95	18.277	16 5 54.7	97.78	0.118 0158	918.4	2.54	6.70	0 55.1
3	9 42 23.76	17.875	15 26 24.8	99.66	0.115 7108	1001.6	2.56	6.74	0 58.4
4	9 49 28.04	17.482	14 46 12.8	101.29	0.113 2122	1079.9	2.57	6.78	1 1.5
5	9 56 22.99	+17.098	+14 5 24.6	−102.69	0.110 5308	−1153.9	2.59	6.82	1 4.5
6	10 3 8.84	16.724	13 24 5.7	103.85	0.107 6768	1223.9	2.60	6.86	1 7.3
7	10 9 45.84	16.360	12 42 21.3	104.81	0.104 6585	1290.8	2.62	6.91	1 9.9
8	10 16 14.21	16.006	12 0 16.2	105.58	0.101 4833	1354.8	2.64	6.96	1 12.5
9	10 22 34.20	15.661	11 17 55.1	106.15	0.098 1575	1416.3	2.67	7.02	1 14.9
10	10 28 46.04	+15.327	+10 35 22.1	−106.57	0.094 6865	−1475.9	2.69	7.07	1 17.1
11	10 34 49.95	15.001	9 52 41.1	106.82	0.091 0745	1533.9	2.71	7.13	1 19.2
12	10 40 46.15	14.684	9 9 56.0	106.91	0.087 3249	1590.6	2.74	7.19	1 21.2
13	10 46 34.83	14.375	8 27 10.4	106.87	0.083 4406	1646.2	2.76	7.26	1 23.1
14	10 52 16.19	14.073	7 44 27.5	106.68	0.079 4235	1701.3	2.78	7.33	1 24.8
15	10 57 50.37	+13.777	+ 7 1 50.7	−106.36	0.075 2749	−1755.8	2.81	7.40	1 26.5
16	11 3 17.54	+13.488	+ 6 19 23.1	−105.92	0.070 9958	−1810.2	2.84	7.47	1 28.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	11 3 17.54	+13.488	+6 19 23.1	−105.92	0.070 9958	−1810.2	2.84	7.47	1 28.0
17	11 8 37.82	13.203	5 37 7.6	105.35	0.066 5860	1864.6	2.87	7.55	1 29.3
18	11 13 51.30	12.922	4 55 7.2	104.66	0.062 0453	1919.3	2.89	7.63	1 30.6
19	11 18 58.09	12.644	4 13 24.8	103.86	0.057 3729	1974.4	2.92	7.71	1 31.8
20	11 23 58.23	12.368	3 32 3.1	102.93	0.052 5679	2029.9	2.95	7.79	1 32.9
21	11 28 51.77	+12.093	+2 51 5.1	−101.89	0.047 6286	−2086.3	2.99	7.88	1 33.8
22	11 33 38.70	11.818	2 10 33.4	100.73	0.042 5530	2143.6	3.02	7.97	1 34.6
23	11 38 19.02	11.542	1 30 31.0	99.45	0.037 3386	2201..	3.06	8.07	1 35.3
24	11 42 52.68	11.263	0 51 0.7	98.05	0.031 9833	2261.1	3.10	8.17	1 36.0
25	11 47 19.60	10.980	+0 12 5.5	96.53	0.026 4842	2321.6	3.14	8.28	1 36.5
26	11 51 39.66	+10.691	−0 26 11.6	− 94.88	0.020 8385	−2383.4	3.18	8.39	1 36.8
27	11 55 52.73	10.396	1 3 47.4	93.09	0.015 0431	2446.4	3.23	8.50	1 37.1
28	11 59 58.60	10.092	1 40 38.5	91.15	0.009 0950	2510.6	3.27	8.62	1 37.3
29	12 3 57.06	9.778	2 16 41.4	89.07	0.002 9912	2576.1	3.32	8.74	1 37.3
30	12 7 47.84	9.451	2 51 52.5	86.82	9.996 7289	2642.7	3.37	8.87	1 37.2
31	12 11 30.60	+ 9.110	−3 26 7.6	− 84.41	9.990 3056	−2710.3	3.42	9.00	1 36.9
Sept. 1	12 15 4.99	8.753	3 59 22.6	81.81	9.983 7189	2778.8	3.47	9.14	1 36.5
2	12 18 30.58	8.376	4 31 32.8	79.01	9.976 9672	2847.7	3.52	9.28	1 36.0
3	12 21 46.88	7.978	5 2 33.2	75.99	9.970 0497	2916.9	3.57	9.43	1 35.3
4	12 24 53.35	7.557	5 32 18.3	72.73	9.962 9665	2985.7	3.63	9.58	1 34.5
5	12 27 49.38	+ 7.108	−6 0 42.3	− 69.22	9.955 7191	−3053.6	3.69	9.74	1 33.5
6	12 30 34.29	6.629	6 27 38.5	65.42	9.948 3105	3119.9	3.76	9.91	1 32.3
7	12 33 7.32	6.118	6 53 0.1	61.32	9.940 7457	3183.6	3.83	10.09	1 30.9
8	12 35 27.66	5.571	7 16 39.2	56.88	9.933 0323	3243.5	3.90	10.27	1 29.2
9	12 37 34.41	4.985	7 38 27.4	52.07	9.925 1807	3298.5	3.97	10.46	1 27.4
10	12 39 26.61	+ 4.357	−7 58 15.4	− 46.86	9.917 2053	−3346.4	4.04	10.65	1 25.3
11	12 41 3.20	3.685	8 15 53.1	41.21	9.909 1252	3385.5	4.11	10.85	1 23.0
12	12 42 23.11	2.966	8 31 9.5	35.08	9.900 9641	3413.3	4.19	11.05	1 20.4
13	12 43 25.18	2.199	8 43 53.0	28.45	9.892 7529	3426.7	4.27	11.26	1 17.4
14	12 44 8.28	1.384	8 53 50.8	21.27	9.884 5300	3422.5	4.35	11.48	1 14.2
15	12 44 31.23	+ 0.521	−9 0 49.6	− 13.53	9.876 3421	−3396.8	4.44	11.70	1 10.6
16	12 44 32.95	− 0.385	9 4 35.6	− 5.21	9.868 2460	3345.1	4.53	11.92	1 6.7
17	12 44 12.42	1.331	9 4 54.8	+ 3.71	9.860 3101	3262.6	4.61	12.14	1 2.4
18	12 43 28.79	2.309	9 1 33.2	13.19	9.852 6146	3143.8	4.69	12.36	0 57.8
19	12 42 21.46	3.304	8 54 17.9	23.17	9.845 2532	2983.3	4.77	12.57	0 52.7
20	12 40 50.16	− 4.303	−8 42 57.5	+ 33.59	9.838 3327	-2775.4	4.85	12.77	0 47.2
21	12 38 55.04	5.285	8 27 23.1	44.31	9.831 9733	2514.7	4.92	12.96	0 41.4
22	12 36 36.80	6.226	8 7 29.8	55.13	9.826 3068	2197.4	4.98	13.13	0 35.2
23	12 33 56.77	7.096	7 43 17.8	65.82	9,821 4739	1819.8	5.04	13.27	0 28.6
24	12 30 57.03	7.863	7 14 53.9	76.07	9.817 6205	1381.2	5.09	13.39	0 21.7
25	12 27 40.44	− 8.494	−6 42 32.7	+ 85.53	9.814 8915	− 883.3	5.12	13.48	0 14.5
26	12 24 10.70	8.954	6 6 37.9	93.81	9.813 4241	− 331.0	5.13	13.52	{0 7.1 23 59.5
27	12 20 32.27	9.212	5 27 42.2	100.53	9.813 3392	+ 267.0	5.13	13.53	23 51.9
28	12 16 50.31	9.245	4 46 27.9	105.31	9.814 7325	898.5	5.12	13.48	23 44.4
29	12 13 10.48	9.033	4 3 45.1	107.86	9.817 6668	1548.4	5.09	13.39	23 36.9
30	12 9 38.72	− 8.572	−3 20 30.3	+107.96	9.822 1656	+2199.3	5.03	13.25	23 29.7
Oct. 1	12 6 21.00	− 7.865	−2 37 43.3	+105.53	9.828 2092	+2832.5	4.96	13.07	23 22.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	12 6 21.00	− 7.865	− 2 37 43.3	+105.53	9.828 2092	+2832.5	4.96	13.07	23 22.8
2	12 3 23.05	6.929	1 56 24.6	100.62	9.835 7331	3430.1	4.88	12.85	23 16.4
3	12 0 50.03	5.792	1 17 32.0	93.40	9.844 6325	3976.2	4.78	12.58	23 10.4
4	11 58 46.39	4.487	0 41 57.8	84.13	9.854 7667	4457.3	4.67	12.29	23 4.9
5	11 57 15.66	3.056	− 0 10 27.0	73.19	9.865 9681	4864.1	4.55	11.98	23 0.0
6	11 56 20.36	− 1.541	+ 0 16 25.0	+ 60.96	9.878 0503	+5191.0	4.42	11.65	22 55.8
7	11 56 2.02	+ 0.016	0 38 12.0	47.85	9.890 8194	5436.3	4.29	11.31	22 52.1
8	11 56 21.15	1.575	0 54 37.7	34.24	9.904 0803	5601.5	4.16	10.97	22 49.1
9	11 57 17.38	3.103	1 5 34.7	20.51	9.917 6461	5691.3	4.03	10.64	22 46.7
10	11 58 49.61	4.570	1 11 3.9	+ 6.97	9.931 3433	5712.2	3.91	10.31	22 44.8
11	12 0 56.07	+ 5.953	+ 1 11 12.8	− 6.14	9.945 0156	+5671.9	3.79	9.99	22 43.5
12	12 3 34.55	7.236	1 6 14.5	18.60	9.958 5267	5579.4	3.67	9.68	22 42.7
13	12 6 42.49	8.407	0 56 26.5	30.26	9.971 7618	5443.4	3.57	9.39	22 42.3
14	12 10 17.17	9.463	0 42 9.2	41.02	9.984 6271	5272.7	3.47	9.12	22 42.3
15	12 14 15.79	10.402	0 23 45.2	50.81	9.997 0494	5075.4	3.37	8.86	22 42.6
16	12 18 35.57	+11.227	+ 0 1 38.2	− 59.61	0.008 9735	+4858.8	3.27	8.62	22 43.3
17	12 23 13.84	11.945	− 0 23 48.2	67.42	0.020 3618	4629.8	3.19	8.40	22 44.3
18	12 28 8.11	12.562	0 52 10.5	74.27	0.031 1907	4393.6	3.11	8.19	22 45.5
19	12 33 16.07	13.087	1 23 5.9	80.20	0.041 4490	4154.9	3.04	8.00	22 46.8
20	12 38 35.63	13.531	1 56 13.2	85.27	0.051 1354	3917.6	2.97	7.82	22 48.4
21	12 44 4.97	+13.902	− 2 31 12.4	− 89.53	0.060 2567	+3684.1	2.91	7.66	22 50.1
22	12 49 42.45	14.211	3 7 44.9	93.06	0.068 8253	3457.3	2.85	7.51	22 51.9
23	12 55 26.68	14.466	3 45 34.1	95.93	0.076 8581	3238.1	2.80	7.37	22 53.7
24	13 1 16.46	14.675	4 24 24.8	98.20	0.084 3755	3027.9	2.76	7.25	22 55.7
25	13 7 10.78	14.845	5 4 3.4	99.93	0.091 3996	2827.1	2.71	7.13	22 57.7
26	13 13 8.78	+14.984	− 5 44 17.8	−101.19	0.097 9531	+2635.8	2.67	7.02	22 59.8
27	13 19 9.79	15.096	6 24 57.1	102.02	0.104 0591	2454.2	2.63	6.92	23 1.9
28	13 25 13.21	15.187	7 5 51.8	102.48	0.109 7411	2282.2	2.59	6.83	23 4.0
29	13 31 18.61	15.260	7 46 53.4	102.60	0.115 0213	2119.5	2.56	6.75	23 6.2
30	13 37 25.60	15.320	8 27 54.4	102.44	0.119 9216	1965.5	2.53	6.68	23 8.4
31	13 43 33.91	+15.370	− 9 8 48.3	−102.01	0.124 4623	+1819.7	2.50	6.61	23 10.6
Nov. 1	13 49 43.32	15.413	9 49 29.2	101.36	0.128 6625	1681.7	2.48	6.54	23 12.9
2	13 55 53.68	15.449	10 29 52.1	100.51	0.132 5404	1551.1	2.46	6.48	23 15.1
3	14 2 4.86	15.482	11 9 52.3	99.48	0.136 1132	1427.2	2.44	6.43	23 17.4
4	14 8 16.81	15.513	11 49 25.8	98.29	0.139 3960	1309.5	2.42	6.38	23 19.7
5	14 14 29.47	+15.542	−12 28 29.1	− 96.96	0.142 4036	+1197.6	2.41	6.34	23 21.9
6	14 20 42.84	15.572	13 6 58.8	95.50	0.145 1485	1090.7	2.39	6.30	23 24.2
7	14 26 56.92	15.601	13 44 52.1	93.92	0.147 6429	988.8	2.37	6.26	23 26.6
8	14 33 11.72	15.633	14 22 6.2	92.24	0.149 8984	891.4	2.36	6.23	23 28.9
9	14 39 27.32	15.666	14 58 38.9	90.47	0.151 9246	797.6	2.35	6.20	23 31.2
10	14 45 43.72	+15.701	−15 34 27.9	− 88.60	0.153 7297	+ 707.5	2.34	6.17	23 33.6
11	14 52 0.98	15.738	16 9 31.1	86.66	0.155 3231	620.8	2.34	6.15	23 35.9
12	14 58 19.18	15.778	16 43 46.8	84.64	0.156 7118	536.9	2.33	6.13	23 38.3
13	15 4 38.36	15.821	17 17 13.0	82.54	0.157 9020	455.5	2.33	6.12	23 40.7
14	15 10 58.60	15.866	17 49 48.1	80.38	0.158 8998	376.3	2.32	6.10	23 43.1
15	15 17 19.97	+15.915	−18 21 30.5	− 78.15	0.159 7100	+ 299.1	2.32	6.09	23 45.5
16	15 23 42.52	+15.965	−18 52 18.7	− 75.86	0.160 3371	+ 223.7	2.31	6.08	23 48.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	15 23 42.52	+15.965	−18 52 18.7	−75.86	0.160 3371	+ 223.7	2.31	6.08	23 48.0
17	15 30 6.31	16.018	19 22 11.1	73.50	0.160 7848	149.6	2.31	6.08	23 50.5
18	15 36 31.42	16.074	19 51 6.3	71.09	0.161 0562	76.7	2.31	6.07	23 53.0
19	15 42 57.89	16.132	20 19 2.9	68.61	0.161 1536	+ 4.8	2.31	6.07	23 55.5
20	15 49 25.76	16.191	20 45 59.4	66.08	0.161 0795	− 66.6	2.31	6.07	23 58.1
21	15 55 55.08	+16.252	−21 11 54.6	−63.50	0.160 8342	− 137.7	2.31	6.08	. . . . .
22	16 2 25.88	16.315	21 36 47.0	60.86	0.160 4190	208.3	2.31	6.08	0 0.7
23	16 8 58.21	16.378	22 0 35.2	58.15	0.159 8342	279.0	2.32	6.09	0 3.3
24	16 15 32.03	16.441	22 23 17.8	55.39	0.159 0797	350.0	2.32	6.10	0 5.9
25	16 22 7.39	16.505	22 44 53.4	52.57	0.158 1540	421.4	2.32	6.11	0 8.5
26	16 28 44.28	+16.568	−23 5 20.7	−49.69	0.157 0563	− 493.6	2.33	6.13	0 11.2
27	16 35 22.66	16.630	23 24 38.2	46.76	0.155 7841	566.7	2.33	6.15	0 13.9
28	16 42 2.52	16.691	23 42 44.5	43.76	0.154 3353	640.9	2.34	6.18	0 16.6
29	16 48 43.80	16.749	23 59 38.2	40.71	0.152 7069	716.4	2.35	6.20	0 19.4
30	16 55 26.44	16.804	24 15 18.1	37.60	0.150 8953	793.6	2.36	6.22	0 22.2
Dec. 1	17 2 10.36	+16.855	−24 29 42.6	−34.43	0.148 8959	− 872.8	2.37	6.25	0 25.0
2	17 8 55.45	16.902	24 42 50.3	31.20	0.146 7043	951.0	2.38	6.28	0 27.8
3	17 15 41.60	16.943	24 54 39.7	27.91	0.144 3145	1037.8	2.39	6.31	0 30.6
4	17 22 28.67	16.978	25 5 9.7	24.58	0.141 7208	1124.2	2.41	6.35	0 33.4
5	17 29 16.47	17.005	25 14 18.8	21.18	0.138 9160	1213.6	2.43	6.39	0 36.3
6	17 36 4.83	+17.023	−25 22 5.7	−17.72	0.135 8929	−1306.3	2.45	6.44	0 39.2
7	17 42 53.50	17.031	25 28 29.0	14.22	0.132 6428	1102.7	2.47	6.49	0 42.0
8	17 49 42.23	17.028	25 33 27.8	10.67	0.129 1567	1503.0	2.49	6.54	0 44.9
9	17 56 30.73	17.011	25 37 0.6	7.07	0.125 4248	1607.6	2.50	6.59	0 47.8
10	18 3 18.65	16.980	25 39 6.7	− 3.43	0.121 4364	1716.9	2.52	6.65	0 50.7
11	18 10 5.62	+16.931	−25 39 44.9	+ 0.25	0.117 1796	−1831.3	2.54	6.72	0 53.5
12	18 16 51.21	16.864	25 38 54.6	3.95	0.112 6419	1951.0	2.57	6.79	0 56.3
13	18 23 34.94	16.776	25 36 35.1	7.68	0.107 8101	2076.5	2.60	6.87	0 59.1
14	18 30 16.25	16.663	25 32 46.1	11.41	0.102 6696	2208.3	2.64	6.95	1 1.9
15	18 36 54.53	16.523	25 27 27.2	15.15	0.097 2050	2346.8	2.67	7.04	1 4.6
16	18 43 29.09	+16.352	−25 20 39.0	+18.87	0.091 3993	−2492.3	2.71	7.13	1 7.2
17	18 49 59.14	16.146	25 12 21.7	22.57	0.085 2361	2644.9	2.75	7.23	1 9.7
18	18 56 23.79	15.901	25 2 36.1	26.22	0.078 6974	2805.4	2.79	7.34	1 12.2
19	19 2 42.04	15.612	24 51 23.9	29.79	0.071 7640	2973.6	2.83	7.46	1 14.6
20	19 8 52.75	15.272	24 38 46.9	33.27	0.064 4177	3149.6	2.88	7.59	1 16.8
21	19 14 54.64	+14.876	−24 24 48.0	+36.62	0.056 6393	−3333.6	2.93	7.73	1 18.9
22	19 20 46.26	14.415	24 9 30.5	39.81	0.048 4104	3521.9	2.99	7.87	1 20.8
23	19 26 25.97	13.882	23 52 58.9	42.79	0.039 7142	3723.0	3.05	8.03	1 22.5
24	19 31 51.93	13.267	23 35 18.6	45.52	0.030 5356	3928.7	3.11	8.20	1 24.0
25	19 37 2.07	12.562	23 16 36.1	47.96	0.020 8628	4134.4	3.18	8.39	1 25.2
26	19 41 54.08	+11.755	−22 56 59.6	+50.02	0.010 6891	−4343.8	3.26	8.59	1 26.1
27	19 46 25.40	10.835	22 36 38.3	51.67	0.000 0138	4551.6	3.34	8.80	1 26.7
28	19 50 33.20	9.793	22 15 43.3	52.83	9.988 8459	4753.6	3.43	9.03	1 26.8
29	19 54 14.42	8.618	21 54 27.0	53.43	9.977 2054	4944.5	3.52	9.27	1 26.5
30	19 57 25.76	7.303	21 33 3.8	53.40	9.965 1271	5117.1	3.62	9.54	1 25.7
31	20 0 3.77	+ 5.840	−21 11 49.3	+52.69	9.952 6647	−5263.0	3.72	9.81	1 24.4
32	20 2 4.90	. . . .	−20 51 0.5	. . . .	9.939 8932	. . . .	3.83	10.11	1 22.4

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Jan.	1	334 42 29.2	4 2 8.0	− 7 17.0	−6 41 23.3	+ 8 43.3	9.587 5088	−63872
	2	338 48 10.3	4 9 18.0	8 43.0	6 31 31.7	11 1.4	9.581 0322	65620
	3	343 1 12.4	4 16 49.9	10 0.5	6 19 17.7	13 28.0	9.574 3937	67102
	4	347 21 57.2	4 24 43.2	11 6.9	6 4 32.8	16 3.1	9.567 6224	68267
	5	351 50 45.4	4 32 56.4	11 59.4	5 47 9.0	18 45.8	9.560 7528	69058
	6	356 27 56.1	4 41 27.8	−12 35.1	−5 26 59.1	+21 35.1	9.553 8255	−69410
	7	1 13 46.2	4 50 14.6	12 51.6	5 3 57.2	24 29.4	9.546 8879	69252
	8	6 8 29.3	4 59 13.2	12 46.2	4 37 59.3	27 26.6	9.539 9944	68514
	9	11 12 15.1	5 8 19.3	12 17.1	4 9 3.9	30 23.9	9.533 2068	67122
	10	16 25 8.6	5 17 27.4	11 23.1	3 37 12.7	33 17.6	9.526 5942	65004
	11	21 47 8.3	5 26 30.6	−10 3.9	−3 2 31.3	+36 3.6	9.520 2322	−62099
	12	27 18 5.7	5 35 21.4	8 20.3	2 25 9.8	38 36.8	9.514 2023	58356
	13	32 57 43.9	5 43 50.8	6 14.6	1 45 23.7	40 51.8	9.508 5901	53740
	14	38 45 36.9	5 51 49.1	3 50.7	1 3 34.2	42 42.7	9.503 4837	48243
	15	44 41 8.2	5 59 5.8	− 1 13.9	−0 20 8.3	44 3.6	9.498 9700	41892
	16	50 43 31.1	6 5 30.4	+ 1 29.3	+0 24 21.3	+44 49.3	9.495 1319	−34742
	17	56 51 48.0	6 10 52.2	4 10.9	1 9 17.1	44 55.4	9.492 0451	26887
	18	63 4 51.4	6 15 1.8	6 42.8	1 53 57.8	44 18.6	9.489 7735	18463
	19	69 21 24.8	6 17 51.0	8 56.8	2 37 39.7	42 57.8	9.488 3661	9632
	20	75 40 4.3	6 19 13.2	10 45.4	3 19 39.1	40 53.8	9.487 8544	− 585
	21	81 59 21.2	6 19 5.4	+12 2.7	+3 59 14.0	+38 9.6	9.488 2495	+ 8472
	22	88 17 44.6	6 17 26.4	12 44.8	4 35 46.5	34 50.0	9.489 5426	17342
	23	94 33 44.4	6 14 18.8	12 50.0	5 8 44.3	31 1.4	9.491 7051	25828
	24	100 45 54.1	6 9 47.3	12 19.0	5 37 42.2	26 51.5	9.494 6899	33764
	25	106 52 53.7	6 3 59.9	11 14.8	6 2 22.8	22 28.1	9.498 4350	41012
	26	112 53 31.8	5 57 6.2	+ 9 41.9	+6 22 36.5	+17 59.1	9.502 8661	+47472
	27	118 46 47.6	5 49 17.0	7 46.4	6 38 21.6	13 31.8	9.507 9010	53080
	28	124 31 51.2	5 40 44.0	5 34.7	6 49 42.8	9 12.2	9.513 4528	57810
	29	130 8 4.7	5 31 38.6	3 13.6	6 56 50.4	5 5.4	9.519 4337	61664
	30	135 35 1.1	5 22 11.6	+ 0 49.3	6 59 59.1	+ 1 15.0	9.525 7575	64674
	31	140 52 24.3	5 12 33.6	− 1 32.5	+6 59 26.6	− 2 16.8	9.532 3421	+66890
Feb.	1	146 0 7.5	5 2 53.0	3 47.1	6 55 32.3	5 28.3	9.539 1111	68372
	2	150 58 12.0	4 53 17.4	5 50.7	6 48 36.8	8 19.4	9.545 9945	69192
	3	155 46 46.0	4 43 53.0	7 40.4	6 39 0.3	10 50.2	9.552 9298	69420
	4	160 26 3.4	4 34 44.8	9 14.4	6 27 2.8	13 1.6	9.559 8612	69128
	5	164 56 22.1	4 25 56.2	−10 31.6	+6 13 3.0	−14 55.0	9.566 7406	+68392
	6	169 18 3.4	4 17 30.3	11 31.6	5 57 18.3	16 31.6	9.573 5267	67272
	7	173 31 30.7	4 9 28.5	12 14.6	5 40 4.8	17 53.0	9.580 1842	65828
	8	177 37 8.8	4 1 52.0	12 41.0	5 21 36.9	19 0.6	9.586 6832	64110
	9	181 35 23.4	3 54 41.6	12 51.9	5 2 7.7	19 56.0	9.592 9989	62171
	10	185 26 40.5	3 47 57.0	−12 48.4	+4 41 48.5	−20 40.7	9.599 1114	+60052
	11	189 11 25.8	3 41 37.9	12 31.5	4 20 49.5	21 15.8	9.605 0044	57784
	12	192 50 4.6	3 35 44.0	12 2.8	3 59 19.6	21 42.8	9.610 6643	55398
	13	196 23 1.8	3 30 14.4	11 23.6	3 37 26.4	22 2.4	9.616 0809	52922
	14	199 50 41.3	3 25 8.4	10 35.2	3 15 16.8	22 15.9	9.621 2462	50374
	15	203 13 26.1	3 20 24.9	− 9 38.9	+2 52 56.4	−22 24.1	9.626 1539	+47774
	16	206 31 38.3	3 16 3.1	− 8 36.1	+2 30 30.3	−22 27.4	9.630 7999	+45140

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Feb.	16	206 31 38.3	3 16 3.1	− 8 36.1	+2 30 30.3	−22 27.4	9.630 7999	+45140
	17	209 45 39.2	3 12 2.1	7 27.9	2 8 2.9	22 26.8	9.635 1809	42476
	18	212 55 49.1	3 8 20.8	6 15.4	1 45 37.8	22 22.8	9.639 2946	39799
	19	216 2 27.2	3 4 58.5	4 59.8	1 23 18.3	22 15.8	9.643 1404	37114
	20	219 5 52.1	3 1 54.2	3 42.0	1 1 7.1	22 6.2	9.646 7172	34424
	21	222 6 21.4	2 59 7.2	− 2 23.0	+0 39 6.7	−21 54.3	9.650 0254	+31739
	22	225 4 12.0	2 56 36.7	− 1 3.5	+0 17 19.1	21 40.6	9.653 0652	29058
	23	227 59 40.1	2 54 22.0	+ 0 15.5	−0 4 13.9	21 25.1	9.655 8373	26385
	24	230 53 1.2	2 52 22.6	1 33.5	0 25 30.6	21 8.2	9.658 3425	23722
	25	233 44 30.2	2 50 37.8	2 49.6	0 46 29.7	20 49.8	9.660 5819	21068
	26	236 34 21.5	2 49 7.1	+ 4 3.4	−1 7 9.7	−20 30.2	9.662 5563	+18422
	27	239 22 49.0	2 47 50.2	5 14.2	1 27 29.6	20 9.4	9.664 2668	15790
	28	242 10 6.3	2 46 46.6	6 21.5	1 47 28.2	19 47.6	9.665 7145	13164
Mar.	1	244 56 26.5	2 45 56.0	7 24.8	2 7 4.4	19 24.6	9.666 8999	10546
	2	247 42 2.6	2 45 18.2	8 23.6	2 26 17.2	19 0.8	9.667 8240	7936
	3	250 27 7.0	2 44 52.7	+ 9 17.6	−2 45 5.6	−18 35.8	9.668 4872	+ 5330
	4	253 11 52.2	2 44 39.8	10 6.3	3 3 28.5	18 9.8	9.668 8902	2729
	5	255 56 30.6	2 44 39.0	10 49.4	3 21 24.8	17 42.6	9.669 0330	+ 128
	6	258 41 14.4	2 44 50.6	11 26.5	3 38 53.3	17 14.2	9.668 9159	− 2170
	7	261 26 15.8	2 45 14.2	11 57.3	3 55 52.9	16 44.8	9.668 5389	5072
	8	264 11 47.0	2 45 50.2	+12 21.5	−4 12 22.3	−16 13.8	9.667 9013	− 7678
	9	266 58 0.2	2 46 38.4	12 38.9	4 28 20.0	15 41.4	9.667 0031	10288
	10	269 45 8.0	2 47 39.2	12 49.3	4 43 44.5	15 7.3	9.665 8436	12904
	11	272 33 22.9	2 48 52.8	12 52.3	4 58 34.0	14 31.4	9.664 4220	15530
	12	275 22 57.8	2 50 19.2	12 47.9	5 12 46.7	13 53.6	9.662 7373	18163
	13	278 14 5.7	2 51 58.8	+12 35.9	−5 26 20.6	−13 13.5	9.660 7891	−20804
	14	281 7 0.0	2 53 52.1	12 16.2	5 39 13.4	12 31.4	9.658 5761	23458
	15	284 1 54.6	2 55 59.4	11 48.7	5 51 22.5	11 46.4	9.656 0972	26122
	16	286 59 3.7	2 58 21.2	11 13.4	6 2 45.2	10 58.6	9.653 3514	28793
	17	289 58 42.0	3 0 57.8	10 30.4	6 13 18.5	10 7.5	9.650 3383	31473
	18	293 1 4.6	3 3 50.0	+ 9 39.7	−6 22 59.0	− 9 12.9	9.647 0566	−34160
	19	296 6 27.4	3 6 58.3	8 41.6	6 31 43.0	8 14.4	9.643 5063	36849
	20	299 15 6.8	3 10 23.3	7 36.3	6 39 26.4	7 11.7	9.639 6869	39536
	21	302 27 19.8	3 14 5.6	6 24.1	6 46 4.8	6 4.3	9.635 5995	42213
	22	305 43 24.1	3 18 6.0	5 5.6	6 51 33.3	4 51.8	9.631 2447	44879
	23	309 3 38.2	3 22 25.3	+ 3 41.4	−6 55 46.6	− 3 33.8	9.626 6246	−47518
	24	312 28 21.2	3 27 4.0	2 12.3	6 58 38.9	2 9.8	9.621 7423	50121
	25	315 57 52.9	3 32 2.8	+ 0 39.1	7 0 3.9	− 0 39.1	9.616 6021	52674
	26	319 32 33.9	3 37 22.7	− 0 56.9	6 59 54.8	+ 0 58.4	9.611 2098	55158
	27	323 12 45.4	3 43 3.9	2 34.5	6 58 4.5	2 43.4	9.605 5734	57555
	28	326 58 49.0	3 49 7.0	− 4 12.0	−6 54 25.3	+ 4 36.4	9.599 7026	−59838
	29	330 51 6.9	3 55 32.6	5 47.8	6 48 49.0	6 37.6	9.593 6106	61975
	30	334 50 1.8	4 2 20.8	7 19.7	6 41 7.3	8 47.2	9.587 3136	63933
	31	338 55 56.0	4 9 31.3	8 45.5	6 31 11.6	11 5.7	9.580 8313	65673
Apr.	1	343 9 11.8	4 17 4.0	10 2.7	6 18 53.1	13 32.7	9.574 1879	67146
	2	347 30 11.1	4 24 58.0	−11 8.7	−6 4 3.5	+16 8.0	9.567 4127	−68302
	3	351 59 14.5	4 33 12.0	−12 0.7	−5 46 34.7	+18 50.8	9.560 5402	−69080

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Apr.	1	343 9 11.8	4 17 4.0	−10 2.7	−6 18 53.1	+13 32.7	9.574 1879	−67146
	2	347 30 11.1	4 24 58.0	11 8.7	6 4 3.5	16 8.0	9.567 4127	68302
	3	351 59 14.5	4 33 12.0	12 0.7	5 46 34.7	18 50.8	9.560 5402	69080
	4	356 36 41.0	4 41 43.8	12 35.9	5 26 19.6	21 40.4	9.553 6113	69418
	5	1 22 47.3	4 50 31.0	12 51.7	5 3 12.3	24 34.8	9.546 6737	69245
	6	6 17 47.0	4 59 30.0	−12 45.7	−4 37 9.0	+27 32.0	9.539 7818	−68488
	7	11 21 49.8	5 8 36.4	12 15.9	4 8 8.2	30 29.2	9.532 9980	67073
	8	16 35 0.3	5 17 44.4	11 21.1	3 36 11.7	33 22.9	9.526 3914	64932
	9	21 57 16.9	5 26 47.4	10 1.1	3 1 25.1	36 8.5	9.520 0378	62004
	10	27 28 30.9	5 35 37.8	8 16.8	2 23 58.9	38 41.4	9.514 0186	58235
	11	33 8 25.2	5 44 6.6	− 6 10.5	−1 44 8.6	+40 55.6	9.508 4200	−53592
	12	38 56 33.3	5 52 3.7	3 46.1	1 2 15.7	42 45.6	9.503 3297	48068
	13	44 52 18.6	5 59 19.0	− 1 8.9	−0 18 47.3	44 5.7	9.498 8349	41688
	14	50 54 53.8	6 5 41.8	+ 1 34.3	+0 25 43.8	44 50.2	9.495 0186	34512
	15	57 3 21.2	6 11 1.7	4 15.8	1 10 39.8	44 55.0	9.491 9556	26640
	16	63 16 33.0	6 15 9.0	+ 6 47.2	+1 55 19.4	+44 16.9	9.489 7095	−18200
	17	69 33 12.2	6 17 55.5	9 0.5	2 38 58.9	42 54.7	9.488 3291	9358
	18	75 51 55.0	6 19 15.2	10 48.2	3 20 54.5	40 49.5	9.487 8448	− 309
	19	82 11 12.4	6 19 4.4	12 4.5	4 0 24.5	38 4.1	9.488 2676	+ 8750
	20	88 29 33.5	6 17 22.7	12 45.5	4 36 50.9	34 43.4	9.489 5883	17612
	21	94 45 28.2	6 14 12.3	+12 49.6	+5 9 41.7	+30 54.0	9.491 7770	+26084
	22	100 57 30.2	6 9 38.4	12 17.5	5 38 31.9	26 43.6	9.494 7866	34002
	23	107 4 19.8	6 3 48.8	11 12.3	6 3 4.4	22 19.9	9.498 5542	41226
	24	113 4 45.8	5 56 53.1	9 38.7	6 23 9.9	17 50.8	9.503 0055	47662
	25	118 57 47.7	5 49 2.4	7 42.5	6 38 46.7	13 23.6	9.508 0581	53244
	26	124 42 36.1	5 40 28.1	+ 5 30.5	+6 49 59.8	+ 9 4.4	9.513 6249	+57947
	27	130 18 33.2	5 31 21.8	3 9.1	6 56 59.8	4 58.0	9.519 6183	61776
	28	135 45 12.6	5 21 54.4	+ 0 44.8	7 0 1.3	+ 1 8.0	9.525 9519	64761
	29	141 2 18.3	5 12 16.0	− 1 36.9	6 59 22.2	− 2 23.0	9.532 5440	66953
	30	146 9 43.8	5 2 35.4	3 51.2	6 55 22.0	5 33.9	9.539 3180	68412
May	1	151 7 30.8	4 53 0.0	− 5 54.3	+6 48 21.2	− 8 24.4	9.546 2044	+69212
	2	155 55 47.6	4 43 36.0	7 43.6	6 38 40.0	10 54.6	9.553 1407	69423
	3	160 34 48.2	4 34 28.2	9 17.1	6 26 38.4	13 5.5	9.560 0718	69118
	4	165 4 50.7	4 25 40.4	10 33.8	6 12 35.0	14 58.4	9.566 9494	68367
	5	169 26 16.5	4 17 15.0	11 33.2	5 56 47.3	16 34.4	9.573 7325	67237
	6	173 39 28.9	4 9 14.0	−12 15.6	+5 39 31.2	−17 55.4	9.580 3860	+65782
	7	177 44 53.0	4 1 38.4	12 41.6	5 21 1.2	19 2.5	9.586 8800	64058
	8	181 42 54.3	3 54 28.6	12 52.0	5 1 30.2	19 57.6	9.593 1902	62114
	9	185 33 58.9	3 47 44.8	12 48.0	4 41 9.6	20 42.0	9.599 2966	59986
	10	189 18 32.4	3 41 26.5	12 30.8	4 20 9.5	21 16.8	9.605 1825	57714
	11	192 57 0.3	3 35 33.4	−12 1.8	+3 58 38.7	−21 43.4	9.610 8354	+55326
	12	196 29 47.3	3 30 4.6	11 22.2	3 36 45.0	22 3.0	9.616 2446	52845
	13	199 57 17.2	3 24 59.2	10 33.5	3 14 34.9	22 16.2	9.621 4021	50296
	14	203 19 53.2	3 20 16.4	9 37.0	2 52 14.3	22 24.2	9.626 3020	47696
	15	206 37 57.2	3 15 55.2	8 34.0	2 29 48.1	22 27.4	9.630 9401	45060
	16	209 51 50.6	3 11 54.9	− 7 25.7	+2 7 20.7	−22 26.8	9.635 3130	+42396
	17	213 1 53.6	3 8 14.2	− 6 13.1	+1 44 55.7	−22 22.6	9.639 4188	+39716

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
May	17	213 1 53.6	3 8 14.2	− 6 13.1	+1 44 55.7	−22 22.6	9.639 4188	+39716
	18	216 8 25.4	3 4 52.4	4 57.4	1 22 36.4	22 15.4	9.643 2561	37032
	19	219 11 44.5	3 1 48.6	3 39.6	1 0 25.6	22 5.8	9.646 8250	34343
	20	222 12 8.5	2 59 2.2	2 20.5	0 38 25.5	21 54.0	9.650 1247	31655
	21	225 9 54.4	2 56 32.2	− 1 1.0	+0 16 38.3	21 40.2	9.653 1562	28976
	22	228 5 18.2	2 54 18.0	+ 0 18.0	−0 4 54.2	−21 24.6	9.655 9200	+26303
	23	230 58 35.5	2 52 19.0	1 35.9	0 26 10.4	21 7.5	9.658 4171	23638
	24	233 50 1.2	2 50 34.7	2 52.0	0 47 8.8	20 49.2	9.660 6481	20985
	25	236 39 49.6	2 49 4.4	4 5.7	1 7 48.3	20 29.5	9.662 6145	18343
	26	239 28 14.7	2 47 48.0	5 16.4	1 28 7.5	20 8.7	9.664 3170	15708
	27	242 15 29.9	2 46 44.7	+ 6 23.6	−1 48 5.4	−19 46.9	9.665 7565	+13084
	28	245 1 48.5	2 45 54.6	7 26.7	2 7 40.9	19 23.9	9.666 9340	10466
	29	247 47 23.3	2 45 17.0	8 25.4	2 26 52.9	19 0.0	9.667 8500	7856
	30	250 32 26.8	2 44 52.1	9 19.2	2 45 40.5	18 35.0	9.668 5053	5250
	31	253 17 11.6	2 44 39.5	10 7.8	3 4 2.6	18 9.0	9.668 9001	2618
June	1	256 1 49.9	2 44 39.2	+10 50.6	−3 21 58.0	−17 41.8	9.669 0349	+ 48
	2	258 46 34.0	2 44 51.0	11 27.5	3 39 25.7	17 13.4	9.668 9097	− 2552
	3	261 31 36.0	2 45 15.0	11 58.1	3 56 24.4	16 43.7	9.668 5245	5154
	4	264 17 8.2	2 45 51.1	12 22.2	4 12 52.7	16 12.8	9.667 8789	7758
	5	267 3 22.9	2 46 40.0	12 39.4	4 28 49.4	15 40.4	9.666 9726	10369
	6	269 50 32.5	2 47 41.2	+12 49.5	−4 44 12.8	−15 6.2	9.665 8049	−12985
	7	272 38 49.6	2 48 55.2	12 52.3	4 59 1.2	14 30.4	9.664 3753	15610
	8	275 28 27.1	2 50 22.0	12 47.7	5 13 12.8	13 52.4	9.662 6826	18244
	9	278 19 37.9	2 52 2.0	12 35.4	5 26 45.4	13 12.4	9.660 7261	20888
	10	281 12 35.7	2 53 55.8	12 15.5	5 39 36.8	12 30.0	9.658 5048	23540
	11	284 7 34.1	2 56 3.4	+11 47.7	−5 51 44.5	−11 45.0	9.656 0177	−26204
	12	287 4 47.5	2 58 25.7	11 12.2	6 3 5.7	10 57.0	9.653 2637	28877
	13	290 4 30.5	3 1 2.8	10 29.0	6 13 37.4	10 5.8	9.650 2421	31556
	14	293 6 58.4	3 3 55.6	9 38.0	6 23 16.2	9 11.2	9.646 9523	34242
	15	296 12 27.0	3 7 4.3	8 39.7	6 31 58.4	8 12.5	9.643 3936	36932
	16	299 21 12.6	3 10 29.8	+ 7 34.1	−6 39 39.8	− 7 9.6	9.639 5661	−39619
	17	302 33 32.4	3 14 12.8	6 21.8	6 46 16.1	6 2.2	9.635 4701	42298
	18	305 49 44.1	3 18 13.8	5 3.1	6 51 42.4	4 49.4	9.631 1070	44960
	19	309 10 6.2	3 22 33.6	3 38.7	6 55 53.2	3 31.2	9.626 4788	47599
	20	312 34 57.7	3 27 12.8	2 9.4	6 58 42.9	2 7.0	9.621 5884	50203
	21	316 4 38.6	3 32 12.3	+ 0 36.2	−7 0 5.1	− 0 36.2	9.616 4400	−52754
	22	319 39 29.3	3 37 32.7	− 0 59.9	6 59 53.0	+ 1 1.6	9.611 0400	55236
	23	323 19 51.2	3 43 14.7	2 37.5	6 57 59.4	2 46.9	9.605 3959	57629
	24	327 6 6.0	3 49 18.6	4 15.1	6 54 16.6	4 40.0	9.599 5181	59906
	25	330 58 35.8	3 55 44.8	5 50.7	6 48 36.6	6 41.4	9.593 4195	62038
	26	334 57 43.2	4 2 33.6	− 7 22.5	−6 40 50.9	+ 8 51.4	9.587 1164	−63992
	27	339 3 50.6	4 9 45.0	8 48.0	6 30 50.9	11 10.0	9.580 6286	65725
	28	343 17 20.5	4 17 18.4	10 5.0	6 18 27.9	13 37.4	9.573 9804	67189
	29	347 38 34.4	4 [redacted] 12.9	11 10.5	6 3 33.4	16 12.9	9.567 2015	68333
	30	352 7 53.0	4 33 27.5	12 2.1	5 45 59.6	18 56.0	9.560 3264	69100
July	1	356 45 35.3	4 41 59.9	−12 36.7	−5 25 39.2	+21 45.7	9.553 3964	−69422
	2	1 31 57.9	4 50 47.6	−12 51.9	−5 2 26.6	+24 40.2	9.546 4590	−69234

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
July	1	356 45 35.3	4 41 59.9	−12 36.7	−5 25 39.2	+21 45.7	9.553 3964	−69422
	2	1 31 57.9	4 50 47.6	12 51.9	5 2 26.6	24 40.2	9.546 4590	69231
	3	6 27 14.3	4 59 46.8	12 45.1	4 36 17.8	27 37.6	9.539 5693	68457
	4	11 31 34.0	5 8 53.4	12 14.5	4 7 11.5	30 34.8	9.532 7896	67022
	5	16 45 1.5	5 18 1.4	11 19.0	3 35 9.6	33 28.2	9.526 1893	64858
	6	22 7 35.0	5 27 4.2	− 9 58.2	−3 0 17.9	+36 13.6	9.519 8445	−61904
	7	27 39 5.5	5 35 54.0	8 13.2	2 22 46.9	38 45.8	9.513 8367	58106
	8	33 19 15.7	5 44 21.9	6 6.3	1 42 52.5	40 59.4	9.508 2524	53435
	9	39 7 38.7	5 52 18.0	3 41.4	1 0 56.2	42 48.6	9.503 1790	47886
	10	45 3 37.6	5 59 31.9	− 1 3.9	−0 17 25.3	44 7.6	9.498 7037	41480
	11	51 6 24.9	6 5 53.0	+ 1 39.4	+0 27 7.2	+44 51.0	9.494 9093	−34282
	12	57 15 2.5	6 11 10.8	4 20.6	1 12 3.5	44 54.5	9.491 8705	26388
	13	63 28 22.1	6 15 15.6	6 51.7	1 56 41.9	44 15.0	9.489 6505	17932
	14	69 45 6.8	6 17 59.6	9 4.3	2 40 18.8	42 51.5	9.488 2973	9081
	15	76 3 52.3	6 19 16.5	10 51.1	3 22 10.6	40 45.0	9.487 8411	− 26
	16	82 23 9.6	6 19 3.0	+12 6.3	+4 1 35.4	+37 58.4	9.488 2921	+ 9027
	17	88 41 27.8	6 17 18.4	12 46.2	4 37 55.6	34 36.7	9.489 6398	17878
	18	94 57 16.9	6 14 5.4	12 49.1	5 10 39.3	30 46.5	9.491 8548	26340
	19	101 9 10.7	6 9 29.0	12 16.0	5 39 21.7	26 35.5	9.494 8890	34238
	20	107 15 49.7	6 3 37.2	11 9.8	6 3 46.0	22 11.6	9.498 6792	41441
	21	113 16 3.1	5 56 39.6	+ 9 35.4	+6 23 43.1	+17 42.4	9.503 1507	+47850
	22	119 8 50.6	5 48 47.2	7 38.6	6 39 11.6	13 15.4	9.508 2206	53104
	23	124 53 23.2	5 40 11.8	5 26.2	6 50 16.7	8 56.6	9.513 8021	58081
	24	130 29 3.5	5 31 4.6	3 4.6	6 57 9.0	4 50.6	9.519 8076	61883
	25	135 55 25.5	5 21 36.7	+ 0 40.3	7 0 3.4	+ 1 1.2	9.526 1506	64842
	26	141 12 13.4	5 11 58.1	− 1 41.2	+6 59 17.7	− 2 29.4	9.532 7496	+67010
	27	146 19 21.1	5 2 17.6	3 55.2	6 55 11.5	5 39.6	9.539 5283	68448
	28	151 16 50.3	4 52 42.4	5 57.9	6 48 5.3	8 29.4	9.546 4174	69230
	29	156 4 49.7	4 43 18.8	7 46.7	6 38 19.5	10 59.0	9.553 3547	69424
	30	160 43 33.4	4 34 11.6	9 19.7	6 26 13.7	13 9.4	9.560 2851	69103
	31	165 13 19.6	4 25 24.4	−10 35.9	+6 12 6.8	−15 1.6	9.567 1605	+68338
Aug.	1	169 34 29.7	4 16 59.8	11 34.8	5 56 16.1	16 37.2	9.573 9402	67197
	2	173 47 27.3	4 8 59.6	12 16.7	5 38 57.5	17 57.6	9.580 5892	65734
	3	177 52 37.2	4 1 24.6	12 42.2	5 20 25.4	19 4.4	9.587 0781	64002
	4	181 50 25.2	3 54 15.8	12 52.1	5 0 52.7	19 59.2	9.593 3823	62050
	5	185 41 17.3	3 47 32.7	−12 47.8	+4 40 30.7	−20 43.2	9.599 4822	+59919
	6	189 25 39.1	3 41 15.2	12 30.1	4 19 29.5	21 17.8	9.605 3612	57642
	7	193 3 56.0	3 35 22.8	12 0.7	3 57 57.9	21 44.2	9.611 0067	55250
	8	196 36 32.7	3 29 54.6	11 20.8	3 36 3.5	22 3.5	9.616 4083	52769
	9	200 3 53.1	3 24 50.0	10 31.9	3 13 53.0	22 16.6	9.621 5582	50218
	10	203 26 20.3	3 20 8.0	− 9 35.2	+2 51 32.1	−22 21.4	9.626 4502	+47615
	11	206 44 16.2	3 15 47.4	8 31.9	2 29 5.8	22 27.5	9.631 0800	44976
	12	209 58 2.1	3 11 47.7	7 23.4	2 6 38.4	22 26.6	9.635 4446	42314
	13	213 7 58.2	3 8 7.6	6 10.8	1 44 13.6	22 22.4	9.639 5422	39635
	14	216 14 23.7	3 4 46.4	4 55.0	1 21 54.5	22 15.2	9.643 3713	36948
	15	219 17 37.0	3 1 43.2	− 3 37.1	+0 59 44.0	−22 5.4	9.646 9318	+34260
	16	222 17 55.9	2 58 57.2	− 2 18.0	+0 37 44.3	−21 53.6	9.650 2233	+31572

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Aug.	16	222 17 55.9	2 58 57.2	− 2 18.0	+0 37 44.3	−21 53.6	9.650 2233	+31572
	17	225 15 37.0	2 56 27.8	− 0 58.6	+0 15 57.5	21 39.7	9.653 2465	28893
	18	228 10 56.7	2 54 14.1	+ 0 20.5	−0 5 34.5	21 24.1	9.656 0021	26220
	19	231 4 10.2	2 52 15.5	1 38.3	0 26 50.2	21 7.0	9.658 4909	23557
	20	233 55 32.6	2 50 31.6	2 54.4	0 47 48.1	20 48.6	9.660 7138	20903
	21	236 45 18.2	2 49 1.8	+ 4 8.0	−1 8 26.9	−20 28.8	9.662 6719	+18260
	22	239 33 40.9	2 47 45.8	5 18.6	1 28 45.4	20 8.0	9.664 3662	15626
	23	242 20 54.2	2 46 43.0	6 25.6	1 48 42.6	19 46.2	9.665 7975	13002
	24	245 7 11.2	2 45 53.1	7 28.6	2 8 17.4	19 23.2	9.666 9668	10384
	25	247 52 44.7	2 45 16.0	8 27.2	2 27 28.7	18 59.2	9.667 8746	7774
	26	250 37 47.5	2 44 51.5	+ 9 20.8	−2 46 15.5	−18 34.2	9.668 5217	+ 5168
	27	253 22 31.8	2 44 39.2	10 9.2	3 4 36.7	18 8.1	9.668 9084	+ 2566
	28	256 7 10.0	2 44 39.4	10 51.9	3 22 31.3	17 40.9	9.669 0351	− 32
	29	258 51 54.5	2 44 51.6	11 28.6	3 39 58.1	17 12.4	9.668 9020	2632
	30	261 36 57.2	2 45 16.0	11 59.0	3 56 55.8	16 42.8	9.668 5086	5235
	31	264 22 30.5	2 45 52.7	+12 22.8	−4 13 23.2	−16 11.8	9.667 8549	− 7840
Sept.	1	267 8 46.7	2 46 41.8	12 39.8	4 29 18.9	15 39.3	9.666 9405	10150
	2	269 55 58.2	2 47 43.4	12 49.7	4 44 41.2	15 5.1	9.665 7646	13068
	3	272 44 17.6	2 48 57.6	12 52.3	4 59 28.5	14 29.1	9.664 3267	15692
	4	275 33 57.7	2 50 24.8	12 47.4	5 13 38.8	13 51.2	9.662 6259	18326
	5	278 25 11.7	2 52 5.4	+12 34.9	−5 27 10.2	−13 11.2	9.660 6612	−20970
	6	281 18 13.0	2 53 59.6	12 14.7	5 40 0.3	12 28.6	9.658 4316	23624
	7	284 13 15.5	2 56 7.8	11 46.7	5 52 6.6	11 43.5	9.655 9360	26288
	8	287 10 33.3	2 58 30.4	11 11.0	6 3 26.3	10 55.4	9.653 1737	28960
	9	290 10 21.2	3 1 8.0	10 27.5	6 13 56.4	10 4.2	9.650 1437	31640
	10	293 12 54.5	3 4 1.2	+ 9 36.3	−6 23 33.5	− 9 9.4	9.646 8454	−34327
	11	296 18 29.0	3 7 10.4	8 37.7	6 32 13.8	8 10.6	9.643 2782	37016
	12	299 27 21.0	3 10 36.5	7 32.0	6 39 53.3	7 7.6	9.639 4423	39702
	13	302 39 47.8	3 14 20.0	6 19.4	6 46 27.5	5 59.9	9.635 3380	42382
	14	305 56 7.0	3 18 21.5	5 0.5	6 51 51.4	4 47.0	9.630 9666	45044
	15	309 16 37.1	3 22 42.0	+ 3 36.0	−6 55 59.8	− 3 28.7	9.626 3301	−47682
	16	312 41 37.4	3 27 21.8	2 6.6	6 58 46.8	2 4.2	9.621 4315	50284
	17	316 11 27.6	3 32 22.0	+ 0 33.2	7 0 6.1	− 0 33.3	9.616 2752	52832
	18	319 46 28.5	3 37 43.2	− 1 3.0	6 59 51.0	+ 1 4.8	9.610 8675	55312
	19	323 27 1.1	3 43 25.6	2 40.6	6 57 54.1	2 50.3	9.605 2158	57702
	20	327 13 27.2	3 49 30.2	− 4 18.1	−6 54 7.8	+ 4 43.6	9.599 3310	−59975
	21	331 6 9.1	3 55 57.3	5 53.7	6 48 24.0	6 45.4	9.593 2257	62103
	22	335 5 29.3	4 2 46.8	7 25.3	6 40 34.2	8 55.6	9.586 9165	64048
	23	339 11 50.2	4 9 58.8	8 50.6	6 30 29.8	11 14.6	9.580 4234	65774
	24	343 25 34.3	4 17 32.9	10 7.2	6 18 2.2	13 42.0	9.573 7707	67230
	25	347 47 3.0	4 25 28.1	−11 12.4	−6 3 2.9	+16 17.9	9.566 9882	−68363
	26	352 16 37.1	4 33 43.2	12 3.4	5 45 23.9	19 1.2	9.560 1108	69117
	27	356 54 35.3	4 42 16.1	12 37.5	5 24 58.3	21 51.0	9.553 1797	69425
	28	1 41 14.4	4 51 4.3	12 52.0	5 1 40.2	24 45.8	9.546 2430	69216
	29	6 36 47.7	5 0 3.8	12 44.5	4 35 25.8	27 43.2	9.539 3560	68420
	30	11 41 24.4	5 9 10.4	−12 13.2	−4 6 14.0	+30 40.2	9.532 5811	−66964
Oct.	1	16 55 9.0	5 18 18.4	−11 16.8	−3 34 6.6	+33 33.5	9.525 9876	−64778

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Oct.	1	16 55 9.0	5 18 18.4	−11 16.8	−3 34 6.6	+33 33.5	9.525 9876	−64778
	2	22 17 59.5	5 27 21.0	9 55.3	2 59 9.8	36 18.4	9.519 6521	61796
	3	27 49 46.5	5 36 10.1	8 9.5	2 21 34.1	38 50.3	9.513 6564	57972
	4	33 30 12.4	5 44 37.0	6 2.0	1 41 35.5	41 3.2	9.508 0868	53274
	5	39 18 50.2	5 52 32.2	3 36.6	0 59 35.8	42 51.6	9.503 0309	47696
	6	45 15 2.5	5 59 44.6	− 0 58.8	−0 16 2.5	+44 9.6	9.498 5759	−41266
	7	51 18 1.6	6 6 3.8	+ 1 44.5	+0 28 31.4	44 51.8	9.494 8040	34045
	8	57 26 48.9	6 11 19.4	4 25.6	1 13 27.7	44 53.8	9.491 7900	26130
	9	63 40 16.0	6 15 21.9	6 56.1	1 58 4.8	44 13.0	9.489 5965	17659
	10	69 57 5.6	6 18 3.2	9 8.0	2 41 39.1	42 48.2	9.488 2711	− 8800
	11	76 15 53.3	6 19 17.3	+10 54.0	+3 23 26.9	+40 40.4	9.487 8430	+ 256
	12	82 35 10.0	6 19 0.8	12 8.1	4 2 46.5	37 52.5	9.488 3221	9308
	13	88 53 24.7	6 17 13.6	12 46.8	4 39 0.3	34 29.9	9.489 6977	18152
	14	95 9 7.6	6 13 57.9	12 48.6	5 11 36.8	30 39.0	9.491 9390	26595
	15	101 20 52.7	6 9 19.0	12 14.4	5 40 11.4	26 27.4	9.494 9978	31473
	16	107 27 20.5	6 3 24.9	+11 7.2	+6 4 27.4	+22 3.2	9.498 8103	+41651
	17	113 27 20.7	5 56 25.4	9 32.0	6 24 16.1	17 34.0	9.503 3015	48034
	18	119 19 53.3	5 48 31.7	7 34.7	6 39 36.3	13 7.2	9.508 3887	53563
	19	125 4 9.8	5 39 55.0	5 21.8	6 50 33.3	8 48.6	9.513 9847	58212
	20	130 39 32.9	5 30 47.0	3 0.1	6 57 17.9	4 43.2	9.520 0018	61986
	21	136 5 37.1	5 21 18.8	+ 0 35.8	+7 0 5.2	+ 0 54.4	9.526 3539	+64920
	22	141 22 6.9	5 11 39.9	− 1 45.5	6 59 13.0	− 2 35.4	9.532 9595	67066
	23	146 28 56.4	5 1 59.4	3 59.2	6 55 0.9	5 45.2	9.539 7427	68482
	24	151 26 7.7	4 52 24.6	6 1.6	6 47 49.4	8 34.4	9.546 6340	69242
	25	156 13 49.5	4 43 1.4	7 49.9	6 37 58.9	11 3.4	9.553 5716	69420
	26	160 52 16.1	4 33 54.8	− 9 22.4	+6 25 49.1	−13 13.1	9.560 5008	+69086
	27	165 21 45.9	4 25 8.3	10 38.0	6 11 38.7	15 4.8	9.567 3739	68308
	28	169 42 40.3	4 16 44.4	11 36.4	5 55 45.0	16 39.9	9.574 1498	67151
	29	173 55 22.9	4 8 45.0	12 17.8	5 38 23.9	17 59.9	9.580 7941	65682
	30	178 0 18.7	4 1 11.0	12 42.7	5 19 49.7	19 6.3	9.587 2774	63945
	31	181 57 53.4	3 54 2.8	−12 52.2	+5 0 15.3	−20 0.7	9.593 5757	+61986
Nov.	1	185 48 32.9	3 47 20.6	12 47.3	4 39 51.9	20 44.4	9.599 6687	59849
	2	189 32 43.0	3 41 3.8	12 29.3	4 18 49.6	21 18.7	9.605 5407	57568
	3	193 10 48.9	3 35 12.2	11 59.6	3 57 17.2	21 44.9	9.611 1786	55174
	4	196 43 15.4	3 29 44.8	11 19.4	3 35 22.2	22 4.0	9.616 5724	52690
	5	200 10 26.4	3 24 41.0	−10 30.2	+3 13 11.3	−22 16.9	9.621 7142	+50137
	6	203 32 44.8	3 19 59.6	9 33.3	2 50 50.2	22 24.5	9.626 5981	47533
	7	206 50 32.7	3 15 39.8	8 29.9	2 28 23.8	22 27.6	9.631 2196	44894
	8	210 4 11.2	3 11 40.6	7 21.2	2 5 56.4	22 26.6	9.635 5760	42231
	9	213 14 0.4	3 8 1.1	6 8.4	1 43 31.7	22 22.2	9.639 6652	39550
	10	216 20 19.7	3 4 40.5	− 4 52.6	+1 21 12.9	−22 15.0	9.643 4858	+36864
	11	219 23 27.4	3 1 37.8	3 34.6	0 59 2.6	22 5.2	9.647 0379	34176
	12	222 23 41.1	2 58 52.4	2 15.5	0 37 3.3	21 53.1	9.650 3211	31490
	13	225 21 17.7	2 56 23.4	− 0 56.1	+0 15 17.0	21 39.2	9.653 3360	28810
	14	228 16 33.2	2 54 10.2	+ 0 22.9	−0 6 14.6	21 23.6	9.656 0832	26136
	15	231 9 43.1	2 52 12.0	+ 1 40.7	−0 27 29.7	−21 6.4	9.658 5636	+23474
	16	234 1 2.2	2 50 28.6	+ 2 56.7	−0 48 27.0	−20 48.0	9.660 7783	+20822

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Nov.	16	234 1 2.2	2 50 28.6	+ 2 56.7	−0 48 27.0	−20 48.0	9.660 7783	+20822
	17	236 50 45.1	2 18 59.4	4 10.2	1 9 5.2	20 28.2	9.662 7282	18178
	18	239 39 5.5	2 47 13.6	5 20.7	1 29 23.1	20 7.4	9.664 4142	15514
	19	242 26 16.8	2 46 41.2	6 27.6	1 49 19.6	19 45.5	9.665 8374	12921
	20	245 12 32.3	2 45 51.8	7 30.5	2 8 53.7	19 22.6	9.666 9986	10304
	21	247 58 4.7	2 45 15.1	+ 8 28.9	−2 28 4.3	−18 58.5	9.667 8983	+ 7693
	22	250 43 6.7	2 44 51.0	9 22.4	2 46 50.3	18 33.4	9.668 5374	5089
	23	253 27 50.8	2 44 39.2	10 10.6	3 5 10.7	18 7.2	9.668 9162	+ 2486
	24	256 12 29.1	2 44 39.5	10 53.1	3 23 4.4	17 40.0	9.669 0348	− 114
	25	258 57 13.9	2 44 52.2	11 29.6	3 40 30.4	17 11.6	9.668 8935	2713
	26	261 42 17.5	2 45 17.0	+11 59.8	−3 57 27.2	−16 41.8	9.668 4921	− 5316
	27	264 27 52.0	2 45 54.1	12 23.4	4 13 53.6	16 10.8	9.667 8302	7922
	28	267 14 9.8	2 46 43.5	12 40.2	4 29 48.3	15 38.2	9.666 9077	10530
	29	270 1 23.2	2 47 45.1	12 49.9	4 45 9.5	15 4.0	9.665 7239	13148
	30	272 49 44.9	2 49 0.2	12 52.2	4 59 55.6	14 28.0	9.664 2779	15774
Dec.	1	275 39 27.8	2 50 27.8	+12 47.1	−5 14 4.8	−13 50.0	9.662 5689	−18408
	2	278 30 45.0	2 52 8.8	12 34.4	5 27 34.9	13 9.8	9.660 5961	21051
	3	281 23 49.9	2 54 3.3	12 14.0	5 40 23.7	12 27.3	9.658 3584	23704
	4	284 18 56.3	2 56 11.8	11 45.7	5 52 28.6	11 42.0	9.655 8549	26368
	5	287 16 18.5	2 58 35.0	11 9.7	6 3 46.8	10 53.9	9.653 0845	29042
	6	290 16 11.4	3 1 13.2	+10 26.0	−6 14 15.3	−10 2.5	9.650 0462	−31723
	7	293 18 50.0	3 4 6.8	9 34.6	6 23 50.6	9 7.6	9.646 7397	34410
	8	296 24 30.3	3 7 16.6	8 35.8	6 32 29.1	8 8.7	9.643 1642	37098
	9	299 33 28.8	3 10 43.2	7 29.8	6 40 6.6	7 5.6	9.639 3201	39783
	10	302 46 2.5	3 14 27.2	6 17.0	6 46 38.7	5 57.8	9.635 2078	42461
	11	306 2 29.2	3 18 29.3	+ 4 58.0	−6 52 0.4	− 4 44.7	9.630 8284	−45123
	12	309 23 7.4	3 22 50.3	3 33.3	6 56 6.3	3 26.2	9.626 1840	47760
	13	312 48 16.3	3 27 30.8	2 3.7	6 58 50.7	2 1.6	9.621 2776	50360
	14	316 18 15.7	3 32 31.6	+ 0 30.2	7 0 7.2	− 0 30.4	9.616 1139	52906
	15	319 53 26.4	3 37 53.3	− 1 6.0	6 59 49.0	+ 1 8.0	9.610 6988	55384
	16	323 34 9.5	3 43 36.5	− 2 43.6	−6 57 48.8	+ 2 53.7	9.605 0402	−57772
	17	327 20 46.8	3 49 41.8	4 21.1	6 53 59.0	4 47.4	9.599 1485	60040
	18	331 13 40.6	3 56 9.4	5 56.6	6 48 11.3	6 49.4	9.593 0371	62162
	19	335 13 13.2	4 2 59.6	7 28.0	6 40 17.5	8 59.8	9.586 7222	64101
	20	339 19 47.3	4 10 12.4	8 53.1	6 30 8.8	11 19.0	9.580 2243	65819
	21	343 33 45.2	4 17 47.0	−10 9.4	−6 17 36.6	+13 46.8	9.573 5674	−67268
	22	347 55 28.3	4 25 42.7	11 14.2	6 2 32.4	16 22.8	9.566 7817	68389
	23	352 25 17.3	4 33 58.4	12 4.8	5 44 48.4	19 6.4	9.559 9024	69128
	24	357 3 31.1	4 42 31.8	12 38.3	5 24 17.5	21 56.4	9.552 9709	69422
	25	1 50 26.1	4 51 20.4	12 52.1	5 0 54.0	24 51.2	9.546 0353	69197
	26	6 46 15.6	5 0 20.2	−12 43.9	−4 34 34.2	+27 48.6	9.539 1512	−68382
	27	11 51 8.7	5 9 26.8	12 11.8	4 5 17.0	30 45.6	9.532 3810	66905
	28	17 5 9.7	5 18 34.8	11 14.7	3 33 4.4	33 38.6	9.525 7947	64694
	29	22 28 16.3	5 27 37.0	9 52.4	2 58 2.5	36 23.4	9.519 4687	61690
	30	28 0 19.1	5 36 25.6	8 5.9	2 20 22.2	38 54.6	9.513 4851	57838
	31	33 41 0.0	5 44 51.8	− 5 57.7	−1 40 19.6	+41 6.9	9.507 9303	−53114
	32	39 29 51.8	.....	− 3 31.9	−0 58 16.6	.....	9.502 8917	....

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	15 53 6.99	+ 5.712	−15 57 21.0	−10.75	9.624 5884	+2923.8	19.96	20.89	21 11.2
2	15 55 26.95	5.950	16 1 54.2	11.99	9.631 5829	2904.7	19.64	20.55	21 9.7
3	15 57 52.55	6.182	16 6 56.0	13.14	9.638 5298	2884.1	19.33	20.23	21 8.3
4	16 0 23.61	6.406	16 12 24.4	14.20	9.645 4258	2862.4	19.03	19.91	21 6.9
5	16 2 59.96	6.622	16 18 17.0	15.17	9.652 2683	2839.5	18.73	19.60	21 5.7
6	16 5 41.43	+ 6.832	−16 24 31.8	−16.05	9.659 0545	+2815.5	18.44	19.29	21 4.5
7	16 8 27.85	7.035	16 31 6.7	16.84	9.665 7821	2790.7	18.16	19.00	21 3.4
8	16 11 19.07	7.232	16 37 59.5	17.55	9.672 4491	2765.1	17.88	18.71	21 2.4
9	16 14 14.94	7.422	16 45 8.3	18.17	9.679 0539	2738.9	17.61	18.43	21 1.4
10	16 17 15.30	7.606	16 52 31.0	18.71	9.685 5952	2712.2	17.35	18.15	21 0.6
11	16 20 20.00	+ 7.785	−17 0 5.8	−19.17	9.692 0719	+2685.0	17.09	17.88	20 59.8
12	16 23 28.91	7.957	17 7 50.7	19.56	9.698 4831	2657.6	16.84	17.62	20 59.0
13	16 26 41.87	8.123	17 15 43.9	19.87	9.704 8282	2630.0	16.59	17.36	20 58.4
14	16 29 58.76	8.284	17 23 43.6	20.10	9.711 1070	2602.3	16.35	17.11	20 57.8
15	16 33 19.44	8.439	17 31 48.1	20.26	9.717 3193	2574.6	16.12	16.87	20 57.2
16	16 36 43.79	+ 8.589	−17 39 55.7	−20.36	9.723 4651	+2546.9	15.89	16.63	20 56.7
17	16 40 11.69	8.735	17 48 4.8	20.39	9.729 5446	2519.4	15.67	16.40	20 56.3
18	16 43 43.04	8.876	17 56 13.8	20.35	9.735 5582	2492.0	15.46	16.18	20 55.9
19	16 47 17.72	9.013	18 4 21.2	20.25	9.741 5062	2464.7	15.25	15.96	20 55.6
20	16 50 55.64	9.146	18 12 25.4	20.09	9.747 3891	2437.7	15.04	15.74	20 55.3
21	16 54 36.69	+ 9.275	−18 20 25.0	−19.87	9.753 2076	+2411.0	14.84	15.53	20 55.1
22	16 58 20.79	9.400	18 28 18.7	19.59	9.758 9622	2384.5	14.65	15.33	20 55.0
23	17 2 7.84	9.521	18 36 5.0	19.26	9.764 6536	2358.3	14.46	15.13	20 54.8
24	17 5 57.76	9.638	18 43 42.7	18.87	9.770 2823	2332.3	14.27	14.93	20 54.8
25	17 9 50.46	9.753	18 51 10.5	18.44	9.775 8490	2306.7	14.09	14.74	20 54.8
26	17 13 45.87	+ 9.864	−18 58 27.2	−17.95	9.781 3545	+2281.3	13.92	14.56	20 54.8
27	17 17 43.90	9.971	19 5 31.5	17.41	9.786 7993	2256.1	13.74	14.38	20 54.8
28	17 21 44.47	10.076	19 12 22.3	16.82	9.792 1842	2231.3	13.57	14.20	20 54.9
29	17 25 47.51	10.177	19 18 58.5	16.19	9.797 5099	2206 8	13.41	14.03	20 55.1
30	17 29 52.94	10.275	19 25 18.9	15.51	9.802 7770	2182.5	13.25	13.86	20 55.3
31	17 34' 0.69	+10.370	−19 31 22.5	−14.79	9.807 9862	+2158.5	13.08	13.69	20 55.5
Feb. 1	17 38 10.70	10.463	19 37 8.4	14.03	9.813 1380	2134.8	12.93	13.53	20 55.7
2	17 42 22.90	10.553	19 42 35.5	13.23	9.818 2333	2111.3	12.78	13.37	20 56.0
3	17 46 37.20	10.639	19 47 43.0	12.39	9.823 2723	2087.9	12.63	13.22	20 56.4
4	17 50 53.54	10.722	19 52 29.8	11.51	9.828 2555	2064.8	12.49	13.07	20 56.7
5	17 55 11.84	+10.802	−19 56 55.1	−10.60	9.833 1835	+2041.9	12.35	12.92	20 57.1
6	17 59 32.02	10.879	20 0 58.1	9.65	9.838 0566	2019.1	12.21	12.78	20 57.5
7	18 3 54.01	10.953	20 4 37.9	8.67	9.842 8755	1996.6	12.08	12.64	20 58.0
8	18 8 17.73	11.023	20 7 53.9	7.66	9.847 6407	1974.4	11.95	12.50	20 58.5
9	18 12 43.11	11.091	20 10 45.2	6.62	9.852 3530	1952.5	11.81	12.36	20 59.0
10	18 17 10.06	+11.155	−20 13 11.2	− 5.55	9.857 0129	+1930.8	11.69	12.23	20 59.5
11	18 21 38.51	11.216	20 15 11.2	4.45	9.861 6212	1909.5	11.56	12.10	21 0.0
12	18 26 8.38	11.273	20 16 44.7	3.33	9.866 1785	1888.4	11.45	11.98	21 0.6
13	18 30 39.59	11.327	20 17 51.0	2.19	9.870 6855	1867.6	11.33	11.85	21 1.2
14	18 35 12.07	11.379	20 18 29.6	− 1.02	9.875 1430	1847.1	11.21	11.73	21 1.8
15	18 39 45.74	+11.427	−20 18 39.9	+ 0.16	9.879 5517	+1826.9	11.10	11.61	21 2.5
16	18 44 20.54	+11.472	−20 18 21.6	+ 1.37	9.883 9126	+1807.1	10.99	11.50	21 3.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	18 44 20.54	+11.472	−20 18 21.6	+ 1.37	9.883 9126	+1807.1	10.99	11.50	21 3.1
17	18 48 56.38	11.514	20 17 34.2	2.59	9.888 2263	1787.7	10.88	11.38	21 3.8
18	18 53 33.20	11.554	20 16 17.2	3.83	9.892 4939	1768.6	10.77	11.27	21 4.5
19	18 58 10.94	11.590	20 14 30.3	5.08	9.896 7159	1749.8	10.67	11.16	21 5.2
20	19 2 49.52	11.624	20 12 13.2	6.35	9.900 8933	1731.4	10.57	11.06	21 5.9
21	19 7 28.89	+11.656	−20 9 25.5	+ 7.63	9.905 0268	+1713.2	10.46	10.95	21 6.6
22	19 12 8.97	11.684	20 6 7.1	8.91	9.909 1170	1695.3	10.37	10.85	21 7.3
23	19 16 49.70	11.710	20 2 17.6	10.21	9.913 1647	1677.8	10.28	10.75	21 8.1
24	19 21 31.02	11.733	19 57 56.9	11.52	9.917 1707	1660.5	10.18	10.65	21 8.8
25	19 26 12.88	11.754	19 53 4.8	12.82	9.921 1355	1643.6	10.08	10.55	21 9.6
26	19 30 55.21	+11.773	−19 47 41.3	+14.14	9.925 0600	+1626.9	10.00	10.46	21 10.4
27	19 35 37.97	11.790	19 41 46.1	15.46	9.928 9446	1610.4	9.90	10.36	21 11.1
28	19 40 21.10	11.804	19 35 19.1	16.79	9.932 7900	1594.2	9.82	10.27	21 11.9
Mar. 1	19 45 4.54	11.816	19 28 20.4	18.11	9.936 5967	1578.2	9.73	10.18	21 12.7
2	19 49 48.26	11.826	19 20 49.9	19.43	9.940 3653	1562.3	9.65	10.10	21 13.5
3	19 54 32.19	+11.834	−19 12 47.6	+20.76	9.944 0960	+1546.7	9.57	10.01	21 14.3
4	19 59 16.28	11.840	19 4 13.5	22.08	9.947 7894	1531.2	9.48	9.92	21 15.1
5	20 4 0.49	11.844	18 55 7.8	23.39	9.951 4458	1515.9	9.40	9.84	21 15.9
6	20 8 44.78	11.846	18 45 30.6	24.71	9.955 0656	1500.6	9.33	9.76	21 16.7
7	20 13 29.08	11.846	18 35 21.9	26.01	9.958 6490	1485.5	9.25	9.68	21 17.5
8	20 18 13.36	+11.844	−18 24 42.0	+27.31	9.962 1964	+1470.6	9.17	9.60	21 18.2
9	20 22 57.57	11.840	18 13 31.1	28.60	9.965 7082	1455.9	9.10	9.52	21 19.0
10	20 27 41.66	11.834	18 1 49.3	29.88	9.969 1847	1441.2	9.03	9.45	21 19.8
11	20 32 25.59	11.826	17 49 37.0	31.15	9.972 6262	1426.7	8.95	9.37	21 20.6
12	20 37 9.31	11.817	17 36 54.3	32.40	9.976 0332	1412.4	8.89	9.30	21 21.4
13	20 41 52.78	+11.806	−17 23 41.7	+33.65	9.979 4061	+1398.3	8.82	9.23	21 22.2
14	20 46 35.97	11.793	17 9 59.4	34.88	9.982 7454	1384.4	8.75	9.16	21 23.0
15	20 51 18.83	11.779	16 55 47.7	36.09	9.986 0515	1370.7	8.69	9.09	21 23.7
16	20 56 1.34	11.763	16 41 7.1	37.29	9.989 3248	1357.1	8.62	9.02	21 24.5
17	21 0 43.46	11.746	16 25 57.8	38.48	9.992 5658	1343.8	8.55	8.95	21 25.2
18	21 5 25.16	+11.729	−16 10 20.3	+39.65	9.995 7750	+1330.6	8.50	8.89	21 26.0
19	21 10 6.43	11.710	15 54 15.0	40.80	9.998 9530	1317.7	8.43	8.82	21 26.7
20	21 14 47.23	11.690	15 37 42.3	41.93	0.002 1000	1304.9	8.37	8.76	21 27.5
21	21 19 27.54	11.669	15 20 42.7	43.04	0.005 2167	1292.4	8.31	8.69	21 28.2
22	21 24 7.35	11.648	15 3 16.6	44.13	0.008 3035	1280.0	8.25	8.63	21 28.9
23	21 28 46.64	+11.626	−14 45 24.6	+45.20	0.011 3609	+1267.8	8.19	8.57	21 29.6
24	21 33 25.40	11.604	14 27 7.0	46.26	0.014 3892	1255.8	8.13	8.51	21 30.3
25	21 38 3.62	11.581	14 8 24.4	47.29	0.017 3889	1244.0	8.08	8.45	21 31.0
26	21 42 41.28	11.558	13 49 17.2	48.30	0.020 3604	1232.3	8.03	8.40	21 31.7
27	21 47 18.38	11.534	13 29 46.1	49.29	0.023 3042	1220.8	7.97	8.34	21 32.3
28	21 51 54.93	+11.511	−13 9 51.5	+50.26	0.026 2205	+1209.5	7.91	8.28	21 33.0
29	21 56 30.91	11.488	12 49 33.9	51.21	0.029 1098	1198.3	7.87	8.23	21 33.6
30	22 1 6.34	11.465	12 28 53.8	52.13	0.031 9725	1187.3	7.81	8.17	21 34.3
31	22 5 41.21	11.441	12 7 51.9	53.03	0.034 8088	1176.3	7.76	8.12	21 34.9
Apr. 1	22 10 15.53	11.418	11 46 28.7	53.90	0.037 6188	1165.4	7.71	8.07	21 35.5
2	22 14 49.30	+11.396	−11 24 44.7	+54.76	0.040 4028	+1154.6	7.66	8.02	21 36.1
3	22 19 22.54	+11.374	−11 2 40.5	+55.59	0.043 1611	+1143.9	7.62	7.97	21 36.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	22 10 15.53	+11.418	−11 46 28.7	+53.90	0.037 6188	+1165.4	7.71	8.07	21 35.5
2	22 14 49.30	11.396	11 24 44.7	54.76	0.040 4028	1154.6	7.66	8.02	21 36.1
3	22 19 22.54	11.374	11 2 40.5	55.59	0.043 1611	1143.9	7.62	7.97	21 36.7
4	22 23 55.25	11.352	10 40 16.6	56.40	0.045 8936	1133.2	7.57	7.92	21 37.3
5	22 28 27.44	11.331	10 17 33.7	57.18	0.048 6006	1122.6	7.52	7.87	21 37.9
6	22 32 59.12	+11.310	− 9 54 32.4	+57.93	0.051 2822	+1112.0	7.47	7.82	21 38.5
7	22 37 30.30	11.289	9 31 13.2	58.66	0.053 9383	1101.5	7.43	7.77	21 39.1
8	22 42 0.98	11.268	9 7 36.8	59.37	0.056 5693	1091.0	7.38	7.72	21 39.6
9	22 46 31.19	11.249	8 43 43.8	60.04	0.059 1753	1080.7	7.34	7.68	21 40.2
10	22 51 0.93	11.230	8 19 34.9	60.69	0.061 7565	1070.4	7.29	7.63	21 40.7
11	22 55 30.21	+11.211	− 7 55 10.6	+61.32	0.064 3131	+1060.1	7.25	7.59	21 41.3
12	22 59 59.05	11.193	7 30 31.7	61.92	0.066 8452	1050.0	7.21	7.54	21 41.8
13	23 4 27.47	11.176	7 5 38.7	62.49	0.069 3532	1040.0	7.17	7.50	21 42.3
14	23 8 55.48	11.159	6 40 32.3	63.03	0.071 8372	1030.0	7.13	7.46	21 42.9
15	23 13 23.10	11.143	6 15 13.2	63.55	0.074 2975	1020.2	7.09	7.42	21 43.4
16	23 17 50.36	+11.128	− 5 49 41.9	+64.05	0.076 7343	+1010.5	7.04	7.37	21 43.9
17	23 22 17.27	11.114	5 23 59.2	64.51	0.079 1478	1000.8	7.01	7.33	21 44.4
18	23 26 43.85	11.101	4 58 5.6	64.95	0.081 5383	991.3	6.97	7.29	21 44.9
19	23 31 10.13	11.089	4 32 1.8	65.36	0.083 9061	981.9	6.93	7.25	21 45.4
20	23 35 36.13	11.078	4 5 48.5	65.74	0.086 2514	972.6	6.89	7.21	21 45.8
21	23 40 1.88	+11.068	− 3 39 26.3	+66.10	0.088 5746	+ 963.4	6.86	7.18	21 46.3
22	23 44 27.40	11.059	3 12 55.9	66.43	0.090 8758	954.3	6.82	7.14	21 46.8
23	23 48 52.73	11.052	2 46 17.9	66.73	0.093 1553	945.3	6.78	7.10	21 47.3
24	23 53 17.89	11.045	2 19 32.9	67.01	0.095 4134	936.4	6.75	7.06	21 47.8
25	23 57 42.92	11.040	1 52 41.6	67.26	0.097 6503	927.6	6.72	7.03	21 48.2
26	0 2 7.84	+11.037	− 1 25 44.6	+67.48	0.099 8662	+ 919.0	6.68	6.99	21 48.7
27	0 6 32.69	11.035	0 58 42.6	67.68	0.102 0614	910.4	6.65	6.96	21 49.2
28	0 10 57.51	11.034	0 31 36.1	67.85	0.104 2361	901.8	6.61	6.92	21 49.6
29	0 15 22.32	11.034	− 0 4 25.9	67.99	0.106 3903	893.3	6.58	6.89	21 50.1
30	0 19 47.17	11.037	+ 0 22 47.4	68.11	0.108 5242	884.9	6.55	6.85	21 50.6
May 1	0 24 12.09	+11.040	+ 0 50 3.3	+68.20	0.110 6380	+ 876.6	6.52	6.82	21 51.1
2	0 28 37.11	11.045	1 17 21.0	68.27	0.112 7317	868.2	6.49	6.79	21 51.5
3	0 33 2.27	11.052	1 44 40.0	68.31	0.114 8052	859.8	6.45	6.75	21 52.0
4	0 37 27.60	11.060	2 11 59.5	68.32	0.116 8587	851.4	6.42	6.72	21 52.5
5	0 41 53.14	11.069	2 39 18.9	68.30	0.118 8921	843.1	6.39	6.69	21 53.0
6	0 46 18.92	+11.080	+ 3 6 37.6	+68.26	0.120 9054	+ 834.7	6.36	6.66	21 53.5
7	0 50 44.98	11.092	3 33 54.9	68.18	0.122 8987	826.4	6.34	6.63	21 54.0
8	0 55 11.34	11.105	4 1 10.0	68.08	0.124 8719	818.0	6.31	6.60	21 54.5
9	0 59 38.03	11.120	4 28 22.4	67.95	0.126 8252	809.7	6.28	6.57	21 55.0
10	1 4 5.09	11.136	4 55 31.3	67.79	0.128 7586	801.5	6.25	6.54	21 55.5
11	1 8 32.55	+11.153	+ 5 22 36.1	+67.60	0.130 6722	+ 793.2	6.22	6.51	21 56.0
12	1 13 0.44	11.171	5 49 36.0	67.39	0.132 5660	785.0	6.19	6.48	21 56.6
13	1 17 28.78	11.191	6 16 30.5	67.15	0.134 4402	776.8	6.17	6.46	21 57.1
14	1 21 57.62	11.212	6 43 18.8	66.87	0.136 2949	768.7	6.15	6.43	21 57.6
15	1 26 26.98	11.235	7 10 0.2	66.57	0.138 1302	760.7	6.12	6.40	21 58.2
16	1 30 56.89	+11.258	+ 7 36 34.0	+66.24	0.139 9462	+ 752.7	6.10	6.38	21 58.8
17	1 35 27.38	+11.283	+ 8 2 59.6	+65.89	0.141 7430	+ 744.7	6.07	6.35	21 59.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
May 17	1 35 27.38	+11.283	+ 8 2 59.6	+65.89	0.141 7430	+744.7	6.07	6.35	21 59.3
18	1 39 58.48	11.309	8 29 16.3	65.50	0.143 5209	736.8	6.04	6.32	21 59.9
19	1 44 30.23	11.336	8 55 23.4	65.08	0.145 2798	729.0	6.02	6.30	22 0.5
20	1 49 2.64	11.365	9 21 20.1	64.64	0.147 0200	721.2	5.99	6.27	22 1.1
21	1 53 35.75	11.395	9 47 5.8	64.16	0.148 7416	713.5	5.97	6.25	22 1.7
22	1 58 9.59	+11.426	+10 12 39.8	+63.66	0.150 4448	+705.9	5.94	6.22	22 2.4
23	2 2 44.19	11.458	10 38 1.5	63.13	0.152 1298	698.3	5.93	6.20	22 3.0
24	2 7 19.57	11.491	11 3 10.0	62.57	0.153 7967	690.8	5.91	6.18	22 3.7
25	2 11 55.77	11.526	11 28 4.8	61.99	0.155 4456	683.3	5.88	6.15	22 4.4
26	2 16 32.82	11.562	11 52 45.1	61.37	0.157 0767	675.9	5.86	6.13	22 5.1
27	2 21 10.74	+11.599	+12 17 10.3	+60.72	0.158 6901	+668.6	5.84	6.11	22 5.8
28	2 25 49.57	11.637	12 41 19.6	60.05	0.160 2859	661.3	5.81	6.08	22 6.5
29	2 30 29.32	11.676	13 5 12.4	59.35	0.161 8643	654.0	5.79	6.06	22 7.2
30	2 35 10.03	11.716	13 28 48.0	58.62	0.163 4253	646.8	5.77	6.04	22 8.0
31	2 39 51.71	11.758	13 52 5.7	57.86	0.164 9688	639.5	5.75	6.02	22 8.7
June 1	2 44 34.40	+11.800	+14 15 4.8	+57.07	0.166 4948	+632.2	5.73	6.00	22 9.5
2	2 49 18.11	11.843	14 37 44.6	56.25	0.168 0033	624.9	5.72	5.98	22 10.3
3	2 54 2.85	11.886	15 0 4.4	55.40	0.169 4942	617.5	5.70	5.96	22 11.1
4	2 58 48.65	11.930	15 22 3.5	54.52	0.170 9675	610.2	5.68	5.94	22 12.0
5	3 3 35.52	11.975	15 43 41.2	53.61	0.172 4233	602.9	5.66	5.92	22 12.8
6	3 8 23.47	+12.021	+16 4 56.7	+52.68	0.173 8614	+595.6	5.64	5.90	22 13.7
7	3 13 12.52	12.067	16 25 49.5	51.71	0.175 2820	588.2	5.62	5.88	22 14.6
8	3 18 2.67	12.113	16 46 18.7	50.72	0.176 6849	580.9	5.60	5.86	22 15.5
9	3 22 53.93	12.159	17 6 23.7	49.69	0.178 0703	573.6	5.58	5.84	22 16.4
10	3 27 46.30	12.205	17 26 3.8	48.64	0.179 4381	566.3	5.56	5.82	22 17.4
11	3 32 39.79	+12.252	+17 45 18.4	+47.56	0.180 7884	+559.0	5.54	5.80	22 18.3
12	3 37 34.39	12.298	18 4 6.6	46.45	0.182 1211	551.6	5.52	5.78	22 19.3
13	3 42 30.10	12.344	18 22 27.9	45.31	0.183 4363	544.3	5.51	5.77	22 20.3
14	3 47 26.92	12.391	18 40 21.5	44.15	0.184 7340	537.1	5.50	5.75	22 21.4
15	3 52 24.85	12.437	18 57 46.8	42.96	0.186 0144	529.9	5.48	5.73	22 22.4
16	3 57 23.88	+12.482	+19 14 43.1	+41.73	0.187 2774	+522.7	5.47	5.72	22 23.5
17	4 2 24.00	12.527	19 31 9.7	40.48	0.188 5233	515.6	5.45	5.70	22 24.5
18	4 7 25.19	12.572	19 47 6.1	39.21	0.189 7521	508.5	5.43	5.68	22 25.6
19	4 12 27.45	12.616	20 2 31.6	37.91	0.190 9639	501.4	5.42	5.67	22 26.7
20	4 17 30.76	12.660	20 17 25.6	36.58	0.192 1588	494.4	5.40	5.65	22 27.9
21	4 22 35.10	+12.702	+20 31 47.5	+35.23	0.193 3370	+487.4	5.39	5.64	22 29.0
22	4 27 40.45	12.744	20 45 36.6	33.86	0.194 4985	480.5	5.37	5.62	22 30.2
23	4 32 46.79	12.785	20 58 52.5	32.46	0.195 6435	473.7	5.36	5.61	22 31.4
24	4 37 54.11	12.825	21 11 34.5	31.04	0.196 7722	466.9	5.34	5.59	22 32.6
25	4 43 2.37	12.863	21 23 42.2	29.60	0.197 8845	460.1	5.33	5.58	22 33.8
26	4 48 11.55	+12.901	+21 35 14.9	+28.13	0.198 9808	+453.4	5.32	5.57	22 35.0
27	4 53 21.63	12.938	21 46 12.2	26.64	0.200 0609	446.7	5.30	5.55	22 36.2
28	4 58 32.58	12.974	21 56 33.5	25.13	0.201 1249	440.0	5.29	5.54	22 37.5
29	5 3 44.37	13.008	22 6 18.4	23.61	0.202 1727	433.2	5.28	5.52	22 38.8
30	5 8 56.97	13.041	22 15 26.5	22.06	0.203 2045	426.5	5.27	5.51	22 40.0
July 1	5 14 10.33	+13.072	+22 23 57.3	+20.50	0.204 2201	+419.8	5.26	5.50	22 41.3
2	5 19 24.42	+13.102	+22 31 50.4	+18.92	0.205 2196	+413.1	5.25	5.49	22 42.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	5 14 10.33	+13.072	+22 23 57.3	+20.50	0.204 2201	+419.8	5.26	5.50	22 41.3
2	5 19 24.42	13.102	22 31 50.4	18.92	0.205 2196	413.1	5.25	5.49	22 42.6
3	5 24 39.20	13.130	22 39 5.4	17.32	0.206 2028	406.3	5.23	5.47	22 43.9
4	5 29 54.62	13.156	22 45 41.9	15.71	0.207 1698	399.5	5.22	5.46	22 45.3
5	5 35 10.65	13.180	22 51 39.6	14.09	0.208 1206	392.8	5.21	5.45	22 46.6
6	5 40 27.23	+13.202	+22 56 58.2	+12.45	0.209 0550	+386.0	5.20	5.44	22 47.9
7	5 45 44.31	13.222	23 1 37.3	10.80	0.209 9732	379.2	5.19	5.43	22 49.3
8	5 51 1.85	13.240	23 5 36.7	9.14	0.210 8751	372.4	5.17	5.41	22 50.7
9	5 56 19.79	13.255	23 8 56.2	7.48	0.211 7606	365.6	5.16	5.40	22 52.0
10	6 1 38.08	13.269	23 11 35.6	5.80	0.212 6299	358.8	5.15	5.39	22 53.4
11	6 6 56.67	+13.280	+23 13 34.5	+ 4.11	0.213 4828	+352.0	5.14	5.38	22 54.8
12	6 12 15.50	13.289	23 14 53.0	2.42	0.214 3195	345.2	5.13	5.37	22 56.1
13	6 17 34.51	13.295	23 15 30.8	+ 0.72	0.215 1398	338.4	5.12	5.36	22 57.5
14	6 22 53.64	13.299	23 15 27.8	− 0.97	0.215 9440	331.7	5.11	5.35	22 58.9
15	6 28 12.85	13.301	23 14 44.0	2.67	0.216 7320	325.0	5.10	5.34	23 0.3
16	6 33 32.08	+13.301	+23 13 19.4	− 4.38	0.217 5038	+318.2	5.09	5.33	23 1.6
17	6 38 51.26	13.297	23 11 13.9	6.08	0.218 2596	311.6	5.08	5.32	23 3.0
18	6 44 10.34	13.292	23 8 27.5	7.78	0.218 9995	305.0	5.07	5.31	23 4.4
19	6 49 29.27	13.285	23 5 0.3	9.48	0.219 7236	298.4	5.07	5.30	23 5.8
20	6 54 47.99	13.275	23 0 52.4	11.18	0.220 4320	291.9	5.06	5.30	23 7.1
21	7 0 6.45	+13.263	+22 56 3.8	−12.87	0.221 1248	+285.5	5.06	5.29	23 8.5
22	7 5 24.59	13.249	22 50 34.7	14.55	0.221 8022	279.0	5.05	5.28	23 9.9
23	7 10 42.37	13.233	22 44 25.4	16.23	0.222 4642	272.7	5.04	5.27	23 11.2
24	7 15 59.74	13.215	22 37 35.9	17.90	0.223 1111	266.4	5.03	5.26	23 12.5
25	7 21 16.65	13.195	22 30 6.5	19.56	0.223 7428	260.1	5.03	5.26	23 13.9
26	7 26 33.06	+13.173	+22 21 57.3	−21.20	0.224 3594	+253.8	5.02	5.25	23 15.2
27	7 31 48.93	13.149	22 13 8.8	22.84	0.224 9610	247.6	5.01	5.24	23 16.5
28	7 37 4.21	13.124	22 3 41.1	24.46	0.225 5477	241.3	5.00	5.23	23 17.8
29	7 42 18.86	13.097	21 53 34.6	26.07	0.226 1194	235.1	5.00	5.23	23 19.1
30	7 47 32.84	13.068	21 42 49.6	27.67	0.226 6762	228.9	4.99	5.22	23 20.4
31	7 52 46.12	+13.038	+21 31 26.5	−29.25	0.227 2180	+222.6	4.98	5.21	23 21.7
Aug. 1	7 57 58.66	13.006	21 19 25.7	30.81	0.227 7449	216.4	4.98	5.21	23 22.9
2	8 3 10.42	12.973	21 6 47.6	32.36	0.228 2568	210.2	4.97	5.20	23 24.2
3	8 8 21.37	12.939	20 53 32.7	33.88	0.228 7537	203.9	4.97	5.20	23 25.4
4	8 13 31.49	12.904	20 39 41.4	35.39	0.229 2356	197.7	4.96	5.19	23 26.6
5	8 18 40.74	+12.867	+20 25 14.2	−36.87	0.229 7025	+191.4	4.95	5.18	23 27.8
6	8 23 49.09	12.829	20 10 11.6	38.34	0.230 1544	185.2	4.95	5.18	23 29.0
7	8 28 56.53	12.790	19 54 34.0	39.79	0.230 5913	178.9	4.94	5.17	23 30.1
8	8 34 3.02	12.750	19 38 22.1	41.20	0.231 0131	172.6	4.94	5.17	23 31.3
9	8 39 8.55	12.710	19 21 36.4	42.60	0.231 4199	166.4	4.93	5.16	23 32.4
10	8 44 13.10	+12.669	+19 4 17.4	−43.98	0.231 8117	+160.1	4.93	5.16	23 33.5
11	8 49 16.65	12.627	18 46 25.7	45.33	0.232 1884	153.9	4.93	5.16	23 34.6
12	8 54 19.19	12.584	18 28 2.0	46.65	0.232 5502	147.6	4.92	5.15	23 35.7
13	8 59 20.70	12.541	18 9 6.9	47.94	0.232 8970	141.4	4.92	5.15	23 36.8
14	9 4 21.17	12.498	17 49 40.9	49.21	0.233 2290	135.3	4.91	5.14	23 37.8
15	9 9 20.60	+12.454	+17 29 44.8	−50.46	0.233 5463	+129.1	4.91	5.14	23 38.9
16	9 14 18.97	+12.410	+17 9 19.1	−51.68	0.233 8488	+123.0	4.91	5.14	23 39.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	9 14 18.97	+12.410	+17 9 19.1	−51.68	0.233 8488	+123.0	4.91	5.14	23 39.9
17	9 19 16.29	12.366	16 48 24.5	52.87	0.234 1368	117.0	4.90	5.13	23 40.9
18	9 24 12.55	12.322	16 27 1.7	54.03	0.234 4103	111.0	4.90	5.13	23 41.9
19	9 29 7.76	12.279	16 5 11.4	55.16	0.234 6696	105.1	4.90	5.13	23 42.8
20	9 34 1.93	12.235	15 42 54.2	56.27	0.234 9147	99.2	4.89	5.12	23 43.8
21	9 38 55.05	+12.192	+15 20 10.8	−57.34	0.235 1458	+ 93.4	4.89	5.12	23 44.7
22	9 43 47.15	12.150	14 57 1.9	58.39	0.235 3630	87.6	4.89	5.12	23 45.6
23	9 48 38.23	12.108	14 33 28.1	59.41	0.235 5663	81.9	4.89	5.12	23 46.5
24	9 53 28.32	12.066	14 9 30.3	60.40	0.235 7559	76.1	4.88	5.11	23 47.4
25	9 58 17.42	12.025	13 45 9.0	61.37	0.235 9318	70.4	4.88	5.11	23 48.2
26	10 3 5.55	+11.985	+13 20 24.9	−62.30	0.236 0941	+ 64.8	4.88	5.11	23 49.1
27	10 7 52.73	11.946	12 55 18.8	63.20	0.236 2429	59.2	4.88	5.11	23 49.9
28	10 12 38.99	11.909	12 29 51.4	64.08	0.236 3783	53.6	4.88	5.11	23 50.7
29	10 17 24.35	11.872	12 4 3.3	64.92	0.236 5002	48.0	4.87	5.10	23 51.5
30	10 22 8.84	11.836	11 37 55.4	65.74	0.236 6088	42.4	4.87	5.10	23 52.3
31	10 26 52.47	+11.800	+11 11 28.2	−66.52	0.236 7038	+ 36.8	4.87	5.10	23 53.1
Sept. 1	10 31 35.27	11.767	10 44 42.6	67.27	0.236 7855	31.2	4.87	5.10	23 53.8
2	10 36 17.28	11.734	10 17 39.3	68.00	0.236 8536	25.6	4.87	5.10	23 54.6
3	10 40 58.51	11.702	9 50 18.9	68.69	0.236 9083	20.0	4.87	5.10	23 55.3
4	10 45 39.01	11.672	9 22 42.2	69.36	0.236 9496	14.4	4.87	5.10	23 56.0
5	10 50 18.79	+11.643	+ 8 54 49.9	−69.99	0.236 9774	+ 8.8	4.87	5.10	23 56.7
6	10 54 57.90	11.616	8 26 42.8	70.60	0.236 9919	+ 3.2	4.87	5.10	23 57.5
7	10 59 36.36	11.590	7 58 21.5	71.17	0.236 9929	− 2.4	4.87	5.10	23 58.1
8	11 4 14.21	11.565	7 29 46.9	71.71	0.236 9804	8.0	4.87	5.10	23 58.8
9	11 8 51.47	11.541	7 0 59.6	72.22	0.236 9545	13.6	4.87	5.10	23 59.5
10	11 13 28.18	+11.519	+ 6 32 0.4	−72.70	0.236 9152	− 19.2	4.87	5.10	. . . . .
11	11 18 4.38	11.498	6 2 50.0	73.15	0.236 8624	24.8	4.87	5.10	0 0.2
12	11 22 40.09	11.479	5 33 29.2	73.57	0.236 7963	30.3	4.87	5.10	0 0.8
13	11 27 15.36	11.461	5 3 58.7	73.96	0.236 7170	35.8	4.87	5.10	0 1.5
14	11 31 50.22	11.444	4 34 19.3	74.32	0.236 6244	41.3	4.87	5.10	0 2.1
15	11 36 24.70	+11.429	+ 4 4 31.6	−74.65	0.236 5188	− 46.7	4.87	5.10	0 2.7
16	11 40 58.85	11.416	3 34 36.5	74.94	0.236 4002	52.1	4.88	5.11	0 3.3
17	11 45 32.69	11.405	3 4 34.7	75.21	0.236 2688	57.4	4.88	5.11	0 4.0
18	11 50 6.28	11.395	2 34 26.8	75.44	0.236 1248	62.6	4.88	5.11	0 4.6
19	11 54 39.65	11.386	2 4 13.7	75.64	0.235 9682	67.9	4.88	5.11	0 5.2
20	11 59 12.84	+11.380	+ 1 33 56.1	−75.82	0.235 7991	− 73.0	4.88	5.11	0 5.8
21	12 3 45.90	11.375	1 3 34.6	75.97	0.235 6177	78.1	4.88	5.11	0 6.4
22	12 8 18.87	11.372	0 33 10.0	76.08	0.235 4242	83.2	4.89	5.12	0 7.0
23	12 12 51.79	11.371	+ 0 2 43.1	76.16	0.235 2185	88.2	4.89	5.12	0 7.6
24	12 17 24.71	11.372	− 0 27 45.5	76.21	0.235 0007	93.2	4.89	5.12	0 8.2
25	12 21 57.67	+11.375	− 0 58 14.9	−76.23	0.234 7710	− 98.2	4.89	5.12	0 8.8
26	12 26 30.72	11.380	1 28 44.5	76.23	0.234 5293	103.2	4.90	5.13	0 9.5
27	12 31 3.90	11.386	1 59 13.5	76.19	0.234 2756	108.2	4.90	5.13	0 10.1
28	12 35 37.25	11.394	2 29 41.3	76.12	0.234 0100	113.1	4.90	5.13	0 10.7
29	12 40 10.81	11.404	3 0 7.0	76.02	0.233 7326	118.0	4.91	5.14	0 11.3
30	12 44 44.64	+11.416	− 3 30 30.0	−75.89	0.233 4434	−123.0	4.91	5.14	0 11.9
Oct. 1	12 49 18.77	+11.429	− 4 0 49.4	−75.73	0.233 1423	−127.9	4.91	5.14	0 12.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	12 49 18.77	+11.429	− 4 0 49.4	−75.73	0.233 1423	−127.9	4.91	5.14	0 12.5
2	12 53 53.25	11.441	4 31 4.6	75.54	0.232 8294	132.9	4.92	5.15	0 13.2
3	12 58 28.11	11.461	5 1 14.8	75.31	0.232 5046	137.8	4.92	5.15	0 13.8
4	13 3 3.41	11.480	5 31 19.2	75.05	0.232 1680	142.7	4.93	5.16	0 14.5
5	13 7 39.18	11.501	6 1 17.1	74.77	0.231 8195	147.7	4.93	5.16	0 15.1
6	13 12 15.46	+11.523	− 6 31 7.7	−74.45	0.231 4590	−152.7	4.93	5.16	0 15.8
7	13 16 52.30	11.547	7 0 50.2	74.09	0.231 0865	157.7	4.94	5.17	0 16.4
8	13 21 29.73	11.573	7 30 23.9	73.71	0.230 7021	162.7	4.94	5.17	0 17.1
9	13 26 7.79	11.600	7 59 48.1	73.30	0.230 3056	167.7	4.95	5.18	0 17.8
10	13 30 46.52	11.628	8 29 1.9	72.85	0.229 8971	172.7	4.95	5.18	0 18.5
11	13 35 25.95	+11.658	− 8 58 4.6	−72.37	0.229 4767	−177.7	4.96	5.19	0 19.2
12	13 40 6.12	11.690	9 26 55.3	71.85	0.229 0442	182.7	4.96	5.19	0 20.0
13	13 44 47.06	11.722	9 55 33.3	71.30	0.228 5999	187.6	4.97	5.20	0 20.7
14	13 49 28.80	11.756	10 23 57.7	70.72	0.228 1437	192.5	4.97	5.20	0 21.5
15	13 54 11.37	11.792	10 52 7.8	70.11	0.227 6758	197.4	4.98	5.21	0 22.2
16	13 58 54.82	+11.829	−11 20 2.8	−69.46	0.227 1963	−202.2	4.99	5.22	0 23.0
17	14 3 39.17	11.867	11 47 41.8	68.78	0.226 7052	207.0	4.99	5.22	0 23.8
18	14 8 24.45	11.907	12 15 4.2	68.07	0.226 2028	211.7	5.00	5.23	0 24.6
19	14 13 10.70	11.948	12 42 9.0	67.32	0.225 6890	216.4	5.00	5.23	0 25.5
20	14 17 57.95	11.990	13 8 55.5	66.55	0.225 1640	221.1	5.01	5.24	0 26.3
21	14 22 46.23	+12.033	−13 35 23.0	−65.74	0.224 6279	−225.7	5.02	5.25	0 27.2
22	14 27 35.56	12.078	14 1 30.5	64.89	0.224 0807	230.3	5.02	5.25	0 28.0
23	14 32 25.96	12.123	14 27 17.4	64.01	0.223 5225	234.9	5.03	5.26	0 28.9
24	14 37 17.47	12.170	14 52 42.8	63.10	0.222 9533	239.5	5.04	5.27	0 29.9
25	14 42 10.11	12.217	15 17 45.9	62.15	0.222 3731	244.0	5.04	5.27	0 30.8
26	14 47 3.91	+12.266	−15 42 25.9	−61.18	0.221 7821	−248.5	5.05	5.28	0 31.8
27	14 51 58.88	12.315	16 6 42.1	60.17	0.221 1802	253.1	5.06	5.29	0 32.7
28	14 56 55.04	12.365	16 30 33.6	59.12	0.220 5674	257.6	5.07	5.30	0 33.7
29	15 1 52.40	12.416	16 53 59.7	58.04	0.219 9437	262.1	5.07	5.30	0 34.7
30	15 6 50.99	12.467	17 16 59.5	56.93	0.219 3091	266.7	5.07	5.31	0 35.8
31	15 11 50.81	+12.518	−17 39 32.3	−55.79	0.218 6636	−271.2	5.08	5.32	0 36.8
Nov. 1	15 16 51.88	12.571	18 1 37.3	54.62	0.218 0071	275.8	5.09	5.33	0 37.9
2	15 21 54.20	12.623	18 23 13.7	53.41	0.217 3397	280.4	5.09	5.33	0 39.0
3	15 26 57.78	12.675	18 44 20.7	52.17	0.216 6611	285.1	5.10	5.34	0 40.1
4	15 32 2.61	12.728	19 4 57.5	50.89	0.215 9713	289.7	5.11	5.35	0 41.3
5	15 37 8.70	+12.780	−19 25 3.4	−49.59	0.215 2704	−294.4	5.12	5.36	0 42.4
6	15 42 16.03	12.831	19 44 37.7	48.26	0.214 5581	299.1	5.13	5.37	0 43.6
7	15 47 24.60	12.883	20 3 39.5	46.89	0.213 8345	303.9	5.14	5.38	0 44.8
8	15 52 34.40	12.934	20 22 8.1	45.49	0.213 0995	308.7	5.15	5.39	0 46.0
9	15 57 45.42	12.984	20 40 2.8	44.06	0.212 3529	313.5	5.16	5.40	0 47.3
10	16 2 57.63	+13.033	−20 57 22.9	−42.61	0.211 5949	−318.3	5.17	5.41	0 48.5
11	16 8 11.02	13.082	21 14 7.7	41.12	0.210 8252	323.1	5.17	5.41	0 49.8
12	16 13 25.56	13.129	21 30 16.4	39.60	0.210 0441	327.9	5.18	5.42	0 51.1
13	16 18 41.22	13.176	21 45 48.3	38.06	0.209 2515	332.6	5.19	5.43	0 52.4
14	16 23 57.98	13.221	22 0 42.9	36.49	0.208 4475	337.4	5.20	5.44	0 53.8
15	16 29 15.80	+13.264	−22 14 59.5	−34.89	0.207 6322	−342.1	5.21	5.45	0 55.1
16	16 34 34.65	+13.306	−22 28 37.4	−33.27	0.206 8055	−346.8	5.22	5.46	0 56.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	16 34 34.65	+13.306	−22 28 37.4	−33.27	0.206 8055	−346.8	5.22	5.46	0 56.5
17	16 39 54.50	13.348	22 41 36.1	31.62	0.205 9676	351.5	5.24	5.48	0 57.9
18	16 45 15.32	13.387	22 53 54.9	29.95	0.205 1185	356.1	5.25	5.49	0 59.3
19	16 50 37.05	13.424	23 5 33.4	28.25	0.204 2583	360.8	5.26	5.50	1 0.7
20	16 55 59.65	13.459	23 16 30.9	26.54	0.203 3869	365.4	5.27	5.51	1 2.1
21	17 1 23.09	+13.493	−23 26 47.0	−24.80	0.202 5044	−370.0	5.28	5.52	1 3.6
22	17 6 47.31	13.525	23 36 21.3	23.05	0.201 6108	374.6	5.29	5.53	1 5.1
23	17 12 12.27	13.554	23 45 13.2	21.27	0.200 7061	379.3	5.29	5.54	1 6.5
24	17 17 37.90	13.582	23 53 22.3	19.48	0.199 7903	383.9	5.30	5.55	1 8.0
25	17 23 4.17	13.607	24 0 48.3	17.68	0.198 8634	388.5	5.32	5.57	1 9.5
26	17 28 31.02	+13.630	−24 7 30.8	−15.86	0.197 9253	−393.2	5.33	5.58	1 11.0
27	17 33 58.38	13.650	24 13 29.5	14.03	0.196 9761	397.9	5.34	5.59	1 12.6
28	17 39 26.20	13.668	24 18 44.1	12.19	0.196 0156	402.5	5.35	5.60	1 14.1
29	17 44 54.42	13.683	24 23 14.3	10.33	0.195 0439	407.2	5.37	5.62	1 15.6
30	17 50 22.98	13.696	24 26 59.8	8.46	0.194 0608	412.0	5.38	5.63	1 17.1
Dec. 1	17 55 51.81	+13.706	−24 30 0.5	− 6.59	0.193 0663	−416.8	5.39	5.64	1 18.7
2	18 1 20.85	13.713	24 32 16.2	4.71	0.192 0602	421.7	5.40	5.65	1 20.2
3	18 6 50.03	13.718	24 33 46.8	2.81	0.191 0423	426.6	5.42	5.67	1 21.8
4	18 12 19.29	13.720	24 34 32.3	− 0.95	0.190 0125	431.6	5.43	5.68	1 23.3
5	18 17 48.56	13.719	24 34 32.4	+ 0.94	0.188 9707	436.6	5.44	5.69	1 24.9
6	18 23 17.76	+13.715	−24 33 47.2	+ 2.82	0.187 9167	−441.7	5.46	5.71	1 26.4
7	18 28 46.84	13.708	24 32 16.8	4.71	0.186 8504	446.9	5.47	5.72	1 27.9
8	18 34 15.71	13.698	24 30 1.1	6.59	0.185 7717	452.1	5.49	5.74	1 29.5
9	18 39 44.31	13.685	24 27 0.3	8.47	0.184 6805	457.3	5.50	5.75	1 31.0
10	18 45 12.56	13.669	24 23 14.5	10.35	0.183 5767	462.6	5.51	5.77	1 32.6
11	18 50 40.40	+13.650	−24 18 43.8	+12.21	0.182 4601	−467.9	5.52	5.78	1 34.1
12	18 56 7.76	13.629	24 13 28.5	14.07	0.181 3309	473.2	5.54	5.80	1 35.6
13	19 1 34.57	13.605	24 7 28.7	15.91	0.180 1888	478.5	5.55	5.81	1 37.1
14	19 7 0.76	13.578	24 0 44.8	17.75	0.179 0340	483.8	5.57	5.83	1 38.6
15	19 12 26.28	13.548	23 53 17.0	19.57	0.177 8664	489.1	5.58	5.84	1 40.1
16	19 17 51.06	+13.516	−23 45 5.6	+21.38	0.176 6861	−494.5	5.60	5.86	1 41.5
17	19 23 15.05	13.482	23 36 11.0	23.17	0.175 4929	499.9	5.61	5.87	1 43.0
18	19 28 38.19	13.446	23 26 33.6	24.94	0.174 2868	505.2	5.63	5.89	1 44.4
19	19 34 0.43	13.407	23 16 13.8	26.70	0.173 0679	510.6	5.65	5.91	1 45.9
20	19 39 21.73	13.367	23 5 12.0	28.44	0.171 8361	516.0	5.66	5.92	1 47.3
21	19 44 42.02	+13.324	−22 53 28.8	+30.16	0.170 5913	−521.4	5.68	5.94	1 48.7
22	19 50 1.26	13.279	22 41 4.6	31.86	0.169 3335	526.8	5.70	5.96	1 50.1
23	19 55 19.42	13.234	22 27 59.9	33.53	0.168 0627	532.2	5.72	5.98	1 51.4
24	20 0 36.46	13.186	22 14 15.3	35.18	0.166 7788	537.7	5.72	5.99	1 52.8
25	20 5 52.33	13.137	21 59 51.4	36.81	0.165 4817	543.2	5.74	6.01	1 54.1
26	20 11 7.01	+13.086	−21 44 48.7	+38.41	0.164 1713	−548.8	5.76	6.03	1 55.4
27	20 16 20.47	13.035	21 29 7.8	39.99	0.162 8476	554.4	5.78	6.05	1 56.7
28	20 21 32.67	12.982	21 12 49.4	41.54	0.161 5103	560.0	5.80	6.07	1 57.9
29	20 26 43.60	12.928	20 55 54.2	43.06	0.160 1594	565.7	5.82	6.09	1 59.2
30	20 31 53.23	12.874	20 38 22.7	44.56	0.158 7947	571.5	5.83	6.10	2 0.4
31	20 37 1.55	+12.819	−20 20 15.6	+46.03	0.157 4161	−577.4	5.85	6.12	2 1.6
32	20 42 8.53	....	−20 1 33.7	....	0.156 0232	....	5.87	6.14	2 2.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Jan.	0	120 48 8.4	1 37 25.6	+3 1.0	+2 23 37.1	+4 5.5	9.856 4210	−137
	2	124 3 1.4	1 37 27.4	3 0.0	2 31 34.0	3 51.3	9.856 3983	90
	4	127 17 57.7	1 37 28.9	2 56.6	2 39 1.8	3 36.3	9.856 3850	− 43
	6	130 32 56.8	1 37 30.1	2 51.0	2 45 58.9	3 20.7	9.856 3810	+ 4
	8	133 47 58.0	1 37 31.0	2 43.2	2 52 24.1	3 4.4	9.856 3864	50
	10	137 3 0.7	1 37 31.6	+2 33.2	+2 58 16.0	+2 47.4	9.856 4012	+ 97
	12	140 18 4.3	1 37 31.9	2 21.3	3 3 33.5	2 30.0	9.856 4253	144
	14	143 33 8.2	1 37 31.9	2 7.6	3 8 15.6	2 12.0	9.856 4587	190
	16	146 48 11.7	1 37 31.6	1 52.3	3 12 21.4	1 53.6	9.856 5012	236
	18	150 3 14.2	1 37 30.8	1 35.5	3 15 50.0	1 34.9	9.856 5528	280
	20	153 18 14.8	1 37 29.8	+1 17.5	+3 18 40.9	+1 15.9	9.856 6131	+323
	22	156 33 13.0	1 37 28.4	0 58.5	3 20 53.5	0 56.6	9.856 6820	366
	24	159 48 8.0	1 37 26.6	0 38.7	3 22 27.4	0 37.2	9.856 7594	408
	26	163 2 59.1	1 37 24.4	+0 18.5	3 23 22.3	+0 17.7	9.856 8449	447
	28	166 17 45.6	1 37 22.0	−0 1.9	3 23 38.1	−0 1.9	9.856 9382	486
	30	169 32 26.8	1 37 19.2	−0 22.4	+3 23 14.8	−0 21.4	9.857 0391	+523
Feb.	1	172 47 2.1	1 37 16.1	0 42.5	3 22 12.6	0 40.8	9.857 1472	558
	3	176 1 30.9	1 37 12.7	1 2.1	3 20 31.6	1 0.1	9.857 2622	592
	5	179 15 52.6	1 37 9.0	1 20.9	3 18 12.4	1 19.1	9.857 3837	623
	7	182 30 6.5	1 37 5.0	1 38.6	3 15 15.3	1 37.9	9.857 5113	652
	9	185 44 12.2	1 37 0.7	−1 55.1	+3 11 41.1	−1 56.3	9.857 6446	+680
	11	188 58 9.1	1 36 56.2	2 10.1	3 7 30.4	2 14.3	9.857 7832	705
	13	192 11 56.9	1 36 51.5	2 23.4	3 2 44.3	2 31.8	9.857 9265	728
	15	195 25 35.0	1 36 46.6	2 34.9	2 57 23.6	2 48.8	9.858 0742	749
	17	198 39 3.1	1 36 41.5	2 44.4	2 51 29.4	3 5.2	9.858 2258	767
	19	201 52 21.0	1 36 36.4	−2 51.9	+2 45 3.1	−3 21.0	9.858 3808	+782
	21	205 5 28.4	1 36 31.0	2 57.2	2 38 5.8	3 36.2	9.858 5386	796
	23	208 18 25.0	1 36 25.6	3 0.2	2 30 38.9	3 50.6	9.858 6989	806
	25	211 31 10.8	1 36 20.2	3 1.0	2 22 44.0	4 4.2	9.858 8610	814
	27	214 43 45.7	1 36 14.7	2 59.5	2 14 22.6	4 17.1	9.859 0245	820
Mar.	1	247 56 9.6	1 36 9.2	−2 55.8	+2 5 36.3	−4 29.1	9.859 1889	+823
	3	221 8 22.5	1 36 3.7	2 49.8	1 56 26.9	4 40.2	9.859 3536	824
	5	224 20 24.5	1 35 58.3	2 41.8	1 46 56.1	4 50.4	9.859 5181	822
	7	227 32 15.9	1 35 53.0	2 31.7	1 37 5.8	4 59.7	9.859 6820	817
	9	230 43 56.7	1 35 47.8	2 19.8	1 26 57.8	5 8.1	9.859 8446	810
	11	233 55 27.2	1 35 42.7	−2 6.1	+1 16 34.1	−5 15.4	9.860 0056	+800
	13	237 6 47.6	1 35 37.8	1 50.9	1 5 56.6	5 21.9	9.860 1643	788
	15	240 17 58.4	1 35 33.0	1 34.3	0 55 7.3	5 27.2	9.860 3204	773
	17	243 28 59.9	1 35 28.5	1 16.6	0 44 8.3	5 31.6	9.860 4733	756
	19	246 39 52.4	1 35 24.1	0 57.9	0 33 1.6	5 35.0	9.860 6225	736
	21	249 50 36.4	1 35 20.0	−0 38.6	+0 21 49.2	−5 37.3	9.860 7677	+714
	23	253 1 12.5	1 35 16.1	−0 18.7	+0 10 33.2	5 38.6	9.860 9083	691
	25	256 11 41.0	1 35 12.5	+0 1.3	−0 0 44.3	5 38.8	9.861 0440	665
	27	259 22 2.5	1 35 9.1	0 21.3	0 12 1.2	5 38.0	9.861 1743	637
	29	262 32 17.6	1 35 6.0	0 41.1	0 23 15.5	5 36.2	9.861 2988	608
	31	265 42 26.9	1 35 3.3	+1 0.3	−0 34 25.2	−5 33.4	9.861 4172	+576
Apr.	2	268 52 30.8	1 35 0.7	+1 18.8	−0 45 28.2	−5 29.5	9.861 5291	+543

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Apr.	2	268 52 30.8	1 35 0.7	+1 18.8	−0 45 28.2	−5 29.5	9.861 5291	+543
	4	272 2 30.0	1 34 58.5	1 36.3	0 56 22.5	5 24.7	9.861 6342	508
	6	275 12 25.0	1 34 56.6	1 52.6	1 7 6.3	5 18.9	9.861 7321	471
	8	278 22 16.5	1 34 54.9	2 7.6	1 17 37.4	5 12.1	9.861 8226	434
	10	281 32 4.9	1 34 53.6	2 21.0	1 27 54.2	5 4.4	9.861 9054	394
	12	284 41 51.0	1 34 52.5	+2 32.6	−1 37 54.6	−4 55.8	9.861 9802	+354
	14	287 51 35.2	1 34 51.7	2 42.4	1 47 37.0	4 46.4	9.862 0468	312
	16	291 1 18.0	1 34 51.2	2 50.2	1 56 59.5	4 36.0	9.862 1051	270
	18	294 11 0.2	1 34 51.0	2 56.0	2 6 0.6	4 24.9	9.862 1548	227
	20	297 20 42.0	1 34 51.0	2 59.6	2 14 38.5	4 12.9	9.862 1958	183
	22	300 30 24.2	1 34 51.2	+3 1.0	−2 22 51.8	−4 0.2	9.862 2280	+139
	24	303 40 7.1	1 34 51.7	3 0.2	2 30 39.0	3 46.8	9.862 2513	94
	26	306 49 51.2	1 34 52.4	2 57.2	2 37 58.7	3 32.7	9.862 2656	49
	28	309 59 36.9	1 34 53.4	2 52.1	2 44 49.5	3 18.0	9.862 2709	+ 4
	30	313 9 24.7	1 34 54.5	2 44.9	2 51 10.2	3 2.6	9.862 2672	41
May	2	316 19 15.0	1 34 55.8	+2 35.7	−2 56 59.7	−2 46.7	9.862 2544	86
	4	319 29 8.0	1 34 57.3	2 24.5	3 2 16.8	2 30.4	9.862 2327	131
	6	322 39 4.2	1 34 59.0	2 11.6	3 7 0.8	2 13.5	9.862 2020	176
	8	325 49 3.9	1 35 0.8	1 57.1	3 11 10.5	1 56.2	9.862 1625	220
	10	328 59 7.3	1 35 2.6	1 41.2	3 14 45.4	1 38.6	9.862 1142	263
	12	332 9 14.6	1 35 4.7	+1 24.0	−3 17 44.6	−1 20.6	9.862 0574	−305
	14	335 19 26.3	1 35 6.9	1 5.8	3 20 7.7	1 2.4	9.861 9923	347
	16	338 29 42.3	1 35 9.2	0 46.8	3 21 54.2	0 44.0	9.861 9188	387
	18	341 40 3.0	1 35 11.5	0 27.2	3 23 3.7	0 25.5	9.861 8375	426
	20	344 50 28.5	1 35 14.0	+0 7.2	3 23 35.9	−0 6.8	9.861 7483	465
	22	348 0 59.0	1 35 16.6	−0 12.8	−3 23 30.7	+0 12.0	9.861 6517	−501
	24	351 11 34.7	1 35 19.2	0 32.7	3 22 48.1	0 30.6	9.861 5479	537
	26	354 22 15.6	1 35 21.8	0 52.2	3 21 28.1	0 49.3	9.861 4371	570
	28	357 33 1.8	1 35 24.5	1 11.0	3 19 31.0	1 7.8	9.861 3199	602
	30	0 43 53.6	1 35 27.3	1 29.0	3 16 57.0	1 26.2	9.861 1964	632
June	1	3 54 50.9	1 35 30.0	−1 45.9	−3 13 46.6	+1 44.2	9.861 0671	−660
	3	7 5 53.8	1 35 32.9	2 1.6	3 10 0.2	2 2.1	9.860 9324	687
	5	10 17 2.5	1 35 35.8	2 15.7	3 5 38.5	2 19.6	9.860 7926	711
	7	13 28 17.1	1 35 38.8	2 28.2	3 0 42.3	2 36.6	9.860 6482	733
	9	16 39 37.5	1 35 41.7	2 38.8	2 55 12.4	2 53.2	9.860 4997	752
	11	19 51 4.0	1 35 44.8	−2 47.5	−2 49 9.7	+3 9.4	9.860 3475	−770
	13	23 2 36.6	1 35 47.8	2 54.1	2 42 35.3	3 25.0	9.860 1920	785
	15	26 14 15.2	1 35 50.9	2 58.5	2 35 30.3	3 39.9	9.860 0337	798
	17	29 26 0.2	1 35 54.0	3 0.8	2 27 56.1	3 54.2	9.859 8732	808
	19	32 37 51.4	1 35 57.2	3 0.8	2 19 53.9	4 7.8	9.859 7108	816
	21	35 49 49.0	1 36 0.4	−2 58.5	−2 11 25.3	+4 20.7	9.859 5472	−820
	23	39 1 53.1	1 36 3.7	2 54.0	2 2 31.7	4 32.8	9.859 3828	823
	25	42 14 3.8	1 36 7.0	2 47.3	1 53 14.7	4 44.0	9.859 2181	823
	27	45 26 21.1	1 36 10.4	2 38.6	1 43 36.1	4 54.4	9.859 0537	820
	29	48 38 45.2	1 36 13.7	2 27.8	1 33 37.6	5 3.9	9.858 8901	816
July	1	51 51 16.0	1 36 17.2	−2 15.2	−1 23 21.0	+5 12.5	9.858 7277	−808
	3	55 3 53.8	1 36 20.6	−2 0.9	−1 12 48.3	+5 20.1	9.858 5672	−797

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
July	1	51 51 16.0	1 36 17.2	−2 15.2	−1 23 21.0	+5 12.5	9.858 7277	−808
	3	55 3 53.8	1 36 20.6	2 0.9	1 12 48.3	5 20.1	9.858 5672	797
	5	58 16 38.5	1 36 24.1	1 45.0	1 2 1.4	5 26.6	9.858 4090	785
	7	61 29 30.3	1 36 27.7	1 27.8	0 51 2.4	5 32.2	9.858 2535	770
	9	64 42 29.2	1 36 31.2	1 9.5	0 39 53.2	5 36.8	9.858 1014	752
	11	67 55 35.2	1 36 34.8	−0 50.3	−0 28 36.0	+5 40.2	9.857 9531	−732
	13	71 8 48.3	1 36 38.4	0 30.5	0 17 13.0	5 42.6	9.857 8090	709
	15	74 22 8.7	1 36 42.0	−0 10.2	−0 5 46.2	5 44.0	9.857 6697	684
	17	77 35 36.2	1 36 45.6	+0 10.1	+0 5 42.1	5 44.2	9.857 5356	657
	19	80 49 10.9	1 36 49.1	0 30.4	0 17 9.7	5 43.2	9.857 4070	628
	21	84 2 52.7	1 36 52.6	+0 50.3	+0 28 34.4	+5 41.3	9.857 2845	−596
	23	87 16 41.5	1 36 56.2	1 9.6	0 39 54.1	5 38.2	9.857 1685	561
	25	90 30 37.3	1 36 59.6	1 27.9	0 51 6.6	5 34.0	9.857 0592	529
	27	93 44 39.8	1 37 2.9	1 45.2	1 2 9.6	5 28.8	9.856 9571	492
	29	96 58 48.9	1 37 6.2	2 1.2	1 13 0.9	5 22.4	9.856 8626	454
	31	100 13 4.4	1 37 9.4	+2 15.6	+1 23 38.6	+5 15.1	9.856 7758	−414
Aug.	2	103 27 26.2	1 37 12.4	2 28.2	1 34 0.5	5 6.7	9.856 6971	373
	4	106 41 53.8	1 37 15.2	2 39.0	1 44 4.6	4 57.2	9.856 6268	330
	6	109 56 27.0	1 37 17.9	2 47.8	1 53 48.9	4 46.9	9.856 5650	287
	8	113 11 5.4	1 37 20.4	2 54.4	2 3 11.5	4 35.6	9.856 5121	242
	10	116 25 48.6	1 37 22.8	+2 58.8	+2 12 10.6	+4 23.4	9.856 4681	−197
	12	119 40 36.3	1 37 24.9	3 0.9	2 20 44.3	4 10.2	9.856 4332	151
	14	122 55 27.9	1 37 26.7	3 0.6	2 28 51.0	3 56.3	9.856 4076	105
	16	126 10 23.0	1 37 28.3	2 58.1	2 36 29.1	3 41.6	9.856 3912	58
	18	129 25 21.0	1 37 29.6	2 53.2	2 43 37.1	3 26.2	9.856 3843	− 11
	20	132 40 21.3	1 37 30.6	+2 46.1	+2 50 13.5	+3 10.1	9.856 3867	+ 35
	22	135 55 23.4	1 37 31.1	2 36.9	2 56 17.2	2 53.4	9.856 3984	82
	24	139 10 26.6	1 37 31.8	2 25.7	3 1 46.8	2 36.1	9.856 4195	129
	26	142 25 30.3	1 37 31.8	2 12.6	3 6 41.3	2 18.4	9.856 4499	175
	28	145 40 33.8	1 37 31.6	1 57.8	3 10 59.9	2 0.2	9.856 4895	220
	30	148 55 36.5	1 37 31.0	+1 41.5	+3 14 41.6	+1 41.5	9.856 5381	+265
Sept.	1	152 10 37.6	1 37 30.0	1 23.9	3 17 45.7	1 22.6	9.856 5955	309
	3	155 25 36.5	1 37 28.8	1 5.2	3 20 11.7	1 3.4	9.856 6617	352
	5	158 40 32.4	1 37 27.1	0 45.7	3 21 59.1	0 44.0	9.856 7363	394
	7	161 55 24.6	1 37 25.1	0 25.6	3 23 7.6	0 24.5	9.856 8191	434
	9	165 10 12.5	1 37 22.8	+0 5.2	+3 23 37.1	+0 5.0	9.856 9099	+473
	11	168 24 55.4	1 37 20.1	−0 15.3	3 23 27.4	−0 14.6	9.857 0083	510
	13	171 39 32.6	1 37 17.0	0 35.5	3 22 38.8	0 34.0	9.857 1140	546
	15	174 54 3.4	1 37 13.8	0 55.4	3 21 11.3	0 53.4	9.857 2268	580
	17	178 8 27.4	1 37 10.2	1 14.4	3 19 5.4	1 12.5	9.857 3461	612
	19	181 22 43.8	1 37 6.2	−1 32.5	+3 16 21.4	−1 31.4	9.857 4717	+643
	21	184 36 52.1	1 37 2.0	1 49.5	3 13 0.1	1 49.9	9.857 6031	671
	23	187 50 51.8	1 36 57.6	2 5.0	3 9 2.1	2 8.0	9.857 7399	696
	25	191 4 42.5	1 36 53.0	2 19.0	3 4 28.2	2 25.7	9.857 8816	720
	27	194 18 23.7	1 36 48.2	2 31.1	2 59 19.5	2 42.9	9.858 0278	742
	29	197 31 55.1	1 36 43.2	−2 41.4	+2 53 36.9	−2 59.6	9.858 1781	+761
Oct.	1	200 45 16.3	1 36 38.0	−2 49.5	+2 47 21.6	−3 15.6	9.858 3319	+777

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Oct.	1	200 45 16.3	1 36 38.0	−2 49.5	+2 47 21.6	−3 15.6	9.858 3319	+777
	3	203 58 27.1	1 36 32.8	2 55.6	2 40 35.0	3 30.9	9.858 4888	791
	5	207 11 27.2	1 36 27.4	2 59.4	2 33 18.3	3 45.6	9.858 6482	802
	7	210 24 16.5	1 36 21.9	3 1.0	2 25 33.0	3 59.5	9.858 8096	812
	9	213 36 54.9	1 36 16.5	3 0.3	2 17 20.7	4 12.6	9.858 9726	818
	11	216 49 22.4	1 36 11.0	−2 57.3	+2 8 43.0	−4 25.0	9.859 1367	+822
	13	220 1 38.9	1 36 5.5	2 52.1	1 59 41.5	4 36.4	9.859 3012	823
	15	223 13 44.5	1 36 0.1	2 44.8	1 50 17.9	4 47.0	9.859 4658	822
	17	226 25 39.3	1 35 54.7	2 35.4	1 40 34.3	4 56.6	9.859 6298	818
	19	229 37 23.5	1 35 49.5	2 24.1	1 30 32.2	5 5.3	9.859 7929	812
	21	232 48 57.4	1 35 44.4	−2 11.1	+1 20 13.8	−5 13.0	9.859 9544	+803
	23	236 0 21.1	1 35 39.4	1 56.4	1 9 40.9	5 19.8	9.860 1138	792
	25	239 11 35.0	1 35 34.6	1 40.2	0 58 55.5	5 25.5	9.860 2708	778
	27	242 22 39.5	1 35 30.0	1 22.9	0 47 59.7	5 30.2	9.860 4247	762
	29	245 33 34.9	1 35 25.5	1 4.5	0 36 55.4	5 33.9	9.860 5752	743
	31	248 44 21.6	1 35 21.3	−0 45.4	+0 25 44.8	−5 36.6	9.860 7217	+722
Nov.	2	251 55 0.2	1 35 17.4	0 25.7	0 14 29.8	5 38.2	9.860 8638	699
	4	255 5 31.2	1 35 13.6	−0 5.7	+0 3 12.7	5 38.8	9.861 0012	674
	6	258 15 55.0	1 35 10.2	+0 14.4	−0 8 4.7	5 38.4	9.861 1333	647
	8	261 26 12.1	1 35 7.0	0 34.2	0 19 20.1	5 36.9	9.861 2598	618
	10	264 36 23.2	1 35 4.1	+0 53.6	−0 30 31.6	−5 34.4	9.861 3803	+587
	12	267 46 28.7	1 35 1.5	1 12.4	0 41 37.2	5 31.0	9.861 4944	554
	14	270 56 29.3	1 34 59.2	1 30.3	0 52 34.8	5 26.5	9.861 6018	520
	16	274 6 25.6	1 34 57.2	1 47.0	1 3 22.5	5 21.0	9.861 7022	484
	18	277 16 18.1	1 34 55.4	2 2.5	1 13 58.2	5 14.6	9.861 7952	446
	20	280 26 7.3	1 34 53.9	+2 16.4	−1 24 20.2	−5 7.2	9.861 8806	+408
	22	283 35 54.0	1 34 52.8	2 28.7	1 34 26.6	4 59.0	9.861 9581	368
	24	286 45 38.7	1 34 51.9	2 39.2	1 44 15.4	4 49.8	9.862 0276	327
	26	289 55 21.8	1 34 51.3	2 47.7	1 53 45.1	4 39.8	9.862 0887	285
	28	293 5 4.0	1 34 51.0	2 54.2	2 2 53.9	4 28.9	9.862 1414	242
	30	296 14 45.8	1 34 50.9	+2 58.6	−2 11 40.1	−4 17.2	9.862 1854	+198
Dec.	2	299 24 27.7	1 34 51.0	3 0.7	2 20 2.2	4 4.8	9.862 2206	154
	4	302 34 10.2	1 34 51.4	3 0.7	2 27 58.7	3 51.6	9.862 2470	109
	6	305 43 53.7	1 34 52.1	2 58.5	2 35 28.1	3 37.7	9.862 2643	64
	8	308 53 38.7	1 34 53.0	2 54.1	2 42 29.2	3 23.2	9.862 2727	+ 19
	10	312 3 25.6	1 34 54.0	+2 47.6	−2 49 0.5	−3 8.1	9.862 2720	− 26
	12	315 13 14.9	1 34 55.3	2 39.1	2 55 1.1	2 52.4	9.862 2623	71
	14	318 23 6.8	1 34 56.7	2 28.6	3 0 29.7	2 36.1	9.862 2436	116
	16	321 33 1.7	1 34 58.3	2 16.3	3 5 25.3	2 19.4	9.862 2160	160
	18	324 43 0.0	1 35 0.0	2 2.3	3 9 47.1	2 2.3	9.862 1794	205
	20	327 53 2.0	1 35 1.9	+1 46.9	−3 13 34.3	−1 44.8	9.862 1341	−248
	22	331 3 7.8	1 35 3.9	1 30.1	3 16 46.1	1 26.9	9.862 0802	291
	24	334 13 17.8	1 35 6.1	1 12.2	3 19 21.9	1 8.8	9.862 0178	333
	26	337 23 32.2	1 35 8.3	0 53.5	3 21 21.2	0 50.5	9.861 9471	374
	28	340 33 51.2	1 35 10.7	0 34.1	3 22 43.7	0 31.9	9.861 8683	414
	30	343 44 14.9	1 35 13.1	+0 14.2	−3 23 28.9	−0 13.3	9.861 7817	−452
	32	346 54 43.6	1 35 15.6	−0 5.8	−3 23 36.9	+0 5.3	9.861 6875	− 0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	23 7 20.75	+6.742	−6 25 38.4	+45.40	0.181 6610	+875.2	3.08	5.79	4 26.7
2	23 10 2.47	6.734	6 7 27.7	45.49	0.183 7576	872.0	3.06	5.76	4 25.4
3	23 12 44.00	6.726	5 49 14.9	45.57	0.185 8466	868.9	3.05	5.74	4 24.2
4	23 15 25.34	6.718	5 31 0.2	45.65	0.187 9282	865.8	3.04	5.71	4 22.9
5	23 18 6.49	6.711	5 12 43.7	45.72	0.190 0026	862.8	3.02	5.68	4 21.7
6	23 20 47.47	+6.704	−4 54 25.6	+45.78	0.192 0695	+859.7	3.01	5.65	4 20.4
7	23 23 28.28	6.697	4 36 6.1	45.84	0.194 1290	856.6	3.00	5.63	4 19.1
8	23 26 8.94	6.691	4 17 45.2	45.89	0.196 1812	853.5	2.98	5.60	4 17.9
9	23 28 49.45	6.685	3 59 23.2	45.94	0.198 2260	850.4	2.97	5.58	4 16.6
10	23 31 29.82	6.679	3 41 0.1	45.98	0.200 2634	847.3	2.95	5.55	4 15.3
11	23 34 10.06	+6.674	−3 22 36.2	+46.01	0.202 2932	+844.2	2.94	5.52	4 14.1
12	23 36 50.19	6.670	3 4 11.6	46.04	0.204 3154	841.0	2.93	5.50	4 12.8
13	23 39 30.20	6.665	2 45 46.5	46.06	0.206 3299	837.8	2.91	5.47	4 11.5
14	23 42 10.10	6.660	2 27 21.0	46.07	0.208 3366	834.5	2.90	5.45	4 10.2
15	23 44 49.89	6.656	2 8 55.2	46.08	0.210 3354	831.2	2.88	5.42	4 8.9
16	23 47 29.60	+6.653	−1 50 29.4	+46.08	0.212 3261	+827.8	2.87	5.40	4 7.7
17	23 50 9.22	6.649	1 32 3.6	46.07	0.214 3086	824.3	2.86	5.37	4 6.4
18	23 52 48.75	6.645	1 13 38.1	46.05	0.216 2829	820.9	2.85	5.35	4 5.1
19	23 55 28.20	6.642	0 55 13.1	46.03	0.218 2489	817.4	2.83	5.32	4 3.8
20	23 58 7.57	6.639	0 36 48.6	46.01	0.220 2064	813.9	2.82	5.30	4 2.5
21	0 0 46.87	+6.636	−0 18 24.9	+45.97	0.222 1555	+810.3	2.81	5.28	4 1.2
22	0 3 26.11	6.633	−0 0 2.1	45.93	0.224 0960	806.8	2.79	5.25	4 0.0
23	0 6 5.28	6.631	+0 18 19.6	45.88	0.226 0282	803.3	2.78	5.23	3 58.7
24	0 8 44.40	6.629	0 36 40.2	45.83	0.227 9517	799.7	2.77	5.21	3 57.4
25	0 11 23.47	6.627	0 54 59.3	45.76	0.229 8667	796.1	2.76	5.18	3 56.1
26	0 14 2.48	+6.625	+1 13 16.8	+45.69	0.231 7732	+792.6	2.75	5.16	3 54.8
27	0 16 41.46	6.623	1 31 32.6	45.62	0.233 6712	789.1	2.73	5.14	3 53.5
28	0 19 20.39	6.622	1 49 46.5	45.54	0.235 5607	785.5	2.72	5.12	3 52.2
29	0 21 59.30	6.620	2 7 58.4	45.45	0.237 4417	782.0	2.71	5.09	3 50.9
30	0 24 38.17	6.619	2 26 8.0	45.35	0.239 3142	778.5	2.70	5.07	3 49.6
31	0 27 17.02	+6.618	+2 44 15.3	+45.26	0.241 1785	+775.1	2.69	5.05	3 48.3
Feb. 1	0 29 55.86	6.618	3 2 20.2	45.15	0.243 0345	771.6	2.68	5.03	3 47.0
2	0 32 34.69	6.618	3 20 22.4	45.04	0.244 8824	768.2	2.67	5.01	3 45.8
3	0 35 13.53	6.619	3 38 21.9	44.92	0.246 7220	764.8	2.65	4.99	3 44.5
4	0 37 52.38	6.619	3 56 18.5	44.79	0.248 5535	761.4	2.64	4.96	3 43.2
5	0 40 31.25	+6.620	+4 14 12.0	+44.67	0.250 3769	+758.0	2.63	4.94	3 41.9
6	0 43 10.15	6.622	4 32 2.4	44.53	0.252 1921	754.6	2.62	4.92	3 40.6
7	0 45 49.09	6.623	4 49 49.4	44.39	0.253 9992	751.2	2.61	4.90	3 39.3
8	0 48 28.07	6.625	5 7 33.1	44.25	0.255 7980	747.8	2.60	4.88	3 38.0
9	0 51 7.11	6.628	5 25 13.2	44.09	0.257 5884	744.3	2.59	4.86	3 36.7
10	0 53 46.21	+6.631	+5 42 49.6	+43.94	0.259 3705	+740.8	2.57	4.84	3 35.4
11	0 56 25.38	6.634	6 0 22.2	43.78	0.261 1440	737.2	2.56	4.82	3 34.1
12	0 59 4.63	6.637	6 17 50.9	43.61	0.262 9091	733.6	2.55	4.80	3 32.9
13	1 1 43.96	6.641	6 35 15.4	43.43	0.264 6654	730.0	2.54	4.78	3 31.6
14	1 4 23.38	6.644	6 52 35.7	43.26	0.266 4129	726.3	2.54	4.77	3 30.3
15	1 7 2.89	+6.648	+7 9 51.7	+43.07	0.268 1515	+722.5	2.53	4.75	3 29.0
16	1 9 42.50	+6.653	+7 27 3.2	+42.88	0.269 8811	+718.8	2.52	4.73	3 27.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	1 9 42.50	+6.653	+ 7 27 3.2	+42.88	0.269 8811	+718.8	2.52	4.73	3 27.7
17	1 12 22.22	6.657	7 44 10.0	42.68	0.271 6017	715.0	2.51	4.71	3 26.4
18	1 15 2.04	6.662	8 1 11.9	42.48	0.273 3133	711.3	2.50	4.69	3 25.1
19	1 17 41.99	6.666	8 18 9.0	42.28	0.275 0157	707.4	2.48	4.67	3 23.9
20	1 20 22.03	6.671	8 35 1.1	42.06	0.276 7089	703.6	2.47	4.65	3 22.6
21	1 23 2.19	+6.676	+ 8 51 47.9	+41.84	0.278 3929	+699.7	2.47	4.64	3 21.3
22	1 25 42.47	6.681	9 8 29.4	41.61	0.280 0677	696.0	2.46	4.62	3 20.1
23	1 28 22.88	6.686	9 25 5.3	41.38	0.281 7335	692.1	2.45	4.60	3 18.8
24	1 31 3.42	6.692	9 41 35.7	41.14	0.283 3899	688.3	2.44	4.58	3 17.5
25	1 33 44.08	6.697	9 58 0.2	40.90	0.285 0372	684.4	2.43	4.57	3 16.3
26	1 36 24.88	+6.703	+10 14 18.9	+40.65	0.286 6752	+680.6	2.42	4.55	3 15.0
27	1 39 5.82	6.709	10 30 31.5	40.40	0.288 3043	676.9	2.41	4.53	3 13.8
28	1 41 46.90	6.715	10 46 38.0	40.14	0.289 9242	673.1	2.40	4.51	3 12.5
Mar. 1	1 44 28.13	6.721	11 2 38.2	39.88	0.291 5352	669.4	2.39	4.50	3 11.3
2	1 47 9.51	6.727	11 18 32.0	39.61	0.293 1374	665.7	2.38	4.48	3 10.0
3	1 49 51.04	+6.734	+11 34 19.2	+39.33	0.294 7305	+662.0	2.37	4.46	3 8.7
4	1 52 32.74	6.741	11 49 59.8	39.05	0.296 3149	658.3	2.37	4.45	3 7.5
5	1 55 14.61	6.748	12 5 33.6	38.77	0.297 8905	651.7	2.36	4.43	3 6.2
6	1 57 56.65	6.756	12 21 0.5	38.48	0.299 4574	651.0	2.35	4.42	3 5.0
7	2 0 38.88	6.764	12 36 20.5	38.19	0.301 0153	647.3	2.34	4.40	3 3.8
8	2 3 21.30	+6.772	+12 51 33.4	+37.89	0.302 5644	+643.6	2.33	4.38	3 2.5
9	2 6 3.91	6.780	13 6 39.0	37.58	0.304 1047	639.9	2.32	4.37	3 1.3
10	2 8 46.72	6.788	13 21 37.3	37.28	0.305 6360	636.2	2.31	4.35	3 0.1
11	2 11 29.74	6.797	13 36 28.2	36.97	0.307 1583	632.4	2.31	4.34	2 58.8
12	2 14 12.97	6.805	13 51 11.6	36.65	0.308 6716	628.6	2.30	4.32	2 57.6
13	2 16 56.40	+6.814	+14 5 47.3	+36.33	0.310 1756	+624.8	2.29	4.31	2 56.4
14	2 19 40.05	6.823	14 20 15.2	36.00	0.311 6704	620.9	2.28	4.29	2 55.2
15	2 22 23.92	6.832	14 34 35.2	35.67	0.313 1558	617.0	2.28	4.28	2 54.0
16	2 25 8.00	6.841	14 48 47.3	35.33	0.314 6320	613.1	2.27	4.26	2 52.8
17	2 27 52.30	6.850	15 2 51.2	34.99	0.316 0986	609.1	2.26	4.25	2 51.6
18	2 30 36.82	+6.860	+15 16 46.9	+34.64	0.317 5557	+605.1	2.26	4.24	2 50.4
19	2 33 21.57	6.869	15 30 34.1	34.29	0.319 0032	601.1	2.25	4.22	2 49.2
20	2 36 6.53	6.878	15 44 13.0	33.94	0.320 4412	597.1	2.24	4.21	2 48.0
21	2 38 51.72	6.887	15 57 43.3	33.58	0.321 8695	593.1	2.23	4.19	2 46.8
22	2 41 37.13	6.896	16 11 4.9	33.22	0.323 2882	589.1	2.22	4.18	2 45.6
23	2 44 22.75	+6.906	+16 24 17.8	+32.85	0.324 6974	+585.1	2.22	4.17	2 44.4
24	2 47 8.60	6.915	16 37 21.7	32.48	0.326 0968	581.1	2.21	4.15	2 43.3
25	2 49 54.67	6.924	16 50 16.6	32.10	0.327 4866	577.1	2.20	4.14	2 42.1
26	2 52 40.96	6.933	17 3 2.4	31.72	0.328 8668	573.1	2.20	4.13	2 40.9
27	2 55 27.46	6.942	17 15 38.9	31.33	0.330 2376	569.1	2.19	4.11	2 39.8
28	2 58 14.18	+6.951	+17 28 6.1	+30.94	0.331 5987	+565.2	2.18	4.10	2 38.6
29	3 1 1.12	6.960	17 40 23.8	30.54	0.332 9504	561.3	2.18	4.09	2 37.4
30	3 3 48.28	6.969	17 52 32.0	30.14	0.334 2928	557.4	2.17	4.08	2 36.3
31	3 6 35.65	6.978	18 4 30.5	29.74	0.335 6258	553.5	2.16	4.06	2 35.1
Apr. 1	3 9 23.23	6.987	18 16 19.3	29.33	0.336 9497	549.7	2.15	4.05	2 34.0
2	3 12 11.04	+6.997	+18 27 58.2	+28.91	0.338 2643	+545.8	2.15	4.04	2 32.8
3	3 14 59.07	+7.006	+18 39 27.2	+28.50	0.339 5697	+542.0	2.14	4.03	2 31.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	3 9 23.23	+6.987	+18 16 19.3	+29.33	0.336 9497	+549.7	2.15	4.05	2 34.0
2	3 12 11.04	6.997	18 27 58.2	28.91	0.338 2643	545.8	2.15	4.04	2 32.8
3	3 14 59.07	7.006	18 39 27.2	28.50	0.339 5697	542.0	2.14	4.03	2 31.7
4	3 17 47.31	7.015	18 50 46.3	28.08	0.340 8659	538.2	2.13	4.01	2 30.6
5	3 20 35.79	7.024	19 1 55.2	27.66	0.342 1529	534.3	2.13	4.00	2 29.4
6	3 23 24.48	+7.033	+19 12 54.0	+27.23	0.343 4306	+530.5	2.12	3.99	2 28.3
7	3 26 13.40	7.043	19 23 42.4	26.81	0.344 6992	526.7	2.12	3.98	2 27.1
8	3 29 2.55	7.052	19 34 20.7	26.38	0.345 9585	522.8	2.11	3.97	2 26.0
9	3 31 51.91	7.061	19 44 48.5	25.94	0.347 2084	518.8	2.11	3.96	2 24.9
10	3 34 41.50	7.071	19 55 5.8	25.50	0.348 4489	511.9	2.10	3.95	2 23.8
11	3 37 31.31	+7.080	+20 5 12.6	+25.06	0.349 6800	+511.0	2.09	3.93	2 22.7
12	3 40 21.34	7.089	20 15 8.8	24.62	0.350 9016	507.0	2.09	3.92	2 21.6
13	3 43 11.58	7.098	20 24 54.2	24.17	0.352 1135	502.9	2.08	3.91	2 20.5
14	3 46 2.04	7.107	20 34 28.9	23.72	0.353 3157	498.9	2.07	3.90	2 19.4
15	3 48 52.70	7.115	20 43 52.7	23.26	0.354 5082	494.8	2.07	3.89	2 18.3
16	3 51 43.56	+7.123	+20 53 5.5	+22.80	0.355 6909	+490.8	2.06	3.88	2 17.2
17	3 54 34.62	7.131	21 2 7.3	22.34	0.356 8639	486.7	2.06	3.87	2 16.1
18	3 57 25.87	7.139	21 10 57.9	21.88	0.358 0270	482.6	2.05	3.86	2 15.0
19	4 0 17.31	7.147	21 19 37.4	21.41	0.359 1803	478.5	2.05	3.85	2 13.9
20	4 3 8.93	7.154	21 28 5.7	20.94	0.360 3238	474.4	2.04	3.84	2 12.9
21	4 6 0.71	+7.161	+21 36 22.6	+20.47	0.361 4574	+470.3	2.04	3.83	2 11.8
22	4 8 52.67	7.168	21 44 28.2	19.99	0.362 5812	466.2	2.03	3.82	2 10.7
23	4 11 44.79	7.175	21 52 22.3	19.51	0.363 6952	462.1	2.03	3.81	2 9.6
24	4 14 37.07	7.181	22 0 4.9	19.04	0.364 7994	458.0	2.02	3.80	2 8.6
25	4 17 29.49	7.187	22 7 36.0	18.55	0.365 8938	454.0	2.02	3.79	2 7.5
26	4 20 22.06	+7.193	+22 14 55.4	+18.07	0.366 9785	+450.0	2.01	3.78	2 6.4
27	4 23 14.76	7.199	22 22 3.2	17.58	0.368 0536	446.0	2.01	3.77	2 5.4
28	4 26 7.60	7.204	22 28 59.2	17.09	0.369 1193	442.0	2.00	3.76	2 4.3
29	4 29 0.55	7.209	22 35 43.5	16.60	0.370 1754	438.1	2.00	3.75	2 3.2
30	4 31 53.63	7.214	22 42 15.9	16.10	0.371 2220	434.1	1.99	3.74	2 2.2
May 1	4 34 46.83	+7.219	+22 48 36.5	+15.61	0.372 2593	+430.3	1.98	3.73	2 1.1
2	4 37 40.14	7.224	22 54 45.1	15.11	0.373 2873	426.4	1.98	3.73	2 0.1
3	4 40 33.56	7.228	23 0 41.8	14.61	0.374 3058	422.4	1.98	3.72	1 59.0
4	4 43 27.09	7.233	23 6 26.5	14.11	0.375 3149	418.5	1.97	3.71	1 58.0
5	4 46 20.72	7.237	23 11 59.2	13.61	0.376 3147	414.6	1.97	3.70	1 56.9
6	4 49 14.45	+7.240	+23 17 19.9	+13.11	0.377 3051	+410.7	1.96	3.69	1 55.9
7	4 52 8.26	7.244	23 22 28.4	12.60	0.378 2860	406.7	1.96	3.68	1 54.8
8	4 55 2.16	7.247	23 27 24.8	12.10	0.379 2574	402.8	1.95	3.67	1 53.8
9	4 57 56.13	7.250	23 32 9.2	11.60	0.380 2193	398.8	1.95	3.67	1 52.8
10	5 0 50.18	7.253	23 36 41.5	11.09	0.381 1714	394.7	1.95	3.66	1 51.7
11	5 3 44.29	+7.256	+23 41 1.5	+10.58	0.382 1139	+390.7	1.94	3.65	1 50.7
12	5 6 38.45	7.258	23 45 9.4	10.08	0.383 0466	386.6	1.94	3.64	1 49.6
13	5 9 32.66	7.260	23 49 5.1	9.57	0.383 9695	382.5	1.93	3.63	1 48.6
14	5 12 26.92	7.261	23 52 48.6	9.06	0.384 8827	378.4	1.93	3.63	1 47.6
15	5 15 21.20	7.262	23 56 19.8	8.54	0.385 7858	374.2	1.93	3.62	1 46.5
16	5 18 15.50	+7.263	+23 59 38.7	+ 8.03	0.386 6791	+370.1	1.92	3.61	1 45.5
17	5 21 9.81	+7.263	+24 2 45.4	+ 7.52	0.387 5625	+366.0	1.92	3.60	1 44.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
May 17	5 21 9.81	+7.263	+24 2 45.4	+ 7.52	0.387 5625	+366.0	1.92	3.60	1 44.4
18	5 24 4.13	7.263	24 5 39.8	7.01	0.388 4359	361.9	1.92	3.60	1 43.4
19	5 26 58.44	7.263	24 8 21.9	6.50	0.389 2995	357.7	1.91	3.59	1 42.4
20	5 29 52.73	7.262	24 10 51.8	5.99	0.390 1530	353.6	1.90	3.58	1 41.3
21	5 32 47.00	7.260	24 13 9.4	5.48	0.390 9966	349.4	1.90	3.58	1 40.3
22	5 35 41.22	+7.258	+24 15 14.7	+ 4.96	0.391 8303	+345.3	1.90	3.57	1 39.3
23	5 38 35.40	7.256	24 17 7.7	4.45	0.392 6542	341.2	1.89	3.56	1 38.2
24	5 41 29.53	7.254	24 18 48.4	3.94	0.393 4683	337.1	1.89	3.56	1 37.2
25	5 44 23.59	7.251	24 20 16.9	3.43	0.394 2725	333.0	1.89	3.55	1 36.1
26	5 47 17.58	7.248	24 21 33.2	2.92	0.395 0669	329.0	1.88	3.54	1 35.1
27	5 50 11.48	+7.244	+24 22 37.2	+ 2.41	0.395 8518	+325.0	1.88	3.54	1 34.1
28	5 53 5.30	7.240	24 23 29.0	1.90	0.396 6270	321.0	1.88	3.53	1 33.0
29	5 55 59.02	7.236	24 24 8.6	1.40	0.397 3928	317.1	1.87	3.52	1 32.0
30	5 58 52.64	7.232	24 24 36.1	0.89	0.398 1490	313.1	1.87	3.52	1 30.9
31	6 1 46.14	7.227	24 24 51.3	+ 0.38	0.398 8956	309.1	1.87	3.51	1 29.9
June 1	6 4 39.53	+7.222	+24 24 54.4	- 0.12	0.399 6328	+305.2	1.87	3.51	1 28.8
2	6 7 32.81	7.217	24 24 45.4	0.63	0.400 3605	301.2	1.86	3.50	1 27.8
3	6 10 25.96	7.212	24 24 24.3	1.13	0.401 0787	297.3	1.86	3.49	1 26.7
4	6 13 18.99	7.207	24 23 51.1	1.63	0.401 7873	293.3	1.86	3.49	1 25.6
5	6 16 11.87	7.201	24 23 5.9	2.13	0.402 4864	289.2	1.85	3.48	1 24.6
6	6 19 4.61	+7.195	+24 22 8.7	- 2.63	0.403 1756	+285.1	1.85	3.48	1 23.5
7	6 21 57.21	7.188	24 20 59.6	3.13	0.403 8551	281.1	1.85	3.47	1 22.5
8	6 24 49.64	7.181	24 19 38.6	3.62	0.404 5248	277.0	1.85	3.47	1 21.4
9	6 27 41.90	7.174	24 18 5.8	4.11	0.405 1848	272.9	1.84	3.46	1 20.3
10	6 30 33.99	7.166	24 16 21.2	4.60	0.405 8349	268.8	1.84	3.46	1 19.2
11	6 33 25.89	+7.159	+24 14 24.8	- 5.09	0.406 4752	+264.7	1.84	3.45	1 18.2
12	6 36 17.61	7.151	24 12 16.7	5.58	0.407 1054	260.5	1.84	3.45	1 17.1
13	6 39 9.12	7.112	24 9 56.9	6.07	0.407 7258	256.4	1.83	3.44	1 16.0
14	6 42 0.43	7.133	24 7 25.5	6.55	0.408 3360	252.2	1.83	3.44	1 14.9
15	6 44 51.52	7.124	24 4 42.5	7.03	0.408 9362	248.0	1.82	3.43	1 13.8
16	6 47 42.38	+7.115	+24 1 48.0	- 7.51	0.409 5263	+243.8	1.82	3.43	1 12.7
17	6 50 33.02	7.105	23 58 42.2	7.98	0.410 1063	239.5	1.82	3.42	1 11.6
18	6 53 23.42	7.095	23 55 25.0	8.45	0.410 6761	235.3	1.82	3.42	1 10.5
19	6 56 13.57	7.084	23 51 56.4	8.93	0.411 2359	231.1	1.81	3.41	1 9.4
20	6 59 3.46	7.073	23 48 16.6	9.39	0.411 7856	227.0	1.81	3.41	1 8.3
21	7 1 53.09	+7.062	+23 44 25.6	- 9.86	0.412 3254	+222.8	1.81	3.41	1 7.2
22	7 4 42.45	7.051	23 40 23.5	10.32	0.412 8551	218.6	1.81	3.40	1 6.1
23	7 7 31.53	7.039	23 36 10.3	10.78	0.413 3749	214.5	1.81	3.40	1 5.0
24	7 10 20.33	7.027	23 31 46.1	11.24	0.413 8849	210.4	1.80	3.39	1 3.8
25	7 13 8.84	7.015	23 27 11.0	11.69	0.414 3850	206.4	1.80	3.39	1 2.7
26	7 15 57.06	+7.003	+23 22 25.0	-12.14	0.414 8754	+202.3	1.80	3.39	1 1.6
27	7 18 44.99	6.991	23 17 28.3	12.59	0.415 3561	198.2	1.80	3.38	1 0.4
28	7 21 32.61	6.978	23 12 20.8	13.03	0.415 8270	194.2	1.80	3.38	0 59.3
29	7 24 19.93	6.966	23 7 2.8	13.47	0.416 2883	190.2	1.79	3.37	0 58.1
30	7 27 6.96	6.953	23 1 34.1	13.91	0.416 7398	186.1	1.79	3.37	0 57.0
July 1	7 29 53.67	+6.940	+22 55 55.0	-14.35	0.417 1816	+182.0	1.79	3.37	0 55.8
2	7 32 40.08	+6.927	+22 50 5.4	-14.78	0.417 6135	+177.9	1.79	3.36	0 54.6

GREENWICH MEAN TIME.

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	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	7 29 53.67	+6.940	+22 55 55.0	−14.35	0.417 1816	+182.0	1.79	3.37	0 55.8
2	7 32 40.08	6.927	22 50 5.4	14.78	0.417 6135	177.9	1.79	3.36	0 54.6
3	7 35 26.18	6.914	22 44 5.5	15.21	0.418 0357	173.9	1.79	3.36	0 53.5
4	7 38 11.97	6.901	22 37 55.4	15.63	0.418 4481	169.8	1.79	3.36	0 52.3
5	7 40 57.44	6.888	22 31 35.1	16.06	0.418 8506	165.7	1.78	3.35	0 51.1
6	7 43 42.58	+6.874	+22 25 4.7	−16.48	0.419 2432	+161.5	1.78	3.35	0 49.9
7	7 46 27.41	6.861	22 18 24.3	16.89	0.419 6257	157.3	1.78	3.35	0 48.7
8	7 49 11.91	6.847	22 11 34.0	17.30	0.419 9982	153.1	1.78	3.35	0 47.5
9	7 51 56.08	6.834	22 4 33.8	17.71	0.420 3607	148.9	1.78	3.34	0 46.3
10	7 54 39.92	6.820	21 57 23.9	18.11	0.420 7129	144.6	1.78	3.34	0 45.1
11	7 57 23.42	+6.806	+21 50 4.4	−18.51	0.421 0549	+140.4	1.78	3.34	0 43.9
12	8 0 6.59	6.792	21 42 35.3	18.91	0.421 3866	136.1	1.77	3.33	0 42.6
13	8 2 49.41	6.777	21 34 56.7	19.30	0.421 7080	131.8	1.77	3.33	0 41.4
14	8 5 31.88	6.762	21 27 8.8	19.69	0.422 0191	127.5	1.77	3.33	0 40.2
15	8 8 14.01	6.748	21 19 11.6	20.08	0.422 3198	123.1	1.77	3.33	0 38.9
16	8 10 55.79	+6.733	+21 11 5.2	−20.15	0.422 6101	+118.8	1.77	3.33	0 37.7
17	8 13 37.21	6.718	21 2 49.8	20.83	0.422 8901	114.5	1.77	3.32	0 36.5
18	8 16 18.27	6.703	20 54 25.3	21.21	0.423 1597	110.2	1.77	3.32	0 35.2
19	8 18 58.96	6.688	20 45 51.9	21.57	0.423 4190	105.9	1.77	3.32	0 33.9
20	8 21 39.29	6.673	20 37 9.8	21.94	0.423 6679	101.6	1.77	3.32	0 32.7
21	8 24 19.26	+6.658	+20 28 18.9	−22.30	0.423 9065	+ 97.3	1.77	3.32	0 31.4
22	8 26 58.86	6.642	20 19 19.5	22.65	0.424 1349	93.0	1.76	3.31	0 30.1
23	8 29 38.09	6.627	20 10 11.5	23.01	0.424 3531	88.8	1.76	3.31	0 28.8
24	8 32 16.96	6.612	20 0 55.1	23 36	0.424 5613	84.6	1.76	3.31	0 27.5
25	8 34 55.47	6.597	19 51 30.4	23.70	0.424 7594	80.4	1.76	3.31	0 26.2
26	8 37 33.61	+6.582	+19 41 57.5	−24.04	0.424 9474	+ 76.2	1.76	3.31	0 24.9
27	8 40 11.39	6.567	19 32 16.4	24.38	0.425 1254	72.1	1.76	3.31	0 23.6
28	8 42 48.81	6.552	19 22 27.3	24.72	0.425 2934	67.9	1.76	3.31	0 22.3
29	8 45 25.86	6.537	19 12 30.1	25.04	0.425 4512	63.6	1.76	3.30	0 21.0
30	8 48 2.57	6.522	19 2 25.2	25.37	0.425 5989	59.4	1.76	3.30	0 19.6
31	8 50 38.93	+6.508	+18 52 12.4	−25.69	0.425 7364	+ 55.2	1.76	3.30	0 18.3
Aug. 1	8 53 14.94	6.493	18 41 52.0	26.01	0.425 8638	50.9	1.76	3.30	0 17.0
2	8 55 50.61	6.479	18 31 24.0	26.32	0.425 9809	46.6	1.76	3.30	0 15.6
3	8 58 25.93	6.464	18 20 48.5	26.63	0.426 0877	42.3	1.76	3.30	0 14.3
4	9 1 0.90	6.450	18 10 5.6	26.94	0.426 1841	38.0	1.76	3.30	0 12.9
5	9 3 35.53	+6.436	+17 59 15.4	−27.24	0.426 2700	+ 33.6	1.76	3.30	0 11.5
6	9 6 9.83	6.422	17 48 18.0	27.54	0.426 3455	29.3	1.76	3.30	0 10.2
7	9 8 43.78	6.408	17 37 13.6	27.83	0.426 4104	24.8	1.76	3.30	0 8.8
8	9 11 17.40	6.394	17 26 2.2	28.12	0.426 4647	20.4	1.76	3.30	0 7.4
9	9 13 50.69	6.380	17 14 43.9	28.40	0.426 5084	16.0	1.76	3.30	0 6.0
10	9 16 23.64	+6.366	+17 3 18.8	−28.69	0.426 5414	+ 11.5	1.76	3.30	0 4.6
11	9 18 56.26	6.352	16 51 47.0	28.96	0.426 5636	7.0	1.76	3.30	0 3.2
12	9 21 28.54	6.338	16 40 8.7	29.23	0.426 5750	+ 2.5	1.76	3.30	0 1.8
13	9 24 0.50	6.325	16 28 23.9	29.50	0.426 5756	− 2.0	1.76	3.30	{0 04 23 59.0
14	9 26 32.13	6.311	16 16 32.7	29.77	0.426 5652	6.6	1.76	3.30	23 57.6
15	9 29 3.43	+6.297	+16 4 35.2	−30.02	0.426 5440	− 11.1	1.76	3.30	23 56.1
16	9 31 34.41	+6.281	+15 52 31.6	−30.27	0.426 5120	− 15.6	1.76	3.30	23 54.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	9 31 34.41	+6.284	+15 52 31.6	−30.27	0.426 5120	− 15.6	1.76	3.30	23 54.7
17	9 34 5.06	6.270	15 40 22.0	30.53	0.426 4692	20.1	1.76	3.30	23 53.3
18	9 36 35.39	6.257	15 28 6.3	30.77	0.426 4156	24.6	1.76	3.30	23 51.8
19	9 39 5.40	6.244	15 15 44.9	31.01	0.426 3512	29.0	1.76	3.30	23 50.4
20	9 41 35.09	6.231	15 3 17.6	31.25	0.426 2762	33.4	1.76	3.30	23 48.9
21	9 44 4.47	+6.218	+14 50 44.8	−31.49	0.426 1906	− 38.0	1.76	3.30	23 47.5
22	9 46 33.54	6.205	14 38 6.3	31.72	0.426 0940	42.4	1.76	3.30	23 46.0
23	9 49 2.31	6.192	14 25 22.3	31.95	0.425 9870	46.8	1.76	3.30	23 44.6
24	9 51 30.78	6.180	14 12 32.9	32.17	0.425 8693	51.3	1.76	3.30	23 43.1
25	9 53 58.96	6.168	13 59 38.2	32.39	0.425 7410	55.7	1.76	3.30	23 41.6
26	9 56 26.85	+6.156	+13 46 38.3	−32.60	0.425 6021	− 60.1	1.76	3.30	23 40.1
27	9 58 54.46	6.145	13 33 33.3	32.81	0.425 4525	64.6	1.76	3.30	23 38.6
28	10 1 21.80	6.134	13 20 23.3	33.02	0.425 2922	69.0	1.76	3.31	23 37.1
29	10 3 48.87	6.123	13 7 8.3	33.23	0.425 1212	73.5	1.76	3.31	23 35.6
30	10 6 15.68	6.112	12 53 48.5	33.42	0.424 9394	78.0	1.76	3.31	23 34.1
31	10 8 42.23	+6.101	+12 40 24.0	−33.62	0.424 7468	− 82.5	1.76	3.31	23 32.6
Sept. 1	10 11 8.53	6.091	12 26 54.8	33.81	0.424 5432	87.1	1.76	3.31	23 31.1
2	10 13 34.58	6.080	12 13 21.1	34.00	0.424 3286	91.7	1.76	3.31	23 29.6
3	10 16 0.39	6.070	11 59 42.8	34.18	0.424 1030	96.3	1.76	3.31	23 28.1
4	10 18 25.95	6.060	11 46 0.3	34.36	0.423 8662	101.0	1.77	3.32	23 26.6
5	10 20 51.29	+6.051	+11 32 13.4	−34.51	0.423 6182	−105.7	1.77	3.32	23 25.1
6	10 23 16.40	6.041	11 18 22.4	34.71	0.423 3590	110.3	1.77	3.32	23 23.5
7	10 25 41.28	6.032	11 4 27.3	34.88	0.423 0885	115.1	1.77	3.32	23 22.0
8	10 28 5.95	6.023	10 50 28.2	35.04	0.422 8066	119.9	1.77	3.32	23 20.5
9	10 30 30.39	6.014	10 36 25.2	35.21	0.422 5132	124.6	1.77	3.33	23 19.0
10	10 32 54.62	+6.005	+10 22 18.4	−35.36	0.422 2083	−129.4	1.77	3.33	23 17.4
11	10 35 18.63	5.996	10 8 8.0	35.51	0.421 8920	134.2	1.77	3.33	23 15.9
12	10 37 42.43	5.988	9 53 54.0	35.66	0.421 5641	139.1	1.77	3.33	23 14.3
13	10 40 6.04	5.980	9 39 36.5	35.80	0.421 2245	143.9	1.78	3.34	23 12.8
14	10 42 29.45	5.971	9 25 15.7	35.94	0.420 8735	148.6	1.78	3.34	23 11.2
15	10 44 52.66	+5.963	+ 9 10 51.5	−36.07	0.420 5110	−153.4	1.78	3.34	23 9.6
16	10 47 15.68	5.955	8 56 24.3	36.20	0.420 1371	158.2	1.78	3.34	23 8.1
17	10 49 38.51	5.947	8 41 53.9	36.33	0.419 7517	163.0	1.78	3.35	23 6.5
18	10 52 1.16	5.940	8 27 20.5	36.45	0.419 3549	167.7	1.78	3.35	23 5.0
19	10 54 23.64	5.933	8 12 44.3	36.57	0.418 9467	172.5	1.78	3.35	23 3.4
20	10 56 45.95	+5.926	+ 7 58 5.2	−36.69	0.418 5271	−177.2	1.79	3.36	23 1.8
21	10 59 8.10	5.920	7 43 23.4	36.80	0.418 0962	181.9	1.79	3.36	23 0.3
22	11 1 30.09	5.913	7 28 38.9	36.91	0.417 6540	186.6	1.79	3.36	22 58.7
23	11 3 51.93	5.907	7 13 51.9	37.01	0.417 2004	191.4	1.79	3.37	22 57.1
24	11 6 13.64	5.902	6 59 2.5	37.11	0.416 7354	196.1	1.79	3.37	22 55.6
25	11 8 35.21	+5.896	+ 6 44 10.6	−37.21	0.416 2590	−200.9	1.79	3.37	22 54.0
26	11 10 56.66	5.891	6 29 16.4	37.30	0.415 7711	205.7	1.80	3.38	22 52.4
27	11 13 17.99	5.886	6 14 20.0	37.39	0.415 2716	210.5	1.80	3.38	22 50.8
28	11 15 39.19	5.881	5 59 21.5	37.48	0.414 7605	215.4	1.80	3.39	22 49.2
29	11 18 0.30	5.877	5 44 21.0	37.56	0.414 2378	220.2	1.80	3.39	22 47.6
30	11 20 21.31	+5.873	+ 5 29 18.5	−37.64	0.413 7034	−225.1	1.80	3.39	22 46.0
Oct. 1	11 22 42.23	+5.870	+ 5 14 14.2	−37.72	0.413 1573	−230.0	1.81	3.40	22 44.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	11 22 42.23	+5.870	+5 14 14.2	−37.72	0.413 1573	−230.0	1.81	3.40	22 44.4
2	11 25 3.07	5.866	4 59 8.1	37.79	0.412 5992	235.0	1.81	3.40	22 42.8
3	11 27 23.82	5.863	4 44 0.3	37.86	0.412 0292	240.0	1.81	3.41	22 41.2
4	11 29 44.50	5.860	4 28 50.9	37.92	0.411 4473	245.0	1.81	3.41	22 39.6
5	11 32 5.10	5.857	4 13 40.1	37.98	0.410 8533	250.0	1.82	3.42	22 38.0
6	11 34 25.64	+5.854	+3 58 27.8	−38.04	0.410 2471	−255.1	1.82	3.42	22 36.4
7	11 36 46.11	5.852	3 43 14.2	38.09	0.409 6286	260.3	1.82	3.43	22 34.8
8	11 39 6.53	5.850	3 27 59.5	38.14	0.408 9978	265.4	1.82	3.43	22 33.2
9	11 41 26.90	5.848	3 12 43.7	38.18	0.408 3548	270.5	1.83	3.44	22 31.6
10	11 43 47.22	5.846	2 57 26.8	38.22	0.407 6993	275.7	1.83	3.44	22 30.0
11	11 46 7.50	+5.844	+2 42 9.0	−38.26	0.407 0315	−280.8	1.84	3.45	22 28.4
12	11 48 27.74	5.842	2 26 50.5	38 29	0.406 3513	286.0	1.84	3.45	22 26.8
13	11 50 47.94	5.841	2 11 31.2	38.32	0.405 6587	291.1	1.84	3.46	22 25.2
14	11 53 8.11	5.840	1 56 11.3	38.34	0.404 9538	296.3	1.84	3.46	22 23.6
15	11 55 28.24	5.839	1 40 50.9	38.36	0.404 2364	301.4	1.85	3.47	22 22.0
16	11 57 48.36	+5.838	+1 25 30.1	−38.37	0.403 5069	−306.5	1.85	3.48	22 20.4
17	12 0 8.47	5.837	1 10 9.0	38.38	0.402 7651	311.6	1.85	3.48	22 18.8
18	12 2 28.56	5.837	0 54 47.7	38.39	0.402 0111	316.7	1.86	3.49	22 17.2
19	12 4 48.66	5.837	0 39 26.2	38.40	0.401 2449	321.8	1.86	3.49	22 15.6
20	12 7 8.76	5.838	0 24 4.7	38.40	0.400 4665	326.9	1.86	3.50	22 14.0
21	12 9 28.88	+5.839	+0 8 43.2	−38.39	0.399 6758	−332.0	1.87	3.51	22 12.4
22	12 11 49.02	5.840	−0 6 38.2	38.39	0.398 8729	337.1	1.87	3.51	22 10.8
23	12 14 9.19	5.841	0 21 59.4	38.38	0.398 0577	342.2	1.87	3.52	22 9.2
24	12 16 29.40	5.843	0 37 20.4	38 37	0.397 2303	347.3	1.88	3.53	22 7.5
25	12 18 49.64	5.845	0 52 41.0	38.35	0.396 3905	352.5	1.88	3.53	22 5.9
26	12 21 9.94	+5.847	−1 8 1.1	−38.33	0.395 5382	−357.7	1.88	3.54	22 4.3
27	12 23 30.29	5.849	1 23 20.7	38.30	0.394 6734	362.9	1.89	3.55	22 2.7
28	12 25 50.70	5.852	1 38 39.7	38.28	0.393 7962	368.1	1.89	3.55	22 1.1
29	12 28 11.18	5.855	1 53 58.0	38.24	0.392 9063	373.1	1.89	3.56	21 59.5
30	12 30 31.74	5.858	2 9 15.4	38.21	0.392 0037	378.7	1.90	3.57	21 57.9
31	12 32 52.38	+5.862	−2 24 31.9	−38.17	0.391 0884	−384.0	1.90	3.58	21 56.4
Nov. 1	12 35 13.10	5.865	2 39 47.5	38.13	0.390 1603	389.4	1.90	3.58	21 54.8
2	12 37 33.92	5.870	2 55 2.0	38.08	0.389 2192	394.8	1.91	3.59	21 53.2
3	12 39 54.84	5.874	3 10 15.3	38.03	0.388 2652	400.2	1.92	3.60	21 51.6
4	12 42 15.86	5.878	3 25 27.3	37.97	0.387 2980	405.8	1.92	3.61	21 50.0
5	12 44 36.99	+5.882	−3 40 38.0	−37.92	0.386 3175	−411.2	1.93	3.62	21 48.4
6	12 46 58.22	5.887	3 55 47.2	37.85	0.385 3240	416.7	1.93	3.62	21 46.8
7	12 49 19.56	5.892	4 10 54.7	37.78	0.384 3171	422.3	1.93	3.63	21 45.2
8	12 51 41.02	5.897	4 26 0.6	37.71	0.383 2970	427.8	1.94	3.64	21 43.6
9	12 54 2.60	5.902	4 41 4.7	37.63	0.382 2635	433.4	1.94	3.65	21 42.1
10	12 56 24.30	+5.907	−4 56 6.9	−37.55	0.381 2167	−438.9	1.95	3.66	21 40.5
11	12 58 46.13	5.912	5 11 7.1	37.47	0.380 1567	444.4	1.95	3.67	21 38.9
12	13 1 8.09	5.918	5 26 5.2	37.38	0.379 0835	449.9	1.96	3.68	21 37.4
13	13 3 30.18	5.923	5 41 1.1	37.28	0.377 9970	455.4	1.96	3.69	21 35.8
14	13 5 52.41	5.929	5 55 54.7	37.18	0.376 8975	460.9	1.96	3.69	21 34.2
15	13 8 14.79	+5.936	−6 10 45.9	−37.08	0.375 7848	−466.4	1.97	3.70	21 32.6
16	13 10 37.32	+5.942	−6 25 34.6	−36.98	0.374 6590	−471.8	1.97	3.71	21 31.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	13 10 37.32	+5.942	− 6 25 34.6	−36.98	0.374 6590	−471.8	1.97	3.71	21 31.1
17	13 13 0.01	5.948	6 40 20.7	36.87	0.373 5201	477.2	1.98	3.72	21 29.5
18	13 15 22.85	5.956	6 55 4.2	36.76	0.372 3682	482.7	1.98	3.73	21 28.0
19	13 17 45.88	5.963	7 9 44.9	36.64	0.371 2030	488.2	1.99	3.74	21 26.4
20	13 20 9.08	5.971	7 24 22.7	36.51	0.370 0248	493.7	2.00	3.75	21 24.8
21	13 22 32.47	+5.978	− 7 38 57.6	−36.39	0.368 8333	−499.2	2.00	3.76	21 23.3
22	13 24 56.04	5.986	7 53 29.5	36.27	0.367 6287	504.7	2.01	3.77	21 21.8
23	13 27 19.81	5.995	8 7 58.3	36.13	0.366 4109	510.2	2.02	3.79	21 20.2
24	13 29 43.79	6.003	8 22 23.9	36.00	0.365 1797	515.8	2.02	3.80	21 18.7
25	13 32 7.97	6.012	8 36 46.2	35.86	0.363 9352	521.3	2.03	3.81	21 17.1
26	13 34 32.36	+6.021	− 8 51 5.1	−35.72	0.362 6773	−527.0	2.03	3.82	21 15.6
27	13 36 56.97	6.030	9 5 20.5	35.57	0.361 4058	532.6	2.04	3.83	21 14.1
28	13 39 21.80	6.039	9 19 32.3	35.42	0.360 1208	538.2	2.04	3.84	21 12.5
29	13 41 46.86	6.049	9 33 40.4	35.26	0.358 8222	543.9	2.05	3.85	21 11.0
30	13 44 12.15	6.059	9 47 44.7	35.10	0.357 5099	549.7	2.05	3.86	21 9.5
Dec. 1	13 46 37.67	+6.068	−10 1 45.2	−34.94	0.356 1838	−555.5	2.06	3.88	21 8.0
2	13 49 3.43	6.078	10 15 41.7	34.77	0.354 8437	561.3	2.07	3.89	21 6.5
3	13 51 29.42	6.088	10 29 34.2	34.60	0.353 4895	567.2	2.07	3.90	21 5.0
4	13 53 55.67	6.099	10 43 22.4	34.42	0.352 1213	573.0	2.08	3.91	21 3.5
5	13 56 22.15	6.109	10 57 6.4	34.24	0.350 7390	578.9	2.09	3.92	21 2.0
6	13 58 48.88	+6.119	−11 10 46.0	−34.06	0.349 3425	−584.8	2.10	3.94	21 0.5
7	14 1 15.86	6.129	11 24 21.1	33.87	0.347 9318	590.8	2.10	3.95	20 59.0
8	14 3 43.08	6.139	11 37 51.5	33.67	0.346 5069	596.7	2.11	3.96	20 57.5
9	14 6 10.55	6.150	11 51 17.2	33.47	0.345 0679	602.5	2.12	3.98	20 56.1
10	14 8 38.27	6.160	12 4 38.1	33.27	0.343 6149	608.4	2.12	3.99	20 54.6
11	14 11 6.24	+6.171	−12 17 54.0	−33.06	0.342 1478	−614.2	2.13	4.00	20 53.1
12	14 13 34.47	6.181	12 31 4.9	32.85	0.340 6668	620.0	2.14	4.02	20 51.6
13	14 16 2.95	6.192	12 44 10.7	32.63	0.339 1717	625.9	2.14	4.03	20 50.2
14	14 18 31.70	6.203	12 57 11.2	32.41	0.337 6627	631.6	2.15	4.04	20 48.7
15	14 21 0.71	6.214	13 10 6.4	32.19	0.336 1398	637.4	2.16	4.06	20 47.3
16	14 23 29.99	+6.226	−13 22 56.2	−31.96	0.334 6030	−643.2	2.17	4.07	20 45.8
17	14 25 59.54	6.237	13 35 40.4	31.73	0.333 0523	649.0	2.18	4.09	20 44.4
18	14 28 29.37	6.249	13 48 19.1	31.49	0.331 4877	654.8	2.18	4.10	20 42.9
19	14 30 59.49	6.261	14 0 52.0	31.25	0.329 9091	660.6	2.19	4.12	20 41.5
20	14 33 29.88	6.273	14 13 19.2	31.01	0.328 3167	666.4	2.20	4.13	20 40.1
21	14 36 0.57	+6.285	−14 25 40.4	−30.76	0.326 7103	−672.2	2.21	4.15	20 38.6
22	14 38 31.55	6.297	14 37 55.7	30.51	0.325 0899	678.1	2.21	4.16	20 37.2
23	14 41 2.82	6.309	14 50 4.9	30.26	0.323 4555	684.0	2.22	4.18	20 35.8
24	14 43 34.39	6.322	15 2 8.0	30.00	0.321 8068	689.9	2.23	4.19	20 34.4
25	14 46 6.26	6.334	15 14 4.9	29.74	0.320 1441	695.8	2.24	4.21	20 33.0
26	14 48 38.43	+6.347	−15 25 55.4	−29.47	0.318 4670	−701.8	2.25	4.23	20 31.6
27	14 51 10.91	6.360	15 37 39.5	29.20	0.316 7756	707.8	2.26	4.24	20 30.2
28	14 53 43.69	6.372	15 49 17.0	28.93	0.315 0696	713.8	2.27	4.26	20 28.8
29	14 56 16.77	6.385	16 0 47.9	28.65	0.313 3493	719.8	2.28	4.28	20 27.4
30	14 58 50.16	6.398	16 12 12.1	28.37	0.311 6143	725.9	2.28	4.29	20 26.1
31	15 1 23.85	+6.410	−16 23 29.5	−28.08	0.309 8647	−732.1	2.29	4.31	20 24.7
32	15 3 57.85	. . .	−16 34 39.9	. . .	0.308 1002	. . .	2.30	4.33	20 23.3

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Jan.	0	23 39 51.5	35 52.5	−41.6	−0 47 27.4	+62.9	0.153 2556	+3007
	2	24 51 30.4	35 46.4	40.1	0 45 21.3	63.3	0.153 8620	3057
	4	26 2 57.1	35 40.3	38.6	0 43 14.4	63.7	0.154 4782	3105
	6	27 14 11.5	35 34.1	37.0	0 41 6.7	64.0	0.155 1039	3151
	8	28 25 13.5	35 27.8	35.4	0 38 58.3	64.4	0.155 7386	3196
	10	29 36 2.8	35 21.5	−33.6	−0 36 49.3	+64.7	0.156 3821	+3239
	12	30 46 39.4	35 15.1	31.9	0 34 39.7	64.9	0.157 0340	3280
	14	31 57 3.3	35 8.7	30.1	0 32 29.7	65.1	0.157 6940	3320
	16	33 7 14.1	35 2.2	28.3	0 30 19.2	65.3	0.158 3617	3357
	18	34 17 11.9	34 55.6	26.4	0 28 8.4	65.5	0.159 0368	3393
	20	35 26 56.6	34 49.1	−24.4	−0 25 57.3	+65.6	0.159 7189	+3428
	22	36 36 28.1	34 42.4	22.5	0 23 46.0	65.7	0.160 4078	3461
	24	37 45 46.2	34 35.7	20.5	0 21 34.5	65.8	0.161 1030	3491
	26	38 54 51.0	34 29.0	18.5	0 19 22.9	65.8	0.161 8042	3521
	28	40 3 42.3	34 22.3	16.5	0 17 11.3	65.8	0.162 5112	3549
	30	41 12 20.1	34 15.5	−14.4	−0 14 59.7	+65.8	0.163 2235	+3574
Feb.	1	42 20 44.3	34 8.7	12.3	0 12 48.1	65.8	0.163 9408	3599
	3	43 28 55.0	34 1.9	10.2	0 10 36.7	65.7	0.164 6629	3622
	5	44 36 52.0	33 55.1	8.1	0 8 25.5	65.5	0.165 3893	3642
	7	45 44 35.4	33 48.3	6.0	0 6 14.6	65.4	0.166 1197	3662
	9	46 52 5.0	33 41.4	− 3.9	−0 4 3.9	+65.3	0.166 8539	+3680
	11	47 59 20.9	33 34.6	− 1.8	−0 1 53.6	65.1	0.167 5914	3696
	13	49 6 23.2	33 27.7	+ 0.3	+0 0 16.3	64.9	0.168 3321	3711
	15	50 13 11.7	33 20.8	2.4	0 2 25.8	64.6	0.169 0755	3723
	17	51 19 46.4	33 13.9	4.4	0 4 34.8	64.4	0.169 8214	3735
	19	52 26 7.5	33 7.1	+ 6.5	+0 6 43.2	+64.1	0.170 5695	+3745
	21	53 32 14.9	33 0.3	8.6	0 8 51.0	63.8	0.171 3194	3753
	23	54 38 8.6	32 53.4	10.6	0 10 58.2	63.5	0.172 0708	3760
	25	55 43 48.7	32 46.6	12.6	0 13 4.8	63.1	0.172 8235	3766
	27	56 49 15.1	32 39.8	14.6	0 15 10.6	62.7	0.173 5772	3771
Mar.	1	57 54 27.9	32 33.0	+16.5	+0 17 15.6	+62.3	0.174 3316	+3773
	3	58 59 27.2	32 26.3	18.4	0 19 19.8	61.9	0.175 0863	3774
	5	60 4 13.0	32 19.5	20.3	0 21 23.2	61.5	0.175 8412	3774
	7	61 8 45.3	32 12.8	22.2	0 23 25.7	61.0	0.176 5959	3772
	9	62 13 4.2	32 6.1	24.0	0 25 27.3	60.6	0.177 3501	3770
	11	63 17 9.8	31 59.5	+25.8	+0 27 28.0	+60.1	0.178 1037	+3766
	13	64 21 2.1	31 52.8	27.5	0 29 27.6	59.6	0.178 8564	3760
	15	65 24 41.2	31 46.2	29.2	0 31 26.2	59.1	0.179 6078	3753
	17	66 28 7.1	31 39.7	30.9	0 33 23.8	58.5	0.180 3577	3745
	19	67 31 20.0	31 33.2	32.5	0 35 20.3	58.0	0.181 1059	3736
	21	68 34 19.9	31 26.7	+34.0	+0 37 15.7	+57.4	0.181 8522	+3726
	23	69 37 6.8	31 20.3	35.5	0 39 9.9	56.8	0.182 5963	3714
	25	70 39 41.0	31 13.9	37.0	0 41 3.0	56.2	0.183 3379	3702
	27	71 42 2.4	31 7.5	38.4	0 42 54.9	55.6	0.184 0769	3688
	29	72 44 11.2	31 1.3	39.7	0 44 45.5	55.0	0.184 8130	3673
	31	73 46 7.5	30 55.0	+41.0	+0 46 34.9	+54.4	0.185 5459	+3656
Apr.	2	74 47 51.3	30 48.8	+42.2	+0 48 23.0	+53.8	0.186 2755	+3639

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Apr.	2	74 47 51.3	30 48.8	+42.2	+0 48 23.0	+53.8	0.186 2755	+3639
	4	75 49 22.8	30 42.7	43.4	0 50 9.9	53.1	0.187 0016	3621
	6	76 50 42.0	30 36.6	44.5	0 51 55.4	52.4	0.187 7240	3602
	8	77 51 49.1	30 30.5	45.5	0 53 39.6	51.8	0.188 4423	3582
	10	78 52 44.2	30 24.6	46.5	0 55 22.4	51.1	0.189 1566	3560
	12	79 53 27.4	30 18.6	+47.4	+0 57 3.9	+50.4	0.189 8664	+3538
	14	80 53 58.8	30 12.8	48.3	0 58 43.9	49.7	0.190 5718	3515
	16	81 54 18.5	30 7.0	49.1	1 0 22.6	49.0	0.191 2724	3491
	18	82 54 26.7	30 1.2	49.8	1 1 59.8	48.3	0.191 9680	3466
	20	83 54 23.4	29 55.5	50.5	1 3 35.6	47.5	0.192 6586	3440
	22	84 54 8.8	29 49.9	+51.1	+1 5 9.9	+46.8	0.193 3440	+3413
	24	85 53 43.0	29 44.3	51.7	1 6 42.8	46.1	0.194 0239	3386
	26	86 53 6.2	29 38.8	52.2	1 8 14.2	45.3	0.194 6982	3357
	28	87 52 18.4	29 33.4	52.6	1 9 44.0	44.6	0.195 3667	3328
	30	88 51 19.8	29 28.0	52.9	1 11 12.4	43.8	0.196 0293	3298
May	2	89 50 10.5	29 22.7	+53.2	+1 12 39.3	+43.1	0.196 6858	+3267
	4	90 48 50.7	29 17.5	53.5	1 14 4.6	42.3	0.197 3361	3236
	6	91 47 20.4	29 12.3	53.6	1 15 28.3	41.5	0.197 9801	3204
	8	92 45 39.9	29 7.2	53.7	1 16 50.5	40.7	0.198 6175	3170
	10	93 43 49.2	29 2.1	53.8	1 18 11.2	40.0	0.199 2482	3137
	12	94 41 48.5	28 57.2	+53.8	+1 19 30.3	+39.2	0.199 8722	+3103
	14	95 39 38.0	28 52.3	53.7	1 20 47.8	38.4	0.200 4892	3068
	16	96 37 17.7	28 47.5	53.5	1 22 3.8	37.6	0.201 0992	3032
	18	97 34 47.9	28 42.7	53.3	1 23 18.1	36.8	0.201 7020	2996
	20	98 32 8.6	28 38.0	53.1	1 24 30.8	36.0	0.202 2975	2959
	22	99 29 20.0	28 33.4	+52.8	+1 25 42.0	+35.2	0.202 8856	+2922
	24	100 26 22.2	28 28.8	52.4	1 26 51.5	34.4	0.203 4662	2884
	26	101 23 15.4	28 24.4	52.0	1 27 59.4	33.6	0.204 0391	2845
	28	102 19 59.7	28 20.0	51.5	1 29 5.7	32.8	0.204 6042	2806
	30	103 16 35.3	28 15.6	51.0	1 30 10.4	32.0	0.205 1615	2767
June	1	104 13 2.3	28 11.4	+50.4	+1 31 13.5	+31.1	0.205 7108	+2726
	3	105 9 20.9	28 7.2	49.7	1 32 14.9	30.3	0.206 2520	2686
	5	106 5 31.2	28 3.1	49.0	1 33 14.7	29.5	0.206 7851	2645
	7	107 1 33.3	27 59.0	48.3	1 34 12.9	28.7	0.207 3100	2604
	9	107 57 27.4	27 55.1	47.5	1 35 9.4	27.9	0.207 8265	2561
	11	108 53 13.7	27 51.2	+46.6	+1 36 4.3	+27.1	0.208 3345	+2519
	13	109 48 52.3	27 47.4	45.7	1 36 57.6	26.2	0.208 8340	2476
	15	110 44 23.3	27 43.6	44.8	1 37 49.2	25.4	0.209 3249	2433
	17	111 39 46.9	27 40.0	43.8	1 38 39.1	24.6	0.209 8071	2389
	19	112 35 3.2	27 36.4	42.8	1 39 27.5	23.8	0.210 2806	2345
	21	113 30 12.4	27 32.9	+41.7	+1 40 14.2	+22.9	0.210 7452	+2301
	23	114 25 14.7	27 29.4	40.6	1 40 59.2	22.1	0.211 2009	2256
	25	115 20 10.2	27 26.1	39.5	1 41 42.6	21.3	0.211 6476	2211
	27	116 14 59.0	27 22.7	38.3	1 42 24.4	20.5	0.212 0852	2165
	29	117 9 41.2	27 19.5	37.1	1 43 4.6	19.7	0.212 5137	2120
July	1	118 4 17.1	27 16.4	+35.8	+1 43 43.1	+18.8	0.212 9330	+2074
	3	118 58 46.8	27 13.3	+34.5	+1 44 19.9	+18.0	0.213 3431	+2027

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
July	1	118 4 17.1	27 16.4	+35.8	+1 43 43.1	+18.8	0.212 9330	+2074
	3	118 58 46.8	27 13.3	34.5	1 44 19.9	18.0	0.213 3431	2027
	5	119 53 10.5	27 10.3	33.2	1 44 55.1	17.2	0.213 7438	1980
	7	120 47 28.2	27 7.4	31.9	1 45 28.7	16.4	0.214 1352	1933
	9	121 41 40.1	27 4.5	30.5	1 46 0.7	15.6	0.214 5171	1886
	11	122 35 46.4	27 1.8	+29.1	+1 46 31.0	+14.8	0.214 8896	+1839
	13	123 29 47.3	26 59.1	27.7	1 46 59.7	14.0	0.215 2526	1791
	15	124 23 42.9	26 56.5	26.2	1 47 26.8	13.1	0.215 6059	1743
	17	125 17 33.3	26 53.9	24.7	1 47 52.2	12.3	0.215 9496	1694
	19	126 11 18.7	26 51.5	23.2	1 48 16.0	11.5	0.216 2836	1646
	21	127 4 59.2	26 49.1	+21.7	+1 48 38.2	+10.7	0.216 6079	+1597
	23	127 58 35.0	26 46.8	20.1	1 48 58.8	9.9	0.216 9225	1548
	25	128 52 6.3	26 44.5	18.6	1 49 17.8	9.1	0.217 2272	1499
	27	129 45 33.1	26 42.3	17.0	1 49 35.2	8.3	0.217 5221	1450
	29	130 38 55.6	26 40.2	15.4	1 49 50.9	7.5	0.217 8071	1400
	31	131 32 14.1	26 38.2	+13.8	+1 50 5.0	+ 6.7	0.218 0821	+1350
Aug.	2	132 25 28.6	26 36.3	12.2	1 50 17.6	5.9	0.218 3472	1301
	4	133 18 39.3	26 34.4	10.6	1 50 28.5	5.1	0.218 6023	1251
	6	134 11 46.3	26 32.6	8.9	1 50 37.9	4.3	0.218 8474	1200
	8	135 4 49.8	26 30.9	7.3	1 50 45.7	3.5	0.219 0824	1150
	10	135 57 50.0	26 29.3	+ 5.6	+1 50 51.8	+ 2.7	0.219 3073	+1099
	12	136 50 46.9	26 27.7	4.0	1 50 56.4	1.9	0.219 5221	1049
	14	137 43 40.7	26 26.2	2.3	1 50 59.4	1.1	0.219 7268	998
	16	138 36 31.7	26 24.8	+ 0.7	1 51 0.9	+ 0.3	0.219 9213	947
	18	139 29 19.9	26 23.4	− 1.0	1 51 0.7	− 0.5	0.220 1056	896
	20	140 22 5.4	26 22.1	− 2.6	+1 50 59.0	− 1.2	0.220 2797	+ 845
	22	141 14 48.5	26 21.0	4.3	1 50 55.7	2.0	0.220 4436	794
	24	142 7 29.3	26 19.8	5.9	1 50 50.9	2.8	0.220 5973	742
	26	143 0 7.9	26 18.8	7.5	1 50 44.5	3.6	0.220 7406	691
	28	143 52 44.5	26 17.8	9.2	1 50 36.6	4.3	0.220 8737	640
	30	144 45 19.3	26 16.9	−10.8	+1 50 27.1	− 5.1	0.220 9965	+ 588
Sept.	1	145 37 52.3	26 16.1	12.4	1 50 16.1	5.9	0.221 1090	536
	3	146 30 23.7	26 15.3	14.0	1 50 3.5	6.7	0.221 2111	485
	5	147 22 53.7	26 14.7	15.6	1 49 49.4	7.4	0.221 3029	433
	7	148 15 22.5	26 14.1	17.1	1 49 33.8	8.2	0.221 3843	381
	9	149 7 50.2	26 13.6	−18.7	+1 49 16.7	− 8.9	0.221 4554	+ 330
	11	150 0 16.8	26 13.1	20.2	1 48 58.0	9.7	0.221 5161	278
	13	150 52 42.7	26 12.7	21.7	1 48 37.8	10.5	0.221 5665	226
	15	151 45 7.8	26 12.4	23.2	1 48 16.1	11.2	0.221 6064	174
	17	152 37 32.5	26 12.2	24.7	1 47 52.9	12.0	0.221 6360	122
	19	153 29 56.7	26 12.1	−26.1	+1 47 28.2	−12.7	0.221 6552	+ 70
	21	154 22 20.8	26 12.0	27.5	1 47 2.0	13.5	0.221 6640	+ 18
	23	155 14 44.7	26 12.0	28.9	1 46 34.3	14.2	0.221 6624	− 34
	25	156 7 8.8	26 12.1	30.3	1 46 5.1	15.0	0.221 6505	86
	27	156 59 33.0	26 12.2	31.6	1 45 34.4	15.7	0.221 6281	138
	29	157 51 57.6	26 12.4	−33.0	+1 45 2.3	−16.4	0.221 5953	− 190
Oct.	1	158 44 22.8	26 12.7	−34.2	+1 44 28.7	−17.2	0.221 5522	− 242

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Oct.	1	158 44 22.8	26 12.7	−34.2	+1 44 28.7	−17.2	0.221 5522	− 242
	3	159 36 48.6	26 13.1	35.5	1 43 53.6	17.9	0.221 4987	294
	5	160 29 15.2	26 13.5	36.7	1 43 17.1	18.6	0.221 4348	345
	7	161 21 42.8	26 14.1	37.9	1 42 39.1	19.4	0.221 3606	397
	9	162 14 11.5	26 14.7	39.0	1 41 59.7	20.1	0.221 2760	449
	11	163 6 41.5	26 15.3	−40.1	+1 41 18.8	−20.8	0.221 1810	− 501
	13	163 59 12.9	26 16.1	41.2	1 40 36.5	21.5	0.221 0757	552
	15	164 51 45.9	26 16.9	42.2	1 39 52.8	22.2	0.220 9601	604
	17	165 44 20.5	26 17.8	43.2	1 39 7.6	22.9	0.220 8342	655
	19	166 36 57.1	26 18.8	44.2	1 38 21.1	23.6	0.220 6980	707
	21	167 29 35.6	26 19.8	−45.1	+1 37 33.1	−24.4	0.220 5515	− 758
	23	168 22 16.3	26 20.9	46.0	1 36 43.7	25.1	0.220 3948	809
	25	169 14 59.4	26 22.1	46.8	1 35 52.9	25.8	0.220 2278	861
	27	170 7 44.9	26 23.4	47.6	1 35 0.7	26.5	0.220 0506	912
	29	171 0 33.0	26 24.7	48.4	1 34 7.1	27.1	0.219 8632	963
	31	171 53 23.8	26 26.1	−49.1	+1 33 12.2	−27.8	0.219 6656	−1014
Nov.	2	172 46 17.6	26 27.7	49.7	1 32 15.8	28.5	0.219 4578	1061
	4	173 39 14.5	26 29.2	50.3	1 31 18.1	29.2	0.219 2399	1115
	6	174 32 14.6	26 30.9	50.9	1 30 19.1	29.9	0.219 0119	1165
	8	175 25 18.0	26 32.6	51.4	1 29 18.7	30.6	0.218 7739	1215
	10	176 18 25.0	26 34.4	−51.9	+1 28 16.9	−31.2	0.218 5258	−1266
	12	177 11 35.6	26 36.2	52.3	1 27 13.8	31.9	0.218 2677	1316
	14	178 4 50.0	26 38.2	52.7	1 26 9.4	32.6	0.217 9996	1366
	16	178 58 8.4	26 40.2	53.0	1 25 3.6	33.2	0.217 7215	1415
	18	179 51 31.0	26 42.3	53.2	1 23 56.6	33.9	0.217 4336	1465
	20	180 44 57.8	26 44.5	−53.4	+1 22 48.2	−34.5	0.217 1357	−1514
	22	181 38 29.0	26 46.7	53.6	1 21 38.5	35.2	0.216 8280	1563
	24	182 32 4.8	26 49.1	53.7	1 20 27.6	35.8	0.216 5105	1612
	26	183 25 45.3	26 51.5	53.8	1 19 15.4	36.4	0.216 1833	1660
	28	184 19 30.7	26 54.0	53.8	1 18 1.9	37.1	0.215 8464	1709
	30	185 13 21.2	26 56.5	−53.7	+1 16 47.1	−37.7	0.215 4998	−1757
Dec.	2	186 7 16.8	26 59.1	53.6	1 15 31.1	38.3	0.215 1435	1805
	4	187 1 17.7	27 1.8	53.5	1 14 13.8	39.0	0.214 7777	1853
	6	187 55 24.2	27 4.6	53.3	1 12 55.3	39.6	0.214 4024	1900
	8	188 49 36.3	27 7.5	53.0	1 11 35.6	40.2	0.214 0177	1947
	10	189 43 54.1	27 10.4	−52.7	+1 10 14.6	−40.8	0.213 6235	−1995
	12	190 38 17.9	27 13.4	52.3	1 8 52.5	41.4	0.213 2199	2041
	14	191 32 47.8	27 16.5	51.9	1 7 29.1	42.0	0.212 8071	2087
	16	192 27 23.9	27 19.6	51.4	1 6 4.6	42.6	0.212 3851	2133
	18	193 22 6.4	27 22.9	50.9	1 4 38.9	43.1	0.211 9538	2179
	20	194 16 55.5	27 26.2	−50.3	+1 3 12.1	−43.7	0.211 5135	−2224
	22	195 11 51.3	27 29.6	49.7	1 1 44.1	44.3	0.211 0642	2269
	24	196 6 53.9	27 33.0	49.0	1 0 15.0	44.8	0.210 6058	2314
	26	197 2 3.5	27 36.6	48.3	0 58 44.8	45.4	0.210 1386	2358
	28	197 57 20.3	27 40.2	47.5	0 57 13.4	46.0	0.209 6626	2402
	30	198 52 44.3	27 43.9	−46.7	+0 55 41.0	−46.5	0.209 1778	−2446
	32	199 48 15.8	27 47.6	−45.8	+0 54 7.5	−47.0	0.208 6844	−2489

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	14 44 43.88	+1.606	−14 47 39.8	−7.02	0.771 8110	−418.1	15.54	1.49	20 1.5
2	14 45 22.23	1.590	14 50 27.2	6.92	0.770 8017	423.0	15.58	1.49	19 58.2
3	14 46 0.19	1.573	14 53 12.2	6.82	0.769 7807	427.8	15.62	1.50	19 54.9
4	14 46 37.74	1.556	14 55 54.8	6.72	0.768 7481	432.6	15.65	1.50	19 51.6
5	14 47 14.89	1.539	14 58 35.0	6.62	0.767 7040	437.4	15.69	1.50	19 48.3
6	14 47 51.63	+1.522	−15 1 12.7	−6.52	0.766 6486	−442.1	15.73	1.51	19 45.0
7	14 48 27.95	1.504	15 3 48.0	6.42	0.765 5819	446.8	15.77	1.51	19 41.6
8	14 49 3.84	1.486	15 6 20.8	6.31	0.764 5041	451.4	15.81	1.51	19 38.3
9	14 49 39.30	1.468	15 8 51.1	6.21	0.763 4152	456.0	15.85	1.52	19 34.9
10	14 50 14.31	1.449	15 11 18.9	6.10	0.762 3155	460.5	15.89	1.52	19 31.6
11	14 50 48.87	+1.430	−15 13 44.1	−6.00	0.761 2049	−465.0	15.93	1.52	19 28.2
12	14 51 22.96	1.411	15 16 6.8	5.89	0.760 0838	469.3	15.97	1.53	19 24.8
13	14 51 56.58	1.391	15 18 26.9	5.78	0.758 9523	473.6	16.01	1.53	19 21.5
14	14 52 29.73	1.371	15 20 44.4	5.67	0.757 8106	477.8	16.05	1.54	19 18.1
15	14 53 2.39	1.350	15 22 59.3	5.56	0.756 6588	482.0	16.10	1.54	19 14.7
16	14 53 34.55	+1.330	−15 25 11.5	−5.45	0.755 4972	−486.0	16.14	1.54	19 11.2
17	14 54 6.21	1.309	15 27 21.1	5.34	0.754 3260	490.0	16.18	1.55	19 7.8
18	14 54 37.36	1.287	15 29 28.0	5.23	0.753 1454	493.9	16.23	1.55	19 4.4
19	14 55 7.98	1.265	15 31 32.3	5.12	0.751 9555	497.7	16.27	1.56	19 1.0
20	14 55 38.08	1.243	15 33 33.8	5.01	0.750 7566	501.4	16.32	1.56	18 57.6
21	14 56 7.65	+1.221	−15 35 32.7	−4.90	0.749 5490	−505.0	16.36	1.57	18 54.1
22	14 56 36.67	1.198	15 37 28.8	4.78	0.748 3328	508.5	16.41	1.57	18 50.6
23	14 57 5.15	1.175	15 39 22.2	4.67	0.747 1084	511.9	16.45	1.58	18 47.2
24	14 57 33.08	1.152	15 41 12.8	4.55	0.745 8759	515.2	16.50	1.58	18 43.7
25	14 58 0.44	1.128	15 43 0.6	4.44	0.744 6356	518.4	16.55	1.58	18 40.2
26	14 58 27.23	+1.104	−15 44 45.7	−4.32	0.743 3878	−521.5	16.60	1.59	18 36.7
27	14 58 53.45	1.080	15 46 28.0	4.20	0.742 1327	524.5	16.64	1.59	18 33.2
28	14 59 19.09	1.056	15 48 7.5	4.09	0.740 8705	527.4	16.69	1.60	18 29.7
29	14 59 44.14	1.031	15 49 44.2	3.97	0.739 6015	530.1	16.74	1.60	18 26.2
30	15 0 8.59	1.006	15 51 18.0	3.85	0.738 3259	532.8	16.79	1.61	18 22.6
31	15 0 32.44	+0.981	−15 52 49.1	−3.73	0.737 0440	−535.4	16.84	1.61	18 19.1
Feb. 1	15 0 55.69	0.956	15 54 17.3	3.61	0.735 7560	537.9	16.89	1.62	18 15.6
2	15 1 18.33	0.930	15 55 42.6	3.50	0.734 4621	540.3	16.94	1.62	18 12.0
3	15 1 40.34	0.904	15 57 5.1	3.38	0.733 1627	542.6	16.99	1.63	18 8.4
4	15 2 1.72	0.878	15 58 24.8	3.26	0.731 8579	544.7	17.04	1.63	18 4.8
5	15 2 22.47	+0.851	−15 59 41.5	−3.14	0.730 5481	−546.8	17.09	1.64	18 1.2
6	15 2 42.58	0.824	16 0 55.4	3.02	0.729 2334	548.8	17.15	1.64	17 57.6
7	15 3 2.04	0.797	16 2 6.3	2.89	0.727 9142	550.6	17.20	1.65	17 54.0
8	15 3 20.85	0.770	16 3 14.3	2.77	0.726 5908	552.2	17.25	1.65	17 50.4
9	15 3 38.99	0.742	16 4 19.4	2.65	0.725 2635	553.8	17.30	1.66	17 46.7
10	15 3 56.46	+0.714	−16 5 21.6	−2.53	0.723 9326	−555.2	17.36	1.66	17 43.1
11	15 4 13.25	0.685	16 6 20.8	2.41	0.722 5986	556.5	17.41	1.67	17 39.4
12	15 4 29.36	0.657	16 7 17.1	2.28	0.721 2617	557.6	17.46	1.67	17 35.8
13	15 4 44.77	0.628	16 8 10.3	2.16	0.719 9223	558.5	17.52	1.68	17 32.1
14	15 4 59.49	0.599	16 9 0.6	2.03	0.718 5808	559.3	17.57	1.68	17 28.4
15	15 5 13.50	+0.569	−16 9 47.8	−1.91	0.717 2376	−560.0	17.63	1.69	17 24.7
16	15 5 26.81	+0.540	−16 10 32.1	−1.78	0.715 8931	−560.5	17.68	1.69	17 20.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	15 5 26.81	+0.540	−16 10 32.1	−1.78	0.715 8931	−560.5	17.68	1.69	17 20.9
17	15 5 39.40	0.510	16 11 13.4	1.66	0.714 5476	560.8	17.73	1.70	17 17.2
18	15 5 51.28	0.480	16 11 51.6	1.53	0.713 2016	560 9	17.79	1.70	17 13.5
19	15 6 2.43	0.450	16 12 26.8	1.40	0.711 8555	560.8	17.85	1.71	17 9.7
20	15 6 12.86	0.420	16 12 59.0	1.28	0.710 5097	560.6	17.90	1.71	17 5.9
21	15 6 22.57	+0.389	−16 13 28.1	−1.15	0.709 1647	−560.2	17.96	1.72	17 2.1
22	15 6 31.54	0.359	16 13 54.2	1.02	0.707 8208	559.6	18.01	1.72	16 58.3
23	15 6 39.78	0.328	16 14 17.3	0.90	0.706 4785	558.9	18.07	1.73	16 54.5
24	15 6 47.28	0.297	16 14 37.3	0.77	0.705 1382	558.0	18.12	1.74	16 50.7
25	15 6 54.04	0.266	16 14 54.3	0.65	0.703 8004	556.9	18.18	1.74	16 46.9
26	15 7 0.06	+0.235	−16 15 8.3	−0.52	0.702 4654	−555.6	18.24	1.75	16 43.1
27	15 7 5.34	0.204	16 15 19.2	0.39	0.701 1336	554.2	18.29	1.75	16 39.2
28	15 7 9.87	0.173	16 15 27.1	0.27	0.699 8055	552.5	18.35	1.76	16 35.3
Mar. 1	15 7 13.65	0.142	16 15 32.0	0.14	0.698 4815	550.7	18.40	1.76	16 31.5
2	15 7 16.69	0.111	16 15 33.9	−0.02	0.697 1620	548.8	18.46	1.77	16 27.6
3	15 7 18.98	+0.080	−16 15 32.8	+0.11	0.695 8475	−546.6	18.51	1.77	16 23.7
4	15 7 20.51	0.048	16 15 28.6	0.24	0.694 5383	544.3	18.57	1.78	16 19.8
5	15 7 21.29	+0.017	16 15 21.4	0.36	0.693 2349	541.8	18.63	1.78	16 15.8
6	15 7 21.32	−0.014	16 15 11.2	0.49	0.691 9378	539.1	18.68	1.79	16 11.9
7	15 7 20.60	0.046	16 14 58.0	0.61	0.690 6475	536.2	18.74	1.79	16 8.0
8	15 7 19.12	−0.078	−16 14 41.8	+0.74	0.689 3643	−533.1	18.79	1.80	16 4.0
9	15 7 16.88	0.109	16 14 22.6	0.86	0.688 0889	529.8	18.85	1.80	16 0.0
10	15 7 13.88	0.141	16 14 0.4	0.99	0.686 8217	526.2	18.90	1.81	15 56.0
11	15 7 10.13	0.172	16 13 35.2	1.11	0.685 5633	522.5	18.96	1.82	15 52.0
12	15 7 5.62	0.204	16 13 7.0	1.24	0.684 3141	518.5	19.01	1.82	15 48.0
13	15 7 0.35	−0.235	−16 12 35.8	+1.36	0.683 0747	−514.3	19.07	1.83	15 44.0
14	15 6 54.33	0.266	16 12 1.6	1.49	0.681 8457	509.9	19.12	1.83	15 39.9
15	15 6 47.57	0.297	16 11 24.4	1.61	0.680 6276	505.2	19.18	1.84	15 35.9
16	15 6 40.06	0.329	16 10 44.3	1.73	0.679 4210	500.3	19.23	1.84	15 31.8
17	15 6 31.80	0.360	16 10 1.3	1.85	0.678 2264	495.2	19.28	1.85	15 27.7
18	15 6 22.81	−0.390	−16 9 15.4	+1.97	0.677 0443	−489.9	19.33	1.85	15 23.6
19	15 6 13.09	0.420	16 8 26.6	2.09	0.675 8753	484.3	19.39	1.86	15 19.5
20	15 6 2.64	0.450	16 7 34.9	2.21	0.674 7199	478.5	19.44	1.86	15 15.4
21	15 5 51.48	0.480	16 6 40.4	2.33	0.673 5786	472.5	19.49	1.87	15 11.3
22	15 5 39.60	0.510	16 5 43.0	2.45	0.672 4520	466.3	19.54	1.87	15 7.2
23	15 5 27.02	−0.539	−16 4 42.8	+2.56	0.671 3406	−459.9	19.59	1.88	15 3.0
24	15 5 13.74	0.568	16 3 39.9	2.68	0.670 2449	453.2	19.64	1.88	14 58.9
25	15 4 59.77	0.596	16 2 34.2	2.79	0.669 1655	446.3	19.69	1.88	14 54.7
26	15 4 45.12	0.624	16 1 25.9	2.90	0.668 1028	439.2	19.74	1.89	14 50.5
27	15 4 29.80	0.652	16 0 14.9	3.01	0.667 0574	431.9	19.78	1.89	14 46.3
28	15 4 13.82	−0.679	−15 59 1.3	+3.12	0.666 0298	−424.4	19.83	1.90	14 42.1
29	15 3 57.20	0.706	15 57 45.1	3.23	0.665 0204	416.7	19.88	1.90	14 37.9
30	15 3 39.93	0.733	15 56 26.3	3.33	0.664 0296	408.9	19.92	1.91	14 33.7
31	15 3 22.02	0.759	15 55 5.0	3.44	0.663 0579	400.8	19.97	1.91	14 29.4
Apr. 1	15 3 3.50	0.784	15 53 41.2	3.54	0.662 1058	392.6	20.01	1.92	14 25.2
2	15 2 44.37	−0.810	−15 52 15.0	+3.64	0.661 1737	−384.2	20.05	1.92	14 21.0
3	15 2 24.64	−0.834	−15 50 46.3	+3.74	0.660 2620	−375.5	20.10	1.92	14 16.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	15 3 3.50	−0.784	−15 53 41.2	+3.54	0.662 1058	−392.6	20.01	1.92	14 25.2
2	15 2 44.37	0.810	15 52 15.0	3.64	0.661 1737	384.2	20.05	1.92	14 21.0
3	15 2 24.64	0.834	15 50 46.3	3.74	0.660 2620	375.5	20.10	1.92	14 16.7
4	15 2 4.32	0.859	15 49 15.4	3.84	0.659 3714	366.7	20.14	1.93	14 12.4
5	15 1 43.43	0.882	15 47 42.1	3.94	0.658 5022	357.6	20.18	1.93	14 8.1
6	15 1 21.97	−0.906	−15 46 6.5	+4.03	0.657 6550	−348.4	20.22	1.94	14 3.8
7	15 0 59.95	0.929	15 44 28.7	4.12	0.656 8301	339.0	20.26	1.94	13 59.5
8	15 0 37.40	0.951	15 42 48.7	4.21	0.656 0282	329.3	20.29	1.94	13 55.2
9	15 0 14.32	0.972	15 41 6.6	4.30	0.655 2495	319.5	20.33	1.95	13 50.9
10	14 59 50.73	0.993	15 39 22.4	4.38	0.654 4946	309.5	20.36	1.95	13 46.6
11	14 59 26.65	−1.014	−15 37 36.2	+4.46	0.653 7639	−299.3	20.40	1.95	13 42.3
12	14 59 2.08	1.033	15 35 48.1	4.54	0.653 0579	288.9	20.43	1.96	13 37.9
13	14 58 37.06	1.052	15 33 58.1	4.62	0.652 3771	278.4	20.46	1.96	13 33.5
14	14 58 11.59	1.070	15 32 6.3	4.70	0.651 7217	267.7	20.49	1.96	13 29.2
15	14 57 45.70	1.087	15 30 12.7	4.77	0.651 0923	256.8	20.52	1.96	13 24.8
16	14 57 19.39	−1.104	−15 28 17.4	+4.84	0.650 4892	−245.8	20.55	1.97	13 20.5
17	14 56 52.69	1.120	15 26 20.5	4.90	0.649 9126	234.6	20.58	1.97	13 16.1
18	14 56 25.63	1.135	15 24 22.1	4.96	0.649 3630	223.3	20.61	1.97	13 11.7
19	14 55 58.21	1.149	15 22 22.2	5.02	0.648 8406	211.9	20.63	1.98	13 7.3
20	14 55 30.46	1.163	15 20 20.9	5.08	0.648 3459	200.3	20.66	1.98	13 2.9
21	14 55 2.40	−1.175	−15 18 18.3	+5.13	0.647 8791	−188.7	20.68	1.98	12 58.5
22	14 54 34.05	1.187	15 16 14.5	5.18	0.647 4403	176.9	20.70	1.98	12 54.1
23	14 54 5.43	1.198	15 14 9.6	5.23	0.647 0299	165.1	20.72	1.98	12 49.7
24	14 53 36.56	1.208	15 12 3.7	5.27	0.646 6480	153.2	20.74	1.98	12 45.3
25	14 53 7.46	1.217	15 9 56.7	5.31	0.646 2947	141.2	20.75	1.99	12 40.9
26	14 52 38.15	−1.225	−15 7 48.9	+5.34	0.645 9702	−129.2	20.77	1.99	12 36.4
27	14 52 8.65	1.232	15 5 40.3	5.37	0.645 6746	117.1	20.78	1.99	12 32.0
28	14 51 38.99	1.239	15 3 31.0	5.40	0.645 4082	104.9	20.80	1.99	12 27.6
29	14 51 9.17	1.245	15 1 21.1	5.42	0.645 1710	92.7	20.81	1.99	12 23.2
30	14 50 39.22	1.250	14 59 10.7	5.44	0.644 9631	80.5	20.82	1.99	12 18.8
May 1	14 50 9.16	−1.254	−14 56 59.9	+5.46	0.644 7846	− 68.2	20.83	1.99	12 14.3
2	14 49 39.02	1.257	14 54 48.7	5.47	0.644 6356	55.9	20.83	1.99	12 9.9
3	14 49 8.81	1.260	14 52 37.2	5.48	0.644 5161	43.6	20.84	2.00	12 5.5
4	14 48 38.55	1.261	14 50 25.6	5.49	0.644 4261	31.3	20.84	2.00	12 1.0
5	14 48 8.26	1.262	14 48 13.8	5.49	0.644 3658	18.9	20.84	2.00	11 56.6
6	14 47 37.97	−1.262	−14 46 2.1	+5.49	0.644 3353	− 6.5	20.85	2.00	11 52.2
7	14 47 7.68	1.261	14 43 50.5	5.48	0.644 3345	+ 5.9	20.85	2.00	11 47.7
8	14 46 37.42	1.260	14 41 39.0	5.47	0.644 3635	18.3	20.84	2.00	11 43.3
9	14 46 7.22	1.257	14 39 27.8	5.46	0.644 4222	30.6	20.84	2.00	11 38.9
10	14 45 37.09	1.253	14 37 17.0	5.44	0.644 5105	43.0	20.84	2.00	11 34.4
11	14 45 7.06	−1.249	−14 35 6.7	+5.42	0.644 6284	+ 55.3	20.83	1.99	11 30.0
12	14 44 37.14	1.244	14 32 56.9	5.39	0.644 7757	67.5	20.83	1.99	11 25.6
13	14 44 7.36	1.237	14 30 47.8	5.36	0.644 9525	79.8	20.82	1.99	11 21.2
14	14 43 37.75	1.230	14 28 39.4	5.33	0.645 1586	92.0	20.81	1.99	11 16.7
15	14 43 8.31	1.222	14 26 31.9	5.29	0.645 3940	104.1	20.80	1.99	11 12.3
16	14 42 39.08	−1.213	−14 24 25.4	+5.25	0.645 6583	+116.1	20.78	1.99	11 7.9
17	14 42 10.07	−1.204	−14 22 20.0	+5.20	0.645 9514	+128.1	20.77	1.99	11 3.5

GREENWICH MEAN TIME.

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	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
May 17	14 42 10.07	−1.204	−14 22 20.0	+5.20	0.645 9514	+128.1	20.77	1.99	11 3.5
18	14 41 41.30	1.193	14 20 15.7	5.15	0.646 2730	139.9	20.75	1.99	10 59.1
19	14 41 12.80	1.182	14 18 12.7	5.10	0.646 6229	151.6	20.74	1.98	10 54.7
20	14 40 44.58	1.170	14 16 11.0	5.04	0.647 0007	163.2	20.72	1.98	10 50.3
21	14 40 16.66	1.156	14 14 10.7	4.98	0.647 4063	174.7	20.70	1.98	10 45.9
22	14 39 49.07	−1.143	−14 12 12.0	+4.91	0.647 8392	+186.0	20.68	1.98	10 41.5
23	14 39 21.81	1.129	14 10 14.9	4.84	0.648 2992	197.2	20.66	1.98	10 37.1
24	14 38 54.90	1.113	14 8 19.5	4.77	0.648 7859	208.3	20.63	1.98	10 32.7
25	14 38 28.37	1.097	14 6 25.9	4.69	0.649 2990	219.2	20.61	1.97	10 28.4
26	14 38 2.23	1.081	14 4 34.2	4.61	0.649 8381	230.0	20.58	1.97	10 24.0
27	14 37 36.49	−1.064	−14 2 44.4	+4.53	0.650 4027	+240.5	20.56	1.97	10 19.7
28	14 37 11.17	1.046	14 0 56.6	4.45	0.650 9926	251.0	20.53	1.97	10 15.3
29	14 36 46.28	1.028	13 59 11.0	4.36	0.651 6074	261.3	20.50	1.96	10 11.0
30	14 36 21.83	1.009	13 57 27.5	4.27	0.652 2466	271.4	20.47	1.96	10 6.6
31	14 35 57.85	0.990	13 55 46.2	4.17	0.652 9099	281.3	20.44	1.96	10 2.3
June 1	14 35 34.33	−0.970	−13 54 7.3	+4.07	0.653 5969	+291.1	20.41	1.95	9 58.0
2	14 35 11.30	0.949	13 52 30.7	3.97	0.654 3073	300.8	20.37	1.95	9 53.7
3	14 34 48.77	0.928	13 50 56.5	3.87	0.655 0405	310.2	20.34	1.95	9 49.4
4	14 34 26.75	0.907	13 49 24.8	3.77	0.655 7963	319.5	20.30	1.94	9 45.1
5	14 34 5.25	0.885	13 47 55.7	3.66	0.656 5742	328.7	20.27	1.94	9 40.8
6	14 33 44.28	−0.862	−13 46 29.3	+3.55	0.657 3738	+337.6	20.23	1.94	9 36.5
7	14 33 23.87	0.839	13 45 5.5	3.44	0.658 1947	346.4	20.19	1.93	9 32.3
8	14 33 4.02	0.815	13 43 44.4	3.32	0.659 0365	355.1	20.15	1.93	9 28.0
9	14 32 44.74	0.791	13 42 26.2	3.20	0.659 8988	363.5	20.11	1.93	9 23.8
10	14 32 26.05	0.766	13 41 10.9	3.08	0.660 7810	371.7	20.07	1.92	9 19.5
11	14 32 7.95	−0.742	−13 39 58.5	+2.96	0.661 6826	+379.7	20.03	1.92	9 15.3
12	14 31 50.45	0.716	13 38 49.0	2.83	0.662 6032	387.5	19.99	1.91	9 11.1
13	14 31 33.57	0.690	13 37 42.6	2.70	0.663 5422	395.0	19.94	1.91	9 6.9
14	14 31 17.31	0.664	13 36 39.2	2.57	0.664 4992	402.4	19.90	1.90	9 2.7
15	14 31 1.68	0.638	13 35 39.0	2.44	0.665 4737	409.6	19.86	1.90	8 58.5
16	14 30 46.69	−0.611	−13 34 41.9	+2.31	0.666 4652	+416.6	19.81	1.90	8 54.3
17	14 30 32.35	0.584	13 33 48.0	2.18	0.667 4730	423.3	19.76	1.89	8 50.1
18	14 30 18.66	0.556	13 32 57.3	2.04	0.668 4967	429.8	19.72	1.89	8 46.0
19	14 30 5.64	0.529	13 32 9.9	1.91	0.669 5358	436.1	19.67	1.88	8 41.8
20	14 29 53.28	0.501	13 31 25.8	1.77	0.670 5896	442.1	19.62	1.88	8 37.7
21	14 29 41.60	−0.473	−13 30 45.0	+1.63	0.671 6577	+448.0	19.58	1.87	8 33.6
22	14 29 30.59	0.444	13 30 7.6	1.49	0.672 7396	453.6	19.53	1.87	8 29.5
23	14 29 20.27	0.416	13 29 33.5	1.35	0.673 8346	459.0	19.48	1.86	8 25.4
24	14 29 10.62	0.388	13 29 2.8	1.21	0.674 9424	464.2	19.43	1.86	8 21.3
25	14 29 1.66	0.359	13 28 35.5	1.07	0.676 0624	469.1	19.38	1.86	8 17.2
26	14 28 53.39	−0.330	−13 28 11.6	+0.92	0.677 1941	+473.9	19.33	1.85	8 13.2
27	14 28 45.82	0.301	13 27 51.1	0.78	0.678 3371	478.5	19.28	1.85	8 9.1
28	14 28 38.93	0.272	13 27 34.1	0.64	0.679 4908	482.9	19.23	1.84	8 5.1
29	14 28 32.74	0.244	13 27 20.5	0.49	0.680 6549	487.1	19.17	1.84	8 1.0
30	14 28 27.24	0.215	13 27 10.4	0.35	0.681 8289	491.1	19.12	1.83	7 57.0
July 1	14 28 22.44	−0.185	−13 27 3.7	+0.21	0.683 0122	+495.0	19.07	1.83	7 53.0
2	14 28 18.34	−0.156	−13 27 0.5	+0.06	0.684 2046	+498.6	19.02	1.82	7 49.0

GREENWICH MEAN TIME.

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	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	14 28 22.44	−0.185	−13 27 3.7	+0.21	0.683 0122	+495.0	19.07	1.83	7 53.0
2	14 28 18.34	0.156	13 27 0.5	+0.06	0.684 2046	498.6	19.02	1.82	7 49.0
3	14 28 14.94	0.127	13 27 0.7	−0.08	0.685 4055	502.1	18.97	1.82	7 45.0
4	14 28 12.24	0.098	13 27 4.3	0.22	0.686 6146	505.4	18.91	1.81	7 41.1
5	14 28 10.24	0.069	13 27 11.4	0.37	0.687 8313	508.5	18.86	1.81	7 37.1
6	14 28 8.95	−0.039	−13 27 22.0	−0.51	0.689 0553	+511.5	18.81	1.80	7 33.1
7	14 28 8.36	−0.010	13 27 36.0	0.66	0.690 2861	514.2	18.75	1.80	7 29.2
8	14 28 8.47	+0.019	13 27 53.5	0.80	0.691 5232	516.7	18.70	1.79	7 25.3
9	14 28 9.29	0.049	13 28 14.4	0.94	0.692 7661	519.0	18.65	1.79	7 21.4
10	14 28 10.82	0.078	13 28 38.8	1.09	0.694 0145	521.2	18.59	1.78	7 17.5
11	14 28 13.05	+0.107	−13 29 6.5	−1.23	0.695 2679	+523.2	18.54	1.78	7 13.6
12	14 28 15.98	0.137	13 29 37.7	1.37	0.696 5259	525.0	18.49	1.77	7 9.7
13	14 28 19.62	0.166	13 30 12.3	1.51	0.697 7880	526.7	18.43	1.76	7 5.8
14	14 28 23.96	0.195	13 30 50.3	1.65	0.699 0538	528.1	18.38	1.76	7 2.0
15	14 28 29.00	0.225	13 31 31.7	1.80	0.700 3229	529.4	18.33	1.75	6 58.1
16	14 28 34.74	+0.254	−13 32 16.5	−1.94	0.701 5949	+530.5	18.27	1.75	6 54.3
17	14 28 41.17	0.283	13 33 4.6	2.08	0.702 8692	531.4	18.22	1.74	6 50.5
18	14 28 48.30	0.311	13 33 56.1	2.21	0.704 1456	532.2	18.16	1.74	6 46.6
19	14 28 56.12	0.340	13 34 50.9	2.35	0.705 4235	532.7	18.11	1.73	6 42.8
20	14 29 4.63	0.369	13 35 48.9	2.48	0.706 7026	533.1	18.06	1.73	6 39.1
21	14 29 13.81	+0.397	−13 36 50.1	−2.62	0.707 9824	+533.4	18.00	1.72	6 35.3
22	14 29 23.67	0.425	13 37 54.6	2.75	0.709 2626	533.4	17.95	1.72	6 31.5
23	14 29 34.21	0.453	13 39 2.3	2.89	0.710 5428	533.4	17.90	1.71	6 27.8
24	14 29 45.42	0.481	13 40 13.1	3.01	0.711 8226	533.2	17.85	1.71	6 24.0
25	14 29 57.29	0.508	13 41 27.0	3.14	0.713 1019	532.9	17.79	1.70	6 20.3
26	14 30 9.82	+0.536	−13 42 44.0	−3.27	0.714 3803	+532.4	17.74	1.70	6 16.6
27	14 30 23.00	0.563	13 44 4.1	3.40	0.715 6574	531.8	17.69	1.69	6 12.9
28	14 30 36.83	0.590	13 45 27.2	3.52	0.716 9330	531.1	17.64	1.69	6 9.2
29	14 30 51.31	0.617	13 46 53.3	3.65	0.718 2068	530.3	17.59	1.68	6 5.5
30	14 31 6.44	0.644	13 48 22.4	3.77	0.719 4784	529.4	17.53	1.68	6 1.8
31	14 31 22.20	+0.670	−13 49 54.4	−3.89	0.720 7477	+528.3	17.48	1.67	5 58.1
Aug. 1	14 31 38.60	0.696	13 51 29.3	4.01	0.722 0142	527.1	17.43	1.67	5 54.5
2	14 31 55.63	0.723	13 53 7.1	4.13	0.723 2777	525.8	17.38	1.66	5 50.8
3	14 32 13.29	0.749	13 54 47.7	4.25	0.724 5380	524.4	17.33	1.66	5 47.2
4	14 32 31.57	0.775	13 56 31.1	4.37	0.725 7948	522.9	17.28	1.66	5 43.6
5	14 32 50.48	+0.800	−13 58 17.3	−4.48	0.727 0477	+521.2	17.23	1.65	5 39.9
6	14 33 9.99	0.826	14 0 6.2	4.59	0.728 2966	519.5	17.18	1.65	5 36.3
7	14 33 30.12	0.851	14 1 57.8	4.70	0.729 5411	517.6	17.13	1.64	5 32.7
8	14 33 50.85	0.876	14 3 52.1	4.81	0.730 7809	515.6	17.08	1.64	5 29.2
9	14 34 12.19	0.901	14 5 48.9	4.92	0.732 0159	513.5	17.04	1.63	5 25.6
10	14 34 34.12	+0.926	−14 7 48.4	−5.03	0.733 2457	+511.3	16.99	1.63	5 22.0
11	14 34 56.65	0.951	14 9 50.5	5.14	0.734 4701	509.0	16.94	1.62	5 18.4
12	14 35 19.77	0.976	14 11 55.0	5.24	0.735 6887	506.5	16.89	1.62	5 14.9
13	14 35 43.48	1.000	14 14 2.1	5.34	0.736 9013	504.0	16.84	1.61	5 11.4
14	14 36 7.76	1.024	14 16 11.5	5.44	0.738 1077	501.3	16.80	1.61	5 7.8
15	14 36 32.62	+1.048	−14 18 23.4	−5.55	0.739 3075	+498.5	16.75	1.60	5 4.3
16	14 36 58.04	+1.071	−14 20 37.7	−5.64	0.740 5006	+495.7	16.71	1.60	5 0.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	14 36 58.04	+1.071	−14 20 37.7	−5.64	0.740 5006	+495.7	16.71	1.60	5 0.8
17	14 37 24.02	1.094	14 22 54.2	5.74	0.741 6868	492.7	16.66	1.60	4 57.3
18	14 37 50.55	1.117	14 25 13.0	5.83	0.742 8657	489.7	16.61	1.59	4 53.8
19	14 38 17.63	1.140	14 27 34.1	5.92	0.744 0373	486.6	16.57	1.59	4 50.3
20	14 38 45.26	1.162	14 29 57.3	6.01	0.745 2012	483.3	16.53	1.58	4 46.9
21	14 39 13.42	+1.184	−14 32 22.6	−6.10	0.746 3573	+480.1	16.48	1.58	4 43.4
22	14 39 42.10	1.206	14 34 50.0	6.19	0.747 5055	476.7	16.44	1.57	4 40.0
23	14 40 11.32	1.228	14 37 19.5	6.27	0.748 6454	473.2	16.40	1.57	4 36.5
24	14 40 41.05	1.249	14 39 51.0	6.35	0.749 7770	469.8	16.35	1.57	4 33.1
25	14 41 11.29	1.271	14 42 24.5	6.43	0.750 9002	466.2	16.31	1.56	4 29.6
26	14 41 42.04	+1.292	−14 44 59.8	−6.51	0.752 0148	+462.6	16.27	1.56	4 26.2
27	14 42 13.29	1.313	14 47 37.0	6.59	0.753 1207	459.0	16.23	1.55	4 22.8
28	14 42 45.04	1.333	14 50 16.1	6.66	0.754 2178	455.3	16.19	1.55	4 19.4
29	14 43 17.28	1.353	14 52 56.9	6.74	0.755 3058	451.4	16.15	1.55	4 16.0
30	14 43 50.00	1.374	14 55 39.5	6.81	0.756 3846	447.6	16.11	1.54	4 12.6
31	14 44 23.21	+1.394	−14 58 23.8	−6.88	0.757 4541	+443.7	16.07	1.54	4 9.2
Sept. 1	14 44 56.90	1.414	15 1 9.8	6.95	0.758 5142	439.7	16.03	1.54	4 5.9
2	14 45 31.07	1.433	15 3 57.4	7.02	0.759 5646	435.6	15.99	1.53	4 2.5
3	14 46 5.70	1.453	15 6 46.6	7.08	0.760 6052	431.5	15.95	1.53	3 59.1
4	14 46 40.80	1.472	15 9 37.4	7.15	0.761 6359	427.4	15.91	1.52	3 55.8
5	14 47 16.35	+1.491	−15 12 29.7	−7.21	0.762 6566	+423.1	15.87	1.52	3 52.5
6	14 47 52.36	1.510	15 15 23.5	7.27	0.763 6670	418.9	15.84	1.52	3 49.1
7	14 48 28.81	1.528	15 18 18.6	7.33	0.764 6671	414.5	15.80	1.51	3 45.8
8	14 49 5.72	1.547	15 21 15.2	7.39	0.765 6567	410.1	15.77	1.51	3 42.5
9	14 49 43.06	1.565	15 24 13.2	7.44	0.766 6356	405.6	15.73	1.51	3 39.2
10	14 50 20.84	+1.583	−15 27 12.5	−7.50	0.767 6037	+401.1	15.70	1.50	3 35.9
11	14 50 59.04	1.601	15 30 13.0	7.55	0.768 5608	396.5	15.66	1.50	3 32.6
12	14 51 37.67	1.618	15 33 14.8	7.60	0.769 5068	391.8	15.63	1.50	3 29.3
13	14 52 16.71	1.635	15 36 17.8	7.65	0.770 4415	387.1	15.59	1.49	3 26.0
14	14 52 56.17	1.652	15 39 21.9	7.69	0.771 3648	382.3	15.56	1.49	3 22.7
15	14 53 36.02	+1.669	−15 42 27.1	−7.74	0.772 2765	+377.5	15.53	1.49	3 19.5
16	14 54 16.28	1.685	15 45 33.4	7.78	0.773 1766	372.6	15.49	1.48	3 16.2
17	14 54 56.92	1.702	15 48 40.7	7.82	0.774 0650	367.7	15.46	1.48	3 12.9
18	14 55 37.96	1.718	15 51 49.0	7.86	0.774 9417	362.8	15.43	1.48	3 9.7
19	14 56 19.37	1.733	15 54 58.1	7.90	0.775 8064	357.8	15.40	1.48	3 6.4
20	14 57 1.16	+1.749	−15 58 8.1	−7.94	0.776 6593	+352.9	15.37	1.47	3 3.2
21	14 57 43.31	1.764	16 1 19.0	7.97	0.777 5002	347.9	15.34	1.47	3 0.0
22	14 58 25.83	1.779	16 4 30.6	8.00	0.778 3290	342.8	15.31	1.47	2 56.7
23	14 59 8.70	1.794	16 7 43.1	8.04	0.779 1457	337.7	15.28	1.46	2 53.5
24	14 59 51.93	1.809	16 10 56.3	8.06	0.779 9501	332.6	15.26	1.46	2 50.3
25	15 0 35.51	+1.823	−16 14 10.2	−8.09	0.780 7423	+327.5	15.23	1.46	2 47.1
26	15 1 19.44	1.837	16 17 24.8	8.12	0.781 5221	322.3	15.20	1.46	2 43.9
27	15 2 3.70	1.851	16 20 39.9	8.14	0.782 2895	317.1	15.17	1.45	2 40.7
28	15 2 48.30	1.865	16 23 55.6	8.16	0.783 0444	311.9	15.15	1.45	2 37.5
29	15 3 33.24	1.879	16 27 11.8	8.19	0.783 7868	306.7	15.12	1.45	2 34.3
30	15 4 18.50	+1.893	−16 30 28.6	−8.21	0.784 5166	+301.4	15.10	1.44	2 31.1
Oct. 1	15 5 4.08	+1.906	−16 33 45.8	−8.22	0.785 2336	+296.1	15.07	1.44	2 28.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	15 5 4.08	+1.906	−16 33 45.8	−8.22	0.785 2336	+296.1	15.07	1.44	2 28.0
2	15 5 49.98	1.919	16 37 3.4	8.21	0.785 9379	290.8	15.05	1.44	2 24.8
3	15 6 36.19	1.932	16 40 21.5	8.26	0.786 6293	285.4	15.02	1.44	2 21.6
4	15 7 22.71	1.945	16 43 39.9	8.27	0.787 3077	280.0	15.00	1.44	2 18.5
5	15 8 9.53	1.957	16 46 58.6	8.29	0.787 9731	274.5	14.98	1.43	2 15.3
6	15 8 56.66	+1.970	−16 50 17.6	−8.30	0.788 6253	+269.0	14.95	1.43	2 12.2
7	15 9 44.08	1.982	16 53 36.9	8.31	0.789 2643	263.5	14.93	1.43	2 9.0
8	15 10 31.79	1.994	16 56 56.4	8.32	0.789 8900	257.9	14.91	1.43	2 5.9
9	15 11 19.77	2.005	17 0 16.1	8.32	0.790 5022	252.3	14.89	1.43	2 2.7
10	15 12 8.04	2.017	17 3 35.9	8.33	0.791 1009	246.6	14.87	1.42	1 59.6
11	15 12 56.58	+2.028	−17 6 55.9	−8.33	0.791 6861	+241.0	14.85	1.42	1 56.5
12	15 13 45.39	2.039	17 10 15.9	8.33	0.792 2577	235.3	14.83	1.42	1 53.4
13	15 14 34.45	2.050	17 13 35.9	8.33	0.792 8155	229.6	14.81	1.42	1 50.2
14	15 15 23.77	2.060	17 16 55.9	8.33	0.793 3597	223.9	14.79	1.42	1 47.1
15	15 16 13.34	2.070	17 20 15.9	8.33	0.793 8901	218.1	14.77	1.41	1 44.0
16	15 17 3.15	+2.080	−17 23 35.9	−8.33	0.794 4066	+212.3	14.76	1.41	1 40.9
17	15 17 53.20	2.090	17 26 55.7	8.32	0.794 9093	206.6	14.74	1.41	1 37.8
18	15 18 43.48	2.100	17 30 15.4	8.32	0.795 3981	200.8	14.72	1.41	1 34.7
19	15 19 33.98	2.109	17 33 34.9	8.31	0.795 8729	194.9	14.71	1.41	1 31.6
20	15 20 24.71	2.118	17 36 54.2	8.30	0.796 3338	189.1	14.69	1.41	1 28.5
21	15 21 15.65	+2.127	−17 40 13.2	−8.29	0.796 7808	+183.4	14.68	1.41	1 25.4
22	15 22 6.81	2.136	17 43 32.0	8.28	0.797 2140	177.6	14.66	1.40	1 22.4
23	15 22 58.17	2.144	17 46 50.4	8.26	0.797 6331	171.7	14.65	1.40	1 19.3
24	15 23 49.74	2.153	17 50 8.5	8.25	0.798 0383	165.9	14.63	1.40	1 16.2
25	15 24 41.50	2.161	17 53 26.2	8.23	0.798 4293	160.0	14.62	1.40	1 13.1
26	15 25 33.46	+2.169	−17 56 43.5	−8.21	0.798 8062	+154.1	14.61	1.40	1 10.1
27	15 26 25.60	2.176	18 0 0.4	8.19	0.799 1689	148.2	14.59	1.40	1 7.0
28	15 27 17.93	2.184	18 3 16.7	8.17	0.799 5175	142.3	14.58	1.40	1 3.9
29	15 28 10.44	2.192	18 6 32.6	8.15	0.799 8518	136.4	14.57	1.40	1 0.9
30	15 29 3.13	2.199	18 9 48.0	8.13	0.800 1720	130.5	14.56	1.39	0 57.8
31	15 29 55.99	+2.206	−18 13 2.9	−8.11	0.800 4780	+124.5	14.55	1.39	0 54.8
Nov. 1	15 30 49.01	2.213	18 16 17.2	8.08	0.800 7696	118.5	14.54	1.39	0 51.7
2	15 31 42.20	2.219	18 19 30.9	8.06	0.801 0468	112.5	14.53	1.39	0 48.7
3	15 32 35.54	2.226	18 22 44.0	8.03	0.801 3096	106.5	14.52	1.39	0 45.6
4	15 33 29.03	2.232	18 25 56.4	8.00	0.801 5578	100.4	14.51	1.39	0 42.6
5	15 34 22.67	+2.238	−18 29 8.2	−7.97	0.801 7915	+ 94.3	14.51	1.39	0 39.5
6	15 35 16.45	2.244	18 32 19.2	7.94	0.802 0106	88.2	14.50	1.39	0 36.5
7	15 36 10.37	2.249	18 35 29.5	7.91	0.802 2150	82.1	14.49	1.39	0 33.5
8	15 37 4.41	2.254	18 38 39.1	7.88	0.802 4047	76.0	14.49	1.39	0 30.4
9	15 37 58.58	2.259	18 41 47.9	7.85	0.802 5797	69.8	14.48	1.39	0 27.4
10	15 38 52.86	+2.264	−18 44 55.8	−7.81	0.802 7399	+ 63.7	14.48	1.39	0 24.4
11	15 39 47.25	2.269	18 48 2.9	7.78	0.802 8853	57.5	14.47	1.39	0 21.3
12	15 40 41.75	2.273	18 51 9.2	7.74	0.803 0160	51.4	14.47	1.39	0 18.3
13	15 41 36.34	2.276	18 54 14.5	7.70	0.803 1319	45.2	14.46	1.38	0 15.3
14	15 42 31.02	2.280	18 57 18.9	7.66	0.803 2330	39.0	14.46	1.38	0 12.2
15	15 43 25.79	+2.284	−19 0 22.3	−7.62	0.803 3193	+ 32.9	14.46	1.38	0 9.2
16	15 44 20.65	+2.287	−19 3 24.7	−7.58	0.803 3909	+ 26.7	14.45	1.38	0 6.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	15 44 20.65	+2.287	−19 3 24.7	−7.58	0.803 3909	+ 26.7	14.45	1.38	0 6.2
17	15 45 15.58	2.290	19 6 26.2	7.54	0.803 4476	20.6	14.45	1.38	0 3.2
18	15 46 10.57	2.293	19 9 26.6	7.49	0.803 4896	14.4	14.45	1.38	{0 0.2 23 57.1
19	15 47 5.63	2.295	19 12 25.9	7.45	0.803 5168	8.3	14.45	1.38	23 54.1
20	15 48 0.75	2.298	19 15 24.2	7.41	0.803 5293	+ 2.1	14.45	1.38	23 51.1
21	15 48 55.93	+2.300	−19 18 21.4	−7.36	0.803 5271	− 4.0	14.45	1.38	23 48.1
22	15 49 51.16	2.302	19 21 17.5	7.31	0.803 5101	10.2	14.45	1.38	23 45.1
23	15 50 46.43	2.304	19 24 12.4	7.26	0.803 4783	16.3	14.45	1.38	23 42.1
24	15 51 41.74	2.305	19 27 6.2	7.22	0.803 4318	22.5	14.45	1.38	23 39.1
25	15 52 37.09	2.307	19 29 58.9	7.17	0.803 3704	28.7	14.45	1.38	23 36.0
26	15 53 32.46	+2.308	−19 32 50.3	−7.12	0.803 2942	− 34.8	14.46	1.38	23 33.0
27	15 54 27.86	2.309	19 35 40.5	7.07	0.803 2033	41.0	14.46	1.38	23 30.0
28	15 55 23.29	2.310	19 38 29.6	7.02	0.803 0975	47.2	14.46	1.38	23 27.0
29	15 56 18.72	2.310	19 41 17.4	6.96	0.802 9768	53.4	14.47	1.39	23 24.0
30	15 57 14.16	2.310	19 44 3.9	6.91	0.802 8413	59.6	14.47	1.39	23 21.0
Dec. 1	15 58 9.61	+2.310	−19 46 49.2	−6.86	0.802 6909	− 65.8	14.48	1.39	23 18.0
2	15 59 5.06	2.310	19 49 33.2	6.80	0.802 5255	72.0	14.48	1.39	23 15.0
3	16 0 0.49	2.309	19 52 15.8	6.75	0.802 3451	78.3	14.49	1.39	23 11.9
4	16 0 55.91	2.309	19 54 57.2	6.70	0.802 1498	84.5	14.50	1.39	23 8.9
5	16 1 51.31	2.308	19 57 37.2	6.61	0.801 9395	90.8	14.50	1.39	23 5.9
6	16 2 46.68	+2.306	−20 0 15.9	−6.58	0.801 7141	− 97.0	14.51	1.39	23 2.9
7	16 3 42.02	2.305	20 2 53.2	6.52	0.801 4737	103.3	14.52	1.39	22 59.9
8	16 4 37.31	2.303	20 5 29.1	6.47	0.801 2184	109.5	14.53	1.39	22 56.9
9	16 5 32.56	2.301	20 8 3.6	6.41	0.800 9480	115.8	14.54	1.39	22 53.9
10	16 6 27.75	2.298	20 10 36.7	6.35	0.800 6626	122.0	14.54	1.39	22 50.8
11	16 7 22.88	+2.296	−20 13 8.3	−6.29	0.800 3623	−128.2	14.55	1.39	22 47.8
12	16 8 17.94	2.293	20 15 38.5	6.23	0.800 0471	134.4	14.57	1.39	22 44.8
13	16 9 12.92	2.289	20 18 7.2	6.17	0.799 7170	140.6	14.58	1.40	22 41.7
14	16 10 7.82	2.286	20 20 34.5	6.10	0.799 3721	146.8	14.59	1.40	22 38.7
15	16 11 2.64	2.282	20 23 0.2	6.04	0.799 0123	153.0	14.60	1.40	22 35.7
16	16 11 57.35	+2.278	−20 25 24.5	−5.98	0.798 6378	−159.1	14.61	1.40	22 32.7
17	16 12 51.97	2.274	20 27 47.3	5.92	0.798 2485	165.3	14.63	1.40	22 29.6
18	16 13 46.48	2.269	20 30 8.5	5.85	0.797 8445	171.4	14.64	1.40	22 26.6
19	16 14 40.88	2.264	20 32 28.2	5.79	0.797 4258	177.5	14.65	1.40	22 23.6
20	16 15 35.16	2.259	20 34 46.4	5.72	0.796 9925	183.6	14.67	1.40	22 20.5
21	16 16 29.32	+2.254	−20 37 3.0	−5.66	0.796 5446	−189.7	14.68	1.41	22 17.5
22	16 17 23.35	2.249	20 39 18.0	5.59	0.796 0821	195.7	14.70	1.41	22 14.5
23	16 18 17.25	2.243	20 41 31.5	5.53	0.795 6051	201.8	14.71	1.41	22 11.4
24	16 19 11.00	2.237	20 43 43.4	5.46	0.795 1135	207.9	14.73	1.41	22 8.4
25	16 20 4.61	2.230	20 45 53.8	5.40	0.794 6074	213.9	14.75	1.41	22 5.4
26	16 20 58.06	+2.224	−20 48 2.6	−5.34	0.794 0868	−219.9	14.77	1.41	22 2.3
27	16 21 51.35	2.217	20 50 9.9	5.27	0.793 5517	226.0	14.78	1.42	21 59.3
28	16 22 44.48	2.210	20 52 15.5	5.20	0.793 0021	232.0	14.80	1.42	21 56.2
29	16 23 37.44	2.203	20 54 19.5	5.14	0.792 4380	238.0	14.82	1.42	21 53.2
30	16 24 30.22	2.195	20 56 22.0	5.07	0.791 8595	244.1	14.84	1.42	21 50.1
31	16 25 22.81	+2.187	−20 58 22.9	−5.00	0.791 2665	−250.1	14.86	1.42	21 47.0
32	16 26 15.21	. . .	−21 0 22.2	. . .	0.790 6591	. . .	14.88	1.42	21 44.0

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Jan.	2	214 40 40.5	4 33.84	−20.6	+1 11 10.5	−2.64	0.735 3374	−101.4
	6	214 58 55.9	4 33.89	20.7	1 10 59.9	2.66	0.735 2966	102.8
	10	215 17 11.6	4 33.94	20.9	1 10 49.2	2.70	0.735 2552	104.2
	14	215 35 27.4	4 33.99	21.1	1 10 38.3	2.74	0.735 2132	105.6
	18	215 53 43.5	4 34.05	21.3	1 10 27.3	2.76	0.735 1707	107.0
	22	216 11 59.8	4 34.10	−21.5	+1 10 16.2	−2.80	0.735 1276	−108.5
	26	216 30 16.3	4 34.15	21.6	1 10 4.9	2.84	0.735 0839	109.9
	30	216 48 33.0	4 34.21	21.8	1 9 53.5	2.86	0.735 0397	111.4
Feb.	3	217 6 50.0	4 34.26	22.0	1 9 42.0	2.89	0.734 9948	112.9
	7	217 25 7.1	4 34.31	22.1	1 9 30.4	2.92	0.734 9494	114.3
	11	217 43 24.5	4 34.38	−22.3	+1 9 18.6	−2.95	0.734 9034	−115.6
	15	218 1 42.2	4 34.44	22.4	1 9 6.8	2.98	0.734 8569	117.0
	19	218 20 0.0	4 34.49	22.6	1 8 54.8	3.00	0.734 8098	118.5
	23	218 38 18.1	4 34.56	22.8	1 8 42.8	3.03	0.734 7621	120.0
	27	218 56 36.5	4 34.62	22.9	1 8 30.6	3.06	0.734 7138	121.4
Mar.	3	219 14 55.1	4 34.68	−23.0	+1 8 18.3	−3.10	0.734 6650	−122.9
	7	219 33 13.9	4 34.74	23.2	1 8 5.8	3.13	0.734 6155	124.3
	11	219 51 33.0	4 34.80	23.3	1 7 53.3	3.15	0.734 5655	125.6
	15	220 9 52.3	4 34.86	23.5	1 7 40.6	3.19	0.734 5150	127.0
	19	220 28 11.9	4 34.92	23.6	1 7 27.8	3.21	0.734 4639	128.5
	23	220 46 31.7	4 34.99	−23.7	+1 7 14.9	−3.24	0.734 4122	−130.0
	27	221 4 51.8	4 35.06	23.9	1 7 1.9	3.27	0.734 3599	131.4
	31	221 23 12.2	4 35.12	24.0	1 6 48.7	3.30	0.734 3071	132.6
Apr.	4	221 41 32.8	4 35.19	24.1	1 6 35.5	3.33	0.734 2538	134.0
	8	221 59 53.7	4 35.26	24.3	1 6 22.1	3.36	0.734 1999	135.5
	12	222 18 14.9	4 35.32	−24.4	+1 6 8.6	−3.39	0.734 1454	−136.9
	16	222 36 36.3	4 35.39	24.5	1 5 55.0	3.41	0.734 0904	138.3
	20	222 54 58.0	4 35.46	24.6	1 5 41.3	3.44	0.734 0348	139.6
	24	223 13 20.0	4 35.54	24.7	1 5 27.5	3.48	0.733 9787	141.0
	28	223 31 42.3	4 35.60	24.8	1 5 13.5	3.51	0.733 9220	142.4
May	2	223 50 4.8	4 35.67	−24.9	+1 4 59.4	−3.53	0.733 8648	−143.8
	6	224 8 27.6	4 35.75	25.1	1 4 45.3	3.56	0.733 8070	145.1
	10	224 26 50.8	4 35.83	25.2	1 4 31.0	3.60	0.733 7487	146.5
	14	224 45 14.2	4 35.89	25.3	1 4 16.5	3.63	0.733 6898	147.9
	18	225 3 37.9	4 35.96	25.4	1 4 2.0	3.65	0.733 6304	149.3
	22	225 22 1.9	4 36.04	−25.4	+1 3 47.3	−3.68	0.733 5704	−150.6
	26	225 40 26.2	4 36.11	25.5	1 3 32.6	3.70	0.733 5099	151.9
	30	225 58 50.8	4 36.20	25.6	1 3 17.7	3.74	0.733 4489	153.3
June	3	226 17 15.8	4 36.28	25.7	1 3 2.7	3.77	0.733 3873	154.7
	7	226 35 41.0	4 36.35	25.8	1 2 47.5	3.80	0.733 3251	156.0
	11	226 54 6.6	4 36.42	−25.9	+1 2 32.3	−3.82	0.733 2625	−157.3
	15	227 12 32.4	4 36.50	26.0	1 2 17.0	3.85	0.733 1993	158.6
	19	227 30 58.6	4 36.59	26.0	1 2 1.5	3.87	0.733 1356	160.0
	23	227 49 25.1	4 36.68	26.1	1 1 46.0	3.89	0.733 0713	161.3
	27	228 7 52.0	4 36.76	26.2	1 1 30.4	3.92	0.733 0066	162.5
July	1	228 26 19.2	4 36.83	−26.2	+1 1 14.6	−3.95	0.732 9413	−163.9
	5	228 44 46.6	4 36.90	−26.3	+1 0 58.8	−3.98	0.732 8755	−165.2

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
July	1	228 26 19.2	4 36.83	−26.2	+1 1 14.6	−3.95	0.732 9413	−163.9
	5	228 44 46.6	4 36.90	26.3	1 0 58.8	3.98	0.732 8755	165.2
	9	229 3 14.4	4 37.00	26.3	1 0 42.8	4.01	0.732 8091	166.6
	13	229 21 42.6	4 37.09	26.4	1 0 26.7	4.04	0.732 7422	167.9
	17	229 40 11.1	4 37.16	26.4	1 0 10.5	4.07	0.732 6748	169.1
	21	229 58 39.9	4 37.25	−26.5	+0 59 54.1	−4.10	0.732 6069	−170.5
	25	230 17 9.1	4 37.34	26.5	0 59 37.7	4.11	0.732 5384	171.8
	29	230 35 38.6	4 37.42	26.6	0 59 21.2	4.14	0.732 4695	173.0
Aug.	2	230 54 8.5	4 37.51	26.6	0 59 4.6	4.17	0.732 4000	174.4
	6	231 12 38.7	4 37.60	26.7	0 58 47.8	4.20	0.732 3300	175.6
	10	231 31 9.3	4 37.69	−26.7	+0 58 31.0	−4.23	0.732 2595	−176.9
	14	231 49 40.2	4 37.78	26.7	0 58 14.0	4.26	0.732 1885	178.3
	18	232 8 11.5	4 37.87	26.8	0 57 56.9	4.29	0.732 1169	179.6
	22	232 26 43.2	4 37.96	26.8	0 57 39.7	4.30	0.732 0448	180.8
	26	232 45 15.2	4 38.05	26.8	0 57 22.5	4.33	0.731 9723	182.0
	30	233 3 47.6	4 38.14	−26.8	+0 57 5.1	−4.36	0.731 8992	−183.3
Sept.	3	233 22 20.3	4 38.24	26.8	0 56 47.6	4.39	0.731 8256	184.5
	7	233 40 53.5	4 38.34	26.8	0 56 30.0	4.42	0.731 7516	185.8
	11	233 59 27.0	4 38.43	26.8	0 56 12.2	4.45	0.731 6770	187.0
	15	234 18 0.9	4 38.52	26.8	0 55 54.4	4.46	0.731 6020	188.3
	19	234 36 35.2	4 38.61	−26.8	+0 55 36.5	−4.49	0.731 5264	−189.5
	23	234 55 9.8	4 38.71	26.8	0 55 18.5	4.51	0.731 4504	190.8
	27	235 13 44.9	4 38.81	26.8	0 55 0.4	4.55	0.731 3738	192.1
Oct.	1	235 32 20.3	4 38.90	26.8	0 54 42.1	4.57	0.731 2967	193.3
	5	235 50 56.1	4 39.01	26.8	0 54 23.8	4.59	0.731 2192	194.5
	9	236 9 32.4	4 39.11	−26.8	+0 54 5.4	−4.62	0.731 1411	−195.7
	13	236 28 9.0	4 39.20	26.8	0 53 46.8	4.65	0.731 0626	196.9
	17	236 46 46.0	4 39.30	26.8	0 53 28.2	4.66	0.730 9836	198.1
	21	237 5 23.4	4 39.41	26.8	0 53 9.5	4.70	0.730 9041	199.3
	25	237 24 1.3	4 39.52	26.7	0 52 50.6	4.73	0.730 8242	200.4
	29	237 42 39.6	4 39.62	−26.7	+0 52 31.7	−4.75	0.730 7438	−201.7
Nov.	2	238 1 18.3	4 39.71	26.7	0 52 12.6	4.77	0.730 6628	203.0
	6	238 19 57.3	4 39.81	26.6	0 51 53.5	4.79	0.730 5814	204.1
	10	238 38 36.8	4 39.93	26.6	0 51 34.3	4.81	0.730 4995	205.3
	14	238 57 16.8	4 40.04	26.6	0 51 15.0	4.85	0.730 4172	206.5
	18	239 15 57.1	4 40.13	−26.5	+0 50 55.5	−4.88	0.730 3343	−207.7
	22	239 34 37.8	4 40.24	26.5	0 50 36.0	4.89	0.730 2510	208.8
	26	239 53 19.0	4 40.35	26.4	0 50 16.4	4.92	0.730 1673	209.9
	30	240 12 0.6	4 40.46	26.4	0 49 56.6	4.95	0.730 0831	211.1
Dec.	4	240 30 42.7	4 40.57	26.3	0 49 36.8	4.96	0.729 9984	212.4
	8	240 49 25.2	4 40.68	−26.2	+0 49 16.9	−4.99	0.729 9132	−213.5
	12	241 8 8.1	4 40.78	26.2	0 48 56.9	5.02	0.729 8276	214.5
	16	241 26 51.4	4 40.89	26.1	0 48 36.7	5.05	0.729 7416	215.7
	20	241 45 35.2	4 41.00	26.0	0 48 16.5	5.06	0.729 6550	216.9
	24	242 4 19.4	4 41.11	26.0	0 47 56.2	5.09	0.729 5681	218.0
	28	242 23 4.1	4 41.24	−25.9	+0 47 35.8	−5.11	0.729 4806	−219.1
	32	242 41 49.3	4 41.34	−25.8	+0 47 15.3	−5.13	0.729 3928	−220.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	13 15 19.83	+0.472	−5 20 58.7	−2.16	0.988 3183	−304.8	7.66	0.90	18 32.0
2	13 15 30.98	0.457	5 21 49.3	2.06	0.987 5853	306.1	7.67	0.91	18 28.2
3	13 15 41.78	0.442	5 22 37.7	1.97	0.986 8492	307.3	7.69	0.91	18 24.5
4	13 15 52.22	0.427	5 23 23.7	1.87	0.986 1103	308.5	7.70	0.91	18 20.7
5	13 16 2.29	0.412	5 24 7.5	1.77	0.985 3686	309.5	7.71	0.91	18 16.9
6	13 16 11.99	+0.397	−5 24 48.9	−1.68	0.984 6245	−310.5	7.73	0.91	18 13.1
7	13 16 21.33	0.381	5 25 28.0	1.58	0.983 8780	311.5	7.74	0.91	18 9.4
8	13 16 30.29	0.366	5 26 4.7	1.48	0.983 1295	312.3	7.75	0.92	18 5.6
9	13 16 38.88	0.350	5 26 39.1	1.38	0.982 3790	313.1	7.77	0.92	18 1.8
10	13 16 47.09	0.334	5 27 11.1	1.29	0.981 6268	313.7	7.78	0.92	17 58.0
11	13 16 54.92	+0.318	−5 27 40.8	−1.19	0.980 8731	−314.3	7.79	0.92	17 54.2
12	13 17 2.37	0.302	5 28 8.0	1.09	0.980 1181	314.8	7.81	0.92	17 50.4
13	13 17 9.44	0.286	5 28 32.9	0.99	0.979 3620	315.2	7.82	0.92	17 46.6
14	13 17 16.12	0.270	5 28 55.3	0.88	0.978 6051	315.5	7.83	0.92	17 42.7
15	13 17 22.41	0.254	5 29 15.3	0.79	0.977 8476	315.7	7.85	0.93	17 38.9
16	13 17 28.30	+0.237	−5 29 33.0	−0.69	0.977 0898	−315.8	7.86	0.93	17 35.1
17	13 17 33.80	0.221	5 29 48.2	0.58	0.976 3318	315.8	7.88	0.93	17 31.2
18	13 17 38.91	0.205	5 30 1.0	0.48	0.975 5741	315.6	7.89	0.93	17 27.4
19	13 17 43.62	0.188	5 30 11.4	0.38	0.974 8168	315.4	7.90	0.93	17 23.5
20	13 17 47.94	0.172	5 30 19.3	0.28	0.974 0602	315.0	7.92	0.93	17 19.6
21	13 17 51.86	+0.155	−5 30 24.8	−0.18	0.973 3046	−314.6	7.93	0.94	17 15.8
22	13 17 55.37	0.138	5 30 27.9	−0.08	0.972 5501	314.1	7.94	0.94	17 11.9
23	13 17 58.49	0.121	5 30 28.6	+0.02	0.971 7970	313.4	7.96	0.94	17 8.0
24	13 18 1.20	0.105	5 30 26.9	0.12	0.971 0456	312.7	7.97	0.94	17 4.1
25	13 18 3.52	0.088	5 30 22.8	0.22	0.970 2961	311.8	7.98	0.94	17 0.2
26	13 18 5.44	+0.072	−5 30 16.3	+0.32	0.969 5488	−310.9	8.00	0.94	16 56.3
27	13 18 6.96	0.055	5 30 7.4	0.42	0.968 8039	309.8	8.01	0.95	16 52.4
28	13 18 8.09	0.039	5 29 56.1	0.52	0.968 0617	308.6	8.03	0.95	16 48.5
29	13 18 8.81	0.022	5 29 42.5	0.62	0.967 3224	307.4	8.04	0.95	16 44.5
30	13 18 9.14	+0.005	5 29 26.5	0.72	0.966 5862	306.0	8.05	0.95	16 40.6
31	13 18 9.07	−0.011	−5 29 8.1	+0.81	0.965 8534	−304.6	8.07	0.95	16 36.7
Feb. 1	13 18 8.61	0.027	5 28 47.4	0.91	0.965 1242	303.0	8.08	0.95	16 32.8
2	13 18 7.75	0.044	5 28 24.4	1.01	0.964 3989	301.4	8.09	0.96	16 28.8
3	13 18 6.49	0.061	5 27 59.0	1.11	0.963 6777	299.6	8.11	0.96	16 24.8
4	13 18 4.84	0.077	5 27 31.3	1.20	0.962 9609	297.7	8.12	0.96	16 20.9
5	13 18 2.79	−0.094	−5 27 1.3	+1.30	0.962 2487	−295.7	8.14	0.96	16 16.9
6	13 18 0.35	0.110	5 26 29.0	1.39	0.961 5413	293.7	8.15	0.96	16 12.9
7	13 17 57.52	0.126	5 25 54.4	1.49	0.960 8390	291.5	8.16	0.96	16 9.0
8	13 17 54.30	0.142	5 25 17.5	1.58	0.960 1421	289.2	8.17	0.96	16 5.0
9	13 17 50.68	0.159	5 24 38.4	1.67	0.959 4509	286.8	8.19	0.97	16 1.0
10	13 17 46.68	−0.175	−5 23 57.1	+1.77	0.958 7656	−284.2	8.20	0.97	15 57.0
11	13 17 42.30	0.191	5 23 13.5	1.86	0.958 0865	281.6	8.21	0.97	15 52.9
12	13 17 37.53	0.207	5 22 27.7	1.95	0.957 4139	278.9	8.23	0.97	15 48.9
13	13 17 32.37	0.223	5 21 39.8	2.04	0.956 7480	276.0	8.24	0.97	15 44.9
14	13 17 26.84	0.238	5 20 49.7	2.13	0.956 0892	273.0	8.25	0.97	15 40 9
15	13 17 20.93	−0.254	−5 19 57.5	+2.22	0.955 4377	−269.9	8.26	0.98	15 36.9
16	13 17 14.65	−0.269	−5 19 3.1	+2.31	0.954 7938	−266.7	8.27	0.98	15 32.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	13 17 14.65	−0.269	−5 19 3.1	+2.31	0.954 7938	−266.7	8.27	0.98	15 32.8
17	13 17 8.00	0.285	5 18 6.7	2.39	0.954 1577	263.3	8.29	0.98	15 28.8
18	13 17 0.99	0.300	5 17 8.2	2.48	0.953 5298	259.9	8.30	0.98	15 24.7
19	13 16 53.61	0.315	5 16 7.7	2.56	0.952 9102	256.4	8.31	0.98	15 20.7
20	13 16 45.88	0.330	5 15 5.2	2.65	0.952 2993	252.7	8.32	0.98	15 16.6
21	13 16 37.79	−0.344	−5 14 0.7	+2.73	0.951 6972	−249.0	8.33	0.98	15 12.5
22	13 16 29.35	0.359	5 12 54.4	2.80	0.951 1043	245.1	8.35	0.98	15 8.4
23	13 16 20.57	0.373	5 11 46.1	2.88	0.950 5208	241.1	8.36	0.99	15 4.3
24	13 16 11.46	0.387	5 10 36.0	2.96	0.949 9469	237.1	8.37	0.99	15 0.3
25	13 16 2.01	0.400	5 9 24.0	3.04	0.949 3829	232.9	8.38	0.99	14 56.2
26	13 15 52.24	−0.414	−5 8 10.3	+3.11	0.948 8289	−228.7	8.39	0.99	14 52.1
27	13 15 42.14	0.427	5 6 54.8	3.18	0.948 2852	224.4	8.40	0.99	14 48.0
28	13 15 31.73	0.440	5 5 37.6	3.25	0.947 7520	219.9	8.41	0.99	14 43.9
Mar. 1	13 15 21.01	0.453	5 4 18.7	3.32	0.947 2296	215.4	8.42	0.99	14 39.8
2	13 15 9.98	0.466	5 2 58.2	3.39	0.946 7181	210.8	8.43	1.00	14 35.6
3	13 14 58.65	−0.478	−5 1 36.1	+3.45	0.946 2178	−206.1	8.44	1.00	14 31.5
4	13 14 47.02	0.490	5 0 12.5	3.52	0.945 7288	201.3	8.45	1.00	14 27.4
5	13 14 35.11	0.502	4 58 47.3	3.58	0.945 2513	196.5	8.46	1.00	14 23.3
6	13 14 22.91	0.511	4 57 20.6	3.64	0.944 7856	191.5	8.47	1.00	14 19.1
7	13 14 10.44	0.525	4 55 52.5	3.70	0.944 3319	186.5	8.48	1.00	14 15.0
8	13 13 57.69	−0.536	−4 54 23.0	+3.76	0.943 8903	−181.4	8.49	1.00	14 10.8
9	13 13 44.68	0.547	4 52 52.1	3.81	0.943 4610	176.2	8.49	1.00	14 6.7
10	13 13 31.42	0.558	4 51 19.9	3.87	0.943 0443	171.0	8.50	1.00	14 2.5
11	13 13 17.90	0.569	4 49 46.4	3.92	0.942 6404	165.6	8.51	1.00	13 58.4
12	13 13 4.13	0.579	4 48 11.7	3.97	0.942 2495	160.1	8.52	1.00	13 54.2
13	13 12 50.13	−0.588	−4 46 35.9	+4.01	0.941 8717	−154.6	8.52	1.01	13 50.1
14	13 12 35.89	0.598	4 44 59.0	4.06	0.941 5073	149.0	8.53	1.01	13 45.9
15	13 12 21.44	0.607	4 43 21.0	4.11	0.941 1565	143.3	8.54	1.01	13 41.7
16	13 12 6.77	0.615	4 41 41.9	4.15	0.940 8194	137.6	8.55	1.01	13 37.5
17	13 11 51.90	0.624	4 40 1.9	4.19	0.940 4962	131.8	8.55	1.01	13 33.3
18	13 11 36.83	−0.632	−4 38 21.0	+4.22	0.940 1870	−125.9	8.56	1.01	13 29.2
19	13 11 21.57	0.640	4 36 39.3	4.26	0.939 8919	120.0	8.56	1.01	13 25.0
20	13 11 6.13	0.647	4 34 56.7	4.29	0.939 6112	114.0	8.57	1.01	13 20.8
21	13 10 50.52	0.654	4 33 13.4	4.32	0.939 3449	107.9	8.57	1.01	13 16.6
22	13 10 34.75	0.660	4 31 29.4	4.35	0.939 0931	101.9	8.58	1.01	13 12.4
23	13 10 18.83	−0.666	−4 29 44.8	+4.37	0.938 8560	− 95.7	8.58	1.01	13 8.2
24	13 10 2.76	0.672	4 27 59.6	4.39	0.938 6336	89.6	8.59	1.01	13 4.0
25	13 9 46.56	0.677	4 26 13.9	4.41	0.938 4261	83.4	8.59	1.01	12 59.8
26	13 9 30.24	0.682	4 24 27.8	4.43	0.938 2335	77.1	8.60	1.02	12 55.6
27	13 9 13.80	0.687	4 22 41.3	4.45	0.938 0559	70.9	8.60	1.02	12 51.4
28	13 8 57.25	−0.692	−4 20 54.4	+4.46	0.937 8934	− 64.6	8.60	1.02	12 47.2
29	13 8 40.60	0.696	4 19 7.2	4.47	0.937 7460	58.3	8.61	1.02	12 43.0
30	13 8 23.86	0.699	4 17 19.8	4.48	0.937 6137	52.0	8.61	1.02	12 38.8
31	13 8 7.04	0.702	4 15 32.3	4.48	0.937 4966	45.6	8.61	1.02	12 34.6
Apr. 1	13 7 50.15	0.705	4 13 44.6	4.49	0.937 3946	39.3	8.61	1.02	12 30.4
2	13 7 33.20	−0.708	−4 11 56.8	+4.49	0.937 3078	− 33.0	8.62	1.02	12 26.1
3	13 7 16.19	−0.710	−4 10 9.1	+4.49	0.937 2363	− 26.6	8.62	1.02	12 21.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	13 7 50.15	−0.705	−4 13 44.6	+4.49	0.937 3946	− 39.3	8.61	1.02	12 30.4
2	13 7 33.20	0.708	4 11 56.8	4.49	0.937 3078	33.0	8.62	1.02	12 26.1
3	13 7 16.19	0.710	4 10 9.1	4.49	0.937 2363	26.6	8.62	1.02	12 21.9
4	13 6 59.13	0.712	4 8 21.4	4.49	0.937 1802	20.2	8.62	1.02	12 17.7
5	13 6 42.03	0.713	4 6 33.8	4.48	0.937 1394	13.8	8.62	1.02	12 13.5
6	13 6 24.91	−0.714	−4 4 46.4	+4.47	0.937 1141	− 7.4	8.62	1.02	12 9.3
7	13 6 7.76	0.715	4 2 59.2	4.46	0.937 1041	− 0.9	8.62	1.02	12 5.1
8	13 5 50.61	0.715	4 1 12.2	4.45	0.937 1096	+ 5.5	8.62	1.02	12 0.8
9	13 5 33.45	0.715	3 59 25.5	4.44	0.937 1305	11.9	8.62	1.02	11 56.6
10	13 5 16.30	0.714	3 57 39.3	4.42	0.937 1669	18.4	8.62	1.02	11 52.4
11	13 4 59.16	−0.714	−3 55 53.4	+4.40	0.937 2186	+ 24.8	8.62	1.02	11 48.2
12	13 4 42.05	0.712	3 54 8.1	4.38	0.937 2858	31.2	8.62	1.02	11 44.0
13	13 4 24.98	0.710	3 52 23.3	4.35	0.937 3683	37.6	8.61	1.02	11 39.8
14	13 4 7.95	0.708	3 50 39.2	4.32	0.937 4661	43.9	8.61	1.02	11 35.6
15	13 3 50.98	0.706	3 48 55.7	4.29	0.937 5792	50.3	8.61	1.02	11 31.3
16	13 3 34.07	−0.703	−3 47 13.0	+4.26	0.937 7074	+ 56.6	8.61	1.02	11 27.1
17	13 3 17.23	0.700	3 45 31.0	4.23	0.937 8508	62.9	8.60	1.02	11 22.9
18	13 3 0.48	0.696	3 43 49.9	4.20	0.938 0092	69.1	8.60	1.02	11 18.7
19	13 2 43.82	0.692	3 42 9.6	4.16	0.938 1825	75.3	8.60	1.02	11 14.5
20	13 2 27.26	0.688	3 40 30.4	4.11	0.938 3707	81.5	8.59	1.01	11 10.3
21	13 2 10.81	−0.683	−3 38 52.2	+4.07	0.938 5737	+ 87.6	8.59	1.01	11 6.1
22	13 1 54.47	0.678	3 37 15.0	4.03	0.938 7914	93.7	8.59	1.01	11 1.9
23	13 1 38.27	0.672	3 35 38.9	3.98	0.939 0236	99.7	8.58	1.01	10 57.7
24	13 1 22.20	0.666	3 34 3.9	3.93	0.939 2701	105.7	8.58	1.01	10 53.5
25	13 1 6.28	0.660	3 32 30.2	3.88	0.939 5308	111.6	8.57	1.01	10 49.3
26	13 0 50.50	−0.654	−3 30 57.7	+3.83	0.939 8056	+117.4	8.57	1.01	10 45.1
27	13 0 34.89	0.647	3 29 26.5	3.77	0.940 0944	123.2	8.56	1.01	10 40.9
28	13 0 19.45	0.640	3 27 56.7	3.71	0.940 3970	128.9	8.55	1.01	10 36.7
29	13 0 4.18	0.633	3 26 28.2	3.66	0.940 7132	134.6	8.55	1.01	10 32.5
30	12 59 49.09	0.625	3 25 1.2	3.59	0.941 0429	140.1	8.54	1.01	10 28.4
May 1	12 59 34.19	−0.617	−3 23 35.7	+3.53	0.941 3859	+145.6	8.53	1.01	10 24.2
2	12 59 19.49	0.608	3 22 11.7	3.47	0.941 7420	151.1	8.53	1.01	10 20.0
3	12 59 4.99	0.600	3 20 49.3	3.40	0.942 1111	156.5	8.52	1.00	10 15.9
4	12 58 50.69	0.591	3 19 28.4	3.34	0.942 4931	161.8	8.51	1.00	10 11.7
5	12 58 36.60	0.582	3 18 9.1	3.27	0.942 8877	167.0	8.50	1.00	10 7.5
6	12 58 22.74	−0.573	−3 16 51.5	+3.20	0.943 2949	+172.2	8.50	1.00	10 3.3
7	12 58 9.11	0.563	3 15 35.6	3.13	0.943 7144	177.3	8.49	1.00	9 59.2
8	12 57 55.71	0.553	3 14 21.4	3.05	0.944 1461	182.4	8.48	1.00	9 55.0
9	12 57 42.55	0.543	3 13 9.0	2.98	0.944 5898	187.4	8.47	1.00	9 50.9
10	12 57 29.64	0.533	3 11 58.4	2.90	0.945 0454	192.3	8.46	1.00	9 46.7
11	12 57 16.99	−0.522	−3 10 49.7	+2.82	0.945 5128	+197.1	8.45	1.00	9 42.6
12	12 57 4.60	0.511	3 9 42.9	2.74	0.945 9916	201.8	8.44	1.00	9 38.5
13	12 56 52.48	0.499	3 8 38.0	2.66	0.946 4816	206.5	8.43	1.00	9 34.3
14	12 56 40.64	0.488	3 7 35.1	2.58	0.946 9826	211.0	8.42	0.99	9 30.2
15	12 56 29.08	0.476	3 6 34.1	2.50	0.947 4943	215.4	8.41	0.99	9 26.1
16	12 56 17.80	−0.464	−3 5 35.2	+2.41	0.948 0166	+219.8	8.40	0.99	9 22.0
17	12 56 6.81	−0.452	−3 4 38.3	+2.33	0.948 5492	+224.0	8.39	0.99	9 17.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
May 17	12 56 6.81	−0.452	−3 4 38.3	+2.33	0.948 5492	+224.0	8.39	0.99	9 17.9
18	12 55 56.11	0.439	3 3 43.5	2.24	0.949 0919	228.2	8.38	0.99	9 13.8
19	12 55 45.72	0.427	3 2 50.8	2.15	0.949 6446	232.3	8.37	0.99	9 9.7
20	12 55 35.63	0.414	3 2 0.2	2.06	0.950 2070	236.3	8.36	0.99	9 5.6
21	12 55 25.85	0.401	3 1 11.8	1.97	0.950 7787	240.1	8.35	0.99	9 1.5
22	12 55 16.39	−0.388	−3 0 25.5	+1.88	0.951 3595	+243.9	8.34	0.98	8 57.4
23	12 55 7.25	0.374	2 59 41.4	1.79	0.951 9492	247.5	8.33	0.98	8 53.3
24	12 54 58.42	0.361	2 58 59.6	1.70	0.952 5474	251.0	8.32	0.98	8 49.2
25	12 54 49.92	0.347	2 58 19.9	1.61	0.953 1540	254.4	8.31	0.98	8 45.2
26	12 54 41.75	0.333	2 57 42.5	1.51	0.953 7687	257.8	8.29	0.98	8 41.1
27	12 54 33.92	−0.319	−2 57 7.3	+1.42	0.954 3913	+261.0	8.28	0.98	8 37.0
28	12 54 26.42	0.305	2 56 34.4	1.32	0.955 0215	264.1	8.27	0.98	8 33.0
29	12 54 19.26	0.291	2 56 3.8	1.23	0.955 6591	267.2	8.26	0.98	8 28.9
30	12 54 12.43	0.277	2 55 35.5	1.13	0.956 3040	270.1	8.24	0.97	8 24.9
31	12 54 5.94	0.263	2 55 9.4	1.04	0.956 9558	273.0	8.23	0.97	8 20.9
June 1	12 53 59.80	−0.249	−2 54 45.7	+0.94	0.957 6144	+275.8	8.22	0.97	8 16.8
2	12 53 54.01	0.234	2 54 24.3	0.84	0.958 2796	278.5	8.21	0.97	8 12.8
3	12 53 48.57	0.220	2 54 5.3	0.75	0.958 9510	281.0	8.20	0.97	8 8.8
4	12 53 43.47	0.205	2 53 48.5	0.65	0.959 6285	283.5	8.18	0.97	8 4.7
5	12 53 38.73	0.190	2 53 34.1	0.55	0.960 3119	285.9	8.17	0.96	8 0.7
6	12 53 34.35	−0.175	−2 53 22.1	+0.45	0.961 0009	+288.2	8.16	0.96	7 56.7
7	12 53 30.32	0.160	2 53 12.4	0.35	0.961 6953	290.4	8.14	0.96	7 52.7
8	12 53 26.65	0.145	2 53 5.1	0.25	0.962 3950	292.6	8.13	0.96	7 48.8
9	12 53 23.35	0.130	2 53 0.2	0.16	0.963 0996	294.6	8.12	0.96	7 44.8
10	12 53 20.41	0.115	2 52 57.6	+0.06	0.963 8089	296.5	8.11	0.96	7 40.8
11	12 53 17.84	−0.100	−2 52 57.4	−0.04	0.964 5226	+298.3	8.09	0.96	7 36.8
12	12 53 15.63	0.084	2 52 59.6	0.14	0.965 2405	300.0	8.08	0.95	7 32.9
13	12 53 13.79	0.069	2 53 4.2	0.24	0.965 9624	301.5	8.06	0.95	7 28.9
14	12 53 12.32	0.054	2 53 11.2	0.34	0.966 6879	303.0	8.05	0.95	7 25.0
15	12 53 11.22	0.038	2 53 20.5	0.44	0.967 4168	304.4	8.04	0.95	7 21.0
16	12 53 10.49	−0.023	−2 53 32.2	−0.54	0.968 1490	+305.7	8.02	0.95	7 17.1
17	12 53 10.13	−0.007	2 53 46.3	0.64	0.968 8841	306.9	8.01	0.94	7 13.1
18	12 53 10.14	+0.008	2 54 2.8	0.74	0.969 6219	308.0	8.00	0.94	7 9.2
19	12 53 10.52	0.024	2 54 21.7	0.84	0.970 3623	309.0	7.98	0.94	7 5.3
20	12 53 11.28	0.039	2 54 43.0	0.94	0.971 1050	309.9	7.97	0.94	7 1.4
21	12 53 12.40	+0.055	−2 55 6.6	−1.03	0.971 8497	+310.7	7.96	0.94	6 57.4
22	12 53 13.90	0.070	2 55 32.5	1.13	0.972 5962	311.4	7.94	0.94	6 53.5
23	12 53 15.76	0.085	2 56 0.7	1.22	0.973 3443	312.0	7.93	0.94	6 49.6
24	12 53 17.99	0.101	2 56 31.3	1.32	0.974 0937	312.5	7.91	0.93	6 45.7
25	12 53 20.59	0.116	2 57 4.3	1.42	0.974 8442	312.9	7.90	0.93	6 41.8
26	12 53 23.56	+0.131	−2 57 39.5	−1.51	0.975 5956	+313.2	7.89	0.93	6 38.0
27	12 53 26.89	0.146	2 58 17.0	1.61	0.976 3477	313.5	7.87	0.93	6 34.1
28	12 53 30.58	0.161	2 58 56.8	1.71	0.977 1003	313.7	7.86	0.93	6 30.2
29	12 53 34.64	0.177	2 59 38.9	1.80	0.977 8533	313.8	7.85	0.93	6 26.4
30	12 53 39.06	0.191	3 0 23.2	1.89	0.978 6065	313.8	7.83	0.92	6 22.5
July 1	12 53 43.83	+0.206	−3 1 9.7	−1.99	0.979 3596	+313.7	7.82	0.92	6 18.7
2	12 53 48.97	+0.222	−3 1 58.5	−2.08	0.980 1125	+313.6	7.81	0.92	6 14.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	12 53 43.83	+0.206	−3 1 9.7	−1.99	0.979 3596	+313.7	7.82	0.92	6 18.7
2	12 53 48.97	0.222	3 1 58.5	2.08	0.980 1125	313.6	7.81	0.92	6 14.8
3	12 53 54.47	0.236	3 2 49.5	2.17	0.980 8651	313.4	7.79	0.92	6 11.0
4	12 54 0.32	0.251	3 3 42.7	2.26	0.981 6170	313.1	7.78	0.92	6 7.1
5	12 54 6.53	0.266	3 4 38.1	2.35	0.982 3682	312.8	7.77	0.92	6 3.3
6	12 54 13.10	+0.281	−3 5 35.7	−2.45	0.983 1183	+312.3	7.75	0.92	5 59.5
7	12 54 20.02	0.296	3 6 35.5	2.54	0.983 8673	311.8	7.74	0.91	5 55.7
8	12 54 27.29	0.310	3 7 37.4	2.63	0.984 6149	311.2	7.73	0.91	5 51.9
9	12 54 34.92	0.325	3 8 41.5	2.71	0.985 3610	310.5	7.71	0.91	5 48.1
10	12 54 42.90	0.340	3 9 47.7	2.80	0.986 1053	309.7	7.70	0.91	5 44.3
11	12 54 51.22	+0.354	−3 10 56.0	−2.89	0.986 8477	+308.9	7.69	0.91	5 40.5
12	12 54 59.89	0.368	3 12 6.4	2.98	0.987 5880	308.0	7.67	0.91	5 36.7
13	12 55 8.90	0.383	3 13 18.8	3.06	0.988 3260	307.0	7.66	0.90	5 32.9
14	12 55 18.26	0.397	3 14 33.4	3.15	0.989 0615	305.9	7.65	0.90	5 29.1
15	12 55 27.96	0.411	3 15 50.0	3.23	0.989 7943	304.7	7.63	0.90	5 25.4
16	12 55 38.00	+0.425	−3 17 8.6	−3.32	0.990 5243	+303.5	7.62	0.90	5 21.6
17	12 55 48.37	0.439	3 18 29.2	3.40	0.991 2512	302.2	7.61	0.90	5 17.8
18	12 55 59.08	0.453	3 19 51.8	3.48	0.991 9748	300.8	7.60	0.90	5 14.1
19	12 56 10.12	0.467	3 21 16.3	3.56	0.992 6950	299.4	7.58	0.90	5 10.3
20	12 56 21.49	0.480	3 22 42.8	3.64	0.993 4117	297.8	7.57	0.89	5 6.6
21	12 56 33.18	+0.494	−3 24 11.2	−3.72	0.994 1246	+296.2	7.56	0.89	5 2.9
22	12 56 45.19	0.507	3 25 41.5	3.80	0.994 8336	294.6	7.55	0.89	4 59.1
23	12 56 57.52	0.520	3 27 13.7	3.88	0.995 5386	292.9	7.53	0.89	4 55.4
24	12 57 10.17	0.536	3 28 47.7	3.95	0.996 2393	291.1	7.52	0.89	4 51.7
25	12 57 23.12	0.546	3 30 23.5	4.03	0.996 9358	289.3	7.51	0.89	4 48.0
26	12 57 36.39	+0.559	−3 32 1.1	−4.10	0.997 6279	+287.4	7.50	0.88	4 44.3
27	12 57 49.96	0.572	3 33 40.5	4.18	0.998 3154	285.5	7.49	0.88	4 40.5
28	12 58 3.84	0.584	3 35 21.6	4.25	0.998 9982	283.5	7.47	0.88	4 36.8
29	12 58 18.01	0.597	3 37 4.5	4.32	0.999 6763	281.5	7.46	0.88	4 33.1
30	12 58 32.49	0.609	3 38 49.1	4.39	1.000 3494	279.4	7.45	0.88	4 29.4
31	12 58 47.26	+0.622	−3 40 35.3	−4.46	1.001 0175	+277.3	7.44	0.88	4 25.8
Aug. 1	12 59 2.33	0.634	3 42 23.3	4.53	1.001 6804	275.1	7.43	0.88	4 22.1
2	12 59 17.68	0.646	3 44 12.9	4.60	1.002 3379	272.8	7.42	0.88	4 18.4
3	12 59 33.33	0.658	3 46 4.1	4.67	1.002 9900	270.5	7.41	0.87	4 14.7
4	12 59 49.26	0.670	3 47 56.9	4.73	1.003 6365	268.2	7.40	0.87	4 11.1
5	13 0 5.47	+0.681	−3 49 51.3	−4.80	1.004 2773	+265.8	7.38	0.87	4 7.4
6	13 0 21.96	0.693	3 51 47.3	4.86	1.004 9123	263.3	7.37	0.87	4 3.8
7	13 0 38.73	0.705	3 53 44.8	4.93	1.005 5413	260.8	7.36	0.87	4 0.1
8	13 0 55.78	0.716	3 55 43.9	4.99	1.006 1643	258.3	7.35	0.87	3 56.5
9	13 1 13.10	0.727	3 57 44.4	5.05	1.006 7811	255.7	7.34	0.87	3 52.8
10	13 1 30.69	+0.738	−3 59 46.4	−5.11	1.007 3916	+253.0	7.33	0.87	3 49.2
11	13 1 48.54	0.749	4 1 49.9	5.17	1.007 9956	250.3	7.32	0.86	3 45.5
12	13 2 6.66	0.760	4 3 54.7	5.23	1.008 5930	247.5	7.31	0.86	3 41.9
13	13 2 25.03	0.771	4 6 1.0	5.29	1.009 1836	244.7	7.30	0.86	3 38.3
14	13 2 43.65	0.781	4 8 8.6	5.35	1.009 7674	241.8	7.29	0.86	3 34.6
15	13 3 2.53	+0.792	−4 10 17.6	−5.40	1.010 3442	+238.9	7.28	0.86	3 31.0
16	13 3 21.66	+0.802	−4 12 27.9	−5.46	1.010 9140	+235.9	7.27	0.86	3 27.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	13 3 21.66	+0.802	−4 12 27.9	−5.46	1.010 9140	+235.9	7.27	0.86	3 27.4
17	13 3 41.03	0.812	4 14 39.5	5.51	1.011 4766	232.9	7.26	0.86	3 23.8
18	13 4 0.64	0.822	4 16 52.3	5.56	1.012 0320	229.9	7.25	0.86	3 20.2
19	13 4 20.48	0.832	4 19 6.4	5.61	1.012 5800	226.8	7.24	0.85	3 16.6
20	13 4 40.56	0.841	4 21 21.7	5.66	1.013 1206	223.7	7.24	0.85	3 13.0
21	13 5 0.87	+0.851	−4 23 38.1	−5.71	1.013 6536	+220.5	7.23	0.85	3 9.4
22	13 5 21.40	0.860	4 25 55.7	5.76	1.014 1791	217.3	7.22	0.85	3 5.8
23	13 5 42.15	0.869	4 28 14.5	5.80	1.014 6968	214.1	7.21	0.85	3 2.2
24	13 6 3.12	0.878	4 30 34.3	5.85	1.015 2068	210.9	7.20	0.85	2 58.6
25	13 6 24.30	0.887	4 32 55.2	5.89	1.015 7090	207.6	7.19	0.85	2 55.1
26	13 6 45.70	+0.896	−4 35 17.2	−5.94	1.016 2033	+204.3	7.18	0.85	2 51.5
27	13 7 7.30	0.904	4 37 40.2	5.98	1.016 6897	201.0	7.18	0.85	2 47.9
28	13 7 29.11	0.913	4 40 4.2	6.02	1.017 1681	197.6	7.17	0.85	2 44.3
29	13 7 51.12	0.921	4 42 29.2	6.06	1.017 6384	194.2	7.16	0.84	2 40.8
30	13 8 13.33	0.929	4 44 55.1	6.10	1.018 1005	190.8	7.15	0.84	2 37.2
31	13 8 35.73	+0.937	−4 47 22.0	−6.14	1.018 5543	+187.4	7.14	0.84	2 33.7
Sept. 1	13 8 58.33	0.945	4 49 49.8	6.18	1.018 9998	183.9	7.14	0.84	2 30.1
2	13 9 21.11	0.953	4 52 18.5	6.21	1.019 4369	180.4	7.13	0.84	2 26.6
3	13 9 44.08	0.961	4 54 48.0	6.25	1.019 8655	176.8	7.12	0.84	2 23.0
4	13 10 7.23	0.968	4 57 18.4	6.28	1.020 2855	173.2	7.12	0.84	2 19.4
5	13 10 30.56	+0.976	−4 59 49.6	−6.32	1.020 6969	+169.6	7.11	0.84	2 15.9
6	13 10 54.07	0.983	5 2 21.6	6.35	1.021 0996	165.9	7.10	0.84	2 12.4
7	13 11 17.74	0.990	5 4 54.3	6.38	1.021 4934	162.2	7.10	0.84	2 8.8
8	13 11 41.59	0.997	5 7 27.8	6.41	1.021 8784	158.6	7.09	0.84	2 5.3
9	13 12 5.60	1.004	5 10 2.0	6.44	1.022 2545	154.8	7.09	0.84	2 1.8
10	13 12 29.77	+1.010	−5 12 36.8	−6.46	1.022 6215	+151.0	7.08	0.83	1 58.2
11	13 12 54.09	1.017	5 15 12.3	6.49	1.022 9794	147.2	7.07	0.83	1 54.7
12	13 13 18.57	1.023	5 17 48.5	6.52	1.023 3281	143.4	7.07	0.83	1 51.2
13	13 13 43.20	1.029	5 20 25.2	6.54	1.023 6676	139.5	7.06	0.83	1 47.6
14	13 14 7.97	1.035	5 23 2.5	6.57	1.023 9978	135.6	7.06	0.83	1 44.1
15	13 14 32.88	+1.041	−5 25 40.4	−6.59	1.024 3186	+131.7	7.05	0.83	1 40.6
16	13 14 57.93	1.046	5 28 18.8	6.61	1.024 6300	127.8	7.05	0.83	1 37.1
17	13 15 23.11	1.052	5 30 57.7	6.63	1.024 9319	123.8	7.04	0.83	1 33.6
18	13 15 48.42	1.057	5 33 37.0	6.65	1.025 2244	119.9	7.04	0.83	1 30.1
19	13 16 13.84	1.062	5 36 16.7	6.66	1.025 5075	116.0	7.03	0.83	1 26.6
20	13 16 39.39	+1.067	−5 38 56.8	−6.68	1.025 7812	+112.0	7.03	0.83	1 23.0
21	13 17 5.05	1.072	5 41 37.3	6.70	1.026 0453	108.0	7.02	0.83	1 19.5
22	13 17 30.83	1.076	5 44 18.2	6.71	1.026 2998	104.0	7.02	0.83	1 16.0
23	13 17 56.72	1.081	5 46 59.4	6.72	1.026 5447	100.0	7.02	0.83	1 12.5
24	13 18 22.71	1.085	5 49 40.9	6.74	1.026 7799	96.0	7.01	0.83	1 9.0
25	13 18 48.80	+1.089	−5 52 22.7	−6.75	1.027 0055	+ 92.0	7.01	0.83	1 5.5
26	13 19 14.99	1.093	5 55 4.8	6.76	1.027 2213	87.9	7.00	0.83	1 2.0
27	13 19 41.28	1.097	5 57 47.1	6.77	1.027 4273	83.8	7.00	0.83	0 58.5
28	13 20 7.66	1.101	6 0 29.6	6.78	1.027 6236	79.7	7.00	0.83	0 55.1
29	13 20 34.12	1.104	6 3 12.3	6.78	1.027 8101	75.7	6.99	0.83	0 51.6
30	13 21 0.66	+1.108	−6 5 55.2	−6.79	1.027 9868	+ 71.5	6.99	0.83	0 48.1
Oct. 1	13 21 27.29	+1.111	−6 8 38.1	−6.79	1.028 1535	+ 67.4	6.99	0.83	0 44.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	13 21 27.29	+1.111	−6 8 38.1	−6.79	1.028 1535	+ 67.4	6.99	0.83	0 44.6
2	13 21 54.00	1.114	6 11 21.2	6.80	1.028 3103	63.3	6.99	0.83	0 41.1
3	13 22 20.78	1.117	6 14 4.4	6.80	1.028 4572	59.1	6.98	0.83	0 37.6
4	13 22 47.63	1.120	6 16 47.6	6.80	1.028 5940	54.9	6.98	0.82	0 34.1
5	13 23 14.54	1.123	6 19 30.9	6.80	1.028 7207	50.7	6.98	0.82	0 30.6
6	13 23 41.52	+1.125	−6 22 14.2	−6.80	1.028 8373	+ 46.5	6.98	0.82	0 27.1
7	13 24 8.55	1.128	6 24 57.5	6.80	1.028 9438	42.3	6.98	0.82	0 23.7
8	13 24 35.64	1.130	6 27 40.7	6.80	1.029 0402	38.0	6.98	0.82	0 20.2
9	13 25 2.77	1.131	6 30 23.8	6.80	1.029 1264	33.8	6.97	0.82	0 16.7
10	13 25 29.95	1.133	6 33 6.9	6.79	1.029 2024	29.5	6.97	0.82	0 13.2
11	13 25 57.17	+1.135	−6 35 49.8	−6.79	1.029 2682	+ 25.3	6.97	0.82	0 9.7
12	13 26 24.42	1.136	6 38 32.6	6.78	1.029 3237	21.0	6.97	0.82	0 6.3
13	13 26 51.70	1.137	6 41 15.2	6.77	1.029 3689	16.7	6.97	0.82	0 2.8 23 59.3
14	13 27 19.01	1.138	6 43 57.6	6.76	1.029 4039	12.4	6.97	0.82	23 55.8
15	13 27 46.34	1.139	6 46 39.8	6.75	1.029 4286	8.1	6.97	0.82	23 52.3
16	13 28 13.69	+1.140	−6 49 21.6	−6.74	1.029 4430	+ 3.9	6.97	0.82	23 48.9
17	13 28 41.05	1.140	6 52 3.2	6.73	1.029 4471	− 0.4	6.97	0.82	23 45.4
18	13 29 8.42	1.141	6 54 44.5	6.71	1.029 4410	4.6	6.97	0.82	23 41.9
19	13 29 35.80	1.141	6 57 25.5	6.70	1.029 4247	8.9	6.97	0.82	23 38.4
20	13 30 3.18	1.141	7 0 6.0	6.68	1.029 3981	13.2	6.97	0.82	23 35.0
21	13 30 30.55	+1.140	−7 2 46.2	−6.67	1.029 3613	− 17.5	6.97	0.82	23 31.5
22	13 30 57.92	1.140	7 5 26.0	6.65	1.029 3143	21.7	6.97	0.82	23 28.0
23	13 31 25.27	1.139	7 8 5.4	6.63	1.029 2571	26.0	6.97	0.82	23 24.5
24	13 31 52.61	1.139	7 10 44.2	6.61	1.029 1897	30.2	6.97	0.82	23 21.0
25	13 32 19.94	1.138	7 13 22.6	6.59	1.029 1120	34.5	6.97	0.82	23 17.6
26	13 32 47.24	+1.137	−7 16 0.5	−6.57	1.029 0242	− 38.7	6.97	0.82	23 14.1
27	13 33 14.52	1.136	7 18 37.9	6.55	1.028 9261	43.0	6.98	0.82	23 10.6
28	13 33 41.77	1.135	7 21 14.7	6.52	1.028 8179	47.2	6.98	0.82	23 7.1
29	13 34 8.98	1.133	7 23 50.9	6.50	1.028 6995	51.5	6.98	0.82	23 3.6
30	13 34 36.16	1.131	7 26 26.6	6.47	1.028 5709	55.7	6.98	0.82	23 0.2
31	13 35 3.29	+1.130	−7 29 1.6	−6.45	1.028 4320	− 60.0	6.98	0.83	22 56.7
Nov. 1	13 35 30.38	1.128	7 31 36.0	6.42	1.028 2829	64.2	6.99	0.83	22 53.2
2	13 35 57.41	1.125	7 34 9.6	6.39	1.028 1237	68.5	6.99	0.83	22 49.7
3	13 36 24.39	1.123	7 36 42.6	6.36	1.027 9542	72.7	6.99	0.83	22 46.2
4	13 36 51.32	1.121	7 39 14.9	6.33	1.027 7746	77.0	6.99	0.83	22 42.7
5	13 37 18.18	+1.118	−7 41 46.4	−6.30	1.027 5848	− 81.2	7.00	0.83	22 39.2
6	13 37 44.97	1.115	7 44 17.1	6.26	1.027 3848	85.4	7.00	0.83	22 35.7
7	13 38 11.69	1.112	7 46 47.1	6.23	1.027 1747	89.7	7.00	0.83	22 32.2
8	13 38 38.33	1.108	7 49 16.2	6.20	1.026 9544	93.9	7.01	0.83	22 28.7
9	13 39 4.88	1.105	7 51 44.5	6.16	1.026 7240	98.1	7.01	0.83	22 25.2
10	13 39 31.35	+1.101	−7 54 11.9	−6.12	1.026 4836	−102.3	7.02	0.83	22 21.8
11	13 39 57.72	1.097	7 56 38.4	6.09	1.026 2331	106.4	7.02	0.83	22 18.3
12	13 40 24.00	1.093	7 59 4.0	6.05	1.025 9727	110.6	7.02	0.83	22 14.8
13	13 40 50.17	1.088	8 1 28.6	6.00	1.025 7023	114.7	7.03	0.83	22 11.3
14	13 41 16.24	1.084	8 3 52.2	5.96	1.025 4221	118.8	7.03	0.83	22 7.8
15	13 41 42.20	+1.079	−8 6 14.8	−5.92	1.025 1320	−122.9	7.04	0.83	22 4.3
16	13 42 8.04	+1.074	−8 8 36.4	−5.88	1.024 8322	−127.0	7.04	0.83	22 0.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	13 42 8.04	+1.074	−8 8 36.4	−5.88	1.024 8322	−127.0	7.04	0.83	22 0.8
17	13 42 33.76	1.069	8 10 56.9	5.83	1.024 5226	131.0	7.05	0.83	21 57.3
18	13 42 59.35	1.064	8 13 16.4	5.79	1.024 2035	135.0	7.05	0.83	21 53.8
19	13 43 24.82	1.058	8 15 34.8	5.74	1.023 8748	139.0	7.06	0.83	21 50.3
20	13 43 50.15	1.053	8 17 52.0	5.69	1.023 5365	142.9	7.06	0.83	21 46.8
21	13 44 15.35	+1.047	−8 20 8.1	−5.65	1.023 1887	−146.9	7.07	0.83	21 43.2
22	13 44 40.40	1.041	8 22 23.1	5.60	1.022 8315	150.8	7.08	0.83	21 39.7
23	13 45 5.31	1.035	8 24 36.9	5.55	1.022 4648	154.7	7.08	0.84	21 36.2
24	13 45 30.08	1.029	8 26 49.5	5.50	1.022 0887	158.6	7.09	0.84	21 32.6
25	13 45 54.69	1.022	8 29 0.9	5.45	1.021 7033	162.5	7.09	0.84	21 29.1
26	13 46 19.14	+1.015	−8 31 11.0	−5.39	1.021 3087	−166.3	7.10	0.84	21 25.6
27	13 46 43.43	1.008	8 33 19.8	5.34	1.020 9049	170.1	7.11	0.84	21 22.1
28	13 47 7.55	1.001	8 35 27.4	5.29	1.020 4920	173.9	7.11	0.84	21 18.5
29	13 47 31.50	0.994	8 37 33.7	5.24	1.020 0700	177.7	7.12	0.84	21 15.0
30	13 47 55.28	0.987	8 39 38.7	5.18	1.019 6390	181.5	7.13	0.84	21 11.5
Dec. 1	13 48 18.88	+0.979	−8 41 42.3	−5.12	1.019 1989	−185.2	7.13	0.84	21 7 9
2	13 48 42.29	0.972	8 43 44.5	5.06	1.018 7499	188.9	7.14	0.84	21 4.4
3	13 49 5.52	0.964	8 45 45.4	5.01	1.018 2921	192.6	7.15	0.84	21 0.8
4	13 49 28.55	0.955	8 47 44.8	4.95	1.017 8255	196.2	7.16	0.84	20 57.3
5	13 49 51.38	0.947	8 49 42.8	4.89	1.017 3502	199.9	7.16	0.85	20 53.7
6	13 50 14.01	+0.938	−8 51 39.3	−4.83	1.016 8662	−203.4	7.17	0.85	20 50.1
7	13 50 36.42	0.929	8 53 34.4	4.76	1.016 3738	206.9	7.18	0.85	20 46.6
8	13 50 58.62	0.920	8 55 27.9	4.70	1.015 8729	210.5	7.19	0.85	20 43.0
9	13 51 20.60	0.911	8 57 19.9	4.63	1.015 3636	213.9	7.20	0.85	20 39.5
10	13 51 42.36	0.902	8 59 10.3	4.57	1.014 8461	217.3	7.21	0.85	20 35.9
11	13 52 3.89	+0.892	−9 0 59.2	−4.50	1.014 3205	−220.7	7.22	0.85	20 32.3
12	13 52 25.18	0.882	9 2 46.5	4.44	1.013 7868	224.0	7.22	0.85	20 28.7
13	13 52 46.24	0.872	9 4 32.2	4.37	1.013 2453	227.2	7.23	0.85	20 25.1
14	13 53 7.05	0.862	9 6 16.2	4.30	1.012 6961	230.4	7.24	0.85	20 21.5
15	13 53 27.62	0.852	9 7 58.6	4.23	1.012 1392	233.6	7.25	0.86	20 17.9
16	13 53 47.94	+0.842	−9 9 39.3	−4.16	1.011 5747	−236.7	7.26	0.86	20 14.3
17	13 54 8.01	0.831	9 11 18.3	4.09	1.011 0028	239.8	7.27	0.86	20 10.7
18	13 54 27.82	0.820	9 12 55.6	4.02	1.010 4235	242.9	7.28	0.86	20 7.1
19	13 54 47.36	0.809	9 14 31.2	3.95	1.009 8371	245.8	7.29	0.86	20 3.5
20	13 55 6.64	0.798	9 16 5.1	3.88	1.009 2437	248.7	7.30	0.86	19 59.9
21	13 55 25.65	+0.786	−9 17 37.2	−3.80	1.008 6432	−251.6	7.31	0.86	19 56.3
22	13 55 44.39	0.775	9 19 7.6	3.73	1.008 0359	254.4	7.32	0.86	19 52.6
23	13 56 2.85	0.763	9 20 36.2	3.65	1.007 4219	257.2	7.33	0.87	19 49.0
24	13 56 21.02	0.751	9 22 3.0	3.58	1.006 8013	259.9	7.34	0.87	19 45.4
25	13 56 38.91	0.739	9 23 28.0	3.50	1.006 1742	262.6	7.35	0.87	19 41.8
26	13 56 56.51	+0.727	−9 24 51.2	−3.43	1.005 5407	−265.2	7.36	0.87	19 38.1
27	13 57 13.82	0.715	9 26 12.5	3.35	1.004 9010	267.8	7.37	0.87	19 34.5
28	13 57 30.82	0.702	9 27 31.9	3.27	1.004 2552	270.4	7.38	0.87	19 30.8
29	13 57 47.53	0.690	9 28 49.5	3.19	1.003 6033	272.9	7.40	0.87	19 27.1
30	13 58 3.93	0.677	9 30 5.2	3.11	1.002 9455	275.3	7.41	0.87	19 23.5
31	13 58 20.02	+0.664	−9 31 19.0	−3.03	1.002 2821	−277.6	7.42	0.88	19 19.8
32	13 58 35.79	. . .	−9 32 30.8	. . .	1.001 6131	. . .	7.43	0.88	19 16.2

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	′ ″	° ′ ″	″		
Jan.	2	193 39 2.7	1 58.63	+0 31.2	+2 27 19.4	+0.84	0.983 3795	+131.0
	10	193 54 51.5	1 58.58	0 30.4	2 27 26.0	0.81	0.983 4842	130.8
	18	194 10 39.9	1 58.52	0 29.5	2 27 32.4	0.79	0.983 5887	130.6
	26	194 26 27.8	1 58.46	0 28.7	2 27 38.6	0.76	0.983 6931	130.4
Feb.	3	194 42 15.3	1 58.41	0 27.8	2 27 44.6	0.74	0.983 7973	130.2
	11	194 58 2.3	1 58.35	+0 27.0	+2 27 50.4	+0.72	0.983 9014	+130.0
	19	195 13 48.9	1 58.29	0 26.1	2 27 56.1	0.69	0.984 0053	129.8
	27	195 29 35.0	1 58.24	0 25.2	2 28 1.5	0.67	0.984 1090	129.6
Mar.	7	195 45 20.7	1 58.18	0 24.4	2 28 6.8	0.64	0.984 2126	129.4
	15	196 1 5.9	1 58.12	0 23.5	2 28 11.8	0.62	0.984 3160	129.2
	23	196 16 50.6	1 58.07	+0 22.6	+2 28 16.7	+0.60	0.984 4193	+129.0
	31	196 32 35.0	1 58.01	0 21.8	2 28 21.4	0.58	0.984 5224	128.8
Apr.	8	196 48 18.8	1 57 95	0 20.9	2 28 25.9	0.55	0.984 6253	128.6
	16	197 4 2.2	1 57.90	0 20.0	2 28 30.2	0.53	0.984 7281	128.4
	24	197 19 45.2	1 57.85	0 19.1	2 28 34.4	0.51	0.984 8307	128.1
May	2	197 35 27.8	1 57.79	+0 18.3	+2 28 38.3	+0.48	0.984 9331	+127.9
	10	197 51 9.9	1 57.74	0 17.4	2 28 42.1	0.46	0.985 0353	127.7
	18	198 6 51.6	1 57.68	0 16.5	2 28 45.7	0.44	0.985 1374	127.5
	26	198 22 32.8	1 57.62	0 15.6	2 28 49.1	0.41	0.985 2393	127.3
June	3	198 38 13.6	1 57.57	0 14.8	2 28 52.3	0.39	0.985 3410	127.1
	11	198 53 54.0	1 57.52	+0 13.9	+2 28 55.3	+0.36	0.985 4426	+126.8
	19	199 9 33.9	1 57.46	0 13.0	2 28 58.1	0.34	0.985 5439	126.6
	27	199 25 13.3	1 57.40	0 12.1	2 29 0.7	0.32	0.985 6451	126.4
July	5	199 40 52.3	1 57.35	0 11.2	2 29 3.2	0.29	0.985 7461	126.1
	13	199 56 30.9	1 57.30	0 10.4	2 29 5.4	0.27	0.985 8469	125.9
	21	200 12 9.1	1 57.24	+0 9.5	+2 29 7.5	+0.25	0.985 9475	+125.6
	29	200 27 46.8	1 57.19	0 8.6	2 29 9.4	0.22	0.986 0479	125.4
Aug.	6	200 43 24.1	1 57.14	0 7.7	2 29 11.1	0.20	0.986 1481	125.2
	14	200 59 1.0	1 57.08	0 6.8	2 29 12.6	0.18	0.986 2482	125.0
	22	201 14 37.4	1 57.02	0 6.0	2 29 13.9	0.16	0.986 3481	124.7
	30	201 30 13.4	1 56.97	+0 5.1	+2 29 15.1	+0.13	0.986 4478	+124.4
Sept.	7	201 45 49.0	1 56.92	0 4.2	2 29 16.0	0.11	0.986 5472	124.1
	15	202 1 24.1	1 56.86	0 3.3	2 29 16.8	0.09	0.986 6464	123.9
	23	202 16 58.8	1 56.81	0 2.4	2 29 17.4	0.06	0.986 7454	123.6
Oct.	1	202 32 33.1	1 56.76	0 1.5	2 29 17.8	0.04	0.986 8442	123.3
	9	202 48 7.0	1 56.71	+0 0.7	+2 29 18.1	+0.02	0.986 9427	+123.0
	17	203 3 40.4	1 56.65	−0 0.2	2 29 18.1	−0.01	0.987 0410	122.8
	25	203 19 13.4	1 56.60	0 1.1	2 29 18.0	0.03	0.987 1391	122.5
Nov.	2	203 34 46.0	1 56.55	0 2.0	2 29 17.7	0.05	0.987 2370	122.3
	10	203 50 18.2	1 56.49	0 2.9	2 29 17.2	0.07	0.987 3347	122.0
	18	204 5 49.9	1 56.44	−0 3.7	+2 29 16.5	−0.09	0.987 4322	+121.8
	26	204 21 21.3	1 56.39	0 4.6	2 29 15.7	0.12	0.987 5295	121.5
Dec.	4	204 36 52.2	1 56.34	0 5.5	2 29 14.6	0.14	0.987 6266	121.2
	12	204 52 22.7	1 56.29	0 6.4	2 29 13.4	0.16	0.987 7234	120.9
	20	205 7 52.8	1 56.23	0 7.3	2 29 12.0	0.19	0.987 8200	120.6
	28	205 23 22.4	1 56.18	−0 8.1	+2 29 10.4	−0.21	0.987 9164	+120.4
	36	205 38 51.6	1 56.12	−0 9.0	+2 29 8.6	−0.23	0.988 0126	+120.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 0	22 48 48.11	+ 7.542	−8 22 5.6	+47.99	1.312 5743	+3214.7	1.67	0.43	4 11.6
4	22 49 19.50	8.151	8 18 46.3	51.64	1.313 8337	3080.6	1.66	0.43	3 56.4
8	22 49 53.28	8.733	8 15 12.7	55.13	1.315 0372	2934.7	1.66	0.43	3 41.3
12	22 50 29.32	9.283	8 11 25.5	58.43	1.316 1798	2776.1	1.66	0.43	3 26.1
16	22 51 7.50	9.800	8 7 25.5	61.54	1.317 2565	2605.7	1.65	0.42	3 11.0
20	22 51 47.67	+10.280	−8 3 13.5	+64.40	1.318 2629	+2424.1	1.65	0.42	2 56.0
24	22 52 29.68	10.716	7 58 50.6	67.01	1.319 1946	2233.6	1.64	0.42	2 40.9
28	22 53 13.34	11.109	7 54 17.7	69.39	1.320 0488	2035.7	1.64	0.42	2 25.9
Feb. 1	22 53 58.50	11.463	7 49 35.8	71.53	1.320 8223	1831.3	1.64	0.42	2 10.9
5	22 54 44.99	11.777	7 44 45.8	73.43	1.321 5131	1621.6	1.64	0.42	1 56.0
9	22 55 32.67	+12.057	−7 39 48.7	+75.08	1.322 1187	+1404.8	1.63	0.42	1 41.1
13	22 56 21.39	12.293	7 34 45.5	76.47	1.322 6363	1183.4	1.63	0.42	1 26.1
17	22 57 10.95	12.480	7 29 37.3	77.60	1.323 0648	957.1	1.63	0.42	1 11.2
21	22 58 1.17	12.623	7 24 25.1	78.45	1.323 4016	727.9	1.63	0.42	0 56.3
25	22 58 51.88	12.723	7 19 10.1	79.02	1.323 6470	497.8	1.63	0.42	0 41.5
Mar. 1	22 59 42.90	+12.781	−7 13 53.3	+79.33	1.323 7998	+ 267.7	1.63	0.42	0 26.6
5	23 0 34.07	12.797	7 8 35.8	79.38	1.323 8612	+ 38.0	1.63	0.42	0 11.7
9	23 1 25.22	12.773	7 3 18.6	79.19	1.323 8302	− 191.6	1.63	0.42	23 53.1
13	23 2 16.20	12.708	6 58 2.6	78.75	1.323 7079	421.3	1.63	0.42	23 38.2
17	23 3 6.83	12.600	6 52 49.0	78.01	1.323 4933	650.0	1.63	0.42	23 23.3
21	23 3 56.94	+12.447	−6 47 38.9	+77.00	1.323 1884	− 874.5	1.63	0.42	23 8.4
25	23 4 46.35	12.251	6 42 33.3	75.76	1.322 7943	1094.8	1.63	0.42	22 53.5
29	23 5 34.90	12.017	6 37 33.2	74.24	1.322 3133	1309.4	1.63	0.42	22 38.6
Apr. 2	23 6 22.44	11.748	6 32 39.7	72.50	1.321 7475	1518.5	1.63	0.42	22 23.6
6	23 7 8.84	11.445	6 27 53.5	70.54	1.321 0992	1722.3	1.64	0.42	22 8.7
10	23 7 53.95	+11.105	−6 23 15.7	+68.34	1.320 3705	−1919.9	1.64	0.42	21 53.7
14	23 8 37.63	10.726	6 18 47.1	65.92	1.319 5642	2110.7	1.64	0.42	21 38.7
18	23 9 19.71	10.308	6 14 28.7	63.22	1.318 6830	2293.6	1.65	0.42	21 23.7
22	23 10 0.05	9.858	6 10 21.6	60.33	1.317 7306	2466.6	1.65	0.42	21 8.6
26	23 10 38.53	9.376	6 6 26.3	57.26	1.316 7111	2628.9	1.65	0.42	20 53.5
30	23 11 15.02	+ 8.867	−6 2 43.8	+53.98	1.315 6289	−2780.7	1.66	0.43	20 38.3
May 4	23 11 49.43	8.333	5 59 14.7	50.56	1.314 4879	2922.6	1.66	0.43	20 23.2
8	23 12 21.65	7.772	5 55 59.6	46.94	1.313 2922	3054.6	1.67	0.43	20 8.0
12	23 12 51.57	7.180	5 52 59.4	43.15	1.312 0458	3174.6	1.67	0.43	19 52.8
16	23 13 19.06	6.563	5 50 14.6	39.22	1.310 7543	3281.2	1.68	0.43	19 37.5
20	23 13 44.05	+ 5.926	−5 47 45.8	+35.15	1.309 4227	−3374.3	1.68	0.43	19 22.2
24	23 14 6.44	5.269	5 45 33.6	30.94	1.308 0569	3451.8	1.69	0.43	19 6.8
28	23 14 26.18	4.598	5 43 38.4	26.66	1.306 6631	3515.5	1.69	0.43	18 51.4
June 1	23 14 43.21	3.916	5 42 0.4	22.31	1.305 2463	3566.0	1.70	0.44	18 36.0
5	23 14 57.49	3.221	5 40 40.0	17.87	1.303 8123	3601.0	1.70	0.44	18 20.5
9	23 15 8.96	+ 2.513	−5 39 37.5	+13.37	1.302 3674	−3622.2	1.71	0.44	18 4.9
13	23 15 17.58	1.796	5 38 53.1	8.84	1.300 9167	3626.9	1.71	0.44	17 49.3
17	23 15 23.32	1.074	5 38 26.8	+ 4.29	1.299 4683	3613.0	1.72	0.44	17 33.6
21	23 15 26.17	+ 0.353	5 38 18.8	− 0.27	1.298 0285	3582.7	1.73	0.44	17 17.9
25	23 15 26.15	− 0.361	5 38 28.9	4.77	1.296 6044	3535.0	1.73	0.44	17 2.2
29	23 15 23.29	− 1.066	−5 38 56.9	− 9.21	1.295 2025	−3472.5	1.74	0.45	16 46.4
July 3	23 15 17.63	− 1.764	−5 39 42.5	−13.57	1.293 8285	−3394.3	1.74	0.45	16 30.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 3	23 15 17.63	−1.764	−5 39 42.5	−13.57	1.293 8285	−3394.3	1.74	0.45	16 30.6
7	23 15 9.19	2.454	5 40 45.4	17.87	1.292 4893	3299.0	1.75	0.45	16 14.7
11	23 14 58.02	3.128	5 42 5.3	22.08	1.291 1916	3186.2	1.75	0.45	15 58.8
15	23 14 44.19	3.784	5 43 41.8	26.13	1.289 9426	3056.8	1.76	0.45	15 42.8
19	23 14 27.78	4.414	5 45 34.1	29.98	1.288 7484	2910.3	1.76	0.45	15 26.8
23	23 14 8.92	−5.010	−5 47 41.4	−33.63	1.287 6164	−2748.2	1.77	0.45	15 10.8
27	23 13 47.74	5.575	5 50 2.9	37.09	1.286 5516	2573.2	1.77	0.45	14 54.7
31	23 13 24.36	6.109	5 52 37.8	40.32	1.285 5597	2384.2	1.78	0.46	14 38.6
Aug. 4	23 12 58.91	6.611	5 55 25.1	43.29	1.284 6461	2181.3	1.78	0.46	14 22.4
8	23 12 31.53	7.070	5 58 23.8	46.01	1.283 8164	1965.4	1.78	0.46	14 6.3
12	23 12 2.41	−7.484	−6 1 32.8	−48.44	1.283 0754	−1737.3	1.79	0.46	13 50.1
16	23 11 31.72	7.850	6 4 50.9	50.53	1.282 4281	1497.5	1.79	0.46	13 33.8
20	23 10 59.68	8.162	6 8 16.6	52.28	1.281 8786	1248.7	1.79	0.46	13 17.5
24	23 10 26.50	8.419	6 11 48.7	53.70	1.281 4300	994.0	1.79	0.46	13 1.3
28	23 9 52.40	8.623	6 15 25.7	54.74	1.281 0842	733.7	1.79	0.46	12 45.0
Sept. 1	23 9 17.58	−8.778	−6 19 6.2	−55.47	1.280 8439	− 466.5	1.80	0.46	12 28.7
5	23 8 42.25	8.877	6 22 49.0	55.84	1.280 7115	− 195.9	1.80	0.46	12 12.4
9	23 8 6.65	8.912	6 26 32.4	55.80	1.280 6875	+ 77.2	1.80	0.46	11 56.0
13	23 7 31.04	8.885	6 30 14.9	55.10	1.280 7735	352.5	1.80	0.46	11 39.7
17	23 6 55.65	8.796	6 33 55.1	54.60	1.280 9692	625.3	1.79	0.46	11 23.4
21	23 6 20.75	−8.648	−6 37 31.2	−53.13	1.281 2732	+ 893.6	1.79	0.46	11 7.1
25	23 5 46.54	8.444	6 41 2.1	51.93	1.281 6834	1156.8	1.79	0.46	10 50.8
29	23 5 13.27	8.185	6 44 26.2	50.07	1.282 1979	1414.8	1.79	0.46	10 34.5
Oct. 3	23 4 41.13	7.872	6 47 42.2	47.89	1.282 8143	1665.9	1.79	0.46	10 18.3
7	23 4 10.37	7.503	6 50 48.9	45.38	1.283 5295	1908.6	1.78	0.46	10 2.0
11	23 3 41.18	−7.079	−6 53 44.8	−42.52	1.284 3399	+2141.8	1.78	0.46	9 45.8
15	23 3 13.81	6.600	6 56 28.7	39.37	1.285 2413	2362.6	1.78	0.46	9 29.6
19	23 2 48.44	6.079	6 58 59.4	35.97	1.286 2279	2567.2	1.77	0.46	9 13.5
23	23 2 25.23	5.520	7 1 16.1	32.32	1.287 2932	2757.9	1.77	0.45	8 57.4
27	23 2 4.33	4.922	7 3 17.7	28.46	1.288 4324	2935.5	1.76	0.45	8 41.3
31	23 1 45.90	−4.289	−7 5 3.5	−24.41	1.289 6395	+3096.8	1.76	0.45	8 25.3
Nov. 4	23 1 30.06	3.625	7 6 32.7	20.16	1.290 9077	3242.2	1.75	0.45	8 9.3
8	23 1 16.94	2.929	7 7 44.6	15.76	1.292 2310	3370.7	1.75	0.45	7 53.4
12	23 1 6.66	2.208	7 8 38.6	11.22	1.293 6017	3479.3	1.74	0.45	7 37.5
16	23 0 59.30	1.469	7 9 14.2	6.58	1.295 0119	3568.8	1.74	0.45	7 21.6
20	23 0 54.92	−0.721	−7 9 31.2	− 1.89	1.296 4543	+3639.9	1.73	0.45	7 5.8
24	23 0 53.54	+0.034	7 9 29.3	+ 2.83	1.297 9214	3692.7	1.73	0.44	6 50.1
28	23 0 55.20	0.796	7 9 8.5	7.57	1.299 4061	3728.2	1.72	0.44	6 34.4
Dec. 2	23 0 59.91	1.561	7 8 28.7	12.33	1.300 9015	3745.3	1.71	0.44	6 18.8
6	23 1 7.69	2.328	7 7 29.9	17.07	1.302 3999	3744.0	1.71	0.44	6 3.2
10	23 1 18.53	+3.089	−7 6 12.2	+21.78	1.303 8942	+3723.9	1.70	0.44	5 47.6
14	23 1 32.39	3.839	7 4 35.8	26.41	1.305 3765	3684.7	1.70	0.44	5 32.1
18	23 1 49.22	4.571	7 2 41.1	30.92	1.306 8397	3628.6	1.69	0.43	5 16.7
22	23 2 8.93	5.284	7 0 28.6	35.31	1.308 2773	3556.8	1.69	0.43	5 1.3
26	23 2 31.46	5.977	6 57 58.8	39.57	1.309 6831	3469.5	1.68	0.43	4 45.9
30	23 2 56.72	+6.649	−6 55 12.2	+43.71	1.311 0510	+3367.7	1.68	0.43	4 30.6
34	23 3 24.62	. . .	−6 52 9.3	. . .	1.312 3755	. . . .	1.67	0.43	4 15.4

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day
		° ′ ″	″	″	° ′ ″	″		
Jan.	4	342 54 46.5	38.58	+0.2	−0 46 20.0	0.00	1.302 8960	+5.8
	14	343 1 12.3	38.59	0.2	0 46 20.0	0.00	1.302 9018	5.8
	24	343 7 38.2	38.59	0.2	0 46 20.1	0.00	1.302 9075	5.7
Feb.	3	343 14 4.1	38.59	+0.1	−0 46 20.1	0.00	1.302 9131	+5.6
	13	343 20 30.0	38.59	0.1	0 46 20.2	0.00	1.302 9187	5.6
	23	343 26 55.9	38.59	+0.1	0 46 20.2	0.00	1.302 9242	5.5
Mar.	5	343 33 21.7	38.59	0.0	−0 46 20.2	0.00	1.302 9297	+5.4
	15	343 39 47.6	38.59	0.0	0 46 20.2	0.00	1.302 9350	5.3
	25	343 46 13.4	38.59	−0.1	0 46 20.2	0.00	1.302 9403	5.2
Apr.	4	343 52 39.3	38.59	−0.1	−0 46 20.2	0.00	1.302 9455	+5.2
	14	343 59 5.1	38.59	0.1	0 46 20.2	0.00	1.302 9506	5.1
	24	344 5 31.0	38.59	0.2	0 46 20.2	0.00	1.302 9557	5.0
May	4	344 11 56.8	38.59	−0.2	−0 46 20.1	0.00	1.302 9607	+5.0
	14	344 18 22.7	38.59	0.2	0 46 20.1	0.00	1.302 9656	4.9
	24	344 24 48.5	38.59	0.3	0 46 20.0	+0.01	1.302 9705	4.8
June	3	344 31 14.4	38.59	−0.3	−0 46 19.9	+0.01	1.302 9753	+4.8
	13	344 37 40.2	38.59	0.3	0 46 19.8	0 01	1.302 9800	4.7
	23	344 44 6.1	38.59	0.4	0 46 19.7	0.01	1.302 9847	4.6
July	3	344 50 31.9	38.59	−0.4	−0 46 19.6	+0.01	1.302 9893	+4.6
	13	344 56 57.8	38.59	0.4	0 46 19.5	0.01	1.302 9938	4.5
	23	345 3 23.6	38.59	0.5	0 46 19.4	0.01	1.302 9983	4.4
Aug.	2	345 9 49.5	38.59	−0.5	−0 46 19.3	+0.01	1.303 0027	+4.4
	12	345 16 15.4	38.59	0.5	0 46 19.1	0.01	1.303 0071	4.3
	22	345 22 41.3	38.59	0.6	0 46 19.0	0.01	1.303 0114	4.2
Sept.	1	345 29 7.1	38.59	−0.6	−0 46 18.8	+0.01	1.303 0156	+4.2
	11	345 35 33.0	38.59	0.6	0 46 18.7	0.01	1.303 0198	4.1
	21	345 41 58.9	38.59	0.7	0 46 18.5	0.02	1.303 0239	4.0
Oct.	1	345 48 24.8	38.59	−0.7	−0 46 18.3	+0.02	1.303 0279	+4.0
	11	345 54 50.6	38.59	0.8	0 46 18.1	0.02	1.303 0319	3.9
	21	346 1 16.5	38.59	0.8	0 46 17 9	0.02	1.303 0358	3.9
	31	346 7 42.4	38.59	−0.8	−0 46 17.7	+0.02	1.303 0397	+3.8
Nov.	10	346 14 8.3	38.59	0.9	0 46 17.5	0.02	1.303 0435	3.7
	20	346 20 34.1	38.59	0.9	0 46 17.2	0.02	1.303 0472	3.6
	30	346 27 0.0	38.59	−0.9	−0 46 17.0	+0.02	1.303 0508	+3.6
Dec.	10	346 33 25.9	38.59	1.0	0 46 16.7	0.02	1.303 0544	3.5
	20	346 39 51.8	38.59	1.0	0 46 16.5	0.02	1.303 0579	3.5
	30	346 46 17.7	38.59	−1.0	−0 46 16.2	+0.03	1.303 0614	+3.4
	40	346 52 43.6	38.59	−1.1	−0 46 15.9	+0.03	1.303 0648	+3.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 0	9 21 0.01	−4.835	+15 41 18.6	+23.41	1.466 9804	−1605.7	1.25	0.30	14 42.0
4	9 20 39.95	5.190	15 42 55.5	25.00	1.466 3669	1460.4	1.25	0.30	14 26.0
8	9 20 18.53	5.513	15 44 38.4	26.44	1.465 8131	1307.5	1.25	0.30	14 9.9
12	9 19 55.89	5.803	15 46 26.8	27.72	1.465 3220	1146.1	1.25	0.30	13 53.8
16	9 19 32.16	6.055	15 48 19.9	28.79	1.464 8972	977.4	1.25	0.30	13 37.7
20	9 19 7.51	−6.263	+15 50 16.9	+29.68	1.464 5409	− 802.7	1.25	0.30	13 21.5
24	9 18 42.11	6.429	15 52 17.1	30.37	1.464 2556	623.6	1.26	0.30	13 5.4
28	9 18 16.13	6.555	15 54 19.6	30.86	1.464 0424	442.0	1.26	0.30	12 49.2
Feb. 1	9 17 49.73	6.636	15 56 23.7	31.15	1.463 9023	258.2	1.26	0.30	12 33.0
5	9 17 23.10	6.674	15 58 28.5	31.23	1.463 8360	− 73.4	1.26	0.30	12 16.9
9	9 16 56.39	−6.674	+16 0 33.3	+31.13	1.463 8436	+ 111.5	1.26	0.30	12 0.7
13	9 16 29.77	6.628	16 2 37.3	30.82	1.463 9252	296.9	1.26	0.30	11 44.5
17	9 16 3.43	6.536	16 4 39.6	30.32	1.464 0808	479.8	1.26	0.30	11 28.3
21	9 15 37.54	6.402	16 6 39.6	29.62	1.464 3086	660.0	1.26	0.30	11 12.2
25	9 15 12.27	6.224	16 8 36.3	28.73	1.464 6080	833.7	1.25	0.30	10 56.1
Mar. 1	9 14 47.80	−6.007	+16 10 29.2	+27.69	1.464 9748	+1001.7	1.25	0.30	10 39.9
5	9 14 24.26	5.757	16 12 17.6	26.48	1.465 4087	1165.2	1.25	0.30	10 23.8
9	9 14 1.79	5.471	16 14 0.8	25.10	1.465 9060	1321.4	1.25	0.30	10 7.7
13	9 13 40.54	5.149	16 15 38.2	23.58	1.466 4648	1470.4	1.25	0.30	9 51.6
17	9 13 20.64	4.791	16 17 9.3	21.93	1.467 0811	1610.2	1.25	0.30	9 35.6
21	9 13 2.23	−4.407	+16 18 33.5	+20.14	1.467 7517	+1741.0	1.25	0.30	9 19.6
25	9 12 45.42	3.994	16 19 50.3	18.25	1.468 4725	1861.4	1.24	0.30	9 3.6
29	9 12 30.31	3.558	16 20 59.4	16.26	1.469 2393	1970.6	1.24	0.30	8 47.6
Apr. 2	9 12 16.98	3.103	16 22 0.3	14.18	1.470 0475	2068.7	1.24	0.30	8 31.6
6	9 12 5.51	2.629	16 22 52.8	12.05	1.470 8929	2156.9	1.24	0.30	8 15.7
10	9 11 55.97	−2.140	+16 23 36.6	+ 9.85	1.471 7716	+2234.7	1.23	0.30	7 59.8
14	9 11 48.41	1.636	16 24 11.5	7.58	1.472 6791	2300.6	1.23	0.30	7 44.0
18	9 11 42.90	1.119	16 24 37.2	5.27	1.473 6105	2354.6	1.23	0.30	7 28.2
22	9 11 39.47	0.596	16 24 53.6	2.93	1.474 5611	2395.5	1.23	0.29	7 12.4
26	9 11 38.14	−0.069	16 25 0.6	+ 0.57	1.475 5253	2424.4	1.22	0.29	6 56.6
30	9 11 38.92	+0.456	+16 24 58.2	− 1.76	1.476 4992	+2442.7	1.22	0.29	6 40.9
May 4	9 11 41.79	0.980	16 24 46.5	4.10	1.477 4780	2450.2	1.22	0.29	6 25.3
8	9 11 46.76	1.504	16 24 25.4	6.44	1.478 4579	2447.0	1.21	0.29	6 9.6
12	9 11 53.82	2.025	16 23 55.0	8.75	1.479 4341	2432.4	1.21	0.29	5 54.0
16	9 12 2.95	2.539	16 23 15.4	11.04	1.480 4023	2406.0	1.21	0.29	5 38.4
20	9 12 14.12	+3.042	+16 22 26.7	−13.30	1.481 3575	+2369.2	1.21	0.29	5 22.9
24	9 12 27.27	3.531	16 21 29.1	15.49	1.482 2963	2322.3	1.20	0.29	5 7.4
28	9 12 42.35	4.007	16 20 22.9	17.61	1.483 2140	2265.3	1.20	0.29	4 51.9
June 1	9 12 59.30	4.464	16 19 8.3	19.68	1.484 1074	2200.4	1.20	0.29	4 36.5
5	9 13 18.04	4.908	16 17 45.5	21.70	1.484 9731	2126.3	1.20	0.29	4 21.1
9	9 13 38.54	+5.336	+16 16 14.8	−23.62	1.485 8073	+2043.7	1.19	0.29	4 5.7
13	9 14 0.70	5.744	16 14 36.6	25.47	1.486 6070	1953.2	1.19	0.29	3 50.3
17	9 14 24.46	6.130	16 12 51.1	27.25	1.487 3687	1853.9	1.19	0.29	3 35.0
21	9 14 49.71	6.492	16 10 58.7	28.93	1.488 0891	1747.2	1.19	0.29	3 19.7
25	9 15 16.36	6.829	16 8 59.8	30.49	1.488 7656	1634.2	1.19	0.29	3 4.4
29	9 15 44.31	+7.141	+16 6 54.9	−31.95	1.489 3957	+1515.7	1.18	0.29	2 49.1
July 3	9 16 13.46	+7.432	+16 4 44.3	−33.32	1.489 9775	+1392.8	1.18	0.28	2 33.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 3	9 16 13.46	+7.432	+16 4 44.3	−33.32	1.489 9775	+1392.8	1.18	0.28	2 33.9
7	9 16 43.73	7.697	16 2 28.5	34.58	1.490 5092	1264.2	1.18	0.28	2 18.6
11	9 17 15.00	7.937	16 0 7.8	35.71	1.490 9881	1129.5	1.18	0.28	2 3.4
15	9 17 47.19	8.149	15 57 42.8	36.76	1.491 4122	990.2	1.18	0.28	1 48.2
19	9 18 20.15	8.327	15 55 13.9	37.66	1.491 7798	847.3	1.18	0.28	1 33.1
23	9 18 53.77	+8.480	+15 52 41.7	−38.12	1.492 0897	+ 701.7	1.18	0.28	1 17.9
27	9 19 27.95	8.604	15 50 6.7	39.06	1.492 3409	554.3	1.18	0.28	1 2.7
31	9 20 2.56	8.697	15 47 29.4	39.57	1.492 5329	405.0	1.18	0.28	0 47.6
Aug. 4	9 20 37.49	8.766	15 44 50.3	39.96	1.492 6646	253.1	1.18	0.28	0 32.4
8	9 21 12.65	8.805	15 42 9.9	40.22	1.492 7352	+ 99.7	1.18	0.28	0 17.3
12	9 21 47.89	+8.813	+15 39 28.7	−40.34	1.492 7443	− 54.3	1.18	0.28	{ 0 2.1 / 23 58.3
16	9 22 23.11	8.789	15 36 47.4	40.30	1.492 6917	209.0	1.18	0.28	23 43.2
20	9 22 58.16	8.731	15 34 6.5	40.11	1.492 5772	363.2	1.18	0.28	23 28.1
24	9 23 32.92	8.646	15 31 26.7	39.78	1.492 4015	511.4	1.18	0.28	23 12.9
28	9 24 7.29	8.535	15 28 48.4	39.32	1.492 1659	664.3	1.18	0.28	22 57.8
Sept. 1	9 24 41.16	+8.394	+15 26 12.3	−38.74	1.491 8702	− 813.2	1.18	0.28	22 42.6
5	9 25 14.40	8.222	15 23 38.7	38.00	1.491 5156	959.8	1.18	0.28	22 27.4
9	9 25 46.90	8.021	15 21 8.5	37.10	1.491 1027	1103.6	1.18	0.28	22 12.2
13	9 26 18.55	7.792	15 18 42.1	36.06	1.490 6332	1243.5	1.18	0.28	21 57.0
17	9 26 49.20	7.530	15 16 20.2	34.88	1.490 1085	1378.8	1.18	0.28	21 41.8
21	9 27 18.76	+7.244	+15 14 3.2	−33.57	1.489 5310	−1507.5	1.18	0.28	21 26.6
25	9 27 47.12	6.933	15 11 51.8	32.12	1.488 9032	1631.0	1.19	0.29	21 11.3
29	9 28 14.19	6.597	15 9 46.4	30.55	1.488 2269	1749.7	1.19	0.29	20 56.0
Oct. 3	9 28 39.86	6.235	15 7 47.6	28.85	1.487 5043	1861.6	1.19	0.29	20 40.7
7	9 29 4.04	5.851	15 5 55.8	27.02	1.486 7385	1966.8	1.19	0.29	20 25.4
11	9 29 26.63	+5.439	+15 4 11.6	−25.07	1.485 9319	−2061.3	1.19	0.29	20 10.0
15	9 29 47.52	5.004	15 2 35.4	23.00	1.485 0883	2152.2	1.20	0.29	19 54.6
19	9 30 6.64	4.553	15 1 7.7	20.81	1.484 2114	2230.9	1.20	0.29	19 39.2
23	9 30 23.92	4.084	14 59 48.8	18.59	1.483 3049	2299.7	1.20	0.29	19 23.7
27	9 30 39.29	3.600	14 58 39.1	16.25	1.482 3729	2359.1	1.20	0.29	19 8.3
31	9 30 52.70	+3.102	+14 57 38.9	−13.84	1.481 4189	−2409.3	1.21	0.29	18 52.8
Nov. 4	9 31 4.09	2.590	14 56 48.5	11.35	1.480 4469	2448.3	1.21	0.29	18 37.2
8	9 31 13.40	2.064	14 56 8.2	8.81	1.479 4618	2475.9	1.21	0.29	18 21.6
12	9 31 20.59	1.531	14 55 38.1	6.23	1.478 4678	2491.5	1.21	0.29	18 6.0
16	9 31 25.64	0.993	14 55 18.4	3.61	1.477 4703	2493.8	1.22	0.29	17 50.4
20	9 31 28.53	+0.454	+14 55 9.2	− 1.00	1.476 4743	−2484.5	1.22	0.29	17 34.7
24	9 31 29.27	−0.084	14 55 10.4	+ 1.60	1.475 4842	2464.1	1.22	0.29	17 19.0
28	9 31 27.86	0.619	14 55 22.0	4.20	1.474 5047	2430.4	1.23	0.29	17 3.2
Dec. 2	9 31 24.32	1.151	14 55 44.0	6.80	1.473 5413	2385.2	1.23	0.30	16 47.4
6	9 31 18.66	1.678	14 56 16.3	9.32	1.472 5982	2327.5	1.23	0.30	16 31.6
10	9 31 10.91	−2.194	+14 56 58.5	+11.79	1.471 6811	−2255.7	1.23	0.30	16 15.7
14	9 31 1.13	2.691	14 57 50.5	14.19	1.470 7953	2171.7	1.24	0.30	15 59.8
18	9 30 49.41	3.168	14 58 51.9	16.48	1.469 9453	2075.9	1.24	0.30	15 43.9
22	9 30 35.81	3.628	15 0 2.2	18.67	1.469 1360	1969.3	1.24	0.30	15 27.9
26	9 30 20.42	4.062	15 1 21.1	20.72	1.468 3712	1852.6	1.24	0.30	15 12.0
30	9 30 3.35	−4.472	+15 2 47.8	+22.64	1.467 6553	−1725.3	1.25	0.30	14 56.0
34	9 29 44.68	. . .	+15 4 22.0	. . .	1.466 9923	. . . .	1.25	0.30	14 39.9

NEPTUNE, 1923.

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	″	″	° ′ ″	″		
Jan.	4	136 35 55.9	21.66	+ 9.7	+0 10 31.8	+0.67	1.478 2979	+2.8
	14	136 39 32.5	21.66	9.9	0 10 38.5	0.66	1.478 3007	2.8
	24	136 43 9.1	21.66	10.0	0 10 45.1	0.66	1.478 3035	2.8
Feb.	3	136 46 45.7	21.66	+10.1	+0 10 51.8	+0.66	1.478 3063	+2.8
	13	136 50 22.2	21.66	10.2	0 10 58.4	0.66	1.478 3091	2.8
	23	136 53 58.8	21.66	10.3	0 11 5.1	0.66	1.478 3119	2.8
Mar.	5	136 57 35.3	21.65	+10.4	+0 11 11.7	+0.66	1.478 3147	+2.8
	15	137 1 11.8	21.65	10.5	0 11 18.4	0.66	1.478 3175	2.8
	25	137 4 48.3	21.65	10.6	0 11 25.0	0.66	1.478 3203	2.8
Apr.	4	137 8 24.8	21.65	+10.7	+0 11 31.7	+0.66	1.478 3231	+2.8
	14	137 12 1.3	21.65	10.8	0 11 38.3	0.66	1.478 3259	2.8
	24	137 15 37.8	21.65	10.9	0 11 44.9	0.66	1.478 3287	2.8
May	4	137 19 14.3	21.65	+11.0	+0 11 51.5	+0.66	1.478 3315	+2.8
	14	137 22 50.8	21.65	11.1	0 11 58.2	0.66	1.478 3343	2.8
	24	137 26 27.2	21.65	11.2	0 12 4.8	0.66	1.478 3371	2.8
June	3	137 30 3.7	21.65	+11.3	+0 12 11.5	+0.66	1.478 3399	+2.8
	13	137 33 40.1	21.64	11.4	0 12 18.1	0.66	1.478 3427	2.8
	23	137 37 16.6	21.64	11.5	0 12 24.8	0.66	1.478 3455	2.8
July	3	137 40 53.0	21.64	+11.6	+0 12 31.4	+0.66	1.478 3483	+2.8
	13	137 44 29.4	21.64	11.7	0 12 38.0	0.66	1.478 3511	2.8
	23	137 48 5.8	21.64	11.8	0 12 44.6	0.66	1.478 3539	2.8
Aug.	2	137 51 42.2	21.64	+11.9	+0 12 51.3	+0.66	1.478 3567	+2.8
	12	137 55 18.6	21.64	12.0	0 12 57.9	0.66	1.478 3595	2.8
	22	137 58 55.0	21.64	12.1	0 13 4.5	0.66	1.478 3623	2.8
Sept.	1	138 2 31.3	21.64	+12.2	+0 13 11.1	+0.66	1.478 3651	+2.8
	11	138 6 7.7	21.64	12.3	0 13 17.7	0.66	1.478 3679	2.8
	21	138 9 44.0	21.63	12.4	0 13 24.3	0.66	1.478 3707	2.8
Oct.	1	138 13 20.3	21.63	+12.5	+0 13 30.9	+0.66	1.478 3735	+2.8
	11	138 16 56.6	21.63	12.6	0 13 37.5	0.66	1.478 3763	2.8
	21	138 20 32.9	21.63	12.7	0 13 44.2	0.66	1.478 3791	2.8
	31	138 24 9.2	21.63	+12.8	+0 13 50.8	+0.66	1.478 3819	+2.8
Nov.	10	138 27 45.5	21.63	12.9	0 13 57.4	0.66	1.478 3847	2.8
	20	138 31 21.8	21.63	13.0	0 14 4.0	0.66	1.478 3875	2.8
	30	138 34 58.1	21.63	+13.1	+0 14 10.6	+0.66	1.478 3903	+2.8
Dec.	10	138 38 34.3	21.63	13.2	0 14 17.2	0.66	1.478 3931	2.8
	20	138 42 10.6	21.63	13.3	0 14 23.8	0.66	1.478 3959	2.8
	30	138 45 46.8	21.62	+13.4	+0 14 30.4	+0.66	1.478 3988	+2.8
	40	138 49 23.1	21.62	+13.5	+0 14 37.1	+0.66	1.478 4016	+2.8

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

The constants of precession, nutation, and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xvi, and together with the notation of BESSEL are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

	Terms of Long Period.	*Terms of Short Period.*
$A=\tau$	$-0.342\,22 \sin \Omega$	$-0.004\,05 \sin 2\,\mathbb{C}$
	$+0.004\,15 \sin 2\,\Omega$	$+0.000\,23 \sin (\mathbb{C}+\Gamma')$
	$-0.025\,26 \sin 2\,\mathrm{L}$	$+0.001\,31 \sin (\mathbb{C}-\Gamma')$
	$+0.002\,51 \sin (\mathrm{L}-\Gamma)$	$-0.000\,68 \sin (2\,\mathbb{C}-\Omega)$
	$-0.000\,99 \sin (3\,\mathrm{L}-\Gamma)$	$-0.000\,52 \sin (3\,\mathbb{C}-\Gamma')$
	$+0.000\,42 \sin (\mathrm{L}+\Gamma)$	$+0.000\,30 \sin (\mathbb{C}-2\,\mathrm{L}+\Gamma')$
	$+0.000\,25 \sin (2\,\mathrm{L}-\Omega)$	$+0.000\,12 \sin 2\,(\mathbb{C}-\mathrm{L})$
	//	//
$B=$	$-9.210 \cos \Omega$	$-0.088 \cos 2\,\mathbb{C}$
	$+0.090 \cos 2\,\Omega$	$-0.018 \cos (2\,\mathbb{C}-\Omega)$
	$-0.551 \cos 2\,\mathrm{L}$	$-0.011 \cos (3\,\mathbb{C}-\Gamma')$
	$-0.022 \cos (3\,\mathrm{L}-\Gamma)$	$+0.005 \cos (\mathbb{C}+\Gamma')$
	$+0.009 \cos (\mathrm{L}+\Gamma)$	
	$+0.007 \cos (2\,\mathrm{L}-\Omega)$	

$C = -20''.4700 \cos \omega \cos \odot$

$D = -20''.4700 \sin \odot$

$E = -0''.0412 \sin \Omega + 0''.0005 \sin 2\,\Omega - 0''.0030 \sin 2\,\mathrm{L}$

BESSEL'S *Star-Constants.*

$a = 3^s.072\,76 + 1^s.336\,33 \sin \alpha_0 \tan \delta_0$ $\qquad a' = 20''.0449 \cos \alpha_0$

$b = \frac{1}{15} \cos \alpha_0 \tan \delta_0$ $\qquad b' = -\sin \alpha_0$

$c = \frac{1}{15} \cos \alpha_0 \sec \delta_0$ $\qquad c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$

$d = \frac{1}{15} \sin \alpha_0 \sec \delta_0$ $\qquad d' = \cos \alpha_0 \sin \delta_0$

Formulæ for Reduction to Apparent Position.

$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \frac{1}{15} E$ (in time)

$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd'$ (in arc)

INDEPENDENT STAR-NUMBERS.

$f + f' = +46''.0914\, A + E$ (in arc)

$= +3^s.07276\, A + \frac{1}{15} E$ (in time)

$f' = -0^s.0124 \sin 2\,\mathbb{C} + 0^s.0041 \sin (\mathbb{C}-\Gamma') + 0^s.0007 \sin (\mathbb{C}+\Gamma')$
$\quad -0^s.0021 \sin (2\,\mathbb{C}-\Omega) - 0^s.0016 \sin (3\,\mathbb{C}-\Gamma')$
$\quad +0^s.0009 \sin (\mathbb{C}-2\,\mathrm{L}+\Gamma') + 0^s.0004 \sin 2\,(\mathbb{C}-\mathrm{L})$

$g \sin G = B$ $\qquad h \sin H = C$ $\qquad i = C \tan \omega$

$g \cos G = 20''.0449\, A$ $\qquad h \cos H = D$

Formulæ for Reduction to Apparent Position.

$\alpha = \alpha_0 + f + f' + \tau\mu + \frac{1}{15} g \sin (G+\alpha_0) \tan \delta_0 + \frac{1}{15} h \sin (H+\alpha_0) \sec \delta_0$ (in time)

$\delta = \delta_0 + \tau\mu' + g \cos (G+\alpha_0) + h \cos (H+\alpha_0) \sin \delta_0 + i \cos \delta_0$ (in arc)

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1923, January $0^d.670$, Washington mean time),

α_0, δ_0, the star's mean R. A. and Decl. at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the Sun's true longitude,
L, the Sun's mean longitude,
Ω, the longitude of the Moon's ascending node,

ω, the obliquity of the ecliptic,
Γ, the long. of the Sun's perigee,
Γ', the long. of the Moon's perigee,
$\mathbb{C}$, the Moon's mean longitude.

The independent star-numbers are more convenient than BESSEL'S when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', with the star-numbers of this Ephemeris, the quantities to be computed are Ac, Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

In the computation of the Besselian star-numbers given for Washington mean midnight of each day of the year, on pages 202–205, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included.

In the computation of the independent star-numbers, pages 206–213, the short-period terms have been included in the two columns headed G and Log g. The quantities f and f' give separately the effect of the long-period and short-period terms. f' differs but slightly from the quantity $-0''.1866 \sin 2\ \mathbb{C} + 0''.0622 \sin (\mathbb{C} - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference of 1896, which quantity that conference decided should be omitted in the reduction of stars from mean to apparent place.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included. The quantity f', which was omitted from the ephemerides of the circumpolar stars given in the *American Ephemeris and Nautical Almanac* for the years 1900 to 1915, inclusive, is now included in these ephemerides in accordance with the decision of the *Congrès International des Éphémérides Astronomiques* held in Paris in October, 1911. See page 43 of *Procès-Verbaux* of that Congress.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm(0^s.020 + 0^s.008 \tan \delta)$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\triangle\alpha$ and $\triangle\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\triangle\alpha = D_\psi\alpha\ \delta''\psi + D_\omega\alpha\ \delta''\omega$$
$$\triangle\delta = D_\psi\delta\ \delta''\psi + D_\omega\delta\ \delta''\omega$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 215-216, and have been computed as follows:

$$\delta''\psi = 50''.37\ A_2 \qquad\qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 200.

The quantities $D_\psi\alpha$, $D_\omega\alpha$, $D_\psi\delta$, and $D_\omega\delta$ are given for each ten-day star on pages 316–513, and have been computed by means of the following formulæ:

$$D_\psi\alpha = {}^1\!/_{15}\ (\cos\omega + \sin\alpha \tan\delta \sin\omega) \qquad D_\omega\alpha = -{}^1\!/_{15} \cos\alpha \tan\delta$$
$$D_\psi\delta = \cos\alpha \sin\omega \qquad D_\omega\delta = \sin\alpha$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 and in the *American Ephemeris and Nautical Almanac* for the years 1912 to 1915, inclusive, the value used for the derivative of the right ascension with reference to ψ was

$$D'\psi\alpha = {}^1\!/_{15} \sin\alpha \tan\delta \sin\omega$$

and the addition of the term ${}^1\!/_{15} \cos\omega$ is made in accordance with the above-mentioned decision of the *Congrès International des Éphémérides Astronomiques* of 1911 with reference to the quantity f'.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)		Log A.	Log B.	Log C.	Log D.
Jan.	0	−8.46449	+0.9935	−0.50375	+1.30476	Feb.	15	+9.02198	+0.9518	−1.19490	+1.05276
	1	8.38739	0.9936	0.54634	1.30336		16	9.02552	0.9500	1.19986	1.04096
	2	8.28847	0.9931	0.58498	1.30182		17	9.02788	0.9486	1.20464	1.02870
	3	8.16584	0.9918	0.62035	1.30013		18	9.02999	0.9477	1.20922	1.01595
h	4	8.01787	0.9900	0.65292	1.29830	h	19	9.03230	0.9474	1.21363	1.00268
(7.0)	5	−7.84510	+0.9879	−0.68310	+1.29632	(10.0)	20	+9.03555	+0.9474	−1.21785	+0.98886
	6	7.64836	0.9859	0.71119	1.29419		21	9.04054	0.9478	1.22190	0.97446
	7	7.41330	0.9845	0.73743	1.29192		22	9.04727	0.9483	1.22577	0.95943
	8	−6.98677	0.9838	0.76205	1.28949		23	9.05633	0.9488	1.22948	0.94374
	9	+6.89763	0.9840	0.78523	1.28692		24	9.06737	0.9489	1.23302	0.92732
	10	+7.49276	+0.9848	−0.80710	+1.28419		25	+9.07940	+0.9484	−1.23640	+0.91012
	11	7.79727	0.9858	0.82778	1.28130		26	9.09146	0.9472	1.23962	0.89210
	12	8.01157	0.9867	0.84740	1.27826		27	9.10250	0.9453	1.24267	0.87316
	13	8.17289	0.9870	0.86603	1.27506		28	9.11119	0.9429	1.24558	0.85322
	14	8.29513	0.9865	0.88377	1.27169	Mar.	1	9.11704	0.9404	1.24833	0.83221
	15	+8.38721	+0.9853	−0.90064	+1.26816		2	+9.12018	+0.9383	−1.25093	+0.80999
	16	8.45530	0.9836	0.91681	1.26447		3	9.12149	0.9369	1.25338	0.78644
	17	8.50474	0.9815	0.93224	1.26060		4	9.12222	0.9364	1.25568	0.76143
	18	8.53983	0.9793	0.94700	1.25656		5	9.12392	0.9370	1.25784	0.73475
h	19	8.56526	0.9774	0.96114	1.25235	h	6	9.12762	0.9381	1.25986	0.70619
(8.0)	20	+8.58410	+0.9759	−0.97470	+1.24796	(11.0)	7	+9.13408	+0.9394	−1.26173	+0.67551
	21	8.59945	0.9748	0.98771	1.24339		8	9.14289	0.9405	1.26346	0.64235
	22	8.61416	0.9741	1.00021	1.23863		9	9.15290	0.9409	1.26506	0.60633
	23	8.62972	0.9738	1.01222	1.23368		10	9.16295	0.9405	1.26651	0.56692
	24	8.64748	0.9739	1.02377	1.22853		11	9.17182	0.9394	1.26783	0.52345
	25	+8.66904	+0.9742	−1.03488	+1.22319		12	+9.17889	+0.9377	−1.26901	+0.47502
	26	8.69443	0.9746	1.04559	1.21764		13	9.18364	0.9358	1.27006	0.42037
	27	8.72370	0.9747	1.05589	1.21189		14	9.18639	0.9340	1.27097	0.35775
	28	8.75526	0.9745	1.06583	1.20592		15	9.18766	0.9327	1.27175	0.28441
	29	8.78654	0.9736	1.07540	1.19973		16	9.18794	0.9318	1.27240	0.19602
	30	+8.81525	+0.9720	−1.08463	+1.19332		17	+9.18800	+0.9316	−1.27292	+0.08482
	31	8.83998	0.9697	1.09353	1.18670		18	9.18811	0.9318	1.27330	9.93488
Feb.	1	8.85878	0.9671	1.10212	1.17979		19	9.18887	0.9325	1.27355	9.70396
	2	8.87186	0.9644	1.11040	1.17266		20	9.19089	0.9336	1.27367	+9.17796
	3	8.88007	0.9622	1.11840	1.16527		21	9.19413	0.9349	1.27366	−9.30929
h	4	+8.88559	+0.9608	−1.12611	+1.15762	h (12.0)	22	+9.19918	+0.9362	−1.27352	−9.74684
(9.0)	5	8.89076	0.9603	1.13355	1.14969		23	9.20545	0.9373	1.27325	9.96015
	6	8.89818	0.9606	1.14074	1.14148		24	9.21294	0.9379	1.27285	0.10240
	7	8.90950	0.9613	1.14767	1.13298		25	9.22097	0.9378	1.27232	0.20922
	8	8.92485	0.9620	1.15436	1.12417		26	9.22861	0.9369	1.27166	0.29472
	9	+8.94285	+0.9623	−1.16081	+1.11503		27	+9.23492	+0.9355	−1.27087	−0.36607
	10	8.96209	0.9619	1.16703	1.10557		28	9.23942	0.9338	1.26995	0.42701
	11	8.98009	0.9607	1.17302	1.09578		29	9.24202	0.9323	1.26890	0.48037
	12	8.99555	0.9588	1.17880	1.08561		30	9.24299	0.9315	1.26771	0.52774
	13	9.00771	0.9565	1.18437	1.07506		31	9.24343	0.9316	1.26640	0.57032
	14	+9.01628	+0.9540	−1.18974	+1.06412	Apr.	1	+9.24433	+0.9327	−1.26495	−0.60895
	15	+9.02198	+0.9518	−1.19490	+1.05276		2	+9.24660	+0.9346	−1.26337	−0.64428

E=0″.00=0ˢ.000

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	+9.24433	+0.9327	−1.26495	−0.60895	May 17	+9.43548	+0.9699	−1.01841	−1.23097
2	9.24660	0.9346	1.26337	0.64428	18	9.44188	0.9709	1.00728	1.23576
3	9.25093	0.9368	1.26166	0.67681	19	9.44838	0.9712	0.99574	1.24037
4	9.25732	0.9389	1.25981	0.70695	20	9.45442	0.9708	0.98376	1.24482
5	9.26507	0.9405	1.25782	0.73499	21	9.45956	0.9700	0.97132	1.24909
h 6	+9.27330	+0.9412	−1.25570	−0.76120	h (16.0) 22	+9.46356	+0.9689	−0.95840	−1.25320
(13.0) 7	9.28094	0.9411	1.25344	0.78579	23	9.46640	0.9681	0.94496	1.25715
8	9.28728	0.9405	1.25104	0.80893	24	9.46847	0.9680	0.93097	1.26094
9	9.29201	0.9394	1.24851	0.83076	25	9.47046	0.9687	0.91640	1.26457
10	9.29498	0.9385	1.24583	0.85141	26	9.47294	0.9702	0.90120	1.26805
11	+9.29673	+0.9378	−1.24300	−0.87100	27	+9.47650	+0.9723	−0.88532	−1.27138
12	9.29756	0.9376	1.24003	0.88961	28	9.48140	0.9746	0.86873	1.27457
13	9.29805	0.9380	1.23692	0.90732	29	9.48745	0.9766	0.85136	1.27761
14	9.29870	0.9389	1.23365	0.92421	30	9.49423	0.9780	0.83314	1.28050
15	9.29981	0.9403	1.23024	0.94034	31	9.50117	0.9785	0.81400	1.28326
16	+9.30172	+0.9420	−1.22667	−0.95576	June 1	+9.50758	+0.9782	−0.79386	−1.28588
17	9.30473	0.9440	1.22295	0.97052	2	9.51309	0.9774	0.77262	1.28836
18	9.30886	0.9460	1.21907	0.98466	3	9.51749	0.9764	0.75016	1.29070
19	9.31425	0.9478	1.21503	0.99822	4	9.52089	0.9754	0.72636	1.29291
20	9.32071	0.9493	1.21082	1.01125	5	9.52349	0.9747	0.70104	1.29499
h 21	+9.32762	+0.9501	−1.20646	−1.02377	h (17.0) 6	+9.52562	+0.9745	−0.67404	−1.29694
(14.0) 22	9.33451	0.9502	1.20192	1.03580	7	9.52771	0.9748	0.64512	1.29876
23	9.34062	0.9496	1.19721	1.04739	8	9.52981	0.9755	0.61402	1.30045
24	9.34541	0.9486	1.19232	1.05854	9	9.53225	0.9766	0.58039	1.30201
25	9.34891	0.9477	1.18726	1.06928	10	9.53530	0.9779	0.54381	1.30345
26	+9.35093	+0.9472	−1.18201	−1.07963	11	+9.53896	+0.9793	−0.50373	−1.30476
27	9.35232	0.9475	1.17657	1.08962	12	9.54324	0.9806	0.45946	1.30595
28	9.35376	0.9488	1.17094	1.09926	13	9.54823	0.9817	0.41003	1.30701
29	9.35624	0.9509	1.16512	1.10856	14	9.55360	0.9823	0.35411	1.30795
30	9.36029	0.9534	1.15909	1.11753	15	9.55919	0.9822	0.28976	1.30877
May 1	+9.36601	+0.9560	−1.15286	−1.12620	16	+9.56457	+0.9814	−0.21412	−1.30946
2	9.37303	0.9582	1.14641	1.13457	17	9.56930	0.9801	0.12230	1.31003
3	9.38079	0.9596	1.13974	1.14266	18	9.57316	0.9785	0.00563	1.31048
4	9.38832	0.9602	1.13284	1.15048	19	9.57606	0.9769	9.84542	1.31081
5	9.39496	0.9600	1.12571	1.15803	20	9.57818	0.9758	9.58864	1.31102
h 6	+9.40040	+0.9594	−1.11834	−1.16533	h 21	+9.57999	+0.9756	−8.87624	−1.31111
(15.0) 7	9.40444	0.9587	1.11071	1.17238	(18.0) 22	9.58214	0.9761	+9.37555	1.31108
8	9.40725	0.9583	1.10283	1.17920	23	9.58486	0.9774	9.74030	1.31093
9	9.40934	0.9582	1.09468	1.18579	24	9.58848	0.9789	9.93564	1.31066
10	9.41097	0.9586	1.08624	1.19215	25	9.59305	0.9803	0.06976	1.31027
11	+9.41268	+0.9595	−1.07752	−1.19830	26	+9.59833	+0.9812	+0.17198	−1.30976
12	9.41462	0.9608	1.06850	1.20424	27	9.60379	0.9813	0.25458	1.30912
13	9.41709	0.9625	1.05917	1.20997	28	9.60919	0.9806	0.32383	1.30836
14	9.42037	0.9645	1.04951	1.21550	29	9.61399	0.9792	0.38342	1.30749
15	9.42447	0.9665	1.03950	1.22085	30	9.61796	0.9775	0.43572	1.30649
16	+9.42957	+0.9684	−1.02914	−1.22600	July 1	+9.62106	+0.9757	+0.48229	−1.30537
17	+9.43548	+0.9699	−1.01841	−1.23097	2	+9.62345	+0.9741	+0.52423	−1.30412

$E = -0''.01 = -0^s.001$

BESSELIAN STAR-NUMBERS, 1923.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
July	1	+9.62106	+0.9757	+0.48229	−1.30537	Aug.	16	+9.72976	+0.9360	+1.17761	−1.08778
	2	9.62345	0.9741	0.52423	1.30412		17	9.73096	0.9367	1.18295	1.07783
	3	9.62531	0.9730	0.56237	1.30275		18	9.73285	0.9376	1.18811	1.06752
	4	9.62697	0.9724	0.59733	1.30126		19	9.73537	0.9383	1.19309	1.05684
	5	9.62865	0.9722	0.62956	1.29964		20	9.73835	0.9383	1.19789	1.04575
h	6	+9.63054	+0.9724	+0.65946	−1.29789	h	21	+9.74145	+0.9374	+1.20253	−1.03424
(19.0)	7	9.63273	0.9730	0.68732	1.29602	(22.0)	22	9.74431	0.9357	1.20699	1.02229
	8	9.63540	0.9736	0.71339	1.29401		23	9.74666	0.9334	1.21128	1.00987
	9	9.63858	0.9743	0.73787	1.29188		24	9.74836	0.9307	1.21542	0.99696
	10	9.64228	0.9747	0.76094	1.28961		25	9.74947	0.9283	1.21939	0.98352
	11	+9.64641	+0.9748	+0.78273	−1.28721		26	+9.75012	+0.9262	+1.22321	−0.96951
	12	9.65078	0.9742	0.80336	1.28468		27	9.75045	0.9247	1.22688	0.95490
	13	9.65506	0.9729	0.82295	1.28201		28	9.75073	0.9238	1.23039	0.93964
	14	9.65892	0.9710	0.84158	1.27920		29	9.75107	0.9235	1.23376	0.92370
	15	9.66216	0.9687	0.85932	1.27625		30	9.75158	0.9236	1.23698	0.90701
	16	+9.66458	+0.9663	+0.87625	−1.27316		31	+9.75240	+0.9240	+1.24005	−0.88952
	17	9.66625	0.9643	0.89244	1.26993	Sept.	1	9.75357	0.9246	1.24298	0.87115
	18	9.66750	0.9630	0.90793	1.26655		2	9.75513	0.9251	1.24577	0.85183
	19	9.66872	0.9626	0.92277	1.26302		3	9.75708	0.9254	1.24842	0.83147
	20	9.67029	0.9630	0.93700	1.25934		4	9.75928	0.9251	1.25093	0.80997
h	21	+9.67259	+0.9639	+0.95066	−1.25551	h	5	+9.76163	+0.9242	+1.25331	−0.78720
(20.0)	22	9.67568	0.9648	0.96379	1.25152	(23.0)	6	9.76386	0.9226	1.25555	0.76303
	23	9.67946	0.9653	0.97642	1.24738		7	9.76580	0.9204	1.25765	0.73728
	24	9.68366	0.9651	0.98858	1.24307		8	9.76720	0.9180	1.25962	0.70976
	25	9.68784	0.9640	1.00029	1.23859		9	9.76803	0.9156	1.26146	0.68022
	26	+9.69156	+0.9622	+1.01158	−1.23395		10	+9.76838	+0.9138	+1.26317	−0.64838
	27	9.69468	0.9599	1.02246	1.22913		11	9.76850	0.9130	1.26475	0.61387
	28	9.69706	0.9574	1.03297	1.22414		12	9.76868	0.9132	1.26619	0.57621
	29	9.69879	0.9551	1.04311	1.21897		13	9.76924	0.9142	1.26751	0.53482
	30	9.70005	0.9532	1.05290	1.21360		14	9.77039	0.9158	1.26870	0.48890
	31	+9.70100	+0.9519	+1.06236	−1.20805		15	+9.77218	+0.9173	+1.26976	−0.43738
Aug.	1	9.70193	0.9511	1.07151	1.20230		16	9.77448	0.9182	1.27070	0.37876
	2	9.70297	0.9507	1.08035	1.19635		17	9.77700	0.9183	1.27150	0.31076
	3	9.70425	0.9507	1.08890	1.19019		18	9.77941	0.9175	1.27218	0.22993
	4	9.70584	0.9509	1.09717	1.18382		19	9.78144	0.9159	1.27274	0.13033
h	5	+9.70789	+0.9512	+1.10517	−1.17723	h	20	+9.78291	+0.9140	+1.27316	−0.00058
(21.0)	6	9.71035	0.9514	1.11290	1.17041	(0.0)	21	9.78380	0.9120	1.27346	9.81445
	7	9.71324	0.9512	1.12038	1.16335		22	9.78422	0.9104	1.27364	−9.48140
	8	9.71635	0.9504	1.12762	1.15605		23	9.78432	0.9095	1.27368	+8.66971
	9	9.71952	0.9490	1.13463	1.14850		24	9.78430	0.9091	1.27360	9.59840
	10	+9.72245	+0.9469	+1.14140	−1.14070		25	+9.78434	+0.9095	+1.27339	+9.87310
	11	9.72491	0.9442	1.14796	1.13262		26	9.78458	0.9103	1.27306	0.04004
	12	9.72675	0.9414	1.15429	1.12426		27	9.78506	0.9115	1.27260	0.16030
	13	9.72793	0.9389	1.16042	1.11560		28	9.78587	0.9129	1.27200	0.25429
	14	9.72859	0.9370	1.16635	1.10665		29	9.78704	0.9143	1.27128	0.33149
	15	+9.72910	+0.9360	+1.17208	−1.09738		30	+9.78857	+0.9155	+1.27043	+0.39694
	16	+9.72976	+0.9360	+1.17761	−1.08778	Oct.	1	+9.79043	+0.9163	+1.26945	+0.45371

E= −0″.01= −0ˢ.001

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct.	1	+9.79043	+0.9163	+1.26945	+0.45371	Nov.	16	+9.85625	+0.9390	+1.04464	+1.21815
	2	9.79245	0.9165	1.26834	0.50384		17	9.85699	0.9392	1.03398	1.22364
	3	9.79447	0.9160	1.26710	0.54869		18	9.85770	0.9400	1.02292	1.22892
	4	9.79627	0.9149	1.26572	0.58925		19	9.85852	0.9414	1.01143	1.23402
h	5	9.79768	0.9133	1.26421	0.62624	h	20	9.85956	0.9431	0.99947	1.23892
(1.0)	6	+9.79862	+0.9117	+1.26256	+0.66023	(4.0)	21	+9.86087	+0.9450	+0.98704	+1.24363
	7	9.79904	0.9106	1.26078	0.69166		22	9.86247	0.9470	0.97410	1.24816
	8	9.79923	0.9103	1.25886	0.72086		23	9.86440	0.9489	0.96062	1.25252
	9	9.79941	0.9110	1.25680	0.74811		24	9.86660	0.9504	0.94655	1.25670
	10	9.79986	0.9127	1.25459	0.77364		25	9.86902	0.9515	0.93188	1.26070
	11	+9.80088	+0.9151	+1.25225	+0.79765		26	+9.87151	+0.9519	+0.91654	+1.26454
	12	9.80252	0.9175	1.24976	0.82029		27	9.87395	0.9517	0.90049	1.26821
	13	9.80469	0.9196	1.24712	0.84170		28	9.87613	0.9508	0.88368	1.27171
	14	9.80721	0.9209	1.24434	0.86198		29	9.87794	0.9496	0.86604	1.27506
	15	9.80974	0.9213	1.24141	0.88124		30	9.87933	0.9486	0.84751	1.27824
	16	+9.81196	+0.9208	+1.23832	+0.89957	Dec.	1	+9.88038	+0.9479	+0.82800	+1.28127
	17	9.81372	0.9198	1.23508	0.91704		2	9.88126	0.9480	0.80742	1.28414
	18	9.81495	0.9186	1.23168	0.93372		3	9.88225	0.9491	0.78566	1.28687
	19	9.81568	0.9178	1.22812	0.94966		4	9.88356	0.9510	0.76261	1.28944
h	20	9.81605	0.9174	1.22440	0.96492	h	5	9.88538	0.9532	0.73811	1.29186
(2.0)	21	+9.81629	+0.9177	+1.22051	+0.97954	(5.0)	6	+9.88775	+0.9553	+0.71199	+1.29413
	22	9.81654	0.9186	1.21645	0.99357		7	9.89055	0.9569	0.68404	1.29625
	23	9.81696	0.9201	1.21222	1.00703		8	9.89357	0.9577	0.65402	1.29823
	24	9.81762	0.9219	1.20781	1.01998		9	9.89652	0.9575	0.62162	1.30006
	25	9.81861	0.9240	1.20323	1.03242		10	9.89917	0.9566	0.58644	1.30175
	26	+9.81991	+0.9261	+1.19846	+1.04440		11	+9.90139	+0.9552	+0.54801	+1.30330
	27	9.82157	0.9281	1.19350	1.05594		12	9.90310	0.9538	0.50568	1.30470
	28	9.82354	0.9297	1.18834	1.06705		13	9.90444	0.9526	0.45862	1.30597
	29	9.82571	0.9307	1.18298	1.07777		14	9.90550	0.9520	0.40566	1.30709
	30	9.82794	0.9311	1.17743	1.08810		15	9.90646	0.9519	0.34517	1.30808
	31	+9.83005	+0.9308	+1.17166	+1.09807		16	+9.90747	+0.9524	+0.27473	+1.30892
Nov.	1	9.83184	0.9300	1.16568	1.10770		17	9.90861	0.9532	0.19041	1.30963
	2	9.83319	0.9290	1.15947	1.11698		18	9.91000	0.9543	0.08547	1.31020
	3	9.83414	0.9282	1.15304	1.12596		19	9.91163	0.9555	9.94663	1.31064
	4	9.83475	0.9282	1.14637	1.13462	h	20	9.91352	0.9567	9.74109	1.31093
h	5	+9.83529	+0.9290	+1.13946	+1.14299	(6.0)	21	+9.91564	+0.9575	+9.33692	+1.31109
(3.0)	6	9.83606	0.9308	1.13230	1.15107		22	9.91798	0.9579	−9.06646	1.31111
	7	9.83725	0.9334	1.12488	1.15888		23	9.92040	0.9578	9.65347	1.31099
	8	9.83906	0.9361	1.11719	1.16642		24	9.92280	0.9569	9.89428	1.31074
	9	9.84141	0.9387	1.10922	1.17371		25	9.92499	0.9554	0.04823	1.31035
	10	+9.84418	+0.9406	+1.10096	+1.18075		26	+9.92690	+0.9534	−0.16156	+1.30982
	11	9.84707	0.9415	1.09240	1.18755		27	9.92839	0.9514	0.25124	1.30915
	12	9.84979	0.9416	1.08353	1.19411		28	9.92952	0.9497	0.32543	1.30834
	13	9.85211	0.9410	1.07433	1.20045		29	9.93042	0.9486	0.38866	1.30740
	14	9.85393	0.9402	1.06479	1.20656		30	9.93130	0.9485	0.44374	1.30631
	15	+9.85527	+0.9394	+1.05490	+1.21246		31	+9.93237	+0.9492	−0.49248	+1.30509
	16	+9.85625	+0.9390	+1.04464	+1.21815		32	+9.93384	+0.9504	−0.53620	+1.30372

$E = -0''.02 = -0^s.001$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Jan.	0	−0.0005	−0.081	−0.008	93 23.6	6 13.6	351 0.9	23 24.1	0.99427	1.31012	−1.38	−0.1410
	1	+0.0023	0.071	−0.004	92 50.5	6 11.4	350 4.5	23 20.3	0.99417	1.30991	1.53	0.1836
	2	0.0050	0.061	+0.001	92 16.0	6 9.1	349 8.1	23 16.5	0.99343	1.30968	1.67	0.2222
	3	0.0077	0.051	0.006	91 42.9	6 6.9	348 11.6	23 12.8	0.99201	1.30942	1.81	0.2576
h	4	0.0105	0.041	0.009	91 13.3	6 4.9	347 15.0	23 9.0	0.99007	1.30914	1.95	0.2902
(7.0)	5	0.0132	−0.031	+0.009	90 49.6	6 3.3	346 18.4	23 5.2	0.98792	1.30884	−2.09	−0.3204
	6	0.0160	0.021	0.007	90 31.7	6 2.1	345 21.6	23 1.4	0.98591	1.30852	2.23	0.3484
	7	0.0187	0.011	+0.003	90 18.5	6 1.2	344 24.8	22 57.7	0.98447	1.30819	2.37	0.3747
	8	0.0214	−0.001	−0.002	90 6.9	6 0.5	343 27.9	22 53.9	0.98381	1.30783	2.51	0.3993
	9	0.0242	+0.009	0.007	89 54.4	5 59.6	342 30.9	22 50.1	0.98399	1.30746	2.65	0.4225
	10	0.0269	+0.019	−0.009	89 37.8	5 58.5	341 33.8	22 46.3	0.98480	1.30707	−2.78	−0.4444
	11	0.0296	0.028	0.009	89 15.4	5 57.0	340 36.6	22 42.4	0.98588	1.30666	2.92	0.4650
	12	0.0324	0.038	0.007	88 47.0	5 55.1	339 39.3	22 38.6	0.98679	1.30623	3.05	0.4846
	13	0.0351	0.048	−0.002	88 14.3	5 52.9	338 41.9	22 34.8	0.98721	1.30579	3.19	0.5033
	14	0.0379	0.057	+0.003	87 39.8	5 50.7	337 44.4	22 31.0	0.98690	1.30533	3.32	0.5210
	15	0.0406	+0.066	+0.008	87 6.3	5 48.4	336 46.8	22 27.1	0.98590	1.30485	−3.45	−0.5379
	16	0.0433	0.076	0.012	86 36.1	5 46.4	335 48.9	22 23.3	0.98433	1.30437	3.58	0.5541
	17	0.0461	0.085	0.013	86 10.5	5 44.7	334 51.0	22 19.4	0.98243	1.30386	3.71	0.5695
	18	0.0488	0.094	0.012	85 50.0	5 43.3	333 52.9	22 15.5	0.98047	1.30334	3.84	0.5842
	19	0.0516	0.103	0.009	85 33.8	5 42.3	332 54.8	22 11.7	0.97870	1.30280	3.97	0.5984
h (8.0)	20	0.0543	+0.112	+0.006	85 21.0	5 41.5	331 56.5	22 7.7	0.97729	1.30226	−4.09	−0.6120
	21	0.0570	0.121	+0.001	85 10.3	5 40.7	330 58.1	22 3.9	0.97630	1.30170	4.22	0.6250
	22	0.0598	0.130	−0.004	84 59.9	5 40.0	329 59.5	22 0.0	0.97575	1.30113	4.34	0.6375
	23	0.0625	0.139	0.008	84 48.8	5 39.3	329 0.8	21 56.1	0.97560	1.30055	4.46	0.6495
	24	0.0652	0.147	0.011	84 36.0	5 38.4	328 2.0	21 52.1	0.97582	1.29995	4.58	0.6610
	25	0.0680	+0.156	−0.013	84 19.8	5 37.3	327 3.0	21 48.2	0.97633	1.29935	−4.70	−0.6721
	26	0.0707	0.164	0.012	83 59.8	5 36.0	326 3.8	21 44.3	0.97695	1.29875	4.82	0.6828
	27	0.0734	0.173	0.010	83 35.0	5 34.3	325 4.5	21 40.3	0.97747	1.29812	4.93	0.6931
	28	0.0762	0.181	0.006	83 6.1	5 32.4	324 5.1	21 36.3	0.97766	1.29749	5.05	0.7031
	29	0.0789	0.189	−0.001	82 34.6	5 30.3	323 5.5	21 32.4	0.97727	1.29686	5.16	0.7126
	30	0.0817	+0.197	+0.004	82 2.8	5 28.2	322 5.8	21 28.4	0.97619	1.29622	−5.27	−0.7219
	31	0.0844	0.205	0.007	81 32.6	5 26.2	321 6.0	21 24.4	0.97448	1.29558	5.38	0.7308
Feb.	1	0.0871	0.213	0.009	81 7.3	5 24.5	320 5.8	21 20.4	0.97231	1.29492	5.49	0.7394
	2	0.0899	0.221	0.008	80 48.0	5 23.2	319 5.6	21 16.4	0.97006	1.29426	5.59	0.7476
	3	0.0926	0.228	+0.005	80 34.8	5 22.3	318 5.2	21 12.3	0.96812	1.29361	5.70	0.7556
h	4	0.0954	+0.236	0.000	80 25.9	5 21.7	317 4.6	21 8.3	0.96690	1.29295	−5.80	−0.7634
(9.0)	5	0.0981	0.243	−0.005	80 18.5	5 21.2	316 3.9	21 4.3	0.96655	1.29228	5.90	0.7708
	6	0.1008	0.251	0.008	80 9.0	5 20.6	315 2.9	21 0.2	0.96704	1.29163	6.00	0.7780
	7	0.1036	0.258	0.009	79 54.8	5 19.7	314 1.9	20 56.1	0.96809	1.29097	6.09	0.7849
	8	0.1063	0.265	0.007	79 34.5	5 18.3	313 0.6	20 52.0	0.96928	1.29030	6.19	0.7916
	9	0.1090	+0.272	−0.003	79 9.0	5 16.6	311 59.2	20 47.9	0.97017	1.28964	−6.28	−0.7981
	10	0.1118	0.279	+0.002	78 39.7	5 14.7	310 57.6	20 43.8	0.97046	1.28899	6.37	0.8043
	11	0.1145	0.286	0.007	78 9.7	5 12.6	309 55.9	20 39.7	0.97002	1.28833	6.46	0.8103
	12	0.1173	0.293	0.011	77 41.6	5 10.8	308 54.0	20 35.6	0.96888	1.28768	6.55	0.8160
	13	0.1200	0.299	0.013	77 17.4	5 9.2	307 51.9	20 31.5	0.96724	1.28704	6.63	0.8216
	14	0.1227	+0.306	+0.013	76 58.5	5 7.9	306 49.6	20 27.3	0.96535	1.28641	−6.71	−0.8270
	15	0.1255	+0.313	+0.011	76 44.6	5 7.0	305 47.2	20 23.1	0.96353	1.28577	−6.79	−0.8322

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Feb.	15	0.1255	+0.313	+0.011	76 44.6	5 7.0	305 47.2	20 23.1	0.96353	1.28577	−6.79	−0.8322
	16	0.1282	0.319	0.007	76 35.0	5 6.3	304 44.7	20 19.0	0.96198	1.28515	6.87	0.8371
	17	0.1310	0.325	+0.002	76 28.3	5 5.9	303 42.0	20 14.8	0.96081	1.28454	6.95	0.8419
	18	0.1337	0.331	−0.002	76 23.0	5 5.5	302 39.1	20 10.6	0.96012	1.28393	7.02	0.8465
	19	0.1364	0.338	0.007	76 18.2	5 5.2	301 36.1	20 6.4	0.95993	1.28334	7.09	0.8509
h (10.0)	20	0.1392	+0.344	−0.010	76 12.3	5 4.8	300 33.0	20 2.2	0.96016	1.28275	−7.16	−0.8551
	21	0.1419	0.350	0.012	76 3.8	5 4.3	299 29.7	19 58.0	0.96080	1.28218	7.23	0.8592
	22	0.1446	0.355	0.013	75 52.2	5 3.5	298 26.3	19 53.8	0.96166	1.28162	7.29	0.8630
	23	0.1474	0.361	0.011	75 35.9	5 2.4	297 22.8	19 49.5	0.96262	1.28108	7.36	0.8667
	24	0.1501	0.367	0.008	75 14.8	5 1.0	296 19.2	19 45.3	0.96342	1.28055	7.42	0.8703
	25	0.1528	+0.372	−0.004	74 50.1	4 59.3	295 15.4	19 41.0	0.96379	1.28003	−7.48	−0.8736
	26	0.1556	0.378	+0.001	74 23.4	4 57.6	294 11.5	19 36.8	0.96354	1.27954	7.53	0.8769
	27	0.1583	0.384	0.005	73 56.5	4 55.8	293 7.5	19 32.5	0.96260	1.27905	7.58	0.8799
	28	0.1611	0.389	0.008	73 32.9	4 54.2	292 3.4	19 28.2	0.96107	1.27859	7.64	0.8828
Mar.	1	0.1638	0.394	0.008	73 14.8	4 53.0	290 59.2	19 24.0	0.95928	1.27814	7.68	0.8856
	2	0.1665	+0.400	+0.005	73 3.2	4 52.2	289 54.9	19 19.7	0.95756	1.27771	−7.73	−0.8882
	3	0.1693	0.405	+0.001	72 57.2	4 51.8	288 50.5	19 15.4	0.95638	1.27730	7.77	0.8906
	4	0.1720	0.410	−0.003	72 54.5	4 51.6	287 46.1	19 11.1	0.95604	1.27690	7.82	0.8929
	5	0.1748	0.415	0.007	72 52.0	4 51.5	286 41.5	19 6.8	0.95667	1.27654	7.85	0.8951
	6	0.1775	0.420	0.008	72 46.2	4 51.1	285 36.8	19 2.5	0.95802	1.27619	7.89	0.8971
h (11.0)	7	0.1802	+0.425	−0.007	72 34.7	4 50.3	284 32.1	18 58.1	0.95982	1.27585	−7.92	−0.8990
	8	0.1830	0.430	−0.004	72 17.1	4 49.1	283 27.4	18 53.8	0.96162	1.27555	7.96	0.9007
	9	0.1857	0.435	+0.001	71 54.9	4 47.7	282 22.5	18 49.5	0.96292	1.27527	7.99	0.9023
	10	0.1884	0.440	0.007	71 30.2	4 46.0	281 17.6	18 45.2	0.96357	1.27500	8.01	0.9038
	11	0.1912	0.445	0.011	71 6.1	4 44.4	280 12.7	18 40.8	0.96343	1.27476	8.04	0.9051
	12	0.1939	+0.450	+0.014	70 44.7	4 43.0	279 7.8	18 36.5	0.96268	1.27455	−8.06	−0.9063
	13	0.1967	0.455	0.014	70 28.3	4 41.9	278 2.8	18 32.2	0.96153	1.27436	8.08	0.9073
	14	0.1994	0.460	0.012	70 17.0	4 41.1	276 57.7	18 27.8	0.96028	1.27418	8.10	0.9082
	15	0.2021	0.464	0.009	70 10.4	4 40.7	275 52.7	18 23.5	0.95923	1.27404	8.11	0.9090
	16	0.2049	0.469	+0.004	70 7.5	4 40.5	274 47.7	18 19.2	0.95850	1.27393	8.12	0.9096
	17	0.2076	+0.474	0.000	70 6.7	4 40.4	273 42.6	18 14.8	0.95826	1.27383	−8.13	−0.9102
	18	0.2104	0.479	−0.005	70 7.0	4 40.5	272 37.6	18 10.5	0.95849	1.27376	8.14	0.9106
	19	0.2131	0.483	0.009	70 6.9	4 40.5	271 32.6	18 6.2	0.95923	1.27371	8.14	0.9108
	20	0.2158	0.488	0.011	70 4.6	4 40.3	270 27.6	18 1.8	0.96042	1.27368	8.15	0.9109
	21	0.2186	0.493	0.013	69 59.4	4 40.0	269 22.7	17 57.5	0.96196	1.27369	8.15	0.9109
h (12.0)	22	0.2213	+0.498	−0.012	69 50.1	4 39.3	268 17.8	17 53.2	0.96370	1.27371	−8.14	−0.9108
	23	0.2240	0.502	0.009	69 36.7	4 38.4	267 13.0	17 48.9	0.96539	1.27376	8.14	0.9105
	24	0.2268	0.507	0.006	69 18.7	4 37.2	266 8.2	17 44.5	0.96680	1.27384	8.13	0.9101
	25	0.2295	0.512	−0.001	68 57.2	4 35.8	265 3.4	17 40.2	0.96773	1.27394	8.12	0.9096
	26	0.2322	0.516	+0.003	68 34.5	4 34.3	263 58.8	17 35.9	0.96800	1.27406	8.11	0.9089
	27	0.2350	+0.521	+0.006	68 13.6	4 32.9	262 54.2	17 31.6	0.96763	1.27421	−8.09	−0.9081
	28	0.2377	0.526	0.007	67 56.7	4 31.8	261 49.8	17 27.3	0.96682	1.27438	8.08	0.9072
	29	0.2405	0.531	0.005	67 45.4	4 31.0	260 45.4	17 23.0	0.96592	1.27457	8.06	0.9062
	30	0.2432	0.536	+0.002	67 40.4	4 30.7	259 41.2	17 18.7	0.96532	1.27479	8.03	0.9050
	31	0.2459	0.540	−0.003	67 39.4	4 30.6	258 37.0	17 14.5	0.96548	1.27503	8.01	0.9036
Apr.	1	0.2487	+0.545	−0.007	67 40.0	4 30.7	257 32.9	17 10.2	0.96654	1.27528	−7.98	−0.9022
	2	0.2514	+0.550	−0.009	67 38.9	4 30.6	256 29.0	17 5.9	0.96848	1.27557	−7.95	−0.9006

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Apr.	1	0.2487	+0.545	- 0.007	67 40.0	4 30.7	257 32.9	17 10.2	0.96654	1.27528	−7.98	−0.9022
	2	0.2514	0.550	0.009	67 38.9	4 30.6	256 29.0	17 5.9	0.96848	1.27557	7.95	0.9006
	3	0.2542	0.555	0.008	67 33.0	4 30.2	255 25.2	17 1.7	0.97102	1.27587	7.92	0.8989
	4	0.2569	0.560	−0.005	67 21.0	4 29.4	254 21.5	16 57.4	0.97376	1.27620	7.89	0.8971
	5	0.2596	0.565	0.000	67 3.5	4 28.2	253 17.9	16 53.1	0.97624	1.27653	7.85	0.8951
h	6	0.2624	+0.571	+0.005	66 42.1	4 26.8	252 14.5	16 49.0	0.97814	1.27690	−7.82	−0.8930
(13.0)	7	0.2651	0.576	0.010	66 19.9	4 25.3	251 11.2	16 44.7	0.97930	1.27728	7.77	0.8907
	8	0.2678	0.581	0.014	65 59.3	4 24.0	250 8.0	16 40.5	0.97977	1.27769	7.73	0.8883
	9	0.2706	0.586	0.015	65 42.3	4 22.8	249 5.1	16 36.3	0.97972	1.27811	7.69	0.8858
	10	0.2733	0.592	0.014	65 30.5	4 22.0	248 2.3	16 32.2	0.97941	1.27855	7.64	0.8831
	11	0.2761	+0.597	+0.011	65 23.3	4 21.5	246 59.6	16 28.0	0.97916	1.27899	−7.59	−0.8802
	12	0.2788	0.603	0.006	65 20.3	4 21.4	245 57.1	16 23.8	0.97915	1.27946	7.54	0.8773
	13	0.2815	0.608	+0.002	65 19.9	4 21.3	244 54.8	16 19.7	0.97955	1.27995	7.48	0.8742
	14	0.2843	0.614	−0.003	65 20.7	4 21.4	243 52.6	16 15.5	0.98041	1.28045	7.43	0.8709
	15	0.2870	0.619	0.007	65 21.5	4 21.4	242 50.6	16 11.4	0.98173	1.28097	7.37	0.8675
	16	0.2898	+0.625	−0.010	65 20.9	4 21.4	241 48.8	16 7.3	0.98349	1.28149	−7.31	−0.8639
	17	0.2925	0.631	0.012	65 17.8	4 21.2	240 47.2	16 3.1	0.98564	1.28203	7.25	0.8602
	18	0.2952	0.637	0.012	65 11.5	4 20.8	239 45.7	15 59.0	0.98803	1.28259	7.18	0.8563
	19	0.2980	0.643	0.010	65 0.7	4 20.0	238 44.5	15 55.0	0.99051	1.28315	7.12	0.8523
	20	0.3007	0.649	0.006	64 45.5	4 19.0	237 43.5	15 50.9	0.99284	1.28371	7.05	0.8481
h	21	0.3034	+0.655	−0.002	64 26.7	4 17.8	236 42.6	15 46.8	0.99477	1.28430	−6.98	−0.8437
(14.0)	22	0.3062	0.661	+0.002	64 5.7	4 16.4	235 42.0	15 42.8	0.99614	1.28489	6.91	0.8392
	23	0.3089	0.667	0.005	63 44.8	4 15.0	234 41.6	15 38.8	0.99687	1.28550	6.83	0.8345
	24	0.3116	0.674	0.006	63 26.7	4 13.8	233 41.3	15 34.8	0.99706	1.28609	6.75	0.8296
	25	0.3144	0.680	0.005	63 12.6	4 12.8	232 41.3	15 30.8	0.99699	1.28670	6.68	0.8245
	26	0.3171	+0.687	+0.002	63 4.5	4 12.3	231 41.5	15 26.8	0.99701	1.28731	−6.60	−0.8193
	27	0.3199	0.693	−0.002	63 1.1	4 12.1	230 41.9	15 22.8	0.99754	1.28793	6.51	0.8138
	28	0.3226	0.700	0.007	63 0.5	4 12.0	229 42.4	15 18.8	0.99884	1.28856	6.43	0.8082
	29	0.3253	0.707	0.010	62 59.3	4 12.0	228 43.2	15 14.9	1.00102	1.28920	6.34	0.8024
	30	0.3281	0.714	0.010	62 54.6	4 11.6	227 44.2	15 11.0	1.00390	1.28983	6.26	0.7963
May	1	0.3308	+0.721	−0.008	62 44.5	4 11.0	226 45.4	15 7.0	1.00713	1.29046	−6.17	−0.7901
	2	0.3336	0.728	−0.003	62 28.7	4 9.9	225 46.9	15 3.1	1.01031	1.29108	6.08	0.7837
	3	0.3363	0.735	+0.003	62 8.1	4 8.5	224 48.4	14 59.2	1.01310	1.29171	5.98	0.7770
	4	0.3390	0.742	0.009	61 45.2	4 7.0	223 50.2	14 55.3	1.01523	1.29235	5.89	0.7701
	5	0.3418	0.749	0.013	61 22.8	4 5.5	222 52.2	14 51.5	1.01661	1.29298	5.79	0.7630
h	6	0.3445	+0.757	+0.015	61 2.7	4 4.2	221 54.5	14 47.6	1.01743	1.29362	−5.70	−0.7556
(15.0)	7	0.3472	0.764	0.015	60 46.7	4 3.1	220 56.8	14 43.8	1.01786	1.29425	5.60	0.7480
	8	0.3500	0.772	0.012	60 35.6	4 2.4	219 59.3	14 40.0	1.01817	1.29487	5.50	0.7401
	9	0.3527	0.779	0.008	60 28.2	4 1.9	219 2.0	14 36.1	1.01859	1.29549	5.39	0.7319
	10	0.3555	0.787	+0.004	60 24.0	4 1.6	218 4.9	14 32.3	1.01929	1.29610	5.29	0.7235
	11	0.3582	+0.795	−0.001	60 21.3	4 1.4	217 8.0	14 28.5	1.02036	1.29671	−5.19	−0.7148
	12	0.3609	0.803	0.005	60 19.2	4 1.3	216 11.3	14 24.8	1.02189	1.29732	5.08	0.7058
	13	0.3637	0.811	0.009	60 16.7	4 1.1	215 14.8	14 21.0	1.02380	1.29792	4.97	0.6964
	14	0.3664	0.819	0.011	60 12.1	4 0.8	214 18.5	14 17.2	1.02607	1.29851	4.86	0.6868
	15	0.3692	0.827	0.011	60 5.0	4 0.3	213 22.3	14 13.5	1.02859	1.29910	4.75	0.6768
	16	0.3719	+0.835	−0.010	59 54.0	3 59.6	212 26.3	14 9.8	1.03129	1.29967	−4.64	−0.6664
	17	0.3746	+0.844	−0.007	59 38.9	3 58.6	211 30.4	14 6.0	1.03393	1.30023	−4.53	−0.6557

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
May	17	0.3746	+0.844	−0.007	59 38.9	3 58.6	211 30.4	14 6.0	1.03393	1.30023	−4.53	−0.6557
	18	0.3774	0.852	−0.003	59 20.2	3 57.4	210 34.8	14 2.3	1.03632	1.30080	4.41	0.6444
	19	0.3801	0.861	+0.001	58 58.6	3 55.9	209 39.3	13 58.6	1.03825	1.30134	4.30	0.6330
	20	0.3828	0.869	0.005	58 36.1	3 54.4	208 43.9	13 54.9	1.03959	1.30188	4.18	0.6210
h	21	0.3856	0.878	0.007	58 14.9	3 53.0	207 48.7	13 51.3	1.04037	1.30240	4.06	0.6086
(16.0)	22	0.3883	+0.886	+0.006	57 56.9	3 51.8	206 53.7	13 47.6	1.04073	1.30291	−3.94	−0.5956
	23	0.3910	0.895	+0.003	57 44.0	3 50.9	205 58.8	13 43.9	1.04097	1.30342	3.82	0.5822
	24	0.3938	0.904	−0.001	57 36.0	3 50.4	205 4.1	13 40.3	1.04145	1.30391	3.70	0.5682
	25	0.3965	0.913	0.006	57 31.4	3 50.1	204 9.6	13 36.6	1.04252	1.30438	3.58	0.5536
	26	0.3993	0.922	0.010	57 28.0	3 49.7	203 15.1	13 33.0	1.04434	1.30484	3.46	0.5384
	27	0.4020	+0.931	−0.011	57 22.9	3 49.5	202 20.8	13 29.4	1.04689	1.30529	−3.33	−0.5226
	28	0.4047	0.940	0.010	57 13.5	3 48.9	201 26.7	13 25.8	1.04993	1.30573	3.21	0.5060
	29	0.4075	0.949	−0.006	56 58.9	3 47.9	200 32.6	13 22.2	1.05312	1.30614	3.08	0.4886
	30	0.4102	0.958	0.000	56 39.1	3 46.6	199 38.7	13 18.6	1.05609	1.30654	2.95	0.4704
	31	0.4130	0.968	+0.006	56 15.7	3 45.1	198 44.9	13 15.0	1.05857	1.30694	2.83	0.4512
June	1	0.4157	+0.977	+0.011	55 51.3	3 43.4	197 51.2	13 11.4	1.06040	1.30732	−2.70	−0.4311
	2	0.4184	0.986	0.014	55 28.0	3 41.9	196 57.6	13 7.8	1.06160	1.30767	2.57	0.4099
	3	0.4212	0.996	0.015	55 7.8	3 40.5	196 4.1	13 4.3	1.06231	1.30800	2.44	0.3874
	4	0.4239	1.005	0.013	54 51 5	3 39.4	195 10.7	13 0.7	1.06276	1.30833	2.31	0.3636
h	5	0.4266	1.015	0.010	54 39.3	3 38.6	194 17.4	12 57.2	1.06319	1.30864	2.18	0.3383
(17.0)	6	0.4294	+1.024	+0.005	54 30.5	3 38.1	193 24.2	12 53.6	1.06375	1.30894	−2.05	−0.3113
	7	0.4321	1.034	+0.001	54 23.8	3 37.6	192 31.0	12 50.1	1.06466	1.30921	1.92	0.2824
	8	0.4349	1.044	−0.004	54 18.5	3 37.2	191 37.9	12 46.5	1.06583	1.30946	1.78	0.2513
	9	0.4376	1.053	0.008	54 13.4	3 36.9	190 44.9	12 43.0	1.06736	1.30970	1.65	0.2176
	10	0.4403	1.063	0.010	54 6.6	3 36.4	189 52.0	12 39.5	1.06930	1.30992	1.52	0.1811
	11	0.4431	+1.073	−0.011	53 58.4	3 36.0	188 59.1	12 35.9	1.07146	1.31012	−1.38	−0.1410
	12	0.4458	1.083	0.010	53 47.3	3 35.1	188 6.3	12 32.4	1.07382	1.31031	1.25	0.0967
	13	0.4486	1.092	0.007	53 32.5	3 34.2	187 13.5	12 28.9	1.07626	1.31047	1.12	0.0473
	14	0.4513	1.102	−0.004	53 14.3	3 33.0	186 20.8	12 25.4	1.07855	1.31062	0.98	9.9914
	15	0.4540	1.112	+0.001	52 52.9	3 31.5	185 28.1	12 21.9	1.08053	1.31076	0.84	9.9270
	16	0.4568	+1.122	+0.005	52 29.4	3 30.0	184 35.4	12 18.4	1.08203	1.31085	−0.71	−9.8514
	17	0.4595	1.132	0.007	52 6.1	3 28.4	183 42.8	12 14.9	1.08296	1.31094	0.58	9.7596
	18	0.4622	1.142	0.007	51 45.0	3 27.0	182 50.2	12 11.3	1.08342	1.31101	0.44	9.6429
	19	0.4650	1.152	0.005	51 27.9	3 25.9	181 57.7	12 7.8	1.08359	1.31107	0.30	9.4827
	20	0.4677	1.161	+0.001	51 15.6	3 25.0	181 5.1	12 4.3	1.08375	1.31110	0.17	9.2259
h	21	0.4704	+1.171	−0.004	51 7.5	3 24.5	180 12.6	12 0.8	1.08428	1.31111	−0.03	−8.5135
(18.0)	22	0.4732	1.181	0.008	51 1.3	3 24.1	179 20.1	11 57.3	1.08548	1.31111	+0.10	+9.0128
	23	0.4759	1.191	0.011	50 55.6	3 23.7	178 27.6	11 53.8	1.08732	1.31109	0.24	9.3776
	24	0.4787	1.201	0.011	50 47.7	3 23.2	177 35.1	11 50.3	1.08969	1.31105	0.37	9.5729
	25	0.4814	1.211	0.008	50 35.4	3 22.4	176 42.6	11 46.8	1.09237	1.31098	0.51	9.7070
	26	0.4841	+1.221	−0.003	50 18.3	3 21.2	175 50.1	11 43.3	1.09505	1.31091	+0.64	+9.8092
	27	0.4869	1.231	+0.003	49 57.5	3 19.5	174 57.6	11 39.8	1.09735	1.31080	0.78	9.8918
	28	0.4896	1.241	0.008	49 33.6	3 18.2	174 5.0	11 36.3	1.09917	1.31068	0.91	9.9611
	29	0.4924	1.250	0.012	49 9.4	3 16.6	173 12.5	11 32.8	1.10041	1.31055	1.05	0.0207
	30	0.4951	1.260	0.014	48 46.9	3 15.1	172 19.9	11 29.3	1.10112	1.31040	1.18	0.0730
July	1	0.4978	+1.270	+0.014	48 27.7	3 13.8	171 27.2	11 25.8	1.10146	1.31022	+1.32	+0.1195
	2	0.5006	+1.279	+0.011	48 12.2	3 12.8	170 34.5	11 22.3	1.10167	1.31002	+1.45	+0.1615

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
July	1	0.4978	+1.270	+0.014	48 27.7	3 13.8	171 27.2	11 25.8	1.10146	1.31022	+1.32	+0.1195
	2	0.5006	1.279	0.011	48 12.2	3 12.8	170 34.5	11 22.3	1.10167	1.31002	1.45	0.1615
	3	0.5033	1.289	0.007	48 0.6	3 12.0	169 41.7	11 18.8	1.10188	1.30982	1.58	0.1996
	4	0.5060	1.299	+0.002	47 51.5	3 11.4	168 48.9	11 15.3	1.10228	1.30959	1.72	0.2346
	5	0.5088	1.308	−0.003	47 44.3	3 11.0	167 56.0	11 11.7	1.10294	1.30934	1.85	0.2668
h	6	0.5115	+1.318	−0.006	47 37.7	3 10.5	167 3.1	11 8.2	1.10392	1.30908	+1.98	+0.2967
(19.0)	7	0.5143	1.328	0.009	47 31.1	3 10.1	166 10.1	11 4.7	1.10520	1.30880	2.11	0.3246
	8	0.5170	1.337	0.011	47 23.2	3 9.5	165 17.0	11 1.1	1.10678	1.30850	2.24	0.3506
	9	0.5197	1.347	0.010	47 13.2	3 8.9	164 23.9	10 57.6	1.10861	1.30818	2.37	0.3751
	10	0.5225	1.356	0.008	47 0.4	3 8.0	163 30.6	10 54.0	1.11055	1.30785	2.50	0.3982
	11	0.5252	+1.366	−0.005	46 44.2	3 6.9	162 37.2	10 50.5	1.11251	1.30750	+2.63	+0.4200
	12	0.5280	1.375	−0.001	46 24.7	3 5.6	161 43.8	10 46.9	1.11427	1.30714	2.76	0.4406
	13	0.5307	1.384	+0.004	46 2.8	3 4.2	160 50.3	10 43.4	1.11565	1.30676	2.88	0.4602
	14	0.5334	1.393	0.007	45 40.0	3 2.7	159 56.7	10 39.8	1.11654	1.30636	3.01	0.4788
	15	0.5362	1.402	0.008	45 18.0	3 1.2	159 2.9	10 36.2	1.11696	1.30595	3.14	0.4966
	16	0.5389	+1.412	+0.007	44 59.0	2 59.9	158 9.1	10 32.6	1.11697	1.30553	+3.26	+0.5135
	17	0.5416	1.421	+0.004	44 44.4	2 59.0	157 15.1	10 29.0	1.11680	1.30509	3.39	0.5297
	18	0.5444	1.430	−0.001	44 34.4	2 58.3	156 21.1	10 25.4	1.11681	1.30464	3.51	0.5452
	19	0.5471	1.439	0.006	44 27.9	2 57.9	155 26.9	10 21.8	1.11722	1.30418	3.63	0.5600
	20	0.5498	1.447	0.010	44 23.4	2 57.6	154 32.6	10 18.2	1.11823	1.30370	3.75	0.5742
h	21	0.5526	+1.456	−0.011	44 17.7	2 57.2	153 38.2	10 14.5	1.11982	1.30321	+3.87	+0.5879
(20.0)	22	0.5553	1.465	0.009	44 9.2	2 56.6	152 43.6	10 10.9	1.12187	1.30271	3.99	0.6010
	23	0.5581	1.473	−0.005	43 56.2	2 55.7	151 48.9	10 7.3	1.12406	1.30220	4.11	0.6137
	24	0.5608	1.482	0.000	43 38.8	2 54.6	150 54.1	10 3.6	1.12616	1.30166	4.22	0.6258
	25	0.5635	1.491	+0.006	43 18.0	2 53.2	149 59.1	9 59.9	1.12784	1.30112	4.34	0.6375
	26	0.5663	+1.499	+0.011	42 56.0	2 51.7	149 4.0	9 56.3	1.12896	1.30058	+4.46	+0.6488
	27	0.5690	1.507	0.013	42 34.4	2 50.3	148 8.7	9 52.6	1.12956	1.30003	4.57	0.6597
	28	0.5718	1.515	0.013	42 15.4	2 49.0	147 13.3	9 48.9	1.12975	1.29947	4.68	0.6702
	29	0.5745	1.524	0.011	41 59.5	2 48.0	146 17.8	9 45.2	1.12966	1.29889	4.79	0.6804
	30	0.5772	1.532	0.008	41 47.1	2 47.1	145 22.0	9 41.5	1.12951	1.29830	4.90	0.6902
	31	0.5800	+1.540	+0.003	41 38.1	2 46.5	144 26.1	9 37.7	1.12945	1.29771	+5.01	+0.6996
Aug.	1	0.5827	1.548	−0.002	41 31.3	2 46.1	143 30.0	9 34.0	1.12962	1.29712	5.11	0.7088
	2	0.5854	1.556	0.006	41 25.8	2 45.7	142 33.7	9 30.2	1.13005	1.29652	5.22	0.7176
	3	0.5882	1.563	0.009	41 20.8	2 45.4	141 37.3	9 26.5	1.13077	1.29591	5.32	0.7262
	4	0.5909	1.571	0.011	41 15.4	2 45.0	140 40.7	9 22.7	1.13176	1.29530	5.42	0.7344
h	5	0.5937	+1.579	−0.011	41 8.4	2 44.6	139 43.9	9 18.9	1.13303	1.29469	+5.53	+0.7424
(21.0)	6	0.5964	1.586	0.010	40 59.4	2 44.0	138 47.0	9 15.1	1.13450	1.29406	5.62	0.7502
	7	0.5991	1.594	0.007	40 47.3	2 43.2	137 49.8	9 11.3	1.13607	1.29343	5.72	0.7576
	8	0.6019	1.601	−0.002	40 32.2	2 42.1	136 52.4	9 7.5	1.13754	1.29281	5.82	0.7649
	9	0.6046	1.608	+0.002	40 14.3	2 41.0	135 54.9	9 3.7	1.13879	1.29219	5.91	0.7719
	10	0.6073	+1.615	+0.006	39 54.7	2 39.6	134 57.2	8 59.8	1.13964	1.29156	+6.01	+0.7786
	11	0.6101	1.622	0.008	39 34.8	2 38.3	133 59.3	8 56.0	1.14001	1.29093	6.10	0.7852
	12	0.6128	1.629	0.008	39 16.7	2 37.1	133 1.2	8 52.1	1.13997	1.29030	6.19	0.7915
	13	0.6156	1.636	0.005	39 2.2	2 36.1	132 2.9	8 48.2	1.13965	1.28968	6.28	0.7977
	14	0.6183	1.643	+0.001	38 52.4	2 35.5	131 4.5	8 44.3	1.13931	1.28906	6.36	0.8036
	15	0.6210	+1.650	−0.004	38 46.7	2 35.1	130 5.8	8 40.4	1.13924	1.28844	+6.45	+0.8093
	16	0.6238	+1.657	−0.008	38 44.0	2 34.9	129 7.0	8 36.5	1.13963	1.28783	+6.53	+0.8149

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6238	+1.657	−0.008	38 44.0	2 34.9	129 7.0	8 36.5	1.13963	1.28783	+6.53	+0.8149
	17	0.6265	1.663	0.010	38 42.0	2 34.8	128 8.0	8 32.5	1.14063	1.28721	6.61	0.8202
	18	0.6292	1.670	0.009	38 38.2	2 34.5	127 8.7	8 28.6	1.14213	1.28659	6.69	0.8254
	19	0.6320	1.676	0.006	38 31.1	2 34.1	126 9.3	8 24.6	1.14394	1.28599	6.77	0.8303
	20	0.6347	1.682	−0.001	38 19.7	2 33.3	125 9.8	8 20.7	1.14577	1.28541	6.84	0.8351
h	21	0.6375	+1.689	+0.005	38 4.4	2 32.3	124 10.0	8 16.7	1.14735	1.28481	+6.92	+0.8398
(22.0)	22	0.6402	1.696	0.010	37 46.8	2 31.1	123 10.1	8 12.7	1.14848	1.28423	6.99	0.8442
	23	0.6429	1.701	0.013	37 28.9	2 29.9	122 10.0	8 8.7	1.14909	1.28365	7.06	0.8485
	24	0.6457	1.707	0.014	37 12.4	2 28.8	121 9.7	8 4.6	1.14920	1.28309	7.12	0.8527
	25	0.6484	1.713	0.012	36 58.8	2 27.9	120 9.2	8 0.6	1.14901	1.28253	7.19	0.8566
	26	0.6512	+1.719	+0.009	36 48.4	2 27.2	119 8.6	7 56.6	1.14867	1.28199	+7.25	+0.8605
	27	0.6539	1.725	+0.004	36 41.4	2 26.8	118 7.7	7 52.5	1.14834	1.28146	7.31	0.8641
	28	0.6566	1.730	0.000	36 37.1	2 26.5	117 6.7	7 48.4	1.14822	1.28094	7.37	0.8676
	29	0.6594	1.736	−0.005	36 34.5	2 26.3	116 5.5	7 44.4	1.14831	1.28044	7.43	0.8710
	30	0.6621	1.742	0.008	36 33.1	2 26.2	115 4.1	7 40.3	1.14869	1.27995	7.49	0.8742
	31	0.6648	+1.747	−0.010	36 31.6	2 26.1	114 2.6	7 36.2	1.14937	1.27947	+7.54	+0.8773
Sept.	1	0.6676	1.753	0.011	36 29.3	2 26.0	113 0.9	7 32.1	1.15033	1.27900	7.59	0.8802
	2	0.6703	1.758	0.011	36 25.4	2 25.7	111 59.0	7 27.9	1.15152	1.27855	7.64	0.8830
	3	0.6730	1.763	0.008	36 19.0	2 25.3	110 57.0	7 23.8	1.15288	1.27812	7.68	0.8857
	4	0.6758	1.769	−0.004	36 9.7	2 24.6	109 54.8	7 19.7	1.15421	1.27770	7.73	0.8882
h	5	0.6785	+1.774	0.000	35 57.6	2 23.8	108 52.5	7 15.5	1.15545	1.27731	+7.77	+0.8906
(23.0)	6	0.6813	1.779	+0.004	35 43.2	2 22.9	107 50.0	7 11.3	1.15637	1.27694	7.81	0.8928
	7	0.6840	1.785	0.007	35 27.7	2 21.8	106 47.4	7 7.2	1.15690	1.27657	7.85	0.8949
	8	0.6867	1.790	0.007	35 13.1	2 20.9	105 44.7	7 3.0	1.15700	1.27623	7.89	0.8969
	9	0.6895	1.795	0.006	35 1.2	2 20.1	104 41.8	6 58.8	1.15677	1.27590	7.92	0.8987
	10	0.6922	+1.800	+0.002	34 53.2	2 19.5	103 38.8	6 54.6	1.15642	1.27560	+7.95	+0.9004
	11	0.6950	1.805	−0.002	34 49.7	2 19.3	102 35.6	6 50.4	1.15623	1.27533	7.98	0.9020
	12	0.6977	1.810	0.007	34 49.7	2 19.3	101 32.4	6 46.2	1.15641	1.27507	8.01	0.9034
	13	0.7004	1.815	0.009	34 51.7	2 19.4	100 29.1	6 41.9	1.15714	1.27483	8.03	0.9048
	14	0.7032	1.819	0.009	34 53.2	2 19.5	99 25.7	6 37.7	1.15843	1.27460	8.05	0.9060
	15	0.7059	+1.824	−0.007	34 52.0	2 19.5	98 22.1	6 33.5	1.16011	1.27441	+8.07	+0.9070
	16	0.7086	1.829	−0.002	34 46.9	2 19.1	97 18.5	6 29.2	1.16196	1.27424	8.09	0.9080
	17	0.7114	1.834	+0.004	34 38.0	2 18.5	96 14.9	6 25.0	1.16370	1.27409	8.11	0.9088
	18	0.7141	1.839	0.009	34 26.0	2 17.7	95 11.1	6 20.7	1.16507	1.27396	8.12	0.9094
	19	0.7169	1.844	0.013	34 12.9	2 16.9	94 7.2	6 16.5	1.16597	1.27386	8.13	0.9100
h	20	0.7196	+1.848	+0.015	34 0.2	2 16.0	93 3.3	6 12.2	1.16636	1.27378	+8.14	+0.9104
(0.0)	21	0.7223	1.853	0.014	33 49.9	2 15.3	91 59.4	6 8.0	1.16637	1.27372	8.14	0.9107
	22	0.7251	1.858	0.011	33 42.5	2 14.8	90 55.5	6 3.7	1.16616	1.27370	8.14	0.9109
	23	0.7278	1.863	0.006	33 38.6	2 14.6	89 51.5	5 59.4	1.16593	1.27368	8.15	0.9109
	24	0.7306	1.867	+0.001	33 37.5	2 14.5	88 47.4	5 55.2	1.16582	1.27370	8.14	0.9108
	25	0.7333	+1.872	−0.003	33 38.5	2 14.6	87 43.3	5 50.9	1.16595	1.27373	+8.14	+0.9106
	26	0.7360	1.877	0.007	33 40.6	2 14.7	86 39.2	5 46.6	1.16636	1.27380	8.13	0.9103
	27	0.7388	1.882	0.010	33 43.3	2 14.9	85 35.1	5 42.3	1.16707	1.27389	8.13	0.9098
	28	0.7415	1.887	0.011	33 45.4	2 15.0	84 31.0	5 38.1	1.16806	1.27399	8.11	0.9092
	29	0.7442	1.891	0.011	33 46.3	2 15.1	83 26.9	5 33.8	1.16930	1.27412	8.10	0.9085
	30	0.7474	+1.896	−0.009	33 45.3	2 15.0	82 22.7	5 29.5	1.17075	1.27428	+8.08	+0.9077
Oct.	1	0.7497	+1.901	−0.006	33 41.4	2 14.7	81 18.5	5 25.2	1.17228	1.27447	+8.07	+0.9067

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7497	+1.901	−0.006	33 41.4	2 14.7	81 18.5	5 25.2	1.17228	1.27447	+8.07	+0.9067
	2	0.7524	1.906	−0.002	33 34.8	2 14.3	80 14.5	5 21.0	1.17374	1.27467	8.05	0.9056
	3	0.7552	1.911	+0.002	33 25.5	2 13.7	79 10.4	5 16.7	1.17499	1.27490	8.02	0.9044
	4	0.7579	1.916	0.005	33 14.7	2 13.0	78 6.3	5 12.4	1.17589	1.27515	8.00	0.9030
h	5	0.7607	1.921	0.006	33 4.0	2 12.3	77 2.3	5 8.2	1.17642	1.27542	7.97	0.9015
(1.0)	6	0.7634	+1.926	+0.005	32 54.8	2 11.7	75 58.3	5 3.9	1.17660	1.27571	+7.94	+0.8998
	7	0.7661	1.931	+0.002	32 49.2	2 11.3	74 54.4	4 59.6	1.17657	1.27603	7.91	0.8980
	8	0.7689	1.936	−0.002	32 47.4	2 11.2	73 50.5	4 55.4	1.17661	1.27636	7.87	0.8961
	9	0.7716	1.941	0.006	32 49.5	2 11.3	72 46.7	4 51.1	1.17696	1.27672	7.84	0.8940
	10	0.7744	1.946	0.010	32 54.0	2 11.6	71 43.0	4 46.7	1.17778	1.27709	7.80	0.8918
	11	0.7771	+1.952	−0.010	32 58.8	2 11.9	70 39.3	4 42.6	1.17919	1.27749	+7.75	+0.8895
	12	0.7798	1.957	0.008	33 1.8	2 12.1	69 35.7	4 38.4	1.18107	1.27790	7.71	0.8870
	13	0.7826	1.963	−0.004	33 1.4	2 12.1	68 32.2	4 34.1	1.18321	1.27833	7.66	0.8844
	14	0.7853	1.968	+0.002	32 57.0	2 11.8	67 28.8	4 29.9	1.18537	1.27879	7.61	0.8816
	15	0.7880	1.973	0.008	32 49.2	2 11.3	66 25.6	4 25.7	1.18727	1.27925	7.56	0.8787
	16	0.7908	+1.979	+0.013	32 39.5	2 10.6	65 22.4	4 21.5	1.18870	1.27974	+7.51	+0.8756
	17	0.7935	1.985	0.015	32 29.5	2 10.0	64 19.3	4 17.3	1.18965	1.28024	7.45	0.8723
	18	0.7963	1.991	0.015	32 21.0	2 9.4	63 16.3	4 13.1	1.19020	1.28076	7.40	0.8689
	19	0.7990	1.996	0.013	32 15.2	2 9.0	62 13.5	4 8.9	1.19047	1.28128	7.33	0.8654
	20	0.8017	2.002	0.009	32 12.7	2 8.8	61 10.8	4 4.7	1.19064	1.28182	7.27	0.8616
h												
(2.0)	21	0.8045	+2.008	+0.004	32 12.9	2 8.9	60 8.2	4 0.5	1.19089	1.28238	+7.21	+0.8578
	22	0.8072	2.014	−0.001	32 15.3	2 9.0	59 5.8	3 56.4	1.19133	1.28295	7.14	0.8537
	23	0.8100	2.020	0.005	32 19.0	2 9.3	58 3.5	3 52.2	1.19205	1.28352	7.07	0.8495
	24	0.8127	2.026	0.008	32 23.4	2 9.6	57 1.3	3 48.1	1.19306	1.28411	7.00	0.8451
	25	0.8154	2.033	0.010	32 27.2	2 9.8	55 59.3	3 44.0	1.19436	1.28472	6.93	0.8405
	26	0.8182	+2.039	−0.010	32 30.1	2 10.0	54 57.3	3 39.8	1.19589	1.28533	+6.85	+0.8357
	27	0.8209	2.045	0.009	32 31.1	2 10.1	53 55.5	3 35.7	1.19763	1.28595	6.77	0.8308
	28	0.8236	2.052	0.006	32 29.7	2 10.0	52 53.9	3 31.6	1.19949	1.28657	6.69	0.8256
	29	0.8264	2.059	−0.003	32 25.9	2 9.7	51 52.4	3 27.5	1.20135	1.28720	6.61	0.8202
	30	0.8291	2.065	+0.001	32 19.1	2 9.3	50 51.1	3 23.4	1.20304	1.28784	6.53	0.8147
	31	0.8318	+2.072	+0.004	32 10.6	2 8.7	49 49.9	3 19.3	1.20447	1.28848	+6.44	+0.8089
Nov.	1	0.8346	2.079	0.006	32 1.3	2 8.1	48 48.8	3 15.3	1.20552	1.28913	6.35	0.8029
	2	0.8373	2.086	0.005	31 52.9	2 7.5	47 47.9	3 11.2	1.20621	1.28978	6.26	0.7967
	3	0.8401	2.093	+0.003	31 46.9	2 7.1	46 47.1	3 7.1	1.20669	1.29044	6.17	0.7903
	4	0.8428	2.100	−0.001	31 44.5	2 7.0	45 46.5	3 3.1	1.20711	1.29109	6.08	0.7836
h	5	0.8455	+2.108	−0.006	31 45.6	2 7.0	44 46.0	2 59.1	1.20774	1.29174	+5.98	+0.7767
(3.0)	6	0.8483	2.115	0.010	31 49.2	2 7.3	43 45.7	2 55.0	1.20879	1.29240	5.88	0.7696
	7	0.8510	2.123	0.012	31 54.0	2 7.6	42 45.6	2 51.0	1.21036	1.29306	5.78	0.7621
	8	0.8538	2.130	0.010	31 57.4	2 7.8	41 45.6	2 47.0	1.21243	1.29372	5.68	0.7544
	9	0.8565	2.138	0.007	31 58.1	2 7.9	40 45.7	2 43.0	1.21484	1.29437	5.58	0.7465
	10	0.8592	+2.146	−0.001	31 55.0	2 7.7	39 46.0	2 39.1	1.21737	1.29502	+5.47	+0.7382
	11	0.8620	2.154	+0.006	31 48.2	2 7.2	38 46.4	2 35.1	1.21972	1.29566	5.37	0.7296
	12	0.8647	2.162	0.011	31 38.9	2 6.6	37 47.0	2 31.1	1.22171	1.29630	5.26	0.7208
	13	0.8674	2.170	0.015	31 28.4	2 5.9	36 47.7	2 27.2	1.22327	1.29693	5.15	0.7116
	14	0.8702	2.178	0.016	31 19.1	2 5.3	35 48.6	2 23.2	1.22433	1.29756	5.04	0.7020
	15	0.8729	+2.186	+0.014	31 11.7	2 4.8	34 49.6	2 19.3	1.22510	1.29818	+4.92	+0.6922
	16	0.8757	+2.195	+0.011	31 7.0	2 4.5	33 50.8	2 15.4	1.22572	1.29879	+4.81	+0.6819

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8757	+2.195	+0.011	31 7.0	2 4.5	33 50.8	2 15.4	1.22572	1.29879	+4.81	+0.6819
	17	0.8784	2.203	0.006	31 5.1	2 4.3	32 52.1	2 11.5	1.22631	1.29940	4.69	0.6712
	18	0.8811	2.212	+0.001	31 5.5	2 4.4	31 53.6	2 7.6	1.22705	1.30000	4.57	0.6602
	19	0.8839	2.221	−0.004	31 7.2	2 4.5	30 55.2	2 3.7	1.22800	1.30059	4.45	0.6487
	20	0.8866	2.229	0.007	31 9.6	2 4.6	29 57.0	1 59.8	1.22923	1.30117	4.33	0.6367
h (4.0)	21	0.8894	+2.238	−0.009	31 11.8	2 4.8	28 58.9	1 55.9	1.23070	1.30173	+4.21	+0.6243
	22	0.8921	2.247	0.010	31 13.1	2 4.9	28 0.9	1 52.1	1.23241	1.30228	4.09	0.6114
	23	0.8948	2.256	0.009	31 12.9	2 4.9	27 3.0	1 48.2	1.23432	1.30283	3.96	0.5979
	24	0.8976	2.265	0.007	31 10.7	2 4.7	26 5.2	1 44.3	1.23635	1.30336	3.84	0.5838
	25	0.9003	2.275	−0.003	31 6.0	2 4.4	25 7.6	1 40.5	1.23841	1.30388	3.71	0.5691
	26	0.9030	+2.284	+0.001	30 58.8	2 3.9	24 10.1	1 36.7	1.24035	1.30438	+3.58	+0.5538
	27	0.9058	2.293	0.004	30 49.4	2 3.3	23 12.7	1 32.8	1.24208	1.30487	3.45	0.5377
	28	0.9085	2.303	0.006	30 38.8	2 2.6	22 15.4	1 29.0	1.24347	1.30533	3.32	0.5209
	29	0.9112	2.312	0.006	30 28.5	2 1.9	21 18.1	1 25.2	1.24451	1.30580	3.19	0.5033
	30	0.9140	2.322	+0.004	30 19.9	2 1.3	20 21.0	1 21.3	1.24526	1.30623	3.05	0.4848
Dec.	1	0.9167	+2.332	0.000	30 14.0	2 0.9	19 24.0	1 17.6	1.24588	1.30666	+2.92	+0.4652
	2	0.9195	2.341	−0.005	30 11.5	2 0.8	18 27.0	1 13.8	1.24657	1.30706	2.78	0.4447
	3	0.9222	2.351	0.010	30 11.8	2 0.8	17 30.2	1 10.0	1.24758	1.30746	2.65	0.4229
	4	0.9249	2.361	0.012	30 13.6	2 0.9	16 33.4	1 6.2	1.24903	1.30783	2.51	0.3999
	5	0.9277	2.371	0.012	30 15.0	2 1.0	15 36.7	1 2.4	1.25095	1.30819	2.37	0.3754
h (5.0)	6	0.9304	+2.381	−0.010	30 14.2	2 0.9	14 40.0	0 58.7	1.25326	1.30852	+2.24	+0.3492
	7	0.9332	2.391	−0.004	30 10.1	2 0.7	13 43.5	0 54.9	1.25576	1.30883	2.10	0.3213
	8	0.9359	2.401	+0.002	30 2.3	2 0.2	12 47.0	0 51.1	1.25821	1.30912	1.96	0.2913
	9	0.9386	2.412	0.009	29 51.7	1 59.4	11 50.5	0 47.4	1.26039	1.30940	1.82	0.2589
	10	0.9414	2.422	0.013	29 39.5	1 58.6	10 54.1	0 43.6	1.26215	1.30966	1.67	0.2237
	11	0.9441	+2.432	+0.015	29 27.3	1 57.8	9 57.8	0 39.9	1.26350	1.30990	+1.53	+0.1853
	12	0.9468	2.442	0.015	29 16.6	1 57.1	9 1.5	0 36.1	1.26445	1.31011	1.39	0.1429
	13	0.9496	2.452	0.012	29 8.2	1 56.5	8 5.3	0 32.4	1.26519	1.31031	1.25	0.0959
	14	0.9523	2.463	0.008	29 2.4	1 56.2	7 9.1	0 28.6	1.26585	1.31048	1.10	0.0429
	15	0.9551	2.473	+0.003	28 59.0	1 55.9	6 13.0	0 24.9	1.26657	1.31064	0.96	9.9824
	16	0.9578	+2.484	−0.002	28 57.1	1 55.8	5 16.9	0 21.1	1.26745	1.31077	+0.82	+9.9120
	17	0.9605	2.494	0.006	28 56.2	1 55.7	4 20.8	0 17.4	1.26852	1.31088	0.67	9.8277
	18	0.9633	2.504	0.008	28 55.3	1 55.7	3 24.7	0 13.6	1.26984	1.31097	0.53	9.7227
	19	0.9660	2.515	0.009	28 53.8	1 55.6	2 28.6	0 9.9	1.27138	1.31105	0.38	9.5839
h (6.0)	20	0.9688	2.526	0.009	28 51.2	1 55.4	1 32.5	0 6.2	1.27308	1.31109	0.24	9.3783
	21	0.9715	+2.536	−0.007	28 47.0	1 55.1	0 36.5	0 2.4	1.27491	1.31112	+0.09	+8.9742
	22	0.9742	2.546	−0.004	28 40.6	1 54.7	359 40.5	23 58.7	1.27681	1.31112	−0.05	−8.7037
	23	0.9770	2.557	0.000	28 32.0	1 54.1	358 44.4	23 55.0	1.27864	1.31110	0.20	9.2907
	24	0.9797	2.567	+0.004	28 21.1	1 53.4	357 48.3	23 51.2	1.28030	1.31106	0.34	9.5315
	25	0.9824	2.578	0.006	28 8.9	1 52.6	356 52.2	23 47.5	1.28165	1.31100	0.48	9.6855
	26	0.9852	+2.588	+0.007	27 56.3	1 51.8	355 56.1	23 43.7	1.28268	1.31091	−0.63	−9.7988
	27	0.9879	2.599	0.006	27 44.7	1 51.0	354 59.9	23 40.0	1.28343	1.31081	0.77	9.8885
	28	0.9906	2.609	+0.002	27 35.4	1 50.4	354 3.7	23 36.2	1.28395	1.31068	0.92	9.9627
	29	0.9934	2.619	−0.003	27 29.2	1 50.0	353 7.5	23 32.5	1.28444	1.31054	1.06	0.0259
	30	0.9961	2.630	0.008	27 25.7	1 49.7	352 11.2	23 28.7	1.28509	1.31036	1.20	0.0810
	31	0.9989	+2.640	−0.012	27 24.5	1 49.6	351 14.9	23 25.0	1.28608	1.31017	−1.35	−0.1297
	32	1.0016	+2.650	−0.013	27 23.7	1 49.6	350 18.6	23 21.2	1.28750	1.30997	−1.49	−0.1734

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.		Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	Log i.
						s	° ′	° ′			
Jan.	0.72	−8.4094	+0.9907	−0.5136	+1.3045	−0.079	93 1	350 48	0.9913	1.3101	−0.1508
	10.69	+7.8287	0.9859	0.8112	1.2836	+0.021	89 12	341 23	0.9859	1.3070	0.4484
	20.67	8.5690	0.9784	0.9769	1.2472	0.114	85 32	331 47	0.9797	1.3022	0.6142
	30.64	8.8096	0.9692	1.0859	1.1924	0.198	82 6	321 57	0.9734	1.2961	0.7231
Feb.	9.61	8.9489	0.9593	1.1615	1.1140	0.273	78 56	311 52	0.9675	1.2896	0.7987
	19.59	+9.0416	+0.9498	−1.2140	+1.0015	+0.338	76 6	301 31	0.9627	1.2833	−0.8513
Mar.	1.56	9.1089	0.9419	1.2485	0.8310	0.394	73 36	290 56	0.9599	1.2781	0.8858
	11.53	9.1615	0.9365	1.2679	+0.5220	0.445	71 24	280 11	0.9598	1.2748	0.9051
	21.50	9.2055	0.9343	1.2737	−9.3115	0.493	69 29	269 23	0.9628	1.2737	0.9109
	31.48	9.2456	0.9354	1.2664	0.5694	0.540	67 44	258 38	0.9691	1.2750	0.9037
Apr.	10.45	+9.2848	+0.9395	−1.2460	−0.8504	+0.592	66 4	248 6	0.9785	1.2785	−0.8832
	20.42	9.3247	0.9458	1.2112	1.0102	0.649	64 23	237 48	0.9908	1.2837	0.8484
	30.39	9.3660	0.9535	1.1597	1.1166	0.713	62 37	227 50	1.0052	1.2898	0.7969
May	10.37	9.4084	0.9616	1.0874	1.1913	0.786	60 43	218 12	1.0210	1.2960	0.7246
	20.34	9.4513	0.9688	0.9857	1.2441	0.868	58 40	208 53	1.0373	1.3018	0.6229
	30.31	+9.4936	+0.9746	−0.8366	−1.2800	+0.957	56 29	199 49	1.0536	1.3065	−0.4739
June	9.29	9.5345	0.9782	0.5878	1.3017	1.051	54 11	190 56	1.0692	1.3096	0.2251
	19.26	9.5731	0.9792	−9.8900	1.3107	1.149	51 48	182 10	1.0839	1.3111	−9.5273
	29.23	9.6088	0.9774	+0.3682	1.3077	1.248	49 23	173 27	1.0972	1.3106	+0.0055
July	9.20	9.6411	0.9730	0.7308	1.2925	1.344	46 58	164 40	1.1091	1.3083	0.3680
	19.18	+9.6697	+0.9661	+0.9180	−1.2642	+1.436	44 38	155 45	1.1195	1.3043	+0.5552
	29.15	9.6947	0.9573	1.0396	1.2208	1.521	42 24	146 37	1.1285	1.2991	0.6768
Aug.	8.12	9.7163	0.9474	1.1249	1.1588	1.598	40 20	137 14	1.1362	1.2931	0.7622
	18.09	9.7346	0.9371	1.1861	1.0718	1.667	38 30	127 33	1.1430	1.2868	0.8233
	28.07	9.7502	0.9275	1.2289	0.9463	1.728	36 53	117 33	1.1492	1.2812	0.8661
Sept.	7.04	+9.7636	+0.9197	+1.2567	−0.7494	+1.782	35 33	107 16	1.1552	1.2767	+0.8939
	17.01	9.7756	0.9145	1.2711	−0.3453	1.832	34 29	96 46	1.1615	1.2742	0.9084
	26.98	9.7867	0.9125	1.2728	+0.1024	1.879	33 41	86 8	1.1685	1.2738	0.9101
Oct.	6.96	9.7979	0.9139	1.2618	0.6749	1.928	33 5	75 29	1.1767	1.2758	0.8990
	16.93	9.8097	0.9183	1.2370	0.9072	1.982	32 39	64 55	1.1864	1.2800	0.8742
	26.90	+9.8227	+0.9251	+1.1965	+1.0491	+2.041	32 16	54 32	1.1976	1.2856	+0.8337
Nov.	5.88	9.8371	0.9332	1.1368	1.1461	2.111	31 54	44 23	1.2102	1.2920	0.7741
	15.85	9.8530	0.9413	1.0514	1.2145	2.189	31 26	34 29	1.2240	1.2984	0.6886
	25.82	9.8702	0.9483	0.9271	1.2620	2.278	30 51	24 49	1.2384	1.3040	0.5643
Dec.	5.79	9.8882	0.9532	0.7307	1.2926	2.374	30 5	15 20	1.2530	1.3083	0.3679
	15.77	+9.9065	+0.9552	+0.3276	+1.3083	+2.476	29 10	5 58	1.2673	1.3107	+9.9648
	25.74	9.9244	0.9538	−0.0783	1.3102	2.580	28 6	356 39	1.2808	1.3110	−9.7155
	35.71	+9.9413	+0.9491	−0.6519	+1.2984	+2.683	26 55	347 17	1.2932	1.3092	−0.2891

$E = -0^s.001$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the stars, given on pages 316 to 513, from the mean places, given on pages 217 to 230. In order to render exact interpolation possible through intervals of ten days, all short-period terms have been omitted.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
Jan. 0	−0.14	−0.06	Feb 15	+0.17	+0.04	Apr. 1	−0.11	+0.06	May 17	−0.11	−0.07
1	−0.07	0.07	16	0.11	0.06	2	0.14	+0.03	18	−0.05	0.07
2	+0.02	0.07	17	+0.04	0.06	3	0.14	−0.01	19	+0.02	0.06
3	0.09	0.05	18	−0.04	0.06	4	0.09	0.04	20	0.08	0.04
4	0.14	−0.02	19	0.11	0.05	5	−0.01	0.07	21	0.11	−0.01
5	+0.15	+0.02	20	−0.17	+0.03	6	+0.09	−0.07	22	+0.10	+0.03
6	0.11	0.05	21	0.20	+0.01	7	0.17	0.06	23	+0.05	0.06
7	+0.04	0.07	22	0.21	−0.02	8	0.23	0.04	24	−0.02	0.08
8	−0.04	0.07	23	0.19	0.05	9	0.25	−0.01	25	0.10	0.07
9	0.11	0.06	24	0.14	0.07	10	0.23	+0.02	26	0.16	0.05
10	−0.15	+0.03	25	−0.06	−0.07	11	+0.18	+0.05	27	−0.18	+0.02
11	0.15	−0.01	26	+0.02	0.06	12	0.11	0.06	28	0.16	−0.02
12	0.11	0.05	27	0.09	0.04	13	+0.03	0.06	29	0.10	0.05
13	−0.03	0.07	28	0.13	−0.01	14	−0.05	0.06	30	−0.01	0.07
14	+0.06	0.07	Mar. 1	0.13	+0.03	15	0.12	0.04	31	+0.09	0.07
15	+0.14	−0.06	2	+0.09	+0.06	16	−0.17	+0.02	June 1	+0.18	−0.06
16	0.19	0.04	3	+0.02	0.08	17	0.19	0.00	2	0.23	−0.03
17	0.21	−0.01	4	−0.05	0.07	18	0.19	−0.03	3	0.24	0.00
18	0.20	+0.02	5	0.11	0.05	19	0.16	0.05	4	0.22	+0.03
19	0.16	0.04	6	0.14	+0.02	20	0.11	0.07	5	0.16	0.05
20	+0.09	+0.06	7	−0.12	−0.02	21	−0.04	−0.07	6	+0.09	+0.06
21	+0.01	0.06	8	−0.06	0.05	22	+0.03	0.06	7	+0.01	0.06
22	−0.06	0.06	9	+0.02	0.07	23	0.08	−0.03	8	−0.06	0.05
23	0.13	0.05	10	0.11	0.07	24	0.10	+0.01	9	0.12	0.04
24	0.18	+0.02	11	0.18	0.06	25	0.09	0.04	10	0.16	+0.01
25	−0.21	0.00	12	+0.22	−0.03	26	+0.03	+0.07	11	−0.18	−0.01
26	0.20	−0.03	13	0.23	0.00	27	−0.04	0.08	12	0.16	0.04
27	0.17	0.05	14	0.20	+0.03	28	0.11	0.07	13	0.12	0.06
28	0.10	0.07	15	0.14	0.05	29	0.16	+0.04	14	−0.06	0.07
29	−0.02	0.07	16	+0.07	0.06	30	0.16	0.00	15	+0.01	0.07
30	+0.06	−0.06	17	−0.01	+0.06	May 1	−0.12	−0.03	16	+0.08	−0.05
31	0.12	−0.03	18	0.08	0.06	2	−0.05	0.06	17	0.12	−0.02
Feb. 1	0.15	+0.01	19	0.15	0.04	3	+0.05	0.07	18	0.12	+0.02
2	0.13	0.04	20	0.19	+0.01	4	0.14	0.07	19	0.09	0.05
3	+0.08	0.07	21	0.21	−0.01	5	0.21	0.05	20	+0.02	0.07
4	0.00	+0.08	22	−0.19	−0.04	6	+0.25	−0.02	21	−0.06	+0.08
5	−0.08	0.07	23	0.16	0.06	7	0.24	+0.01	22	0.13	0.06
6	0.13	+0.04	24	0.09	0.07	8	0.20	0.04	23	0.17	+0.03
7	0.14	0.00	25	−0.02	0.07	9	0.14	0.06	24	0.17	−0.01
8	0.11	−0.03	26	+0.05	0.05	10	+0.06	0.06	25	0.13	0.04
9	−0.05	−0.06	27	+0.10	−0.02	11	−0.02	+0.06	26	−0.05	−0.07
10	+0.04	0.07	28	0.11	+0.02	12	0.09	0.05	27	+0.04	0.07
11	0.12	0.07	29	0.09	0.05	13	0.14	+0.03	28	0.14	0.06
12	0.18	0.05	30	+0.03	0.07	14	0.18	0.00	29	0.20	0.04
13	0.22	−0.02	31	−0.05	0.08	15	0.19	−0.02	30	0.23	−0.01
14	+0.21	+0.01	Apr. 1	−0.11	+0.06	16	−0.16	−0.05	July 1	+0.22	+0.02
15	+0.17	+0.04	2	−0.14	+0.03	17	−0.11	−0.07	2	+0.18	+0.05

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 1	+0.22	+0.02	Aug 16	−0.13	+0.05	Oct. 1	−0.10	−0.07	Nov. 16	+0.18	+0.06
2	0.18	0.05	17	0.16	+0.02	2	−0.03	0.07	17	0.10	0.07
3	0.11	0.06	18	0.15	−0.02	3	+0.04	0.06	18	+0.02	0.07
4	+0.03	0.07	19	0.10	0.05	4	0.08	−0.03	19	−0.06	0.05
5	−0.04	0.06	20	−0.02	0.07	5	0.10	0.00	20	0.12	0.03
6	−0.11	+0.04	21	+0.08	−0.07	6	+0.09	+0.04	21	−0.15	+0.01
7	0.15	+0.02	22	0.16	0.06	7	+0.04	0.07	22	0.16	−0.02
8	0.18	−0.01	23	0.21	−0.03	8	−0.03	0.08	23	0.15	0.04
9	0.17	0.03	24	0.23	0.00	9	0.10	0.07	24	0.11	0.06
10	0.14	0.05	25	0.20	+0.03	10	0.16	0.05	25	−0.05	0.07
11	−0.08	−0.07	26	+0.15	+0.05	11	−0.17	+0.01	26	+0.01	−0.07
12	−0.01	0.07	27	+0.07	0.07	12	0.14	−0.03	27	0.07	0.05
13	+0.06	0.06	28	−0.01	0.06	13	−0.06	0.06	28	0.10	−0.02
14	0.12	−0.03	29	0.08	0.05	14	+0.03	0.07	29	0.10	+0.02
15	0.14	0.00	30	0.13	0.04	15	0.13	0.07	30	+0.07	0.05
16	+0.12	+0.04	31	−0.17	+0.01	16	+0.21	−0.05	Dec. 1	0.00	+0.07
17	+0.06	0.07	Sept. 1	0.19	−0.02	17	0.25	−0.02	2	−0.08	0.08
18	−0.02	0.08	2	0.17	0.04	18	0.25	+0.01	3	0.16	0.07
19	0.10	0.07	3	0.13	0.06	19	0.21	0.04	4	0.20	+0.04
20	0.16	0.04	4	−0.07	0.07	20	0.14	0.06	5	0.20	0.00
21	−0.18	+0.01	5	0.00	0.07	21	+0.06	+0.07	6	−0.16	−0.04
22	0.15	−0.03	6	+0.06	0.05	22	−0.02	0.06	7	−0.07	0.07
23	−0.09	0.06	7	0.11	−0.02	23	0.09	0.05	8	+0.04	0.08
24	+0.01	0.07	8	0.12	+0.02	24	0.14	+0.03	9	0.14	0.07
25	0.10	0.07	9	0.09	0.05	25	0.17	0.00	10	0.22	0.04
26	+0.18	−0.05	10	+0.03	+0.07	26	−0.17	−0.03	11	+0.25	−0.01
27	0.22	−0.02	11	−0.04	0.08	27	0.15	0.05	12	0.24	+0.02
28	0.22	+0.01	12	0.11	0.06	28	0.11	0.07	13	0.20	0.05
29	0.19	0.04	13	0.15	+0.03	29	−0.05	0.07	14	0.13	0.06
30	0.13	0.06	14	0.16	0.00	30	+0.02	0.06	15	+0.05	0.07
31	+0.05	+0.07	15	−0.11	−0.04	31	+0.07	−0.04	16	−0.03	+0.06
Aug. 1	−0.02	0.06	16	−0.03	0.07	Nov. 1	0.10	−0.01	17	0.09	0.04
2	0.09	0.05	17	+0.06	0.08	2	0.09	+0.03	18	0.13	+0.02
3	0.15	+0.03	18	0.15	0.07	3	+0.05	0.06	19	0.15	−0.01
4	0.18	0.00	19	0.21	0.04	4	−0.02	0.08	20	0.14	0.04
5	−0.18	−0.02	20	+0.24	−0.01	5	−0.10	+0.08	21	−0.11	−0.06
6	0.16	0.05	21	0.22	+0.02	6	0.16	0.06	22	−0.06	0.07
7	0.11	0.07	22	0.17	0.05	7	0.19	+0.02	23	0.00	0.07
8	−0.04	0.07	23	0.10	0.06	8	0.17	−0.02	24	+0.06	0.06
9	+0.03	0.06	24	+0.02	0.07	9	0.11	0.05	25	0.10	−0.03
10	+0.10	−0.04	25	−0.05	+0.06	10	−0.01	−0.07	26	+0.12	0.00
11	0.13	−0.01	26	0.12	0.04	11	+0.09	0.07	27	0.10	+0.04
12	0.13	+0.03	27	0.16	+0.02	12	0.18	0.06	28	+0.04	0.07
13	0.09	0.06	28	0.18	−0.01	13	0.24	−0.03	29	−0.05	0.08
14	+0.02	0.08	29	0.18	0.03	14	0.26	0.00	30	0.13	0.07
15	−0.06	+0.07	30	−0.15	−0.06	15	+0.23	+0.03	31	−0.19	+0.05
16	−0.13	+0.05	Oct. 1	−0.10	−0.07	16	+0.18	+0.06	32	−0.22	+0.01

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
33 Piscium	4.7	K0	0 1 23.683	+3.0713	−.0006	− 6 8 17.95	+20.135	+0.091
α Andromedæ (*Alpheratz*)	2.2	A0p	0 4 24.224	3.0975	+.0107	+28 39 55.26	19.879	−0.163
β Cassiopeiæ	2.4	F5	0 5 3.554	3.1894	+.0681	+58 43 30.44	19.860	−0.180
ϵ Phœnicis	3.9	K0	0 5 30.388	3.0490	+.0096	−46 10 20.64	19.846	−0.193
22 Andromedæ	5.1	F0	0 6 18.788	3.1125	+.0021	+45 38 37.65	20.033	−0.004
γ Pegasi	2.9	B2	0 9 16.115	+3.0873	+.0003	+14 45 19.97	+20.019	−0.010
σ Andromedæ	4.5	A2	0 14 18.024	3.1297	−.0044	+36 21 30.09	19.959	−0.047
ι Ceti	3.8	K0	0 15 30.299	3.0568	−.0013	− 9 15 2.35	19.970	−0.030
ζ Tucanæ	4.3	F8	0 16 4.349	3.1424	+.2735	−65 19 36.93	21.168	+1.172
44 Piscium	6.0	G5	0 21 27.283	3.0747	−.0014	+ 1 30 47.80	19.934	−0.023
β Hydri	2.9	G0	0 21 43.780	+3.1885	+.6954	−77 41 16.44	+20.273	+0.318
α Phœnicis	2.4	K0	0 22 28.945	2.9707	+.0188	−42 43 26.92	19.545	−0.403
12 Ceti	6.0	K5	0 26 6.569	3.0622	+.0011	− 4 22 57.15	19.915	0.000
13 Ceti †	5.2	G0	0 31 17.039	3.0873	+.0273	− 4 0 59.28	19.841	−0.017
ζ Cassiopeiæ	3.7	B2	0 32 40.378	3.3328	+.0036	+53 28 24.09	19.834	−0.007
π Andromedæ	4.4	B3	0 32 45.813	+3.1997	+.0019	+33 17 44.52	+19.841	0.000
ϵ Andromedæ	4.5	G5	0 34 28.946	3.1661	−.0172	+28 53 37.94	19.565	−0.254
δ Andromedæ	3.5	K0	0 35 12.368	3 2039	+ 0110	+30 26 22.85	19.712	−0.097
α Cassiopeiæ (*Schedir*) †	*var.*	K0	0 36 7.611	3.3914	+.0063	+56 6 55.01	19.765	−0.032
μ Phœnicis	4.6	K0	0 37 41.313	2.8376	−.0046	−46 30 28.71	19.743	−0.032
β Ceti	2.2	K0	0 39 43.517	+3.0120	+.0160	−18 24 32.12	+19.786	+0.041
ο Cassiopeiæ	4.7	B2	0 40 25.618	3.3348	+.0028	+47 51 47.67	19.728	−0.006
21 Cassiopeiæ	5.6	A2	0 40 31.996	3 9194	−.0050	+74 34 2.90	19.706	−0.026
ζ Andromedæ	4.3	K0	0 43 15.201	3.1762	−.0073	+23 50 54.82	19.611	−0 078
η Cassiopeiæ †	3.6	F8	0 44 25.892	3.6188	+.1433	+57 24 30.72	19.193	−0.477
δ Piscium	4.6	K5	0 44 41.135	+3.1108	+.0055	+ 7 9 58.72	+19.621	−0.044
λ Hydri	5.0	K5	0 45 55.853	2.0981	+.0125	−75 20 31.71	19.643	−0.001
20 Ceti	4.9	K0	0 49 4.262	3 0645	−.0005	− 1 33 42.94	19.581	−0.003
γ Cassiopeiæ	2.2	B0p	0 52 2.841	3.6038	+.0036	+60 18 0.41	19.525	−0.005
μ Andromedæ	3.9	A2	0 52 28.396	3.3236	+.0132	+38 4 55.13	19.552	+0.030
α Sculptoris	4.4	B5	0 54 53.709	+2.8896	−.0018	−29 46 24.92	+19.460	−0.013
ϵ Piscium	4.4	K0	0 58 56.700	3.1120	−.0051	+ 7 28 33.23	19.411	+0 026
β Phœnicis †	3.4	K0	1 2 38.880	2.6781	−.0057	−47 7 52.37	19.276	−0.024
μ Cassiopeiæ	5.3	G5	1 3 8.045	3.9752	+.3920	+54 32 36.16	17.732	−1.557
η Ceti	3.6	K0	1 4 42.967	3.0175	+.0143	−10 35 23.88	19.125	−0.126
β Andromedæ	2.4	Ma	1 5 24.876	+3.3531	+.0148	+35 12 45.58	+19.117	−0.117
τ Piscium	4.7	K0	1 7 24.882	3.2992	+.0056	+29 40 52.51	19.155	−0.029
ζ Piscium †	5.6	A5	1 9 42.392	3.1326	+.0096	+ 7 10 6.83	19.073	0.052
κ Tucanæ †	5.0	F8	1 13 9.541	2.0381	+.0713	−69 17 6.52	19 121	+0.089
f Piscium	5.3	A2	1 13 49.546	3.0932	−.0033	+ 3 12 33.61	18.988	−0.025
υ Piscium	4.7	A2	1 15 13.771	+3.2926	+.0016	+26 51 35.19	+18.966	−0.008
θ Ceti	3.8	K0	1 20 10.431	2.9979	−.0057	− 8 34 48.95	18.616	0 215
δ Cassiopeiæ	2.8	A5	1 20 45.872	3.9071	+.0107	+59 50 8.96	18.776	−0.037
γ Phœnicis	3.4	K5	1 25 1.357	2.6067	−.0029	−43 42 45.47	18.456	−0.225
38 Cassiopeiæ	6.0	F5	1 25 28.352	4.4274	+.0263	+69 52 8.55	18.595	−0.072
η Piscium	3.7	G5	1 27 21.575	+3.2070	+.0015	+14 56 57.72	+18.603	0.003
υ Andromedæ	4.2	G0	1 32 16.218	3.5129	−.0153	+41 1 15.31	18.066	−0.377
40 Cassiopeiæ	5.5	K0	1 32 19.765	4.7484	−.0011	+72 38 54.38	18.438	−0.002
π Piscium	5.6	F0	1 33 0.814	3.1776	−.0049	+11 44 53.09	18.451	+0.034
υ Persei	3.8	K0	1 33 15.376	3.6715	+.0064	+48 14 19.04	18.288	−0.119
α Eridani (*Achernar*)	0.6	B5	1 34 50.866	+2.2351	+.0103	−57 37 39.77	+18.312	−0.041
ω Cassiopeiæ	5.5	A0p	1 36 36.857	4.4118	+.0089	+67 39 15.59	18.288	−0.002
ν Piscium	4.7	K0	1 37 25.338	3.1205	−.0015	+ 5 5 54.57	18.264	+0.003
φ Persei	4.2	B0p	1 38 49.446	3.7486	+.0031	+50 18 5.31	18.195	−0.015
τ Ceti	3.6	K0	1 40 29.414	2.7867	−.1198	−16 20 32.75	19.008	+0.859
ο Piscium	4.5	K0	1 41 19.510	+3.1659	+.0049	+ 8 46 14.47	+18.162	+0.045
ϵ Sculptoris †	5.4	F0	1 42 2.117	+2.8043	+.0052	−25 26 12.56	+18.040	−0.051

13 Ceti, dup., $5^m.5$, $6^m.2$, 0″.3
α Cassiop., var. irreg., $2^m.2$, $2^m.8$
η Cassiop., comp. $7^m.6$, 4″ n. pr.

β Phœnicis, dup., $4^m.1$, $4^m.1$, 1″
ζ Piscium, star $6^m.5$, 24″ n. f.

κ Tucanæ, comp. 7^m, 6″ n.
ϵ Sculptoris, comp. 9^m, 5″ n. f.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ζ Ceti	3.9	K0	1 47 39.545	+2.9603	+.0020	−10 42 53.31	+17.847	−0.027
α Trianguli	3.6	F5	1 48 41.233	3.4154	+.0015	+29 12 15.77	17.602	−0.231
ε Cassiopeiæ	3.4	B3	1 48 50.224	4.2925	+.0053	+63 17 30.13	17.812	−0.015
ξ Piscium	4.8	K0	1 49 34.048	3.1044	+.0015	+ 2 48 28.70	17.818	+0.021
β Arietis	2.7	A5	1 50 22.913	3.3098	+.0064	+20 25 56.01	17.654	−0.111
ψ Phœnicis	4.4	Mb	1 50 33.420	+2.4030	−.0124	−46 40 46.91	+17.653	−0.104
α Hydri	3.0	F0	1 56 20.135	1.8816	+.0276	−61 56 39.10	17.544	+0.026
υ Ceti	4.2	K5	1 56 22.572	2.8257	+.0082	−21 27 1.05	17.507	−0.009
50 Cassiopeiæ	4.1	A0	1 56 49.450	5.0763	−.0092	+72 2 58.67	17.517	+0.020
γ Andromedæ *pr.*	2.3	K0	1 59 9.903	3.6744	+.0046	+41 57 39.58	17.345	−0.051
γ Andromedæ *seq.*	5.1	A	Δα + 0.842	....	...	Δδ + 4.56	....	...
α Arietis	2.2	K2	2 2 49.691	+3.3777	+.0139	+23 5 56.58	+17.090	−0.144
β Trianguli	3.1	A5	2 4 57.344	3.5639	+.0127	+34 37 25.60	17.094	−0.044
55 Cassiopeiæ	6.2	F5	2 8 24.999	4.6783	−.0020	+66 9 52.20	16.977	−0.002
6 Persei	5.4	K0	2 8 28.414	3.9779	+.0368	+50 42 32.18	16.810	−0.167
ξ¹ Ceti	4.5	G5	2 8 54.975	+3.1778	−.0012	+ 8 29 9.78	+16.940	−0.016
μ Fornacis	5.2	A0	2 9 30.733	2.6376	− 0037	−31 5 5.56	16.906	−0.022
γ Trianguli	4.1	A0	2 12 43.849	3.5607	+.0010	+33 29 30.62	16.724	−0.052
67 Ceti	5.7	G5	2 13 8.479	2.9910	+.0054	− 6 46 35.11	16.646	−0.110
φ Eridani	3.8	B8	2 13 45.401	2.1409	+.0062	−51 52 5.66	16.698	−0.029
o Ceti (*Mira*) †	*var.*	Md	2 15 27.327	+3.0296	+.0002	− 3 19 35.28	+16.416	−0.229
κ Fornacis	5.4	F5	2 19 1.114	2.7447	+.0138	−24 9 56.90	16.392	−0.077
δ Hydri	4.3	A2	2 20 22.376	1.0606	−.0097	−69 0 33.94	16.421	+0.020
ι Cassiopeiæ †	4.6	A5p	2 22 41.967	4.9136	−.0003	+67 3 26.34	16.294	+0.010
ξ² Ceti	4.3	A0	2 24 3.739	3.1874	+.0025	+ 8 6 56.48	16.206	−0.007
σ Ceti	4.8	F5	2 28 26.166	+2.8417	−.0063	−15 34 54.11	+15.883	−0.102
36 H. Cassiopeiæ	5.3	K0	2 30 40.520	5.6549	−.0052	+72 28 58.09	15.884	+0.017
ν Ceti	5.0	G5	2 31 49.840	+3.1160	−.0025	+ 5 15 29.13	15.786	−0.018
μ Hydri	5.3	K0	2 33 15.686	−1.3315	+.0121	−79 26 43.99	15.689	−0.038
ν Arietis	5.4	A2	2 34 26.426	+3.4036	+.0001	+21 37 45.20	15.642	−0.021
δ Ceti	4.0	B2	2 35 32.048	+3.0738	+.0011	− 0 0 10.05	+15.608	+0.004
ε Hydri	4.3	B9	2 38 23.955	0.9164	+.0168	−68 35 48.03	15.450	+0.005
θ Persei	4.2	G0	2 38 55.876	4.0874	+.0353	+48 54 13.79	15.327	−0.088
γ Ceti *seq.* †	3.7	A0	2 39 18.515	3.1067	−.0096	+ 2 54 43.47	15.244	−0.150
π Ceti	4.4	B5	2 40 27.392	2.8540	−.0012	−14 11 2.55	15.318	−0.011
μ Ceti	4.4	A5	2 40 46.593	+3.2404	+.0188	+ 9 47 23.86	+15.286	−0.025
η Persei †	3.9	K0	2 45 4.111	4.3630	+.0041	+55 34 37.51	15.055	−0.012
41 Arietis	3.7	B8	2 45 26.788	3.5266	+.0050	+26 56 38.82	14.933	−0.111
β Fornacis	4.5	K0	2 45 52.089	2.5121	+.0080	−32 43 43.46	15.176	+0.156
σ Arietis	5.5	B5	2 47 14.280	3.3092	+.0016	+14 45 55.80	14.906	−0.034
τ² Eridani	4.8	K0	2 47 32.654	+2.7201	−.0044	−21 19 14.12	+14.906	−0.017
τ Persei	4.1	G0p	2 48 47.247	4.2411	+.0008	+52 26 54.59	14.847	−0.003
η Eridani	4.0	K0	2 52 39.912	2.9306	+.0060	− 9 12 13.60	14.407	−0.213
ε Arietis (*mean*) †	4.6	A2	2 54 48.293	3.4269	−.0009	+21 1 59.62	14.482	−0.010
θ Eridani †	3.4	A2	2 55 20.624	2.2767	−.0025	−40 36 45.40	14.483	+0.024
47 H. Cephei	5.7	Ma	2 55 46.841	+7.8858	−.0102	+79 6 59.32	+14.443	+0.010
α Ceti	2.8	Ma	2 58 15.125	3.1340	−.0009	+ 3 47 18.58	14.204	−0.078
τ³ Eridani	4.2	A3	2 58 59.814	2.6450	−.0104	−23 55 31.55	14.192	−0.044
γ Persei	3.1	G0p	2 59 12.522	4.3328	+.0010	+53 12 22.13	14.218	−0.004
ρ Persei †	*var.*	Mb	3 0 14.139	3.8379	+.0116	+38 32 34.28	14.044	−0.115
μ Horologii	5.2	F0	3 1 47.627	+1.4086	−.0123	−60 2 8.80	+14.008	−0.054
θ Hydri	5.5	B8	3 2 4.947	0.1058	+.0034	−72 12 11.33	14.058	+0.014
β Persei (*Algol*) †	*var.*	B8	3 3 9.095	3.8963	+.0008	+40 39 36.35	13.976	−0.002
δ Arietis	4.5	K0	3 7 13.351	3.4275	+.0110	+19 26 11.58	13.721	+0.001
12 Eridani †	4.0	F8	3 8 47.936	2.5469	+.0241	−29 17 23.87	14.256	+0.636
ζ Arietis	5.0	A0	3 10 28.297	+3.4450	−.0019	+20 45 35.91	+13.430	−0.082
48 H. Cephei	5.5	F0	3 10 29.472	+7.5292	+.0204	+77 27 14.30	+13.455	−0.055

o Ceti, var., 331^d, $1^m.7$-$9^m.6$, star 9^m f. 8″
ι Cassiop., triple, 7^m, 8^m, 2″, 8″
γ Ceti, comp. $6^m.2$, 2″.7 pr.

η Persei, star $8^m.5$, 28″ n. pr.
ε Arietis, dup., $5^m.2$, $5^m.6$, 1″.2
θ Eridani, comp. $4^m.4$, f. 8″

ρ Persei, var. irreg., $3^m.4$-$4^m.2$
β Persei, var., $2^d.87$, $2^m.1$-$3^m.2$
12 Eridani, comp. 7^m, 1″.4 n. pr.

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			h m s	s	s	° ′ ″	″	″
38 G. Horologii . . †	5.7	N	3 10 35.884	+1.5155	−.0005	−57 36 34.59	+13.497	−0.006
ζ Eridani . . .	4.9	A3	3 12 5.504	2.9128	−.0008	− 9 6 17.31	13.460	+0.053
τ Arietis . . .	5.2	B3	3 16 46.690	3.4607	+.0023	+20 52 13.46	13.066	−0.033
e Eridani . . .	4.3	G5	3 16 51.144	+2.3979	+.2808	−43 21 48.45	13.850	+0.755
ι Hydri . . .	5.5	F2	3 17 50.771	−1.5384	+.0351	−77 40 13.29	13.068	+0.010
α Persei . . .	1.9	F5	3 18 48.964	+4.2729	+.0030	+49 35 18.15	+12.936	−0.028
o Tauri . . .	3.8	G5	3 20 40.019	3.2263	−.0046	+ 8 45 31.99	12.766	−0.074
2 H. Camelopardalis .	4.4	A0	3 22 49.285	4.8434	+.0027	+59 40 24.41	12.696	+0.001
ξ Tauri . . .	3.8	B8	3 22 59.622	3.2493	+.0040	+ 9 27 54.18	12.636	−0.046
f Tauri . . .	4.3	K0	3 26 37.162	3.3100	+.0016	+12 40 25.80	12.438	+0.002
ε Eridani . . . †	3.8	K0p	3 29 18.094	+2.8257	−.0660	− 9 43 4.48	+12.278	+0.027
τ^5 Eridani . .	4.3	B8	3 30 23.093	2.6185	+.0023	−21 53 25.56	12.137	−0.039
δ Persei . . .	3.1	B5	3 37 26.077	4.2633	+.0035	+47 32 33.63	11.644	−0.036
δ Eridani . . .	3.7	K0	3 39 33.534	2.8735	−.0061	−10 1 23.94	12.260	+0.731
ν Persei . . .	3.9	F5	3 39 57.388	4.0695	−.0004	+42 20 12.03	11.500	0.000
5 H. Camelopardalis .	4.7	A0	3 42 12.213	+6.2967	+.0059	+71 5 48.37	+11.282	−0.057
η Tauri (*Alcyone*) . †	3.0	B5	3 42 54.217	3.5630	+.0016	+23 52 5.22	11.239	−0.050
τ^6 Eridani . .	4.3	F8	3 43 32.079	2.5808	−.0115	−23 28 32.07	10.761	−0.481
g Eridani . . .	4.2	K0	3 46 34.395	+2.2453	−.0036	−36 25 56.87	10.994	−0.028
γ Hydri . . .	3.2	Ma	3 48 24.754	−0.9568	+.0097	−74 28 30.94	11.004	+0.117
ζ Persei . . .	2.9	B1	3 49 17.236	+3.7673	+.0010	+31 39 22.17	+10.808	−0.014
9 H. Camelopardalis . †	5.2	K0p	3 50 33.520	5.0998	+.0003	+60 53 5.52	10.712	−0.017
ε Persei . . . †	3.0	B0	3 52 40.909	4.0215	+.0031	+39 47 19.58	10.544	−0.027
ξ Persei . . .	4.0	Oe5	3 53 57.858	3.8888	+.0012	+35 34 14.50	10.459	−0.017
γ Eridani . . .	3.2	K5	3 54 26.182	2.7988	+.0017	−13 43 35.88	10.330	0.111
λ Tauri . . . †	*var.*	B3	3 56 24.735	+3.3221	+.0002	+12 16 25.95	+10.282	−0.011
δ Reticuli . . .	4.4	Ma	3 57 31.219	0.9421	−.0020	−61 37 1.11	10.207	0.002
ν Tauri . . .	3.9	A0	3 59 3.521	3.1904	+.0008	+ 5 46 36.11	10.088	0.005
A Tauri . . . †	4.5	K0	4 0 8.403	3.5415	+.0069	+21 52 21.76	9.954	−0.058
c Persei . . .	4.0	B3p	4 3 3.938	4.3500	+.0042	+47 30 30.03	9.757	−0.032
p Tauri . . .	5.6	F0	4 6 8.278	+3.6505	−.0024	+26 16 52.23	+ 9.512	−0.042
o^1 Eridani . . .	4.1	F5	4 8 6.354	2.9278	+.0007	− 7 2 14.26	9.488	+0.086
μ Tauri . . .	4.3	B3	4 11 21.080	3.2564	+.0016	+ 8 42 2.23	9.126	−0.024
α Horologii . . .	3.8	K0	4 11 26.997	1.9877	+.0040	−42 29 2.18	8.912	−0.231
α Reticuli . . .	3.4	G5	4 13 25.667	0.7667	+.0018	−62 39 58.79	9.033	+0.044
γ Tauri . . .	3.9	K0	4 15 24.550	+3.4125	+.0083	+15 26 34.24	+ 8.807	−0.026
δ Tauri . . .	3.9	K0	4 18 29.500	3.4578	+.0075	+17 21 47.15	8.560	−0.030
υ^5 Eridani . .	4.1	K5	4 21 8.657	+2.2531	+.0052	−34 11 41.98	8.423	+0.042
δ Mensæ . . .	5.6	K0	4 23 8.180	−4.1252	+.0043	−80 23 44.14	8.294	+0.072
ε Tauri . . .	3.6	K0	4 24 7.094	+3.5016	+.0082	+19 0 39.17	8.109	−0.034
m Persei . . . †	6.1	F0	4 27 59.554	+4.2171	+.0012	+42 54 3.12	+ 7.837	+0.004
α Tauri (*Aldebaran*) .	1.1	K5	4 31 30.001	3.4408	+.0047	+16 21 20.55	7.360	−0.189
α Doradus . . .	3.5	A0p	4 32 19.880	1.2954	+.0067	−55 12 14.01	7.471	−0.011
ν Eridani . . .	4.1	B2	4 32 28.208	2.9962	−.0005	− 3 30 31.52	7.471	0.000
53 Eridani . . .	4.0	K0	4 34 39.121	2.7458	−.0061	−14 27 12.51	7.139	−0.154
τ Tauri . . .	4.3	B5	4 37 37.287	+3.5996	+.0007	+22 48 37.62	+ 7.031	−0.020
α Cœli	4.5	F2	4 38 4.706	1.9303	−.0149	−42 0 37.80	6.907	−0.106
Groombridge 848 .	6.0	F0	4 38 26.534	8.0338	+.0094	+75 48 13.40	6.840	−0.144
4 Camelopardalis . .	5.4	A2	4 41 34.941	4.9897	+.0062	+56 37 19.92	6.577	−0.148
μ Eridani . . .	4.2	B5	4 41 39.086	2.9992	+.0011	− 3 23 40.76	6.711	−0.009
π^3 Orionis . . .	3.3	F8	4 45 39.515	+3.2557	+.0312	+ 6 49 41.30	+ 6.412	+0.023
9 Camelopardalis . .	4.4	B0	4 46 23.146	5.9535	+.0039	+66 12 50.42	6.333	+0.005
i Tauri . . .	5.1	F0	4 46 52.059	3.5084	+.0059	+18 42 36.22	6.253	−0.035
π^5 Orionis . . .	3.9	B3	4 50 14.374	3.1245	+.0002	+ 2 18 56.96	6.013	+0.005
ι Aurigæ . . .	2.9	K2	4 51 58.583	3.9050	+.0009	+33 2 44.04	5.841	−0.021
ε Aurigæ . . . †	*var.*	F5p	4 56 26.433	+4.3027	+.0012	+43 42 39.07	+ 5.475	−0.013
β Camelopardalis . .	4.2	G0	4 56 33.642	+5.3289	−.0004	+60 19 54.02	+ 5.467	−0.011

38 Horologii, remarkable purplish red star.
ε Eridani, comp. 9^m, s. 7″

η Tauri, quad., comps. $6^m.3$, $7^m.6$, $8^m.2$, 117″, 181″, 190°
9 H. Camelop., comp. 8^m, 1″.9 n. f.
ε Persei, comp. 8^m, 8″.6 n. f.

λ Tauri, var., $3^d.95$, $3^m.3$–$4^m.2$
A Tauri, star $6^m.5$ f. 38^s 254″ s.
m Persei, star 7^m, 115″ s. pr.
ε Aurigæ, var. irreg., $3^m.0$–$4^m.5$

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ζ Aurigæ	3.9	K0p	4 57 5.544	+4.1909	+.0013	+40 57 54.01	+5.411	−0.022
ι Tauri	4.7	A5	4 58 29.517	3.5854	+.0056	+21 28 52.12	5.266	−0.049
11 Orionis	4.6	B9	5 0 10.065	3.4272	+.0013	+15 17 53.22	5.138	−0.036
η Aurigæ	3.3	B3	5 1 6.755	4.2054	+.0039	+41 7 54.56	5.022	−0.072
ϵ Leporis	3.3	K5	5 2 12.043	2.5387	+.0012	−22 28 24.54	4.938	−0.064
β Eridani	2.9	A2	5 4 3.844	+2.9495	−.0056	− 5 11 5.33	+4.770	−0.074
μ Aurigæ	4.8	A3	5 8 9.355	4.1027	−.0020	+38 23 41.11	4.416	−0.080
μ Leporis	3.3	A0p	5 9 28.326	2.6942	+.0027	−16 17 44.26	4.356	−0.028
19 H. Camelopardalis	5.2	F8	5 9 50.252	9.8489	−.0274	+79 8 46.52	4.508	+0.156
β Orionis (*Rigel*) †	0.3	B8p	5 10 50.186	2.8826	.0000	− 8 17 22.17	4.267	0.000
α Aurigæ (*Capella*)	0.2	G0	5 10 59.883	+4.4299	+.0086	+45 55 16.73	+3.824	−0.429
λ Aurigæ	4.8	G0	5 13 43.330	4.2186	+.0460	+40 1 55.89	3.360	−0.660
τ Orionis	3.7	B5	5 13 52.027	2.9128	−.0009	− 6 55 35.38	4.003	−0.005
o Columbæ	4.9	K0	5 14 42.246	2.1590	+.0027	−34 58 11.79	3.584	−0.352
γ Orionis (*Bellatrix*)	1.7	B2	5 21 0.014	3.2173	−.0004	+ 6 16 51.92	3.377	−0.017
β Tauri	1.8	B8	5 21 25.385	+3.7919	+.0025	+28 32 37.71	+3.181	−0.177
17 Camelopardalis	5.8	K5	5 22 53.610	5.6620	+.0003	+63 0 17.70	3.224	−0.007
β Leporis	3.0	G0	5 24 56.762	2.5705	.0000	−20 49 11.33	2.965	−0.089
χ Aurigæ	4.9	B1	5 27 42.897	3.9045	+ 0006	+32 8 11.23	2.801	−0.013
δ Orionis †	2.5	B0	5 28 4.324	3.0645	.0000	− 0 21 17.92	2.781	−0.002
α Leporis	2.7	F0	5 29 20.031	+2.6459	+.0003	−17 52 35.14	+2.674	0.000
Groombridge 966	6.4	K5	5 29 25.137	8.0110	−.0002	+74 59 44.74	2.684	+0.017
ϕ^{1} Orionis	4.5	B0	5 30 35.535	3.2929	−.0002	+ 9 26 18.72	2.550	0.015
ι Orionis †	2.9	Oe5	5 31 39.965	2.9345	+.0001	− 5 57 33.77	2.470	−0.002
ϵ Orionis	1.8	B0	5 32 18.338	3.0438	.0000	− 1 14 59.62	2.417	+0.001
ζ Tauri	3.0	B3	5 33 2.531	+3.5853	+.0006	+21 5 48.42	+2.320	−0.032
α Columbæ	2.8	B5p	5 36 51.645	2.1727	+.0006	−34 6 52.05	1.982	−0.038
ζ Orionis †	2.0	B0	5 36 52.390	3.0272	+.0005	− 1 58 56.36	2.005	0.014
o Aurigæ	5.5	A0	5 39 55.981	4.6159	−.0018	+49 47 38.93	1.734	0.018
ζ Leporis	3.7	A2	5 43 27.952	2.7181	−.0013	−14 50 58.58	1.444	−0.001
κ Orionis	2.2	B0	5 44 6.256	+2.8451	+.0001	− 9 41 45.27	+1.386	−0.003
δ Doradus	4.5	A5	5 44 37.928	0.1028	−.0081	−65 45 51.95	1.342	−0.001
ν Aurigæ	4.2	K0	5 46 9.144	4.1577	−.0001	+39 7 39.13	1.224	+0.013
δ Leporis	3.9	K0	5 48 0.562	2.5797	+.0161	−20 53 4.65	0.399	−0.649
α Orionis (*Betelgeux*) †	*var.*	Ma	5 51 0.171	3.2480	+.0020	+ 7 23 38.18	0.796	+0.009
η Leporis	3.8	F5	5 52 53.855	+2.7325	−.0028	−14 10 50.62	+0.762	+0.141
δ Aurigæ	3.9	K0	5 53 11.289	4.9421	+.0118	+54 16 50.66	0.477	−0.118
β Aurigæ	2.1	A0p	5 53 52.876	4.4021	−.0038	+44 56 28.51	0.529	−0.006
θ Aurigæ †	2.7	A0p	5 54 28.235	4.0918	+.0047	+37 12 31.02	+0.393	−0.091
1 Geminorum	4.3	G5	5 59 26.391	3.6476	+.0002	+23 16 7.57	−0.060	−0.109
1 G. Puppis †	6.2	F8	6 2 15.438	+1.7260	−.0088	−45 2 9.59	+0.028	+0.225
ν Orionis	4.4	B2	6 3 10.569	3.4265	+.0012	+14 46 44.07	−0.303	−0.025
η Geminorum †	*var.*	Ma	6 10 13.835	3.6227	−.0039	+22 31 49.55	0.911	−0.016
22 H. Camelopardalis	4.7	A0	6 10 21.932	6.6174	+.0025	+69 20 57.52	1.020	−0.114
2 Lyncis	4.4	A0	6 12 49.993	5.2981	+.0012	+59 2 27.10	1.092	+0.030
ζ Canis Majoris	3.1	B3	6 17 21.341	+2.3020	−.0006	−30 1 43.21	−1.540	−0.023
μ Geminorum	3.2	Ma	6 18 18.170	3.6906	+.0046	+22 33 16.11	1.714	−0.114
ψ^{1} Aurigæ	5.1	K2	6 18 58.292	4.6255	+.0029	+49 19 44.18	1.661	−0.004
β Canis Majoris	2.0	B1	6 19 18.505	2.6417	−.0006	−17 54 59.71	1.683	+0.004
8 Monocerotis †	4.5	A5	6 19 41.306	3.1802	−.0004	+ 4 37 59.36	1.711	+0.009
α Argus (*Canopus*)	−0.9	F0	6 22 14.557	+1.3320	+.0022	−52 39 11.61	−1.934	+0.009
10 Monocerotis	5.0	B3	6 24 9.503	2.9642	+.0010	− 4 42 48.07	2.103	+0.006
ν Geminorum	4.1	B5	6 24 23.482	3.5628	−.0005	+20 15 43.98	2.145	−0.016
8 Lyncis	6.0	G0	6 30 39.551	5.4904	−.0267	+61 33 3.29	2.949	−0.276
ξ^{2} Canis Majoris	4.5	A0	6 31 49.780	2.5158	+.0022	−22 54 8.23	2.740	+0.035
23 H. Camelopardalis	5.6	F8	6 33 7.316	+10.2861	−.0286	+79 39 5.07	−3.520	−0.632
γ Geminorum	1.9	A0	6 33 15.865	+ 3.4669	+.0033	+16 27 58.47	−2.947	−0.048

β Orionis, comp. 8^{m}.0, 9″.5 s. pr.
δ Orionis, star 6^{m}.9, 52″.6 n.
ι Orionis, comp. 7^{m}.3, 11″.5 s. f.

ζ Orionis, comp. 4^{m}.2, 2″.4 s. f.
α Orionis, rod star, var. irreg., 1^{m}.0–1^{m}.4
θ Aurigæ, comp. 7^{m}.5, 2″.5 n. pr.

1 Puppis, star 5^{m}.8, f. 12^{s}, 150″ s.
η Gem., var., 231^{d}.4, 3^{m}.2–4^{m}.2, comp. 8^{m}.8, 1″.2 n. pr.
8 Monoc., star 6^{m}.5, 13″.7 n. *f*

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
51 Aurigæ	5.7	K0	6 33 19.491	+4.1592	−.0020	+39 27 36.80	− 3.017	−0.113
ν Argus	3.2	B8	6 35 24.403	1.8368	+.0008	−43 7 40.15	3.104	−0.019
S Monocerotis †	4.7	Oe5	6 36 44.273	3.3046	.0000	+ 9 58. 5.35	3.207	−0.008
ϵ Geminorum	3.2	G5	6 39 11.746	3.6925	−.0001	+25 12 31.47	3.430	−0.018
ξ Geminorum	3.4	F5	6 40 58.106	3.3682	−.0076	+12 58 47.58	3.757	−0.193
ψ^5 Aurigæ	5.3	G0	6 41 11.597	+4.3291	+.0018	+43 39 20.27	− 3.424	+0.160
α Canis Majoris (*Sirius*) †	−1.6	A0	6 41 45.294	2.6434	−.0374	−16 36 34.35	4.838	−1.206
18 Monocerotis	4.7	K0	6 43 50.731	3.1280	−.0020	+ 2 29 51.32	3.827	−0.016
43 Camelopardalis	5.1	B5	6 45 24.765	6.4844	+.0021	+68 58 48.78	3.934	+0.012
α Pictoris	3.3	A5	6 47 24.180	0.6172	−.0104	−61 51 31.16	3.878	+0.238
θ Geminorum	3.6	A2	6 47 42.992	+3.9575	+.0010	+34 3 19.96	− 4.194	−0.050
τ Argus	2.8	K0	6 48 1.514	1.4883	+.0024	−50 31 21.94	4.277	−0.107
θ Canis Majoris	4.2	K2	6 50 36.775	2.7880	−.0091	−11 56 27.56	4.398	−0.007
15 Lyncis †	4.5	K0	6 50 37.037	5.2047	+.0021	+58 31 32.15	4.521	- 0.130
ϵ Canis Majoris †	1.6	B1	6 55 35.962	2.3575	−.0001	−28 51 58.91	4.813	+0.003
ζ Geminorum †	*var.*	G0	6 59 32.610	+3.5602	−.0002	+20 41. 4.20	− 5.156	- 0.007
o^2 Canis Majoris	3.1	B5p	6 59 48.550	2 5049	−.0006	−23 43 11.23	5.167	+0.005
γ Canis Majoris	4.1	B5	7 0 16.508	2.7148	+.0003	−15 31 6.54	5.221	−0.010
δ Canis Majoris	2.0	F8	7 5 15.560	2.4382	- .0015	−26 16 12.08	5.628	+0.003
63 Aurigæ	5.1	K2	7 6 21.783	4.1318	+.0052	+39 26 51.44	5.726	−0.003
51 Geminorum	5.3	Mb	7 8 57.104	+3.4476	+.0019	+16 17 27.18	− 5.982	- 0.042
γ^2 Volantis †	3.9	K0	7 9 24.263	−0.5038	+.0004	−70 22 27.11	5.900	+0.078
λ Geminorum	3.6	A2	7 13 40.171	+3.1498	−.0029	+16 40 49.62	6.378	−0.045
π Argus	2.7	K5	7 14 25.394	2.1190	.0008	−36 57 31.33	6.405	- 0.010
δ Geminorum †	3.5	F0	7 15 31.602	+3.5859	−.0010	+22 7 31.43	6.501	−0.015
δ Volantis	4.0	F5	7 16 52.835	−0.0214	+.0004	−67 48 58.97	− 6.605	- 0.006
ι Geminorum	3.9	K0	7 20 56.818	+3.7296	−.0086	+27 57 8.77	7.021	-0.087
η Canis Majoris	2.4	B5p	7 21 3.013	2.3738	+.0003	−29 9 7.16	6.935	+0.007
Groombridge 1308	5.8	K0	7 22 53.135	6.2680	+.0018	+68 37 30.22	7.137	−0.045
β Canis Minoris	3.1	B8	7 22 58.581	3.2551	−.0032	+ 8 26 44.12	7.147	−0.047
ρ Geminorum	4.2	F0	7 24 9.690	+3.8621	+.0118	+31 56 20.95	− 7.014	+0.183
σ Argus †	3.3	K5	7 26 47.211	1.9019	−.0071	−43 8 41.42	7.230	+0.180
α^2 Geminorum (*Castor*)	2.0	A0	7 29 41.397	3.8321	−.0144	+32 3 32.79	7.727	−0.082
α^1 Geminorum	2.8	A0	$\Delta\alpha$ − 0.225	....	...	$\Delta\delta$ − 4.09	...	...
25 Monocerotis	5.2	F5	7 33 26.954	2.9817	−.0066	− 3 56 16.45	7.927	+0.022
α Can. Min. (*Procyon*) †	0.5	F5	7 35 16.327	+3.1417	−.0172	+ 5 25 23.65	− 9.131	−1.036
24 Lyncis	5.0	A2	7 36 30.125	5.0897	−.0013	+58 53 32.11	8.249	−0.056
κ Geminorum †	3.7	G5	7 39 48.131	3.6256	- .0014	+24 35 1.69	8.516	- 0.060
β Geminorum (*Pollux*)	1.2	K0	7 40 36.420	3.6747	−.0170	+28 12 48.27	8.574	−0.054
4 Puppis	5.1	F2	7 42 24.144	2.7636	−.0003	−14 22 32.51	8.664	- 0.002
ξ Argus	3.5	G0	7 46 3.351	+2.5233	−.0004	−24 39 56.20	− 8.948	0.000
ϕ Geminorum	5.0	A2	7 48 47.291	3.6755	- .0020	+26 57 59.10	9.188	−0.027
26 Lyncis	5.7	K0	7 49 6.812	4.3788	−.0022	+47 45 56.33	9.192	−0.005
Groombridge 1374	5.6	K0	7 51 0.698	7.2291	- .0023	+74 7 33.44	9.371	−0.037
χ Argus	3.6	B3	7 54 49.298	1.5256	−.0043	−52 46 31.62	9.622	+0.006
ω Cancri	5.9	K0	7 56 16.474	+3.6328	+.0003	+25 36 17.07	− 9.743	−0.004
χ Geminorum	5.0	K0	7 58 47.576	3.6891	−.0012	+28 0 40.80	9.983	−0.053
27 Lyncis	4.9	A2	8 2 40.564	4.5266	−.0032	+51 43 48.54	10.227	−0.003
ρ Argus	2.9	F5	8 4 15.865	2.5547	−.0065	−24 4 52.88	10.291	+0.052
3 H. Ursæ Majoris	5.5	G5	8 5 10.278	6.0023	+.0002	+68 42 9.56	10.407	+0.005
γ Argus †	2.2	Oap	8 7 9.645	+1.8498	−.0003	−47 6 33.15	−10.571	−0.011
ζ Cancri (*mean*) †	4.7	G0	8 7 47.905	3.4437	+.0051	+17 52 52.41	10.736	−0.129
20 Puppis	5.0	G5	8 9 47.619	2.7579	−.0009	−15 33 19.05	10.754	+0.001
Bradley 1147	5.7	G5	8 9 54.725	7.5999	+.0077	+75 59 38.70	10.771	−0.008
β Cancri	3.8	K2	8 12 20.447	3.2551	−.0035	+ 9 25 26.04	10.994	−0.052
31 Lyncis	4.4	K5	8 17 34.371	+4.1183	+.0015	+43 26 11.25	−11.422	−0.100
d^1 Cancri	5.9	F0	8 18 57.447	+3.4381	−.0038	+18 34 49.66	−11.453	−0.031

S Monoc., comp. 8^m.3, 2″.9 s. pr.
15 Lyncis, dup., 4^m.9, 6^m.2, 0″.7
ϵ Can. Maj., comp. 9^m, 7″.8 s. f.
ζ Gem., var., 10^d.15, 3^m.7–4^m.3

γ^2 Volantis, comp. 5^m.8, 12″.9 n. pr.
δ Gem., comp. 8^m, 7″.0 s. pr.
σ Argus, star 8^m, 22″.4 n. f.
κ Gem., comp. 8^m.5, 6″.6 s. pr.

γ Argus, star 5^m, 42″.5 s. pr.
ζ Cancri, triple; binary 5^m.6, 6^m.3, 1″, with comp. 6^m.0, 5″.4 s. f.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page x remain to be applied to reduce to the positions of the stars.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ϵ Argus	1.7	K0p	8 20 56.114	+1.2330	−.0042	−59 15 40.88	−11.557	+0.008
30 Monocerotis	4.0	A0	8 21 48.864	+2.9993	−.0039	− 3 39 15.24	11.646	−0.019
θ Chamæleontis	4.3	K0	8 22 58.588	−1.7605	−.0451	−77 14 12.40	11.692	+0.018
o Ursæ Majoris	3.5	G0	8 23 52.980	+5.0060	−.0160	+60 58 37.57	11.886	−0.112
Groombridge 1450	6.0	K0	8 27 54.983	3.9071	−.0082	+38 16 53.85	12.236	−0.179
η Cancri	5.5	K0	8 28 15.551	+3.4733	−.0025	+20 42 13.38	−12.136	−0.055
Groombridge 1446	6.3	K0	8 31 11.094	6.7271	−.0043	+73 54 2.23	12.402	−0.117
δ Hydræ	4.2	A0	8 33 34.886	3.1776	−.0018	+ 5 58 23.59	12.464	−0.014
σ Hydræ	4.5	K0	8 34 44.072	3.1378	−.0008	+ 3 36 46.02	12.541	−0.013
γ Cancri	4.7	A0	8 38 50.012	3.4757	−.0071	+21 44 47.14	12.849	−0.043
δ Cancri	4.2	K0	8 40 18.735	+3.4128	−.0009	+18 26 17.66	−13.145	−0.240
α Pyxidis	3.7	B2	8 40 29.851	2.4112	−.0003	−32 54 29.08	12.907	+0.011
ι Cancri †	4.2	G5	8 42 2.557	3.6363	−.0006	+29 2 33.24	13.071	−0.051
δ Argus †	2.0	A0	8 42 34.411	1.6516	−.0035	−54 25 33.38	13.156	−0.100
ϵ Hydræ †	3.5	F8	8 42 42.017	3.1792	−.0127	+ 6 42 8.33	13.116	−0.048
σ^2 Cancri (*mean*) †	5.5	K0	8 49 33.092	+3.6662	+.0034	+30 52 19.37	−13.535	−0.021
ζ Hydræ	3.3	K0	8 51 19.547	3.1739	−.0060	+ 6 14 22.14	13.621	+0.007
ι Ursæ Majoris	3.1	A5	8 53 56.681	4.1192	−.0435	+48 20 42.05	14.043	−0.248
α Cancri	4.3	A3	8 54 16.697	3.2838	+.0021	+12 9 23.85	13.857	−0.042
b^1 Carinæ †	5.1	B3	8 55 5.306	1.4677	−.0031	−58 55 54.95	13.886	−0.019
κ Ursæ Majoris	3.7	A0	8 58 22.649	+4.1072	−.0027	+47 27 43.55	−14.140	−0.067
κ Cancri	5.1	B8	9 3 34.737	3.2519	−.0012	+10 58 44.10	14.406	−0.013
σ^2 Ursæ Majoris †	4.9	F8	9 3 38.535	5.3115	−.0003	+67 26 54.84	14.164	−0.066
λ Argus	2.2	K5	9 5 9.789	2.2066	−.0015	−43 7 16.74	14.496	−0.007
θ Hydræ	3.8	A0	9 10 21.600	3.1231	+.0088	+ 2 38 23.94	15.112	−0.312
β Argus	1.8	A0	9 12 21.673	+0.6670	−.0310	−69 23 59.76	−14.823	+0.094
83 Cancri	6.6	F5	9 14 41.249	3.3525	−.0076	+18 1 57.25	15.189	−0.136
ι Argus	2.2	F0	9 15 1.614	1.6039	−.0055	−58 57 5.93	15.066	+0.006
40 Lyncis	3.3	K5	9 16 22.178	3.6614	−.0178	+34 43 8.64	15.137	+0.012
θ Pyxidis	4.9	Ma	9 18 4.792	2.6516	−.0048	−25 38 15.04	15.279	−0.032
α Hydræ	2.2	K2	9 23 48.242	+2.9486	−.0010	− 8 19 26.59	−15.531	+0.033
h Ursæ Majoris	3.8	F0	9 25 28.747	4.7570	+.0183	+63 23 58.61	15.635	+0.024
ψ Argus †	3.6	F5	9 27 39.840	2.3599	−.0181	−40 7 45.88	15.739	+0 038
d Ursæ Majoris	4.6	G0	9 27 42.288	5.3169	−.0111	+70 10 11.88	15.708	+0 071
θ Ursæ Majoris	3.3	F8	9 27 43.080	4.0260	−.1026	+52 1 45.23	16.323	−0.542
ξ Leonis	5.1	G5	9 27 47.866	+3.2361	−.0063	+11 38 29.73	−15.868	−0.084
10 Leonis Minoris	4.6	G5	9 29 30.754	3.6828	+.0011	+36 44 25.23	15.898	−0.021
o Leonis	3.8	F5p	9 37 2.597	3.2043	−.0096	+10 14 36.48	16.303	−0.033
θ Antliæ	5.0	F5	9 40 46.120	2.6735	−.0036	−27 24 58.79	16.429	+0.029
ϵ Leonis	3.1	G0p	9 41 29.053	3.4095	−.0034	+24 7 45.98	16.516	−0.022
υ Argus †	3.2	F0	9 45 10.693	+1.5004	−.0025	−64 42 52.85	−16.692	−0.017
υ Ursæ Majoris	3.9	F0	9 45 31.763	4.2857	−.0382	+59 24 6.48	16.850	−0.157
6 Sextantis	6.0	A3	9 47 21.283	3.0213	+.0011	− 3 52 54.40	16.809	−0.028
μ Leonis	4.1	K0	9 48 23.252	3.4156	−.0171	+26 22 13.26	16.884	−0.054
Groombridge 1586	6.0	K0	9 51 32.113	5.4131	−.0197	+73 14 47.60	17.037	−0.060
19 Leonis Minoris	5.2	F5	9 52 58.498	+3.6822	−.0111	+41 25 23.30	−17.066	−0.022
ϕ Argus	3.7	B5	9 54 9.372	2.1023	−.0033	−54 12 3.80	17.119	−0.020
π Leonis	4.9	Ma	9 56 8.750	3.1716	−.0029	+ 8 24 51.45	17.215	−0.027
η Leonis	3.6	A0p	10 3 8.129	3.2717	−.0022	+17 8 19.59	17.499	−0.004
α Leonis (*Regulus*)	1.3	B8	10 4 16.407	3.1974	−.0169	+12 20 38.76	17.545	−0.002
λ Hydræ	3.8	K0	10 6 50.052	+2.9248	−.0137	−11 58 22.28	−17.738	−0.088
q Velorum	4.1	A2	10 11 29.967	2.5139	+.0153	−41 44 24.10	17.808	+0.032
ζ Leonis	3.6	F0	10 12 24.686	3.3408	+.0014	+23 48 5.86	17.885	−0.009
λ Ursæ Majoris	3.5	A0	10 12 27.672	3.6280	−.0142	+43 17 58.50	17.917	−0.038
32 Ursæ Majoris	5.7	A3	10 12 27.764	4.3844	−.0140	+65 29 35.55	17.891	−0.012
γ Leonis *pr.* †	2.6	K0	10 15 43.803	+3.3104	+.0212	+20 13 53.80	−18.158	−0.152
μ Ursæ Majoris	3.2	K5	10 17 44.951	+3.5831	−.0068	+41 53 14.45	−18.056	+0.027

ι Cancri, star 6^m.6, 30″.6 n. pr.
δ Argus, comp. 5^m, 2″ s.
ϵ Hydræ, triple; binary 3^m.5, 6^m.8, 0″.2, with comp. 7^m.8, 3″.3

σ^2 Cancri, dup., 5^m.9, 6^m.4, 1″.4
b^1 Carinæ, comp. 7^m.2, 5^s f.
σ^2 Urs. Maj., binary, 4^m.9, 8^m, 1″.3

ψ Argus, dup., 3^m.8, 6^m.0, 0″.8
υ Argus, comp. 6^m.0, 4″.9 s. f.
γ Leonis, comp. 3^m.8, 3″.7 s. f.

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			h m s	s	s	° ′ ″	″	″
30 H. Ursæ Majoris .	4.9	A0	10 18 36.299	+4.3528	−.0024	+65 57 23.48	−18.133	−0.018
μ Hydræ . .	4.1	K5	10 22 21.941	2.9009	−.0089	−16 26 33.63	18.332	−0.079
31 Leonis Minoris .	4.4	K0	10 23 26.244	3.4768	−.0094	+37 6 8.02	18.404	−0.112
α Antliæ . .	4.4	K5	10 23 37.572	2.7432	−.0060	−30 40 32.45	18.321	−0.023
36 Ursæ Majoris .	4.8	F5	10 25 42.717	3.8556	−.0208	+56 22 33.32	18.411	−0.039
9 H. Draconis .	5.0	G5	10 28 35.776	+5.1631	−.0084	+76 6 37.21	−18.481	−0.009
ρ Leonis . .	3.8	B0p	10 28 45.526	3.1610	−.0004	+ 9 42 12.08	18.481	−0.003
33 Sextantis . .	6.4	K0	10 37 29.148	3.0518	−.0100	− 1 20 9.99	18.870	−0.110
41 Leonis Minoris .	5.0	A2	10 39 13.973	3.2658	−.0084	+23 35 31.12	18.803	+0.009
θ Argus . .	3.0	B0	10 40 12.289	2.1340	−.0043	−63 59 28.90	18.869	−0.027
42 Leonis Minoris .	5.4	B9	10 41 35.262	+3.3407	−.0024	+31 5 17.81	−18.924	−0.041
η Argus . . †	*var.*	Pec.	10 42 4.166	2.3226	−.0002	−59 16 46.00	18.906	−0.009
μ Argus . . †	2.8	G5	10 43 27.206	2.5751	+.0066	−49 0 48.02	19.018	−0.081
δ^2 Chamæleontis . †	4.6	B3	10 45 4.551	0.5860	−.0192	−80 8 2.56	18.987	−0.004
l Leonis . .	5.3	A0	10 45 12.722	3.1558	+.0001	+10 57 10.57	19.020	−0.033
ν Hydræ . .	3.3	Ma	10 45 49.441	+2.9586	+.0061	−15 47 24.41	−18.793	+0.211
46 Leonis Minoris .	3.9	K0	10 49 0.646	3.3615	+.0074	+34 37 49.49	19.374	−0.283
54 Leonis . . †	4.5	A0	10 51 26.832	3.2517	−.0060	+25 9 38.91	19.173	−0.018
ι Antliæ . .	4.7	K0	10 53 7.888	2.7972	+.0112	−36 43 24.88	19.335	−0.138
Groombridge 1706 .	6.3	G5	10 53 50.490	4.8617	−.0264	+78 10 59.07	19.251	−0.035
α Crateris . .	4.2	K0	10 56 1.263	+2 9212	−.0327	−17 53 19.21	−19.161	+0.108
d Leonis . .	5.0	K0	10 56 35.074	3.0989	+.0001	+ 4 1 52.28	19.305	−0.022
β Ursæ Majoris .	2.4	A0	10 57 12.420	3.6357	+.0105	+56 47 43.75	19.271	+0.026
α Ursæ Majoris .	2.0	K0	10 58 59.480	3.7222	−.0164	+62 10 1.27	19.410	−0.071
χ Leonis . .	4.7	F0	11 1 2.780	3.0957	−.0234	+ 7 45 9.85	19.426	−0.040
p^4 Leonis . .	5.7	K0	11 2 58.613	+3.0611	−.0253	+ 2 22 26.23	−19.508	−0.080
ψ Ursæ Majoris .	3.2	K0	11 5 20.538	3.3822	−.0053	+44 54 59.76	19.510	−0.033
β Crateris . .	4.5	A2	11 7 52.114	2.9185	.0000	−22 24 19.20	19.635	−0.106
δ Leonis . .	2.6	A2	11 10 0.991	3.1942	+.0108	+20 56 44.76	19.711	−0.141
θ Leonis . .	3.4	A0	11 10 12.060	3.1197	−.0049	+15 51 2.38	19.658	−0.085
ν Ursæ Majoris .	3.7	K0	11 14 19.478	+3.2462	−.0018	+33 30 53.03	−19.622	+0.026
δ Crateris . .	3.8	K0	11 15 29.362	2.9979	−.0088	−14 21 42.01	19.473	+0.195
σ Leonis . .	4.1	A0	11 17 10.029	3.0947	−.0062	+ 6 27 5.86	19.708	−0.013
π Centauri . .	4.3	B5	11 17 29.365	2.7286	−.0041	−54 4 7.93	19.714	−0.013
ι Leonis . . †	4.0	F5	11 19 54.661	3.1281	+.0103	+10 57 12.75	19.822	−0.083
τ Leonis . .	5.2	K0	11 23 58.670	+3.0856	+.0008	+ 3 16 49.80	−19.814	−0.016
λ Draconis . .	4.1	Ma	11 26 51.176	3.5878	−.0072	+69 45 22.43	19.856	−0.021
ξ Hydræ . .	3.7	G5	11 29 12.687	2.9476	−.0158	−31 25 53.52	19.919	−0.055
λ Centauri . .	3.3	B9	11 32 13.157	2.7538	−.0073	−62 35 37.41	19.924	−0.027
υ Leonis . .	4.5	K0	11 33 0.371	3.0716	.0000	− 0 23 54.53	19.867	+0.039
π Chamæleontis .	5.7	F0	11 34 4.471	+2.4584	−.0321	−75 28 13.09	−19.939	−0.023
3 Draconis . .	5.5	K0	11 38 11.606	3.3664	−.0080	+67 10 16.08	19.920	+0.035
ζ Crateris . .	4.9	G5	11 40 51.458	3.0385	+.0018	−17 55 21.38	20.016	−0.041
χ Ursæ Majoris .	3.8	K0	11 41 59.519	3.1773	−.0128	+48 12 22.96	19.963	+0.020
β Leonis (*Denebola*)	2.2	A2	11 45 8.025	3.0619	−.0341	+15 0 9.20	20.121	−0.118
β Virginis . .	3.8	F8	11 46 41.062	+3.1252	+.0494	+ 2 11 55.45	−20.286	−0.275
Groombridge 1830 .	6.5	G5	11 48 32.807	3.4652	+.3398	+38 16 17.28	25.804	−5.784
γ Ursæ Majoris .	2.5	A0	11 49 47.360	3.1666	+.0115	+54 7 22.35	20.021	+0.004
π Virginis . .	4.6	A3	11 56 55.625	3.0741	−.0009	+ 7 2 37.27	20.075	−0.032
o Virginis . .	4.2	G5	12 1 17.249	3.0568	−.0148	+ 9 9 37.87	20.012	+0.032
δ Centauri . .	2.9	B3p	12 4 21.570	+3.0983	−.0050	−50 17 37.62	−20.071	−0.030
ϵ Corvi . .	3.2	K0	12 6 9.698	3.0824	−.0051	−22 11 29.81	20.035	+0.003
4 H. Draconis . .	5.1	A5	12 8 36.701	2.8383	+.0026	+78 2 38.64	20.011	+0.019
δ Crucis . .	3.1	B3	12 11 3.130	3.1792	+.0021	−58 19 15.69	20.060	−0.038
δ Ursæ Majoris .	3.4	A2	12 11 37.514	2.9815	+.0149	+57 27 37.41	20.014	+0.005
γ Corvi . . .	2.8	B8	12 11 50.598	+3.0826	−.0114	−17 6 51.85	−20.002	+0.017
2 Canum Venaticorum †	5.8	K5	12 12 16.445	+3.0142	+.0038	+41 5 18.89	−20.062	−0.046

η Argus, var. irreg., 1^m.6–6^m.6
μ Argus, comp. 7^m, 2″.2 n. f.

δ^2 Cham., star 5^m.5 pr. 32^s, 256″ n.
54 Leonis, comp. 6^m.3, 6″.4, s. f.

ι Leonis, comp. 6^m.8, 2″.6 n. f.
2 Can. Ven., star 8^m, 11″.6 s. pr.

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			h m s	s	s	° ′ ″	″	″
β Chamæleontis	4.4	B5	12 13 47.568	+3.4630	−.0188	−78 53 4.89	−19.992	+0.017
η Virginis	4.0	A0	12 15 57.985	3.0696	−.0036	− 0 14 20.45	20.024	−0.027
α^1 Crucis	1.6	B1	12 22 18.075	3.3176	−.0064	−62 40 21.37	19.990	−0.039
α^2 Crucis	2.1	B1	Δα + 0.620	....	...	Δδ − 1.78	....	...
20 Comæ	5.7	A2	12 25 51.324	3.0177	+.0036	+21 19 20.45	19.953	−0.036
δ Corvi †	3.1	A0	12 25 52.676	+3.1022	−.0140	−16 5 12.89	−20.066	−0.149
γ Crucis †	1.6	Mb	12 26 52.865	3.3079	−.0028	−56 40 55.26	20.168	−0.261
8 Canum Venaticorum	4.3	G0	12 30 5.470	2.8549	−.0616	+41 46 32.25	19.593	+0.279
κ Draconis	3.9	B5p	12 30 12.375	2.5735	−.0112	+70 12 45.08	19.861	+0.010
β Corvi	2.8	G5	12 30 20.283	3.1468	−.0008	−22 58 16.00	19.931	−0.061
24 Comæ *seq.* †	5.2	K0	12 31 16.094	+3.0102	−.0007	+18 48 2.42	−19.846	+0.013
α Muscæ	2.9	B3	12 32 34.353	3.5497	−.0088	−68 42 41.42	19.872	−0.029
χ Virginis	4.8	K0	12 35 16.201	3.0944	−.0056	− 7 34 19.38	19.839	−0.031
γ Centauri †	2.4	A0	12 37 15.733	3.2980	−.0196	−48 32 13.90	19.800	−0.020
γ Virginis (*mean*) †	2.9	F0	12 37 45.530	3.0401	−.0365	− 1 1 38.25	19.770	+0.004
ρ Virginis	5.0	A0	12 37 59.272	+3.0371	+.0058	+10 39 34.61	−19.877	−0.107
76 Ursæ Majoris	5.9	A0	12 38 12.429	2.6285	−.0065	+63 8 8.16	19.785	−0.018
β Crucis	1.5	B1	12 43 12.560	3.4877	−.0064	−59 16 5.49	19.723	−0.033
31 Comæ	5.1	G0	12 47 56.948	2.9232	−.0022	+27 57 33.71	19.632	−0.024
n Centauri	4.3	A5	12 49 9.948	3.3151	+.0060	−39 45 37.51	19.620	−0.035
ε Ursæ Majoris (*Alioth*)	1.7	A0p	12 50 38.817	+2.6460	+.0138	+56 22 39.03	−19.570	−0.013
δ Virginis	3.7	Ma	12 51 43.434	3.0210	−.0318	+ 3 48 56.19	19.597	−0.060
α Canum Venat. *seq.* †	2.9	A0p	12 52 25.715	2.8094	−.0203	+38 44 2.12	19.474	+0.049
δ Muscæ	3.6	K2	12 56 56.736	4.0843	+.0197	−71 8 1.95	19.460	−0.031
ε Virginis	3.0	K0	12 58 20.632	2.9864	−.0186	+11 22 21.64	19.384	+0.015
θ Virginis †	4.4	A0	13 5 57.657	+3.1039	−.0029	− 5 7 41.85	−19.260	−0.040
43 Comæ	4.3	G0	13 8 16.932	2.8019	−.0599	+28 16 5.32	18.283	+0.878
20 Canum Venaticorum	4.7	F0	13 14 5.617	2.6946	−.0094	+40 58 39.64	18.991	+0.015
γ Hydræ	3.3	G5	13 14 43.877	3.2570	+.0046	−22 45 56.48	19.011	−0.053
ι Centauri	2.9	A2	13 16 15.645	3.3641	−.0294	−36 18 23.68	19.042	−0.097
ζ^1 Ursæ Maj. (*Mizar*) †	2.4	A0p	13 20 49.777	+2.4208	+.0153	+55 19 37.61	−18.811	−0.030
ζ^2 Ursæ Majoris	4.0	A0	Δα + 0.920	....	...	Δδ −12.43	....	...
α Virginis (*Spica*)	1.2	B2	13 21 8.036	3.1580	−.0028	−10 45 35.23	18.834	−0.032
Groombridge 2001	6.1	K5	13 24 10.063	1.5249	+.0012	+72 47 27.52	18.727	−0.019
70 Virginis	5.2	G5	13 24 39.831	2.9340	−.0168	+14 11 22.54	19.277	−0.584
ζ Virginis	3.4	A2	13 30 46.064	+3.0550	−.0195	− 0 12 9.52	−18.454	+0.039
17 H. Canum Venaticorum	5.0	F0	13 31 21.660	2.6810	+.0073	+37 34 35.65	18.477	−0.004
ε Centauri	2.6	B1	13 34 59.828	3.7850	−.0039	−53 4 32.27	18.387	−0.039
m Virginis	5.2	Ma	13 37 34.075	3.1461	−.0073	− 8 18 53.93	18.223	+0.032
τ Boötis	4.5	F5	13 43 36.176	2.8508	−.0341	+17 50 23.73	18.005	+0.026
η Ursæ Majoris (*Alkaid*)	1.9	B3	13 44 30.546	+2.3672	−.0118	+49 41 49.43	−18.019	−0.023
89 Virginis	5.1	K0	13 45 41.016	3.2554	−.0077	−17 45 4.11	17.992	−0.041
ζ Centauri	3.1	B2p	13 50 43.591	3.7294	−.0070	−46 54 36.33	17.814	−0.064
η Boötis	2.8	G0	13 51 1.108	2.8567	−.0014	+18 46 59.32	18.102	−0.363
11 Boötis	6.1	A3	13 57 41.057	2.7213	−.0060	+27 45 28.26	17.455	+0.005
τ Virginis	4.3	A2	13 57 43.578	+3.0518	+.0010	+ 1 54 59.59	−17.487	−0.029
θ Apodis †	*var.*	Mb	13 57 46.229	5.7641	−.0293	−76 25 33.80	17.485	−0.029
β Centauri	0.9	B1	13 58 22.493	4.2126	−.0033	−60 0 8.35	17.463	−0.033
π Hydræ	3.5	K0	14 1 58.907	3.4112	+.0031	−26 18 43.73	17.418	−0.146
θ Centauri	2.3	K0	14 2 8.646	3.5222	−.0437	−35 59 30.63	17.790	−0.525
α Draconis	3.6	A0	14 2 18.301	+1.6248	−.0071	+64 44 36.51	−17.247	+0.011
d Boötis	4.8	F5	14 6 53.285	2.7369	−.0014	+25 27 20.49	17.128	−0.078
κ Virginis	4.3	K0	14 8 47.140	+3.1978	+.0006	− 9 54 57.61	16.830	+0.132
4 Ursæ Minoris	5.0	K0	14 9 7.406	−0.2697	−.0108	+77 54 33.35	16.921	+0.026
ι Virginis	4.2	F5	14 11 58.450	+3.1433	−.0012	− 5 38 1.30	17.240	−0.427
α Boötis (*Arcturus*)	0.2	K0	14 12 8.915	+2.7357	−.0779	+19 34 57.51	−18.808	−2.004
λ Boötis	4.3	A0	14 13 27.503	+2.2827	−.0172	+46 26 28.69	−16.591	+0.151

δ Corvi, star 8^m, 24″.4 s. pr.
γ Crucis, star $6^m.6$, 85″ n. f.
24 Comæ, star $6^m.7$, 20″.6 pr.
γ Cent., dup., $3^m.1$, $3^m.1$, 1″.7

γ Virginis, binary, $3^m.7$, $3^m.7$, 6″.4, P=321°
α Can. Ven., star 5^m, 19″.8 s. pr.
θ Virginis, comp. 9^m, 7″.1 n. pr.

ζ^1 Urs. Maj., star Alcor $4^m.0$, f. $78^s.9$, 222″ n.
θ Apodis, var. irreg., $5^m.5$–$6^m.6$

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			h m s	s	s	° ′ ″	″	″
λ Virginis	4.6	A2	14 14 56.361	+3.2419	−.0024	−13 1 2.65	−16.649	+0.021
2 Libræ	6.3	K0	14 19 16.824	3.2248	−.0014	−11 21 47.08	16.522	−0.067
θ Boötis	4.1	F8	14 22 34.589	2.0432	−.0254	+52 12 21.99	16.695	−0.406
f Boötis	5.4	A5	14 22 52.444	2.7902	−.0052	+19 34 20.51	16.260	+0.015
φ Virginis †	5.0	K0	14 24 13.995	+3.0897	−.0090	− 1 53 0.45	16.209	−0.004
5 Ursæ Minoris	4.4	K2	14 27 40.037	−0.1535	+.0022	+76 2 18.11	−16.005	+0.021
ρ Boötis	3.8	K0	14 28 30.727	+2.5864	−.0073	+30 42 31.48	15.868	+0.113
γ Boötis	3.0	F0	14 28 58.702	2.4170	−.0091	+38 38 40.00	15.812	+0.145
η Centauri	2.6	B3p	14 30 36.617	3.8000	−.0032	−41 49 13.39	15.902	−0.032
σ Boötis	4.5	F0	14 31 19.714	2.6130	+.0150	+30 4 44.32	15.707	+0.125
α Centauri †	0.1	G0	14 34 21.402	+4.0605	−.4866	−60 31 6.45	−14.947	+0.721
33 Boötis	5.4	A0	14 35 58.373	2.2340	−.0056	+44 44 9.76	15.623	−0.043
α Apodis	3.8	K5	14 38 12.870	7.3302	−.0088	−78 43 10.47	15.479	−0.024
μ Virginis	4.0	F5	14 39 0.005	3.1595	+.0071	− 5 19 27.25	15.733	−0.322
ε Boötis †	2.7	K0p	14 41 37.456	2.6203	−.0035	+27 23 53.00	15.254	+0.009
109 Virginis	3.8	A0	14 42 21.276	+3.0318	−.0074	+ 2 12 59.58	−15.257	−0.035
8 Libræ	5.3	F5	14 46 25.445	3.3145	−.0073	−15 40 40.47	15.062	−0.074
α Libræ	2.9	A2	14 46 36.895	3.3150	−.0078	−15 43 21.59	15.054	−0.077
Groombridge 2164	5.7	K2	14 49 29.048	+1.5209	−.0165	+59 36 23.04	14.692	+0.118
β Ursæ Minoris	2.2	K5	14 50 54.862	−0.1967	−.0065	+74 28 12.48	14.722	+0.003
Piazzi 221	5.8	A0	14 52 35.073	+2.8300	−.0021	+14 45 23.96	−14.636	−0.011
ξ^2 Libræ	5.6	K0	14 52 35.187	3.2515	−.0006	−11 5 59.34	14.626	−0.001
β Lupi	2.8	B2p	14 53 28.669	3.9162	−.0070	−42 49 29.92	14.634	−0.062
δ Libræ †	*var.*	A0	14 56 51.305	3.2022	−.0051	− 8 12 51.49	14.382	−0.015
β Boötis	3.6	G5	14 59 2.742	2.2600	−.0036	+40 41 36.77	14.273	−0.040
γ Scorpii	3.4	Ma	14 59 33.547	+3.5065	−.0056	−24 58 48.75	−14.249	−0.048
ψ Boötis	4.7	K0	15 1 8.757	2.5701	−.0133	+27 14 49.48	14.117	−0.014
c Boötis	5.0	F0	15 3 55.135	2.6348	+.0136	+25 10 5.37	14.114	−0.184
ζ Lupi	3.5	K0	15 6 44.585	4.2961	−.0126	−51 48 25.62	13.817	−0.066
ι Libræ	4.7	A0p	15 7 49.683	3.4155	−.0031	−19 30 5.06	13.735	−0.053
3 Serpentis	5.4	K0	15 11 21.589	+2.9805	−.0017	+ 5 13 27.58	−13.459	−0.005
γ Trianguli Australis	3.1	A0	15 11 41.719	5.5639	−.0137	−68 23 48.13	13.474	−0.042
δ Boötis	3.5	K0	15 12 23.922	2.4194	+.0075	+33 36 4.47	13.512	−0.125
β Libræ	2.7	B8	15 12 51.646	+3.2258	−.0066	− 9 5 59.08	13.381	−0.024
γ Ursæ Minoris	3.1	A2	15 20 50.387	−0.1099	−.0020	+72 6 28.60	12.815	+0.013
μ Boötis *pr.* †	4.5	F0	15 21 34.894	+2.2665	−.0121	+37 38 47.28	−12.697	+0.081
τ^1 Serpentis	5.5	Ma	15 22 13.004	2.7803	−.0024	+15 41 52.14	12.760	−0.024
ι Draconis	3.5	K0	15 23 12.997	1.3344	+.0014	+59 14 6.99	12.658	+0.010
32 Libræ	5.9	K0	15 23 54.630	3.3799	+.0006	−16 26 56.75	12.664	−0.043
β Coronæ Borealis	3.7	Fp	15 24 39.266	2.4740	−.0130	+29 22 13.09	12.492	+0.078
ν^1 Boötis	5.2	K5	15 28 9.814	+2.1554	+.0016	+41 5 41.24	−12.344	−0.014
γ Lupi (*mean*) †	3.0	B3	15 30 0.161	3.9895	−.0020	−40 54 33.62	12.251	−0.049
γ Libræ	4.0	K0	15 31 12.974	3.3534	+.0047	−14 32 1.05	12.111	+0.007
α Coronæ Borealis	2.3	A0	15 31 25.629	2.5396	+.0090	+26 58 22.53	12.203	−0.100
ζ Coronæ Borealis *seq.* †	5.1	B8	15 36 28.710	2.2598	−.0005	+36 53 6.12	11.760	−0.012
α Serpentis	2.8	K0	15 40 28.422	+2.9535	+.0089	+ 6 40 0.90	−11.421	+0.043
β Serpentis	3.7	A2	15 42 38.026	2.7688	+.0054	+15 39 42.43	11.363	−0.055
κ Serpentis	4.3	K5	15 45 16.362	2.6998	−.0035	+18 22 42.00	11.216	−0.100
12 H. Draconis	5.1	A2	15 45 29.318	0.9090	+.0047	+62 50 13.63	11.169	−0.068
μ Serpentis	3.6	A0	15 45 35.979	+3.1291	−.0058	− 3 11 44.17	11.121	−0.028
ζ Ursæ Minoris	4.3	A2	15 46 46.529	−2.1878	+.0082	+78 1 55.35	−11.010	−0.004
ε Serpentis	3.8	A0	15 46 58.557	+2.9889	+.0081	+ 4 42 31.26	10.922	+0.070
β Trianguli Australis	3.0	F0	15 48 20.575	5.2641	−.0290	−63 11 40.84	11.300	−0.408
λ Libræ	5.1	B3	15 48 51.619	3.4786	−.0017	−19 56 17.49	10.900	−0.016
γ Serpentis	3.9	F8	15 52 53.726	2.7702	+.0212	+15 54 43.12	11.844	−1.289
π Scorpii	3.0	B2p	15 54 11.390	+3.6252	−.0010	−25 53 37.23	−10.508	−0.048
ε Coronæ Borealis	4.2	K0	15 54 23.903	+2.4825	−.0065	+27 5 59.78	−10.511	−0.067

φ Virginis, comp. 9^m, 4″.5 s. f.
ε Boötis, comp. 5^m.1, 2″.8 n. pr.
δ Libræ, var., 2^d.33, 4^m.8–6^m.2
μ Boötis, star 6^m.7, 108″ s.
γ Lupi, binary, 3^m.7, 3^m.9, 0″.4
ζ Cor. Bor., comp. 6^m.0, 6″.2 n. pr.

α Centauri, dup., 0^m.3, 1^m.7; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page x remain to be applied to reduce to the position of α^2 Centauri.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
δ Scorpii	2.5	B1p	15 55 46.590	+3.5436	−.0011	−22 24 13.52	−10.375	−0.035
θ Draconis	4.1	F8	16 0 26.712	1.1228	−.0392	+58 46 13.86	9.650	+0.338
β Scorpii †	2.9	B1	16 0 57.345	3.4846	−.0011	−19 35 44.95	9.978	−0.028
κ Herculis †	5.3	G5	16 4 35.869	2.7054	−.0039	+17 15 3.21	9.696	−0.023
Groombridge 2320	5.4	A0	16 6 6.401	0.1560	−.0074	+68 0 45.96	9.505	+0.052
φ Herculis	4.3	A0	16 6 20.604	+1.8901	−.0017	+45 8 10.07	−9.502	+0.036
δ^1 Apodis	4.8	Mb	16 8 46.943	8.8803	−.0050	−78 30 17.06	9.406	−0.056
δ Ophiuchi	3.0	Ma	16 10 18.507	3.1421	−.0031	− 3 29 49.54	9.376	−0.144
σ Coronæ Bor. *seq.* †	5.8	G0	16 11 47.664	+2.2161	−.0223	+34 3 11.21	9.188	−0.072
19 Ursæ Minoris	5.5	B8	16 12 59.965	−1.7384	+.0007	+76 4 19.04	9.014	+0.008
γ^2 Normæ	4.1	K0	16 14 4.037	+4.4750	−.0216	−49 58 5.39	−9.002	−0.064
ε Ophiuchi	3.3	K0	16 14 14.704	3.1725	+.0054	− 4 30 21.23	8.888	+0.037
σ Scorpii †	3.1	B1	16 16 30.275	3.6128	−.0011	−25 24 33.63	8.786	−0.039
τ Herculis	3.9	B5	16 17 25.576	1.8035	+.0001	+46 29 45.54	8.646	+0.029
γ Herculis	3.8	F0	16 18 31.350	+2.6457	−.0031	+19 19 58.50	8.552	+0.037
η Ursæ Minoris	5.0	F0	16 19 44.032	−1.7811	−.0232	+75 56 0.14	−8.240	+0.252
γ Apodis	3.9	K0	16 21 35.333	+9.1277	−.0408	−78 43 38.22	8.428	−0.083
ω Herculis	4.5	Ap	16 21 51.418	2.7622	−.0028	+14 12 34.42	8.383	−0.059
η Draconis †	2.9	G5	16 22 56.743	0.8093	−.0020	+61 41 17.36	8.179	+0.058
α Scorpii (*Antares*) †	1.2	Map	16 24 40.972	3.6753	−.0006	−26 15 44.61	8.127	−0.028
β Herculis	2.8	K0	16 26 54.497	+2.5777	−.0076	+21 39 22.77	−7.945	−0.025
λ Ophiuchi †	3.8	A0	16 27 1.700	+3.0211	−.0022	+ 2 9 4.93	7.989	−0.079
A Draconis	5.0	B8p	16 28 7.559	−0.1264	−.0019	+68 56 5.13	7.786	+0.036
τ Scorpii	2.9	B0	16 31 5.124	+3.7308	−.0013	−28 3 27.44	7.617	−0.034
σ Herculis	4.2	A0	16 31 37.218	1.9338	−.0006	+42 35 41.67	7.514	+0.026
ζ Ophiuchi	2.7	B0	16 32 55.002	+3.3015	+.0007	−10 24 44.23	−7.412	+0.022
24 Scorpii	5.0	K0	16 37 7.022	3.4671	−.0017	−17 35 39.47	7.096	−0.004
ζ Herculis †	3.0	G0	16 38 22.987	2.2616	−.0364	+31 44 29.24	6.599	+0.390
η Herculis	3.6	K0	16 40 15.320	2.0561	+.0031	+39 4 4.15	6.928	−0.093
α Trianguli Australis	1.9	K2	16 40 29.723	6.3306	+.0028	−68 53 18.81	6.861	−0.049
Groombridge 2377	4.9	F0	16 43 50.173	+1.1381	+.0015	+56 55 8.61	−6.478	+0.062
ε Scorpii	2.4	K0	16 45 10.311	3.8810	−.0505	−34 9 17.97	6.693	−0.264
49 Herculis	6.4	A0	16 48 34.466	2.7305	+.0010	+15 6 8.06	6.160	−0.014
ϵ^1 Aræ	4.2	K2	16 53 26.384	4.7735	−.0011	−53 2 38.62	5.756	−0.017
κ Ophiuchi	3.4	K0	16 54 1.345	2.8385	−.0199	+ 9 29 37.11	5.702	−0.011
30 Ophiuchi	5.0	K0	16 56 59.978	+3.1634	−.0017	− 4 6 29.75	−5.517	−0.076
ε Herculis	3.9	A0	16 57 20.574	2.2949	−.0036	+31 2 19.92	5.389	+0.023
d Herculis	5.3	A2	16 58 45.690	2.2123	−.0016	+33 40 43.62	5.301	−0.009
η Ophiuchi †	2.6	A0	17 5 57.577	3.4380	+.0017	−15 37 50.88	4.591	+0.091
η Scorpii	3.4	F2	17 6 38.078	4.2936	+.0023	−43 8 21.84	4.931	−0.306
ζ Draconis	3.2	B5	17 8 33.663	+0.1705	−.0021	+65 48 33.61	−4.444	+0.018
α Herculis †	*var.*	Mb	17 11 8.138	2.7347	−.0008	+14 28 37.12	4.212	+0.029
δ Herculis †	3.2	A0	17 11 52.076	2.4634	−.0019	+24 55 44.52	4.337	−0.158
π Herculis	3.4	K2	17 12 21.847	2.0887	−.0025	+36 53 42.27	4.137	−0.001
θ Ophiuchi	3.4	B3	17 17 16.713	3.6824	−.0006	−24 55 26.73	3.751	−0.036
w Herculis	5.4	G0	17 17 46.625	+2.2433	+.0096	+32 33 56.91	−4.719	−1.047
β Aræ	2.8	K2	17 18 53.716	4.9826	−.0004	−55 27 31.53	3.603	−0.027
b Ophiuchi	4.3	F0	17 21 39.915	3.6611	−.0009	−24 6 21.62	3.475	−0.137
σ Ophiuchi	4.4	K0	17 22 41.608	2.9759	+.0002	+ 4 12 22.37	3.241	+0.008
δ Aræ	3.8	B8	17 24 8.480	5.4078	−.0097	−60 37 18.65	3.244	−0.120
α Aræ	3.0	B3p	17 25 53.175	+4.6340	−.0036	−49 49 0.67	−3.056	−0.083
λ Herculis	4.5	K0	17 27 37.567	2.4243	+.0016	+26 10 3.87	2.804	+0.018
λ Scorpii	1.7	B2	17 28 22.661	4.0716	−.0003	−37 2 56.42	2.784	−0.027
β Draconis	3.0	G0	17 28 41.520	1.3546	−.0017	+52 21 28.10	2.721	+0.009
α Ophiuchi	2.1	A5	17 31 21.561	2.7840	+.0080	+12 36 53.66	2.733	−0.235
ξ Serpentis	3.6	A5	17 33 10.541	+3.4333	−.0038	−15 21 4.49	−2.401	−0.060
ι Herculis	3.8	B3	17 37 17.489	+1.6938	+.0003	+46 2 47.89	−1.980	+0.003

β Scorpii, comp. $5^m.1$, 13″.3 n. f.
κ Herculis, star $6^m.5$, 29″.7 n. f.
σ Cor. Bor., comp. $6^m.7$, 4″.6 s. pr.
σ Scorpii, star 8^m, 21″ pr.
η Draconis, comp. 8^m, 5″.4 s. f.

α Scorpii, comp. 7^m, 3″.2 pr.
λ Ophiuchi, comp. 6^m, 1″.2 n. f.
ζ Herculis, binary, $3^m.0$, $6^m.0$, 1″.
η Oph., binary, $3^m.2$, $3^m.7$, 0″.5

α Herculis, var. irreg., $3^m.1$–$3^m.9$, dup., comp. 6^m, 4″.6 s. f.
δ Herculis, binary, comp. 8^m, 11″ s. pr.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ω Draconis	4.9	F5	17 37 24.018	−0.3533	+.0013	+68 47 37.10	−1.655	+0.318
η Pavonis	3.6	K0	17 38 10.213	+5.8829	−.0027	−64 41 21.13	1.986	−0.080
β Ophiuchi	2.9	K0	17 39 40.091	2.9631	−.0026	+ 4 35 54.02	1.618	+0.158
ι^1 Scorpii	3.1	F5p	17 42 11.922	+4.1952	+.0006	−40 5 55.21	1.563	−0.008
ψ Draconis †	4.9	F5	17 43 18.219	−1.0727	+.0025	+72 11 13.35	1.727	−0.268
μ Herculis	3.5	G5	17 43 26.656	+2.3473	−.0237	+27 45 53.19	−2.196	−0.749
γ Ophiuchi	3.7	A0	17 44 1.857	3.0074	−.0016	+ 2 44 6.49	1.468	−0.073
ξ Draconis	3.9	K0	17 52 11.913	1.0383	+.0130	+56 53 3.58	0.605	+0.077
89 Herculis	5.5	F2	17 52 18.835	+2.4209	+.0013	+26 3 40.69	0.666	+0.006
35 Draconis	5.0	F5	17 52 53.661	−2.6894	+.0114	+76 58 26.51	0.378	+0.213
θ Herculis	4.0	K0	17 53 36.720	+2.0572	+.0006	+37 15 35.53	−0.554	+0.004
ξ Herculis	3.8	K0	17 54 46.367	2.3317	+.0072	+29 15 18.99	0.475	−0.018
ν Ophiuchi	3.5	K0	17 54 47.206	3.3021	−.0006	− 9 45 55.47	0.576	−0.120
γ Draconis	2.4	K5	17 54 49.073	1.3927	−.0006	+51 29 50.46	0.477	−0.024
67 Ophiuchi	3.9	B5p	17 56 47.331	3.0050	+.0008	+ 2 56 2.81	−0.294	−0.013
θ Aræ	3.9	B1	18 0 38.186	+4.6700	−.0010	−50 5 54.88	+0.005	−0.050
γ Sagittarii	3.1	K0	18 0 51.594	3.8521	−.0055	−30 25 35.40	−0.123	−0.198
70 Ophiuchi †	4.1	K0	18 1 33.750	3.0318	+.0178	+ 2 30 57.88	0.985	−1.122
72 Ophiuchi	3.7	A2	18 3 41.908	2 8434	−.0015	+ 9 33 6.80	+0.410	+0.087
o Herculis	3.8	A0	18 4 32.296	2.3396	−.0002	+28 45 3.28	+0.399	+0.002
μ Sagittarii	4.0	B8p	18 9 9.465	+3.5870	−.0004	−21 4 49.14	+0.799	−0.002
η Sagittarii	3.2	Mb	18 12 25.054	4.0596	−.0109	−36 47 9.65	0.933	−0.153
Groombridge 2533	5.4	B5	18 13 15.041	1.8654	−.0006	+42 7 56.42	1.157	−0.001
36 Draconis	5.0	F5	18 13 27.224	0.3155	+.0535	+64 22 15.51	1.202	+0.026
δ Sagittarii	2.8	K0	18 16 3.866	3.8405	+.0023	−29 51 44.21	1.370	−0.034
η Serpentis	3.4	K0	18 17 19.465	+3.1029	−.0378	− 2 55 11.60	+0.822	−0.692
ϵ Sagittarii	2.0	A0	18 19 3.643	3.9813	−.0041	−34 25 20.40	1.513	−0.122
109 Herculis	3.9	K0	18 20 24.977	2.5561	+.0139	+21 44 0.63	1.522	−0.261
α Telescopii	3.8	B3	18 21 15.864	+4.4496	−.0016	−46 0 45.06	1.789	−0.068
χ Draconis	3.7	F8	18 22 26.878	−1.0792	+.1178	+72 41 58.97	1.589	−0.371
λ Sagittarii	2.9	K0	18 23 13.127	+3.7026	−.0033	−25 27 56.76	+1.828	−0.199
c Serpentis	5.4	G5	18 25 40.524	3.1215	+.0015	− 2 2 10.62	2.206	−0.035
1 Aquilæ	4.1	K0	18 31 1.007	3.2646	−.0013	− 8 17 56.80	2.389	−0.315
ζ Pavonis	4.1	K0	18 34 2.540	7.0163	−.0056	−71 29 47.57	2.802	−0.165
α Lyræ (*Vega*)	0.1	A0	18 34 19.884	2.0315	+.0177	+38 42 40.19	3.272	+0.280
2 Aquilæ	4.7	F0	18 38 3.536	+3.2865	+.0020	− 9 7 38.89	+3.308	−0.006
ϕ Sagittarii	3.3	B8	18 40 50.755	3.7484	+.0034	−27 4 16.61	3.547	−0.006
110 Herculis	4.3	F5	18 42 20.803	2.5805	−.0019	+20 28 17.49	3.339	−0.344
6 Aquilæ	4.5	G0	18 43 5.328	3.1828	−.0009	− 4 49 53.31	3.723	−0 023
λ Pavonis	4.4	B2	18 45 5.174	5.5637	−.0030	−62 16 39.81	3.896	−0.022
β Lyræ †	*var.*	B2p	18 47 14.207	+2.2118	+.0001	+33 16 20.63	+4.097	−0.003
50 Draconis	5.4	A0	18 48 52.048	−1.9213	−.0032	+75 20 36.92	4.293	+0.051
o Draconis †	4.8	K0	18 50 4.058	+0.8878	+.0116	+59 17 37.93	4.368	+0.023
σ Sagittarii	2.1	B3	18 50 29.433	3.7196	−.0003	−26 23 37.92	4.306	−0.075
θ Serpentis *pr.* †	4.5	A5	18 52 23.475	2.9821	+.0027	+ 4 6 8.11	4.570	+0.028
R Lyræ †	*var.*	Mb	18 52 59.544	+1.8260	+.0026	+43 50 38.18	+4.672	+0.078
γ Lyræ	3.3	A0	18 56 3.759	2.2436	−.0006	+32 34 58.78	4.819	−0.006
ϵ Aquilæ	4.2	K0	18 56 7.634	2.7221	−.0042	+14 57 45.34	4.779	−0.081
ζ Sagittarii †	2.7	A2	18 57 42.789	3.8173	−.0024	−29 59 30.50	4.975	−0.019
ζ Aquilæ	3.0	A0	19 1 52.239	2.7569	−.0008	+13 44 52.54	5.247	−0.099
λ Aquilæ	3.6	A0	19 2 9.751	+3.1834	−.0020	− 4 59 56.56	+5.288	−0.083
α Coronæ Australis	4.1	A2	19 4 14.053	4.0322	+.0051	−38 1 33.88	5.127	−0.118
ι Lyræ	5.1	B5	19 4 33.268	2.1413	+.0005	+35 58 42.91	5.565	−0.006
π Sagittarii	3.0	F2	19 5 11.124	3.5684	−.0005	−21 8 50.17	5.589	−0.036
ψ Sagittarii	4.9	F5	19 10 49.207	3.6795	+.0025	−25 23 26.68	6.061	−0.035
δ Draconis	3.2	K0	19 12 32.541	+0.0204	+.0175	+67 31 33.81	+6.327	+0.088
d Sagittarii	5.0	K0	19 13 7.822	+3.5104	−.0015	−19 5 28.33	+6.271	−0.017

ψ Draconis, star 6^m.1, 30″.4 n. f.
70 Ophiuchi, comp. 6^m, 5″.9 s. f.

β Lyræ, var., 12^d.9, 3^m.4–4^m.1, star 7^m, 46″ s. f.
o Draco., star 7^m.6, 32″.1 n. pr.

θ Serpentis, star 5^m.4, 22″.2 s. f.
R Lyræ, var., 46^d.4, 4^m.0–4^m.7
ζ Sag., binary, 3^m.4, 3^m.6, 0″.5

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			h m s	s	s	° ′ ″	″	″
θ Lyræ	4.5	K0	19 13 41.673	+2.0809	−.0015	+37 59 45.18	+ 6.341	+0.006
ω Aquilæ	5.1	A5	19 14 12.131	2.8158	−.0002	+11 27 19.77	6.391	+0.014
κ Cygni	4.0	K0	19 15 19.456	+1.3876	+.0071	+53 13 33.02	6.592	+0.122
τ Draconis	4.6	K0	19 17 2.706	−1.1403	−.0312	+73 12 46.72	6.721	+0.109
δ Aquilæ	3.4	F0	19 21 36.968	+3.0248	+.0168	+ 2 57 36.56	7.070	+0.082
β Cygni †	3.2	K0p	19 27 36.940	+2.4190	−.0002	+27 47 49.15	+ 7.468	−0.010
ι Cygni	3.9	A2	19 27 45.915	1.5131	+.0023	+51 33 54.59	7.619	+0.129
μ Aquilæ	4.6	K0	19 30 19.700	2.9311	+.0145	+ 7 12 52.34	7.551	−0.146
h Sagittarii	4.7	B9	19 32 1.374	3.6522	+.0015	−25 3 17.44	7.807	−0.027
κ Aquilæ	5.0	B0	19 32 45.009	3.2285	+.0005	− 7 11 58.85	7.894	+0.002
θ Cygni	4.6	F5	19 34 22.616	+1.6088	−.0024	+50 2 31.66	+ 8.274	+0.250
54 Sagittarii	5.4	K0	19 36 18.797	3.1381	+.0016	−16 28 15.61	8.131	−0.047
β Sagittæ	4.4	K0	19 37 35.407	2.6939	+.0001	+17 17 48.10	8.218	−0.032
15 Cygni	5.0	K0	19 41 30.018	2.1641	+.0068	+37 10 3.74	8.631	+0.041
f Sagittarii	5.1	K0	19 41 52.301	3.5007	−.0099	−19 56 50.45	8.531	−0.088
δ Cygni †	3.0	A0	19 42 34.153	+1.8760	+.0055	+44 56 31.50	+ 8.719	+0.044
γ Aquilæ	2.8	K2	19 42 35.929	2.8519	+.0007	+10 25 28.46	8.674	−0.003
δ Sagittæ	3.8	Map	19 43 57.264	2.6719	+.0001	+18 20 36.36	8.801	+0.017
α Aquilæ (*Altair*)	0.9	A5	19 47 1.586	+2.9270	+.0360	+ 8 39 49.94	9.403	+0.379
ϵ Draconis †	4.0	K0	19 48 26.611	−0.1912	+.0170	+70 4 18.38	9.162	+0.027
η Aquilæ †	*var.*	G0	19 48 33.059	+3.0565	+.0005	+ 0 48 25.08	+ 9.135	−0.008
ι Sagittarii	4.2	K0	19 49 57.063	4.1112	−.0017	−42 4 19.01	9.297	+0.045
β Aquilæ	3.9	K0	19 51 31.855	2.9167	+.0025	+ 6 12 48.38	8.894	−0.481
ϵ Pavonis	4.1	A0	19 51 42.581	6.9740	+.0112	−73 6 56.22	9.268	−0.120
γ Sagittæ	3.7	K5	19 55 19.935	2.6673	+.0011	+19 16 55.54	9.692	+0.025
c Sagittarii	4.6	Mb	19 57 55.559	+3.6917	+.0023	−27 55 30.46	+ 9.878	+0.013
τ Aquilæ	5.6	K0	20 0 22.720	2.9306	+.0010	+ 7 3 35.78	10.080	+0.029
θ Aquilæ	3.4	A0	20 7 19.946	3.0356	+.0020	− 1 3 3.08	10.578	+0.006
o Cygni *seq.* †	4.0	K0p	20 11 12.473	+1.8902	+.0014	+46 30 25.86	10.864	+0.005
κ Cephei †	4.4	B9	20 11 30.688	−1.9788	+.0021	+77 28 48.67	10.907	+0.026
24 Vulpeculæ	5.4	K0	20 13 29.413	+2.5674	+.0017	+24 25 59.04	+11.014	−0.012
α^2 Capricorni †	3.8	K0	20 13 47.026	3.3298	+.0010	−12 47 4.28	11.056	+0.008
β Capricorni †	3.2	G0p	20 16 41.237	3.3726	+.0030	−15 1 31.97	11.265	+0.007
γ Cygni	2.3	F8p	20 19 27.864	2.1528	+.0001	+40 0 34.18	11.460	+0.001
α Pavonis	2.1	B3	20 19 33.906	4.7595	.0000	−56 58 59.72	11.374	−0.092
π Capricorni †	5.2	B8	20 22 54.928	+3.4351	+.0001	−18 27 54.14	+11.703	−0.002
ρ Capricorni †	5.0	F0	20 24 28.234	3.4237	−.0013	−18 4 9.31	11.795	−0.020
41 Cygni	4.1	F5	20 26 15.008	2.4517	+.0014	+30 6 39.07	11.933	−0.002
θ Cephei	4.3	A5	20 28 17.582	1.0105	+.0066	+62 44 5.62	12.066	−0.018
ϵ Delphini	4.0	B5	20 29 32.075	+2.8663	+.0007	+11 2 26.21	12.145	−0.025
Groombridge 3241	6.4	K2	20 30 21.070	−0.2442	−.0017	+72 16 15.25	+12.208	−0.018
α Indi	3.2	K0	20 32 9.326	+1.2265	+.0027	−47 33 40.90	12.405	+0.053
β Delphini †	3.7	F5	20 33 56.336	2.8138	+.0082	+14 19 35.02	12.439	−0.035
υ Capricorni	5.3	Ma	20 35 40.110	3.4171	−.0018	−18 24 38.01	12.585	−0.007
α Delphini	3.9	B8	20 36 3.709	2.7868	+.0017	+15 38 23.37	12.636	+0.017
β Pavonis	3.6	A5	20 38 2.305	+5.4339	−.0079	−66 28 53.51	+12.750	−0.003
α Cygni (*Deneb*)	1.3	A2p	20 38 48.388	2.0449	+.0001	+45 0 16.16	12.802	−0.002
δ Delphini	4.5	A2	20 39 51.849	2.8008	−.0014	+14 47 50.49	12.826	−0.050
ψ Capricorni	4.3	F8	20 41 32.386	3.5553	−.0010	−25 32 54.22	12.810	−0.148
γ Delphini *seq.* †	4.5	G5	20 43 5.146	2.7832	−.0023	+15 50 45.50	12.894	−0.196
ϵ Cygni	2.6	K0	20 43 5.735	+2.4277	+.0294	+33 40 51.94	+13.417	+0.327
ϵ Aquarii	3.8	A0	20 43 30.547	3.2486	+.0017	− 9 46 42.70	13.088	−0.030
η Cephei	3.6	K0	20 43 43.569	1.2234	+.0131	+61 32 21.72	13.953	+0.820
μ Aquarii	4.8	A3	20 48 30.130	3.2371	+.0025	− 9 16 23.80	13.407	−0.039
β Indi	3.7	K0	20 48 48.224	+4.7056	+.0018	−58 44 44.33	13.457	−0.008
220 H^1. Draconis	5.6	K0	20 51 7.854	−2.6541	−.0105	+80 15 51.93	+13.589	−0.025

β Cygni, star 5^m.4, 34″.7 n. f.
δ Cygni, comp. 8^m, 1″.6 n. pr.
ϵ Draconis, comp. 7^m.6, 3″.1 n.
υ Aquilæ, var., 7^d.18, 3^m.7–4^m.4

o Cygni, star 5^m.0 pr. 19^s, 270″ n., star 7^m.8 f. 1^s, 96″ s.
κ Cephei, comp. 8^m, 7″.5 s. f.
α^2 Capricor., α^1 Capricor., 4^m.6 pr. 24^s, 137″ n.

β Capricor., star 6^m.2 pr. 14^s, 10″ s.
π Capricor., comp. 9^m, 3″.4 s. f.
ρ Capricor., comp. 7^m.6, 2″.8 s.
β Delphini, binary, 4^m.1, 5^m.4, 0″.5
γ Delphini, comp. 5^m.5, 11″.2 pr.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
32 Vulpeculæ	5.2	K2	20 51 16.676	+2.5565	−.0003	+27 45 50.64	+13.629	+0.004
ν Cygni	4.0	A0	20 54 18.104	2.2359	+.0008	+40 52 11.93	13.799	−0.018
α Octantis	5.2	F2	20 55 26.607	7.3546	−.0004	−77 19 10.59	13.500	−0.389
γ Microscopii	4.7	G5	20 56 34.372	3.6847	−.0004	−32 33 34.89	13.956	−0.004
θ Capricorni	4.2	A0	21 1 37.250	3.3744	+.0051	−17 32 23.36	14.207	−0.066
ξ Cygni	3.9	K5	21 2 7.763	+2.1816	+.0009	+43 37 12.51	+14.313	+0.008
61 Cygni *pr.*	5.6	K5	21 3 26.578	2.6856	+.3496	+38 22 11.89	17.636	+3.251
61 Cygni *seq.*	6.3	K5	Δα + 1.484	....	...	Δδ −16.62	....	...
ν Aquarii	4.5	K0	21 5 24.064	+3.2692	+.0057	−11 41 3.09	14.498	−0.006
Bradley 2777	5.9	A	21 7 4.298	−1.1558	+.0102	+77 48 51.94	14.634	+0.030
3 Piscis Australis	5.6	K5	21 8 43.582	+3.5618	+.0075	−27 56 3.33	+14.597	−0.106
ζ Cygni	3.4	K0	21 9 39.489	2.5524	−.0002	+29 54 37.17	14.697	−0.061
τ Cygni †	3.8	F0	21 11 43.001	2.3944	+.0141	+37 42 57.95	15.313	+0.434
α Equulei	4.1	F8p	21 11 58.500	2.9990	+.0034	+ 4 55 43.41	14.809	−0.085
σ Cygni	4.3	A0p	21 14 23.431	2.3552	−.0001	+39 4 17.31	15.038	+0.003
θ^1 Microscopii	4.9	A2p	21 15 50.346	+3.8419	+.0028	−41 8 9.36	+15.124	+0.005
α Cephei	2.6	A5	21 16 44.630	1.4311	+.0221	+62 15 32.23	15.220	+0.050
ι Capricorni	4.3	K0	21 17 57.712	3.3131	+.0022	−17 9 47.91	15.244	+0.004
1 Pegasi	4.2	K0	21 18 31.509	2.7742	+.0075	+19 28 27.67	15.336	+0.064
γ Pavonis	4.3	F8	21 20 5.838	4.9909	+.0153	−65 42 57.47	16.145	+0.784
ζ Capricorni	3.9	G5p	21 22 16.470	+3.4290	+.0004	−22 44 44.44	+15.502	+0.020
g Cygni †	5.3	K0	21 26 36.419	2.2132	+.0050	+46 12 2.04	15.825	+0.105
β Aquarii	3.1	G0	21 27 30.400	3.1593	+.0012	− 5 54 38.61	15.758	−0.011
β Cephei †	3.3	B1	21 27 40.438	0.7832	+.0026	+70 13 20.91	15.783	+0.005
ξ Aquarii	4.8	A5	21 33 39.261	3.1950	+.0075	− 8 12 0.90	16.072	−0.023
74 Cygni	5.1	A5	21 33 51.713	+2.1039	+.0003	+40 4 1.16	+16.115	+0.009
γ Capricorni	3.8	F0p	21 35 49.636	3.3262	+.0129	−17 0 38.80	16.190	−0.017
ε Pegasi	2.5	K0	21 40 24.230	2.9161	+.0016	+ 9 31 16.58	16.440	0.000
11 Cephei	4.8	K0	21 40 47.934	0.8854	+.0221	+70 57 23.81	16.553	+0.093
δ Capricorni	3.0	A5	21 42 47.579	3.3131	+.0176	−16 28 38.74	16.261	−0.297
π^2 Cygni	4.3	B3	21 43 56.829	+2.2152	+.0009	+48 57 10.09	+16.614	−0.001
μ Capricorni	5.2	F0	21 49 5.976	3.2721	+.0201	−13 54 54.28	16.864	+0.001
γ Gruis	3.2	B8	21 49 16.252	3.6387	+.0077	−37 43 40.13	16.851	−0.021
16 Pegasi	5.0	B3	21 49 33.454	2.7288	+.0005	+25 33 44.52	16.891	+0.006
79 Draconis	6.6	A0	21 51 53.545	0.7150	+.0101	+73 20 16.04	17.010	+0.016
20 Pegasi	5.7	F2	21 57 20.249	+2.9223	+.0038	+12 45 1.63	+17.188	−0.054
ε Indi	4.7	K5	21 57 28.739	4.6036	+.4783	−57 6 11.60	14.678	−2.570
α Aquarii	3.2	G0	22 1 49.786	3.0817	+.0010	− 0 41 40.03	17.437	−0.002
ι Aquarii	4.4	B8	22 2 16.814	3.2116	+.0022	−14 14 38.06	17.396	−0.062
20 Cephei	5.4	K5	22 2 40.059	1.8232	+.0032	+62 24 34.32	17.526	+0.051
α Gruis	2.2	B5	22 3 23.225	+3.7901	+.0110	−47 20 5.49	+17.331	−0.174
ι Pegasi	4.0	F5	22 3 25.528	2.7920	+.0222	+24 58 6.33	17.528	+0.021
θ Pegasi	3.7	A0	22 6 18.965	3.0266	+.0187	+ 5 49 6.79	17.665	+0.036
π Pegasi	4.4	F5	22 6 33.975	2.6634	−.0003	+32 47 59.55	17.621	−0.018
ζ Cephei	3.6	K0	22 8 10.837	2.0790	+.0018	+57 49 16.93	17.716	+0.010
24 Cephei	5.0	G5	22 8 19.825	+1.1559	+.0014	+71 57 41.90	+17.716	+0.004
θ Aquarii	4.3	K0	22 12 46.296	3.1666	+.0074	− 8 10 1.93	17.872	−0.018
α Tucanæ	2.9	K2	22 13 14.279	4.1281	−.0118	−60 38 37.85	17.874	−0.035
γ Aquarii	4.0	A0	22 17 40.779	3.0988	+.0081	− 1 46 32.68	18.095	+0.015
31 Pegasi	4.9	B3p	22 17 43.679	2.9531	+.0010	+11 49 0.01	18.089	+0.007
3 Lacertæ	4.6	K0	22 20 31.774	+2.3568	−.0007	+51 50 34.33	+17.998	−0.188
π Aquarii	4.6	B1	22 21 20.673	3.0636	+.0004	+ 0 59 9.96	18.215	−0.001
σ Aquarii	4.9	A0	22 26 34.450	3.1764	.0000	−11 4 20.64	18.377	−0.026
α Lacertæ	3.8	A0	22 28 7.013	2.4694	+.0157	+49 53 10.22	18.469	+0.014
υ Aquarii	5.3	F5	22 30 29.006	3.2839	+.0148	−21 6 11.84	18.381	−0.154
226 B. Cephei	5.7	A0	22 30 55.610	+1.0620	−.0052	+75 49 46.30	+18.550	0.000

τ Cygni, comp. 7m, 0″.8 | g Cygni, star 6m.7 f. 10m, 420″ s. | β Cephei, star 8m, 13″.3 s. pr.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
η Aquarii	4.1	B8	22 31 24.002	+3.0830	+.0057	− 0 30 53.25	+18.513	−0.053
10 Lacertæ	4.9	Oe5	22 35 48.241	2.6901	+.0011	+38 38 56.60	18.696	−0.011
ϵ Piscis Australis	4.2	B8	22 36 23.977	3.3212	+.0008	−27 26 45.24	18.715	−0.011
ζ Pegasi	3.6	B8	22 37 37.275	2.9916	+.0054	+10 25 44.14	18.750	−0.014
β Gruis	2.2	Mb	22 38 4.603	3.5925	+.0133	−47 17 16.49	18.752	−0.026
η Pegasi	3.1	G0	22 39 23.424	+2.8101	+.0011	+29 49 4.71	+18.780	−0.037
λ Pegasi	4.1	K0	22 42 49.207	2.8876	+.0037	+23 9 36.21	18.910	−0.009
ϵ Gruis	3.7	A2	22 43 54.648	3.6340	+.0093	−51 43 19.45	18.892	−0.059
τ Aquarii	4.2	K5	22 45 31.029	3.1784	−.0008	−13 59 57.67	18.963	−0.033
μ Pegasi	3.7	K0	22 46 17.111	2.8940	+.0110	+24 11 40.66	18.975	−0.042
ι Cephei	3.7	K0	22 46 56.084	+2.1299	− 0111	+65 47 42.42	+18.909	−0.126
λ Aquarii	3.8	Ma	22 48 35.896	3.1304	+.0002	− 7 59 23.03	19.115	+0.035
ρ Indi	6.1	G5	22 49 19.200	4.2040	- .0133	−70 29 8.14	19.153	+0 053
δ Aquarii	3.5	A2	22 50 33.921	3.1854	−.0034	−16 13 50.49	19.106	−0.026
α Pisc. Aust. (*Fomalhaut*)	1.3	A3	22 53 23.969	3.3193	+.0252	−30 1 50.80	19.033	0.171
o Andromedæ	3.6	B5p	22 58 22.449	+2.7561	+.0020	+41 54 42.57	+19.315	−0.010
β Pegasi †	*var.*	Ma	23 0 2.343	2.9062	+.0146	+27 39 53.20	19.498	+0.135
α Pegasi (*Markab*)	2.6	A0	23 0 55.423	2 9868	+.0040	+14 47 26.45	19.343	−0.039
55 Pegasi	4.7	Ma	23 3 7.469	3.0211	+.0003	+ 8 59 35.46	19.418	−0.012
c^2 Aquarii	3.8	K0	23 5 20.584	3.2009	+.0032	−21 35 26.55	19.519	+0.041
π Cephei †	4.6	G5	23 5 26.638	+1.9014	+.0023	+74 58 15.74	+19.447	- 0.032
ι Gruis	4.1	K0	23 6 0.354	3.4041	+.0121	−45 39 50.95	19.460	−0.031
59 Pegasi	5.2	A3	23 7 50.888	3.0281	−.0007	+ 8 18 6.35	19.533	+0.004
5 H^1. Cassiopeiæ	5.6	K2	23 9 34.180	2 8818	+.2538	+56 44 35.13	19.860	+0.299
ϕ Aquarii	4.4	Ma	23 10 20.091	3.1068	+.0015	− 6 27 51.79	19.382	- 0.194
ψ Aquarii †	4.5	K0	23 11 51.534	+3.1444	+.0250	− 9 30 26.41	+19.599	−0.005
γ Tucanæ	4.1	F2	23 12 56.650	3.5145	−.0057	−58 39 30.68	19.684	+0.060
γ Piscium	3.8	K0	23 13 10.387	3.1094	+ 0502	+ 2 51 40.82	19.649	+0.021
γ Sculptoris	4.5	K0	23 14 40.147	3.2431	+.0002	−32 57 6.37	19.588	−0.066
o Cephei †	4.9	G5	23 15 27.393	2.4551	+.0113	+67 41 24.17	19.685	+0.018
τ Pegasi	4.6	A5	23 16 49.383	+2.9667	+.0018	+23 19 6.92	+19.678	−0.012
b^1 Aquarii	4.2	K0	23 18 55.676	3.1521	−.0099	−20 31 16.27	19.634	−0.089
4 Cassiopeiæ	5.2	K5	23 21 24.507	2.6536	- .0001	+61 51 35.69	19.752	−0.010
υ Pegasi	4.6	G0	23 21 32.014	2.9915	+.0134	+22 58 47.68	19.794	+0.030
κ Piscium	4.9	A2p	23 22 59.110	3.0752	+.0056	+ 0 50 2.20	19.692	−0.093
θ Piscium	4.4	G5	23 24 3.671	+3.0422	- .0088	+ 5 57 21.28	+19.758	−0.041
70 Pegasi	4.7	K0	23 25 15.533	3.0326	+.0040	+12 20 8.19	19.850	+0.035
β Sculptoris	4.5	B9	23 28 50.796	3 2226	+.0071	−38 14 40.22	19.866	+0.006
72 Pegasi (*mean*) †	5.2	K2	23 30 7.759	2.9723	+.0035	+30 54 1.04	19.865	- 0.009
λ Andromedæ	4.0	K0	23 33 47.406	2.9304	+.0158	+46 2 27.17	19.494	−0.420
ι Andromedæ	4.3	B8	23 34 21.284	+2.9369	+.0025	+42 50 30.07	+19.919	0.000
ι Piscium	4.3	G0	23 35 59.332	3.0846	+.0246	+ 5 12 31.76	19.499	−0.436
γ Cephei	3.4	K0	23 36 10.514	2.4449	−.0173	+77 12 9.38	20.094	+0.157
κ Andromedæ	4.3	A0	23 36 36.626	2.9496	+.0078	+43 54 26.63	19.916	−0.024
ω^2 Aquarii	4.6	A0	23 38 43.818	3.1122	+.0063	−14 58 14.39	19.896	−0.063
ψ^1 Aquarii	5.3	B8	23 40 12.580	+3.1137	+.0019	−18 42 16.14	+19.965	−0.006
ψ Andromedæ	5.1	K0	23 42 12.758	2.9660	+.0005	+45 59 33.45	19.977	−0.008
41 H. Cephei	5.0	A0	23 44 13.087	2.8545	+.0024	+67 22 43.81	19.988	−0.010
δ Sculptoris	4.6	A0	23 44 55.002	3.1265	+.0059	−28 33 23.67	19.868	−0.133
ϕ Pegasi	5.2	Ma	23 48 34.072	3.0489	−.0013	+18 41 33.28	19.981	−0.039
ρ Cassiopeiæ	4.8	F8p	23 50 31.615	+2.9853	−.0023	+57 4 15.66	+20.029	+0.002
Groombridge 4163	6.6	B9	23 51 3.771	2.8873	−.0040	+73 58 54.37	20.025	−0.005
ω Piscium	4.0	F5	23 55 21.376	3.0799	+.0102	+ 6 26 13.52	19.933	−0.108
ϵ Tucanæ	4.7	B9	23 55 55.556	3.1337	+.0076	−66 0 18.82	20.035	−0.007
30 Piscium	4.7	Mb	23 58 0.676	3.0770	+.0030	− 6 26 31.16	20.007	−0.037
2 Ceti	4.6	A0	23 59 47.788	+3.0746	+.0015	−17 45 53.03	+20.032	−0.013

β Pegasi, var. irreg., 2^m.2–2^m.7
π Cephei, comp. 7^m, 0″.9 f.

ψ Aquarii, star 8^m.5, 49″.4 n. pr.
o Cephei, comp. 8^m, 2″.9 s. pr.

72 Pegasi, binary, 6^m.0, 6^m.0, 0″.4

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			h m s	s	s	° ′ ″	″	″
43 H. Cephei	4.5	K0	0 57 55.489	+ 7.7462	+.0735	+85 50 41.77	+19.404	−0.004
α Ursæ Min. (*Polaris*) †	2.1	F8	1 33 11.898	+30.5750	+.1514	+88 53 34.33	+18.412	+0.001
4 G. Octantis	5.6	K0	1 41 39.995	− 3.6908	+.0086	−85 9 32.70	+18.132	+0.028
Groombridge 750	6.7	F8	4 11 48.583	+17.7236	+.0131	+85 21 5.69	+ 9.157	+0.042
Groombridge 944	6.4	K0	5 37 5.478	+18.7948	+.0130	+85 9 42.71	+ 1.996	−0.004
31 G. Mensæ	6.2	A0	5 45 4.700	−11.6700	−.0119	−84 49 38.84	+ 1.391	+0.087
ζ Mensæ	5.6	A2	6 46 28.850	− 4.9537	−.0035	−80 44 2.02	− 3.955	+0.082
51 H. Cephei	5.3	Ma	7 4 58.549	+28.9932	−.0581	+87 10 21.62	− 5.642	−0.034
7 G. Octantis	6.4	F5	7 14 18.185	−20.4268	−.0145	−86 54 45.50	− 6.380	+0.006
25 H. Camelopardalis	5.1	Mb	7 14 59.083	+12.7819	+.0131	+82 33 51.51	− 6.489	−0.047
Groombridge 1119	7.0	A0	8 21 41.998	+57.9704	−.0383	+88 51 51.95	−11.601	+0.018
ζ Octantis	5.4	A3	9 8 8.703	− 8.2569	−.1152	−85 21 25.35	−14.625	+0.044
1 H. Draconis	4.6	K0	9 26 14.295	+ 8.7400	−.0059	+81 40 7.28	−15.727	−0.027
ζ Chamæleontis	5.2	B3	9 36 12.346	− 1.6759	−.0121	−80 35 44.11	−16.209	+0.019
30 H. Camelopardalis	5.3	F5	10 21 50.081	+ 7.5157	−.0460	+82 57 4.81	−18.225	+0.009
η Octantis	6.3	A0	10 59 53.036	− 0.3843	−.0577	−84 10 46.79	−29.361	−0.005
Bradley 1672	6.3	F0	12 14 30.802	+ 0.1165	−.0705	+88 7 36.40	−19.946	+0.058
ι Octantis	5.4	K0	12 46 43.161	+ 6.0288	+.0368	−84 42 20.01	−19.606	+0.024
32 H. Camelop. *seq.* †	5.3	A2	12 48 33.111	+ 0.4547	−.0183	+83 49 52.98	−19.581	+0.016
κ Octantis	5.6	A2	13 28 9.628	+ 9.2187	−.0768	−85 23 33.94	−18.604	−0.024
δ Octantis	4.1	K2	14 14 23.592	+ 9.3326	−.0513	−83 19 1.42	−16.710	−0.014
Groombridge 2283	7.2	K0	15 1 45.970	−19.0017	−.0070	+87 31 46.68	−14.034	+0.031
ρ Octantis	5.7	A2	15 25 17.036	+13.4498	+.0813	−84 12 45.34	−12.446	+0.081
ε Ursæ Minoris	4.4	G5	16 53 48.037	− 6.2321	+.0057	+82 9 58.64	− 5.710	−0.001
59 G. Apodis	5.9	Mb	17 17 1.936	+11.1801	+.0087	−80 47 29.50	− 3.775	−0.039
δ Ursæ Minoris	4.4	A0	17 57 4.326	−19.4946	+.0170	+86 36 50.43	− 0.208	+0.018
χ Octantis	5.2	K0	18 9 46.186	+35.6998	−.0937	−87 39 48.39	+ 0.727	−0.127
λ Ursæ Minoris	6.6	Mb	18 55 23.393	−73.3103	−.1120	+89 1 32.83	+ 4.803	+0.005
σ Octantis	5.5	F0	19 37 1.735	+91.7037	+.1068	−89 12 41.41	+ 8.236	0.000
76 Draconis	5.7	A0	20 48 15.385	− 4.2013	+.0131	+82 14 50.67	+13.455	+0.025
λ Octantis †	5.4	G0p	21 39 16.433	+ 9.4506	+.0387	−83 4 28.91	+16.371	−0.012
υ Octantis	5.7	K0	22 17 21.969	+12.1303	−.0400	−86 21 38.42	+18.143	+0.074
β Octantis	4.3	F0	22 38 16.769	+ 6.2711	−.0301	−81 47 9.68	+18.786	+0.002
39 H. Cephei	5.6	F0	23 27 42.388	− 0.3089	+.0615	+86 52 58.09	+19.866	+0 020
γ^{1} Octantis	5.1	G5	23 47 38.028	+ 3.5917	−.0246	−82 26 48.40	+20.004	−0.012

α Ursæ Min., star 9^{m}, 18″ s. pr. | 32 H. Camelop., star 5^{m}.8, 21″.6 n. pr. | λ Octantis, binary, 5^{m}.5, 8^{m}.0, 3″.2 n. f

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	0 57	+85 50	Jan.	1 33	+88 53	Jan.	1 41	−85 9	Jan.	4 11	+85 21	Jan.	5 37	+85 9
	s	″		s	″		s	″		s	″		s	″
0.3	65.89	58.90	0.3	60.05	49.59	0.3	37.72	57.09	0.4	65.33	8.47	0.5	21.31	37.89
1.3	65.63	58.99	1.3	59.08	49.75	1.3	37.44	57.09	1.4	65.25	8.76	1.5	21.32	38.20
2.3	65.35	59.09	2.3	58.06	49.90	2.3	37.17	57.09	2.4	65.16	9.08	2.5	21.33	38.52
3.3	65.06	59.18	3.3	56.99	50.06	3.3	36.91	57.08	3.4	65.05	9.40	3.4	21.34	38.86
4.3	64.75	59.28	4.3	55.86	50.22	4.3	36.67	57.06	4.4	64.93	9.71	4.4	21.33	39.22
5.3	64.43	59.35	5.3	54.66	50.35	5.3	36.42	57.05	5.4	64.80	10.00	5.4	21.30	39.57
6.2	64.09	59.40	6.3	53.45	50.46	6.3	36.19	57.04	6.4	64.63	10.30	6.4	21.25	39.91
7.2	63.77	59.42	7.3	52.24	50.55	7.3	35.95	57.04	7.4	64.46	10.58	7.4	21.17	40.24
8.2	63.45	59.42	8.3	51.07	50.60	8.3	35.68	57.05	8.4	64.29	10.82	8.4	21.09	40.54
9.2	63.17	59.41	9.3	49.97	50.65	9.3	35.41	57.06	9.4	64.12	11.05	9.4	21.00	40.83
10.2	62.88	59.41	10.3	48.92	50.70	10.3	35.13	57.07	10.4	63.97	11.27	10.4	20.92	41.11
11.2	62.62	59.40	11.3	47.93	50.75	11.3	34.84	57.06	11.4	63.82	11.49	11.4	20.86	41.39
12.2	62.36	59.40	12.3	46.94	50.80	12.3	34.54	57.03	12.4	63.68	11.72	12.4	20.81	41.66
13.2	62.10	59.41	13.3	45.94	50.88	13.3	34.25	56.98	13.4	63.54	11.95	13.4	20.76	41.94
14.2	61.83	59.44	14.3	44.89	50.96	14.3	33.96	56.90	14.4	63.41	12.19	14.4	20.71	42.23
15.2	61.54	59.46	15.2	43.79	51.02	15.3	33.68	56.82	15.4	63.27	12.46	15.4	20.66	42.55
16.2	61.23	59.47	16.2	42.64	51.09	16.2	33.44	56.72	16.4	63.09	12.72	16.4	20.58	42.86
17.2	60.91	59.46	17.2	41.44	51.15	17.2	33.19	56.62	17.3	62.91	12.97	17.4	20.50	43.18
18.2	60.60	59.43	18.2	40.21	51.20	18.2	32.95	56.54	18.3	62.71	13.22	18.4	20.40	43.50
19.2	60.28	59.38	19.2	38.97	51.21	19.2	32.70	56.46	19.3	62.49	13.46	19.4	20.27	43.81
20.2	59.95	59.32	20.2	37.74	51.20	20.2	32.46	56.38	20.3	62.27	13.66	20.4	20.14	44.10
21.2	59.64	59.24	21.2	36.54	51.19	21.2	32.20	56.32	21.3	62.04	13.86	21.4	20.00	44.39
22.2	59.35	59.15	22.2	35.36	51.15	22.2	31.94	56.25	22.3	61.81	14.04	22.4	19.85	44.66
23.2	59.06	59.05	23.2	34.22	51.10	23.2	31.67	56.17	23.3	61.59	14.21	23.4	19.70	44.90
24.2	58.77	58.95	24.2	33.11	51.06	24.2	31.40	56.09	24.3	61.37	14.36	24.4	19.55	45.15
25.2	58.50	58 84	25.2	32.04	51.02	25.2	31.12	56.01	25.3	61.17	14.51	25.4	19.41	45.39
26.2	58.23	58.75	26.2	31.01	50.97	26.2	30.84	55.89	26.3	60.96	14.67	26.4	19.27	45.62
27.2	57.99	58.67	27.2	29.98	50.92	27.2	30.56	55.76	27.3	60.77	14.82	27.4	19.15	45.86
28.2	57.74	58.58	28.2	28.95	50.89	28.2	30.28	55.62	28.3	60.58	14.99	28.4	19.02	46.10
29.2	57.47	58.50	29.2	27.89	50.88	29.2	30.01	55.45	29.3	60.39	15.16	29.4	18.90	46.35
30.2	57.19	58.42	30.2	26.79	50.87	30.2	29.77	55.28	30.3	60.18	15.34	30.4	18.78	46.62
31.2	56.90	58.35	31.2	25.65	50.83	31.2	29.52	55.10	31.3	59.96	15.52	31.4	18.64	46.90
13.82		+13.78	51.97		+51.96	11.87		−11.82	12.34		+12.30	11.86		+11.81
0^h	57^m	$55^s.489$	1^h	33^m	$11^s.898$	1^h	41^m	$39^s.995$	4^h	11^m	$48^s.583$	5^h	37^m	$5^s.478$
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Jan.	5 45	−84 49	Jan.	6 46	−80 44	Jan.	7 5	+87 10	Jan.	7 14	−86 54	Jan.	7 15	+82 33
0.5	19.32	53.30	0.5	38.26	10.84	0.5	21.34	9.67	0.5	47.61	51.31	0.5	7.46	38.75
1.5	19.20	53.63	1.5	38.25	11.22	1.5	21.53	9.96	1.5	47.57	51.69	1.5	7.55	39.02
2.5	19.07	53.95	2.5	38.21	11.59	2.5	21.70	10.27	2.5	47.51	52.06	2.5	7.63	39.31
3.5	18.94	54.24	3.5	38.18	11.92	3.5	21.87	10.59	3.5	47.44	52.40	3.5	7.71	39.63
4.4	18.82	54.52	4.5	38.15	12.24	4.5	22.02	10.94	4.5	47.37	52.73	4.5	7.78	39.95
5.4	18.71	54.79	5.5	38.11	12.56	5.5	22.13	11.28	5.5	47.30	53.05	5.5	7.84	40.29
6.4	18.60	55.07	6.5	38.08	12.88	6.5	22.23	11.63	6.5	47.24	53.37	6.5	7.89	40.62
7.4	18.48	55.36	7.5	38.06	13.21	7.5	22.29	11.98	7.5	47.18	53.69	7.5	7.93	40.96
8.4	18.37	55.67	8.5	38.03	13.55	8.5	22.33	12.31	8.5	47.14	54.02	8.5	7.94	41.29
9.4	18.24	55.98	9.5	38.00	13.92	9.5	22.34	12.63	9.5	47.10	54.38	9.5	7.96	41.58
10.4	18.11	56.31	10.5	37.96	14.29	10.5	22.37	12.93	10.5	47.04	54.75	10.5	7.98	41.87
11.4	17.97	56.64	11.5	37.92	14.67	11.5	22.41	13.22	11.5	46.96	55.13	11.5	8.01	42.15
12.4	17.80	56.96	12.5	37.88	15.05	12.5	22.46	13.51	12.5	46.86	55.52	12.5	8.05	42.42
13.4	17.63	57.27	13.5	37.84	15.43	13.5	22.51	13.80	13.5	46.73	55.90	13.5	8.09	42.70
14.4	17.46	57.56	14.5	37.78	15.77	14.5	22.58	14.12	14.5	46.59	56.26	14.5	8.13	42.99
15.4	17.28	57.85	15.5	37.72	16.11	15.5	22.64	14.44	15.5	46.43	56.61	15.5	8.17	43.31
16.4	17.10	58.10	16.5	37.65	16.43	16.5	22.70	14.78	16.5	46.26	56.94	16.5	8.21	43.63
17.4	16.92	58.34	17.5	37.59	16.75	17.5	22.72	15.11	17.5	46.09	57.25	17.5	8.22	43.96
18.4	16.75	58.59	18.5	37.53	17.04	18.5	22.70	15.48	18.5	45.94	57.56	18.5	8.23	44.30
19.4	16.60	58.83	19.5	37.47	17.35	19.5	22.66	15.85	19.5	45.79	57.87	19.5	8.22	44.64
20.4	16.44	59.08	20.4	37.41	17.66	20.5	22.60	16.19	20.5	45.65	58.19	20.5	8.21	44.97
21.4	16.27	59.35	21.4	37.35	17.98	21.5	22.52	16.52	21.5	45.50	58.51	21.5	8.20	45.30
22.4	16.10	59.61	22.4	37.29	18.31	22.5	22.44	16.84	22.5	45.36	58.84	22.5	8.17	45.62
23.4	15.92	59.87	23.4	37.23	18.63	23.5	22.34	17.16	23.5	45.22	59.19	23.5	8.14	45.92
24.4	15.74	60.14	24.4	37.17	18.97	24.5	22.23	17.47	24.5	45.05	59.53	24.5	8.11	46.21
25.4	15.56	60.43	25.4	37.09	19.31	25.4	22.12	17.76	25.5	44.87	59.89	25.5	8.08	46.50
26.4	15.36	60.69	26.4	37.01	19.65	26.4	22.03	18.04	26.5	44.68	60.25	26.5	8.07	46.78
27.4	15.14	60.95	27.4	36.93	19.99	27.4	21.95	18.33	27.5	44.46	60.60	27.5	8.05	47.06
28.4	14.92	61.20	28.4	36.85	20.32	28.4	21.89	18.61	28.4	41.23	60.94	28.4	8.03	47.34
29.4	14.69	61.43	29.4	36.75	20.63	29.4	21.82	18.92	29.4	43.97	61.28	29.4	8.02	47.63
30.4	14.46	61.63	30.4	36.65	20.91	30.4	21.74	19.24	30.4	43.70	61.60	30.4	8.01	47.94
31.4	14.24	61.83	31.4	36.55	21.19	31.4	21.66	19.57	31.4	43.42	61.89	31.4	7.98	48.26
11.10	−11.06		6.21	−6.13		20.26	+20.23		18.59	−18.56		7.72	+7.66	
5h 45m 4s.700			6h 46m 28s.850			7h 4m 58s.549			7h 14m 18s.185			7h 14m 59s.083		
−84° 49′ 38″.84			−80° 44′ 2″.02			+87° 10′ 21″.62			−86° 54′ 45″.50			+82° 33′ 51″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	8 22	+88 51	Jan.	9 8	−85 21	Jan.	9 26	+81 39	Jan.	9 36	−80 35	Jan.	10 21	+82 56
	s	″		s	″		s	″		s	″		s	″
0.6	22.50	35.12	0.6	28.10	19.22	0.6	17.46	47.75	0.6	21.50	35.41	0.7	51.18	44.19
1.6	23.23	35.37	1.6	28.23	19.57	1.6	17.60	47.91	1.6	21.58	35.75	1.7	51.37	44.28
2.6	23.98	35.63	2.6	28.34	19.92	2.6	17.75	48.09	2.6	21.66	36.10	2.6	51.56	44.37
3.6	24.73	35.91	3.6	28.44	20.26	3.6	17.90	48.27	3.6	21.73	36.43	3.6	51.75	44.49
4.6	25.46	36.21	4.6	28.53	20.59	4.6	18.04	48.47	4.6	21.79	36.75	4.6	51.94	44.62
5.6	26.13	36.52	5.6	28.62	20.91	5.6	18.18	48.69	5.6	21.86	37.07	5.6	52.13	44.77
6.6	26.72	36.83	6.6	28.71	21.22	6.6	18.30	48.93	6.6	21.92	37.37	6.6	52.31	44.95
7.5	27.24	37.15	7.6	28.81	21.53	7.6	18.41	49.17	7.6	21.98	37.67	7.6	52.46	45.13
8.5	27.68	37.46	8.6	28.92	21.84	8.6	18.52	49.41	8.6	22.06	37.98	8.6	52.61	45.32
9.5	28.09	37.75	9.6	29.03	22.17	9.6	18.61	49.64	9.6	22.14	38.30	9.6	52.75	45.51
10.5	28.47	38.04	10.6	29.14	22.53	10.6	18.70	49.87	10.6	22.22	38.66	10.6	52.89	45.68
11.5	28.87	38.31	11.6	29.24	22.91	11.6	18.80	50.09	11.6	22.30	39.03	11.6	53.03	45.83
12.5	29.31	38.58	12.6	29.34	23.30	12.6	18.90	50.29	12.6	22.37	39.41	12.6	53.17	45.98
13.5	29.77	38.86	13.6	29.42	23.69	13.6	19.00	50.49	13.6	22.43	39.80	13.6	53.32	46.13
14.5	30.27	39.14	14.6	29.47	24.08	14.6	19.12	50.70	14.6	22.48	40.18	14.6	53.49	46.30
15.5	30.77	39.44	15.6	29.51	24.46	15.6	19.24	50.93	15.6	22.53	40.56	15.6	53.66	46.47
16.5	31.24	39.75	16.6	29.55	24.82	16.6	19.35	51.17	16.6	22.57	40.93	16.6	53.82	46.65
17.5	31.67	40.08	17.6	29.59	25.16	17.6	19.46	51.44	17.6	22.61	41.28	17.6	53.97	46.86
18.5	32.03	40.41	18.6	29.62	25.51	18.6	19.56	51.72	18.6	22.65	41.62	18.6	54.12	47.09
19.5	32.33	40.75	19.5	29.66	25.84	19.6	19.65	52.01	19.6	22.68	41.96	19.6	54.27	47.34
20.5	32.57	41.10	20.5	29.70	26.18	20.6	19.73	52.30	20.6	22.72	42.30	20.6	54.40	47.59
21.5	32.75	41.44	21.5	29.74	26.53	21.6	19.79	52.59	21.6	22.76	42.64	21.6	54.52	47.84
22.5	32.88	41.78	22.5	29.78	26.89	22.6	19.86	52.88	22.6	22.80	42.99	22.6	54.63	48.09
23.5	32.98	42.11	23.5	29.82	27.25	23.6	19.92	53.16	23.6	22.85	43.35	23.6	54.74	48.35
24.5	33.08	42.43	24.5	29.86	27.61	24.6	19.97	53.45	24.6	22.89	43.71	24.6	54.84	48.60
25.5	33.16	42.73	25.5	29.89	28.00	25.5	20.02	53.73	25.6	22.93	44.09	25.6	54.94	48.84
26.5	33.26	43.04	26.5	29.92	28.39	26.5	20.08	54.00	26.5	22.97	44.50	26.6	55.05	49.08
27.5	33.39	43.34	27.5	29.93	28.80	27.5	20.15	54.25	27.5	22.99	44.90	27.6	55.15	49.31
28.5	33.53	43.64	28.5	29.93	29.20	28.5	20.23	54.51	28.5	23.01	45.31	28.6	55.26	49.53
29.5	33.70	43.94	29.5	29.91	29.59	29.5	20.30	54.77	29.5	23.03	45.72	29.6	55.39	49.75
30.5	33.89	44.26	30.5	29.88	29.98	30.5	20.38	55.04	30.5	23.04	46.11	30.6	55.51	49.98
31.5	34.05	44.59	31.5	29.84	30.36	31.5	20.44	55.33	31.5	23.05	46.50	31.6	55.63	50.24
50.30	+50.29		12.35	−12.31		6.90	+6.83		6.12	−6.04		8.14	+8.08	
8^h	21^m	$41^s.998$	9^h	8^m	$8^s.703$	9^h	26^m	$14^s.295$	9^h	36^m	$12^s.346$	10^h	21^m	$50^s.081$
+88°	51′	51″.95	−85°	21′	25″.35	+81°	40′	7″.28	−80°	35′	44″.11	+82°	57′	4″.81

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Jan.	11 0	−84 10	Jan.	12 14	+88 7	Jan.	12 46	−84 41	Jan.	12 48	+83 49	Jan.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
0.7	4.75	30.39	0.7	14.82	17.22	0.8	49.30	57.30	0.8	26.51	35.18	0.8	13.18	9.99
1.7	4.95	30.64	1.7	15.51	17.17	1.8	49.57	57.41	1.8	26.73	35.06	1.8	13.50	10.03
2.7	5.14	30.91	2.7	16.21	17.13	2.7	49.81	57.52	2.7	26.95	34.95	2.8	13.79	10.08
3.7	5.31	31.17	3.7	16.95	17.10	3.7	50.07	57.63	3.7	27.17	34.84	3.8	14.08	10.15
4.7	5.48	31.42	4.7	17.70	17.07	4.7	50.30	57.74	4.7	27.41	34.75	4.8	14.36	10.21
5.7	5.63	31.67	5.7	18.47	17.05	5.7	50.54	57.85	5.7	27.64	34.69	5.8	14.64	10.26
6.7	5.79	31.90	6.7	19.23	17.08	6.7	50.76	57.95	6.7	27.88	34.64	6.8	14.90	10.31
7.7	5.96	32.12	7.7	19.95	17.11	7.7	50.99	58.05	7.7	28.11	34.62	7.8	15.17	10.34
8.7	6.13	32.34	8.7	20.62	17.16	8.7	51.23	58.14	8.7	28.32	34.61	8.8	15.46	10.37
9.7	6.31	32.57	9.7	21.27	17.22	9.7	51.50	58.24	9.7	28.52	34.61	9.8	15.76	10.40
10.7	6.50	32.84	10.7	21.88	17.27	10.7	51.77	58.36	10.7	28.72	34.61	10.8	16.07	10.44
11.7	6.70	33.12	11.7	22.48	17.31	11.7	52.04	58.49	11.7	28.91	34.60	11.8	16.40	10.51
12.6	6.88	33.44	12.7	23.09	17.34	12.7	52.31	58.65	12.7	29.10	34.56	12.7	16.74	10.60
13.6	7.05	33.75	13.7	23.73	17.36	13.7	52.58	58.83	13.7	29.31	34.52	13.7	17.07	10.71
14.6	7.20	34.07	14.7	24.39	17.39	14.7	52.83	59.02	14.7	29.52	34.49	14.7	17.38	10.83
15.6	7.36	34.39	15.7	25.09	17.44	15.7	53.08	59.21	15.7	29.75	34.48	15.7	17.67	10.96
16.6	7.50	34.71	16.7	25.80	17.49	16.7	53.31	59.39	16.7	29.98	34.47	16.7	17.96	11.09
17.6	7.63	35.00	17.7	26.52	17.56	17.7	53.54	59.58	17.7	30.21	34.47	17.7	18.24	11.22
18.6	7.76	35.29	18.7	27.24	17.65	18.7	53.75	59.76	18.7	30.45	34.51	18.7	18.50	11.35
19.6	7.88	35.58	19.7	27.94	17.77	19.7	53.97	59.94	19.7	30.67	34.55	19.7	18.76	11.45
20.6	8.01	35.86	20.7	28.61	17.90	20.7	54.18	60.09	20.7	30.89	34.63	20.7	19.03	11.56
21.6	8.15	36.14	21.7	29.26	18.03	21.7	54.40	60.26	21.7	31.09	34.71	21.7	19.30	11.67
22.6	8.28	36.43	22.7	29.88	18.17	22.7	54.62	60.43	22.7	31.30	34.79	22.7	19.58	11.78
23.6	8.42	36.74	23.7	30.48	18.31	23.7	54.85	60.61	23.7	31.50	34.88	23.7	19.87	11.91
24.6	8.56	37.06	24.7	31.06	18.45	24.7	55.09	60.80	24.7	31.68	34.96	24.7	20.16	12.03
25.6	8.71	37.39	25.7	31.63	18.59	25.7	55.34	60.99	25.7	31.87	35.04	25.7	20.48	12.17
26.6	8.85	37.72	26.7	32.19	18.72	26.7	55.58	61.22	26.7	32.07	35.13	26.7	20.77	12.33
27.6	8.99	38.08	27.7	32.75	18.85	27.7	55.82	61.45	27.7	32.26	35.21	27.7	21.07	12.51
28.6	9.10	38.45	28.7	33.34	18.97	28.7	56.06	61.70	28.7	32.45	35.27	28.7	21.37	12.71
29.6	9.21	38.82	29.7	33.94	19.09	29.7	56.29	61.97	29.7	32.65	35.34	29.7	21.67	12.93
30.6	9.31	39.19	30.6	34.56	19.22	30.7	56.49	62.25	30.7	32.87	35.42	30.7	21.94	13.15
31.6	9.40	39.55	31.6	35.20	19.35	31.7	56.69	62.52	31.7	33.09	35.50	31.7	22.21	13.36
9.86		−9.80	30.51		+30.49	10.83		−10.78	9.30		+9.24	12.43		−12.39
10h 59m 53s.036			12h 14m 30s.802			12h 46m 43s.161			12h 48m 33s.111			13h 28m 9s 628		
−84° 10′ 46″.79			+88° 7′ 36″.40			−84° 42′ 20″.01			+83° 49′ 52″.98			−85° 23′ 33″.94		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Jan.	14 14	−83 18	Jan.	15 1	+87 31	Jan.	15 25	−84 12	Jan.	16 53	+82 9	Jan.	17 16	−80 47
0.8	23.19	37.20	0.8	17.21	37.52	0.9	11.69	22.35	0.9	37.86	59.20	0.9	54.39	13.01
1.8	23.42	37.17	1.8	17.54	37.25	1.9	11.93	22.21	1.9	37.91	58.26	1.9	54.51	12.76
2.8	23.62	37.16	2.8	17.91	36.99	2.9	12.16	22.08	2.9	37.96	58.50	2.9	54.61	12.51
3.8	23.82	37.16	3.8	18.31	36.72	3.9	12.39	21.98	3.9	38.02	58.14	3.9	54.72	12.28
4.8	24.03	37.16	4.8	18.73	36.45	4.9	12.59	21.89	4.9	38.10	57.77	4.9	54.83	12.06
5.8	24.22	37.15	5.8	19.16	36.21	5.9	12.80	21.80	5.9	38.18	57.40	5.9	54.92	11.83
6.8	24.40	37.13	6.8	19.62	36.00	6.8	13.00	21.69	6.9	38.26	57.07	6.9	55.01	11.61
7.8	24.59	37.10	7.8	20.08	35.80	7.8	13.19	21.56	7.9	38.34	56.74	7.9	55.09	11.38
8.8	24.79	37.06	8.8	20.51	35.62	8.8	13.39	21.42	8.9	38.43	56.44	8.9	55.17	11.14
9.8	24.99	37.03	9.8	20.95	35.45	9.8	13.62	21.27	9.9	38.51	56.15	9.9	55.27	10.87
10.8	25.22	37.02	10.8	21.37	35.28	10.8	13.85	21.13	10.9	38.59	55.87	10.9	55.38	10.61
11.8	25.45	37.01	11.8	21.76	35.11	11.8	14.10	21.01	11.9	38.67	55.59	11.9	55.49	10.34
12.8	25.68	37.02	12.8	22.14	34.93	12.8	14.36	20.91	12.9	38.75	55.32	12.9	55.62	10.09
13.8	25.92	37.06	13.8	22.53	34.74	13.8	14.63	20.82	13.9	38.82	55.03	13.9	55.76	9.85
14.8	26.16	37.12	14.8	22.95	34.54	14.8	14.88	20.77	14.9	38.90	54.71	14.9	55.90	9.63
15.8	26.38	37.19	15.8	23.40	34.35	15.8	15.13	20.72	15.9	38.99	54.39	15.9	56.04	9.43
16.8	26.59	37.27	16.8	23.86	34.15	16.8	15.38	20.68	16.9	39.09	54.07	16.9	56.17	9.24
17.8	26.79	37.34	17.8	24.35	33.96	17.8	15.61	20.63	17.9	39.19	53.75	17.9	56.28	9.06
18.8	26.98	37.40	18.8	24.86	33.80	18.8	15.83	20.59	18.9	39.32	53.46	18.9	56.39	8.89
19.8	27.17	37.46	19.8	25.37	33.65	19.8	16.05	20.55	19.9	39.44	53.16	19.9	56.52	8.71
20.8	27.37	37.51	20.8	25.89	33.52	20.8	16.28	20.50	20.9	39.56	52.89	20.9	56.63	8.52
21.8	27.56	37.55	21.8	26.41	33.42	21.8	16.51	20.45	21.9	39.68	52.62	21.9	56.74	8.33
22.8	27.77	37.59	22.8	26.91	33.32	22.8	16.74	20.38	22.9	39.81	52.37	22.9	56.85	8.14
23.8	27.97	37.64	23.8	27.40	33.23	23.8	16.97	20.32	23.9	39.93	52.13	23.9	56.98	7.93
24.7	28.20	37.70	24.8	27.88	33.15	24.8	17.21	20.26	24.9	40.05	51.90	24.9	57.10	7.72
25.7	28.42	37.78	25.8	28.35	33.06	25.8	17.46	20.22	25.9	40.16	51.68	25.9	57.23	7.51
26.7	28.65	37.87	26.8	28.82	32.98	26.8	17.73	20.18	26.9	40.27	51.45	26.9	57.37	7.31
27.7	28.88	37.97	27.8	29.28	32.90	27.8	18.00	20.17	27.8	40.38	51.23	27.9	57.52	7.12
28.7	29.11	38.10	28.8	29.74	32.80	28.8	18.28	20.17	28.8	40.51	51.00	28.9	57.67	6.96
29.7	29.33	38.24	29.8	30.21	32.69	29.8	18.55	20.20	29.8	40.63	50.76	29.9	57.83	6.81
30.7	29.55	38.39	30.8	30.71	32.58	30.8	18.80	20.23	30.8	40.75	50.51	30.9	57.99	6.67
31.7	29.75	38.55	31.8	31.22	32.48	31.8	19.05	20.28	31.8	40.88	50.25	31.9	58.14	6.56
8.58		−8.53	23.17		+23.15	9.91		−9.86	7.34		+7.27	6.24		−6.16
14h	14m	23s.592	15h	1m	45s.970	15h	25m	17s.036	16h	53m	48s.037	17h	17m	1s.936
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Jan.	17 56	+86 36	Jan.	18 9	−87 39	Jan.	18 54	+89 1	Jan.	19 35	−89 12	Jan.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
0.9	42.02	56.59	0.9	11.43	36.11	1.0	14.55	43.78	1.0	4.17	37.75	1.1	10.22	68.31
1.9	42.00	56.26	1.9	11.70	35.78	2.0	14.14	43.46	2.0	4.30	37.40	2.1	10.12	68.08
2.9	41.99	55.90	2.9	11.98	35.49	3.0	13.74	43.13	3.0	4.48	37.06	3.1	10.01	67.81
3.9	41.99	55.54	3.9	12.25	35.20	4.0	13.39	42.77	4.0	4.69	36.72	4.1	9.89	67.53
4.9	42.03	55.17	4.9	12.52	34.92	4.9	13.10	42.41	5.0	4.89	36.41	5.1	9.79	67.22
5.9	42.08	54.79	5.9	12.76	34.64	5.9	12.90	42.04	6.0	5.04	36.09	6.1	9.69	66.91
6.9	42.14	54.43	6.9	12.99	34.36	6.9	12.79	41.67	7.0	5.14	35.78	7.1	9.59	66.60
7.9	42.23	54.08	7.9	13.20	34.07	7.9	12.75	41.33	8.0	5.18	35.46	8.1	9.51	66.28
8.9	42.33	53.75	8.9	13.42	33.76	8.9	12.76	40.99	9.0	5.21	35.13	9.1	9.45	65.97
9.9	42.44	53.42	9.9	13.66	33.43	9.9	12.80	40.67	10.0	5.28	34.76	10.1	9.38	65.68
10.9	42.53	53.13	10.9	13.93	33.10	10.9	12.81	40.37	11.0	5.41	34.38	11.1	9.32	65.40
11.9	42.62	52.84	11.9	14.24	32.77	11.9	12.78	40.08	12.0	5.67	33.99	12.1	9.26	65.14
12.9	42.70	52.53	12.9	14.59	32.44	12.9	12.71	39.76	13.0	6.04	33.61	13.1	9.19	64.88
13.9	42.78	52.21	13.9	14.97	32.13	13.9	12.61	39.45	14.0	6.51	33.23	14.1	9.12	64.60
14.9	42.85	51.89	14.9	15.38	31.83	14.9	12.53	39.12	14.9	7.06	32.87	15.1	9.05	64.31
15.9	42.94	51.55	15.9	15.77	31.55	15.9	12.47	38.78	15.9	7.63	32.53	16.0	8.97	63.99
16.9	43.04	51.21	16.9	16.14	31.30	16.9	12.48	38.43	16.9	8.20	32.21	17.0	8.90	63.67
17.9	43.18	50.86	17.9	16.51	31.05	17.9	12.56	38.08	17.9	8.72	31.88	18.0	8.84	63.33
18.9	43.32	50.51	18.9	16.85	30.80	18.9	12.73	37.72	18.9	9.22	31.56	19.0	8.78	62.98
19.9	43.50	50.17	19.9	17.19	30.55	19.9	12.96	37.36	19.9	9.67	31.25	20.0	8.73	62.63
20.9	43.68	49.84	20.9	17.52	30.28	20.9	13.26	37.02	20.9	10.11	30.93	21.0	8.68	62.29
21.9	43.87	49.52	21.9	17.86	30.01	21.9	13.59	36.68	21.9	10.54	30.61	22.0	8.65	61.94
22.9	44.06	49.24	22.9	18.22	29.74	22.9	13.97	36.36	22.9	10.99	30.28	23.0	8.62	61.59
23.9	44.25	48.96	23.9	18.58	29.46	23.9	14.35	36.04	23.9	11.47	29.93	24.0	8.59	61.26
24.9	44.45	48.68	24.9	18.95	29.18	24.9	14.74	35.75	24.9	12.01	29.57	25.0	8.56	60.94
25.9	44.64	48.41	25.9	19.36	28.89	25.9	15.12	35.45	25.9	12.61	29.21	26.0	8.55	60.63
26.9	44.83	48.16	26.9	19.78	28.61	26.9	15.45	35.15	26.9	13.30	28.87	27.0	8.52	60.32
27.9	45.01	47.88	27.9	20.25	28.34	27.9	15.79	34.86	27.9	14.09	28.52	28.0	8.49	60.01
28.9	45.18	47.60	28.9	20.75	28.09	28.9	16.08	34.56	28.9	14.97	28.17	29.0	8.47	59.70
29.9	45.36	47.32	29.9	21.26	27.85	29.9	16.37	34.24	29.9	15.93	27.83	30.0	8.44	59.38
30.9	45.55	47.02	30.9	21.78	27.63	30.9	16.69	33.92	30.9	16.92	27.50	31.0	8.41	59.05
31.9	45.75	46.71	31.9	22.29	27.43	31.9	17.05	33.59	31.9	17.93	27.18	32.0	8.38	58.69
16.93		+16.90	24.48		−24.46	58.92		+58.91	72.44		−72.43	7.42		+7.35
17h	57m	4s.326	18h	9m	46s.186	18h	55m	23s.393	19h	37m	1s.735	20h	48m	15s.385
+86°	36′	50″.43	−87°	39′	48″.39	+89°	1′	32″.83	−89°	12′	41″.41	+82°	14′	50″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	21 39	−83 4	Jan.	22 16	−86 21	Jan.	22 38	−81 47	Jan.	23 27	+86 53	Jan.	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.1	3.81	38.21	1.1	59.93	51.35	1.2	7.57	24.43	1.2	46.74	18.31	1.2	30.70	8.32
2.1	3.73	37.92	2.1	59.72	51.07	2.2	7.47	24.18	2.2	46.34	18.28	2.2	30.55	8.15
3.1	3.67	37.62	3.1	59.53	50.80	3.2	7.37	23.93	3.2	45.93	18.25	3.2	30.41	7.98
4.1	3.60	37.33	4.1	59.35	50.53	4.2	7.29	23.70	4.2	45.51	18.20	4.2	30.28	7.81
5.1	3.54	37.05	5.1	59.17	50.28	5.2	7.21	23.46	5.2	45.05	18.12	5.2	30.16	7.66
6.1	3.48	36.79	6.1	58.99	50.03	6.2	7.12	23.25	6.2	44.62	18.03	6.2	30.04	7.51
7.1	3.39	36.53	7.1	58.80	49.77	7.1	7.02	23.04	7.2	44.20	17.90	7.2	29.91	7.37
8.1	3.31	36.26	8.1	58.60	49.52	8.1	6.92	22.82	8.2	43.82	17.78	8.2	29.77	7.23
9.1	3.23	35.98	9.1	58.37	49.26	9.1	6.82	22.60	9.2	43.45	17.65	9.2	29.62	7.09
10.1	3.14	35.68	10.1	58.14	48.98	10.1	6.71	22.36	10.2	43.11	17.54	10.2	29.46	6.92
11.1	3.05	35.36	11.1	57.91	48.68	11.1	6.60	22.09	11.2	42.77	17.43	11.2	29.30	6.75
12.1	2.98	35.02	12.1	57.70	48.36	12.1	6.50	21.81	12.2	42.44	17.32	12.2	29.15	6.55
13.1	2.92	34.67	13.1	57.50	48.03	13.1	6.41	21.50	13.2	42.11	17.22	13.2	29.01	6.32
14.1	2.87	34.32	14.1	57.34	47.69	14.1	6.33	21.19	14.2	41.75	17.13	14.2	28.87	6.08
15.1	2.83	33.97	15.1	57.19	47.36	15.1	6.26	20.90	15.2	41.38	17.02	15.2	28.76	5.84
16.1	2.80	33.63	16.1	57.06	47.03	16.1	6.20	20.60	16.2	41.00	16.89	16.2	28.65	5.61
17.1	2.77	33.31	17.1	56.94	46.71	17.1	6.14	20.31	17.2	40.60	16.75	17.2	28.54	5.38
18.1	2.74	33.00	18.1	56.82	46.42	18.1	6.07	20.03	18.2	40.21	16.58	18.2	28.42	5.16
19.1	2.71	32.71	19.1	56.69	46.13	19.1	6.01	19.76	19.1	39.83	16.40	19.2	28.31	4.94
20.1	2.67	32.41	20.1	56.56	45.84	20.1	5.94	19.49	20.1	39.46	16.21	20.2	28.20	4.74
21.1	2.62	32.10	21.1	56.42	45.55	21.1	5.86	19.22	21.1	39.12	16.01	21.2	28.07	4.54
22.1	2.58	31.78	22.1	56.27	45.24	22.1	5.78	18.95	22.1	38.78	15.80	22.2	27.94	4.32
23.1	2.53	31.46	23.1	56.11	44.93	23.1	5.70	18.67	23.1	38.46	15.59	23.2	27.81	4.10
24.1	2.48	31.13	24.1	55.96	44.60	24.1	5.62	18.36	24.1	38.17	15.38	24.1	27.68	3.87
25.1	2.44	30.79	25.1	55.82	44.26	25.1	5.54	18.05	25.1	37.88	15.18	25.1	27.55	3.63
26.1	2.40	30.43	26.1	55.68	43.92	26.1	5.48	17.74	26.1	37.59	14.98	26.1	27.43	3.36
27.1	2.37	30.06	27.1	55.55	43.55	27.1	5.41	17.41	27.1	37.30	14.79	27.1	27.31	3.10
28.1	2.36	29.68	28.1	55.45	43.17	28.1	5.36	17.06	28.1	37.02	14.60	28.1	27.20	2.81
29.0	2.36	29.30	29.1	55.38	42.81	29.1	5.31	16.70	29.1	36.71	14.41	29.1	27.10	2.50
30.0	2.37	28.92	30.1	55.32	42.44	30.1	5.27	16.34	30.1	36.40	14.22	30.1	27.00	2.18
31.0	2.39	28.57	31.1	55.28	42.07	31.1	5.24	16.00	31.1	36.09	14.02	31.1	26.91	1.87
32.0	2.41	28.23	32.1	55.24	41.72	32.1	5.23	15.67	32.1	35.76	13.80	32.1	26.83	1.58
8.30		−8.23	15.76		−15.73	7.00		−6.93	18.42		+18.39	7.61		−7.55
21h	39m	16s.433	22h	17m	21s.969	22h	38m	16s.769	23h	27m	42s.388	23h	47m	38s.028
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	0 57	+85 50	Feb.	1 32	+88 53	Feb.	1 41	−85 9	Feb.	4 11	+85 21	Feb.	5 37	+85 9
	s	″		s	″		s	″		s	″		s	″
0.2	56.90	58.35	0.2	85.65	50.83	0.2	29.52	55.10	0.3	59.96	15.52	0.4	18.64	46.90
1.2	56.60	58.26	1.2	84.45	50.79	1.2	29.29	54.91	1.3	59.73	15.71	1.4	18.49	47.18
2.2	56.30	58.13	2.2	83.23	50.74	2.2	29.07	54.73	2.3	59.49	15.88	2.4	18.32	47.45
3.2	56.00	57.99	3.2	82.01	50.67	3.2	28.84	54.56	3.3	59.21	16.03	3.4	18.13	47.70
4.2	55.70	57.82	4.2	80.83	50.56	4.2	28.61	54.41	4.3	58.94	16.15	4.4	17.93	47.94
5.2	55.42	57.65	5.2	79.72	50.43	5.2	28.37	54.26	5.3	58.68	16.25	5.4	17.72	48.14
6.2	55.17	57.47	6.2	78.67	50.29	6.2	28.10	54.11	6.3	58.43	16.34	6.4	17.52	48.34
7.2	54.93	57.29	7.2	77.69	50.16	7.2	27.84	53.94	7.3	58.18	16.42	7.4	17.33	48.51
8.2	54.70	57.12	8.2	76.77	50.03	8.2	27.57	53.76	8.3	57.95	16.49	8.4	17.15	48.68
9.2	54.49	56.97	9.2	75.85	49.92	9.2	27.30	53.54	9.3	57.73	16.57	9.3	16.98	48.85
10.2	54.27	56.83	10.2	74.90	49.82	10.2	27.05	53.32	10.3	57.52	16.66	10.3	16.82	49.04
11.1	54.04	56.68	11.2	73.93	49.73	11.2	26.81	53.09	11.3	57.30	16.76	11.3	16.65	49.24
12.1	53.79	56.53	12.2	72.90	49.63	12.2	26.57	52.85	12.3	57.07	16.86	12.3	16.48	49.45
13.1	53.52	56.36	13.2	71.82	49.51	13.2	26.37	52.60	13.3	56.82	16.96	13.3	16.29	49.65
14.1	53.26	56.17	14.2	70.71	49.37	14.2	26.16	52.36	14.3	56.55	17.06	14.3	16.07	49.86
15.1	52.99	55.97	15.2	69.60	49.22	15.2	25.95	52.13	15.3	56.27	17.15	15.3	15.85	50.06
16.1	52.74	55.75	16.2	68.52	49.05	16.2	25.74	51.92	16.3	55.98	17.21	16.3	15.62	50.25
17.1	52.49	55.52	17.2	67.46	48.87	17.2	25.54	51.69	17.3	55.69	17.26	17.3	15.37	50.40
18.1	52.24	55.27	18.2	66.44	48.67	18.2	25.32	51.47	18 3	55.40	17.28	18.3	15.12	50.56
19.1	52.02	55.02	19.2	65.48	48.46	19.2	25.10	51.25	19.3	55.12	17.30	19.3	14.87	50.70
20.1	51.81	54.77	20.1	64.56	48.24	20.2	24.87	51.03	20.3	54.84	17.30	20.3	14.63	50.81
21.1	51.61	54.53	21.1	63.67	48.02	21.2	24.65	50.81	21.3	54.57	17.29	21.3	14.39	50.92
22.1	51.42	54.28	22.1	62.83	47.82	22.1	24.42	50.57	22.3	54.33	17.28	22.3	14.15	51.02
23.1	51.23	54.03	23.1	62.03	47.61	23.1	24.19	50.32	23.2	54.08	17.26	23.3	13.93	51.13
24.1	51.07	53.80	24.1	61.24	47.42	24.1	23.96	50.05	24.2	53.84	17.25	24.3	13.72	51.23
25.1	50.89	53.58	25.1	60.46	47.23	25.1	23.76	49.76	25.2	53.60	17.26	25.3	13.51	51.35
26.1	50.71	53.36	26.1	59.64	47.05	26.1	23.56	49.45	26.2	53.37	17.27	26.3	13.31	51.47
27.1	50.52	53.14	27.1	58.78	46.87	27.1	23.36	49.14	27.2	53.12	17.29	27.3	13.08	51.60
28.1	50.32	52.91	28.1	57.89	46.68	28.1	23.18	48.83	28.2	52.86	17.30	28.3	12.86	51.73
29.1	50.11	52.67	29.1	56.96	46.48	29.1	23.03	48.51	29.2	52.58	17.31	29.3	12.63	51.86
30.1	49.91	52.40	30.1	56.05	46.25	30.1	22.87	48.22	30.2	52.30	17.31	30.3	12.38	51.97
31.1	49.71	52.11	31.1	55.17	46.01	31.1	22.70	47.93	31.2	52.01	17.28	31.3	12.11	52.07
13.81		+13.78	51.95		+51.94	11.86		−11.82	12.35		+12.31	11.86		+11.82
0h	57m	55s.489	1h	33m	11s.898	1h	41m	39s.995	4h	11m	48s.583	5h	37m	5s.478
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Feb.	5 45	−84 50	Feb.	6 46	−80 44	Feb.	7 5	+87 10	Feb.	7 14	−86 55	Feb.	7 15	+82 33
	s	″		s	″		s	″		s	″		s	″
0.4	14.24	1.83	0.4	36.55	21.19	0.4	21.66	19.57	0.4	43.42	1.89	0.4	7.98	48.26
1.4	14.01	2.00	1.4	36.45	21.46	1.4	21.56	19.89	1.4	43.15	2.17	1.4	7.95	48.58
2.4	13.78	2.17	2.4	36.36	21.72	2.4	21.42	20.23	2.4	42.90	2.44	2.4	7.91	48.91
3.4	13.58	2.36	3.4	36.27	21.98	3.4	21.25	20.56	3.4	42.65	2.72	3.4	7.86	49.24
4.4	13.38	2.56	4.4	36.18	22.24	4.4	21.06	20.88	4.4	42.41	3.01	4.4	7.80	49.55
5.4	13.16	2.76	5.4	36.09	22.52	5.4	20.83	21.18	5.4	42.17	3.32	5.4	7.72	49.84
6.4	12.93	2.99	6.4	36.00	22.82	6.4	20.60	21.46	6.4	41.92	3.64	6.4	7.64	50.12
7.4	12.70	3.21	7.4	35.90	23.13	7.4	20.41	21.71	7.4	41.66	3.96	7.4	7.58	50.37
8.4	12.46	3.44	8.4	35.79	23.43	8.4	20.21	21.95	8.4	41.38	4.28	8.4	7.51	50.61
9.4	12.21	3.64	9.4	35.68	23.72	9.4	20.02	22.19	9.4	41.07	4.61	9.4	7.46	50.86
10.3	11.94	3.84	10.4	35.57	24.00	10.4	19.85	22.46	10.4	40.74	4.93	10.4	7.41	51.12
11.3	11.67	4.01	11.4	35.44	24.26	11.4	19.69	22.72	11.4	40.41	5.21	11.4	7.36	51.39
12.3	11.41	4.14	12.4	35.32	24.50	12.4	19.52	23.01	12.4	40.07	5.48	12.4	7.30	51.66
13.3	11.16	4.27	13.4	35.20	24.72	13.4	19.32	23.30	13.4	39.72	5.73	13.4	7.24	51.95
14.3	10.91	4.40	14.4	35.08	24.94	14.4	19.09	23.60	14.4	39.38	5.98	14.4	7.16	52.25
15.3	10.68	4.53	15.4	34.96	25.15	15.4	18.83	23.90	15.4	39.05	6.22	15.4	7.07	52.54
16.3	10.44	4.65	16.4	34.85	25.37	16.4	18.56	24.18	16.4	38.73	6.46	16.4	6.97	52.83
17.3	10.20	4.78	17.4	34.74	25.58	17.4	18.25	24.46	17.4	38.42	6.70	17.4	6.87	53.11
18.3	9.96	4.91	18.4	34.63	25.81	18.4	17.93	24.73	18.4	38.11	6.95	18.4	6.76	53.36
19.3	9.72	5.05	19.4	34.52	26.03	19.4	17.61	24.97	19.4	37.79	7.22	19.4	6.63	53.61
20.3	9.46	5.19	20.4	34.40	26.26	20.4	17.29	25.21	20.4	37.47	7.48	20.4	6.51	53.85
21.3	9.21	5.34	21.4	34.27	26.50	21.4	16.97	25.43	21.4	37.14	7.75	21.4	6.40	54.08
22.3	8.94	5.48	22.4	34.14	26.73	22.4	16.65	25.64	22.4	36.80	8.01	22.4	6.29	54.30
23.3	8.66	5.61	23.4	34.01	26.96	23.4	16.36	25.84	23.4	36.44	8.27	23.4	6.18	54.50
24.3	8.38	5.72	24.4	33.88	27.19	24.4	16.06	26.05	24.4	36.06	8.52	24.4	6.08	54.70
25.3	8.11	5.83	25.4	33.75	27.39	25.4	15.78	26.25	25.4	35.65	8.77	25.4	5.99	54.92
26.3	7.82	5.92	26.3	33.61	27.58	26.4	15.51	26.48	26.4	35.24	9.00	26.4	5.90	55.14
27.3	7.53	5.99	27.3	33.47	27.76	27.4	15.24	26.70	27.4	34.82	9.20	27.4	5.81	55.37
28.3	7.25	6.05	28.3	33.32	27.90	28.4	14.94	26.94	28.4	34.40	9.39	28.4	5.71	55.60
29.3	6.97	6.09	29.3	33.18	28.05	29.4	14.62	27.17	29.4	33.99	9.57	29.4	5.60	55.84
30.3	6.70	6.13	30.3	33.04	28.19	30.4	14.27	27.40	30.4	33.61	9.75	30.4	5.47	56.08
31.3	6.44	6.18	31.3	32.90	28.34	31.3	13.90	27.61	31.4	33.22	9.93	31.4	5.33	56.31
11.11		−11.06	6.22		−6.13	20.28		+20.25	18.60		−18.57	7.73		+7.66
5h 45m 4s.700			6h 46m 28s.850			7h 4m 58s.549			7h 14m 18s.185			7h 14m 59s.083		
−84° 49′ 38″.84			−80° 44′ 2″.02			+87° 10′ 21″.62			−86° 54′ 45″.50			+82° 33′ 51″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	8 22	+88 51	Feb.	9 8	−85 21	Feb.	9 26	+81 39	Feb.	9 36	−80 35	Feb.	10 21	+82 56
	s	″		s	″		s	″		s	″		s	″
0.5	34.05	44.59	0.5	29.84	30.36	0.5	20.44	55.33	0.5	23.05	46.50	0.6	55.63	50.24
1.5	34.18	44.95	1.5	29.80	30.72	1.5	20.51	55.64	1.5	23.04	46.87	1.6	55.74	50.52
2.5	34.21	45.30	2.5	29.76	31.06	2.5	20.57	55.97	2.5	23.04	47.22	2.6	55.85	50.82
3.5	34.18	45.66	3.5	29.72	31.40	3.5	20.61	56.30	3.5	23.05	47.58	3.6	55.95	51.13
4.5	34.05	46.00	4.5	29.69	31.76	4.5	20.64	56.63	4.5	23.06	47.93	4.6	56.03	51.44
5.5	33.87	46.34	5.5	29.67	32.11	5.5	20.67	56.95	5.5	23.06	48.29	5.6	56.09	51.75
6.5	33.66	46.66	6.5	29.65	32.48	6.5	20.68	57.26	6.5	23.07	48.68	6.6	56.15	52.04
7.5	33.46	46.96	7.5	29.63	32.88	7.5	20.69	57.55	7.5	23.08	49.08	7.6	56.21	52.32
8.5	33.26	47.25	8.5	29.60	33.29	8.5	20.72	57.82	8.5	23.09	49.50	8.5	56.27	52.58
9.5	33.11	47.53	9.5	29.54	33.70	9.5	20.75	58.09	9.5	23.09	49.91	9.5	56.34	52.84
10.5	33.00	47.82	10.5	29.47	34.11	10.5	20.78	58.37	10.5	23.08	50.32	10.5	56.42	53.09
11.5	32.91	48.13	11.5	29.39	34.50	11.5	20.81	58.66	11.5	23.07	50.74	11.5	56.49	53.36
12.5	32.78	48.45	12.5	29.30	34.88	12.5	20.85	58.97	12.5	23.05	51.13	12.5	56.57	53.65
13.4	32.63	48.78	13.5	29.19	35.23	13.5	20.88	59.28	13.5	23.02	51.51	13.5	56.64	53.95
14.4	32.41	49.12	14.5	29.09	35.57	14.5	20.89	59.61	14.5	22.99	51.87	14.5	56.70	54.26
15.4	32.14	49.46	15.5	29.00	35.91	15.5	20.90	59.95	15.5	22.96	52.22	15.5	56.76	54.58
16.4	31.79	49.80	16.5	28.91	36.25	16.5	20.90	60.29	16.5	22.94	52.57	16.5	56.81	54.92
17.4	31.39	50.14	17.5	28.82	36.58	17.5	20.89	60.63	17.5	22.91	52.92	17.5	56.85	55.27
18.4	30.94	50.47	18.5	28.73	36.92	18.5	20.87	60.97	18.5	22.88	53.28	18.5	56.88	55.62
19.4	30.46	50.77	19.5	28.65	37.26	19.5	20.84	61.30	19.5	22.85	53.64	19.5	56.90	55.95
20.4	29.95	51.06	20.5	28.56	37.62	20.5	20.81	61.62	20.5	22.83	54.01	20.5	56.91	56.28
21.4	29.44	51.35	21.5	28.47	37.99	21.5	20.79	61.92	21.5	22.81	54.38	21.5	56.92	56.59
22.4	28.94	51.63	22.5	28.38	38.37	22.5	20.77	62.22	22.5	22.79	54.76	22.5	56.93	56.88
23.4	28.46	51.91	23.5	28.28	38.74	23.5	20.74	62.50	23.5	22.76	55.17	23.5	56.94	57.17
24.4	28.00	52.18	24.5	28.15	39.12	24.5	20.73	62.78	24.5	22.73	55.57	24.5	56.95	57.46
25.4	27.58	52.45	25.4	28.02	39.50	25.5	20.72	63.07	25.5	22.69	55.96	25.5	56.98	57.75
26.4	27.17	52.74	26.4	27.87	39.86	26.5	20.71	63.36	26.5	22.64	56.35	26.5	57.01	58.05
27.4	26.76	53.01	27.4	27.70	40.20	27.5	20.70	63.65	27.5	22.58	56.72	27.5	57.04	58.36
28.4	26.32	53.32	28.4	27.53	40.54	28.5	20.69	63.97	28.5	22.52	57.07	28.5	57.06	58.68
29.4	25.83	53.62	29.4	27.37	40.86	29.5	20.66	64.30	29.5	22.46	57.41	29.5	57.07	59.01
30.4	25.25	53.92	30.4	27.20	41.17	30.4	20.62	64.63	30.5	22.40	57.74	30.5	57.08	59.34
31.4	24.61	54.21	31.4	27.06	41.48	31.4	20.58	64.96	31.5	22.34	58.07	31.5	57.07	59.69
50.43	+50.42		12.36	−12.32		6.90	+6.83		6.12	−6.04		8.15	+8.09	
8h	21m	41s.998	9h	8m	8s.703	9h	26m	14s.295	9h	36m	12s.346	10h	21m	50s.081
+88°	51′	51″.95	−85°	21′	25″.35	+81°	40′	7″.28	−80°	35′	44″.11	+82°	57′	4″.81

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Feb.	11 0	−84 10	Feb.	12 14	+88 7	Feb.	12 46	−84 42	Feb.	12 48	+83 49	Feb.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
0.6	9.40	39.55	0.6	35.20	19.35	0.7	56.69	2.52	0.7	33.09	35.50	0.7	22.21	13.36
1.6	9.48	39.89	1.6	35.85	19.52	1.7	56.88	2.79	1.7	33.29	35.60	1.7	22.45	13.56
2.6	9.56	40.23	2.6	36.48	19.70	2.7	57.07	3.03	2.7	33.50	35.72	2.7	22.69	13.76
3.6	9.64	40.57	3.6	37.10	19.89	3.7	57.26	3.28	3.7	33.70	35.86	3.7	22.93	13.96
4.6	9.72	40.90	4.6	37.66	20.12	4.7	57.45	3.51	4.7	33.90	36.03	4.7	23.18	14.15
5.6	9.82	41.23	5.6	38.18	20.34	5.7	57.65	3.75	5.7	34.08	36.20	5.7	23.44	14.34
6.6	9.92	41.59	6.6	38.65	20.56	6.7	57.86	3.99	6.7	34.25	36.38	6.7	23.71	14.53
7.6	10.02	41.95	7.6	39.11	20.76	7.7	58.08	4.26	7.7	34.40	36.55	7.7	24.00	14.75
8.6	10.12	42.33	8.6	39.56	20.95	8.6	58.30	4.54	8.6	34.56	36.70	8.7	24.29	14.98
9.6	10.22	42.74	9.6	40.01	21.13	9.6	58.50	4.86	9.6	34.73	36.84	9.7	24.57	15.22
10.6	10.29	43.15	10.6	40.48	21.32	10.6	58.71	5.18	10.6	34.91	36.98	10.7	24.86	15.50
11.6	10.35	43.54	11.6	41.00	21.51	11.6	58.90	5.51	11.6	35.08	37.12	11.7	25.11	15.77
12.6	10.40	43.93	12.6	41.53	21.71	12.6	59.08	5.83	12.6	35.26	37.28	12.7	25.36	16.04
13.6	10.45	44.31	13.6	42.05	21.94	13.6	59.23	6.15	13.6	35.45	37.46	13.7	25.59	16.31
14.6	10.49	44.68	14.6	42.57	22.18	14.6	59.39	6.45	14.6	35.64	37.64	14.7	25.79	16.57
15.6	10.52	45.04	15.6	43.09	22.43	15.6	59.54	6.75	15.6	35.81	37.84	15.7	26.01	16.82
16.6	10.56	45.38	16.6	43.57	22.70	16.6	59.69	7.04	16.6	35.98	38.07	16.7	26.23	17.07
17.6	10.60	45.73	17.6	44.01	22.98	17.6	59.84	7.32	17.6	36.15	38.31	17.6	26.44	17.31
18.5	10.64	46.09	18.6	44.43	23.26	18.6	60.00	7.61	18.6	36.30	38.55	18.6	26.66	17.55
19.5	10.69	46.46	19.6	44.82	23.55	19.6	60.17	7.90	19.6	36.44	38.80	19.6	26.88	17.79
20.5	10.74	46.82	20.6	45.19	23.83	20.6	60.34	8.21	20.6	36.58	39.04	20.6	27.11	18.04
21.5	10.78	47.19	21.6	45.52	24.09	21.6	60.50	8.52	21.6	36.71	39.29	21.6	27.35	18.31
22.5	10.83	47.57	22.6	45.84	24.36	22.6	60.67	8.83	22.6	36.83	39.53	22.6	27.59	18.58
23.5	10.88	47.97	23.6	46.16	24.65	23.6	60.84	9.16	23.6	36.96	39.77	23.6	27.82	18.87
24.5	10.91	48.38	24.6	46.48	24.89	24.6	61.00	9.52	24.6	37.09	40.00	24.6	28.05	19.18
25.5	10.92	48.80	25.6	46.82	25.14	25.6	61.15	9.89	25.6	37.22	40.23	25.6	28.28	19.50
26.5	10.93	49.22	26.6	47.19	25.39	26.6	61.29	10.25	26.6	37.35	40.45	26.6	28.49	19.83
27.5	10.93	49.63	27.6	47.55	25.66	27.6	61.41	10.62	27.6	37.49	40.66	27.6	28.69	20.17
28.5	10.92	50.01	28.6	47.92	25.93	28.6	61.52	10.98	28.6	37.64	40.88	28.6	28.87	20.51
29.5	10.90	50.39	29.6	48.29	26.22	29.6	61.63	11.35	29.6	37.79	41.14	29.6	29.04	20.84
30.5	10.88	50.76	30.6	48.63	26.53	30.6	61.73	11.68	30.6	37.92	41.42	30.6	29.20	21.16
31.5	10.87	51.11	31.6	48.94	26.85	31.6	61.83	12.01	31.6	38.05	41.71	31.6	29.37	21.46
9.86		−9.81	30.53		+30.51	10.83		−10.78	9.30		+9.25	12.44		−12.40
10^h	59^m	$53^s.036$	12^h	14^m	$30^s.802$	12^h	46^m	$43^s.161$	12^h	48^m	$33^s.111$	13^h	28^m	$9^s.628$
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Feb.	14 14	−83 18	Feb.	15 1	+87 31	Feb.	15 25	−84 12	Feb.	16 53	+82 9	Feb.	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
0.7	29.75	38.55	0.8	31.22	32.48	0.8	19.05	20.28	0.8	40.88	50.25	0.9	58.14	6.56
1.7	29.95	38.71	1.8	31.77	32.39	1.8	19.30	20.33	1.8	41.02	50.00	1.9	58.29	6.45
2.7	30.14	38.85	2.8	32.32	32.32	2.8	19.53	20.37	2.8	41.17	49.76	2.8	58.43	6.34
3.7	30.31	38.98	3.8	32.87	32.26	3.8	19.76	20.41	3.8	41.32	49.56	3.8	58.57	6.21
4.7	30.50	39.11	4.8	33.40	32.24	4.8	19.99	20.42	4.8	41.47	49.36	4.8	58.70	6.08
5.7	30.69	39.23	5.7	33.93	32.24	5.8	20.23	20.43	5.8	41.62	49.19	5.8	58.84	5.94
6.7	30.92	39.36	6.7	34.44	32.25	6.8	20.48	20.45	6.8	41.76	49.04	6.8	58.98	5.78
7.7	31.13	39.50	7.7	34.92	32.27	7.8	20.75	20.48	7.8	41.91	48.90	7.8	59.13	5.62
8.7	31.35	39.67	8.7	35.38	32.27	8.8	21.03	20.51	8.8	42.04	48.76	8.8	59.30	5.48
9.7	31.58	39.84	9.7	35.85	32.26	9.8	21.31	20.56	9.8	42.18	48.60	9.8	59.47	5.35
10.7	31.80	40.04	10.7	36.31	32.23	10.8	21.59	20.65	10.8	42.31	48.43	10.8	59.64	5.24
11.7	32.00	40.26	11.7	36.81	32.20	11.8	21.86	20.75	11.8	42.45	48.26	11.8	59.81	5.15
12.7	32.20	40.47	12.7	37.32	32.19	12.7	22.11	20.86	12.8	42.60	48.09	12.8	59.98	5.09
13.7	32.39	40.69	13.7	37.86	32.19	13.7	22.35	20.97	13.8	42.76	47.91	13.8	60.13	5.03
14.7	32.57	40.91	14.7	38.41	32.20	14.7	22.59	21.08	14.8	42.91	47.75	14.8	60.29	4.97
15.7	32.74	41.11	15.7	38.96	32.23	15.7	22.82	21.18	15.8	43.09	47.60	15.8	60.44	4.91
16.7	32.91	41.30	16.7	39.51	32.26	16.7	23.05	21.27	16.8	43.25	47.47	16.8	60.58	4.83
17.7	33.08	41.49	17.7	40.04	32.31	17.7	23.27	21.36	17.8	43.43	47.35	17.8	60.72	4.75
18.7	33.25	41.68	18.7	40.57	32.40	18.7	23.50	21.45	18.8	43.60	47.25	18.8	60.86	4.68
19.7	33.43	41.87	19.7	41.09	32.50	19.7	23.74	21.53	19.8	43.75	47.16	19.8	61.01	4.60
20.7	33.62	42.06	20.7	41.58	32.60	20.7	23.98	21.62	20.8	43.91	47.10	20.8	61.16	4.52
21.7	33.81	42.26	21.7	42.06	32.70	21.7	24.23	21.71	21.8	44.07	47.03	21.8	61.31	4.43
22.7	34.00	42.48	22.7	42.53	32.80	22.7	24.48	21.82	22.8	44.23	46.97	22.8	61.49	4.36
23.7	34.20	42.72	23.7	42.99	32.88	23.7	24.75	21.95	23.8	44.39	46.91	23.8	61.66	4.30
24.7	34.40	42.96	24.7	43.44	32.97	24.7	25.02	22.08	24.8	44.54	46.85	24.8	61.83	4.25
25.7	34.59	43.22	25.7	43.90	33.05	25.7	25.28	22.23	25.8	44.70	46.76	25.8	62.02	4.21
26.7	34.78	43.50	26.7	44.37	33.11	26.7	25.53	22.41	26.8	44.85	46.68	26.8	62.20	4.20
27.7	34.96	43.78	27.7	44.85	33.17	27.7	25.78	22.60	27.8	45.00	46.60	27.8	62.37	4.20
28.7	35.11	44.07	28.7	45.36	33.26	28.7	26.02	22.80	28.8	45.17	46.52	28.8	62.55	4.22
29.7	35.26	44.36	29.7	45.86	33.35	29.7	26.24	22.98	29.8	45.35	46.46	29.8	62.70	4.23
30.6	35.41	44.63	30.7	46.37	33.48	30.7	26.44	23.15	30.8	45.52	46.41	30.8	62.86	4.24
31.6	35.55	44.88	31.7	46.86	33.62	31.7	26.65	23.32	31.8	45.70	46.37	31.8	63.00	4.24
8.59		−8.53	23.16		+23.14	9.91		−9.86	7.33		+7.27	6.24		−6.16
14h	14m	23s.592	15h	1m	45s.970	15h	25m	17s.036	16h	53m	48s.037	17h	17m	1s.936
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Feb.	17 56	+86 36	Feb.	18 9	−87 39	Feb.	18 54	+89 1	Feb.	19 35	−89 12	Feb.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
0.9	45.75	46.71	0.9	22.29	27.43	0.9	17.05	33.59	0.9	17.93	27.18	1.0	8.38	58.69
1.9	45.98	46.40	1.9	22.77	27.23	1.9	17.50	33.25	1.9	18.89	26.90	2.0	8.37	58.32
2.9	46.22	46.11	2.9	23.24	27.03	2.9	18.03	32.92	2.9	19.79	26.62	2.9	8.35	57.95
3.9	46.49	45.83	3.9	23.67	26.84	3.9	18.66	32.59	3.9	20.62	26.33	3.9	8.35	57.59
4.9	46.76	45.57	4.9	24.11	26.62	4.9	19.34	32.29	4.9	21.44	26.01	4.9	8.36	57.23
5.9	47.04	45.33	5.9	24.56	26.39	5.9	20.05	32.01	5.9	22.21	25.70	5.9	8.37	56.89
6.9	47.32	45.12	6.9	25.02	26.15	6.9	20.76	31.74	6.9	23.07	25.37	6.9	8.39	56.56
7.9	47.57	44.92	7.9	25.53	25.90	7.9	21.42	31.50	7.9	24.01	25.03	7.9	8.41	56.25
8.9	47.83	44.72	8.9	26.07	25.65	8.9	22.04	31.25	8.9	25.06	24.68	8.9	8.43	55.94
9.9	48.07	44.50	9.9	26.64	25.43	9.9	22.63	30.98	9.9	26.22	24.35	9.9	8.45	55.64
10.9	48.32	44.28	10.9	27.23	25.23	10.9	23.21	30.71	10.9	27.46	24.03	10.9	8.47	55.33
11.9	48.58	44.04	11.9	27.82	25.05	11.9	23.80	30.43	11.9	28.72	23.73	11.9	8.48	55.02
12.8	48.85	43.80	12.9	28.39	24.88	12.9	24.43	30.15	12.9	29.99	23.44	12.9	8.49	54.68
13.8	49.13	43.56	13.9	28.95	24.73	13.9	25.14	29.86	13.9	31.24	23.17	13.9	8.51	54.34
14.8	49.43	43.32	14.9	29.49	24.58	14.9	25.92	29.57	14.9	32.44	22.91	14.9	8.53	53.98
15.8	49.75	43.10	15.9	30.01	24.43	15.9	26.76	29.28	15.9	33.60	22.65	15.9	8.56	53.62
16.8	50.07	42.89	16.8	30.52	24.28	16.9	27.67	28.99	16.9	34.72	22.39	16.9	8.60	53.25
17.8	50.41	42.69	17.8	31.03	24.13	17.9	28.61	28.74	17.9	35.81	22.13	17.9	8.65	52.89
18.8	50.75	42.50	18.8	31.53	23.96	18.9	29.59	28.49	18.9	36.92	21.86	18.9	8.70	52.55
19.8	51.10	42.33	19.8	32.05	23.79	19.9	30.58	28.25	19.9	38.04	21.59	19.9	8.76	52.23
20.8	51.44	42.18	20.8	32.59	23.62	20.9	31.57	28.03	20.9	39.19	21.31	20.9	8.82	51.91
21.8	51.77	42.04	21.8	33.14	23.44	21.9	32.55	27.83	21.9	40.40	21.02	21.9	8.89	51.60
22.8	52.10	41.91	22.8	33.72	23.26	22.9	33.50	27.62	22.9	41.68	20.73	22.9	8.95	51.31
23.8	52.42	41.77	23.8	34.32	23.11	23.9	34.41	27.43	23.9	43.05	20.44	23.9	9.01	51.03
24.8	52.73	41.63	24.8	34.96	22.97	24.9	35.30	27.23	24.9	44.51	20.16	24.9	9.07	50.75
25.8	53.04	41.49	25.8	35.61	22.83	25.9	36.18	27.03	25.9	46.03	19.91	25.9	9.13	50.46
26.8	53.35	41.34	26.8	36.26	22.73	26.9	37.05	26.81	26.9	47.61	19.65	26.9	9.19	50.16
27.8	53.67	41.18	27.8	36.91	22.64	27.9	37.95	26.59	27.9	49.19	19.43	27.9	9.24	49.85
28.8	53.99	41.01	28.8	37.53	22.56	28.8	38.90	26.36	28.9	50.74	19.21	28.9	9.30	49.53
29.8	54.35	40.85	29.8	38.13	22.48	29.8	39.92	26.14	29.9	52.25	19.01	29.9	9.36	49.21
30.8	54.72	40.70	30.8	38.69	22.40	30.8	41.02	25.93	30.9	53.67	18.80	30.9	9.44	48.88
31.8	55.09	40.59	31.8	39.25	22.31	31.8	42.18	25.73	31.9	55.04	18.60	31.9	9.52	48.56
16.92		+16.89	24.46		−24.44	58.76		+58.75	72.19		−72.18	7.41		+7.35
17^h	57^m	$4^s.326$	18^h	9^m	$46^s.186$	18^h	55^m	$23^s.393$	19^h	37^m	$1^s.735$	20^h	48^m	$15^s.385$
+86°	36′	50″.43	−87°	39′	48″.39	+89°	1′	32″.83	−89°	12′	41″.41	+82°	14′	50″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Feb.	21 39	−83 4	Feb.	22 16	−86 21	Feb.	22 38	−81 47	Feb.	23 27	+86 53	Feb.	23 47	−82 26
	s	″		s	″		s	″		s	″		s	″
1.0	2.41	28.23	1.1	55.24	41.72	1.1	5.23	15.67	1.1	35.76	13.80	1.1	26.83	61.58
2.0	2.43	27.90	2.1	55.21	41.38	2.1	5.21	15.34	2.1	35.43	13.57	2.1	26.75	61.29
3.0	2.44	27.57	3.1	55.16	41.05	3.1	5.17	15.02	3.1	35.11	13.30	3.1	26.66	61.01
4.0	2.43	27.25	4.1	55.10	40.72	4.1	5.13	14.71	4.1	34.83	13.03	4.1	26.58	60.73
5.0	2.43	26.91	5.1	55.02	40.39	5.1	5.08	14.40	5.1	34.58	12.76	5.1	26.49	60.46
6.0	2.42	26.55	6.1	54.94	40.03	6.1	5.03	14.07	6.1	34.34	12.48	6.1	26.38	60.19
7.0	2.42	26.18	7.0	54.86	39.66	7.1	4.98	13.71	7.1	34.14	12.23	7.1	26.27	59.90
8.0	2.42	25.80	8.0	54.79	39.29	8.1	4.94	13.35	8.1	33.94	11.98	8.1	26.17	59.58
9.0	2.43	25.41	9.0	54.74	38.89	9.1	4.90	12.97	9.1	33.74	11.75	9.1	26.08	59.24
10.0	2.46	25.02	10.0	54.72	38.48	10.1	4.89	12.59	10.1	33.51	11.51	10.1	26.00	58.88
11.0	2.51	24.63	11.0	54.72	38.07	11.1	4.88	12.21	11.1	33.28	11.27	11.1	25.92	58.52
12.0	2.56	24.25	12.0	54.73	37.69	12.1	4.87	11.83	12.1	33.05	11.03	12.1	25.86	58.18
13.0	2.61	23.88	13.0	54.76	37.31	13.0	4.87	11.45	13.1	32.81	10.75	13.1	25.80	57.83
14.0	2.67	23.54	14.0	54.79	36.95	14.0	4.86	11.10	14.1	32.56	10.47	14.1	25.75	57.50
15.0	2.72	23.20	15.0	54.82	36.61	15.0	4.86	10.76	15.1	32.32	10.16	15.1	25.69	57.17
15.9	2.76	22.86	16.0	54.83	36.27	16.0	4.86	10.42	16.1	32.10	9.85	16.1	25.63	56.85
16.9	2.80	22.53	17.0	54.84	35.92	17.0	4.85	10.09	17.1	31.91	9.53	17.1	25.56	56.54
17.9	2.84	22.20	18.0	54.85	35.58	18.0	4.84	9.76	18.1	31.73	9.21	18.1	25.50	56.23
18.9	2.87	21.87	19.0	54.84	35.22	19.0	4.83	9.41	19.1	31.56	8.88	19.1	25.43	55.92
19.9	2.90	21.51	20.0	54.84	34.86	20.0	4.81	9.06	20.1	31.41	8.56	20.1	25.36	55.60
20.9	2.94	21.15	21.0	54.85	34.49	21.0	4.79	8.70	21.1	31.28	8.24	21.1	25.30	55.27
21.9	2.98	20.79	22.0	54.86	34.12	22.0	4.78	8.33	22.1	31.17	7.94	22.1	25.23	54.90
22.9	3.03	20.41	23.0	54.89	33.73	23.0	4.78	7.96	23.1	31.06	7.64	23.1	25.17	54.55
23.9	3.10	20.04	24.0	54.92	33.34	24.0	4.78	7.57	24.0	30.95	7.35	24.1	25.11	54.18
24.9	3.16	19.65	24.9	54.98	32.93	25.0	4.79	7.16	25.0	30.84	7.07	25.1	25.06	53.79
25.9	3.25	19.27	25.9	55.07	32.52	26.0	4.83	6.77	26.0	30.71	6.79	26.1	25.02	53.40
26.9	3.34	18.89	26.9	55.17	32.11	27.0	4.87	6.38	27.0	30.58	6.51	27.1	24.99	53.01
27.9	3.44	18.55	27.9	55.30	31.73	28.0	4.91	6.00	28.0	30.44	6.21	28.1	24.98	52.63
28.9	3.54	18.21	28.9	55.41	31.35	29.0	4.95	5.63	29.0	30.30	5.89	29.0	24.96	52.26
29.9	3.63	17.88	29.9	55.52	31.01	30.0	4.98	5.27	30.0	30.17	5.56	30.0	24.95	51.89
30.9	3.72	17.56	30.9	55.63	30.67	30.9	5.01	4.93	31.0	30.06	5.22	31.0	24.92	51.55
31.9	3.80	17.24	31.9	55.72	30.33	31.9	5.02	4.59	32.0	29.97	4.87	32.0	24.89	51.21
8.29		−8.23	15.75		−15.72	7.00		−6.93	18.41		+18.38	7.61		−7.54
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Mar.	0 57	+85 50	Mar.	1 32	+88 53	Mar.	1 41	−85 9	Mar.	4 11	+85 21	Mar.	5 37	+85 9
0.1	50.32	52.91	0.1	57.89	46.68	0.1	23.18	48.83	0.2	52.86	17.30	0.3	12.86	51.73
1.1	50.11	52.67	1.1	56.96	46.48	1.1	23.03	48.51	1.2	52.58	17.31	1.3	12.63	51.86
2.1	49.91	52.40	2.1	56.05	46.25	2.1	22.87	48.22	2.2	52.30	17.31	2.3	12.38	51.97
3.1	49.71	52.11	3.1	55.17	46.01	3.1	22.70	47.93	3.2	52.01	17.28	3.3	12.11	52.07
4.1	49.53	51.81	4.1	54.35	45.73	4.1	22.53	47.65	4.2	51.72	17.22	4.3	11.84	52.13
5.1	49.38	51.51	5.1	53.61	45.46	5.1	22.34	47.38	5.2	51.44	17.14	5.3	11.56	52.19
6.1	49.25	51.21	6.1	52.95	45.18	6.1	22.14	47.10	6.2	51.19	17.05	6.3	11.31	52.22
7.1	49.13	50.92	7.1	52.37	44.91	7.1	21.95	46.81	7.2	50.94	16.96	7.3	11.06	52.25
8.1	49.03	50.63	8.1	51.81	44.67	8.1	21.75	46.49	8.2	50.71	16.86	8.3	10.83	52.26
9.1	48.92	50.36	9.1	51.26	44.42	9.1	21.56	46.16	9.2	50.50	16.78	9.3	10.61	52.27
10.1	48.81	50.10	10.1	50.67	44.19	10.1	21.37	45.81	10.2	50.27	16.72	10.3	10.39	52.31
11.1	48.68	49.84	11.1	50.06	43.96	11.1	21.22	45.46	11.2	50.05	16.65	11.3	10.17	52.35
12.1	48.55	49.58	12.1	49.40	43.72	12.1	21.07	45.11	12.2	49.81	16.59	12.3	9.94	52.40
13.1	48.41	49.30	13.1	48.71	43.46	13.1	20.94	44.77	13.2	49.55	16.51	13.3	9.70	52.45
14.1	48.27	49.01	14.1	48.02	43.19	14.1	20.81	44.44	14.2	49.28	16.43	14.3	9.43	52.50
15.1	48.13	48.69	15.1	47.35	42.90	15.1	20.68	44.11	15.2	49.02	16.34	15.3	9.16	52.54
16.1	48.01	48.37	16.1	46.71	42.59	16.1	20.56	43.79	16.2	48.74	16.24	16.3	8.87	52.54
17.1	47.90	48.04	17.1	46.11	42.27	17.1	20.43	43.47	17.2	48.47	16.10	17.3	8.59	52.55
18.1	47.80	47.70	18.1	45.57	41.95	18.1	20.30	43.16	18.2	48.20	15.95	18.2	8.31	52.52
19.1	47.71	47.36	19.1	45.09	41.63	19.1	20.17	42.86	19.2	47.95	15.80	19.2	8.04	52.49
20.0	47.65	47.03	20.1	44.66	41.31	20.1	20.03	42.55	20.2	47.70	15.62	20.2	7.77	52.45
21.0	47.60	46.71	21.1	44.28	40.99	21.1	19.88	42.22	21.2	47.47	15.44	21.2	7.52	52.39
22.0	47.55	46.39	22.1	43.95	40.70	22.1	19.74	41.88	22.2	47.25	15.26	22.2	7.28	52.32
23.0	47.52	46.08	23.1	43.63	40.41	23.1	19.60	41.52	23.2	47.05	15.09	23.2	7.05	52.26
24.0	47.48	45.79	24.1	43.33	40.12	24.1	19.46	41.16	24.2	46.84	14.94	24.2	6.82	52.20
25.0	47.45	45.49	25.1	43.02	39.84	25.1	19.35	40.78	25.2	46.65	14.78	25.2	6.60	52.15
26.0	47.41	45.20	26.1	42.67	39.57	26.1	19.24	40.40	26.2	46.45	14.63	26.2	6.37	52.10
27.0	47.36	44.91	27.1	42.30	39.29	27.1	19.16	40.01	27.2	46.23	14.49	27.2	6.15	52.06
28.0	47.29	44.62	28.1	41.91	39.01	28.1	19.08	39.63	28.2	46.01	14.35	28.2	5.91	52.03
29.0	47.23	44.30	29.0	41.51	38.70	29.1	19.01	39.25	29.2	45.78	14.20	29.2	5.67	52.00
30.0	47.18	43.97	30.0	41.13	38.39	30.0	18.95	38.90	30.2	45.55	14.03	30.2	5.40	51.95
31.0	47.13	43.63	31.0	40.81	38.06	31.0	18.87	38.56	31.2	45.32	13.84	31.2	5.13	51.86
13.81	+13.77		51.87	+51.86		11.86	−11.82		12.35	+12.31		11.86	+11.82	
0h 57m 55s.489			1h 33m 11s.898			1h 41m 39s.995			4h 11m 48s.583			5h 37m 5s.478		
+85° 50′ 41″.77			+88° 53′ 34″.33			−85° 9′ 32″.70			+85° 21′ 5″.69			+85° 9′ 42″.71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	5 44	−84 50	Mar.	6 46	−80 44	Mar.	7 5	+87 10	Mar.	7 14	−86 55	Mar.	7 15	+82 33
	s	″		s	″		s	″		s	″		s	″
0.3	67.25	6.05	0.3	33.32	27.90	0.4	14.94	26.94	0.4	34.40	9.39	0.4	5.71	55.60
1.3	66.97	6.09	1.3	33.18	28.05	1.4	14.62	27.17	1.4	33.99	9.57	1.4	5.60	55.84
2.3	66.70	6.13	2.3	33.04	28.19	2.4	14.27	27.40	2.4	33.61	9.75	2.4	5.47	56.08
3.3	66.44	6.18	3.3	32.90	28.34	3.3	13.90	27.61	3.4	33.22	9.93	3.4	5.33	56.31
4.3	66.18	6.23	4.3	32.76	28.51	4.3	13.51	27.81	4.4	32.85	10.12	4.4	5.19	56.51
5.3	65.92	6.31	5.3	32.63	28.69	5.3	13.10	27.99	5.3	32.47	10.33	5.4	5.04	56.69
6.3	65.66	6.39	6.3	32.50	28.87	6.3	12.71	28.13	6.3	32.09	10.55	6.3	4.89	56.84
7.3	65.38	6.48	7.3	32.36	29.05	7.3	12.32	28.27	7.3	31.68	10.78	7.3	4.76	56.99
8.3	65.09	6.55	8.3	32.22	29.22	8.3	11.97	28.40	8.3	31.27	11.00	8.3	4.64	57.13
9.3	64.79	6.61	9.3	32.08	29.37	9.3	11.64	28.53	9.3	30.82	11.20	9.3	4.51	57.26
10.3	64.49	6.65	10.3	31.92	29.51	10.3	11.31	28.67	10.3	30.37	11.40	10.3	4.39	57.41
11.3	64.19	6.66	11.3	31.76	29.62	11.3	10.98	28.82	11.3	29.91	11.56	11.3	4.27	57.57
12.3	63.90	6.66	12.3	31.61	29.73	12.3	10.62	28.99	12.3	29.45	11.71	12.3	4.15	57.74
13.3	63.63	6.65	13.3	31.46	29.83	13.3	10.27	29.16	13.3	29.01	11.85	13.3	4.02	57.92
14.3	63.35	6.63	14.3	31.31	29.91	14.3	9.85	29.31	14.3	28.58	11.99	14.3	3.88	58.10
15.3	63.08	6.62	15.3	31.16	29.99	15.3	9.43	29.47	15.3	28.15	12.11	15.3	3.72	58.26
16.3	62.81	6.60	16.3	31.02	30.07	16.3	9.00	29.61	16.3	27.73	12.23	16.3	3.55	58.41
17.3	62.55	6.58	17.3	30.88	30.16	17.3	8.55	29.74	17.3	27.32	12.35	17.3	3.38	58.56
18.3	62.29	6.58	18.3	30.74	30.25	18.3	8.09	29.84	18.3	26.91	12.48	18.3	3.21	58.69
19.2	62.03	6.58	19.3	30.60	30.34	19.3	7.63	29.94	19.3	26.49	12.62	19.3	3.04	58.79
20.2	61.76	6.58	20.3	30.46	30.44	20.3	7.19	30.03	20.3	26.08	12.77	20.3	2.87	58.88
21.2	61.47	6.59	21.3	30.30	30.54	21.3	6.75	30.09	21.3	25.65	12.91	21.3	2.72	58.97
22.2	61.20	6.59	22.3	30.15	30.63	22.3	6.33	30.15	22.3	25.20	13.05	22.3	2.56	59.03
23.2	60.91	6.58	23.3	30.00	30.73	23.3	5.92	30.20	23.3	24.75	13.19	23.3	2.41	59.09
24.2	60.63	6.54	24.3	29.85	30.81	24.3	5.54	30.26	24.3	24.29	13.33	24.3	2.27	59.16
25.2	60.33	6.50	25.3	29.67	30.87	25.3	5.16	30.33	25.3	23.81	13.43	25.3	2.13	59.24
26.2	60.03	6.44	26.3	29.52	30.91	26.3	4.78	30.41	26.3	23.32	13.52	26.3	1.99	59.33
27.2	59.74	6.36	27.3	29.36	30.92	27.3	4.39	30.49	27.3	22.83	13.58	27.3	1.85	59.42
28.2	59.46	6.26	28.3	29.21	30.93	28.3	3.99	30.57	28.3	22.34	13.64	28.3	1.71	59.52
29.2	59.19	6.15	29.3	29.06	30.93	29.3	3.57	30.66	29.3	21.87	13.69	29.3	1.54	59.62
30.2	58.94	6.05	30.3	28.90	30.93	30.3	3.13	30.72	30.3	21.43	13.74	30.3	1.37	59.69
31.2	58.69	5.96	31.3	28.75	30.94	31.3	2.67	30.77	31.3	21.00	13.79	31.3	1.20	59.75
11.11	−11.06		6.22	−6.13		20.29	+20.26		18.61	−18.58		7.73	+7.66	
5^h 45^m	$4^s.700$		6^h 46^m	$28^s.850$		7^h 4^m	$58^s.549$		7^h 14^m	$18^s.185$		7^h 14^m	$59^s.083$	
−84° 49′	38″.84		−80° 44′	2″.02		+87° 10′	21″.62		−86° 54′	45″.50		+82° 33′	51″.51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Mar.	8 22	+88 51	Mar.	9 8	−85 21	Mar.	9 26	+81 40	Mar.	9 36	−80 35	Mar.	10 21	+82 56
	s	″		s	″		s	″		s	″		s	″
0.4	26.32	53.32	0.4	27.53	40.54	0.5	20.69	3.97	0.5	22.52	57.07	0.5	57.06	58.68
1.4	25.83	53.62	1.4	27.37	40.86	1.5	20.66	4.30	1.5	22.46	57.41	1.5	57.07	59.01
2.4	25.25	53.92	2.4	27.20	41.17	2.4	20.62	4.63	2.5	22.40	57.74	2.5	57.08	59.34
3.4	24.61	54.21	3.4	27.06	41.48	3.4	20.58	4.96	3.5	22.34	58.07	3.5	57.07	59.69
4.4	23.89	54.49	4.4	26.92	41.80	4.4	20.53	5.28	4.4	22.28	58.41	4.5	57.04	60.03
5.4	23.15	54.75	5.4	26.78	42.12	5.4	20.46	5.58	5.4	22.22	58.76	5.5	57.01	60.37
6.4	22.39	54.99	6.4	26.65	42.47	6.4	20.39	5.86	6.4	22.17	59.12	6.5	56.97	60.68
7.4	21.65	55.22	7.4	26.50	42.83	7.4	20.33	6.12	7.4	22.13	59.49	7.5	56.93	60.97
8.4	20.95	55.43	8.4	26.33	43.19	8.4	20.28	6.38	8.4	22.08	59.87	8.5	56.89	61.25
9.4	20.30	55.64	9.4	26.16	43.55	9.4	20.23	6.64	9.4	22.01	60.24	9.5	56.88	61.53
10.4	19.67	55.86	10.4	25.98	43.89	10.4	20.18	6.90	10.4	21.94	60.61	10.5	56.86	61.81
11.4	19.04	56.09	11.4	25.78	44.21	11.4	20.14	7.16	11.4	21.86	60.96	11.5	56.84	62.10
12.4	18.40	56.33	12.4	25.58	44.51	12.4	20.09	7.44	12.4	21.78	61.30	12.5	56.82	62.41
13.4	17.70	56.60	13.4	25.36	44 80	13.4	20.03	7.74	13.4	21.69	61.62	13.5	56.79	62.73
14.4	16.94	56.84	14.4	25.16	45.09	14.4	19.96	8.03	14.4	21.60	61.92	14.5	56.75	63.06
15.4	16.12	57.09	15.4	24.97	45.36	15.4	19.88	8.33	15.4	21.52	62.21	15.5	56.70	63.40
16.4	15.25	57.33	16.4	24.77	45.63	16.4	19.80	8.63	16.4	21.44	62.50	16.4	56.65	63.74
17.4	14.34	57.56	17.4	24.58	45.89	17.4	19.71	8.93	17.4	21.36	62.79	17.4	56.59	64.07
18.4	13.40	57.78	18.4	24.39	46.16	18.4	19.62	9.21	18.4	21.28	63.10	18.4	56.51	64.39
19.4	12.43	57.97	19.4	24.20	46.44	19.4	19.52	9.48	19.4	21.21	63.41	19.4	56.43	64.70
20.4	11.47	58.17	20.4	24.02	46.73	20.4	19.42	9.73	20.4	21.13	63.72	20.4	56.35	65.01
21.3	10.52	58.34	21.4	23.83	47.02	21.4	19.32	9.97	21.4	21.05	64.04	21.4	56.27	65.30
22.3	9.59	58.49	22.4	23.62	47.32	22.4	19.22	10.20	22.4	20.97	64.36	22.4	56.19	65.58
23.3	8.69	58.64	23.4	23.40	47.62	23.4	19.13	10.41	23.4	20.89	64.68	23.4	56.11	65.83
24.3	7.81	58.79	24.4	23.18	47.92	24.4	19.04	10.63	24.4	20.80	65.01	24.4	56.03	66.09
25.3	6.98	58.95	25.4	22.95	48.20	25.4	18.96	10.85	25.4	20.71	65.32	25.4	55.97	66.35
26.3	6.16	59.11	26.4	22.71	48.47	26.4	18.88	11.07	26.4	20.61	65.61	26.4	55.91	66.61
27.3	5.34	59.29	27.4	22.45	48.71	27.4	18.80	11.30	27.4	20.50	65.90	27.4	55.85	66.89
28.3	4.48	59.47	28.4	22.20	48.94	28.4	18.71	11.53	28.4	20.38	66.17	28.4	55.78	67.17
29.3	3.57	59.65	29.4	21.95	49.16	29.4	18.62	11.78	29.4	20.27	66.41	29.4	55.70	67.46
30.3	2.58	59.82	30.4	21.71	49.37	30.4	18.51	12.03	30.4	20.17	66.65	30.4	55.61	67.75
31.3	1.54	59.97	31.4	21.48	49.59	31.4	18.38	12.27	31.4	20.07	66.90	31.4	55.50	68.04
50.52		+50.51	12.37		−12.33	6.90		+6.83	6.12		−6.04	8.15		+8.09
$8^h\ 21^m\ 41^s.998$			$9^h\ 8^m\ 8^s.703$			$9^h\ 26^m\ 14^s.295$			$9^h\ 36^m\ 12^s.346$			$10^h\ 21^m\ 50^s.081$		
+88° 51′ 51″.95			−85° 21′ 25″.35			+81° 40′ 7″.28			−80° 35′ 44″.11			+82° 57′ 4″.81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Mar.	11 0	−84 10	Mar.	12 14	+88 7	Mar.	12 47	−84 42	Mar.	12 48	+83 49	Mar.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
0.5	10.92	50.01	0.6	47.92	25.93	0.6	1.52	10.98	0.6	37.64	40.88	0.6	28.87	20.51
1.5	10.90	50.39	1.6	48.29	26.22	1.6	1.63	11.35	1.6	37.79	41.14	1.6	29.04	20.84
2.5	10.88	50.76	2.6	48.63	26.53	2.6	1.73	11.68	2.6	37.92	41.42	2.6	29.20	21.16
3.5	10.87	51.11	3.6	48.94	26.85	3.6	1.83	12.01	3.6	38.05	41.71	3.6	29.37	21.46
4.5	10.86	51.47	4.6	49.20	27.18	4.6	1.95	12.34	4.6	38.15	42.01	4.6	29.55	21.75
5.5	10.86	51.84	5.6	49.40	27.51	5.6	2.08	12.67	5.6	38.24	42.31	5.6	29.73	22.04
6.5	10.87	52.22	6.6	49.57	27.82	6.6	2.21	13.01	6.6	38.32	42.61	6.6	29.93	22.34
7.5	10.89	52.62	7.5	49.72	28.12	7.6	2.35	13.38	7.6	38.40	42.89	7.6	30.13	22.66
8.5	10.89	53.04	8.5	49.87	28.40	8.6	2.49	13.75	8.6	38.48	43.16	8.6	30.34	22.99
9.5	10.88	53.47	9.5	50.04	28.68	9.6	2.60	14.14	9.6	38.56	43.42	9.6	30.54	23.35
10.5	10.85	53.88	10.5	50.22	28.95	10.6	2.71	14.54	10.6	38.65	43.68	10.6	30.72	23.71
11.5	10.81	54.29	11.5	50.44	29.23	11.6	2.80	14.93	11.6	38.75	43.94	11.6	30.88	24.09
12.5	10.76	54.67	12.5	50.66	29.54	12.6	2.88	15.31	12.6	38.84	44.21	12.6	31.03	24.46
13.5	10.71	55.05	13.5	50.86	29.85	13.6	2.94	15.69	13.6	38.94	44.50	13.6	31.16	24.80
14.5	10.65	55.41	14.5	51.06	30.18	14.6	3.01	16.05	14.6	39.03	44.82	14.6	31.28	25.15
15.5	10.60	55.77	15.5	51.22	30.52	15.6	3.07	16.39	15.6	39.11	45.15	15.6	31.40	25.49
16.5	10.54	56.11	16.5	51.37	30.87	16.5	3.13	16.74	16.5	39.18	45.47	16.6	31.52	25.81
17.5	10.49	56.45	17.5	51.47	31.22	17.5	3.19	17.09	17.5	39.24	45.80	17.6	31.64	26.13
18.5	10.44	56.79	18.5	51.54	31.57	18.5	3.26	17.43	18.5	39.30	46.14	18.6	31.77	26.45
19.5	10.39	57.15	19.5	51.59	31.91	19.5	3.33	17.80	19.5	39.35	46.48	19.6	31.90	26.77
20.5	10.34	57.51	20.5	51.60	32.25	20.5	3.41	18.15	20.5	39.38	46.81	20.6	32.04	27.10
21.5	10.30	57.88	21.5	51.59	32.58	21.5	3.49	18.51	21.5	39.41	47.13	21.6	32.18	27.44
22.5	10.26	58.26	22.5	51.57	32.90	22.5	3.57	18.87	22.5	39.43	47.46	22.6	32.32	27.80
23.5	10.21	58.65	23.5	51.56	33.22	23.5	3.63	19.26	23.5	39.46	47.76	23.6	32.45	28.16
24.5	10.15	59.04	24.5	51.55	33.51	24.5	3.70	19.67	24.5	39.50	48.05	24.6	32.58	28.53
25.5	10.07	59.43	25.5	51.55	33.80	25.5	3.76	20.08	25.5	39.53	48.34	25.6	32.71	28.92
26.4	9.98	59.81	26.5	51.58	34.09	26.5	3.79	20.48	26.5	39.57	48.63	26.5	32.81	29.31
27.4	9.88	60.18	27.5	51.61	34.40	27.5	3.82	20.87	27.5	39.62	48.94	27.5	32.90	29.70
28.4	9.77	60.54	28.5	51.64	34.72	28.5	3.83	21.26	28.5	39.66	49.25	28.5	32.97	30.08
29.4	9.67	60.88	29.5	51.65	35.04	29.5	3.83	21.64	29.5	39.70	49.57	29.5	33.02	30.46
30.4	9.57	61.20	30.5	51.63	35.38	30.5	3.84	22.01	30.5	39.71	49.90	30.5	33.08	30.80
31.4	9.47	61.52	31.5	51.56	35.73	31.5	3.85	22.34	31.5	39.73	50.25	31.5	33.16	31.15
9.86		−9.81	30.57		+30.55	10.84		−10.79	9.30		+9.25	12.44		−12.40
10h	59m	53s.036	12h	14m	30s.802	12h	46m	43s.161	12h	48m	32s.111	13h	28m	9s.628
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	14 14	−83 18	Mar.	15 1	+87 31	Mar.	15 25	−84 12	Mar.	16 53	+82 9	Mar.	17 17	−80 47
	s	″		s	″		s	″		s	″		s	″
0.7	35.11	44.07	0.7	45.36	33.26	0.7	26.02	22.80	0.8	45.17	46.52	0.8	2.55	4.22
1.7	35.26	44.36	1.7	45.86	33.35	1.7	26.24	22.98	1.8	45.35	46.46	1.8	2.70	4.23
2.6	35.41	44.63	2.7	46.37	33.48	2.7	26.44	23.15	2.8	45.52	46.41	2.8	2.86	4.24
3.6	35.55	44.88	3.7	46.86	33.62	3.7	26.65	23.32	3.8	45.70	46.37	3.8	3.00	4.24
4.6	35.70	45.13	4.7	47.34	33.79	4.7	26.87	23.47	4.7	45.88	46.37	4.8	3.15	4.21
5.6	35.87	45.37	5.7	47.80	33.96	5.7	27.10	23.62	5.7	46.04	46.39	5.8	3.30	4.18
6.6	36.04	45.61	6.7	48.23	34.14	6.7	27.34	23.77	6.7	46.20	46.42	6.8	3.48	4.17
7.6	36.22	45.88	7.7	48.63	34.31	7.7	27.59	23.94	7.7	46.35	46.45	7.8	3.66	4.15
8.6	36.40	46.16	8.7	49.01	34.48	8.7	27.84	24.12	8.7	46.50	46.49	8.8	3.83	4.13
9.6	36.57	46.47	9.7	49.39	34.63	9.7	28.09	24.31	9.7	46.65	46.50	9.8	4.01	4.15
10.6	36.74	46.79	10.7	49.79	34.78	10.7	28.34	24.54	10.7	46.81	46.51	10.7	4.20	4.19
11.6	36.89	47.11	11.7	50.21	34.93	11.7	28.57	24.77	11.7	46.96	46.51	11.7	4.37	4.24
12.6	37.04	47.44	12.7	50.64	35.08	12.7	28.79	25.01	12.7	47.14	46.51	12.7	4.55	4.29
13.6	37.17	47.76	13.7	51.09	35.26	13.7	28.99	25.25	13.7	47.30	46.52	13.7	4.70	4.36
14.6	37.29	48.07	14.6	51.54	35.44	14.7	29.19	25.47	14.7	47.47	46.55	14.7	4.86	4.43
15.6	37.41	48.37	15.6	51.98	35.64	15.7	29.39	25.70	15.7	47.64	46.58	15.7	5.01	4.49
16.6	37.53	48.65	16.6	52.41	35.86	16.7	29.57	25.90	16.7	47.81	46.64	16.7	5.15	4.55
17.6	37.65	48.94	17.6	52.83	36.09	17.7	29.76	26.11	17.7	47.98	46.72	17.7	5.30	4.60
18.6	37.77	49.22	18.6	53.22	36.32	18.7	29.96	26.32	18.7	48.15	46.81	18.7	5.44	4.65
19.6	37.90	49.50	19.6	53.61	36.56	19.7	30.16	26.52	19.7	48.32	46.91	19.7	5.59	4.69
20.6	38.03	49.78	20.6	53.96	36.81	20.6	30.36	26.73	20.7	48.47	47.01	20.7	5.76	4.74
21.6	38.16	50.10	21.6	54.30	37.05	21.6	30.56	26.95	21.7	48.62	47.14	21.7	5.93	4.79
22.6	38.29	50.40	22.6	54.62	37.30	22.6	30.78	27.17	22.7	48.77	47.26	22.7	6.09	4.84
23.6	38.43	50.73	23.6	54.93	37.54	23.6	31.00	27.42	23.7	48.91	47.38	23.7	6.26	4.90
24.6	38.57	51.06	24.6	55.23	37.77	24.6	31.22	27.68	24.7	49.06	47.49	24.7	6.42	4.99
25.6	38.70	51.43	25.6	55.54	37.99	25.6	31.42	27.95	25.7	49.20	47.59	25.7	6.61	5.08
26.6	38.81	51.79	26.6	55.87	38.21	26.6	31.62	28.23	26.7	49.35	47.68	26.7	6.78	5.20
27.6	38.92	52.15	27.6	56.20	38.43	27.6	31.81	28.53	27.7	49.50	47.77	27.7	6.95	5.33
28.6	39.01	52.51	28.6	56.54	38.66	28.6	31.99	28.82	28.7	49.65	47.87	28.7	7.11	5.47
29.6	39.10	52.85	29.6	56.89	38.90	29.6	32.14	29.11	29.7	49.80	48.00	29.7	7.26	5.61
30.6	39.18	53.18	30.6	57.22	39.16	30.6	32.30	29.38	30.7	49.96	48.13	30.7	7.39	5.74
31.6	39.27	53.50	31.6	57.54	39.44	31.6	32.47	29.64	31.7	50.11	48.29	31.7	7.52	5.84
8.59		−8.53	23.17		+23.15	9.91		−9.86	7.33		+7.27	6.24		−6.16
14^h	14^m	$23^s.592$	15^h	1^m	$45^s.970$	15^h	25^m	$17^s.036$	16^h	53^m	$48^s.037$	17^h	17^m	$1^s.936$
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	17 56	+86 36	Mar.	18 9	−87 39	Mar.	18 54	+89 1	Mar.	19 35	−89 12	Mar.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
0.8	53.99	41.01	0.8	37.53	22.56	0.8	38.90	26.36	0.9	50.74	19.21	0.9	9.30	49.53
1.8	54.35	40.85	1.8	38.13	22.48	1.8	39.92	26.14	1.9	52.25	19.01	1.9	9.36	49.21
2.8	54.72	40.70	2.8	38.69	22.40	2.8	41.02	25.93	2.9	53.67	18.80	2.9	9.44	48.88
3.8	55.09	40.59	3.8	39.25	22.31	3.8	42.18	25.73	3.9	55.04	18.60	3.9	9.52	48.56
4.8	55.47	40.49	4.8	39.81	22.21	4.8	43.37	25.55	4.9	56.38	18.37	4.9	9.61	48.26
5.8	55.85	40.42	5.8	40.38	22.10	5.8	44.56	25.40	5.9	57.75	18.14	5.9	9.71	47.98
6.8	56.22	40.36	6.8	40.98	21.97	6.8	45.73	25.26	6.9	59.17	17.89	6.9	9.82	47.73
7.8	56.56	40.31	7.8	41.62	21.86	7.8	46.83	25.15	7.9	60.70	17.64	7.9	9.92	47.49
8.8	56.90	40.26	8.8	42.28	21.75	8.8	47.88	25.03	8.9	62.32	17.39	8.9	10.01	47.26
9.8	57.23	40.21	9.8	42.97	21.66	9.8	48.91	24.90	9.8	64.02	17.15	9.9	10.11	47.02
10.8	57.56	40.13	10.8	43.66	21.60	10.8	49.93	24.77	10.8	65.76	16.95	10.9	10.20	46.78
11.8	57.90	40.05	11.8	44.33	21.56	11.8	50.98	24.62	11.8	67.51	16.76	11.9	10.29	46.52
12.8	58.26	39.98	12.8	44.98	21.52	12.8	52.07	24.47	12.8	69.22	16.59	12.9	10.38	46.25
13.8	58.63	39.90	13.8	45.60	21.51	13.8	53.23	24.31	13.8	70.91	16.42	13.9	10.48	45.97
14.8	59.01	39.84	14.8	46.20	21.49	14.8	54.44	24.16	14.8	72.52	16.27	14.9	10.58	45.69
15.8	59.42	39.78	15.8	46.80	21.46	15.8	55.71	24.01	15.8	74.08	16.12	15.9	10.69	45.42
16.8	59.82	39.74	16.8	47.37	21.43	16.8	57.01	23.89	16.8	75.61	15.96	16.9	10.81	45.15
17.8	60.22	39.73	17.8	47.94	21.40	17.8	58.33	23.79	17.8	77.11	15.79	17.9	10.94	44.90
18.8	60.61	39.73	18.8	48.52	21.36	18.8	59.68	23.70	18.8	78.62	15.62	18.9	11.07	44.66
19.8	60.99	39.74	19.8	49.11	21.32	19.8	61.01	23.64	19.8	80.15	15.46	19.9	11.20	44.44
20.8	61.37	39.77	20.8	49.71	21.28	20.8	62.31	23.58	20.8	81.72	15.28	20.9	11.33	44.24
21.7	61.75	39.80	21.8	50.33	21.24	21.8	63.58	23.52	21.8	83.35	15.10	21.9	11.46	44.05
22.7	62.12	39.83	22.8	50.98	21.21	22.8	64.80	23.48	22.8	85.05	14.93	22.9	11.59	43.87
23.7	62.46	39.87	23.8	51.64	21.19	23.8	65.99	23.43	23.8	86.81	14.76	23.9	11.72	43.69
24.7	62.80	39.90	24.8	52.31	21.18	24.8	67.15	23.38	24.8	88.64	14.61	24.9	11.85	43.51
25.7	63.13	39.93	25.7	52.99	21.19	25.8	68.27	23.33	25.8	90.52	14.46	25.9	11.97	43.33
26.7	63.48	39.94	26.7	53.67	21.23	26.8	69.40	23.26	26.8	92.41	14.35	26.9	12.09	43.14
27.7	63.83	39.95	27.7	54.34	21.28	27.8	70.56	23.20	27.8	94.30	14.24	27.9	12.21	42.95
28.7	64.20	39.96	28.7	54.97	21.33	28.8	71.77	23.14	28.8	96.13	14.15	28.8	12.33	42.75
29.7	64.57	39.99	29.7	55.57	21.39	29.8	73.06	23.08	29.8	97.87	14.06	29.8	12.46	42.55
30.7	64.95	40.03	30.7	56.15	21.44	30.8	74.39	23.03	30.8	99.55	13.98	30.8	12.60	42.36
31.7	65.34	40.11	31.7	56.72	21.47	31.8	75.75	23.01	31.8	101.17	13.88	31.8	12.75	42.18
16.92	+16.89		24.45	−24.43		58.67	+58.66		72.03	−72.02		7.41	+7.34	
17h 57m 4s.326			18h 9m 46s.186			18h 55m 23s.393			19h 37m 1s.735			20h 48m 15s.385		
+86° 36′ 50″.43			−87° 39′ 48″.39			+89° 1′ 32″.83			−89° 12′ 41″.41			+82° 14′ 50″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Mar.	21 39	−83 4	Mar.	22 16	−86 21	Mar.	22 38	−81 46	Mar.	23 27	+86 52	Mar.	23 47	−82 26
	s	″		s	″		s	″		s	″		s	″
0.9	3.54	18.21	0.9	55.41	31.35	1.0	4.95	65.63	1.0	30.30	65.89	1.0	24.96	52.26
1.9	3.63	17.88	1.9	55.52	31.01	2.0	4.98	65.27	2.0	30.17	65.56	2.0	24.95	51.89
2.9	3.72	17.56	2.9	55.63	30.67	2.9	5.01	64.93	3.0	30.06	65.22	3.0	24.92	51.55
3.9	3.80	17.24	3.9	55.72	30.33	3.9	5.02	64.59	4.0	29.97	64.87	4.0	24.89	51.21
4.9	3.87	16.91	4.9	55.79	29.98	4.9	5.04	64.23	5.0	29.92	64.52	5.0	24.86	50.87
5.9	3.94	16.57	5.9	55.85	29.61	5.9	5.05	63.87	6.0	29.89	64.19	6.0	24.82	50.50
6.9	4.01	16.20	6.9	55.93	29.23	6.9	5.08	63.49	7.0	29.88	63.87	7.0	24.78	50.13
7.9	4.10	15.83	7.9	56.01	28.83	7.9	5.11	63.08	8.0	29.89	63.58	8.0	24.75	49.75
8.9	4.19	15.46	8.9	56.13	28.43	8.9	5.15	62.68	9.0	29.89	63.28	9.0	24.73	49.33
9.9	4.30	15.09	9.9	56.26	28.01	9.9	5.19	62.29	10.0	29.88	63.00	10.0	24.72	48.91
10.9	4.43	14.72	10.9	56.41	27.66	10.9	5.24	61.90	11.0	29.85	62.70	11.0	24.72	48.51
11.9	4.56	14.39	11.9	56.59	27.28	11.9	5.31	61.51	12.0	29.82	62.39	12.0	24.72	48.12
12.9	4.69	14.05	12.9	56.77	26.91	12.9	5.38	61.14	13.0	29.77	62.06	13.0	24.73	47.73
13.9	4.81	13.74	13.9	56.95	26.57	13.9	5.44	60.80	14.0	29.72	61.74	14.0	24.75	47.36
14.9	4.93	13.45	14.9	57.11	26.23	14.9	5.51	60.45	14.9	29.70	61.39	15.0	24.76	47.00
15.9	5.04	13.16	15.9	57.26	25.90	15.9	5.57	60.12	15.9	29.69	61.04	16.0	24.76	46.64
16.9	5.15	12.87	16.9	57.41	25.57	16.9	5.62	59.78	16.9	29.70	60.68	17.0	24.76	46.29
17.9	5.26	12.56	17.9	57.56	25.25	17.9	5.67	59.45	17.9	29.74	60.32	18.0	24.76	45.94
18.9	5.36	12.25	18.9	57.70	24.92	18.9	5.71	59.12	18.9	29.80	59.97	19.0	24.76	45.58
19.9	5.46	11.94	19.9	57.84	24.59	19.9	5.76	58.78	19.9	29.88	59.63	19.9	24.76	45.22
20.9	5.57	11.64	20.9	57.98	24.25	20.9	5.82	58.42	20.9	29.97	59.30	20.9	24.76	44.86
21.9	5.68	11.32	21.9	58.13	23.89	21.9	5.88	58.06	21.9	30.07	58.98	21.9	24.76	44.48
22.9	5.81	10.99	22.9	58.31	23.53	22.9	5.94	57.69	22.9	30.17	58.68	22.9	24.77	44.09
23.9	5.94	10.66	23.9	58.49	23.17	23.9	6.01	57.30	23.9	30.27	58.39	23.9	24.79	43.68
24.9	6.08	10.33	24.9	58.70	22.80	24.9	6.09	56.92	24.9	30.37	58.10	24.9	24.82	43.27
25.9	6.24	10.01	25.9	58.94	22.46	25.9	6.18	56.55	25.9	30.45	57.82	25.9	24.86	42.86
26.9	6.40	9.72	26.9	59.17	22.12	26.9	6.28	56.19	26.9	30.51	57.53	26.9	24.90	42.47
27.9	6.56	9.45	27.9	59.42	21.79	27.9	6.38	55.85	27.9	30.57	57.22	27.9	24.95	42.08
28.9	6.72	9.16	28.9	59.67	21.47	28.9	6.48	55.52	28.9	30.65	56.91	28.9	25.00	41.70
29.9	6.88	8.90	29.9	59.91	21.17	29.9	6.57	55.20	29.9	30.73	56.59	29.9	25.06	41.33
30.9	7.03	8.65	30.9	60.13	20.87	30.9	6.66	54.89	30.9	30.85	56.27	30.9	25.10	40.98
31.9	7.16	8.39	31.9	60.34	20.57	31.9	6.74	54.58	31.9	30.98	55.94	31.9	25.13	40.64
8.29		−8.23	15.74		−15.71	7.00		−6.93	18.39		+18.37	7.61		−7.54
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	0 57	+85 50	Apr.	1 32	+88 53	Apr.	1 41	−85 9	Apr.	4 11	+85 21	Apr.	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.0	47.13	43.63	0.0	40.81	38.06	0.0	18.87	38.56	0.2	45.32	13.84	0.2	65.13	51.86
1.0	47.12	43.29	1.0	40.58	37.72	1.0	18.79	38.23	1.1	45.10	13.62	1.2	64.87	51.76
2.0	47.13	42.96	2.0	40.43	37.37	2.0	18.70	37.88	2.1	44.90	13.39	2.2	64.63	51.62
3.0	47.17	42.63	3.0	40.37	37.04	3.0	18.59	37.52	3.1	44.72	13.16	3.2	64.40	51.48
4.0	47.21	42.31	4.0	40.36	36.71	4.0	18.49	37.16	4.1	44.55	12.92	4.2	64.19	51.34
5.0	47.26	42.01	5.0	40.36	36.42	5.0	18.40	36.78	5.1	44.40	12.69	5.2	63.99	51.19
6.0	47.31	41.72	6.0	40.36	36.13	6.0	18.31	36.39	6.1	44.26	12.48	6.2	63.79	51.06
6.9	47.34	41.43	7.0	40.31	35.86	7.0	18.25	35.98	7.1	44.11	12.28	7.2	63.59	50.93
7.9	47.37	41.15	8.0	40.23	35.57	8.0	18.19	35.58	8.1	43.94	12.07	8.2	63.40	50.83
8.9	47.39	40.87	9.0	40.11	35.29	9.0	18.15	35.19	9.1	43.77	11.87	9.2	63.18	50.72
9.9	47.40	40.57	10.0	39.98	34.97	10 0	18.12	34.80	10.1	43.59	11.65	10.2	62.96	50.61
10.9	47.41	40.25	11.0	39.87	34.66	11.0	18.11	34.43	11.1	43.41	11.43	11.2	62.72	50.48
11.9	47.44	39.92	12.0	39.78	34.33	12.0	18.08	34.06	12.1	43.22	11.20	12.2	62.49	50.35
12.9	47.48	39.59	13.0	39.75	33.99	13.0	18.05	33.72	13.1	43.03	10.96	13.2	62.25	50.21
13.9	47.52	39.26	14.0	39.76	33.64	14.0	18.03	33.37	14.1	42.85	10.69	14.2	62.01	50.04
14.9	47.60	38.93	15.0	39.83	33.29	15.0	18.00	33.03	15.1	42.69	10.42	15.2	61.78	49.87
15.9	47.68	38.60	15.9	39.95	32.95	16.0	17.97	32.69	16.1	42.54	10.14	16.2	61.56	49.67
16.9	47.78	38.28	16.9	40.12	32.61	17.0	17.94	32.33	17.1	42.40	9.86	17.2	61.36	49.46
17.9	47.88	37.96	17.9	40.35	32.28	17.9	17.90	31.96	18.1	42.27	9.57	18.2	61.17	49.24
18.9	48.00	37.66	18.9	40.61	31.96	18.9	17.86	31.59	19.1	42.16	9.29	19.2	60.99	49.03
19.9	48.13	37.38	19.9	40.88	31.66	19.9	17.83	31.22	20.1	42.06	9.01	20.2	60.82	48.83
20.9	48.24	37.11	20.9	41.15	31.37	20.9	17.82	30.83	21.1	41.97	8.75	21.2	60.65	48.64
21.9	48.35	36.85	21.9	41.40	31.09	21.9	17.82	30.42	22.1	41.87	8.50	22.2	60.50	48.44
22.9	48.45	36.60	22.9	41.64	30.83	22.9	17.83	30.02	23.1	41.78	8.26	23.1	60.34	48.26
23.9	48.55	36.35	23.9	41.83	30.56	23.9	17.86	29.61	24.1	41.67	8.02	24.1	60.17	48.08
24.9	48.64	36.08	24.9	41.99	30.27	24.9	17.89	29.23	25.1	41.55	7.77	25.1	60.00	47.91
25.9	48.74	35.80	25.9	42.16	29.96	25.9	17.93	28.84	26.1	41.42	7.51	26.1	59.81	47.73
26.9	48.84	35.51	26.9	42.39	29.65	26.9	17.97	28.46	27.1	41.30	7.24	27.1	59.61	47.53
27.9	48.96	35.21	27.9	42.69	29.33	27.9	18.00	28.14	28.1	41.20	6.95	28.1	59.42	47.30
28.9	49.10	34.91	28.9	43.07	29.01	28.9	18.02	27.80	29.1	41.10	6.63	29.1	59.24	47.06
29.9	49.28	34.62	29.9	43.53	28.69	29.9	18.03	27.46	30.1	41.03	6.31	30.1	59.10	46.78
30.9	49.47	34.35	30.9	44.07	28.40	30.9	18.04	27.11	31.1	40.98	5.99	31.1	58.96	46.51
13.80		+13.76	51.74		+51.73	11.85		−11.81	12.34		+12.30	11.86		+11.82
0^h	57^m	$55^s.489$	1^h	33^m	$11^s.898$	1^h	41^m	$39^s.995$	4^h	11^m	$48^s.583$	5^h	37^m	$5^s.478$
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Apr.	5 44	−84 50	Apr.	6 46	−80 44	Apr.	7 4	+87 10	Apr.	7 14	−86 55	Apr.	7 14	+82 33
	s	″		s	″		s	″		s	″		s	″
0.2	58.69	5.96	0.3	28.75	30.94	0.3	62.67	30.77	0.3	21.00	13.79	0.3	61.20	59.75
1.2	58.42	5.90	1.3	28.61	30.97	1.3	62.21	30.79	1.3	20.57	13.86	1.3	61.02	59.78
2.2	58.16	5.84	2.3	28.47	31.01	2.3	61.74	30.80	2.3	20.14	13.94	2.3	60.85	59.81
3.2	57.89	5.79	3.2	28.32	31.05	3.3	61.31	30.77	3.3	19.69	14.03	3.3	60.69	59.81
4.2	57.61	5.73	4.2	28.17	31.09	4.3	60.88	30.74	4.3	19.23	14.12	4.3	60.54	59.80
5.2	57.34	5.65	5.2	28.00	31.11	5.3	60.49	30.70	5.3	18.75	14.21	5.3	60.39	59.78
6.2	57.05	5.56	6.2	27.83	31.12	6.3	60.11	30.66	6.3	18.24	14.26	6.3	60.25	59.77
7.2	56.76	5.44	7.2	27.68	31.12	7.3	59.74	30.65	7.3	17.73	14.31	7.3	60.11	59.77
8.2	56.48	5.30	8.2	27.52	31.08	8.3	59.36	30.64	8.3	17.25	14.32	8.3	59.97	59.78
9.2	56.21	5.15	9.2	27.37	31.04	9.2	58.96	30.64	9.3	16.76	14.34	9.3	59.82	59.80
10.2	55.97	4.99	10.2	27.22	30.98	10.2	58.54	30.64	10.2	16.29	14.34	10.3	59.67	59.82
11.2	55.73	4.83	11.2	27.07	30.92	11.2	58.11	30.65	11.2	15.83	14.32	11.2	59.51	59.83
12.2	55.48	4.68	12.2	26.92	30.85	12.2	57.65	30.64	12.2	15.40	14.30	12.2	59.34	59.83
13.2	55.24	4.53	13.2	26.78	30.79	13.2	57.19	30.61	13.2	14.97	14.30	13.2	59.16	59.82
14.2	55.01	4.40	14.2	26.64	30.74	14.2	56.74	30.56	14.2	14.54	14.29	14.2	58.98	59.79
15.2	54.78	4.26	15.2	26.51	30.69	15.2	56.27	30.50	15.2	14.11	14.29	15.2	58.81	59.75
16.2	54.54	4.13	16.2	26.37	30.64	16.2	55.82	30.42	16.2	13.69	14.29	16.2	58.63	59.70
17.2	54.30	4.01	17.2	26.22	30.59	17.2	55.39	30.33	17.2	13.26	14.30	17.2	58.48	59.62
18.2	54.05	3.88	18.2	26.07	30.54	18.2	54.96	30.24	18.2	12.82	14.30	18.2	58.32	59.54
19.2	53.80	3.73	19.2	25.92	30.50	19.2	54.56	30.13	19.2	12.36	14.31	19.2	58.16	59.46
20.2	53.55	3.57	20.2	25.78	30.45	20.2	54.18	30.02	20.2	11.90	14.30	20.2	58.02	59.37
21.2	53.30	3.39	21.2	25.64	30.38	21.2	53.81	29.92	21.2	11.43	14.28	21.2	57.88	59.28
22.2	53.05	3.20	22.2	25.49	30.29	22.2	53.45	29.82	22.2	10.95	14.24	22.2	57.75	59.19
23.2	52.81	3.00	23.2	25.33	30.17	23.2	53.11	29.73	23.2	10.46	14.19	23.2	57.62	59.13
24.1	52.57	2.78	24.2	25.18	30.04	24.2	52.75	29.65	24.2	9.99	14.10	24.2	57.49	59.07
25.1	52.34	2.56	25.2	25.04	29.91	25.2	52.38	29.57	25.2	9.54	14.02	25.2	57.34	59.01
26.1	52.12	2.34	26.2	24.90	29.77	26.2	52.00	29.48	26.2	9.11	13.93	26.2	57.20	58.93
27.1	51.91	2.13	27.2	24.76	29.62	27.2	51.58	29.38	27.2	8.69	13.85	27.2	57.04	58.85
28.1	51.71	1.93	28.2	24.63	29.49	28.2	51.16	29.25	28.2	8.28	13.77	28.2	56.88	58.74
29.1	51.51	1.75	29.2	24.50	29.39	29.2	50.74	29.10	29.2	7.87	13.71	29.2	56.72	58.61
30.1	51.28	1.58	30.2	24.38	29.29	30.2	50.35	28.92	30.2	7.46	13.65	30.2	56.57	58.47
31.1	51.06	1.41	31.2	24.25	29.20	31.2	50.00	28.73	31.2	7.04	13.61	31.2	56.43	58.32
11.11	−11.06		6.22	−6.14		20.29	+20.27		18.62	−18.59		7.73	+7.66	
5h	45m	4s.700	6h	46m	28s.850	7h	4m	58s.549	7h	14m	18s.185	7h	14m	59s.083
−84°	49′	38″.84	−80°	44′	2″.02	+87°	10′	21″.62	−86°	54′	45″.50	+82°	33′	51″.51

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	8 21	+88 51	Apr.	9 8	−85 21	Apr.	9 26	+81 40	Apr.	9 36	−80 36	Apr.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.3	61.54	59.97	0.4	21.48	49.59	0.4	18.38	12.27	0.4	20.07	6.90	0.4	55.50	8.04
1.3	60.47	60.10	1.4	21.25	49.82	1.4	18.26	12.47	1.4	19.97	7.16	1.4	55.38	8.32
2.3	59.38	60.20	2.4	21.03	50.06	2.4	18.13	12.66	2.4	19.87	7.42	2.4	55.26	8.57
3.3	58.30	60.30	3.3	20.81	50.31	3.4	18.01	12.84	3.4	19.78	7.70	3.4	55.14	8.80
4.3	57.28	60.37	4.3	20.58	50.58	4.4	17.90	13.00	4.4	19.69	7.99	4.4	55.03	9.00
5.3	56.30	60.44	5.3	20.33	50.83	5.4	17.79	13.15	5.4	19.58	8.28	5.4	54.92	9.20
6.3	55.36	60.51	6.3	20.07	51.08	6.4	17.68	13.30	6.4	19.47	8.56	6.4	54.82	9.40
7.3	54.45	60.59	7.3	19.79	51.31	7.4	17.58	13.45	7.4	19.35	8.82	7.4	54.73	9.60
8.3	53.54	60.68	8.3	19.52	51.51	8.3	17.48	13.62	8.4	19.23	9.06	8.4	54.63	9.82
9.3	52.59	60.77	9.3	19.25	51.70	9.3	17.37	13.80	9.4	19.11	9.29	9.4	54.53	10.05
10.3	51.61	60.87	10.3	18.97	51.88	10.3	17.26	13.99	10.3	18.98	9.49	10.4	54.42	10.30
11.3	50.57	60.97	11.3	18.70	52.04	11.3	17.14	14.18	11.3	18.85	9.68	11.4	54.30	10.55
12.3	49.49	61.07	12.3	18.43	52.19	12.3	17.01	14.36	12.3	18.74	9.87	12.4	54.18	10.80
13.3	48.37	61.16	13.3	18.18	52.34	13.3	16.87	14.54	13.3	18.62	10.05	13.4	54.04	11.04
14.3	47.22	61.22	14.3	17.94	52.50	14.3	16.73	14.69	14.3	18.50	10.23	14.4	53.90	11.26
15.3	46.06	61.27	15.3	17.70	52.67	15.3	16.59	14.84	15.3	18.39	10.42	15.4	53.75	11.47
16.3	44.91	61.30	16.3	17.45	52.83	16.3	16.44	14.98	16.3	18.28	10.62	16.4	53.60	11.68
17.3	43.78	61.31	17.3	17.20	53.01	17.3	16.30	15.08	17.3	18.17	10.82	17.4	53.45	11.88
18.3	42.66	61.32	18.3	16.94	53.19	18.3	16.16	15.18	18.3	18.06	11.02	18.4	53.31	12.06
19.3	41.58	61.32	19.3	16.68	53.36	19.3	16.02	15.28	19.3	17.95	11.23	19.4	53.16	12.21
20.3	40.56	61.32	20.3	16.41	53.54	20.3	15.89	15.37	20.3	17.83	11.44	20.4	53.02	12.35
21.3	39.57	61.31	21.3	16.13	53.70	21.3	15.77	15.45	21.3	17.70	11.65	21.4	52.89	12.49
22.3	38.63	61.31	22.3	15.84	53.85	22.3	15.66	15.53	22.3	17.57	11.83	22.3	52.76	12.63
23.3	37.69	61.32	23.3	15.54	53.98	23.3	15.55	15.62	23.3	17.43	11.99	23.3	52.64	12.78
24.3	36.74	61.33	24.3	15.23	54.08	24.3	15.43	15.72	24.3	17.30	12.14	24.3	52.52	12.96
25.3	35.75	61.33	25.3	14.94	54.19	25.3	15.30	15.82	25.3	17.16	12.28	25.3	52.39	13.13
26.3	34.71	61.34	26.3	14.66	54.28	26.3	15.17	15.93	26.3	17.03	12.40	26.3	52.25	13.30
27.2	33.62	61.34	27.3	14.38	54.36	27.3	15.03	16.03	27.3	16.90	12.51	27.3	52.10	13.47
28.2	32.48	61.31	28.3	14.11	54.45	28.3	14.88	16.10	28.3	16.77	12.63	28.3	51.93	13.63
29.2	31.34	61.27	29.3	13.85	54.55	29.3	14.72	16.16	29.3	16.65	12.76	29.3	51.76	13.77
30.2	30.22	61.20	30.3	13.59	54.66	30.3	14.58	16.20	30.3	16.53	12.90	30.3	51.59	13.88
31.2	29.15	61.12	31.3	13.33	54.79	31.3	14.43	16.22	31.3	16.41	13.06	31.3	51.43	13.98
50.57		+50.56	12.37		−12.33	6.90		+6.83	6.12		−6.04	8.15		+8.09
$8^h\ 21^m\ 41^s.998$			$9^h\ 8^m\ 8^s.703$			$9^h\ 26^m\ 14^s.295$			$9^h\ 36^m\ 12^s.346$			$10^h\ 21^m\ 50^s.081$		
+88° 51′ 51″.95			−85° 21′ 25″.35			+81° 40′ 7″.28			−80° 35′ 44″.11			+82° 57′ 4″.81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Apr.	11 0	−84 11	Apr.	12 14	+88 7	Apr.	12 47	−84 42	Apr.	12 48	+83 49	Apr.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
0.4	9.47	1.52	0.5	51.56	35.73	0.5	3.85	22.34	0.5	39.73	50.25	0.5	33.16	31.15
1.4	9.39	1.84	1.5	51.44	36.08	1.5	3.88	22.69	1.5	39.72	50.60	1.5	33.24	31.49
2.4	9.31	2.17	2.5	51.28	36.40	2.5	3.92	23.05	2.5	39.70	50.94	2.5	33.33	31.83
3.4	9.23	2.53	3.5	51.10	36.72	3.5	3.95	23.42	3.5	39.68	51.26	3.5	33.43	32.20
4.4	9.15	2.89	4.5	50.90	37.01	4.5	3.99	23.80	4.5	39.65	51.57	4.5	33.53	32.57
5.4	9.06	3.27	5.5	50.71	37.29	5.5	4.03	24.22	5.5	39.62	51.86	5.5	33.62	32.96
6.4	8.96	3.64	6.5	50.53	37.56	6.5	4.04	24.64	6.5	39.61	52.15	6.5	33.71	33.37
7.4	8.83	3.99	7.5	50.39	37.84	7.5	4.05	25.05	7.5	39.60	52.44	7.5	33.77	33.77
8.4	8.71	4.33	8.5	50.25	38.13	8.5	4.04	25.43	8.5	39.59	52.73	8.5	33.81	34.17
9.4	8.57	4.65	9.5	50.12	38.43	9.5	4.00	25.82	9.5	39.59	53.02	9.5	33.84	34.56
10.4	8.43	4.96	10.5	50.00	38.74	10.5	3.97	26.19	10.5	39.58	53.34	10.5	33.85	34.94
11.4	8.29	5.25	11.5	49.84	39.06	11.5	3.93	26.54	11.5	39.57	53.66	11.5	33.86	35.30
12.4	8.16	5.53	12.5	49.66	39.38	12.5	3.89	26.88	12.5	39.53	54.00	12.5	33.88	35.64
13.4	8.03	5.81	13.4	49.43	39.71	13.5	3.86	27.22	13.5	39.49	54.34	13.5	33.89	35.98
14.4	7.90	6.09	14.4	49.17	40.03	14.5	3.83	27.55	14.5	39.45	54.68	14.5	33.90	36.32
15.4	7.78	6.37	15.4	48.90	40.35	15.5	3.80	27.89	15.5	39.40	55.02	15.5	33.93	36.66
16.4	7.67	6.66	16.4	48.58	40.66	16.5	3.79	28.23	16.5	39.34	55.35	16.5	33.96	36.99
17.4	7.56	6.96	17.4	48.25	40.95	17.5	3.78	28.58	17.5	39.26	55.68	17.5	33.99	37.34
18.4	7.43	7.25	18.4	47.91	41.24	18.5	3.76	28.94	18.5	39.18	55.99	18.5	34.02	37.70
19.4	7.30	7.56	19.4	47.57	41.51	19.5	3.73	29.30	19.5	39.12	56.28	19.5	34.06	38.07
20.4	7.17	7.88	20.4	47.22	41.76	20.5	3.70	29.67	20.5	39.05	56.56	20.5	34.07	38.44
21.4	7.03	8.19	21.4	46.89	42.00	21.5	3.66	30.05	21.5	38.98	56.83	21.5	34.09	38.82
22.4	6.86	8.49	22.4	46.59	42.24	22.4	3.61	30.43	22.4	38.92	57.09	22.5	34.09	39.21
23.4	6.69	8.77	23.4	46.30	42.49	23.4	3.55	30.80	23.4	38.86	57.36	23.5	34.06	39.60
24.4	6.52	9.04	24.4	46.02	42.74	24.4	3.46	31.17	24.4	38.80	57.63	24.5	34.03	39.99
25.4	6.35	9.29	25.4	45.74	43.01	25.4	3.38	31.52	25.4	38.74	57.91	25.5	33.98	40.36
26.4	6.18	9.52	26.4	45.42	43.28	26.4	3.29	31.85	26.4	38.68	58.20	26.5	33.93	40.70
27.4	6.01	9.74	27.4	45.06	43.56	27.4	3.20	32.17	27.4	38.59	58.52	27.5	33.89	41.04
28.4	5.86	9.96	28.4	44.66	43.84	28.4	3.14	32.48	28.4	38.49	58.83	28.5	33.85	41.36
29.4	5.72	10.20	29.4	44.21	44.11	29.4	3.08	32.79	29.4	38.39	59.13	29.5	33.84	41.68
30.4	5.58	10.47	30.4	43.73	44.34	30.4	3.02	33.11	30.4	38.26	59.41	30.5	33.82	42.01
31.4	5.43	10.73	31.4	43.25	44.57	31.4	2.97	33.44	31.4	38.14	59.68	31.5	33.81	42.37
9.87		−9.82	30.61		+30.59	10.84		−10.80	9.31		+9.25	12.45		−12.41
10h	59m	53s.036	12h	14m	30s.802	12h	46m	43s.161	12h	48m	33s.111	13h	28m	9s.628
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Apr.	14 14	−83 18	Apr.	15 1	+87 31	Apr.	15 25	−84 12	Apr.	16 53	+82 9	Apr.	17 17	−80 47
	s	″		s	″		s	″		s	″		s	″
0.6	39.27	53.50	0.6	57.54	39.44	0.6	32.47	29.64	0.7	50.11	48.29	0.7	7.52	5.84
1.6	39.37	53.81	1.6	57.82	39.74	1.6	32.64	29.89	1.7	50.25	48.47	1.7	7.66	5.95
2.6	39.46	54.12	2.6	58.07	40.04	2.6	32.81	30.14	2.7	50.39	48.66	2.7	7.82	6.04
3.6	39.56	54.44	3.6	58.29	40.34	3.6	32.99	30.39	3.7	50.53	48.87	3.7	7.97	6.13
4.6	39.69	54.78	4.6	58.48	40.64	4.6	33.19	30.66	4.7	50.66	49.06	4.7	8.14	6.23
5.6	39.80	55.14	5.6	58.66	40.92	5.6	33.39	30.94	5.7	50.78	49.25	5.7	8.32	6.36
6.6	39.91	55.51	6.6	58.85	41.17	6.6	33.59	31.26	6.7	50.90	49.43	6.7	8.49	6.50
7.5	40.00	55.89	7.6	59.07	41.42	7.6	33.77	31.57	7.7	51.02	49.61	7.7	8.66	6.65
8.5	40.08	56.27	8.6	59.29	41.67	8.6	33.93	31.89	8.7	51.15	49.77	8.7	8.81	6.82
9.5	40.14	56.65	9.6	59.52	41.94	9.6	34.07	32.21	9.7	51.28	49.94	9.7	8.95	7.00
10.5	40.20	57.01	10.6	59.76	42.21	10.6	34.20	32.53	10.6	51.41	50.11	10.7	9.10	7.19
11.5	40.25	57.35	11.6	60.00	42.50	11.6	34.33	32.84	11.6	51.55	50.30	11.7	9.23	7.37
12.5	40.30	57.69	12.6	60.23	42.81	12.6	34.46	33.13	12.6	51.68	50.51	12.7	9.36	7.55
13.5	40.35	58.02	13.6	60.43	43.14	13.6	34.58	33.41	13.6	51.81	50.74	13.7	9.48	7.72
14.5	40.40	58.34	14.6	60.62	43.46	14.6	34.70	33.70	11.6	51.94	50.97	14.7	9.60	7.87
15.5	40.45	58.67	15.6	60.77	43.79	15.6	34.83	33.98	15.6	52.07	51.22	15.7	9.73	8.02
16.5	40.51	58.99	16.6	60.92	44.13	16.6	34.97	34.26	16.6	52.17	51.47	16.6	9.86	8.18
17.5	40.57	59.32	17.6	61.03	44.46	17.6	35.10	34.54	17.6	52.28	51.74	17.6	10.00	8.33
18.5	40.63	59.66	18.6	61.13	44.79	18.6	35.24	34.83	18.6	52.39	52.01	18.6	10.14	8.48
19.5	40.70	60.01	19.6	61.22	45.11	19.6	35.39	35.14	19.6	52.50	52.26	19.6	10.29	8.66
20.5	40.76	60.38	20.5	61.28	45.41	20.6	35.53	35.46	20.6	52.59	52.50	20.6	10.43	8.83
21.5	40.81	60.75	21.5	61.36	45.70	21.6	35.67	35.79	21.6	52.69	52.75	21.6	10.58	9.02
22.5	40.86	61.14	22.5	61.44	45.98	22.6	35.80	36.13	22.6	52.78	53.00	22.6	10.72	9.25
23.5	40.90	61.52	23.5	61.53	46.26	23.6	35.91	36.50	23.6	52.88	53.23	23.6	10.86	9.48
24.5	40.92	61.90	24.5	61.64	46.54	24.6	36.01	36.85	24.6	52.98	53.45	24.6	10.99	9.72
25.5	40.93	62.27	25.5	61.74	46.84	25.6	36.10	37.19	25.6	53.08	53.68	25.6	11.12	9.96
26.5	40.94	62.61	26.5	61.84	47.16	26.5	36.18	37.53	26.6	53.18	53.93	26.6	11.23	10.19
27.5	40.95	62.94	27.5	61.92	47.48	27.5	36.26	37.85	27.6	53.28	54.20	27.6	11.34	10.40
28.5	40.96	63.27	28.5	61.97	47.82	28.5	36.35	38.14	28.6	53.37	54.49	28.6	11.45	10.60
29.5	40.99	63.59	29.5	61.99	48.16	29.5	36.44	38.43	29.6	53.45	54.81	29.6	11.56	10.79
30.5	41.02	63.92	30.5	61.97	48.51	30.5	36.54	38.74	30.6	53.53	55.13	30.6	11.68	10.98
31.5	41.06	64.26	31.5	61.92	48.84	31.5	36.66	39.05	31.6	53.59	55.44	31.6	11.81	11.18
8.59		−8.53	23.19		+23.17	9.91		−9.86	7.34		+7.27	6.24		−6.16
14h	14m	23s.592	15h	1m	45s.970	15h	25m	17s.036	16h	53m	48s.037	17h	17m	1s.936
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	17 57	+86 36	Apr.	18 9	−87 39	Apr.	18 55	+89 1	Apr.	19 36	−89 12	Apr.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
0.7	5.34	40.11	0.7	56.72	21.47	0.8	15.75	23.01	0.8	41.17	13.88	0.8	12.75	42.18
1.7	5.72	40.19	1.7	57.31	21.49	1.8	17.11	23.01	1.8	42.78	13.77	1.8	12.90	42.04
2.7	6.08	40.30	2.7	57.90	21.50	2.8	18.44	23.05	2.8	44.44	13.64	2.8	13.06	41.90
3.7	6.42	40.43	3.7	58.53	21.51	3.8	19.70	23.10	3.8	46.17	13.52	3.8	13.21	41.80
4.7	6.75	40.55	4.7	59.18	21.54	4.8	20.90	23.15	4.8	47.98	13.41	4.8	13.37	41.70
5.7	7.07	40.66	5.7	59.87	21.58	5.7	22.04	23.19	5.8	49.89	13.30	5.8	13.51	41.61
6.7	7.38	40.77	6.7	60.54	21.63	6.7	23.16	23.22	6.8	51.84	13.20	6.8	13.66	41.51
7.7	7.70	40.87	7.7	61.21	21.72	7.7	24.27	23.25	7.8	53.79	13.13	7.8	13.80	41.40
8.7	8.02	40.96	8.7	61.86	21.81	8.7	25.42	23.26	8.8	55.72	13.07	8.8	13.93	41.27
9.7	8.35	41.05	9.7	62.47	21.92	9.7	26.61	23.27	9.8	57.58	13.02	9.8	14.07	41.14
10.7	8.69	41.15	10.7	63.05	22.03	10.7	27.85	23.28	10.8	59.38	12.99	10.8	14.22	41.02
11.7	9.05	41.26	11.7	63.62	22.13	11.7	29.14	23.31	11.8	61.12	12.96	11.8	14.37	40.90
12.7	9.41	41.39	12.7	64.17	22.24	12.7	30.45	23.35	12.8	62.80	12.93	12.8	14.53	40.79
13.7	9.77	41.52	13.7	64.71	22.33	13.7	31.78	23.41	13.8	64.45	12.90	13.8	14.70	40.69
14.7	10.11	41.69	14.7	65.25	22.43	14.7	33.11	23.49	14.8	66.08	12.87	14.8	14.87	40.59
15.7	10.45	41.86	15.7	65.80	22.52	15.7	34.43	23.58	15.7	67.72	12.84	15.8	15.03	40.52
16.7	10.79	42.04	16.7	66.34	22.60	16.7	35.71	23.68	16.7	69.39	12.80	16.8	15.20	40.47
17.7	11.11	42.23	17.7	66.90	22.68	17.7	36.95	23.80	17.7	71.09	12.75	17.8	15.37	40.43
18.7	11.41	42.42	18.7	67.49	22.78	18.7	38.16	23.91	18.7	72.83	12.71	18.8	15.54	40.40
19.7	11.70	42.61	19.7	68.09	22.88	19.7	39.31	24.04	19.7	74.64	12.66	19.8	15.69	40.39
20.7	11.98	42.81	20.7	68.70	23.00	20.7	40.39	24.16	20.7	76.51	12.63	20.8	15.85	40.37
21.7	12.26	43.00	21.7	69.32	23.13	21.7	41.43	24.27	21.7	78.43	12.62	21.8	16.00	40.36
22.7	12.52	43.18	22.7	69.94	23.27	22.7	42.47	24.37	22.7	80.35	12.62	22.8	16.15	40.33
23.7	12.79	43.35	23.7	70.52	23.45	23.7	43.51	24.46	23.7	82.27	12.64	23.8	16.30	40.30
24.7	13.06	43.52	24.7	71.09	23.63	24.7	44.57	24.56	24.7	84.12	12.68	24.8	16.45	40.26
25.7	13.35	43.69	25.7	71.63	23.81	25.7	45.68	24.66	25.7	85.91	12.72	25.8	16.60	40.22
26.7	13.64	43.87	26.7	72.15	23.98	26.7	46.85	24.78	26.7	87.61	12.76	26.8	16.76	40.20
27.6	13.93	44.07	27.7	72.63	24.13	27.7	48.06	24.91	27.7	89.24	12.80	27.8	16.93	40.19
28.6	14.23	44.29	28.7	73.12	24.28	28.7	49.25	25.07	28.7	90.83	12.84	28.8	17.10	40.19
29.6	14.51	44.53	29.7	73.62	24.42	29.7	50.40	25.25	29.7	92.44	12.85	29.8	17.27	40.23
30.6	14.76	44.80	30.6	74.14	24.56	30.7	51.49	25.45	30.7	94.10	12.86	30.8	17.45	40.28
31.6	15.00	45.07	31.6	74.69	24.69	31.7	52.50	25.65	31.7	95.84	12.86	31.8	17.62	40.34
16.92		+16.89	24.45		−24.43	58.66		+58.65	71.94		−71.94	7.41		+7.34
17^h	57^m	$4^s.326$	18^h	9^m	$46^s.186$	18^h	55^m	$23^s.393$	19^h	37^m	$1^s.735$	20^h	48^m	$15^s.385$
+86°	36′	50″.43	−87°	39′	48″.39	+89°	1′	32″.83	−89°	12′	41″.41	+82°	14′	50″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Apr.	21 39	−83 4	Apr.	22 17	−86 21	Apr.	22 38	−81 46	Apr.	23 27	+86 52	Apr.	23 47	−82 26
	s	″		s	″		s	″		s	″		s	″
0.9	7.16	8.39	0.9	0.34	20.57	0.9	6.74	54.58	0.9	30.98	55.94	0.9	25.13	40.64
1.9	7.29	8.12	1.9	0.54	20.26	1.9	6.81	54.26	1.9	31.15	55.62	1.9	25.16	40.30
2.9	7.42	7.84	2.9	0.73	19.95	2.9	6.88	53.93	2.9	31.34	55.33	2.9	25.19	39.93
3.9	7.56	7.54	3.9	0.93	19.62	3.9	6.97	53.57	3.9	31.55	55.05	3.9	25.22	39.55
4.9	7.71	7.23	4.9	1.16	19.28	4.9	7.06	53.21	4.9	31.75	54.79	4.9	25.26	39.16
5.9	7.89	6.94	5.9	1.42	18.94	5.9	7.16	52.85	5.9	31.94	54.54	5.9	25.31	38.75
6.9	8.07	6.65	6.9	1.69	18.61	6.9	7.27	52.51	6.9	32.12	54.30	6.9	25.37	38.34
7.9	8.25	6.37	7.9	1.97	18.29	7.9	7.38	52.16	7.9	32.29	54.04	7.9	25.45	37.95
8.9	8.43	6.12	8.9	2.27	18.00	8.9	7.51	51.83	8.9	32.45	53.78	8.9	25.53	37.57
9.9	8.60	5.88	9.9	2.56	17.72	9.9	7.64	51.53	9.9	32.61	53.51	9.9	25.61	37.20
10.8	8.78	5.68	10.9	2.85	17.45	10.9	7.75	51.24	10.9	32.78	53.22	10.9	25.69	36.86
11.8	8.93	5.47	11.9	3.13	17.21	11.9	7.86	50.96	11.9	32.96	52.93	11.9	25.77	36.52
12.8	9.09	5.26	12.9	3.38	16.96	12.9	7.97	50.69	12.9	33.15	52.64	12.9	25.83	36.19
13.8	9.25	5.06	13.9	3.63	16.70	13.9	8.07	50.42	13.9	33.38	52.35	13.9	25.89	35.86
14.8	9.41	4.85	14.9	3.89	16.45	14.9	8.17	50.15	14.9	33.62	52.06	14.9	25.96	35.54
15.8	9.56	4.63	15.9	4.14	16.20	15.9	8.27	49.87	15.9	33.88	51.78	15.9	26.03	35.22
16.8	9.72	4.41	16.9	4.41	15.95	16.9	8.37	49.59	16.9	34.15	51.53	16.9	26.10	34.89
17.8	9.89	4.19	17.9	4.67	15.68	17.9	8.48	49.30	17.9	34.42	51.29	17.9	26.16	34.55
18.8	10.06	3.97	18.9	4.93	15.40	18.9	8.59	49.00	18.9	34.70	51.05	18.9	26.24	34.21
19.8	10.24	3.73	19.9	5.21	15.13	19.9	8.70	48.70	19.9	34.99	50.83	19.9	26.32	33.84
20.8	10.42	3.50	20.8	5.52	14.85	20.9	8.83	48.40	20.9	35.26	50.63	20.9	26.41	33.48
21.8	10.61	3.29	21.8	5.84	14.58	21.9	8.97	48.11	21.9	35.53	50.43	21.9	26.50	33.11
22.8	10.81	3.09	22.8	6.17	14.34	22.9	9.12	47.82	22.9	35.77	50.24	22.9	26.60	32.75
23.8	11.01	2.90	23.8	6.51	14.09	23.9	9.27	47.55	23.9	36.01	50.03	23.9	26.71	32.41
24.8	11.21	2.72	24.8	6.85	13.87	24.9	9.42	47.30	24.9	36.25	49.81	24.9	26.83	32.08
25.8	11.41	2.58	25.8	7.19	13.67	25.8	9.56	47.06	25.9	36.51	49.59	25.9	26.95	31.76
26.8	11.60	2.43	26.8	7.51	13.47	26.8	9.69	46.83	26.9	36.78	49.36	26.9	27.06	31.47
27.8	11.78	2.29	27.8	7.82	13.28	27.8	9.83	46.61	27.9	37.07	49.13	27.9	27.16	31.18
28.8	11.95	2.13	28.8	8.11	13.09	28.8	9.96	46.39	28.9	37.39	48.90	28.9	27.25	30.89
29.8	12.12	1.96	29.8	8.39	12.89	29.8	10.07	46.16	29.9	37.73	48.71	29.9	27.34	30.58
30.8	12.29	1.78	30.8	8.68	12.66	30.8	10.19	45.91	30.9	38.10	48.53	30.9	27.43	30.27
31.8	12.47	1.60	31.8	8.99	12.43	31.8	10.32	45.64	31.9	38.46	48.38	31.9	27.54	29.94
8.29		−8.22	15.73		−15.70	6.99		−6.92	18.38		+18.35	7.60		−7.54
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
May	0 57	+85 50	May	1 32	+88 53	May	1 41	−85 9	May	4 11	+85 20	May	5 36	+85 9
0.9	49.47	34.35	0.9	44.07	28.40	0.9	18.04	27.11	1.1	40.98	65.99	1.1	58.96	46.51
1.9	49.67	34.11	1.9	44.64	28.11	1.9	18.05	26.74	2.1	40.94	65.68	2.1	58.85	46.27
2.9	49.87	33.88	2.9	45.20	27.86	2.9	18.06	26.36	3.1	40.93	65.39	3.1	58.74	46.01
3.9	50.05	33.66	3.9	45.73	27.62	3.9	18.10	25.97	4.1	40.91	65.10	4.1	58.64	45.77
4.9	50.22	33.46	4.9	46.23	27.38	4.9	18.15	25.56	5.1	40.88	64.84	5.1	58.54	45.55
5.9	50.37	33.24	5.9	46.70	27.14	5.9	18.21	25.17	6.1	40.84	64.57	6.1	58.43	45.32
6.9	50.53	33.01	6.9	47.12	26.89	6.9	18.30	24.79	7.0	40.78	64.31	7.1	58.30	45.10
7.9	50.68	32.78	7.9	47.54	26.62	7.9	18.38	24.43	8.0	40.72	64.03	8.1	58.17	44.87
8.9	50.85	32.53	8.9	47.99	26.35	8.9	18.47	24.08	9.0	40.66	63.75	9.1	58.03	44.63
9.9	51.02	32.28	9.9	48.45	26.07	9.9	18.56	23.74	10.0	40.60	63.45	10.1	57.89	44.38
10.9	51.20	32.03	10.9	48.98	25.78	10.9	18.65	23.42	11.0	40.55	63.15	11.1	57.75	44.11
11.9	51.39	31.78	11.9	49.56	25.49	11.9	18.73	23.10	12.0	40.50	62.83	12.1	57.62	43.84
12.9	51.59	31.54	12.9	50.18	25.21	12.9	18.81	22.78	13.0	40.48	62.50	13.1	57.50	43.55
13.9	51.82	31.30	13.9	50.86	24.93	13.9	18.87	22.45	14.0	40.47	62.17	14.1	57.39	43.25
14.9	52.05	31.07	14.9	51.59	24.66	14.9	18.94	22.13	15.0	40.47	61.84	15.1	57.29	42.95
15.9	52.30	30.87	15.9	52.34	24.42	15.9	19.02	21.81	16.0	40.48	61.52	16.1	57.21	42.65
16.9	52.55	30.67	16.9	53.12	24.18	16.9	19.10	21.47	17.0	40.51	61.21	17.1	57.15	42.36
17.9	52.79	30.49	17.9	53.90	23.98	17.9	19.19	21.11	18.0	40.54	60.92	18.1	57.09	42.07
18.9	53.02	30.34	18.9	54.66	23.77	18.9	19.29	20.75	19.0	40.58	60.62	19.1	57.04	41.79
19.9	53.25	30.19	19.9	55.39	23.57	19.9	19.41	20.39	20.0	40.62	60.35	20.1	57.00	41.52
20.9	53.47	30.04	20.9	56.07	23.38	20.9	19.54	20.03	21.0	40.66	60.10	21.1	56.96	41.28
21.9	53.67	29.87	21.9	56.72	23.18	21.9	19.67	19.69	22.0	40.67	59.84	22.1	56.91	41.03
22.9	53.87	29.70	22.9	57.36	22.98	22.9	19.82	19.36	23.0	40.69	59.56	23.1	56.85	40.77
23.9	54.09	29.52	23.9	58.03	22.75	23.9	19.96	19.05	24.0	40.71	59.29	24.1	56.76	40.50
24.9	54.32	29.34	24.9	58.74	22.53	24.9	20.11	18.76	25.0	40.73	58.98	25.1	56.68	40.22
25.9	54.56	29.15	25.9	59.54	22.30	25.9	20.24	18.47	25.9	40.76	58.67	26.1	56.62	39.91
26.9	54.83	28.97	26.9	60.41	22.08	26.9	20.36	18.19	26.9	40.80	58.34	27.1	56.56	39.60
27.9	55.12	28.83	27.9	61.38	21.88	27.9	20.46	17.90	27.9	40.88	58.01	28.1	56.54	39.27
28.9	55.41	28.69	28.9	62.37	21.68	28.9	20.57	17.59	28.9	40.98	57.69	29.1	56.53	38.94
29.9	55.71	28.59	29.9	63.38	21.52	29.9	20.70	17.28	29.9	41.09	57.39	30.0	56.54	38.61
30.9	56.00	28.49	30.9	64.35	21.37	30.9	20.83	16.97	30.9	41.20	57.11	31.0	56.56	38.31
31.8	56.28	28.40	31.9	65.28	21.24	31.9	20.97	16.65	31.9	41.31	56.84	32.0	56.58	38.03
13.79	+13.75		51.63	+51.62		11.84	−11.80		12.34	+12.30		11.86	+11.81	
0^h	57^m	$55^s.489$	1^h	33^m	$11^s.898$	1^h	41^m	$39^s.995$	4^h	11^m	$48^s.583$	5^h	37^m	$5^s.478$
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON:

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	5 44	−84 49	May	6 46	−80 44	May	7 4	+87 10	May	7 13	−86 55	May	7 14	+82 33
	s	″		s	″		s	″		s	″		s	″
1.1	51.06	61.41	1.2	24.25	29.20	1.2	50.00	28.73	1.2	67.04	13.61	1.2	56.43	58.32
2.1	50.84	61.22	2.2	24.11	29.09	2.2	49.66	28.55	2.2	66.58	13.56	2.2	56.32	58.14
3.1	50.61	61.02	3.2	23.97	28.97	3.2	49.34	28.37	3.2	66.12	13.50	3.2	56.21	57.97
4.1	50.39	60.79	4.2	23.83	28.83	4.2	49.05	28.20	4.2	65.66	13.41	4.2	56.09	57.82
5.1	50.17	60.55	5.2	23.69	28.68	5.2	48.75	28.05	5.2	65.20	13.31	5.2	55.98	57.68
6.1	49.96	60.28	6.2	23.55	28.50	6.2	48.44	27.89	6.2	64.75	13.18	6.2	55.87	57.55
7.1	49.76	60.01	7.2	23.42	28.32	7.2	48.13	27.74	7.2	64.32	13.04	7.2	55.74	57.41
8.1	49.58	59.74	8.2	23.29	28.12	8.2	47.81	27.59	8.2	63.91	12.89	8.2	55.62	57.28
9.1	49.40	59.48	9.2	23.17	27.92	9.2	47.48	27.44	9.2	63.52	12.74	9.2	55.49	57.15
10.1	49.23	59.22	10.1	23.06	27.73	10.2	47.12	27.26	10.2	63.13	12.58	10.2	55.36	57.01
11.1	49.08	58.98	11.1	22.95	27.54	11.2	46.76	27.09	11.2	62.76	12.44	11.2	55.22	56.84
12.1	48.91	58.74	12.1	22.84	27.36	12.2	46.40	26.89	12.2	62.40	12.30	12.2	55.08	56.66
13.1	48.74	58.49	13.1	22.73	27.18	13.2	46.06	26.67	13.2	62 03	12.17	13.2	54.94	56.47
14.1	48.58	58.25	14.1	22.62	27.01	14.2	45.72	26.44	14.2	61.67	12.04	14.2	54.81	56.28
15.1	48.41	58.02	15.1	22.50	26.83	15.1	45.42	26.21	15.2	61 30	11.92	15.2	54.70	56.06
16.1	48.24	57.79	16.1	22.39	26.66	16.1	45.13	25.98	16.2	60.92	11.80	16.2	54.59	55.83
17.1	48.06	57.54	17.1	22.28	26.48	17.1	44.86	25.73	17.1	60.52	11.66	17.2	54.49	55.61
18.1	47.89	57.27	18.1	22.17	26.29	18.1	44.62	25.49	18.1	60.12	11.52	18.1	54.40	55.39
19.1	47.71	57.00	19.1	22.04	26.07	19.1	44.39	25.25	19.1	59.72	11.34	19.1	54.31	55.19
20.1	47.54	56.70	20.1	21.92	25.85	20.1	44.19	25.04	20.1	59.32	11.16	20.1	54.23	54.99
21.1	47.39	56.38	21.1	21.81	25.61	21.1	43.97	24.84	21.1	58.94	10.97	21.1	54.15	54.80
22.1	47.24	56.06	22.1	21.70	25.36	22 1	43.74	24.63	22.1	58.56	10.76	22.1	54.06	54.61
23.1	47.11	55.75	23.1	21.60	25.09	23.1	43.50	24.42	23.1	58.21	10.54	23.1	53.97	54.42
24.1	46.99	55.44	24.1	21.50	24.84	24.1	43.23	24.20	24.1	57.88	10.32	24.1	53.87	54.22
25.1	46.87	55.14	25.1	21.41	24.59	25.1	42.96	23.98	25.1	57.56	10.12	25.1	53.77	54.00
26.1	46.75	54.85	26.1	21.32	24.36	26.1	42.69	23.72	26.1	57.25	9.92	26.1	53.66	53.77
27.1	46.63	54.58	27.1	21.23	24.14	27.1	42.45	23.45	27.1	56.94	9.74	27.1	53.56	53.51
28.1	46.51	54.32	28.1	21.14	23.93	28.1	42.22	23.15	28.1	56.62	9.58	28.1	53.47	53.23
29.1	46.38	54.06	29.1	21.05	23.71	29.1	42.03	22.85	29.1	56.29	9.41	29.1	53.41	52.95
30.1	46.24	53.79	30.1	20.95	23.49	30.1	41.87	22.55	30.1	55.95	9.24	30.1	53.36	52.68
31.0	46.11	53.49	31.1	20.85	23.25	31.1	41.73	22.27	31.1	55.59	9.05	31.1	53.31	52.41
32.0	45.98	53.17	32.1	20.75	22.98	32.1	41.62	22.00	32.1	55.23	8.82	32.1	53.26	52.16
11.10	−11.06		6.22	−6.13		20.28	+20.26		18.61	−18.58		7.73	+7.66	
$5^h\ 45^m\ 4^s.700$			$6^h\ 46^m\ 28^s.850$			$7^h\ 4^m\ 58^s.549$			$7^h\ 14^m\ 18^s.185$			$7^h\ 14^m\ 59^s.083$		
−84° 49′ 38″.84			−80° 44′ 2″.02			+87° 10′ 21″.62			−86° 54′ 45″.50			+82° 33′ 51″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
May	8 21	+88 51	May	9 8	−85 21	May	9 26	+81 40	May	9 36	−80 36	May	10 21	+82 57
1.2	29.15	61.12	1.3	13.33	54.79	1.3	14.43	16.22	1.3	16.41	13.06	1.3	51.43	13.98
2.2	28.14	61.02	2.3	13.06	54.92	2.3	14.30	16.22	2.3	16.30	13.22	2.3	51.28	14.04
3.2	27.19	60.92	3.3	12.77	55.04	3.3	14.17	16.22	3.3	16.17	13.37	3.3	51.13	14.11
4.2	26.30	60.83	4.3	12.48	55.14	4.3	14.05	16.22	4.3	16.04	13.51	4.3	50.99	14.17
5.2	25.41	60.76	5.3	12.17	55.22	5.3	13.94	16.23	5.3	15.90	13.64	5.3	50.85	14.26
6.2	24.52	60.70	6.3	11.86	55.28	6.3	13.82	16.24	6.3	15.76	13.74	6.3	50.71	14.34
7.2	23.59	60.64	7.3	11.57	55.33	7.3	13.69	16.27	7.3	15.61	13.81	7.3	50.58	14.43
8.2	22.62	60.58	8.3	11.28	55.36	8.3	13.57	16.31	8.3	15.47	13.87	8.3	50.43	14.53
9.2	21.62	60.50	9.2	10.99	55.37	9.3	13.43	16.34	9.3	15.34	13.93	9.3	50.27	14.64
10.2	20.57	60.42	10.2	10.71	55.38	10.3	13.29	16.37	10.3	15.21	13.98	10.3	50.10	14.75
11.2	19.51	60.33	11.2	10.44	55.39	11.3	13.14	16.38	11.3	15.08	14.02	11.3	49.93	14.84
12.2	18.45	60.23	12.2	10.18	55.41	12.3	12.99	16.38	12.3	14.95	14.07	12.3	49.75	14.91
13.2	17.41	60.10	13.2	9.92	55.44	13.3	12.83	16.37	13.3	14.82	14.12	13.3	49.57	14.97
14.2	16.37	59.97	14.2	9.66	55.46	14.3	12.69	16.33	14.3	14.70	14.17	14.3	49.40	15.02
15.2	15.37	59.82	15.2	9.40	55.50	15.2	12.55	16.29	15.3	14.58	14.23	15.3	49.23	15.06
16.2	14.40	59.67	16.2	9.13	55.53	16.2	12.41	16.23	16.2	14.46	14.28	16.3	49.06	15.07
17.2	13.50	59.50	17.2	8.86	55.56	17.2	12.27	16.17	17.2	14.33	14.36	17.3	48.91	15.08
18.2	12.64	59.32	18.2	8.58	55.57	18.2	12.14	16.09	18.2	14.20	14.42	18.3	48.75	15.07
19.2	11.85	59.16	19.2	8.28	55.59	19.2	12.03	16.01	19.2	14.06	14.47	19.3	48.60	15.06
20.2	11.07	59.01	20.2	7.97	55.59	20.2	11.93	15.95	20.2	13.92	14.50	20.3	48.45	15.05
21.2	10.31	58.86	21.2	7.68	55.56	21.2	11.82	15.89	21.2	13.78	14.51	21.3	48.31	15.06
22.2	9.52	58.72	22.2	7.39	55.52	22.2	11.69	15.84	22.2	13.64	14.51	22.3	48.17	15.07
23.2	8.69	58.58	23.2	7.10	55.46	23.2	11.57	15.79	23.2	13.50	14.48	23.3	48.02	15.09
24.2	7.82	58.44	24.2	6.82	55.40	24.2	11.44	15.74	24.2	13.37	14.45	24.3	47.88	15.12
25.2	6.91	58.28	25.2	6.55	55.33	25.2	11.31	15.68	25.2	13.24	14.42	25.3	47.70	15.13
26.2	5.98	58.11	26.2	6.31	55.28	26.2	11.17	15.60	26.2	13.11	14.40	26.3	47.52	15.13
27.2	5.07	57.90	27.2	6.07	55.24	27.2	11.03	15.50	27.2	12.99	14.39	27.3	47.34	15.09
28.2	4.21	57.68	28.2	5.82	55.21	28.2	10.90	15.37	28.2	12.88	14.39	28.3	47.17	15.03
29.2	3.43	57.44	29.2	5.57	55.19	29.2	10.78	15.22	29.2	12.76	14.40	29.2	47.00	14.95
30.2	2.71	57.19	30.2	5.30	55.17	30.2	10.67	15.06	30.2	12.63	14.41	30.2	46.85	14.86
31.2	2.05	56.94	31.2	5.02	55.13	31.2	10.56	14.90	31.2	12.50	14.41	31.2	46.71	14.77
32.2	1.45	56.72	32.2	4.74	55.09	32.2	10.46	14.75	32.2	12.37	14.38	32.2	46.58	14.68
50.56	+50.55		12.38	−12.34		6.90	+6.83		6.12	−6.04		8.15	+8.09	
$8^h\ 21^m\ 41^s.998$			$9^h\ 8^m\ 8^s.703$			$9^h\ 26^m\ 14^s.295$			$9^h\ 36^m\ 12^s.346$			$10^h\ 21^m\ 50^s.081$		
+88° 51′ 51″.95			−85° 21′ 25″.35			+81° 40′ 7″.28			−80° 35′ 44″.11			+82° 57′ 4″.81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
May	10 59	−84 11	May	12 14	+88 7	May	12 46	−84 42	May	12 48	+83 49	May	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
1.4	65.43	10.73	1.4	43.25	44.57	1.4	62.97	33.44	1.4	38.14	59.68	1.5	33.81	42.37
2.3	65.28	11.00	2.4	42.76	44.77	2.4	62.92	33.80	2.4	38.03	59.92	2.4	33.80	42.73
3.3	65.12	11.26	3.4	42.29	44.96	3.4	62.84	34.16	3.4	37.92	60.15	3.4	33.77	43.11
4.3	64.95	11.53	4.4	41.86	45.14	4.4	62.76	34.52	4.4	37.81	60.37	4.4	33.74	43.49
5.3	64.77	11.77	5.4	41.44	45.33	5.4	62.67	34.86	5.4	37.71	60.59	5.4	33.68	43.87
6.3	64.58	12.00	6.4	41.06	45.52	6.4	62.56	35.19	6.4	37.61	60.82	6.4	33.60	44.24
7.3	64.39	12.20	7.4	40.65	45.74	7.4	62.43	35.52	7.4	37.52	61.06	7.4	33.52	44.58
8.3	64.19	12.39	8.4	40.23	45.96	8.4	62.30	35.82	8.4	37.42	61.31	8.4	33.42	44.92
9.3	64.00	12.58	9.4	39.79	46.18	9.4	62.18	36.11	9.4	37.31	61.58	9.4	33.32	45.24
10.3	63.81	12.75	10.4	39.32	46.41	10.4	62.05	36.39	10.4	37.19	61.85	10.4	33.22	45.53
11.3	63.63	12.90	11.4	38.81	46.63	11.4	61.94	36.66	11.4	37.06	62.11	11.4	33.12	45.83
12.3	63.45	13.07	12.4	38.29	46.84	12.4	61.83	36.93	12.4	36.92	62.36	12.4	33.03	46.12
13.3	63.27	13.24	13.4	37.74	47.04	13.4	61.72	37.21	13.4	36.78	62.61	13.4	32.95	46.41
14.3	63.10	13.41	14.4	37.18	47.24	14.4	61.61	37.48	14.4	36.64	62.85	14.4	32.87	46.70
15.3	62.94	13.59	15.4	36.60	47.41	15.4	61.51	37.76	15.4	36.48	63.08	15.4	32.80	47.01
16.3	62.77	13.78	16.4	36.02	47.57	16.4	61.40	38.04	16.4	36.32	63.28	16.4	32.72	47.32
17.3	62.59	13.96	17.4	35.45	47.71	17.4	61.29	38.33	17.4	36.17	63.47	17.4	32.64	47.64
18.3	62.40	14.15	18.4	34.89	47.85	18.4	61.16	38.65	18.4	36.03	63.65	18.4	32.55	47.97
19.3	62.21	14.33	19.4	34.36	47.97	19.4	61.04	38.95	19.4	35.89	63.82	19.4	32.45	48.31
20.3	62.01	14.49	20.3	33.85	48.09	20.4	60.89	39.23	20.4	35.75	63.98	20.4	32.33	48.64
21.3	61.79	14.63	21.3	33.35	48.22	21.4	60.73	39.52	21.4	35.62	64.15	21.4	32.19	48.96
22.3	61.57	14.76	22.3	32.86	48.36	22.4	60.56	39.77	22.4	35.49	64.33	22.4	32.04	49.27
23.3	61.35	14.86	23.3	32.36	48.50	23.4	60.39	40.02	23.4	35.36	64.51	23.4	31.89	49.56
24.3	61.15	14.96	24.3	31.83	48.65	24.4	60.22	40.25	24.4	35.22	64.70	24.4	31.73	49.84
25.3	60.95	15.05	25.3	31.26	48.80	25.4	60.07	40.47	25.4	35.07	64.90	25.4	31.59	50.09
26.3	60.76	15.15	26.3	30.65	48.94	26.4	59.92	40.70	26.4	34.89	65.09	26.4	31.46	50.34
27.3	60.58	15.26	27.3	30.00	49.05	27.4	59.79	40.92	27.4	34.71	65.27	27.4	31.33	50.61
28.3	60.40	15.39	28.3	29.33	49.15	28.4	59.66	41.15	28.4	34.52	65.42	28.4	31.23	50.88
29.3	60.22	15.52	29.3	28.66	49.22	29.3	59.53	41.39	29.3	34.34	65.56	29.4	31.13	51.15
30.3	60.04	15.66	30.3	28.02	49.27	30.3	59.39	41.65	30.3	34.17	65.66	30.4	31.01	51.44
31.3	59.85	15.79	31.3	27.41	49.32	31.3	59.25	41.90	31.3	34.00	65.76	31.4	30.88	51.76
32.3	59.63	15.89	32.3	26.84	49.37	32.3	59.07	42.16	32.3	33.83	65.85	32.4	30.73	52.05
9.87		−9.82	30.64		+30.63	10.85		−10.80	9.31		+9.26	12.46		−12.42
$10^h\ 59^m\ 53^s.036$			$12^h\ 14^m\ 30^s.802$			$12^h\ 46^m\ 43^s.161$			$12^h\ 48^m\ 33^s.111$			$13^h\ 28^m\ 9^s.628$		
−84° 10′ 46″.79			+88° 7′ 36″.40			−84° 42′ 20″.01			+83° 49′ 52″.98			−85° 23′ 33″.94		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	14 14	−83 19	May	15 1	+87 31	May	15 25	−84 12	May	16 53	+82 9	May	17 17	−80 47
	s	″		s	″		s	″		s	″		s	″
1.5	41.06	4.26	1.5	61.92	48.84	1.5	36.66	39.05	1.6	53.59	55.44	1.6	11.81	11.18
2.5	41.10	4.62	2.5	61.86	49.16	2.5	36.77	39.37	2.6	53.66	55.75	2.6	11.95	11.38
3.5	41.14	4.99	3.5	61.80	49.45	3.5	36.88	39.73	3.6	53.73	56.04	3.6	12.09	11.61
4.5	41.16	5.36	4.5	61.75	49.73	4.5	36.98	40.08	4.6	53.79	56.32	4.6	12.22	11.85
5.5	41.17	5.74	5.5	61.71	50.01	5.5	37.07	40.45	5.6	53.85	56.59	5.6	12.35	12.12
6.5	41.17	6.11	6.5	61.70	50.29	6.5	37.12	40.81	6.6	53.92	56.86	6.6	12.46	12.39
7.5	41.16	6.48	7.5	61.69	50.58	7.5	37.18	41.16	7.6	53.98	57.13	7.6	12.57	12.66
8.5	41.12	6.82	8.5	61.67	50.89	8.5	37.24	41.51	8.6	54.05	57.41	8.6	12.67	12.92
9.5	41.08	7.15	9.5	61.64	51.20	9.5	37.28	41.84	9.6	54.12	57.69	9.6	12.75	13.19
10.5	41.05	7.47	10.5	61.61	51.52	10.5	37.31	42.16	10.6	54.18	58.01	10.6	12.83	13.44
11.5	41.03	7.79	11.5	61.56	51.85	11.5	37.35	42.48	11.6	54.24	58.32	11.6	12.91	13.68
12.5	41.00	8.09	12.5	61.48	52.19	12.5	37.39	42.79	12.6	54.30	58.65	12.6	13.00	13.91
13.5	40.99	8.40	13.5	61.38	52.53	13.5	37.43	43.09	13.6	54.35	58.99	13.6	13.09	14.15
14.4	40.97	8.70	14.5	61.25	52.86	14.5	37.48	43.40	14.6	54.39	59.33	14.6	13.18	14.39
15.4	40.96	9.01	15.5	61.10	53.18	15.5	37.53	43.71	15.6	54.43	59.66	15.6	13.27	14.62
16.4	40.95	9.33	16.5	60.95	53.50	16.5	37.58	44.02	16.6	54.47	60.00	16.6	13.37	14.86
17.4	40.94	9.67	17.5	60.77	53.79	17.5	37.64	44.34	17.5	54.50	60.32	17.6	13.47	15.10
18.4	40.92	10.00	18.5	60.59	54.08	18.5	37.69	44.69	18.5	54.51	60.64	18.6	13.57	15.37
19.4	40.89	10.34	19.5	60.41	54.36	19.5	37.74	45.05	19.5	54.53	60.94	19.6	13.68	15.65
20.4	40.86	10.70	20.5	60.26	54.61	20.5	37.76	45.41	20.5	54.56	61.23	20.6	13.78	15.96
21.4	40.81	11.04	21.5	60.11	54.86	21.5	37.77	45.78	21.5	54.59	61.52	21.6	13.86	16.27
22.4	40.74	11.37	22.5	59.97	55.12	22.5	37.78	46.13	22.5	54.62	61.81	22.6	13.94	16.57
23.4	40.67	11.70	23.5	59.82	55.40	23.5	37.78	46.47	23.5	54.65	62.10	23.5	14.00	16.87
24.4	40.60	11.99	24.5	59.67	55.70	24.5	37.76	46.80	24.5	54.66	62.42	24.5	14.05	17.16
25.4	40.53	12.27	25.5	59.49	56.01	25.5	37.75	47.10	25.5	54.68	62.75	25.5	14.11	17.44
26.4	40.47	12.55	26.5	59.29	56.32	26.5	37.74	47.39	26.5	54.70	63.09	26.5	14.17	17.69
27.4	40.42	12.82	27.5	59.06	56.62	27.5	37.74	47.68	27.5	54.71	63.45	27.5	14.24	17.94
28.4	40.38	13.10	28.4	58.78	56.91	28.5	37.77	47.99	28.5	54.70	63.81	28.5	14.32	18.18
29.4	40.35	13.41	29.4	58.48	57.19	29.5	37.80	48.30	29.5	54.69	64.15	29.5	14.41	18.45
30.4	40.31	13.72	30.4	58.18	57.43	30.5	37.81	48.62	30.5	54.67	64.50	30.5	14.49	18.73
31.4	40.27	14.04	31.4	57.89	57.67	31.5	37.83	48.96	31.5	54.66	64.81	31.5	14.57	19.01
32.4	40.21	14.37	32.4	57.60	57.90	32.4	37.83	49.32	32.5	54.64	65.10	32.5	14.65	19.32
8.60		−8.54	23.22		+23.20	9.92		−9.87	7.34		+7.27	6.25		−6.17
14^h	14^m	$23^s.592$	15^h	1^m	$45^s.970$	15^h	25^m	$17^s.036$	16^h	53^m	$48^s.037$	17^h	17^m	$1^s.936$
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
May	17 57	+86 36	May	18 10	−87 39	May	18 55	+89 1	May	19 37	−89 12	May	20 48	+82 14
1.6	15.00	45.07	1.6	14.69	24.69	1.7	52.50	25.65	1.7	35.84	12.86	1.8	17.62	40.34
2.6	15.21	45.32	2.6	15.27	24.84	2.7	53.44	25.85	2.7	37.65	12.89	2.8	17.77	40.43
3.6	15.41	45.57	3.6	15.85	25.02	3.7	54.33	26.04	3.7	39.52	12.92	3.8	17.93	40.49
4.6	15.62	45.81	4.6	16.42	25.20	4.7	55.19	26.22	4.7	41.41	12.96	4.7	18.08	40.56
5.6	15.82	46.05	5.6	16.97	25.41	5.7	56.06	26.39	5.7	43.27	13.03	5.7	18.23	40.63
6.6	16.04	46.27	6.6	17.49	25.63	6.7	56.95	26.56	6.7	45.07	13.12	6.7	18.38	40.68
7.6	16.26	46.49	7.6	17.97	25.85	7.7	57.89	26.73	7.7	46.79	13.22	7.7	18.53	40.73
8.6	16.48	46.72	8.6	18.44	26.08	8.7	58 88	26.90	8.7	48.45	13.33	8.7	18.68	40.77
9.6	16.71	46.96	9.6	18.87	26.30	9.7	59.90	27.08	9.7	50.02	13.44	9.7	18.84	40.82
10.6	16.94	47.21	10.6	19.30	26.50	10.7	60.93	27.27	10.7	51.54	13 55	10.7	18.99	40.88
11.6	17.17	47.48	11.6	19.71	26.71	11.7	61.93	27.47	11.7	53.03	13.65	11.7	19.17	40.96
12.6	17.38	47.76	12.6	20.12	26.91	12.6	62.92	27.70	12.7	54.52	13.75	12.7	19.32	41.05
13.6	17.58	48.05	13.6	20.53	27.11	13.6	63.88	27.94	13.7	56.01	13.84	13.7	19.48	41.14
14.6	17.78	48.36	14.6	20.95	27.31	14.6	64.80	28 18	14.7	57.50	13.92	14.7	19.65	41.27
15.6	17.95	48.67	15.6	21.38	27.50	15.6	65.66	28.44	15.7	59.04	14.01	15.7	19.82	41.41
16.6	18.10	48.96	16.6	21.84	27.71	16.6	66.46	28.69	16.7	60.63	14.09	16.7	19.97	41.56
17.6	18.24	49.26	17.6	22.30	27.93	17.6	67.20	28.94	17.7	62.27	14.19	17.7	20.12	41.71
18.6	18.38	49.56	18.6	22.76	28.15	18.6	67.88	29.20	18.7	63.95	14.32	18.7	20.27	41.86
19.6	18.50	49.84	19.6	23.23	28.38	19.6	68.53	29.44	19.7	65.64	14.44	19.7	20.41	42.01
20.6	18.63	50.11	20.6	23.68	28.65	20.6	69.17	29.68	20.7	67.33	14.58	20.7	20.55	42.15
21.6	18.76	50.37	21.6	24.10	28.93	21.6	69.83	29.90	21.7	68.95	14.76	21.7	20.69	42.29
22.6	18.89	50.63	22.6	24.49	29.20	22.6	70.51	30.11	22.6	70.51	14.93	22.7	20.82	42.41
23.6	19.03	50.90	23.6	24.84	29.48	23.6	71.24	30.34	23.6	71.97	15.10	23.7	20.95	42.53
24.6	19.17	51.18	24.6	25.17	29.75	24.6	72.00	30.57	24.6	73.33	15.28	24.7	21.09	42.67
25.6	19.31	51.49	25.6	25.48	29.99	25.6	72.76	30.83	25.6	74.65	15.43	25.7	21.23	42.83
26.6	19.45	51.80	26.6	25.80	30.24	26.6	73.49	31.11	26.6	75.95	15.58	26.7	21.38	43.01
27.6	19.55	52.13	27.6	26.14	30.47	27.6	74.16	31.42	27.6	77.27	15.71	27.7	21.54	43.20
28.6	19.64	52.48	28.6	26.51	30.69	28.6	74.75	31.73	28.6	78.65	15.85	28.7	21.69	43.42
29.6	19.70	52.83	29.6	26.89	30.91	29.6	75.26	32.04	29.6	80.11	15.98	29.7	21.84	43.65
30.6	19.75	53.16	30.6	27.30	31.17	30.6	75.69	32.34	30.6	81.63	16.13	30.7	21.97	43.88
31.6	19.78	53.47	31.6	27.70	31.44	31.6	76.07	32.63	31.6	83.19	16.30	31.7	22.09	44.11
32.6	19.82	53.76	32.6	28.08	31.72	32.6	76.44	32.91	32.6	84.71	16.48	32.7	22.20	44.34
16.93		+16.90	24.47		−24.45	58.74		+58.73	71.97		−71.97	7.41		+7.34
17h	57m	4s.326	18h	9m	46s.186	18h	55m	23s.393	19h	37m	1s.735	20h	48m	15s.385
+86°	36′	50″.43	−87°	39′	48″.39	+89°	1′	32″.83	−89°	12′	41″.41	+82°	14′	50″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
May	21 39	−83 3	May	22 17	−86 21	May	22 38	−81 46	May	23 27	+86 52	May	23 47	−82 26
1.8	12.47	61.60	1.8	8.99	12.43	1.8	10.32	45.64	1.9	38.46	48.38	1.9	27.54	29.94
2.8	12.66	61.41	2.8	9.31	12.19	2.8	10.46	45.37	2.9	38.81	48.24	2.9	27.64	29.61
3.8	12.87	61.24	3.8	9.65	11.96	3.8	10.62	45.12	3.9	39.13	48.11	3.9	27.76	29.28
4.8	13.08	61.08	4.8	10.02	11.75	4.8	10.77	44.87	4.9	39.45	47.99	4.9	27.89	28.94
5.8	13.30	60.93	5.8	10.39	11.56	5.8	10.93	44.63	5.9	39.75	47.86	5.9	28.02	28.62
6.8	13.51	60.80	6.8	10.76	11.38	6.8	11.09	44.42	6.9	40.04	47.72	6.9	28.16	28.33
7.8	13.71	60.71	7.8	11.13	11.21	7.8	11.24	44.22	7.8	40.35	47.55	7.9	28.29	28.04
8.8	13.91	60.62	8.8	11.48	11.08	8.8	11.40	44.04	8.8	40.66	47.38	8.9	28.43	27.78
9.8	14.10	60.54	9.8	11.82	10.95	9.8	11.55	43.87	9.8	40.98	47.21	9.9	28.56	27.54
10.8	14.29	60.46	10.8	12.15	10.82	10.8	11.70	43.72	10.8	41.32	47.06	10.9	28.69	27.30
11.8	14.46	60.37	11.8	12.46	10.69	11.8	11.84	43.56	11.8	41.68	46.90	11.9	28.81	27.06
12.8	14.64	60.28	12.8	12.78	10.56	12.8	11.97	43.39	12.8	42.05	46.76	12.8	28.93	26.82
13.8	14.82	60.20	13.8	13.10	10.43	13.8	12.10	43.22	13.8	42.44	46.63	13.8	29.04	26.58
14.8	15.01	60.11	14.8	13.42	10.29	14.8	12.25	43.04	14.8	42.83	46.52	14.8	29.16	26.33
15.8	15.19	60.01	15.8	13.74	10.14	15.8	12.39	42.87	15.8	43.23	46.42	15.8	29.29	26.06
16.8	15.38	59.90	16.8	14.07	9.99	16.8	12.53	42.70	16.8	43.63	46.33	16.8	29.41	25.80
17.7	15.58	59.80	17.8	14.43	9.85	17.8	12.69	42.51	17.8	44.01	46.28	17.8	29.55	25.53
18.7	15.79	59.71	18.8	14.79	9.71	18.8	12.86	42.32	18.8	44.38	46.22	18.8	29.69	25.27
19.7	16.01	59.65	19.8	15.17	9.58	19.8	13.03	42.15	19.8	44.73	46.16	19.8	29.84	25.00
20.7	16.23	59.58	20.8	15.56	9.47	20.8	13.21	42.00	20.8	45.07	46.10	20.8	30.01	24.76
21.7	16.45	59.54	21.8	15.95	9.37	21.8	13.38	41.86	21.8	45.40	46.03	21.8	30.18	24.52
22.7	16.65	59.53	22.8	16.34	9.30	22.8	13.55	41.75	22.8	45.74	45.95	22.8	30.33	24.31
23.7	16.86	59.52	23.8	16.72	9.24	23.8	13.72	41.65	23.8	46.10	45.87	23.8	30.49	24.11
24.7	17.06	59.51	24.8	17.07	9.18	24.8	13.87	41.56	24.8	46.47	45.79	24.8	30.64	23.92
25.7	17.24	59.50	25.8	17.41	9.12	25.8	14.02	41.47	25.8	46.85	45.73	25.8	30.78	23.74
26.7	17.41	59.47	26.8	17.73	9.05	26.8	14.16	41.36	26.8	47.26	45.67	26.8	30.92	23.56
27.7	17.59	59.44	27.7	18.05	8.97	27.8	14.30	41.23	27.8	47.68	45.64	27.8	31.06	23.37
28.7	17.76	59.39	28.7	18.37	8.88	28.8	14.45	41.10	28.8	48.12	45.63	28.8	31.20	23.15
29.7	17.96	59.34	29.7	18.73	8.78	29.8	14.63	40.97	29.8	48.54	45.64	29.8	31.34	22.93
30.7	18.16	59.29	30.7	19.09	8.69	30.8	14.79	40.84	30.8	48.94	45.68	30.8	31.50	22.72
31.7	18.38	59.26	31.7	19.47	8.62	31.8	14.96	40.73	31.8	49.32	45.71	31.8	31.67	22.50
32.7	18.59	59.25	32.7	19.88	8.56	32.7	15.14	40.62	32.8	49.69	45.74	32.8	31.84	22.30
8.28		−8.22	15.72		−15.69	6.99		−6.92	18.37		+18.34	7.60		−7.54
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
June	0 57	+85 50	June	1 33	+88 53	June	1 41	−85 9	June	4 11	+85 20	June	5 36	+85 9
0.8	56.28	28.40	0.9	5.28	21.24	0.9	20.97	16.65	0.9	41.31	56.84	1.0	56.58	38.03
1.8	56.55	28.31	1.9	6.17	21.11	1.9	21.14	16.32	1.9	41.41	56.60	2.0	56.60	37.77
2.8	56.79	28.22	2.9	7.01	20.98	2.9	21.32	16.00	2.9	41.51	56.35	3.0	56.61	37.50
3.8	57.03	28.12	3.9	7.83	20.84	3.9	21.50	15.71	3.9	41.59	56.10	4.0	56.61	37.23
4.8	57.27	28.00	4.9	8.65	20.69	4.9	21.68	15.43	4.9	41.65	55.83	5.0	56.60	36.95
5.8	57.52	27.90	5.9	9.49	20.51	5.9	21.87	15.16	5.9	41.73	55.57	6.0	56.59	36.67
6.8	57.79	27.79	6.9	10.37	20.34	6.9	22.05	14.92	6.9	41.81	55.29	7.0	56.57	36.38
7.8	58.06	27.66	7.9	11.29	20.17	7.9	22.23	14.68	7.9	41.89	55.01	8.0	56.56	36.07
8.8	58.35	27.55	8.8	12.26	20.02	8.9	22.40	14.45	8.9	41.99	54.72	9.0	56.55	35.75
9.8	58.64	27.44	9.8	13.28	19.86	9.9	22.57	14.22	9.9	42.10	54.42	10.0	56.56	35.42
10.8	58.96	27.34	10.8	14.34	19.72	10.8	22.73	13.98	10.9	42.23	54.12	11.0	56.59	35.09
11.8	59.26	27.28	11.8	15.42	19.59	11.8	22.90	13.75	11.9	42.36	53.83	12.0	56.63	34.76
12.8	59.57	27.22	12.8	16.53	19.48	12.8	23.07	13.51	12.9	42.51	53.55	13.0	56.68	34.45
13.8	59.90	27.19	13.8	17.64	19.38	13.8	23.24	13.26	13.9	42.68	53.29	14.0	56.76	34.15
14.8	60.20	27.17	14.8	18.73	19.30	14.8	23.42	12.99	14.9	42.85	53.04	15.0	56.84	33.86
15.8	60.49	27.16	15.8	19.78	19.24	15.8	23.62	12.73	15.9	43.03	52.81	16.0	56.93	33.57
16.8	60.78	27.15	16.8	20.78	19.18	16.8	23.84	12.48	16.9	43.18	52.59	16.9	57.01	33.30
17.8	61.05	27.14	17.8	21.73	19.12	17.8	24.06	12.23	17.9	43.33	52.37	17.9	57.07	33.03
18.8	61.32	27.13	18.8	22.67	19.05	18.8	24.29	12.00	18.9	43.47	52.15	18.9	57.13	32.77
19.8	61.59	27.09	19.8	23.60	18.97	19.8	24.52	11.79	19.9	43.60	51.93	19.9	57.19	32.51
20.8	61.86	27.06	20.8	24.56	18.88	20.8	24.75	11.59	20.9	43.74	51.69	20.9	57.24	32.24
21.8	62.14	27.02	21.8	25.58	18.79	21.8	24.96	11.41	21.9	43.88	51.44	21.9	57.29	31.95
22.8	62.45	26.98	22.8	26.68	18.70	22.8	25.16	11.24	22.9	44.05	51.19	22.9	57.37	31.63
23.8	62.77	26.97	23.8	27.86	18.63	23.8	25.36	11.06	23.9	44.23	50.92	23.9	57.45	31.31
24.8	63.11	26.97	24.8	29.08	18.57	24.8	25.56	10.89	24.9	44.43	50.67	24.9	57.55	30.98
25.8	63.45	27.01	25.8	30.31	18.54	25.8	25.75	10.70	25.9	44.66	50.42	25.9	57.68	30.68
26.8	63.78	27.05	26.8	31.53	18.53	26.8	25.94	10.50	26.9	44.89	50.19	26.9	57.81	30.39
27.8	64.11	27.12	27.8	32.70	18.53	27.8	26.16	10.29	27.9	45.12	50.00	27.9	57.96	30.11
28.8	64.41	27.19	28.8	33.80	18.54	28.8	26.38	10.08	28.9	45.34	49.82	28.9	58.11	29.85
29.8	64.70	27.25	29.8	34.86	18.56	29.8	26.63	9.87	29.9	45.54	49.64	29.9	58.25	29.61
30.8	64.98	27.31	30.8	35.89	18.56	30.8	26.88	9.69	30.9	45.74	49.46	30.9	58.37	29.36
31.8	65.25	27.35	31.8	36.89	18.56	31.8	27.13	9.53	31.9	45.93	49.29	31.9	58.48	29.12
13.79	+13.75		51.56	+51.55		11.84	−11.79		12.33	+12.29		11.85	+11.81	
0^h	57^m	$55^s.489$	1^h	33^m	$11^s.898$	1^h	41^m	$39^s.995$	4^h	11^m	$48^s.583$	5^h	37^m	$5^s.478$
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
June	h m s 5 44	° ′ ″ −84 49	June	h m s 6 46	° ′ ″ −80 44	June	h m s 7 4	° ′ ″ +87 10	June	h m s 7 13	° ′ ″ −86 55	June	h m s 7 14	° ′ ″ +82 33
1.0	45.98	53.17	1.1	20.75	22.98	1.1	41.62	22.00	1.1	55.23	8.82	1.1	53.26	52.16
2.0	45.85	52.84	2.1	20.66	22.71	2.1	41.50	21.74	2.1	54.89	8.59	2.1	53.21	51.91
3.0	45.75	52.50	3.1	20.58	22.42	3.1	41.37	21.49	3.1	54.55	8.34	3.1	53.17	51.68
4.0	45.66	52.16	4.1	20.50	22.12	4.1	41.21	21.24	4.1	54.25	8.07	4.1	53.11	51.45
5.0	45.58	51.83	5.1	20.42	21.82	5.1	41.03	20.99	5.1	53.96	7.81	5.1	53.04	51.23
6.0	45.50	51.50	6.1	20.34	21.52	6.1	40.85	20.73	6.1	53.71	7.54	6.1	52.97	50.99
7.0	45.44	51.17	7.1	20.28	21.23	7.1	40.67	20.46	7.1	53.46	7.29	7.1	52.91	50.73
8.0	45.38	50.85	8.1	20.22	20.95	8.1	40.49	20.18	8.1	53.22	7.04	8.1	52.84	50.46
9.0	45.31	50.56	9.1	20.16	20.67	9.1	40.34	19.87	9.1	52.99	6.80	9.1	52.77	50.18
10.0	45.25	50.26	10.1	20.10	20.40	10.1	40.19	19.56	10.1	52.76	6.57	10.1	52.70	49.89
11.0	45.19	49.97	11.1	20.04	20.13	11.1	40.05	19.24	11.1	52.52	6.34	11.1	52.65	49.60
12.0	45.12	49.68	12.1	19.97	19.88	12.1	39.95	18.93	12.1	52.28	6.11	12.1	52.60	49.29
13.0	45.05	49.38	13.1	19.91	19.61	13.1	39.86	18.60	13.1	52.03	5.87	13.1	52.56	48.98
14.0	44.98	49.06	14.1	19.85	19.33	14.1	39.80	18.29	14.1	51.77	5.64	14.1	52.55	48.69
15.0	44.92	48.74	15.1	19.78	19.04	15.1	39.76	17.97	15.1	51.50	5.38	15.1	52.54	48.39
16.0	44.85	48.41	16.0	19.71	18.72	16.1	39.74	17.67	16.1	51.25	5.11	16.1	52.53	48.11
17.0	44.80	48.05	17.0	19.65	18.40	17.1	39.71	17.40	17.1	51.00	4.80	17.1	52.52	47.84
18.0	44.75	47.69	18.0	19.60	18.07	18.1	39.68	17.13	18.1	50.75	4.49	18.1	52.51	47.59
18.9	44.71	47.33	19.0	19.55	17.72	19.1	39.64	16.86	19.1	50.54	4.17	19.1	52.48	47.34
19.9	44.70	46.99	20.0	19.50	17.38	20.1	39.59	16.59	20.1	50.35	3.85	20.1	52.45	47.07
20.9	44.69	46.64	21.0	19.45	17.05	21.0	39.52	16.30	21.1	50.17	3.56	21.1	52.43	46.80
21.9	44.68	46.31	22.0	19.42	16.75	22.0	39.45	15.98	22.1	50.03	3.28	22.1	52.40	46.52
22.9	44.68	46.02	23.0	19.39	16.46	23.0	39.38	15.66	23.0	49.88	3.01	23.1	52.37	46.20
23.9	44.68	45.72	24.0	19.36	16.17	24.0	39.34	15.33	24.0	49.72	2.75	24.0	52.35	45.88
24.9	44.65	45.43	25.0	19.32	15.89	25.0	39.33	14.99	25.0	49.55	2.50	25.0	52.35	45.55
25.9	44.62	45.12	26.0	19.29	15.60	26.0	39.36	14.64	26.0	49.38	2.25	26.0	52.36	45.21
26.9	44.61	44.81	27.0	19.25	15.29	27.0	39.42	14.30	27.0	49.19	1.98	27.0	52.39	44.88
27.9	44.59	44.48	28.0	19.21	14.98	28.0	39.51	13.97	28.0	49.00	1.70	28.0	52.43	44.57
28.9	44.58	44.14	29.0	19.17	14.66	29.0	39.59	13.67	29.0	48.81	1.38	29.0	52.46	44.28
29.9	44.58	43.77	30.0	19.14	14.32	30.0	39.66	13.38	30.0	48.63	1.06	30.0	52.49	43.99
30.9	44.59	43.41	31.0	19.13	13.95	31.0	39.72	13.09	31.0	48.49	0.73	31.0	52.50	43.72
31.9	44.62	43.07	32.0	19.11	13.60	32.0	39.77	12.81	32.0	48.38	0.40	32.0	52.52	43.45
11.10	−11.05		6.21	−6.13		+20.27	+20.24		18.60	−18.57		7.73	+7.66	
5^h	45^m	$4^s.700$	6^h	46^m	$28^s.850$	7^h	4^m	$58^s.549$	7^h	14^m	$18^s.185$	7^h	14^m	$59^s.083$
−84°	49′	38″.84	−80°	44′	2″.02	+87°	10′	21″.62	−86°	54′	45″.50	+82°	33′	51″.51

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
June	8 20	+88 51	June	9 7	−85 21	June	9 26	+81 40	June	9 36	−80 36	June	10 21	+82 57
1.2	61.45	56.72	1.2	64.74	55.09	1.2	10.46	14.75	1.2	12.37	14.38	1.2	46.58	14.68
2.2	60.85	56.50	2.2	64.45	55.01	2.2	10.36	14.61	2.2	12.24	14.34	2.2	46.44	14.60
3.1	60.23	56.31	3.2	64.17	54.92	3.2	10.27	14.49	3.2	12.10	14.28	3.2	46.31	14.54
4.1	59.58	56.12	4.2	63.90	54.79	4.2	10.17	14.38	4.2	11.97	14.19	4.2	46.17	14.47
5.1	58.89	55.92	5.2	63.63	54.67	5.2	10.06	14.27	5.2	11.83	14.11	5.2	46.03	14.42
6.1	58.17	55.71	6.2	63.38	54.54	6.2	9.93	14.14	6.2	11.69	14.01	6.2	45.88	14.37
7.1	57.44	55.49	7.2	63.14	54.41	7.2	9.81	14.01	7.2	11.57	13.91	7.2	45.72	14.31
8.1	56.70	55.26	8.2	62.91	54.28	8.2	9.69	13.87	8.2	11.47	13.80	8.2	45.55	14.23
9.1	55.97	55.02	9.2	62.68	54.16	9.2	9.56	13.72	9.2	11.36	13.70	9.2	45.38	14.14
10.1	55.27	54.75	10.2	62.45	54.04	10.2	9.45	13.54	10.2	11.25	13.61	10.2	45.22	14.04
11.1	54.59	54.49	11.2	62.23	53.93	11.2	9.34	13.36	11.2	11.14	13.53	11.2	45.06	13.91
12.1	53.96	54.22	12.2	62.01	53.82	12.2	9.23	13.17	12.2	11.02	13.44	12.2	44.91	13.78
13.1	53.38	53.94	13.2	61.78	53.71	13.2	9.13	12.97	13.2	10.90	13.35	13.2	44.77	13.64
14.1	52.87	53.65	14.2	61.54	53.59	14.2	9.03	12.75	14.2	10.78	13.27	14.2	44.63	13.49
15.1	52.41	53.36	15.1	61.30	53.47	15.2	8.94	12.54	15.2	10.66	13.19	15.2	44.49	13.33
16.1	52.00	53.09	16.1	61.05	53.34	16.2	8.85	12.33	16.2	10.54	13.07	16.2	44.37	13.17
17.1	51.63	52.83	17.1	60.79	53.18	17.2	8.78	12.13	17.2	10.41	12.94	17.2	44.26	13.02
18.1	51.24	52.59	18.1	60.53	53.00	18.2	8.71	11.94	18.2	10.29	12.80	18.2	44.15	12.88
19.1	50.83	52.34	19.1	60.29	52.81	19.2	8.63	11.76	19.2	10.17	12.62	19.2	44.02	12.75
20.1	50.37	52.10	20.1	60.05	52.61	20.2	8.54	11.58	20.2	10.06	12.45	20.2	43.89	12.62
21.1	49.86	51.83	21.1	59.83	52.41	21.1	8.45	11.39	21.2	9.95	12.28	21.2	43.76	12.49
22.1	49.33	51.55	22.1	59.64	52.21	22.1	8.36	11.19	22.1	9.84	12.11	22.2	43.61	12.35
23.1	48.80	51.24	23.1	59.46	52.02	23.1	8.26	10.96	23.1	9.74	11.94	23.2	43.46	12.18
24.1	48.32	50.93	24.1	59.27	51.84	24.1	8.16	10.72	24.1	9.64	11.80	24.2	43.32	11.99
25.1	47.92	50.60	25.1	59.08	51.69	25.1	8.07	10.45	25.1	9.54	11.67	25.2	43.19	11.77
26.1	47.59	50.27	26.1	58.88	51.55	26.1	7.99	10.18	26.1	9.45	11.54	26.2	43.05	11.55
27.1	47.35	49.94	27.1	58.67	51.40	27.1	7.93	9.91	27.1	9.35	11.40	27.2	42.94	11.32
28.1	47.16	49.61	28.1	58.45	51.22	28.1	7.88	9.64	28.1	9.25	11.25	28.2	42.84	11.10
29.1	46.99	49.30	29.1	58.24	51.02	29.1	7.83	9.37	29.1	9.14	11.08	29.2	42.74	10.88
30.1	46.83	49.02	30.1	58.02	50.80	30.1	7.78	9.13	30.1	9.03	10.89	30.2	42.65	10.67
31.1	46.64	48.74	31.1	57.82	50.56	31.1	7.72	8.90	31.1	8.92	10.67	31.2	42.56	10.47
32.1	46.41	48.46	32.1	57.62	50.32	32.1	7.67	8.67	32.1	8.81	10.45	32.2	42.46	10.28
50.48	+50.47		12.37	−12.33		6.90	+6.83		6.12	−6.04		8.15	+8.09	
$8^h\ 21^m\ 41^s.998$			$9^h\ 8^m\ 8^s.703$			$9^h\ 26^m\ 14^s.295$			$9^h\ 36^m\ 12^s.346$			$10^h\ 21^m\ 50^s.081$		
+88° 51′ 51″.95			−85° 21′ 25″.35			+81° 40′ 7″.28			−80° 35′ 44″.11			+82° 57′ 4″.81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
June	10 59	−84 11	June	12 14	+88 7	June	12 46	−84 42	June	12 48	+83 50	June	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
1.3	59.63	15.89	1.3	26.84	49.37	1.3	59.07	42.16	1.3	33.83	5.85	1.4	30.73	52.05
2.3	59.41	15.99	2.3	26.28	49.42	2.3	58.89	42.40	2.3	33.68	5.94	2.4	30.55	52.34
3.3	59.19	16.06	3.3	25.73	49.48	3.3	58.70	42.63	3.3	33.53	6.04	3.4	30.37	52.61
4.3	58.97	16.12	4.3	25.18	49.56	4.3	58.51	42.83	4.3	33.38	6.17	4.4	30.19	52.85
5.3	58.75	16.17	5.3	24.61	49.64	5.3	58.31	43.02	5.3	33.23	6.30	5.4	29.99	53.08
6.3	58.53	16.21	6.3	24.01	49.72	6.3	58.12	43.20	6.3	33.06	6.43	6.4	29.79	53.29
7.2	58.33	16.22	7.3	23.40	49.80	7.3	57.93	43.35	7.3	32.88	6.56	7.3	29.61	53.49
8.2	58.13	16.23	8.3	22.76	49.86	8.3	57.75	43.51	8.3	32.69	6.68	8.3	29.43	53.69
9.2	57.94	16.25	9.3	22.11	49.91	9.3	57.57	43.66	9.3	32.50	6.80	9.3	29.25	53.89
10.2	57.74	16.27	10.3	21.45	49.96	10.3	57.40	43.81	10.3	32.31	6.91	10.3	29.08	54.10
11.2	57.55	16.30	11.3	20.76	49.99	11.3	57.22	43.98	11.3	32.12	7.00	11.3	28.90	54.30
12.2	57.37	16.34	12.3	20.08	50.00	12.3	57.05	44.15	12.3	31.92	7.06	12.3	28.73	54.53
13.2	57.18	16.38	13.3	19.41	49.99	13.3	56.88	44.32	13.3	31.73	7.12	13.3	28.57	54.74
14.2	56.99	16.41	14.3	18.75	49.98	14.3	56.71	44.50	14.3	31.54	7.16	14.3	28.40	54.96
15.2	56.80	16.44	15.3	18.13	49.94	15.3	56.53	44.68	15.3	31.36	7.19	15.3	28.22	55.18
16.2	56.57	16.45	16.3	17.52	49.92	16.3	56.33	44.85	16.3	31.18	7.22	16.3	28.02	55.41
17.2	56.34	16.47	17.3	16.95	49.89	17.3	56.11	45.02	17.3	31.02	7.23	17.3	27.80	55.63
18.2	56.12	16.46	18.3	16.39	49.87	18.3	55.89	45.17	18.3	30.85	7.26	18.3	27.58	55.84
19.2	55.90	16.42	19.3	15.83	49.86	19.3	55.66	45.30	19.3	30.68	7.29	19.3	27.34	56.03
20.2	55.68	16.37	20.3	15.25	49.85	20.3	55.44	45.40	20.3	30.52	7.34	20.3	27.10	56.19
21.2	55.48	16.31	21.3	14.64	49.85	21.3	55.23	45.49	21.3	30.34	7.40	21.3	26.86	56.33
22.2	55.27	16.25	22.3	13.99	49.84	22.3	55.03	45.57	22.3	30.14	7.45	22.3	26.64	56.47
23.2	55.09	16.20	23.3	13.30	49.80	23.3	54.83	45.65	23.3	29.94	7.49	23.3	26.44	56.60
24.2	54.91	16.16	24.3	12.60	49.76	24.3	54.65	45.74	24.3	29.73	7.49	24.3	26.26	56.74
25.2	54.74	16.13	25.3	11.90	49.68	25.3	54.47	45.84	25.3	29.52	7.49	25.3	26.07	56.89
26.2	54.57	16.12	26.2	11.22	49.60	26.3	54.29	45.95	26.3	29.32	7.45	26.3	25.89	57.05
27.2	54.38	16.09	27.2	10.57	49.49	27.3	54.10	46.08	27.3	29.12	7.41	27.3	25.70	57.22
28.2	54.18	16.06	28.2	9.95	49.38	28.3	53.90	46.20	28.3	28.94	7.35	28.3	25.48	57.39
29.2	53.97	16.01	29.2	9.38	49.27	29.3	53.67	46.31	29.3	28.76	7.29	29.3	25.25	57.56
30.2	53.76	15.93	30.2	8.82	49.17	30.3	53.45	46.40	30.3	28.60	7.25	30.3	25.01	57.71
31.2	53.55	15.85	31.2	8.27	49.07	31.3	53.22	46.47	31.3	28.43	7.21	31.3	24.76	57.84
32.2	53.34	15.75	32.2	7.71	48.99	32.3	52.99	46.53	32.3	28.26	7.18	32.3	24.49	57.94
9.88	−9.82		30.65	+30.64		10.85	−10.80		9.31	+9.26		12.47	−12.43	
10^h	59^m	$53^s.036$	12^h	14^m	$30^s.802$	12^h	46^m	$43^s.161$	12^h	48^m	$33^s.111$	13^h	28^m	$9^s.628$
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
June	14 14	−83 19	June	15 1	+87 31	June	15 25	−84 12	June	16 53	+82 10	June	17 17	−80 47
1.4	40.21	14.37	1.4	57.60	57.90	1.4	37.83	49.32	1.5	54.64	5.10	1.5	14.65	19.32
2.4	40.13	14.69	2.4	57.34	58.13	2.4	37.82	49.68	2.5	54.63	5.39	2.5	14.71	19.64
3.4	40.04	14.99	3.4	57.10	58.36	3.4	37.78	50.02	3.5	54.62	5.68	3.5	14.77	19.96
4.4	39.94	15.28	4.4	56.86	58.59	4.4	37.73	50.35	4.5	54.61	5.97	4.5	14.82	20.28
5.4	39.84	15.56	5.4	56.62	58.84	5.4	37.68	50.66	5.5	54.60	6.28	5.5	14.86	20.59
6.4	39.74	15.80	6.4	56.35	59.10	6.4	37.62	50.96	6.5	54.60	6.60	6.5	14.88	20.89
7.4	39.64	16.04	7.4	56.08	59.36	7.4	37.56	51.25	7.5	54.59	6.93	7.5	14.91	21.18
8.4	39.54	16.28	8.4	55.79	59.63	8.4	37.50	51.53	8.5	54.58	7.26	8.5	14.94	21.47
9.4	39.45	16.51	9.4	55.48	59.89	9.4	37.45	51.80	9.5	54.54	7.59	9.5	14.97	21.74
10.4	39.36	16.75	10.4	55.15	60.15	10.4	37.40	52.07	10.5	54.51	7.94	10.5	15.00	22.01
11.4	39.27	16.99	11.4	54.79	60.40	11.4	37.36	52.35	11.5	54.47	8.28	11.5	15.04	22.27
12.4	39.18	17.23	12.4	54.42	60.63	12.4	37.32	52.63	12.5	54.43	8.61	12.5	15.08	22.55
13.4	39.10	17.48	13.4	54.04	60.84	13.4	37.28	52.93	13.5	54.38	8.94	13.5	15.12	22.82
14.4	39.02	17.73	14.4	53.66	61.06	14.4	37.24	53.22	14.5	54.33	9.26	14.5	15.16	23.11
15.4	38.92	18.00	15.4	53.27	61.25	15.4	37.20	53.54	15.5	54.27	9.55	15.5	15.20	23.42
16.4	38.82	18.27	16.4	52.90	61.43	16.4	37.14	53.86	16.5	54.22	9.83	16.5	15.25	23.73
17.4	38.71	18.52	17.4	52.55	61.60	17.4	37.06	54.17	17.5	54.17	10.10	17.5	15.28	24.06
18.4	38.58	18.77	18.4	52.21	61.77	18.4	36.98	54.46	18.5	54.12	10.37	18.5	15.29	24.40
19.4	38.45	19.00	19.4	51.88	61.95	19.4	36.88	54.76	19.5	54.07	10.64	19.5	15.30	24.72
20.3	38.31	19.20	20.4	51.54	62.14	20.4	36.77	55.05	20.5	54.03	10.93	20.5	15.30	25.04
21.3	38.17	19.40	21.4	51.17	62.34	21.4	36.66	55.30	21.5	53.98	11.24	21.5	15.29	25.32
22.3	38.04	19.58	22.4	50.79	62.55	22.4	36.55	55.54	22.5	53.93	11.55	22.5	15.29	25.60
23.3	37.93	19.76	23.4	50.38	62.76	23.4	36.46	55.77	23.4	53.86	11.87	23.5	15.29	25.87
24.3	37.82	19.94	24.4	49.94	62.96	24.4	36.38	56.01	24.4	53.78	12.19	24.5	15.30	26.13
25.3	37.71	20.13	25.4	49.48	63.15	25.4	36.32	56.25	25.4	53.70	12.51	25.5	15.31	26.39
26.3	37.61	20.33	26.4	49.00	63.30	26.4	36.25	56.52	26.4	53.61	12.80	26.5	15.34	26.66
27.3	37.50	20.56	27.4	48.52	63.44	27.4	36.17	56.79	27.4	53.52	13.09	27.5	15.36	26.94
28.3	37.39	20.76	28.4	48.06	63.55	28.4	36.09	57.07	28.4	53.44	13.35	28.5	15.37	27.25
29.3	37.26	20.97	29.4	47.63	63.66	29.4	35.99	57.36	29.4	53.35	13.59	29.4	15.38	27.56
30.3	37.12	21.18	30.4	47.20	63.79	30.4	35.88	57.63	30.4	53.27	13.83	30.4	15.38	27.88
31.3	36.97	21.37	31.4	46.79	63.91	31.4	35.75	57.88	31.4	53.18	14.07	31.4	15.37	28.20
32.3	36.81	21.53	32.3	46.38	64.04	32.4	35.62	58.13	32.4	53.10	14.32	32.4	15.34	28.52
8.60		−8.54	23.24		+23.22	9.92		−9.87	7.34		+7.27	6.25		−6.17
14^h	14^m	$23^s.592$	15^h	1^m	$45^s.970$	15^h	25^m	$17^s.036$	16^h	53^m	$48^s.037$	17^h	17^m	$1^s.936$
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	17 57	+86 36	June	18 10	−87 39	June	18 56	+89 1	June	19 38	−89 12	June	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
1.6	19.82	53.76	1.6	28.08	31.72	1.6	16.44	32.91	1.6	24.71	16.48	1.7	22.20	44.34
2.5	19.85	54.05	2.6	28.42	32.01	2.6	16.83	33.18	2.6	26.19	16.69	2.7	22.31	44.54
3.5	19.90	54.34	3.6	28.72	32.33	3.6	17.25	33.45	3.6	27.57	16.91	3.7	22.42	44.73
4.5	19.96	54.62	4.6	29.00	32.64	4.6	17.71	33.71	4.6	28.87	17.14	4.7	22.55	44.92
5.5	20.02	54.92	5.6	29.25	32.93	5.6	18.18	33.97	5.6	30.07	17.36	5.7	22.67	45.11
6.5	20.09	55.21	6.5	29.48	33.23	6.6	18.68	34.24	6.6	31.22	17.58	6.7	22.79	45.31
7.5	20.15	55.53	7.5	29.68	33.53	7.6	19.18	34.53	7.6	32.31	17.81	7.7	22.92	45.53
8.5	20.20	55.86	8.5	29.89	33.80	8.6	19.66	34.84	8.6	33.37	18.02	8.7	23.05	45.76
9.5	20.24	56.20	9.5	30.09	34.07	9.6	20.10	35.15	9.6	34.43	18.22	9.7	23.18	46.00
10.5	20.26	56.54	10.5	30.30	34.34	10.6	20.50	35.47	10.6	35.50	18.42	10.6	23.31	46.24
11.5	20.27	56.89	11.5	30.53	34.60	11.6	20.84	35.81	11.6	36.58	18.62	11.6	23.43	46.51
12.5	20.27	57.24	12.5	30.77	34.86	12.6	21.10	36.14	12.6	37.70	18.82	12.6	23.54	46.78
13.5	20.23	57.57	13.5	31.01	35.14	13.6	21.32	36.47	13.6	38.86	19.03	13.6	23.65	47.06
14.5	20.19	57.90	14.5	31.26	35.43	14.6	21.47	36.80	14.6	40.04	19.25	14.6	23.76	47.35
15.5	20.14	58.22	15.5	31.51	35.74	15.6	21.56	37.10	15.6	41.25	19.48	15.6	23.85	47.64
16.5	20.09	58.52	16.5	31.74	36.06	16.6	21.61	37.39	16.6	42.44	19.72	16.6	23.94	47.92
17.5	20.04	58.81	17.5	31.96	36.39	17.6	21.72	37.69	17.6	43.61	19.99	17.6	24.03	48.17
18.5	19.99	59.09	18.5	32.14	36.72	18.5	21.82	37.97	18.6	44.69	20.27	18.6	24.12	48.41
19.5	19.95	59.38	19.5	32.28	37.05	19.5	21.96	38.25	19.6	45.67	20.55	19.6	24.20	48.66
20.5	19.92	59.67	20.5	32.39	37.38	20.5	22.14	38.53	20.6	46.55	20.83	20.6	24.29	48.91
21.5	19.89	59.99	21.5	32.47	37.70	21.5	22.33	38.85	21.6	47.35	21.11	21.6	24.38	49.18
22.5	19.85	60.32	22.5	32.56	37.98	22.5	22.50	39.18	22.6	48.10	21.35	22.6	24.48	49.46
23.5	19.80	60.66	23.5	32.65	38.26	23.5	22.63	39.52	23.6	48.86	21.60	23.6	24.58	49.78
24.5	19.71	61.03	24.5	32.77	38.52	24.5	22.68	39.88	24.6	49.65	21.83	24.6	24.69	50.09
25.5	19.62	61.37	25.5	32.90	38.80	25.5	22.64	40.24	25.6	50.51	22.06	25.6	24.78	50.43
26.5	19.49	61.70	26.5	33.05	39.08	26.5	22.51	40.58	26.6	51.42	22.29	26.6	24.85	50.77
27.5	19.35	62.02	27.5	33.21	39.39	27.5	22.32	40.92	27.6	52.39	22.53	27.6	24.91	51.11
28.5	19.20	62.32	28.5	33.36	39.70	28.5	22.09	41.24	28.5	53.35	22.80	28.6	24.98	51.44
29.5	19.06	62.61	29.5	33.47	40.03	29.5	21.86	41.55	29.5	54.26	23.09	29.6	25.04	51.76
30.5	18.93	62.89	30.5	33.56	40.37	30.5	21.67	41.84	30.5	55.10	23.40	30.6	25.10	52.05
31.5	18.82	63.16	31.5	33.60	40.71	31.5	21.51	42.14	31.5	55.84	23.71	31.6	25.16	52.33
32.5	18.71	63.44	32.5	33.61	41.05	32.5	21.37	42.43	32.5	56.47	24.02	32.6	25.21	52.62
16.94		+16.91	24.49		−24.47	58.88		+58.87	72.11		−72.10	7.41		+7.34
$17^h\ 57^m\ 4^s.326$			$18^h\ 9^m\ 46^s.186$			$18^h\ 55^m\ 23^s.393$			$19^h\ 37^m\ 1^s.735$			$20^h\ 48^m\ 15^s.385$		
+86° 36′ 50″.43			−87° 39′ 48″.39			+89° 1′ 32″.83			−89° 12′ 41″.41			+82° 14′ 50″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	21 39	−83 3	June	22 17	−86 21	June	22 38	−81 46	June	23 27	+86 52	June	23 47	−82 26
	s	″		s	″		s	″		s	″		s	″
1.7	18.59	59.25	1.7	19.88	8.56	1.7	15.14	40.62	1.8	49.69	45.74	1.8	31.84	22.30
2.7	18.81	59.26	2.7	20.28	8.51	2.7	15.32	40.53	2.8	50.05	45.75	2.8	32.02	22.11
3.7	19.02	59.29	3.7	20.66	8.49	3.7	15.50	40.47	3.8	50.40	45.76	3.8	32.20	21.93
4.7	19.22	59.33	4.7	21.04	8.48	4.7	15.67	40.42	4.8	50.75	45.75	4.8	32.37	21.79
5.7	19.41	59.39	5.7	21.40	8.49	5.7	15.82	40.39	5.8	51.11	45.74	5.8	32.54	21.67
6.7	19.59	59.45	6.7	21.74	8.50	6.7	15.98	40.36	6.8	51.49	45.73	6.8	32.69	21.55
7.7	19.76	59.51	7.7	22.07	8.52	7.7	16.14	40.34	7.8	51.88	45.73	7.8	32.85	21.44
8.7	19.93	59.57	8.7	22.41	8.53	8.7	16.29	40.31	8.8	52.29	45.75	8.8	33.00	21.33
9.7	20.10	59.63	9.7	22.73	8.54	9.7	16.43	40.28	9.8	52.71	45.78	9.8	33.16	21.22
10.7	20.27	59.68	10.7	23.05	8.56	10.7	16.57	40.25	10.8	53.13	45.82	10.8	33.30	21.10
11.7	20.44	59.74	11.7	23.37	8.57	11.7	16.73	40.22	11.8	53.54	45.86	11.8	33.46	20.98
12.7	20.62	59.78	12.7	23.70	8.58	12.7	16.88	40.19	12.7	53.96	45.94	12.8	33.62	20.85
13.7	20.80	59.82	13.7	24.04	8.57	13.7	17.04	40.15	13.7	54.37	46.03	13.8	33.77	20.72
14.7	20.99	59.86	14.7	24.41	8.57	14.7	17.21	40.12	14.7	54.76	46.13	14.8	33.95	20.59
15.7	21.18	59.92	15.7	24.77	8.58	15.7	17.38	40.08	15.7	55.13	46.22	15.8	34.13	20.46
16.7	21.38	60.00	16.7	25.15	8.61	16.7	17.56	40.07	16.7	55.50	46.31	16.8	34.31	20.35
17.7	21.58	60.08	17.7	25.53	8.65	17.7	17.74	40.06	17.7	55.83	46.41	17.7	34.50	20.24
18.7	21.78	60.20	18.7	25.90	8.71	18.7	17.91	40.09	18.7	56.17	46.50	18.7	34.69	20.15
19.7	21.97	60.33	19.7	26.26	8.80	19.7	18.08	40.13	19.7	56.51	46.58	19.7	34.87	20.10
20.7	22.15	60.46	20.7	26.60	8.89	20.7	18.24	40.18	20.7	56.88	46.66	20.7	35.04	20.05
21.7	22.29	60.59	21.7	26.93	8.98	21.7	18.39	40.24	21.7	57.24	46.74	21.7	35.21	20.01
22.7	22.44	60.72	22.7	27.23	9.07	22.7	18.52	40.29	22.7	57.62	46.83	22.7	35.36	19.98
23.6	22.59	60.83	23.7	27.52	9.16	23.7	18.66	40.34	23.7	58.03	46.94	23.7	35.51	19.93
24.6	22.74	60.94	24.7	27.81	9.22	24.7	18.81	40.36	24.7	58.45	47.09	24.7	35.66	19.88
25.6	22.90	61.03	25.7	28.13	9.28	25.7	18.95	40.37	25.7	58.87	47.25	25.7	35.83	19.81
26.6	23.08	61.12	26.7	28.46	9.33	26.7	19.10	40.38	26.7	59.26	47.43	26.7	36.00	19.73
27.6	23.25	61.22	27.7	28.79	9.40	27.7	19.27	40.42	27.7	59.63	47.61	27.7	36.17	19.65
28.6	23.43	61.34	28.7	29.15	9.47	28.7	19.44	40.45	28.7	59.97	47.80	28.7	36.35	19.59
29.6	23.62	61.48	29.7	29.51	9.57	29.7	19.61	40.50	29.7	60.30	47.97	29.7	36.53	19.55
30.6	23.80	61.65	30.7	29.85	9.69	30.7	19.78	40.56	30.7	60.62	48.12	30.7	36.72	19.53
31.6	23.96	61.82	31.7	30.19	9.83	31.7	19.93	40.65	31.7	60.93	48.27	31.7	36.91	19.52
32.6	24.11	62.00	32.6	30.52	9.97	32.7	20.08	40.77	32.7	61.25	48.42	32.7	37.09	19.52
8.28		−8.22	15.72		−15.69	6.99		−6.92	18.37		+18.34	7.60		−7.53
21h	39m	16s.433	22h	17m	21s.969	22h	38m	16s.769	23h	27m	42s.388	23h	47m	38s.028
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

152737°—1923——18

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	0 58	+85 50	July	1 33	+88 53	July	1 41	−85 9	July	4 11	+85 20	July	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.8	4.98	27.31	0.8	35.89	18.56	0.8	26.88	9.69	0.9	45.74	49.46	0.9	58.37	29.36
1.8	5.25	27.35	1.8	36.89	18.56	1.8	27.13	9.53	1.9	45.93	49.29	1.9	58.48	29.12
2.8	5.52	27.39	2.8	37.90	18.54	2.8	27.38	9.38	2.9	46.11	49.10	2.9	58.59	28.87
3.8	5.81	27.43	3.8	38.93	18.51	3.8	27.64	9.26	3.9	46.30	48.91	3.9	58.69	28.61
4.8	6.10	27.46	4.8	40.00	18.50	4.8	27.89	9.16	4.9	46.49	48.72	4.9	58.80	28.34
5.8	6.39	27.50	5.8	41.12	18.48	5.8	28.13	9.06	5.9	46.69	48.51	5.9	58.92	28.07
6.7	6.71	27.54	6.8	42.27	18.47	6.8	28.36	8.96	6.9	46.90	48.30	6.9	59.05	27.78
7.7	7.03	27.60	7.8	43.45	18.47	7.8	28.59	8.87	7.9	47.13	48.09	7.9	59.19	27.49
8.7	7.35	27.68	8.8	44.66	18.48	8.8	28.81	8.77	8.9	47.36	47.88	8.9	59.33	27.20
9.7	7.67	27.76	9.8	45.87	18.51	9.8	29.03	8.66	9.9	47.60	47.69	9.9	59.51	26.91
10.7	8.00	27.86	10.8	47.09	18.55	10.8	29.25	8.55	10.9	47.86	47.50	10.9	59.69	26.63
11.7	8.32	27.99	11.8	48.30	18.61	11.8	29.49	8.43	11.9	48.13	47.35	11.9	59.87	26.39
12.7	8.63	28.13	12.8	49.47	18.70	12.8	29.72	8.30	12.9	48.40	47.21	12.9	60.07	26.14
13.7	8.92	28.27	13.8	50.59	18.78	13.8	29.98	8.18	13.9	48.65	47.08	13.9	60.26	25.91
14.7	9.19	28.41	14.8	51.66	18.87	14.8	30.25	8.07	14.9	48.90	46.96	14.9	60.46	25.69
15.7	9.46	28.55	15.7	52.68	18.96	15.8	30.52	7.97	15.9	49.14	46.85	15.9	60.64	25.49
16.7	9.73	28.69	16.7	53.68	19.04	16.7	30.80	7.90	16.9	49.37	46.73	16.9	60.81	25.28
17.7	9.99	28.82	17.7	54.69	19.10	17.7	31.07	7.84	17.9	49.60	46.60	17.9	60.96	25.06
18.7	10.26	28.92	18.7	55.74	19.15	18.7	31.34	7.81	18.8	49.83	46.45	18.9	61.12	24.84
19.7	10.55	29.02	19.7	56.86	19.21	19.7	31.58	7.78	19.8	50.07	46.30	19.9	61.29	24.60
20.7	10.86	29.15	20.7	58.05	19.27	20.7	31.81	7.77	20.8	50.33	46.14	20.9	61.46	24.34
21.7	11.18	29.28	21.7	59.29	19.36	21.7	32.04	7.75	21.8	50.60	45.98	21.9	61.66	24.09
22.7	11.50	29.45	22.7	60.54	19.45	22.7	32.26	7.72	22.8	50.89	45.83	22.9	61.89	23.84
23.7	11.83	29.63	23.7	61.77	19.58	23.7	32.49	7.68	23.8	51.19	45.72	23.9	62.13	23.59
24.7	12.13	29.83	24.7	62.97	19.72	24.7	32.72	7.63	24.8	51.49	45.62	24.9	62.38	23.38
25.7	12.42	30.05	25.7	64.11	19.88	25.7	32.99	7.57	25.8	51.79	45.55	25.9	62.62	23.18
26.7	12.69	30.26	26.7	65.19	20.04	26.7	33.25	7.52	26.8	52.08	45.49	26.9	62.85	22.99
27.7	12.94	30.46	27.7	66.21	20.20	27.7	33.53	7.49	27.8	52.37	45.44	27.9	63.08	22.82
28.7	13.19	30.66	28.7	67.20	20.36	28.7	33.81	7.48	28.8	52.64	45.38	28.9	63.30	22.65
29.7	13.44	30.84	29.7	68.18	20.50	29.7	34.08	7.49	29.8	52.88	45.32	29.9	63.51	22.48
30.7	13.69	31.02	30.7	69.17	20.62	30.7	34.35	7.52	30.8	53.13	45.23	30.9	63.71	22.31
31.7	13.94	31.20	31.7	70.19	20.75	31.7	34.60	7.55	31.8	53.39	45.15	31.9	63.91	22.12
13.79		+13.75	51.56		+51.55	11.83		−11.79	12.33		+12.29	11.85		+11.80
0h 57m 55s.489			1h 33m 11s.898			1h 41m 39s.995			4h 11m 48s.583			5h 37m 5s.478		
+85° 50′ 41″.77			+88° 53′ 34″.33			−85° 9′ 32″.70			+85° 21′ 5″.69			+85° 9′ 42″.71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
July	h m s 5 44	° ′ ″ −84 49	July	h m s 6 46	° ′ ″ −80 44	July	h m s 7 4	° ′ ″ +87 10	July	h m s 7 13	° ′ ″ −86 54	July	h m s 7 14	° ′ ″ +82 33
0.9	44.59	43.41	1.0	19.13	13.95	1.0	39.72	13.09	1.0	48.49	60.73	1.0	52.50	43.72
1.9	44.62	43.07	2.0	19.11	13.60	2.0	39.77	12.81	2.0	48.38	60.40	2.0	52.52	43.45
2.9	44.65	42.72	3.0	19.09	13.24	3.0	39.80	12.52	3.0	48.27	60.07	3.0	52.53	43.18
3.9	44.70	42.38	3.9	19.07	12.90	4.0	39.83	12.23	4.0	48.19	59.74	4.0	52.53	42.89
4.9	44.75	42.04	4.9	19.07	12.58	5.0	39.85	11.91	5.0	48.11	59.42	5.0	52.54	42.60
5.9	44.80	41.73	5.9	19.07	12.25	6.0	39.88	11.59	6.0	48.05	59.11	6.0	52.55	42 29
6.9	44.85	41.44	6.9	19.07	11.93	7.0	39.93	11.27	7.0	47.99	58.82	7.0	52.56	41.98
7.9	44.91	41.15	7.9	19.07	11.62	8.0	40.01	10.95	8.0	47.94	58.53	8.0	52.58	41.65
8.9	44.96	40.86	8.9	19.07	11.33	8.9	40.09	10.62	9.0	47.88	58.25	9.0	52.62	41.32
9.9	45.01	40.56	9.9	19.07	11.03	9.9	40.19	10.28	10.0	47.80	57.96	10.0	52.66	40.99
10.9	45.05	40.27	10.9	19.07	10.72	10.9	40.33	9.95	10.9	47.72	57.66	11.0	52.71	40.66
11.9	45.10	39.95	11.9	19.06	10.41	11.9	40.49	9.61	11.9	47.65	57.38	11.9	52.77	40.35
12.9	45.14	39.63	12.9	19.06	10.08	12.9	40.67	9 29	12.9	47.57	57.06	12.9	52 84	40.04
13.9	45.19	39.30	13.9	19.06	9.74	13.9	40.86	9.00	13.9	47.51	56.73	13.9	52.91	39.75
14.9	45.25	38.96	14.9	19.06	9.38	14.9	41.04	8.71	14.9	47.45	56.39	14.9	52.98	39.47
15.9	45.34	38.62	15.9	19.07	9.02	15.9	41.21	8.43	15.9	47.40	56.04	15.9	53.05	39.20
16.9	45.43	38.28	16.9	19.08	8.66	16.9	41.36	8.16	16.9	47 39	55.69	16.9	53.10	38.94
17.9	45.52	37.95	17.9	19.12	8.30	17.9	41.49	7.89	17.9	47.39	55.35	17.9	53.15	38.67
18.9	45.63	37.65	18.9	19.15	7.96	18.9	41.61	7.60	18.9	47.42	55.01	18.9	53.19	38.39
19.9	45.74	37.36	19.9	19.18	7.64	19.9	41.74	7.29	19.9	47.46	54.70	19.9	53.24	38.08
20.9	45.85	37.10	20.9	19.22	7.33	20.9	41.89	6.96	20.9	47.50	54.41	20.9	53.29	37.76
21.9	45.95	36.84	21.9	19.25	7.06	21.9	42.07	6.62	21.9	47.53	54.13	21.9	53.35	37.44
22.9	46.04	36.58	22.9	19.28	6.78	22.9	42.29	6.28	22.9	47.54	53.84	22.9	53.41	37.11
23.9	46.13	36.31	23.9	19.29	6.49	23.9	42.53	5.94	23.9	47.55	53.56	23.9	53.53	36.77
24.9	46.22	36.03	24.9	19.31	6.18	24.9	42.80	5.62	24.9	47.56	53.27	24.9	53.63	36.47
25.9	46.31	35.75	25.9	19.34	5.86	25.9	43.08	5.34	25.9	47.56	52.96	25.9	53.74	36.18
26.9	46.41	35.44	26.9	19.37	5.52	26.9	43.36	5.06	26.9	47.57	52.64	26.9	53.85	35.90
27.9	46.54	35.12	27.9	19.41	5.19	27.9	43.61	4.79	27.9	47.61	52.31	27.9	53.95	35.63
28.9	46.67	34.82	28.9	19.45	4.86	28.9	43.86	4.53	28.9	47.67	51.97	28.9	54.04	35.37
29.9	46.81	34.53	29.9	19.50	4.52	29.9	44.10	4.27	29.9	47.76	51.63	29.9	54.13	35.12
30.9	46.95	34.24	30.9	19.55	4.18	30.9	44.32	4.00	30.9	47.86	51.29	30.9	54.21	34.87
31.9	47.11	33.99	31.9	19.61	3.87	31.9	44.54	3.74	31.9	47.99	50.96	31.9	54.29	34.60
11.09	−11.05		6.21	−6.13		20.25	+20.22		18.58	−18.56		7.72	+7.66	
5^h	45^{m1}	$4^s.700$	6^h	46^m	$28^s.850$	7^h	4^m	$58^s.549$	7^h	14^m	$18^s.185$	7^h	14^m	$59^s.083$
−84°	49′	38″.84	−80°	44′	2″.02	+87°	10′	21″.62	−86°	54′	45″.50	+82°	33′	51″.51

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5 4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
July	8 20	+88 51	July	9 7	−85 21	July	9 26	+81 39	July	9 36	−80 36	July	10 21	+82 57
1.1	46.64	48.74	1.1	57.82	50.56	1.1	7.72	68.90	1.1	8.92	10.67	1.2	42.56	10.47
2.1	46.41	48.46	2.1	57.62	50.32	2.1	7.67	68.67	2.1	8.81	10.45	2.2	42.46	10.28
3.1	46.15	48.18	3.1	57.44	50.06	3.1	7.61	68.44	3.1	8.72	10.22	3.2	42.35	10.10
4.1	45.88	47.90	4.1	57.26	49.80	4.1	7.54	68.21	4.1	8.63	9.99	4.1	42.22	9.91
5.1	45.59	47.59	5.1	57.11	49.54	5.1	7.46	67.96	5.1	8.53	9.75	5.1	42.10	9.70
6.1	45.30	47.27	6.1	56.96	49.30	6.1	7.38	67.71	6.1	8.44	9.51	6.1	41.98	9.49
7.1	45.03	46.94	7.1	56.81	49.06	7.1	7.31	67.44	7.1	8.36	9.28	7.1	41.86	9.27
8.1	44.80	46.61	8.1	56.66	48.82	8.1	7.25	67.15	8.1	8.28	9.06	8.1	41.74	9.03
9.0	44.62	46.27	9.1	56.52	48.59	9.1	7.19	66.85	9.1	8.21	8.87	9.1	41.63	8.76
10.0	44.51	45.92	10.1	56.37	48.36	10.1	7.14	66.55	10.1	8.14	8.66	10.1	41.53	8.48
11.0	44.44	45.56	11.1	56.23	48.11	11.1	7.09	66.24	11.1	8.06	8.45	11.1	41.44	8.21
12.0	44.43	45.23	12.1	56.06	47.91	12.1	7.06	65.93	12.1	7.98	8.23	12.1	41.36	7.94
13.0	44.48	44.89	13.1	55.89	47.67	13.1	7.03	65.62	13.1	7.89	8.01	13.1	41.28	7.65
14.0	44.58	44.56	14.1	55.73	47.41	14.1	7.01	65.32	14.1	7.80	7.78	14.1	41.22	7.37
15.0	44.67	44.25	15.1	55.58	47.13	15.1	6.99	65.03	15.1	7.72	7.51	15.1	41.15	7.10
16.0	44.74	43.95	16.1	55.43	46.84	16.1	6.96	64.75	16.1	7.64	7.24	16.1	41.09	6.86
17.0	44.79	43.65	17.1	55.28	46.54	17.1	6.93	64.48	17.1	7.56	6.95	17.1	41.01	6.62
18.0	44.79	43.35	18.1	55.15	46.23	18.1	6.90	64.21	18.1	7.49	6.66	18.1	40.93	6.37
19.0	44.74	43.04	19.1	55.05	45.92	19.1	6.86	63.94	19.1	7.43	6.37	19.1	40.84	6.12
20.0	44.69	42.72	20.1	54.95	45.64	20.1	6.81	63.64	20.1	7.37	6.08	20.1	40.75	5.85
21.0	44.67	42.37	21.1	54.87	45.37	21.1	6.77	63.33	21.1	7.31	5.81	21.1	40.66	5.57
22.0	44.70	42.01	22.0	54.79	45.12	22.1	6.74	63.00	22.1	7.26	5.57	22.1	40.57	5.26
23.0	44.83	41.63	23.0	54.70	44.87	23.1	6.72	62.65	23.1	7.21	5.34	23.1	40.50	4.94
24.0	45.04	41.26	24.0	54.60	44.61	24.1	6.71	62.29	24.1	7.15	5.10	24.1	40.44	4.60
25.0	45.31	40.89	25.0	54.49	44.34	25.1	6.71	61.93	25.1	7.09	4.86	25.1	40.39	4.26
26.0	45.62	40.56	26.0	54.37	44.07	26.1	6.72	61.59	26.1	7.04	4.59	26.1	40.35	3.93
27.0	45.93	40.22	27.0	54.26	43.77	27.0	6.73	61.27	27.1	6.98	4.32	27.1	40.31	3.62
27.9	46.25	39.91	28.0	54.16	43.45	28.0	6.73	60.96	28.1	6.92	4.02	28.1	40.27	3.33
28.9	46.53	39.60	29.0	54.06	43.13	29.0	6.73	60.68	29.0	6.86	3.70	29.1	40.23	3.04
29.9	46.77	39.30	30.0	53.98	42.80	30.0	6.72	60.39	30.0	6.80	3.38	30.1	40.19	2.76
30.9	46.99	38.99	31.0	53.92	42.47	31.0	6.72	60.09	31.0	6.75	3.04	31.1	40.14	2.47
31.9	47.18	38.68	32.0	53.86	42.14	32.0	6.71	59.78	32.0	6.71	2.71	32.1	40.09	2.18
50.36	+50.35		12.37	−12.33		6.90	+6.83		6.12	−6.04		8.15	+8.09	
$8^h\ 21^m\ 41^s.998$			$9^h\ 8^m\ 8^s.703$			$9^h\ 26^m\ 14^s.295$			$9^h\ 36^m\ 12^s.346$			$10^h\ 21^m\ 50^s.081$		
+88° 51′ 51″.95			−85° 21′ 25″.35			+81° 40′ 7″.28			−80° 35′ 44″.11			+82° 57′ 4″.81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	10 59	−84 11	July	12 13	+88 7	July	12 46	−84 42	July	12 48	+83 50	July	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
1.2	53.55	15.85	1.2	68.27	49.07	1.3	53.22	46.47	1.3	28.43	7.21	1.3	24.76	57.84
2.2	53.34	15.75	2.2	67.71	48.99	2.3	52.99	46.53	2.3	28.26	7.18	2.3	24.49	57.94
3.2	53.13	15.62	3.2	67.14	48.93	3.3	52.76	46.56	3.3	28.08	7.15	3.3	24.24	58.04
4.2	52.94	15.49	4.2	66.54	48.85	4.2	52.53	46.57	4.2	27.90	7.12	4.3	23.99	58.12
5.2	52.75	15.36	5.2	65.93	48.77	5.2	52.30	46.58	5.2	27.71	7.09	5.3	23.74	58.19
6.2	52.57	15.22	6.2	65.28	48.68	6.2	52.10	46.59	6.2	27.51	7.06	6.3	23.50	58.25
7.2	52.39	15.09	7.2	64.64	48.59	7.2	51.89	46.59	7.2	27.32	7.03	7.3	23.26	58.31
8.2	52.22	14.98	8.2	63.99	48.46	8.2	51.69	46.60	8.2	27.11	6.98	8.3	23.03	58.36
9.2	52.06	14.87	9.2	63.33	48.32	9.2	51.49	46.61	9.2	26.91	6.90	9.3	22.81	58.42
10.2	51.89	14.75	10.2	62.69	48.18	10.2	51.29	46.63	10.2	26.71	6.81	10.3	22.60	58.50
11.2	51.72	14.64	11.2	62.07	48.00	11.2	51.09	46.66	11.2	26.52	6.70	11.3	22.38	58.58
12.2	51.54	14.53	12.2	61.46	47.82	12.2	50.88	46.69	12.2	26.33	6.58	12.3	22.16	58.66
13.2	51.36	14.40	13.2	60.90	47.63	13.2	50.68	46.72	13.2	26.15	6.45	13.3	21.92	58.75
14.1	51.18	14.27	14.2	60.37	47.44	14.2	50.15	46.73	14.2	25.98	6.32	14.2	21.66	58.83
15.1	50.99	14.12	15.2	59.87	47.27	15.2	50.21	46.74	15.2	25.83	6.19	15.2	21.39	58.89
16.1	50.80	13.94	16.2	59.37	47.10	16.2	49.98	46.72	16.2	25.68	6.08	16.2	21.12	58.94
17.1	50.61	13.76	17.2	58.86	46.95	17.2	49.73	46.68	17.2	25.51	5.97	17.2	20.84	58.95
18.1	50.42	13.56	18.2	58.35	46.80	18.2	49.50	46.63	18.2	25.34	5.86	18.2	20.57	58.96
19.1	50.26	13.36	19.2	57.79	46.66	19.2	49.27	46.56	19.2	25.16	5.76	19.2	20.30	58.95
20.1	50.11	13.16	20.2	57.19	46.49	20.2	49.07	46.48	20.2	24.97	5.65	20.2	20.06	58.93
21.1	49.97	12.97	21.2	56.57	46.31	21.2	48.87	46.41	21.2	24.76	5.53	21.2	19.83	58.92
22.1	49.84	12.79	22.2	55.95	46.11	22.2	48.69	46.35	22.2	24.57	5.39	22.2	19.61	58.91
23.1	49.70	12.62	23.2	55.34	45.88	23.2	48.50	46.30	23.2	24.37	5.22	23.2	19.39	58.91
24.1	49.55	12.47	24.2	54.78	45.64	24.2	48.32	46.27	24.2	24.19	5.04	24.2	19.17	58.91
25.1	49.41	12.30	25.2	54.25	45.39	25.2	48.12	46.24	25.2	24.01	4.84	25.2	18.94	58.93
26.1	49.24	12.12	26.2	53.76	45.14	26.2	47.90	46.19	26.2	23.86	4.63	26.2	18.70	58.95
27.1	49.07	11.93	27.2	53.29	44.89	27.2	47.68	46.14	27.2	23.71	4.43	27.2	18.46	58.96
28.1	48.92	11.71	28.2	52.86	44.65	28.2	47.45	46.06	28.2	23.56	4.23	28.2	18.18	58.94
29.1	48.76	11.48	29.2	52.41	44.43	29.2	47.22	45.97	29.2	23.41	4.05	29.2	17.90	58.90
30.1	48.61	11.23	30.2	51.96	44.22	30.2	46.98	45.84	30.2	23.25	3.88	30.2	17.62	58.85
31.1	48.46	10.96	31.2	51.50	44.00	31.2	46.76	45.72	31.2	23.10	3.71	31.2	17.35	58.78
32.1	48.32	10.71	32.1	51.02	43.79	32.2	46.55	45.58	32.2	22.92	3.55	32.2	17.08	58.70
9.87		−9.82	30.64		+30.63	10.85		−10.81	9.31		+9.26	12.47		−12.43
10^h	59^m	$53^s.036$	12^h	14^m	$30^s.802$	12^h	46^m	$43^s.161$	12^h	48^m	$33^s.111$	13^h	28^m	$9^s.628$
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
July	14 14	−83 19	July	15 1	+87 32	July	15 25	−84 12	July	16 53	+82 10	July	17 17	−80 47
1.3	36.97	21.37	1.4	46.79	3.91	1.4	35.75	57.88	1.4	53.18	14.07	1.4	15.37	28.20
2.3	36.81	21.53	2.3	46.38	4.04	2.4	35.62	58.13	2.4	53.10	14.32	2.4	15.34	28.52
3.3	36.65	21.68	3.3	45.98	4.17	3.4	35.47	58.36	3.4	53.02	14.57	3.4	15.31	28.81
4.3	36.49	21.82	4.3	45.57	4.31	4.4	35.33	58.56	4.4	52.94	14.84	4.4	15.27	29.09
5.3	36.33	21.94	5.3	45.13	4.46	5.4	35.18	58.77	5.4	52.85	15.11	5.4	15.23	29.37
6.3	36.18	22.05	6.3	44.68	4.60	6.4	35.01	58.96	6.4	52.77	15.39	6.4	15.20	29.63
7.3	36.03	22.16	7.3	44.21	4.74	7.4	34.90	59.15	7.4	52.67	15.67	7.4	15.17	29.88
8.3	35.89	22.27	8.3	43.71	4.87	8.3	34.77	59.34	8.4	52.57	15.95	8.4	15.14	30.13
9.3	35.75	22.39	9.3	43.20	4.98	9.3	34.64	59.53	9.4	52.46	16.23	9.4	15.11	30.37
10.3	35.61	22.51	10.3	42.69	5.09	10.3	34.52	59.72	10.4	52.35	16.48	10.4	15.10	30.63
11.3	35.48	22.64	11.3	42.17	5.18	11.3	34.40	59.92	11.4	52.22	16.72	11.4	15.08	30.90
12.3	35.35	22.77	12.3	41.66	5.24	12.3	34.28	60.13	12.4	52.10	16.96	12.4	15.05	31.17
13.3	35.20	22.91	13.3	41.15	5.30	13.3	34.14	60.36	13.4	51.99	17.16	13.4	15.02	31.45
14.3	35.05	23.04	14.3	40.67	5.35	14.3	34.00	60.58	14.4	51.88	17.36	14.4	14.99	31.74
15.3	34.87	23.16	15.3	40.19	5.39	15.3	33.85	60.78	15.4	51.76	17.54	15.4	14.96	32.04
16.3	34.69	23.26	16.3	39.73	5.42	16.3	33.67	60.99	16.4	51.65	17.73	16.4	14.92	32.33
17.3	34.51	23.35	17.3	39.28	5.47	17.3	33.49	61.17	17.4	51.54	17.93	17.4	14.85	32.62
18.3	34.33	23.41	18.3	38.83	5.53	18.3	33.30	61.32	18.4	51.43	18.15	18.4	14.78	32.88
19.3	34.15	23.46	19.3	38.34	5.60	19.3	33.12	61.47	19.4	51.30	18.37	19.4	14.72	33.12
20.3	34.00	23.50	20.3	37.83	5.67	20.3	32.95	61.60	20.4	51.17	18.61	20.4	14.66	33.34
21.3	33.84	23.54	21.3	37.29	5.74	21.3	32.80	61.70	21.4	51.04	18.85	21.4	14.59	33.55
22.3	33.70	23.59	22.3	36.74	5.81	22.3	32.65	61.83	22.4	50.91	19.08	22.4	14.53	33.77
23.3	33.55	23.65	23.3	36.16	5.85	23.3	32.51	61.96	23.4	50.77	19.28	23.4	14.49	33.98
24.3	33.42	23.72	24.3	35.59	5.86	24.3	32.37	62.11	24.4	50.62	19.48	24.4	14.45	34.21
25.3	33.27	23.79	25.3	35.03	5.85	25.3	32.22	62.27	25.4	50.47	19.64	25.4	14.41	34.46
26.3	33.12	23.86	26.3	34.51	5.83	26.3	32.07	62.43	26.4	50.33	19.79	26.4	14.36	34.71
27.2	32.94	23.92	27.3	34.00	5.81	27.3	31.90	62.58	27.4	50.19	19.94	27.4	14.30	34.96
28.2	32.76	23.97	28.3	33.51	5.78	28.3	31.71	62.73	28.4	50.05	20.08	28.4	14.22	35.21
29.2	32.57	23.99	29.3	33.03	5.75	29.3	31.51	62.86	29.3	49.92	20.23	29.4	14.14	35 46
30.2	32.38	24.00	30.3	32.56	5.74	30.3	31.31	62.96	30.3	49.79	20.37	30.4	14.06	35.70
31.2	32.19	23.99	31.3	32.06	5.74	31.3	31.10	63.07	31.3	49.65	20.54	31.4	13.96	35.93
32.2	32.00	23.95	32.3	31.56	5.73	32.3	30.90	63.16	32.3	49.52	20.71	32.4	13.86	36.13
8.60		−8.54	23.25		+23.23	9.92		−9.87	7.34		+7.27	6.25		−6.17
14h	14m	23s.592	15h	1m	45s.970	15h	25m	17s.036	16h	53m	48s.037	17h	17m	1s.936
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
July	17 57	+86 37	July	18 10	−87 39	July	18 56	+89 1	July	19 38	−89 12	July	20 48	+82 14
1.5	18.82	3.16	1.5	33.60	40.71	1.5	21.51	42.14	1.5	55.84	23.71	1.6	25.16	52.33
2.5	18.71	3.44	2.5	33.61	41.05	2.5	21.37	42.43	2.5	56.47	24.02	2.6	25.21	52.62
3.5	18.60	3.72	3.5	33.61	41.38	3.5	21.28	42.73	3.5	57.02	24.33	3.6	25.27	52.91
4.5	18.49	4.01	4.5	33.58	41.70	4.5	21.18	43.04	4.5	57.50	24.62	4.6	25.33	53.20
5.5	18.36	4.33	5.5	33.54	41.99	5.5	21.06	43.36	5.5	57.94	24.91	5.6	25.40	53.52
6.5	18.24	4.64	6.5	33.49	42.29	6.5	20.92	43.68	6.5	58.36	25.20	6.6	25.47	53.84
7.5	18.10	4.95	7.5	33.45	42.58	7.5	20.74	44.02	7.5	58.77	25.48	7.6	25.53	54.18
8.5	17.93	5.28	8.5	33.42	42.86	8.5	20.50	44.37	8.5	59.19	25.75	8.6	25.59	54.52
9.4	17.76	5.60	9.5	33.40	43.13	9.5	20.19	44.72	9.5	59.61	26.03	9.6	25.64	54.88
10.4	17.57	5.91	10.5	33.39	43.42	10.5	19.82	45.06	10.5	60.11	26.29	10.6	25.70	55.24
11.4	17.37	6.21	11.5	33.39	43.70	11.5	19.39	45.40	11.5	60.62	26.57	11.6	25.74	55.60
12.4	17.14	6.50	12.5	33.39	44.02	12.5	18.90	45.73	12.5	61.14	26.86	12.6	25.78	55.96
13.4	16.92	6.77	13.4	33.38	44.33	13.5	18.38	46 02	13.5	61.67	27.17	13.6	25.80	56.31
14.4	16.70	7.02	14.4	33.34	44.66	14.5	17.87	46.32	14.5	62.19	27.48	14.6	25.81	56.65
15.4	16.50	7.27	15.4	33.27	44.99	15.5	17.35	46.60	15.5	62.62	27.82	15.6	25.83	56.98
16.4	16.29	7.51	16.4	33.18	45.33	16.5	16.88	46.88	16.5	62.94	28.15	16.6	25.85	57.29
17.4	16.09	7.75	17.4	33.05	45.66	17.5	16.45	47.16	17.5	63.16	28.49	17.5	25.86	57.60
18.4	15.90	8.02	18.4	32.89	45.96	18.5	16.04	47.45	18.5	63.27	28.82	18.5	25.90	57.91
19.4	15.70	8.29	19.4	32.71	46.25	19.5	15.64	47.77	19.5	63.32	29.14	19.5	25.93	58.25
20.4	15.49	8.58	20.4	32.53	46.53	20.5	15.21	48.09	20.5	63.35	29.42	20.5	25.96	58.61
21.4	15.26	8.87	21.4	32.39	46.78	21 5	14.71	48.42	21.5	63.39	29.70	21.5	26.00	58.97
22.4	15.00	9.17	22.4	32.26	47.03	22.5	14.11	48.76	22.5	63.48	29.96	22.5	26.01	59.35
23.4	14.73	9.46	23.4	32.15	47.30	23.5	13.44	49.09	23.5	63.65	30.23	23.5	26.03	59.74
24.4	14.45	9.74	24.4	32.05	47.57	24.4	12.70	49.42	24.5	63.87	30.51	24.5	26.04	60.13
25.4	14.15	9.98	25.4	31.95	47.85	25.4	11.90	49.72	25.5	64.08	30.82	25.5	26.04	60.50
26.4	13.86	10.22	26.4	31.82	48.16	26.4	11.09	50.01	26.5	64.28	31.14	26.5	26.02	60.86
27.4	13.57	10.42	27.4	31.66	48.47	27.4	10.32	50.28	27.5	64.40	31.47	27.5	26.01	61.21
28.4	13.29	10.63	28.4	31.47	48.78	28.4	9.57	50.54	28.5	64.44	31.80	28.5	26.00	61.54
29.4	13.02	10.84	29.4	31.25	49.09	29.4	8.86	50.80	29.5	64.36	32.14	29.5	25.98	61.87
30.4	12.76	11.06	30.4	30.99	49.38	30.4	8.19	51.06	30.5	64.18	32.48	30.5	25.97	62.19
31.4	12.50	11.28	31.4	30.71	49.66	31.4	7.52	51.33	31.5	63.94	32.80	31.5	25.96	62.52
32.4	12.24	11.52	32.4	30.42	49.93	32.4	6.85	51.62	32.5	63.63	33.12	32.5	25.96	62.85
16.95		+16.92	24.52		−24.50	59.05		+59.04	72.32		−72.31	7.41		+7.35
17h	57m	4s.326	18h	9m	46s.186	18h	55m	23s.393	19h	37m	1s.735	20h	48m	15s.385
+86°	36′	50″.43	−87°	39′	48″.39	+89°	1′	32″.83	−89°	12′	41″.41	+82°	14′	50″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
July	21 39	−83 4	July	22 17	−86 21	July	22 38	−81 46	July	23 28	+86 52	July	23 47	−82 26
1.6	23.96	1.82	1.7	30.19	9.83	1.7	19.93	40.65	1.7	0.93	48.27	1.7	36.91	19.52
2.6	24.11	2.00	2.6	30.52	9.97	2.7	20.08	40.77	2.7	1.25	48.42	2.7	37.09	19.52
3.6	24.26	2.20	3.6	30.82	10.11	3.7	20.23	40.90	3.7	1.58	48.57	3.7	37.26	19.56
4.6	24.40	2.40	4.6	31.11	10.27	4.7	20.36	41.02	4.7	1.93	48.72	4.7	37.43	19.61
5.6	24.53	2.60	5.6	31.39	10.43	5.7	20.50	41.15	5.7	2.29	48.89	5.7	37.58	19.65
6.6	24.66	2.78	6.6	31.66	10.59	6.7	20.64	41.27	6.7	2.65	49.06	6.7	37.73	19.68
7.6	24.78	2.97	7.6	31.91	10.75	7.7	20.76	41.40	7.7	3.02	49.24	7.7	37.88	19.72
8.6	24.90	3.15	8.6	32.17	10.90	8.6	20.89	41.50	8.7	3.38	49.43	8.7	38.03	19.76
9.6	25.03	3.32	9.6	32.44	11.05	9.6	21.02	41.61	9.7	3.74	49.64	9.7	38.19	19.80
10.6	25.17	3.49	10.6	32.71	11.19	10.6	21.14	41.71	10.7	4.09	49.87	10.7	38.34	19.83
11.6	25.30	3.66	11.6	32.99	11.33	11.6	21.28	41.82	11.7	4.43	50.11	11.7	38.51	19.85
12.6	25.44	3.84	12.6	33.28	11.48	12.6	21.43	41.93	12.7	4.75	50.36	12.7	38.68	19.87
13.6	25.59	4.03	13.6	33.58	11.65	13.6	21.57	42.06	13.7	5.04	50.60	13.7	38.85	19.90
14.6	25.74	4.25	14.6	33.89	11.82	14.6	21.72	42.20	14.7	5.32	50.85	14.7	39.03	19.94
15.6	25.89	4.47	15.6	34.19	12.00	15.6	21.87	42.34	15.7	5.59	51.08	15.7	39.21	20.00
16.6	26.03	4.71	16.6	34.48	12.22	16.6	22.01	42.52	16.7	5.86	51.30	16.7	39.39	20.08
17.6	26.14	4.96	17.6	34.75	12.44	17.6	22.14	42.71	17.7	6.13	51.52	17.7	39.56	20.18
18.6	26.25	5.21	18.6	34.99	12.67	18.6	22.27	42.91	18.7	6.42	51.73	18.7	39.71	20.29
19.6	26.34	5.47	19.6	35.22	12.90	19.6	22.37	43.11	19.6	6.73	51.95	19.7	39.86	20.41
20.6	26.43	5.71	20.6	35.41	13.12	20.6	22.47	43.30	20.6	7.05	52.18	20.7	40.00	20.53
21.6	26.52	5.94	21.6	35.61	13.32	21.6	22.57	43.48	21.6	7.37	52.42	21.7	40.13	20.64
22.6	26.62	6.14	22.6	35.83	13.51	22.6	22.68	43.64	22.6	7.69	52.70	22.7	40.26	20.74
23.6	26.72	6.34	23.6	36.05	13.70	23.6	22.80	43.78	23.6	8.01	52.99	23.7	40.40	20.83
24.6	26.82	6.54	24.6	36.28	13.88	24.6	22.91	43.93	24.6	8.29	53.30	24.6	40.55	20.92
25.6	26.95	6.77	25.6	36.52	14.07	25.6	23.04	44.10	25.6	8.55	53.61	25.6	40.72	21.00
26.6	27.08	7.01	26.6	36.78	14.29	26.6	23.17	44.28	26.6	8.79	53.91	26.6	40.89	21.10
27.6	27.18	7.28	27.6	37.03	14.52	27.6	23.30	44.47	27.6	9.01	54.20	27.6	41.05	21.22
28.6	27.29	7.55	28.6	37.27	14.77	28.6	23.41	44.70	28.6	9.23	54.49	28.6	41.20	21.35
29.5	27.37	7.84	29.6	37.49	15.04	29.6	23.52	44.93	29.6	9.44	54.77	29.6	41.35	21.50
30.5	27.46	8.13	30.6	37.69	15.30	30.6	23.62	45.17	30.6	9.67	55.03	30.6	41.50	21.68
31.5	27.53	8.42	31.6	37.87	15.58	31.6	23.72	45.42	31.6	9.90	55.29	31.6	41.64	21.86
32.5	27.59	8.71	32.6	38.03	15.86	32.6	23.81	45.67	32.6	10.14	55.56	32.6	41.77	22.05
8.29		−8.22	15.72		−15.69	6.99		−6.92	18.38		+18.35	7.60		−7.53
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Aug.	0 58	+85 50	Aug.	1 34	+88 53	Aug.	1 41	−85 9	Aug.	4 11	+85 20	Aug.	5 37	+85 9
0.7	13.94	31.20	0.7	10.19	20.75	0.7	34.60	7.55	0.8	53.39	45.15	0.9	3.91	22.12
1.7	14.21	31.37	1.7	11.24	20.87	1.7	34.85	7.60	1.8	53.65	45.06	1.9	4.11	21.92
2.7	14.48	31.55	2.7	12.31	20.99	2.7	35.10	7.67	2.8	53.92	44.98	2.9	4.34	21.72
3.7	14.75	31.74	3.7	13.43	21.12	3.7	35.34	7.73	3.8	54.20	44.89	3.9	4.56	21.51
4.7	15.03	31.94	4.7	14.56	21.27	4.7	35.58	7.79	4.8	54.49	44.80	4.9	4.79	21.30
5.7	15.31	32.16	5.7	15.70	21.44	5.7	35.81	7.84	5.8	54.80	44.74	5.9	5.03	21.11
6.7	15.60	32.39	6.7	16.84	21.62	6.7	36.03	7.89	6.8	55.11	44.67	6.9	5.31	20.92
7.7	15.88	32.63	7.7	17.96	21.81	7.7	36.26	7.94	7.8	55.42	44.62	7.9	5.58	20.74
8.7	16.15	32.91	8.7	19.05	22.04	8.7	36.49	7.98	8.8	55.75	44.60	8.9	5.85	20.59
9.7	16.39	33.18	9.7	20.09	22.26	9.7	36.74	8.02	9.8	56.06	44.59	9.9	6.13	20.44
10.7	16.63	33.46	10.7	21.08	22.49	10.7	36.99	8.07	10.8	56.37	44.59	10.8	6.41	20.31
11.7	16.85	33.73	11.7	22.01	22.71	11.7	37.26	8.12	11.8	56.66	44.61	11.8	6.68	20.20
12.6	17.05	33.98	12.7	22.89	22.93	12.7	37.53	8.20	12.8	56.94	44.62	12.8	6.92	20.10
13.6	17.26	34.23	13.7	23.77	23.13	13.7	37.79	8.29	13.8	57.21	44.62	13.8	7.16	19.98
14.6	17.48	34.47	14.7	24.68	23.32	14.7	38.04	8.42	14.8	57.48	44.61	14.8	7.41	19.85
15.6	17.70	34.70	15.7	25.62	23.51	15.7	38.29	8.55	15.8	57.76	44.57	15.8	7.64	19.71
16.6	17.93	34.94	16.7	26.63	23.70	16.7	38.51	8.69	16.8	58.04	44.54	16.8	7.89	19.56
17.6	18.19	35.20	17.7	27.70	23.90	17.7	38.71	8.83	17.8	58.35	44.51	17.8	8.16	19.38
18.6	18.46	35.47	18.7	28.79	24.13	18.7	38.91	8.96	18.8	58.67	44.50	18.8	8.44	19.23
19.6	18.71	35.76	19.7	29.88	24.37	19.7	39.11	9.09	19.8	59.00	44.49	19.8	8.73	19.08
20.6	18.96	36.07	20.7	30.92	24.64	20.7	39.33	9.19	20.8	59.35	44.50	20.8	9.05	18.96
21.6	19.20	36.39	21.6	31.91	24.92	21.7	39.55	9.30	21.8	59.69	44.54	21.8	9.37	18.86
22.6	19.40	36.72	22.6	32.83	25.21	22.6	39.77	9.41	22.8	60.02	44.60	22.8	9.67	18.78
23.6	19.59	37.05	23.6	33.68	25.50	23.6	40.01	9.54	23.8	60.33	44.67	23.8	9.96	18.72
24.6	19.78	37.37	24.6	34.49	25.78	24.6	40.25	9.66	24.7	60.62	44.74	24.8	10.24	18.66
25.6	19.95	37.66	25.6	35.26	26.03	25.6	40.50	9.81	25.7	60.90	44.80	25.8	10.51	18.60
26.6	20.12	37.94	26.6	36.04	26.28	26.6	40.73	9.99	26.7	61.18	44.86	26.8	10.78	18.53
27.6	20.29	38.22	27.6	36.84	26.52	27.6	40.95	10.18	27.7	61.46	44.91	27.8	11.04	18.45
28.6	20.47	38.50	28.6	37.66	26.76	28.6	41.17	10.38	28.7	61.73	44.96	28.8	11.30	18.37
29.6	20.66	38.78	29.6	38.50	27.00	29.6	41.37	10.60	29.7	62.02	45.00	29.8	11.56	18.29
30.6	20.85	39.07	30.6	39.37	27.27	30.6	41.56	10.82	30.7	62.31	45.04	30.8	11.83	18.19
31.6	21.04	39.38	31.6	40.25	27.53	31.6	41.74	11.02	31.7	62.63	45.08	31.8	12.11	18.10
13.79	+13.76		51.61	+51.60		11.83	−11.79		12.32	+12.28		11.84	+11.80	
0^h 57^m	$55^s.489$		1^h 33^m	$11^s.898$		1^h 41^m	$39^s.995$		4^h 11^m	$48^s.583$		5^h 37^m	$5^s.478$	
+85° 50′	41″.77		+88° 53′	34″.33		−85° 9′	32″.70		+85° 21′	5″.69		+85° 9′	42″.71	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Aug.	5 44	−84 49	Aug.	6 46	−80 43	Aug.	7 4	+87 9	Aug.	7 13	−86 54	Aug.	7 14	+82 33
0.9	47.11	33.99	0.9	19.61	63.87	0.9	44.54	63.74	0.9	47.99	50.96	0.9	54.29	34.60
1.9	47.27	33.74	1.9	19.67	63.56	1.9	44.76	63.46	1.9	48.11	50.65	1.9	54.37	34.32
2.9	47.43	33.50	2.9	19.73	63.27	2.9	44.98	63.17	2.9	48.24	50.36	2.9	54.45	34.03
3.9	47.59	33.26	3.9	19.80	62.99	3.9	45.23	62.87	3.9	48.38	50.07	3.9	54.53	33.74
4.9	47.74	33.03	4.9	19.86	62.71	4.9	45.50	62.58	4.9	48.52	49.79	4.9	54.63	33.45
5.9	47.89	32.81	5.9	19.93	62.43	5.9	45.78	62.28	5.9	48.65	49.52	5.9	54.74	33.14
6.9	48.04	32.58	6.9	19.98	62.17	6.9	46.10	61.99	6.9	48.77	49.25	6.9	54.85	32.85
7.9	48.19	32.36	7.9	20.04	61.90	7.9	46.42	61.70	7.9	48.89	48.97	7.9	54.98	32.56
8.9	48.33	32.12	8.9	20.10	61.61	8.9	46.76	61.42	8.9	49.01	48.68	8.9	55.12	32.28
9.9	48.49	31.88	9.9	20.16	61.33	9.9	47.13	61.16	9.9	49.13	48.39	9.9	55.26	32.03
10.8	48.65	31.63	10.9	20.22	61.02	10.9	47.50	60.92	10.9	49.26	48.07	10.9	55.40	31.78
11.8	48.82	31.38	11.9	20.29	60.71	11.9	47.85	60.69	11.9	49.39	47.76	11.9	55.53	31.54
12.8	48.99	31.12	12.9	20.37	60.40	12.9	48.19	60.46	12.9	49.56	47.44	12.9	55.66	31.32
13.8	49.18	30.88	13.9	20.45	60.11	13.9	48.52	60.23	13.9	49.75	47.12	13.9	55.77	31.11
14.8	49.38	30.65	14.9	20.53	59.82	14.9	48.81	60.00	14.9	49.95	46.82	14.9	55.88	30.87
15.8	49.58	30.45	15.9	20.62	59.55	15.9	49.11	59.76	15.9	50.18	46.53	15.9	55.99	30.62
16.8	49.78	30.27	16.9	20.71	59.31	16.9	49.42	59.50	16.9	50.40	46.27	16.9	56.11	30.35
17.8	49.97	30.13	17.9	20.81	59.08	17.9	49.75	59.23	17.9	50.63	46.03	17.9	56.24	30.07
18.8	50.16	29.98	18.9	20.90	58.87	18.9	50.11	58.95	18.9	50.85	45.80	18.9	56.38	29.80
19.8	50.34	29.82	19.9	20.99	58.65	19.9	50.51	58.67	19.9	51.05	45.57	19.9	56.53	29.52
20.8	50.52	29.65	20.9	21.07	58.42	20.9	50.93	58.42	20.9	51.24	45.34	20.9	56.69	29.25
21.8	50.70	29.48	21.9	21.15	58.19	21.9	51.37	58.18	21.9	51.43	45.09	21.9	56.85	29.01
22.8	50.88	29.29	22.9	21.23	57.94	22.9	51.81	57.96	22.9	51.62	44.82	22.9	57.02	28.78
23.8	51.07	29.09	23.9	21.31	57.69	23.9	52.24	57.76	23.9	51.84	44.55	23.9	57.18	28.58
24.8	51.29	28.90	24.9	21.41	57.42	24.9	52.65	57.57	24.9	52.07	44.27	24.9	57.34	28.38
25.8	51.51	28.72	25.9	21.51	57.17	25.9	53.03	57.38	25.9	52.32	43.99	25.9	57.48	28.19
26.8	51.73	28.55	26.8	21.61	56.93	26.9	53.41	57.20	26.9	52.59	43.72	26.9	57.62	28.00
27.8	51.96	28.40	27.8	21.73	56.69	27.9	53.77	57.01	27.9	52.88	43.47	27.9	57.76	27.80
28.8	52.20	28.26	28.8	21.84	56.47	28.9	54.14	56.81	28.9	53.18	43.22	28.9	57.90	27.59
29.8	52.43	28.13	29.8	21.96	56.27	29.9	54.50	56.58	29.9	53.49	42.98	29.9	58.04	27.37
30.8	52.66	28.01	30.8	22.07	56.09	30.9	54.88	56.36	30.9	53.80	42.77	30.9	58.18	27.14
31.8	52.89	27.93	31.8	22.18	55.92	31.8	55.28	56.14	31.9	54.10	42.58	31.9	58.33	26.92
11.09	−11.04		6.21	−6.13		20.23	+20.21		18.57	−18.54		7.72	+7.66	
5h 45m 4s.700			6h 46m 28s.850			7h 4m 58s.549			7h 14m 18s.185			7h 14m 59s.083		
−84° 49′ 38″.84			−80° 44′ 2″.02			+87° 10′ 21″.62			−86° 54′ 45″.50			+82° 33′ 51″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Aug.	8 20	+88 51	Aug.	9 7	−85 21	Aug.	9 26	+81 39	Aug.	9 36	−80 35	Aug.	10 21	+82 56
0.9	47.18	38.68	1.0	53.86	42.14	1.0	6.71	59.78	1.0	6.71	62.71	1.1	40.09	62.18
1.9	47.38	38.36	2.0	53.82	41.82	2.0	6.70	59.47	2.0	6.67	62.39	2.1	40.03	61.88
2.9	47.60	38.03	3.0	53.78	41.51	3.0	6.69	59.15	3.0	6.64	62.08	3.1	39.97	61.57
3.9	47.85	37.70	4.0	53.75	41.20	4.0	6.68	58.82	4.0	6.63	61.79	4.1	39.91	61.25
4.9	48.12	37.33	5.0	53.72	40.91	5.0	6.68	58.48	5.0	6.61	61.49	5.1	39.86	60.93
5.9	48.45	36.98	6.0	53.70	40.62	6.0	6.68	58.13	6.0	6.58	61.21	6.1	39.82	60.59
6.9	48.84	36.63	7.0	53.67	40.33	7.0	6.69	57.77	7.0	6.55	60.93	7.1	39.78	60.23
7.9	49.29	36.28	8.0	53.64	40.04	8.0	6.72	57.41	8.0	6.52	60.64	8.1	39.75	59.87
8.9	49.80	35.94	8.9	53.61	39.75	9.0	6.75	57.04	9.0	6.49	60.35	9.1	39.74	59.50
9.9	50.35	35.60	9.9	53.57	39.44	10.0	6.79	56.70	10.0	6.47	60.06	10.0	39.74	59.15
10.9	50.91	35.28	10.9	53.51	39.12	11.0	6.83	56.36	11.0	6.44	59.74	11.0	39.74	58.81
11.9	51.48	34.97	11.9	53.47	38.79	12.0	6.87	56.05	12.0	6.40	59.40	12.0	39.74	58.48
12.9	52.01	34.69	12.9	53.44	38.45	13.0	6.91	55.74	13.0	6.37	59.07	13.0	39.73	58.16
13.9	52.50	34.40	13.9	53.43	38.11	13.9	6.95	55.43	14.0	6.36	58.71	14.0	39.73	57.85
14.9	52.96	34.10	14.9	53.43	37.76	14.9	6.96	55.12	15.0	6.35	58.36	15.0	39.72	57.54
15.9	53.37	33.79	15.9	53.46	37.42	15.9	6.97	54.81	15.9	6.35	58.03	16.0	39.69	57.23
16.9	53.81	33.46	16.9	53.50	37.10	16.9	6.99	54.47	16.9	6.35	57.71	17.0	39.67	56.89
17.9	54.28	33.12	17.9	53.55	36.81	17.9	7.02	54.11	17.9	6.35	57.42	18.0	39.65	56.53
18.9	54.82	32.77	18.9	53.59	36.52	18.9	7.05	53.75	18.9	6.36	57.12	19.0	39.63	56.17
19.9	55.45	32.41	19.9	53.63	36.25	19.9	7.09	53.37	19.9	6.37	56.84	20.0	39.63	55.78
20.9	56.14	32.08	20.9	53.65	35.97	20.9	7.14	52.99	20.9	6.37	56.56	21.0	39.64	55.39
21.9	56.89	31.76	21.9	53.66	35.67	21.9	7.20	52.64	21.9	6.38	56.25	22.0	39.67	55.01
22.9	57.66	31.45	22.9	53.68	35.36	22.9	7.28	52.30	22.9	6.38	55.94	23.0	39.70	54.63
23.9	58.42	31.16	23.9	53.69	35.03	23.9	7.36	51.96	23.9	6.38	55.62	24.0	39.73	54.29
24.9	59.16	30.88	24.9	53.73	34.70	24.9	7.42	51.63	24.9	6.38	55.28	25.0	39.77	53.95
25.9	59.85	30.60	25.9	53.77	34.36	25.9	7.47	51.32	25.9	6.38	54.95	26.0	39.80	53.62
26.9	60.51	30.33	26.9	53.83	34.02	26.9	7.53	51.02	26.9	6.40	54.60	27.0	39.81	53.30
27.9	61.15	30.06	27.9	53.89	33.68	27.9	7.58	50.72	27.9	6.43	54.25	27.9	39.82	52.98
28.9	61.78	29.77	28.9	53.98	33.34	28.9	7.63	50.41	28.9	6.45	53.91	28.9	39.84	52.64
29.9	62.42	29.47	29.9	54.07	33.02	29.9	7.68	50.10	29.9	6.47	53.58	29.9	39.85	52.30
30.9	63.08	29.18	30.9	54.18	32.73	30.9	7.73	49.76	30.9	6.51	53.26	30.9	39.86	51.95
31.9	63.77	28.87	31.9	54.28	32.44	31.9	7.79	49.41	31.9	6.55	52.96	31.9	39.87	51.58
50.24		+50.23	12.36		−12.32	6.90		+6.83	6.12		−6.04	8.15		+8.09
8^h	21^m	$41^s.998$	9^h	8^m	$8^s.703$	9^h	26^m	$14^s.295$	9^h	36^m	$12^s.346$	10^h	21^m	$50^s.081$
+88°	51′	51″.95	−85°	21′	25″.35	+81°	40′	7″.28	−80°	35′	44″.11	+82°	57′	4″.81

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Aug.	10 59	−84 11	Aug.	12 13	+88 7	Aug.	12 46	−84 42	Aug.	12 48	+83 49	Aug.	13 28	−85 23
1.1	48.32	10.71	1.1	51.02	43.79	1.2	46.55	45.58	1.2	22.92	63.55	1.2	17.08	58.70
2.1	48.19	10.46	2.1	50.51	43.57	2.2	46.35	45.43	2.2	22.75	63.38	2.2	16.84	58.61
3.1	48.08	10.19	3.1	50.00	43.35	3.2	46.16	45.28	3.2	22.58	63.20	3.2	16.60	58.51
4.1	47.97	9.94	4.1	49.48	43.11	4.2	45.97	45.13	4.2	22.41	63.01	4.2	16.37	58.41
5.1	47.87	9.69	5.1	48.96	42.84	5.2	45.79	44.99	5.2	22.23	62.81	5.2	16.14	58.31
6.1	47.77	9.45	6.1	48.47	42.57	6.2	45.61	44.85	6.2	22.05	62.58	6.2	15.92	58.23
7.1	47.66	9.22	7.1	47.99	42.29	7.2	45.43	44.72	7.2	21.90	62.36	7.2	15.70	58.17
8.1	47.55	8.99	8.1	47.53	42.00	8.2	45.25	44.60	8.2	21.75	62.11	8.2	15.48	58.09
9.1	47.44	8.76	9.1	47.11	41.69	9.2	45.07	44.48	9.2	21.60	61.84	9.2	15.25	58.01
10.1	47.31	8.52	10.1	46.72	41.38	10.1	44.88	44.36	10.1	21.46	61.57	10.2	15.01	57.93
11.1	47.18	8.26	11.1	46.36	41.09	11.1	44.67	44.22	11.1	21.33	61.30	11.2	14.76	57.85
12.1	47.05	7.99	12.1	46.02	40.80	12.1	44.47	44.05	12.1	21.20	61.06	12.2	14.50	57.76
13.1	46.94	7.68	13.1	45.68	40.52	13.1	44.26	43.88	13.1	21.08	60.81	13.2	14.23	57.64
14.1	46.83	7.37	14.1	45.32	40.25	14.1	44.06	43.68	14.1	20.95	60.57	14.2	13.98	57.50
15.1	46.74	7.06	15.1	44.95	39.98	15.1	43.86	43.46	15.1	20.82	60.34	15.2	13.73	57.34
16.1	46.65	6.76	16.1	44.54	39.71	16.1	43.68	43.24	16.1	20.67	60.11	16.2	13.49	57.17
17.1	46.59	6.47	17.1	44.12	39.43	17.1	43.52	43.04	17.1	20.51	59.87	17.2	13.28	57.00
18.1	46.53	6.19	18.1	43.68	39.12	18.1	43.38	42.83	18.1	20.36	59.60	18.2	13.08	56.84
19.1	46.48	5.93	19.1	43.24	38.80	19.1	43.24	42.64	19.1	20.21	59.32	19.2	12.90	56.69
20.0	46.42	5.67	20.1	42.83	38.46	20.1	43.10	42.45	20.1	20.06	59.03	20.1	12.72	56.54
21.0	46.36	5.41	21.1	42.47	38.09	21.1	42.95	42.27	21.1	19.92	58.71	21.1	12.52	56.41
22.0	46.28	5.15	22.1	42.15	37.73	22.1	42.79	42.09	22.1	19.80	58.39	22.1	12.31	56.28
23.0	46.19	4.87	23.1	41.88	37.39	23.1	42.62	41.90	23.1	19.69	58.07	23.1	12.09	56.14
24.0	46.11	4.58	24.1	41.63	37.05	24.1	42.44	41.70	24.1	19.59	57.76	24.1	11.86	55.97
25.0	46.03	4.26	25.1	41.39	36.72	25.1	42.27	41.48	25.1	19.49	57.47	25.1	11.63	55.79
26.0	45.96	3.94	26.1	41.15	36.41	26.1	42.09	41.24	26.1	19.39	57.18	26.1	11.40	55.60
27.0	45.90	3.61	27.1	40.89	36.11	27.1	41.93	40.98	27.1	19.29	56.91	27.1	11.17	55.38
28.0	45.85	3.27	28.1	40.61	35.80	28.1	41.78	40.71	28.1	19.18	56.63	28.1	10.95	55.16
29.0	45.81	2.93	29.1	40.32	35.49	29.1	41.63	40.44	29.1	19.07	56.35	29.1	10.75	54.93
30.0	45.78	2.60	30.1	40.01	35.17	30.1	41.49	40.16	30.1	18.94	56.06	30.1	10.56	54.70
31.0	45.76	2.28	31.1	39.70	34.85	31.1	41.36	39.89	31.1	18.82	55.77	31.1	10.38	54.47
32.0	45.75	1.95	32.1	39.41	34.51	32.1	41.26	39.62	32.1	18.70	55.46	32.1	10.21	54.24
9.87		−9.82	30.61		+30.59	10.85		−10.80	9.31		+9.26	12.47		−12.43
10^h	59^m	$53^s.036$	12^h	14^m	$30^s.802$	12^h	46^m	$43^s.161$	12^h	48^m	$33^s.111$	13^h	28^m	$9^s.628$
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	14 14	−83 19	Aug.	15 1	+87 32	Aug.	15 25	−84 13	Aug.	16 53	+82 10	Aug.	17 17	−80 47
	s	″		s	″		s	″		s	″		s	″
1.2	32.00	23.95	1.3	31.56	5.73	1.3	30.90	3.16	1.3	49.52	20.71	1.4	13.86	36.13
2.2	31.82	23.91	2.3	31.05	5.74	2.3	30.70	3.22	2.3	49.38	20.88	2.4	13.77	36.32
3.2	31.65	23.87	3.3	30.52	5.75	3.3	30.50	3.28	3.3	49.23	21.06	3.4	13.68	36.50
4.2	31.48	23.84	4.3	29.97	5.75	4.3	30.31	3.32	4.3	49.08	21.23	4.3	13.59	36.68
5.2	31.33	23.81	5.3	29.41	5.72	5.3	30.13	3.37	5.3	48.93	21.38	5.3	13.51	36.85
6.2	31.18	23.79	6.3	28.86	5.68	6.3	29.95	3.43	6.3	48.77	21.53	6.3	13.43	37.03
7.2	31.03	23.76	7.3	28.30	5.63	7.3	29.78	3.50	7.3	48.60	21.67	7.3	13.35	37.20
8.2	30.87	23.75	8.2	27.74	5.57	8.3	29.61	3.57	8.3	48.43	21.78	8.3	13.27	37.38
9.2	30.70	23.74	9.2	27.18	5.48	9.3	29.43	3.64	9.3	48.27	21.89	9.3	13.20	37.57
10.2	30.53	23.73	10.2	26.65	5.38	10.3	29.25	3.71	10.3	48.10	21.97	10.3	13.12	37.78
11.2	30.36	23.70	11.2	26.13	5.28	11.3	29.06	3.78	11.3	47.95	22.05	11.3	13.03	37.98
12.2	30.18	23.65	12.2	25.65	5.18	12.3	28.84	3.85	12.3	47.79	22.11	12.3	12.93	38.18
13.2	29.99	23.59	13.2	25.16	5.08	13.3	28.62	3.90	13.3	47.63	22.19	13.3	12.82	38.38
14.2	29.80	23.50	14.2	24.68	5.00	14.2	28.39	3.94	14.3	47.48	22.27	14.3	12.69	38.54
15.2	29.61	23.39	15.2	24.18	4.93	15.2	28.18	3.94	15.3	47.32	22.36	15.3	12.57	38.69
16.2	29.44	23.28	16.2	23.66	4.87	16.2	27.97	3.93	16.3	47.17	22.46	16.3	12.46	38.82
17.2	29.28	23.17	17.2	23.11	4.80	17.2	27.77	3.89	17.3	46.99	22.57	17.3	12.35	38.93
18.2	29.14	23.06	18.2	22.55	4.72	18.2	27.59	3.86	18.3	46.83	22.68	18.3	12.24	39.03
19.2	28.99	22.95	19.2	21.97	4.63	19.2	27.41	3.85	19.3	46.65	22.78	19.3	12.15	39.14
20.2	28.86	22.86	20.2	21.39	4.51	20.2	27.24	3.84	20.3	46.48	22.85	20.3	12.06	39.26
21.2	28.71	22.78	21.2	20.82	4.37	21.2	27.07	3.84	21.3	46.30	22.91	21.3	11.97	39.39
22.2	28.57	22.71	22.2	20.29	4.21	22.2	26.89	3.85	22.3	46.12	22.95	22.3	11.88	39.53
23.2	28.40	22.62	23.2	19.77	4.04	23.2	26.70	3.86	23.3	45.94	22.98	23.3	11.77	39.67
24.2	28.23	22.53	24.2	19.29	3.87	24.2	26.50	3.86	24.3	45.77	22.99	24.3	11.67	39.81
25.2	28.05	22.40	25.2	18.81	3.72	25.2	26.27	3.85	25.3	45.62	23.00	25.3	11.55	39.95
26.2	27.87	22.27	26.2	18.34	3.56	26.2	26.05	3.81	26.3	45.46	23.02	26.3	11.42	40.08
27.2	27.69	22.12	27.2	17.87	3.42	27.2	25.82	3.75	27.3	45.29	23.05	27.3	11.28	40.18
28.2	27.52	21.95	28.2	17.40	3.29	28.2	25.60	3.69	28.3	45.12	23.08	28.3	11.14	40.27
29.2	27.36	21.77	29.2	16.91	3.15	29.2	25.39	3.60	29.3	44.96	23.11	29.3	11.01	40.34
30.2	27.21	21.59	30.2	16.41	3.02	30.2	25.19	3.50	30.3	44.78	23.14	30.3	10.88	40.40
31.2	27.06	21.40	31.2	15.91	2.88	31.2	24.99	3.40	31.3	44.60	23.17	31.3	10.75	40.46
32.1	26.92	21.21	32.2	15.39	2.74	32.2	24.79	3.30	32.3	44.42	23.21	32.3	10.62	40.50
8.60		−8.54	23.25		+23.23	9.93		−9.88	7.34		+7.27	6.25		−6.17
14^h	14^m	$23^s.592$	15^h	1^m	$45^s.970$	15^h	25^m	$17^s.036$	16^h	53^m	$48^s.037$	17^h	17^m	$1^s.936$
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Aug.	17 57	+86 37	Aug.	18 10	−87 39	Aug.	18 55	+89 1	Aug.	19 38	−89 12	Aug.	20 48	+82 15
1.4	12.24	11.52	1.4	30.42	49.93	1.4	66.85	51.62	1.5	63.63	33.12	1.5	25.96	2.85
2.4	11.97	11.75	2.4	30.13	50.17	2.4	66.16	51.91	2.5	63.30	33.41	2.5	25.95	3.20
3.4	11.69	11.99	3.4	29.84	50.41	3.4	65.45	52.20	3.4	62.95	33.71	3.5	25.94	3.56
4.4	11.40	12.23	4.4	29.55	50.65	4.4	64.68	52.51	4.4	62.60	33.99	4.5	25.93	3.92
5.4	11.08	12.47	5.4	29.27	50.88	5.4	63.85	52.81	5.4	62.26	34.28	5.5	25.92	4.29
6.4	10.76	12.70	6.4	29.02	51.11	6.4	62.97	53.10	6.4	61.96	34.56	6.5	25.89	4.67
7.4	10.43	12.93	7.4	28.77	51.34	7.4	62.02	53.39	7.4	61.68	34.84	7.5	25.86	5.05
8.4	10.09	13.13	8.4	28.52	51.58	8.4	61.02	53.68	8.4	61.44	35.12	8.5	25.83	5.43
9.4	9.73	13.33	9.4	28.27	51.83	9.4	59.99	53.93	9.4	61.20	35.41	9.5	25.79	5.79
10.4	9.37	13.51	10.4	28.01	52.10	10.4	58.92	54.17	10.4	60.96	35.73	10.5	25.74	6.14
11.4	9.03	13.66	11.4	27.73	52.37	11.4	57.88	54.40	11.4	60.65	36.05	11.5	25.68	6.48
12.4	8.69	13.81	12.4	27.41	52.64	12.4	56.87	54.62	12.4	60.27	36.37	12.5	25.63	6.81
13.4	8.36	13.96	13.4	27.06	52.89	13.4	55.89	54.84	13.4	59.76	36.69	13.5	25.58	7.13
14.4	8.03	14.13	14.4	26.68	53.14	14.4	54.96	55.07	14.4	59.16	37.01	14.5	25.53	7.45
15.4	7.71	14.31	15.4	26.27	53.36	15.4	54.07	55.31	15.4	58.46	37.30	15.5	25.49	7.78
16.3	7.39	14.49	16.4	25.87	53.56	16.4	53.14	55.56	16.4	57.72	37.57	16.5	25.44	8.11
17.3	7.06	14.69	17.4	25.49	53.75	17.4	52.17	55.83	17.4	56.99	37.84	17.5	25.40	8.47
18.3	6.69	14.89	18.4	25.12	53.92	18.4	51.12	56.10	18.4	56.30	38.08	18.5	25.35	8.84
19.3	6.32	15.09	19.3	24.78	54.10	19.4	50.00	56.37	19.4	55.67	38.33	19.5	25.30	9.22
20.3	5.91	15.27	20.3	24.45	54.28	20.4	48.80	56.62	20.4	55.10	38.58	20.5	25.24	9.60
21.3	5.50	15.41	21.3	24.13	54.47	21.4	47.55	56.86	21.4	54.55	38.85	21.5	25.16	9.97
22.3	5.10	15.55	22.3	23.80	54.67	22.4	46.28	57.08	22.4	54.01	39.12	22.4	25.08	10.31
23.3	4.71	15.66	23.3	23.44	54.88	23.4	45.03	57.28	23.4	53.41	39.40	23.4	25.00	10.65
24.3	4.32	15.77	24.3	23.06	55.09	24.4	43.81	57.47	24.4	52.72	39.69	24.4	24.92	10.96
25.3	3.95	15.87	25.3	22.64	55.30	25.4	42.64	57.65	25.4	51.94	39.98	25.4	24.84	11.25
26.3	3.59	15.97	26.3	22.18	55.49	26.4	41.52	57.83	26.4	51.06	40.27	26.4	24.75	11.55
27.3	3.23	16.08	27.3	21.71	55.68	27.4	40.40	58.02	27.4	50.10	40.56	27.4	24.67	11.86
28.3	2.87	16.20	28.3	21.22	55.84	28.4	39.29	58.21	28.4	49.08	40.81	28.4	24.61	12.17
29.3	2.51	16.33	29.3	20.73	55.99	29.4	38.19	58.41	29.4	48.02	41.06	29.4	24.53	12.49
30.3	2.13	16.46	30.3	20.25	56.13	30.3	37.05	58.61	30.4	46.95	41.31	30.4	24.45	12.81
31.3	1.75	16.59	31.3	19.78	56.26	31.3	35.89	58.83	31.4	45.87	41.53	31.4	24.38	13.14
32.3	1.36	16.72	32.3	19.31	56.37	32.3	34.67	59.05	32.4	44.82	41.75	32.4	24.30	13.47
16.96	+16.93		24.54	−24.52		59.19	+59.18		72.56	−72.56		7.42	+7.35	
17h 57m 4s.326			18h 9m 46s.186			18h 55m 23s.393			19h 37m 1s.735			20h 48m 15s.385		
+86° 36′ 50″.43			−87° 39′ 48″.39			+89° 1′ 32″.83			−89° 12′ 41″.41			+82° 14′ 50″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Aug.	21 39	−83 4	Aug.	22 17	−86 21	Aug.	22 38	−81 46	Aug.	23 28	+86 52	Aug.	23 47	−82 26
	s	″		s	″		s	″		s	″		s	″
1.5	27.59	8.71	1.6	38.03	15.86	1.6	23.81	45.67	1.6	10.14	55.56	1.6	41.77	22.05
2.5	27.64	9.00	2.6	38.18	16.13	2.6	23.89	45.93	2.6	10.39	55.83	2.6	41.90	22.24
3.5	27.69	9.27	3.6	38.33	16.41	3.6	23.96	46.17	3.6	10.64	56.11	3.6	42.01	22.43
4.5	27.74	9.55	4.6	38.47	16.66	4.6	24.04	46.41	4.6	10.89	56.42	4.6	42.13	22.62
5.5	27.79	9.82	5.6	38.60	16.91	5.6	24.12	46.65	5.6	11.15	56.73	5.6	42.25	22.80
6.5	27.84	10.08	6.6	38.74	17.16	6.6	24.20	46.87	6.6	11.39	57.05	6.6	42.37	22.98
7.5	27.90	10.33	7.6	38.88	17.41	7.6	24.28	47.09	7.6	11.62	57.39	7.6	42.49	23.15
8.5	27.97	10.60	8.5	39.04	17.65	8.6	24.36	47.31	8.6	11.82	57.74	8.6	42.61	23.31
9.5	28.03	10.86	9.5	39.21	17.91	9.6	24.45	47.54	9.6	12.00	58.09	9.6	42.74	23.48
10.5	28.10	11.14	10.5	39.39	18.18	10.6	24.55	47.78	10.6	12.15	58.44	10.6	42.87	23.66
11.5	28.16	11.44	11.5	39.56	18.46	11.6	24.65	48.04	11.6	12.29	58.78	11.6	43.01	23.84
12.5	28.22	11.75	12.5	39.71	18.75	12.6	24.74	48.31	12.6	12.43	59.11	12.6	43.15	24.06
13.5	28.27	12.07	13.5	39.85	19.07	13.5	24.81	48.61	13.6	12.57	59.42	13.6	43.28	24.28
14.5	28.30	12.40	14.5	39.96	19.39	14.5	24.87	48.91	14.6	12.72	59.73	14.6	43.38	24.53
15.5	28.32	12.72	15.5	40.06	19.71	15.5	24.93	49.21	15.6	12.90	60.03	15.6	43.48	24.79
16.5	28.33	13.02	16.5	40.12	20.00	16.5	24.97	49.50	16.6	13.08	60.35	16.6	43.58	25.04
17.5	28.34	13.30	17.5	40.17	20.29	17.5	25.01	49.78	17.6	13.28	60.68	17.6	43.67	25.28
18.5	28.34	13.58	18.5	40.22	20.58	18.5	25.05	50.05	18.6	13.47	61.04	18.6	43.75	25 52
19.5	28.35	13.85	19.5	40.28	20.85	19.5	25.10	50.29	19.6	13.65	61.41	19.6	43.84	25.74
20.5	28.38	14.11	20.5	40.37	21.11	20.5	25.15	50.53	20.6	13.81	61.79	20.6	43.94	25.95
21.5	28.41	14.38	21.5	40.45	21.38	21.5	25.21	50.78	21.6	13.95	62.17	21.6	44.03	26.17
22.5	28.44	14.66	22.5	40.55	21.66	22.5	25.26	51.05	22.6	14.06	62.56	22.6	44.13	26.39
23.5	28.47	14.97	23.5	40.65	21.95	23.5	25.33	51.33	23.6	14.15	62.93	23.6	44 21	26.61
24.5	28.48	15.28	24.5	40.75	22.26	24.5	25.39	51.62	24.6	14.23	63.30	24.6	44.35	26.86
25.5	28.49	15.60	25.5	40.82	22.58	25.5	25.44	51.93	25.5	14.30	63.64	25.6	44.44	27.14
26.5	28.49	15.94	26.5	40.87	22.92	26.5	25.47	52.26	26.5	14.37	63.97	26.6	44.53	27.42
27.5	28.48	16.27	27.5	40.88	23.26	27.5	25.50	52.59	27.5	14.45	64.30	27.6	44.61	27.72
28.5	28.44	16.60	28.5	40.89	23.60	28.5	25.51	52.91	28.5	14.54	64.63	28.6	44.68	28.02
29.5	28.40	16.92	29.5	40.89	23.93	29.5	25.53	53.23	29.5	14.64	64.96	29.6	44.74	28.32
30.5	28.36	17.23	30.5	40.88	24.25	30.5	25.53	53.55	30.5	14.74	65.32	30.5	44.79	28.61
31.5	28.32	17.52	31.5	40.85	24.57	31.5	25.53	53.87	31.5	14.85	65.68	31.5	44.84	28.90
32.5	28.29	17.81	32.5	40.82	24.88	32.5	25.54	54.16	32.5	14.96	66.05	32.5	44.89	29.21
8.29		−8.23	15.73		−15.70	6.99		−6.92	18.39		+18.37	7.60		−7.53
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Sept.	0 58	+85 50	Sept.	1 34	+88 53	Sept.	1 41	−85 9	Sept.	4 12	+85 20	Sept.	5 37	+85 9
0.6	21.04	39.38	0.6	40.25	27.53	0.6	41.74	11.02	0.7	2.63	45.08	0.8	12.11	18.10
1.6	21.24	39.69	1.6	41.15	27.80	1.6	41.92	11.23	1.7	2.93	45.14	1.8	12.40	18.01
2.6	21.45	40.02	2.6	42.05	28.08	2.6	42.09	11.44	2.7	3.26	45.20	2.8	12.71	17.92
3.6	21.64	40.36	3.6	42.94	28.38	3.6	42.27	11.63	3.7	3.58	45.27	3.8	13.03	17.87
4.6	21.83	40.70	4.6	43.79	28.70	4.6	42.45	11.82	4.7	3.90	45.36	4.8	13.34	17.82
5.6	22.00	41.06	5.6	44.58	29.03	5.6	42.62	12.01	5.7	4.22	45.48	5.8	13.67	17.79
6.6	22.15	41.43	6.6	45.31	29.36	6.6	42.81	12 20	6.7	4.54	45.61	6.8	13.99	17.78
7.6	22.29	41.80	7.6	45.99	29.70	7.6	43.01	12.39	7.7	4.84	45.75	7.8	14.30	17.77
8.6	22.42	42.15	8.6	46.62	30.03	8.6	43.20	12 61	8.7	5.13	45.89	8.8	14.59	17.77
9.6	22.52	42.48	9.6	47.22	30.35	9.6	43.40	12.83	9.7	5.41	46.02	9.8	14.88	17.77
10.6	22.63	42.81	10.6	47.81	30.64	10.6	43.60	13.08	10.7	5.68	46.15	10.8	15.16	17.77
11.6	22.76	43.12	11.6	48.45	30.93	11.6	43.75	13.35	11.7	5.95	46.25	11.8	15.43	17.74
12.6	22.90	43.44	12.6	49.15	31.22	12.6	43.91	13.62	12.7	6.23	46.35	12.8	15.70	17.71
13.6	23.06	43.76	13.6	49.89	31.51	13.6	44.05	13.90	13.7	6.51	46.45	13.8	16.00	17.67
14.6	23.22	44.10	14.6	50.67	31.83	14.6	44.17	14.17	14.7	6.83	46.55	14.8	16.31	17.64
15.6	23.38	44.47	15.6	51.46	32.16	15.6	44.29	14.42	15.7	7.15	46.68	15.7	16.63	17.62
16.6	23.54	44.85	16.6	52.22	32.52	16.6	44.42	14.67	16.7	7.48	46.81	16.7	16.96	17.61
17.6	23.68	45.26	17.6	52.92	32.89	17.6	44.54	14.91	17.7	7.81	46.98	17.7	17.30	17.61
18.5	23.80	45.65	18.6	53.54	33.26	18.6	44.68	15.15	18.7	8.13	47.15	18.7	17.64	17.65
19.5	23.90	46.04	19.6	54.07	33.63	19.6	44.82	15.39	19.7	8.42	47.34	19.7	17.96	17.70
20.5	23.98	46.42	20.6	54.55	34.00	20.6	44.97	15.63	20.7	8.71	47.53	20.7	18.28	17.75
21.5	24.04	46.78	21.6	55.00	34.34	21.6	45.13	15.90	21.7	8.97	47.71	21.7	18.56	17.81
22.5	24.11	47.14	22.6	55.43	34.68	22.6	45.27	16.18	22.7	9.24	47.90	22.7	18.85	17.86
23.5	24.18	47.48	23.6	55.88	35.01	23.6	45.41	16.50	23.7	9.48	48.08	23.7	19.12	17.91
24.5	24.25	47.83	24.6	56.33	35.33	24.6	45.52	16.82	24.7	9.73	48.25	24.7	19.40	17.95
25.5	24.33	48.17	25.6	56.80	35.65	25.6	45.63	17.14	25.7	9.98	48.40	25.7	19.67	18.00
26.5	24.41	48.51	26.6	57.31	35.97	26.6	45.72	17.46	26.7	10.25	48.56	26.7	19.95	18.04
27.5	24.50	48.85	27.5	57.82	36.30	27.6	45.81	17.77	27.7	10.52	48.72	27.7	20.24	18.07
28.5	24.59	49.21	28.5	58.35	36.63	28.5	45.87	18.08	28.7	10.80	48.89	28.7	20.54	18.09
29.5	24.69	49.58	29.5	58.87	36.99	29.5	45.94	18.39	29.6	11.08	49.07	29.7	20.85	18.13
30.5	24.77	49.96	30.5	59.38	37.35	30.5	46.01	18.69	30.6	11.37	49.25	30.7	21.16	18.19
31.5	24.85	50.34	31.5	59.86	37.72	31.5	46.08	18.98	31.6	11.66	49.45	31.7	21.48	18.27
13.80		+13.77	51.73		+51.72	11.84		−11.80	12.33		+12.29	11.84		+11.80
0h	57m	55s.489	1h	33m	11s.898	1h	41m	39s.995	4h	11m	48s.583	5h	37m	5s.478
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Sept.	5 44	−84 49	Sept.	6 46	−80 43	Sept.	7 4	+87 9	Sept.	7 13	−86 54	Sept.	7 14	+82 33
0.8	52.89	27.93	0.8	22.18	55.92	0.8	55.28	56.14	0.9	54.10	42.58	0.9	58.33	26.92
1.8	53.11	27.84	1.8	22.29	55.76	1.8	55.70	55.94	1.9	54.41	42.39	1.9	58.48	26.70
2.8	53.34	27.76	2.8	22.40	55.59	2.8	56.13	55.73	2.8	54.70	42.21	2.9	58.65	26.48
3.8	53.54	27.67	3.8	22.51	55.43	3.8	56.59	55.52	3.8	54.99	42.02	3.8	58.83	26.26
4.8	53.75	27.57	4.8	22.63	55.26	4.8	57.06	55.32	4.8	55.26	41.84	4.8	59.01	26.06
5.8	53.96	27.46	5.8	22.74	55.10	5.8	57.57	55.13	5.8	55.54	41.64	5.8	59.19	25.86
6.8	54.18	27.35	6.8	22.84	54.92	6.8	58.06	54.97	6.8	55.82	41.44	6.8	59.38	25.69
7.8	54.40	27.25	7.8	22.95	54.73	7.8	58.54	54.83	7.8	56.11	41.21	7.8	59.56	25.54
8.8	54.63	27.14	8.8	23.08	54.53	8.8	59.00	54.70	8.8	56.42	40.99	8.8	59.75	25.40
9.8	54.87	27.04	9.8	23.20	54.35	9.8	59.44	54.57	9.8	56.75	40.77	9.8	59.92	25.26
10.8	55.12	26.97	10.8	23.33	54.19	10.8	59.87	54.44	10.8	57.11	40.57	10.8	60.08	25.11
11.8	55.38	26.91	11.8	23.46	54.04	11.8	60.30	54.29	11.8	57.48	40.39	11.8	60.23	24.94
12.8	55.63	26.87	12.8	23.59	53.93	12.8	60.73	54.12	12.8	57.85	40.24	12.8	60.40	24.77
13.8	55.87	26.86	13.8	23.72	53.83	13.8	61.18	53.95	13.8	58.22	40.10	13.8	60.57	24.59
14.8	56.10	26.86	14.8	23.84	53.74	14.8	61.64	53.77	14.8	58.56	39.99	14.8	60.75	24.41
15.8	56.33	26.85	15.8	23.97	53.66	15.8	62.14	53.59	15.8	58.91	39.88	15.8	60.93	24.23
16.7	56.55	26.85	16.8	24.10	53.58	16.8	62.66	53.43	16.8	59.24	39.77	16.8	61.13	24.05
17.7	56.77	26.84	17.8	24.22	53.48	17.8	63.19	53.29	17.8	59.56	39.66	17.8	61.33	23.89
18.7	56.99	26.81	18.8	24.34	53.39	18.8	63.72	53.15	18.8	59.88	39.53	18.8	61.55	23.74
19.7	57.22	26.77	19.8	24.46	53.29	19.8	64.26	53.05	19.8	60.21	39.39	19.8	61.75	23.63
20.7	57.46	26.72	20.8	24.59	53.16	20.8	64.78	52.96	20.8	60.57	39.24	20.8	61.95	23.53
21.7	57.70	26.70	21.8	24.72	53.04	21.8	65.26	52.88	21.8	60.93	39.08	21.8	62.14	23.43
22.7	57.95	26.69	22.8	24.86	52.94	22.8	65.73	52.82	22.8	61.31	38.93	22.8	62.32	23.33
23.7	58.21	26.69	23.8	24.99	52.85	23.8	66.19	52.74	23.8	61.72	38.80	23.8	62.50	23.24
24.7	58.46	26.71	24.8	25.13	52.79	24.8	66.65	52.65	24.8	62.13	38.70	24.8	62.67	23.14
25.7	58.72	26.75	25.8	25.28	52.75	25.8	67.10	52.55	25.8	62.55	38.60	25.8	62.84	23.03
26.7	58.97	26.81	26.8	25.42	52.72	26.8	67.56	52.45	26.8	62.96	38.53	26.8	63.01	22.90
27.7	59.22	26.89	27.8	25.57	52.71	27.8	68.03	52.35	27.8	63.38	38.47	27.8	63.19	22.78
28.7	59.45	26.97	28.8	25.70	52.70	28.8	68.51	52.25	28.8	63.79	38.42	28.8	63.37	22.66
29.7	59.69	27.04	29.8	25.84	52.69	29.8	69.01	52.14	29.8	64.18	38.37	29.8	63.57	22.53
30.7	59.92	27.12	30.8	25.98	52.69	30.8	69.54	52.05	30.8	64.56	38.33	30.8	63.77	22.43
31.7	60.15	27.18	31.8	26.11	52.68	31.8	70.08	51.97	31.8	64.93	38.29	31.8	63.98	22.34
11.09	−11.04		6.21	−6.13		20.22	+20.19		18.56	−18.53		7.72	+7.65	
$5^h\ 45^m\ 4^s.700$			$6^h\ 46^m\ 28^s.850$			$7^h\ 4^m\ 58^s.549$			$7^h\ 14^m\ 18^s.185$			$7^h\ 14^m\ 59^s.083$		
−84° 49′ 38″.84			−80° 44′ 2″.02			+87° 10′ 21″.62			−86° 54′ 45″.50			+82° 33′ 51″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	8 21	+88 51	Sept.	9 7	−85 21	Sept.	9 26	+81 39	Sept.	9 36	−80 35	Sept.	10 21	+82 56
	s	″		s	″		s	″		s	″		s	″
0.9	3.77	28.87	0.9	54.28	32.44	0.9	7.79	49.41	0.9	6.55	52.96	0.9	39.87	51.58
1.9	4.50	28.56	1.9	54.39	32.16	1.9	7.85	49.06	1.9	6.59	52.66	1.9	39.91	51.21
2.9	5.29	28.25	2.9	54.49	31.88	2.9	7.91	48.71	2.9	6.63	52.37	2.9	39.94	50.84
3.9	6.12	27.94	3.9	54.59	31.61	3.9	7.99	48.35	3.9	6.67	52.08	3.9	39.98	50.46
4.9	7.00	27.65	4.9	54.68	31.33	4.9	8.08	48.01	4.9	6.71	51.80	4.9	40.03	50.07
5.9	7.94	27.37	5.9	54.77	31.06	5.9	8.18	47.68	5.9	6.74	51.51	5.9	40.09	49.69
6.9	8.91	27.11	6.9	54.86	30.77	6.9	8.28	47.34	6.9	6.77	51.22	6.9	40.16	49.32
7.9	9.89	26.87	7.9	54.94	30.46	7.9	8.39	47.04	7.9	6.81	50.91	7.9	40.23	48.98
8.9	10.83	26.63	8.9	55.04	30.15	8.9	8.49	46.74	8.9	6.85	50.59	8.9	40.30	48.64
9.9	11.76	26.40	9.9	55.14	29.84	9.9	8.58	46.44	9.9	6.89	50.26	9.9	40.37	48.31
10.9	12.60	26.16	10.9	55.28	29.53	10.9	8.67	46.15	10.9	6.94	49.93	10.9	40.43	47.99
11.9	13.42	25.90	11.9	55.42	29.23	11.9	8.75	45.87	11.9	6.99	49.61	11.9	40.48	47.66
12.9	14.23	25.64	12.9	55.59	28.95	12.9	8.82	45.55	12.9	7.05	49.32	12.9	40.52	47.32
13.9	15.08	25.38	13.9	55.76	28.70	13.9	8.89	45.22	13.9	7.12	49.04	13.9	40.57	46.96
14.9	15.97	25.10	14.9	55.92	28.46	14.9	8.98	44.88	14.9	7.19	48.77	14.9	40.62	46.59
15.9	16.93	24.82	15.9	56.08	28.24	15.9	9.08	44.54	15.9	7.26	48.53	15.9	40.68	46.21
16.9	17.95	24.54	16.9	56.23	28.02	16.9	9.19	44.19	16.9	7.33	48.29	16.9	40.76	45.82
17.9	19.05	24.27	17.9	56.37	27.79	17.9	9.31	43.85	17.9	7.40	48.04	17.9	40.85	45.43
18.9	20.16	24.03	18.9	56.51	27.55	18.9	9.43	43.53	18.9	7.47	47.78	18.9	40.95	45.06
19.8	21.27	23.81	19.9	56.65	27.29	19.9	9.56	43.24	19.9	7.53	47.52	19.9	41.05	44.71
20.8	22.36	23.61	20.9	56.80	27.02	20.9	9.68	42.95	20.9	7.58	47.25	20.9	41.15	44.37
21.8	23.43	23.41	21.9	56.95	26.75	21.9	9.79	42.67	21.9	7.66	46.96	21.9	41.26	44.05
22.8	24.45	23.22	22.9	57.13	26.48	22.9	9.90	42.40	22.9	7.74	46.67	22.9	41.35	43.73
23.8	25.43	23.03	23.9	57.31	26.21	23.9	10.00	42.14	23.9	7.82	46.38	23.9	41.43	43.41
24.8	26.39	22.84	24.9	57.51	25.96	24.9	10.11	41.87	24.9	7.90	46.11	24.9	41.52	43.10
25.8	27.34	22.64	25.9	57.72	25.72	25.9	10.21	41.60	25.9	7.98	45.84	25.9	41.61	42.78
26.8	28.30	22.43	26.9	57.94	25.50	26.9	10.31	41.32	26.9	8.08	45.60	26.9	41.69	42.46
27.8	29.30	22.21	27.9	58.16	25.30	27.9	10.42	41.04	27.9	8.18	45.36	27.9	41.77	42.13
28.8	30.32	21.99	28.9	58.39	25.11	28.9	10.53	40.75	28.9	8.28	45.13	28.9	41.86	41.79
29.8	31.39	21.77	29.9	58.60	24.93	29.9	10.65	40.45	29.9	8.38	44.93	29.9	41.95	41.44
30.8	32.51	21.55	30.9	58.80	24.75	30.9	10.78	40.16	30.9	8.47	44.72	30.9	42.05	41.09
31.8	33.67	21.35	31.8	59.01	24.58	31.9	10.91	39.86	31.9	8.56	44.53	31.9	42.16	40.74
50.13	+50.12		12.36	−12.32		6.90	+6.82		6.12	−6.04		8.14	+8.08	
$8^h\ 21^m\ 41^s.998$			$9^h\ 8^m\ 8^s.703$			$9^h\ 26^m\ 14^s.295$			$9^h\ 36^m\ 12^s.346$			$10^h\ 21^m\ 50^s.081$		
+88° 51′ 51″.95			−85° 21′ 25″.35			+81° 40′ 7″.28			−80° 35′ 44″.11			+82° 57′ 4″.81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

	η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Sept.	10 59	−84 10	Sept.	12 13	+88 7	Sept.	12 46	−84 42	Sept.	12 48	+83 49	Sept.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
1.0	45.75	61.95	1.1	39.41	34.51	1.1	41.26	39.62	1.1	18.70	55.46	1.1	10.21	54.24
2.0	45.74	61.65	2.1	39.12	34.15	2.1	41.15	39.35	2.1	18.59	55.15	2.1	10.04	54.01
3.0	45.72	61.36	3.1	38.84	33.79	3.1	41.05	39.11	3.1	18.48	54.82	3.1	9.89	53.79
4.0	45.71	61.07	4.1	38.59	33.42	4.1	40.94	38.86	4.1	18.37	54.47	4.1	9.73	53.57
5.0	45.69	60.79	5.1	38.37	33.04	5.1	40.83	38.61	5.1	18.27	54.11	5.1	9.58	53.37
6.0	45.68	60.49	6.1	38.19	32.66	6.1	40.72	38.36	6.1	18.18	53.75	6.1	9.40	53.16
6.9	45.65	60.18	7.0	38.05	32.27	7.1	40.59	38.12	7.1	18.12	53.39	7.1	9.22	52.94
7.9	45.62	59.87	8.0	37.94	31.90	8.1	40.46	37.86	8.1	18.05	53.04	8.1	9.04	52.72
8.9	45.59	59.54	9.0	37.83	31.55	9.1	40.33	37.58	9.1	17.99	52.70	9.1	8.86	52.48
9.9	45.58	59.20	10.0	37.71	31.21	10.1	40.21	37.29	10.1	17.93	52.37	10.1	8.67	52.22
10.9	45.58	58.85	11.0	37.58	30.87	11.1	40.10	36.98	11.1	17.85	52.04	11.1	8.49	51.95
11.9	45.59	58.50	12.0	37.42	30.54	12.1	40.00	36.67	12.1	17.77	51.72	12.1	8.34	51.66
12.9	45.62	58.17	13.0	37.24	30.18	13.1	39.93	36.35	13.1	17.68	51.40	13.1	8.20	51.37
13.9	45.66	57.85	14.0	37.04	29.82	14.1	39.87	36.04	14.1	17.59	51.07	14.1	8.09	51.09
14.9	45.71	57.55	15.0	36.83	29.45	15.1	39.81	35.75	15.1	17.50	50.71	15.1	7.98	50.81
15.9	45.75	57.26	16.0	36.64	29.04	16.0	39.76	35.47	16.0	17.41	50.33	16.1	7.89	50.56
16.9	45.80	56.99	17.0	36.51	28.63	17.0	39.71	35.20	17.0	17.34	49.94	17.1	7.79	50.31
17.9	45.84	56.72	18.0	36.42	28.22	18.0	39.66	34.94	18.0	17.28	49.55	18.1	7.68	50.07
18.9	45.87	56.44	19.0	36.38	27.81	19.0	39.60	34.67	19.0	17.23	49.16	19.1	7.55	49.83
19.9	45.88	56.13	20.0	36.37	27.43	20.0	39.52	34.39	20.0	17.20	48.76	20.1	7.43	49.56
20.9	45.91	55.81	21.0	36.38	27.04	21.0	39.44	34.10	21.0	17.17	48.38	21.1	7.30	49.29
21.9	45.94	55.49	22.0	36.39	26.67	22.0	39.35	33.78	22.0	17.14	48.01	22.1	7.16	49.00
22.9	45.98	55.15	23.0	36.39	26.33	23.0	39.29	33.46	23.0	17.11	47.67	23.1	7.03	48.68
23.9	46.03	54.81	24.0	36.38	25.98	24.0	39.23	33.12	24.0	17.07	47.33	24.1	6.92	48.37
24.9	46.09	54.48	24.9	36.34	25.63	25.0	39.18	32.78	25.0	17.03	46.99	25.0	6.82	48.04
25.9	46.15	54.15	25.9	36.31	25.27	26.0	39.14	32.44	26.0	16.98	46.65	26.0	6.73	47.71
26.9	46.24	53.83	26.9	36.26	24.91	27.0	39.13	32.10	27.0	16.94	46.30	27.0	6.65	47.38
27.9	46.33	53.52	27.9	36.21	24.54	28.0	39.11	31.77	28.0	16.90	45.94	28.0	6.59	47.06
28.9	46.43	53.23	28.9	36.16	24.16	29.0	39.11	31.45	29.0	16.85	45.58	29.0	6.54	46.73
29.9	46.53	52.95	29.9	36.14	23.78	30.0	39.11	31.14	30.0	16.80	45.20	30.0	6.49	46.43
30.9	46.62	52.68	30.9	36.14	23.37	31.0	39.12	30.85	31.0	16.77	44.79	31.0	6.45	46.13
31.9	46.71	52.42	31.9	36.17	22.97	32.0	39.12	30.55	32.0	16.76	44.39	32.0	6.41	45.85
	9.87	−9.81		30.56	+30.54		10.85	−10.80		9.31	+9.25		12.46	−12.42
	10^h 59^m	$53^s.036$		12^h 14^m	$30^s.802$		12^h 46^m	$43^s.161$		12^h 48^m	$33^s.111$		13^h 28^m	$9^s.628$
	−84° 10′	46″.79		+88° 7′	36″.40		−84° 42′	20″.01		+83° 49′	52″.98		−85° 23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Sept.	14 14	−83 19	Sept.	15 1	+87 31	Sept.	15 25	−84 12	Sept.	16 53	+82 10	Sept.	17 17	−80 47
	s	″		s	″		s	″		s	″		s	″
1.1	26.92	21.21	1.2	15.39	62.74	1.2	24.79	63.30	1.3	44.42	23.21	1.3	10.62	40.50
2.1	26.78	21.02	2.2	14.86	62.57	2.2	24.61	63.20	2.3	44.24	23.24	2.3	10.51	40.53
3.1	26.65	20.84	3.2	14.33	62.39	3.2	24.43	63.10	3.3	44.06	23.25	3.3	10.40	40.56
4.1	26.52	20.66	4.2	13.80	62.19	4.2	24.26	63.02	4.2	43.87	23.25	4.3	10.30	40.61
5.1	26.40	20.49	5.2	13.28	61.97	5.2	24.08	62.93	5.2	43.69	23.22	5.3	10.19	40.67
6.1	26.27	20.34	6.2	12.80	61.75	6.2	23.90	62.85	6.2	43.51	23.18	6.3	10.07	40.74
7.1	26.12	20.17	7.2	12.33	61.52	7.2	23.71	62.77	7.2	43.34	23.12	7.3	9.94	40.81
8.1	25.98	20.00	8.2	11.89	61.29	8.2	23.52	62.68	8.2	43.16	23.05	8.3	9.82	40.87
9.1	25.82	19.82	9.2	11.46	61.06	9.2	23.32	62.59	9.2	42.98	22.99	9.3	9.69	40.93
10.1	25.67	19.62	10.2	11.03	60.84	10.2	23.10	62.47	10.2	42.81	22.92	10.2	9.56	40.98
11.1	25.52	19.39	11.2	10.60	60.64	11.2	22.89	62.34	11.2	42.65	22.87	11.2	9.41	41.00
12.1	25.38	19.14	12.2	10.15	60.44	12.2	22.69	62.17	12.2	42.48	22.83	12.2	9.28	41.00
13.1	25.26	18.89	13.2	9.69	60.24	13.2	22.50	62.00	13.2	42.31	22.80	13.2	9.14	40.96
14.1	25.15	18.64	14.1	9.21	60.04	14.2	22.33	61.81	14.2	42.13	22.78	14.2	9.00	40.92
15.1	25.05	18.39	15.1	8.70	59.82	15.2	22.18	61.63	15.2	41.94	22.74	15.2	8.90	40.89
16.1	24.96	18.16	16.1	8.19	59.58	16.2	22.03	61.47	16.2	41.75	22.70	16.2	8.79	40.85
17.1	24.86	17.94	17.1	7.71	59.32	17.2	21.89	61.32	17.2	41.57	22.62	17.2	8.68	40.83
18.1	24.76	17.74	18.1	7.23	59.05	18.2	21.74	61.19	18.2	41.38	22.53	18.2	8.58	40.82
19.1	24.66	17.54	19.1	6.80	58.77	19.1	21.57	61.05	19.2	41.20	22.42	19.2	8.45	40.81
20.1	24.54	17.31	20.1	6.38	58.49	20.1	21.40	60.91	20.2	41.02	22.29	20.2	8.33	40.81
21.1	24.43	17.08	21.1	6.01	58.20	21.1	21.22	60.75	21.2	40.85	22.16	21.2	8.20	40.80
22.1	24.30	16.82	22.1	5.63	57.93	22.1	21.04	60.57	22.2	40.68	22.03	22.2	8.07	40.77
23.1	24.18	16.55	23.1	5.26	57.67	23.1	20.86	60.38	23.2	40.52	21.92	23.2	7.93	40.74
24.1	24.07	16.27	24.1	4.89	57.41	24.1	20.67	60.16	24.2	40.35	21.81	24.2	7.79	40.69
25.1	23.97	15.99	25.1	4.50	57.16	25.1	20.49	59.94	25.2	40.20	21.71	25.2	7.64	40.61
26.1	23.87	15.69	26.1	4.12	56.91	26.1	20.32	59.72	26.2	40.03	21.61	26.2	7.51	40.52
27.1	23.78	15.39	27.1	3.72	56.66	27.1	20.17	59.48	27.2	39.86	21.50	27.2	7.37	40.42
28.1	23.69	15.10	28.1	3.31	56.39	28.1	20.02	59.24	28.2	39.69	21.40	28.2	7.24	40.32
29.1	23.63	14.80	29.1	2.91	56.12	29.1	19.88	58.99	29.2	39.52	21.29	29.2	7.12	40.21
30.1	23.57	14.51	30.1	2.50	55.85	30.1	19.75	58.75	30.2	39.35	21.16	30.2	7.01	40.09
31.1	23.51	14.23	31.1	2.09	55.56	31.1	19.63	58.52	31.2	39.18	21.02	31.2	6.90	39.99
32.1	23.45	13.96	32.1	1.70	55.24	32.1	19.51	58.30	32.2	39.00	20.87	32.2	6.79	39.89
8.60		−8.54	23.23		+23.21	9.92		−9.87	7.34		+7.27	6.25		−6.17
14^h	14^m	$23^s.592$	15^h	1^m	$45^s.970$	15^h	25^m	$17^s.036$	16^h	53^m	$48^s.037$	17^h	17^m	$1^s.936$
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Sept.	17 56	+86 37	Sept.	18 10	−87 39	Sept.	18 54	+89 1	Sept.	19 38	−89 12	Sept.	20 48	+82 15
	s	″		s	″		s	″		s	″		s	″
1.3	61.36	16.72	1.3	19.31	56.37	1.3	94.67	59.05	1.4	44.82	41.75	1.4	24.30	13.47
2.3	60.95	16.85	2.3	18.86	56.48	2.3	93.41	59.25	2.4	43.78	41.96	2.4	24.22	13.81
3.3	60.54	16.95	3.3	18.43	56.61	3.3	92.10	59.45	3.4	42.79	42.16	3.4	24.12	14.14
4.3	60.12	17.05	4.3	18.00	56.73	4.3	90.73	59.63	4.4	41.84	42.37	4.4	24.02	14.49
5.3	59.68	17.12	5.3	17.58	56.86	5.3	89.32	59.80	5.4	40.90	42.59	5.4	23.91	14.82
6.3	59.25	17.18	6.3	17.16	57.00	6.3	87.89	59.95	6.4	39.97	42.81	6.4	23.80	15.13
7.3	58.82	17.23	7.3	16.71	57.13	7.3	86.47	60.09	7.4	39.01	43.05	7.4	23.68	15.42
8.3	58.40	17.27	8.3	16.25	57.27	8.3	85.07	60.22	8.4	37.98	43.29	8.4	23.57	15.70
9.3	58.00	17.30	9.3	15.77	57.40	9.3	83.71	60.34	9.3	36.86	43.53	9.4	23.45	15.97
10.3	57.62	17.33	10.3	15.25	57.52	10.3	82.40	60.46	10.3	35.64	43.76	10.4	23.34	16.23
11.3	57.22	17.37	11.3	14.71	57.62	11.3	81.14	60 59	11.3	34.34	43.97	11.4	23.23	16.49
12.3	56.83	17.42	12.3	14.15	57.71	12.3	79.89	60.73	12.3	32.98	44.16	12.4	23.13	16.77
13.3	56.42	17.49	13.3	13.62	57.76	13.3	78.60	60.90	13.3	31.61	44.33	13.4	23.02	17.06
14.3	56.01	17.57	14.3	13.11	57.81	14.3	77.25	61.07	14.3	30.28	44.48	14.4	22.91	17.38
15.3	55.58	17.65	15.3	12.64	57.84	15.3	75.83	61.23	15.3	29.01	44.63	15.4	22.80	17.70
16.3	55.13	17.71	16.3	12.18	57.87	16.3	74.35	61.38	16.3	27.82	44.78	16.4	22.67	18.02
17.3	54.68	17.76	17.3	11.74	57.91	17.3	72.82	61.52	17.3	26.67	44.92	17.4	22.54	18.32
18.3	54.23	17.77	18.3	11.31	57.96	18.3	71.26	61.63	18.3	25.53	45.09	18.4	22.41	18.61
19.3	53.77	17.76	19.3	10.85	58.02	19.3	69.70	61.73	19.3	24.38	45.26	19.4	22.27	18.87
20.2	53.34	17.73	20.3	10.36	58.09	20.3	68.18	61.82	20.3	23.16	45.43	20.4	22.13	19.11
21.2	52.90	17.69	21.3	9.85	58.15	21.3	66.72	61.88	21.3	21.87	45.61	21.4	21.99	19.35
22.2	52.49	17.66	22.3	9.31	58.21	22.3	65.30	61.94	22.3	20.47	45.78	22.4	21.85	19.58
23.2	52.11	17.65	23.3	8.75	58.26	23.3	63.93	62.00	23.3	18.99	45.94	23.4	21.71	19.80
24.2	51.71	17.63	24.2	8.18	58.28	24.3	62.58	62.09	24.3	17.47	46.09	24.4	21.58	20.02
25.2	51.32	17.62	25.2	7.60	58.29	25.3	61.24	62.17	25.3	15.90	46.22	25.4	21.45	20.25
26.2	50.91	17.61	26.2	7.03	58.28	26.3	59.88	62.26	26.3	14.33	46.33	26.4	21.32	20.49
27.2	50.51	17.61	27.2	6.47	58.27	27.3	58.50	62.35	27.3	12.77	46.41	27.4	21.20	20.73
28.2	50.09	17.61	28.2	5.94	58.23	28.3	57.08	62.44	28.3	11.22	46.53	28.3	21.07	20.97
29.2	49.67	17.61	29.2	5.42	58.20	29.3	55.63	62.53	29.3	9.70	46.62	29.3	20.94	21.22
30.2	49.23	17.60	30.2	4.91	58.15	30.3	54.14	62.61	30.3	8.23	46.69	30.3	20.79	21.48
31.2	48.80	17.57	31.2	4.44	58.09	31.3	52.60	62.67	31.3	6.81	46.77	31.3	20.64	21.72
32.2	48.34	17.52	32.2	3.96	58.04	32.3	51.02	62.73	32.3	5.44	46.85	32.3	20.49	21.96
16.97		+16.94	24.56		−24.54	59.29		+59.28	72.75		−72.74	7.42		+7.35
17^h	57^m	$4^s.326$	18^h	9^m	$46^s.186$	18^h	55^m	$23^s.393$	19^h	37^m	$1^s.735$	20^h	48^m	$15^s.385$
+86°	36′	50″.43	−87°	39′	48″.39	+89°	1′	32″.83	−89°	12′	41″.41	+82°	14′	50″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	21 39	−83 4	Sept.	22 17	−86 21	Sept.	22 38	−81 46	Sept.	23 28	+86 53	Sept.	23 47	−82 26
	s	″		s	″		s	″		s	″		s	″
1.5	28.29	17.81	1.5	40.82	24.88	1.5	25.54	54.16	1.5	14.96	6.05	1.5	44.89	29.21
2.5	28.25	18.10	2.5	40.79	25.17	2.5	25.54	54.45	2.5	15.05	6.43	2.5	44.94	29.49
3.5	28.22	18.38	3.5	40.78	25.45	3.5	25.55	54.73	3.5	15.12	6.82	3.5	45.00	29.76
4.4	28.19	18.65	4.5	40.77	25.73	4.5	25.56	55.01	4.5	15.18	7.21	4.5	45.06	30.03
5.4	28.16	18.93	5.5	40.77	26.02	5.5	25.58	55.29	5.5	15.23	7.61	5.5	45.12	30.29
6.4	28.15	19.21	6.5	40.77	26.31	6.5	25.60	55.58	6.5	15.24	8.00	6.5	45.18	30.55
7.4	28.14	19.50	7.5	40.78	26.62	7.5	25.62	55.88	7.5	15.25	8.40	7.5	45.24	30.82
8.4	28.10	19.82	8.5	40.78	26.94	8.5	25.64	56.19	8.5	15.24	8.78	8.5	45.31	31.11
9.4	28.06	20.14	9.5	40.75	27.27	9.5	25.64	56.52	9.5	15.22	9.15	9.5	45.37	31.43
10.4	28.01	20.46	10.5	40.70	27.61	10.5	25.63	56.85	10.5	15.21	9.48	10.5	45.42	31.75
11.4	27.93	20.78	11.5	40.62	27.94	11.5	25.62	57.19	11.5	15.21	9.83	11.5	45.46	32.08
12.4	27.85	21.08	12.5	40.53	28.27	12.5	25.59	57.51	12.5	15.22	10.18	12.5	45.47	32.41
13.4	27.77	21.36	13.5	40.43	28.58	13.5	25.55	57.82	13.5	15.26	10.55	13.5	45.48	32.74
14.4	27.68	21.61	14.4	40.31	28.87	14.5	25.51	58.12	14.5	15.29	10.92	14.5	45.49	33.05
15.4	27.60	21.86	15.4	40.20	29.15	15.5	25.48	58.41	15.5	15.33	11.33	15.5	45.49	33.34
16.4	27.54	22.10	16.4	40.10	29.41	16.5	25.46	58.67	16.5	15.34	11.73	16.5	45.50	33.62
17.4	27.47	22.35	17.4	40.01	29.67	17.5	25.43	58.93	17.5	15.33	12.15	17.5	45.52	33.89
18.4	27.41	22.60	18.4	39.93	29.94	18.5	25.42	59.20	18.5	15.28	12.56	18.5	45.55	34.17
19.4	27.35	22.87	19.4	39.86	30.21	19.4	25.41	59.49	19.5	15.23	12.95	19.5	45.58	34.46
20.4	27.29	23.15	20.4	39.78	30.52	20.4	25.38	59.80	20.5	15.14	13.34	20.5	45.61	34.77
21.4	27.21	23.44	21.4	39.69	30.83	21.4	25.35	60.11	21.5	15.05	13.71	21.5	45.63	35.08
22.4	27.13	23.73	22.4	39.57	31.14	22.4	25.32	60.44	22.5	14.97	14.07	22.5	45.64	35.41
23.4	27.03	24.02	23.4	39.44	31.46	23.4	25.27	60.76	23.5	14.89	14.43	23.5	45.64	35.75
24.4	26.92	24.31	24.4	39.29	31.78	24.4	25.21	61.08	24.5	14.81	14.77	24.5	45.64	36.10
25.4	26.79	24.59	25.4	39.11	32.08	25.4	25.15	61.40	25.5	14.75	15.11	25.5	45.62	36.44
26.4	26.67	24.84	26.4	38.93	32.37	26.4	25.09	61.71	26.5	14.69	15.48	26.5	45.59	36.78
27.4	26.55	25.09	27.4	38.74	32.66	27.4	25.02	62.01	27.5	14.64	15.83	27.5	45.56	37.12
28.4	26.43	25.34	28.4	38.55	32.94	28.4	24.95	62.29	28.5	14.58	16.19	28.5	45.52	37.44
29.4	26.31	25.56	29.4	38.35	33.19	29.4	24.88	62.57	29.5	14.51	16.56	29.5	45.49	37.75
30.4	26.19	25.77	30.4	38.16	33.44	30.4	24.81	62.83	30.5	14.43	16.95	30.5	45.46	38.05
31.4	26.08	25.97	31.4	37.98	33.69	31.4	24.75	63.09	31.4	14.34	17.34	31.5	45.43	38.34
32.4	25.98	26.19	32.4	37.80	33.93	32.4	24.68	63.34	32.4	14.24	17.73	32.5	45.40	38.63
8.29		−8.23	15.74		−15.71	7.00		−6.92	18.41		+18.38	7.60		−7.54
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Oct.	0 58	+85 50	Oct.	1 34	+88 53	Oct.	1 41	−85 9	Oct.	4 12	+85 20	Oct.	5 37	+85 9
0.5	24.77	49.96	0.5	59.38	37.35	0.5	46.01	18.69	0.6	11.37	49.25	0.7	21.16	18.19
1.5	24.85	50.34	1.5	59.86	37.72	1.5	46.08	18.98	1.6	11.66	49.45	1.7	21.48	18.27
2.5	24.91	50.74	2.5	60.29	38.10	2.5	46.15	19.26	2.6	11.95	49.68	2.7	21.80	18.35
3.5	24.96	51.15	3.5	60.65	38.51	3.5	46.22	19.54	3.6	12.23	49.91	3.7	22.12	18.45
4.5	24.99	51.56	4.5	60.96	38.90	4.5	46.32	19.82	4.6	12.50	50.16	4.7	22.44	18.58
5.5	25.00	51.95	5.5	61.20	39.29	5.5	46.40	20.10	5.6	12.75	50.42	5.7	22.73	18.71
6.5	25.00	52.34	6.5	61.39	39.67	6.5	46.49	20.41	6.6	12.99	50.67	6.7	23.02	18.84
7.5	25.00	52.70	7.5	61.59	40.04	7.5	46.55	20.74	7.6	13.21	50.92	7.7	23.29	18.97
8.5	25.00	53.06	8.5	61.81	40.38	8.5	46.62	21.08	8.6	13.43	51.15	8.7	23.55	19.08
9.5	25.01	53.40	9.5	62.07	40.73	9.5	46.67	21.42	9.6	13.66	51.37	9.7	23.82	19.18
10.5	25.05	53.75	10.5	62.38	41.07	10.5	46.70	21.77	10.6	13.90	51.57	10.7	24.09	19.27
11.5	25.10	54.11	11.5	62.74	41.44	11.5	46.71	22.11	11.6	14.15	51.79	11.7	24.38	19.35
12.5	25.15	54.49	12.5	63.11	41.81	12.5	46.70	22.44	12.6	14.42	52.01	12.7	24.69	19.44
13.5	25.19	54.89	13.5	63.45	42.20	13.5	46.70	22.75	13.6	14.69	52.24	13.7	25.01	19.55
14.5	25.21	55.30	14.5	63.74	42.60	14.5	46.70	23.04	14.6	14.97	52.49	14.7	25.34	19.67
15.5	25.22	55.71	15.5	63.96	43.02	15.5	46.70	23.32	15.6	15.24	52.77	15.7	25.65	19.81
16.5	25.21	56.12	16.5	64.11	43.43	16.5	46.71	23.60	16.6	15.48	53.06	16.7	25.95	19.98
17.5	25.17	56.53	17.5	64.17	43.84	17.5	46.73	23.91	17.6	15.72	53.35	17.7	26.24	20.15
18.5	25.12	56.90	18.5	64.19	44.22	18.5	46.75	24.23	18.6	15.93	53.64	18.7	26.52	20.34
19.5	25.07	57.27	19.5	64.18	44.60	19.5	46.77	24.55	19.6	16.12	53.94	19.7	26.79	20.52
20.5	25.01	57.61	20.5	64.16	44.96	20.5	46.78	24.89	20.6	16.31	54.22	20.7	27.03	20.70
21.5	24.96	57.95	21.5	64.16	45.32	21.5	46.78	25.23	21.6	16.49	54.48	21.7	27.27	20.86
22.5	24.91	58.29	22.5	64.19	45.66	22.5	46.76	25.59	22.6	16.67	54.74	22.6	27.51	21.02
23.5	24.87	58.63	23.5	64.22	46.00	23.5	46.73	25.95	23.6	16.86	55.00	23.6	27.76	21.17
24.5	24.83	58.97	24.5	64.26	46.35	24.5	46.69	26.29	24.6	17.05	55.26	24.6	28.01	21.32
25.4	24.80	59.33	25.5	64.32	46.70	25.5	46.65	26.63	25.6	17.25	55.52	25.6	28.26	21.47
26.4	24.77	59.69	26.5	64.38	47.06	26.5	46.59	26.96	26.6	17.46	55.78	26.6	28.53	21.64
27.4	24.74	60.05	27.5	64.43	47.44	27.5	46.52	27.29	27.6	17.66	56.05	27.6	28.80	21.81
28.4	24.69	60.42	28.5	64.45	47.83	28.5	46.45	27.60	28.6	17.88	56.33	28.6	29.08	22.00
29.4	24.63	60.80	29.5	64.43	48.22	29.5	46.39	27.89	29.6	18.09	56.65	29.6	29.35	22.20
30.4	24.56	61.18	30.5	64.35	48.61	30.5	46.33	28.19	30.6	18.29	56.97	30.6	29.63	22.41
31.4	24.47	61.57	31.5	64.21	49.02	31.5	46.28	28.47	31.6	18.48	57.31	31.6	29.90	22.64
13.81	+13.78		51.87	+51.86		11.84	−11.80		12.33	+12.29		11.84	+11.80	
$0^h\ 57^m\ 55^s.489$			$1^h\ 33^m\ 11^s.898$			$1^h\ 41^m\ 39^s.995$			$4^h\ 11^m\ 48^s.583$			$5^h\ 37^m\ 5^s.478$		
+85° 50′ 41″.77			+88° 53′ 34″.33			−85° 9′ 32″.70			+85° 21′ 5″.69			+85° 9′ 42″.71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Oct.	5 44	−84 49	Oct.	6 46	−80 43	Oct.	7 5	+87 9	Oct.	7 14	−86 54	Oct.	7 15	+82 33
0.7	59.92	27.12	0.8	25.98	52.69	0.8	9.54	52.05	0.8	4.56	38.33	0.8	3.77	22 43
1.7	60.15	27.18	1.8	26.11	52.68	1.8	10.08	51.97	1.8	4.93	38.29	1.8	3.98	22.34
2.7	60.37	27.25	2.7	26.24	52.68	2.8	10.64	51.90	2.8	5.30	38.25	2.8	4.18	22.25
3.7	60.59	27.32	3.7	26.37	52.66	3.8	11.20	51.84	3.8	5.67	38.21	3.8	4.41	22.19
4.7	60.81	27.37	4.7	26.49	52.64	4.8	11.75	51.80	4.8	6.04	38.15	4.8	4.63	22.14
5.7	61.04	27.42	5.7	26.63	52.62	5.8	12.28	51.79	5.8	6.42	38.09	5.8	4.83	22.10
6.7	61.27	27.48	6.7	26.77	52.60	6.8	12.79	51.78	6.8	6.82	38.02	6.8	5.03	22.06
7.7	61.51	27.57	7.7	26.91	52.59	7.7	13.28	51.77	7.8	7.23	37.97	7.8	5.22	22.03
8.7	61.75	27.67	8.7	27.05	52.60	8.7	13.76	51.73	8.8	7.66	37.95	8.8	5.40	21.99
9.7	62.00	27.79	9.7	27.20	52.64	9.7	14.24	51.71	9.7	8.09	37.94	9.8	5.58	21.94
10.7	62.24	27.93	10.7	27.35	52.71	10.7	14.72	51.67	10.7	8.51	37.97	10.7	5.77	21.88
11.7	62.46	28.11	11.7	27.48	52.80	11.7	15.23	51.62	11.7	8.93	38.00	11.7	5.96	21.81
12.7	62.66	28.29	12.7	27.62	52.90	12.7	15.75	51.57	12.7	9.32	38.05	12.7	6.16	21.74
13.7	62.86	28.45	13.7	27.75	52.99	13.7	16.30	51.52	13.7	9.71	38.11	13.7	6.38	21.67
14.7	63.06	28.61	14.7	27.87	53.07	14.7	16.87	51.50	14.7	10.08	38.16	14.7	6.60	21.62
15.7	63.26	28.76	15.7	28.00	53.15	15.7	17.45	51.49	15.7	10.44	38.20	15.7	6.83	21.60
16.7	63.45	28.90	16.7	28.12	53.21	16.7	18.03	51.50	16.7	10.80	38.22	16.7	7.05	21.59
17.7	63.65	29.03	17.7	28.26	53.27	17.7	18.58	51.54	17.7	11.17	38.25	17.7	7.25	21.59
18.7	63.87	29.16	18.7	28.39	53.33	18.7	19.10	51.58	18.7	11.56	38.26	18.7	7.46	21.62
19.7	64.09	29.30	19.7	28.52	53.41	19.7	19.60	51.63	19.7	11.96	38.29	19.7	7.66	21.66
20.7	64.32	29.48	20.7	28.65	53.49	20.7	20.08	51.67	20.7	12.38	38.32	20.7	7.85	21.69
21.7	64.54	29.65	21.7	28.79	53.59	21.7	20.54	51.72	21.7	12.80	38.37	21.7	8.04	21.70
22.7	64.74	29.84	22.7	28.94	53.72	22.7	21.01	51.76	22.7	13.22	38.46	22.7	8.22	21.72
23.6	64.95	30.06	23.7	29.08	53.85	23.7	21.48	51.80	23.7	13.65	38.54	23.7	8.40	21.73
24.6	65.16	30.28	24.7	29.22	53.99	24.7	21.95	51.82	24.7	14.07	38.64	24.7	8.58	21.74
25.6	65.36	30.51	25.7	29.35	54.16	25.7	22.43	51.85	25.7	14.47	38.77	25.7	8.77	21.74
26.6	65.55	30.75	26.7	29.47	54.33	26.7	22.94	51.88	26.7	14.86	38.90	26.7	8.96	21.74
27.6	65.72	30.99	27.7	29.60	54.50	27.7	23.45	51.92	27.7	15.24	39.03	27.7	9.15	21.75
28.6	65.89	31.23	28.7	29.73	54.68	28.7	23.98	51.96	28.7	15.61	39.16	28.7	9.36	21.78
29.6	66.06	31.47	29.7	29.83	54.85	29.7	24.51	52.01	29.7	15.97	39.29	29.7	9.58	21.82
30.6	66.21	31.70	30.7	29.94	55.00	30.7	25.04	52.09	30.7	16.31	39.42	30.7	9.80	21.87
31.6	66.38	31.90	31.7	30.05	55.15	31.7	25.58	52.18	31.7	16.65	39.54	31.7	10.00	21.94
11.09	−11.04		6.21	−6.13		20.21	+20.19		18.55	−18.53		7.72	+7.65	
5h 45m	4s.700		6h 46m	28s.850		7h 4m	58s.549		7h 14m	18s.185		7h 14m	59s.083	
−84° 49′	38″.84		−80° 44′	2″.02		+87° 10′	21″.62		−86° 54′	45″.50		+82° 33′	51″.51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Oct.	8 21	+88 51	Oct.	9 7	−85 21	Oct.	9 26	+81 39	Oct.	9 36	−80 35	Oct.	10 21	+82 56
	s	″		s	″		s	″		s	″		s	″
0.8	32.51	21.55	0.9	58.80	24.75	0.9	10.78	40.16	0.9	8.47	44.72	0.9	42.05	41.09
1.8	33.67	21.35	1.8	59.01	24.58	1.9	10.91	39.86	1.9	8.56	44.53	1.9	42.16	40.74
2.8	34.88	21.16	2.8	59.21	24.40	2.9	11.05	39.57	2.9	8.66	44.33	2.9	42.29	40.39
3.8	36.12	20.98	3.8	59.40	24.21	3.9	11.20	39.29	3.9	8.76	44.13	3.9	42.43	40.05
4.8	37.37	20.83	4.8	59.59	24.02	4.9	11.35	39.05	4.9	8.85	43.90	4.9	42.57	39.73
5.8	38.59	20.69	5.8	59.79	23.82	5.9	11.50	38.81	5.9	8.93	43.68	5.9	42.71	39.42
6.8	39.77	20.55	6.8	59.99	23.63	6.9	11.65	38.57	6.9	9.02	43.46	6.9	42.84	39.13
7.8	40.91	20.42	7.8	60.22	23.43	7.8	11.78	38.35	7.9	9.13	43.23	7.9	42.96	38.84
8.8	42.01	20.28	8.8	60.46	23.24	8.8	11.91	38.13	8.8	9.24	43.03	8.9	43.09	38.56
9.8	43.08	20.14	9.8	60.73	23.06	9.8	12.04	37.91	9.8	9.35	42.83	9.9	43.20	38.27
10.8	44.15	19.97	10.8	60.99	22.92	10.8	12.16	37.67	10.8	9.48	42.65	10.9	43.31	37.96
11.8	45.27	19.80	11.8	61.25	22.81	11.8	12.29	37.40	11.8	9.60	42.50	11.9	43.42	37.65
12.8	46.45	19.62	12.8	61.50	22.71	12.8	12.42	37.13	12.8	9.72	42.36	12.9	43.54	37.32
13.8	47.69	19.45	13.8	61.75	22.62	13.8	12.58	36.86	13.8	9.85	42.24	13.9	43.68	36.99
14.8	48.98	19.30	14.8	61.98	22.53	14.8	12.74	36.59	14.8	9.97	42.12	14.9	43.83	36.66
15.8	50.32	19.17	15.8	62.21	22.44	15.8	12.91	36.35	15.8	10.08	42.00	15.9	44.00	36.34
16.8	51.64	19.06	16.8	62.44	22.32	16.8	13.08	36.12	16.8	10.19	41.87	16.9	44.16	36.04
17.8	52.96	18.96	17.8	62.66	22.20	17.8	13.25	35.91	17.8	10.30	41.73	17.9	44.32	35.75
18.8	54.23	18.87	18.8	62.89	22.07	18.8	13.41	35.72	18.8	10.41	41.58	18.9	44.48	35.49
19.8	55.45	18.79	19.8	63.14	21.94	19.8	13.56	35.54	19.8	10.53	41.42	19.9	44.64	35.24
20.8	56.63	18.72	20.8	63.40	21.82	20.8	13.70	35.38	20.8	10.65	41.27	20.9	44.79	35.00
21.8	57.78	18.64	21.8	63.67	21.71	21.8	13.85	35.21	21.8	10.78	41.12	21.8	44.93	34.77
22.8	58.90	18.56	22.8	63.95	21.61	22.8	14.00	35.02	22.8	10.91	40.99	22.8	45.08	34.53
23.8	60.03	18.49	23.8	64.23	21.53	23.8	14.14	34.84	23.8	11.05	40.89	23.8	45.22	34.29
24.8	61.18	18.40	24.8	64.52	21.47	24.8	14.28	34.65	24.8	11.19	40.78	24.8	45.36	34.02
25.7	62.34	18.31	25.8	64.80	21.42	25.8	14.43	34.47	25.8	11.33	40.71	25.8	45.50	33.76
26.7	63.53	18.22	26.8	65.08	21.38	26.8	14.58	34.28	26.8	11.47	40.65	26.8	45.65	33.50
27.7	64.77	18.13	27.8	65.35	21.37	27.8	14.74	34.09	27.8	11.60	40.59	27.8	45.80	33.23
28.7	66.05	18.05	28.8	65.61	21.36	28.8	14.91	33.89	28.8	11.73	40.54	28.8	45.98	32.96
29.7	67.36	17.99	29.8	65.88	21.34	29.8	15.08	33.71	29.8	11.86	40.49	29.8	46.16	32.71
30.7	68.71	17.94	30.8	66.14	21.32	30.8	15.26	33.54	30.8	11.99	40.44	30.8	46.34	32.46
31.7	70.06	17.90	31.8	66.38	21.30	31.8	15.45	33.38	31.8	12.12	40.39	31.8	46.53	32.22
50.06	+50.05		12.35	−12.31		6.89	+6.82		6.12	−6.04		8.14	+8.08	
8^h	21^m	$41^s.998$	9^h	8^m	$8^s.703$	9^h	26^m	$14^s.295$	9^h	36^m	$12^s.346$	10^h	21^m	$50^s.081$
+88°	51′	51″.95	−85°	21′	25″.35	+81°	40′	7″.28	−80°	35′	44″.11	+82°	57′	4″.81

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Oct.	10 59	−84 10	Oct.	12 13	+88 7	Oct.	12 46	−84 42	Oct.	12 48	+83 49	Oct.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
0.9	46.62	52.68	0.9	36.14	23.37	1.0	39.12	30.85	1.0	16.77	44.79	1.0	6.45	46.13
1.9	46.71	52.42	1.9	36.17	22.97	2.0	39.12	30.55	2.0	16.76	44.39	2.0	6.41	45.85
2.9	46.80	52.16	2.9	36.24	22.57	3.0	39.13	30.26	3.0	16.75	43.98	3.0	6.37	45.57
3.9	46.88	51.90	3.9	36.34	22.17	3.9	39.12	29.96	3.9	16.75	43.58	4.0	6.32	45.30
4.9	46.96	51.62	4.9	36.48	21.78	4.9	39.10	29.66	4.9	16.76	43.18	5.0	6.25	45.02
5.9	47.04	51.34	5.9	36.64	21.39	5.9	39.09	29.35	5.9	16.77	42.78	6.0	6.19	44.71
6.9	47.13	51.05	6.9	36.80	21.02	6.9	39.08	29.03	6.9	16.78	42.40	7.0	6.13	44.39
7.9	47.22	50.75	7.9	36.95	20.66	7.9	39.08	28.70	7.9	16.79	42.04	8.0	6.07	44.07
8.9	47.34	50.45	8.9	37.06	20.31	8.9	39.08	28.35	8.9	16.80	41.68	9.0	6.03	43.74
9.9	47.47	50.16	9.9	37.17	19.95	9.9	39.12	28.00	9.9	16.80	41.34	10.0	6.02	43.40
10.9	47.61	49.89	10.9	37.24	19.59	10.9	39.16	27.67	10.9	16.79	40.98	11.0	6.02	43.05
11.9	47.75	49.65	11.9	37.30	19.22	11.9	39.23	27.37	11.9	16.78	40.61	12.0	6.05	42.73
12.9	47.90	49.42	12.9	37.38	18.83	12.9	39.31	27.08	12.9	16.78	40.21	13.0	6.09	42.41
13.9	48.05	49.20	13.9	37.49	18.42	13.9	39.39	26.80	13.9	16.78	39.80	13.9	6.14	42.13
14.9	48.20	49.00	14.9	37.65	18.02	14.9	39.45	26.53	14.9	16.79	39.38	14.9	6.17	41.84
15.9	48.33	48.80	15.9	37.86	17.61	15.9	39.51	26.26	15.9	16.83	38.95	15.9	6.18	41.56
16.9	48.46	48.57	16.9	38.10	17.22	16.9	39.56	25.98	16.9	16.87	38.53	16.9	6.20	41.29
17.9	48.58	48.34	17.9	38.38	16.83	17.9	39.60	25.70	17.9	16.92	38.14	17.9	6.20	41.00
18.9	48.70	48.10	18.9	38.67	16.46	18.9	39.65	25.38	18.9	16.97	37.76	18.9	6.20	40.68
19.9	48.83	47.84	19.9	38.95	16.13	19.9	39.69	25.07	19.9	17.03	37.40	19.9	6.20	40.37
20.9	48.98	47.59	20.9	39.22	15.79	20.9	39.75	24.74	20.9	17.08	37.04	20.9	6.21	40.04
21.9	49.14	47.35	21.9	39.46	15.46	21.9	39.83	24.41	21.9	17.12	36.70	21.9	6.25	39.70
22.9	49.31	47.11	22.9	39.69	15.13	22.9	39.91	24.09	22.9	17.17	36.35	22.9	6.29	39.36
23.9	49.48	46.88	23.9	39.91	14.79	23.9	40.00	23.77	23.9	17.21	36.00	23.9	6.36	39.02
24.9	49.65	46.68	24.9	40.13	14.45	24.9	40.10	23.47	24.9	17.24	35.64	24.9	6.44	38.69
25.9	49.84	46.48	25.9	40.36	14.10	25.9	40.23	23.18	25.9	17.28	35.28	25.9	6.52	38.37
26.9	50.03	46.29	26.9	40.60	13.74	26.9	40.35	22.89	26.9	17.33	34.91	26.9	6.61	38.06
27.9	50.21	46.14	27.9	40.86	13.38	27.9	40.48	22.61	27.9	17.38	34.54	27.9	6.71	37.77
28.9	50.40	45.98	28.9	41.14	13.01	28.9	40.61	22.36	28.9	17.44	34.15	28.9	6.81	37.48
29.9	50.58	45.83	29.9	41.47	12.65	29.9	40.74	22.12	29.9	17.51	33.76	29.9	6.92	37.21
30.8	50.76	45.68	30.9	41.83	12.29	30.9	40.85	21.87	30.9	17.59	33.35	30.9	7.01	36.93
31.8	50.92	45.52	31.9	42.23	11.93	31.9	40.96	21.62	31.9	17.69	32.96	31.9	7.10	36.65
9.86		−9.81	30.51		+30.49	10.84		−10.79	9.30		+9.25	12.46		−12.42
10^h	59^m	$53^s.036$	12^h	14^m	$30^s.802$	12^h	46^m	$43^s.161$	12^h	48^m	$33^s.111$	13^h	28^m	$9^s.628$
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	14 14	−83 19	Oct.	15 0	+87 31	Oct.	15 25	−84 12	Oct.	16 53	+82 10	Oct.	17 17	−80 47
	s	″		s	″		s	″		s	″		s	″
1.1	23.51	14.23	1.1	62.09	55.56	1.1	19.63	58.52	1.2	39.18	21.02	1.2	6.90	39.99
2.1	23.45	13.96	2.1	61.70	55.24	2.1	19.51	58.30	2.2	39.00	20.87	2.2	6.79	39.89
3.1	23.39	13.70	3.1	61.32	54.91	3.1	19.39	58.10	3.2	38.83	20.70	3.2	6.69	39.79
4.1	23.33	13.44	4.1	60.98	54.58	4.1	19.27	57.89	4.2	38.66	20.52	4.2	6.58	39.71
5.1	23.25	13.18	5.1	60.65	54.24	5.1	19.13	57.67	5.2	38.50	20.33	5.2	6.45	39.62
6.1	23.17	12.91	6.1	60.35	53.91	6.1	18.99	57.44	6.2	38.34	20.12	6.2	6.33	39.53
7.1	23.09	12.62	7.1	60.06	53.59	7.1	18.85	57.21	7.2	38.19	19.92	7.2	6.21	39.44
8.0	23.03	12.30	8.1	59.78	53.28	8.1	18.70	56.97	8.2	38.04	19.73	8.2	6.09	39.31
9.0	22.96	11.98	9.1	59.48	52.99	9:1	18.56	56.69	9.2	37.89	19.56	9.2	5.95	39.17
10.0	22.90	11.65	10.1	59.16	52.70	10.1	18.45	56.40	10.2	37.74	19.39	10.2	5.84	39.00
11.0	22.87	11.32	11.1	58.83	52.41	11.1	18.34	56.10	11.1	37.59	19.24	11.2	5.73	38.82
12.0	22.86	11.00	12.1	58.49	52.10	12.1	18.25	55.80	12.1	37.42	19.07	12.2	5.62	38.63
13.0	22.85	10.70	13.1	58.12	51.78	13.1	18.18	55.52	13.1	37.25	18.90	13.2	5.52	38.44
14.0	22.85	10.41	14.1	57.78	51.44	14.1	18.12	55.25	14.1	37.07	18.70	14.2	5.43	38.26
15.0	22.84	10.13	15.1	57.45	51.07	15.1	18.06	55.01	15.1	36.92	18.48	15.2	5.34	38.09
16.0	22.82	9.87	16.1	57.16	50.70	16.1	17.98	54.76	16.1	36.76	18.25	16.2	5.26	37.94
17.0	22.79	9.59	17.1	56.91	50.33	17.1	17.90	54.51	17.1	36.61	18.00	17.1	5.17	37.79
18.0	22.76	9.30	18.1	56.67	49.96	18.1	17.80	54.25	18.1	36.46	17.75	18.1	5.07	37.65
19.0	22.73	8.99	19.1	56.48	49.59	19.1	17.70	53.98	19.1	36.32	17.48	19.1	4.97	37.48
20.0	22.70	8.68	20.0	56.28	49.26	20.1	17.61	53.70	20.1	36.19	17.23	20.1	4.86	37.31
21.0	22.67	8.36	21.0	56.08	48.92	21.1	17.51	53.41	21.1	36.07	16.99	21.1	4.74	37.13
22.0	22.66	8.03	22.0	55.88	48.59	22.1	17.42	53.09	22.1	35.94	16.75	22.1	4.63	36.93
23.0	22.65	7.69	23.0	55.67	48.26	23.1	17.33	52.77	23.1	35.81	16.53	23.1	4.52	36.70
24.0	22.65	7.35	24.0	55.47	47.94	24.1	17.27	52.45	24.1	35.67	16.30	24.1	4.42	36.47
25.0	22.66	7.01	25.0	55.24	47.61	25.1	17.22	52.12	25.1	35.54	16.08	25.1	4.32	36.24
25.9	22.68	6.68	26.0	55.02	47.28	26.0	17.18	51.79	26.1	35.41	15.85	26.1	4.23	35.99
26.9	22.71	6.35	27.0	54.80	46.94	27.0	17.14	51.47	27.1	35.28	15.61	27.1	4.15	35.75
27.9	22.75	6.04	28.0	54.58	46.58	28.0	17.11	51.16	28.1	35.14	15.36	28.1	4.09	35.51
28.9	22.79	5.75	29.0	54.38	46.22	29.0	17.10	50.87	29.1	35.00	15.10	29.1	4.02	35.27
29.9	22.83	5.47	30.0	54.18	45.84	30.0	17.08	50.59	30.1	34.86	14.82	30.1	3.95	35.04
30.9	22.86	5.18	31.0	54.02	45.45	31.0	17.06	50.31	31.1	34.74	14.50	31.1	3.89	34.82
31.9	22.89	4.91	32.0	53.88	45.06	32.0	17.03	50.03	32.1	34.62	14.19	32.1	3.83	34.62
8.60		−8.54	23.21		+23.19	9.92		−9.87	7.34		+7.27	6.25		−6.17
14h	14m	23s.592	15h	1m	45s.970	15h	25m	17s.036	16h	53m	48s.037	17h	17m	1s.936
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Oct.	17 56	+86 37	Oct.	18 9	−87 39	Oct.	18 54	+89 2	Oct.	19 37	−89 12	Oct.	20 48	+82 15
1.2	48.80	17.57	1.2	64.44	58.09	1.3	52.60	2.67	1.3	66.81	46.77	1.3	20.64	21.72
2.2	48.34	17.52	2.2	63.96	58.04	2.3	51.02	2.73	2.3	65.44	46.85	2.3	20.49	21.96
3.2	47.90	17.46	3.2	63.50	58.00	3.3	49.42	2.76	3.3	64.09	46.93	3.3	20.31	22.17
4.2	47.46	17.37	4.2	63.03	57.95	4.3	47.82	2.77	4.3	62.75	47.01	4.3	20.16	22.38
5.2	47.02	17.28	5.2	62.54	57.92	5.3	46.23	2.78	5.3	61.34	47.10	5.3	19.99	22.56
6.2	46.60	17.17	6.2	62.03	57.89	6.2	44.71	2.78	6.3	59.87	47.19	6.3	19.84	22.73
7.2	46.20	17.07	7.2	61.49	57.87	7.2	43.24	2.77	7.3	58.34	47.28	7.3	19.68	22.90
8.2	45.81	16.97	8.2	60.94	57.83	8.2	41.82	2.76	8.3	56.72	47.34	8.3	19.53	23.06
9.2	45.43	16.89	9.2	60.38	57.78	9.2	40.43	2.76	9.3	55.05	47.40	9.3	19.37	23.23
10.2	45.02	16.82	10.2	59.84	57.69	10.2	39.04	2.79	10.3	53.37	47.42	10.3	19.22	23.41
11.2	44.62	16.76	11.2	59.32	57.60	11.2	37.61	2.83	11.3	51.72	47.43	11.3	19.08	23.61
12.2	44.21	16.70	12.2	58.84	57.47	12.2	36 12	2.87	12.3	50.14	47.42	12.3	18.93	23.81
13.2	43.78	16.62	13.2	58.38	57.33	13.2	34.55	2.88	13.3	48.65	47.40	13.3	18.78	24.02
14.2	43.34	16.53	14.2	57.99	57.20	14.2	32.94	2.90	14.3	47.24	47.39	14.3	18.61	24.21
15.2	42.90	16.43	15.2	57.55	57.07	15.2	31.30	2.90	15.3	45.87	47.39	15.3	18.43	24.40
16.2	42.45	16.29	16.2	57.13	56.94	16.2	29.66	2.87	16.2	44.49	47.39	16.3	18.26	24.55
17.2	42.03	16.15	17.2	56.70	56.84	17.2	28.06	2.82	17.2	43.10	47.41	17.3	18.07	24.70
18.2	41.62	15.98	18.2	56.24	56.73	18.2	26.53	2.76	18.2	41.63	47.42	18.3	17.90	24.83
19.2	41.24	15.81	19.2	55.75	56.63	19.2	25.05	2.69	19.2	40.10	47.43	19.3	17.72	24.93
20.2	40.86	15.65	20.2	55.24	56.52	20.2	23.63	2.61	20.2	38.48	47.44	20.3	17.55	25.03
21.2	40.50	15.50	21.2	54.73	56.40	21.2	22.26	2.54	21.2	36.81	47.44	21.3	17.38	25.13
22.2	40.14	15.35	22.2	54.21	56.27	22.2	20.90	2.48	22.2	35.13	47.40	22.3	17.23	25.23
23.2	39.78	15.21	23.2	53.72	56.10	23.2	19.54	2.42	23.2	33.44	47.36	23.3	17.07	25.34
24.2	39.42	15.07	24.2	53.24	55.93	24.2	18.16	2.38	24.2	31.76	47.30	24.3	16.91	25.47
25.2	39.05	14.93	25.2	52.77	55.74	25.2	16.77	2.33	25.2	30.13	47.24	25.3	16.75	25.58
26.2	38.67	14.79	26.2	52.33	55.54	26.2	15.36	2.29	26.2	28.54	47.15	26.3	16.59	25.69
27.1	38.30	14.65	27.2	51.90	55.31	27.2	13.92	2.23	27.2	27.02	47.05	27.3	16.42	25.81
28.1	37.92	14.48	28.2	51.51	55.11	28.2	12.43	2.15	28.2	25.54	46.96	28.3	16.25	25.92
29.1	37.53	14.31	29.2	51.13	54.92	29.2	10.92	2.08	29.2	24.12	46.86	29.3	16.07	26.03
30.1	37.14	14.13	30.2	50.77	54.73	30.2	9.39	1.99	30.2	22.75	46.76	30.3	15.89	26.13
31.1	36.76	13.93	31.1	50.41	54.55	31.2	7.86	1.88	31.2	21.41	46.68	31.3	15.70	26.19
32.1	36.38	13.70	32.1	50.04	54.38	32.2	6.36	1.75	32.2	20.08	46.60	32.3	15.52	26.24
16.97	+16.94		24.55	−24.53		59.32	+59.31		72.82	−72.81		7.42	+7.35	
17h 57m 4s.326			18h 9m 46s.186			18h 55m 23s.393			19h 37m 1s.735			20h 48m 15s.385		
+86° 36′ 50″.43			−87° 39′ 48″.39			+89° 1′ 32″.83			−89° 12′ 41″.41			+82° 14′ 50″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Oct.	21 39	−83 4	Oct.	22 17	−86 21	Oct.	22 38	−81 47	Oct.	23 28	+86 53	Oct.	23 47	−82 26
	s	″		s	″		s	″		s	″		s	″
1.4	26.08	25.97	1.4	37.98	33.69	1.4	24.75	3.09	1.4	14.34	17.34	1.5	45.43	38.34
2.4	25.98	26.19	2.4	37.80	33.93	2.4	24.68	3.34	2.4	14.24	17.73	2.5	45.40	38.63
3.4	25.87	26.41	3.4	37.63	34.17	3.4	24.62	3.60	3.4	14.10	18.12	3.5	45.39	38.92
4.4	25.77	26.63	4.4	37.47	34.42	4.4	24.57	3.86	4.4	13.95	18.51	4.5	45.37	39.21
5.4	25.66	26.86	5.4	37.31	34.68	5.4	24.51	4.13	5.4	13.77	18.88	5.5	45.35	39.51
6.4	25.55	27.09	6.4	37.14	34.95	6.4	24.44	4.42	6.4	13.60	19.22	6.4	45.33	39.82
7.4	25.42	27.33	7.4	36.95	35.22	7.4	24.36	4.71	7.4	13.42	19.55	7.4	45.30	40.15
8.4	25.29	27.57	8.4	36.73	35.49	8.4	24.28	5.00	8.4	13.26	19.88	8.4	45.25	40.48
9.4	25.14	27.79	9.4	36.49	35.74	9.4	24.19	5.28	9.4	13.11	20.20	9.4	45.19	40.82
10.4	24.99	27.99	10.4	36.23	35.99	10.4	24.09	5.54	10.4	12.97	20.54	10.4	45.13	41.14
11.3	24.83	28.17	11.4	35.96	36.22	11.4	23.98	5.78	11.4	12.85	20.90	11.4	45.05	41.44
12.3	24.68	28.32	12.4	35.70	36.42	12.4	23.87	6.01	12.4	12.73	21.27	12.4	44.97	41.73
13.3	24.53	28.47	13.4	35.45	36.61	13.4	23.77	6.21	13.4	12.59	21.65	13.4	44.91	41.99
14.3	24.40	28.61	14.4	35.21	36.79	14.4	23.68	6.41	14.4	12.42	22.03	14.4	44.85	42.25
15.3	24.27	28.74	15.4	34.98	36.97	15.4	23.59	6.61	15.4	12 23	22.41	15.4	44.78	42.50
16.3	24.14	28.89	16.4	34.77	37.15	16.4	23.51	6.83	16.4	12.02	22.78	16.4	44.72	42.76
17.3	24.01	29.06	17.4	34.55	37.34	17.4	23.43	7.05	17.4	11.79	23.13	17.4	44.67	43.03
18.3	23.88	29.23	18.4	34.32	37.56	18.4	23.34	7.28	18.4	11.55	23.47	18.4	44.61	43.30
19.3	23.74	29.41	19.4	34.08	37.78	19.4	23.24	7.52	19.4	11.30	23.78	19.4	44.54	43.59
20.3	23.59	29.59	20.3	33.81	38.00	20.4	23.13	7.76	20.4	11.06	24.07	20.4	44.46	43.90
21.3	23.42	29.76	21.3	33.54	38.22	21.4	23.02	8.00	21.4	10.83	24.37	21.4	44.38	44.20
22.3	23.24	29.92	22.3	33.23	38.42	22.4	22.89	8.24	22.4	10.61	24.66	22.4	44.29	44.50
23.3	23.06	30.07	23.3	32.92	38.61	23.4	22.77	8.47	23.4	10.41	24.95	23.4	44.19	44.80
24.3	22.88	30.18	24.3	32.60	38.79	24.4	22.64	8.67	24.4	10.20	25.26	24.4	44.09	45.08
25.3	22.70	30.29	25.3	32.28	38.94	25.4	22.50	8.86	25.4	9.99	25.57	25.4	43.98	45.35
26.3	22.53	30.40	26.3	31.96	39.09	26.3	22.37	9.04	26.4	9.78	25.89	26.4	43.87	45.61
27.3	22.36	30.49	27.3	31.65	39.22	27.3	22.24	9.21	27.4	9.55	26.21	27.4	43.76	45.87
28.3	22.21	30.57	28.3	31.36	39.35	28.3	22.12	9.36	28.4	9.32	26.54	28.4	43.65	46.10
29.3	22.05	30.65	29.3	31.07	39.47	29.3	22.01	9.51	29.4	9.06	26.87	29.4	43.55	46.32
30.3	21.91	30.72	30.3	30.79	39.59	30.3	21.90	9.66	30.4	8.79	27.19	30.4	43.46	46.53
31.3	21.76	30.79	31.3	30.51	39.71	31.3	21.79	9.80	31.4	8.50	27.51	31.4	43.36	46.75
32.3	21.61	30.87	32.3	30.24	39.83	32.3	21.68	9.97	32.4	8.18	27.80	32.4	43.27	46.96
8.29		−8.23	15.75		−15.72	7.00		−6.93	18.43		+18.40	7.61		−7.54
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Nov.	0 58	+85 51	Nov.	1 34	+88 53	Nov.	1 41	−85 9	Nov.	4 12	+85 20	Nov.	5 37	+85 9
0.4	24.47	1.57	0.5	64.21	49.02	0.5	46.28	28.47	0.6	18.48	57.31	0.6	29.90	22.64
1.4	24.37	1.94	1.5	64.00	49.41	1.5	46.23	28.76	1.6	18.66	57.65	1.6	30.15	22.88
2.4	24.24	2.29	2.4	63.73	49.79	2.5	46.19	29.05	2.6	18.81	57.99	2.6	30.38	23.13
3.4	24.11	2.63	3.4	63.43	50.16	3.5	46.13	29.37	3.6	18.95	58.32	3.6	30.60	23.38
4.4	23.98	2.96	4.4	63.14	50.51	4.4	46.07	29.68	4.6	19.09	58.64	4.6	30.82	23.62
5.4	23.88	3.29	5.4	62.89	50.85	5.4	45.98	30.02	5.5	19.22	58.93	5.6	31.02	23.84
6.4	23.78	3.61	6.4	62.69	51.18	6.4	45.89	30.35	6.5	19.36	59.22	6.6	31.24	24.04
7.4	23.69	3.93	7.4	62.54	51.51	7.4	45.76	30.68	7.5	19.51	59.51	7.6	31.46	24.24
8.4	23.61	4.26	8.4	62.42	51.88	8.4	45.63	30.98	8.5	19.69	59.80	8.6	31.70	24.45
9.4	23.53	4.62	9.4	62.29	52.25	9.4	45.50	31.27	9.5	19.86	60.10	9.6	31.95	24.66
10.4	23.44	4.98	10.4	62.12	52.63	10.4	45.36	31.53	10.5	20.04	60.42	10.6	32.22	24.88
11.4	23.33	5.35	11.4	61.88	53.03	11.4	45.24	31.79	11.5	20.22	60.75	11.6	32.47	25.12
12.4	23.20	5.71	12.4	61.57	53.42	12.4	45.13	32.05	12.5	20.37	61.12	12.6	32.71	25.39
13.4	23.05	6.05	13.4	61.16	53.80	13.4	45.02	32.30	13.5	20.52	61.48	13.6	32.94	25.67
14.4	22.88	6.39	14.4	60.70	54.18	14.4	44.91	32.56	14.5	20.63	61.84	14.6	33.15	25.97
15.4	22.71	6.71	15.4	60.20	54.53	15.4	44.81	32.83	15.5	20.73	62.20	15.6	33.35	26.27
16.4	22.53	7.00	16.4	59.69	54.86	16.4	44.68	33.11	16.5	20.81	62.54	16.6	33.53	26.55
17.4	22.34	7.29	17.4	59.19	55.19	17.4	44.56	33.40	17.5	20.89	62.87	17.6	33.70	26.82
18.4	22.16	7.57	18.4	58.70	55.48	18.4	44.43	33.70	18.5	20.95	63.20	18.6	33.85	27.09
19.4	22.01	7.85	19.4	58.22	55.79	19.4	44.27	33.99	19.5	21.03	63.50	19.6	34.02	27.34
20.4	21.86	8.12	20.4	57.77	56.10	20.4	44.10	34.28	20.5	21.11	63.81	20.6	34.19	27.58
21.4	21.70	8.39	21.4	57.34	56.41	21.4	43.93	34.56	21.5	21.20	64.12	21.6	34.35	27.83
22.4	21.54	8.67	22.4	56.90	56.73	22.4	43.76	34.83	22.5	21.30	64.44	22.6	34.53	28.08
23.4	21.39	8.96	23.4	56.47	57.04	23.4	43.58	35.07	23.5	21.39	64.76	23.6	34.71	28.35
24.4	21.22	9.26	24.4	56.01	57.36	24.4	43.39	35.31	24.5	21.49	65.09	24.6	34.89	28.63
25.4	21.05	9.56	25.4	55.51	57.70	25.4	43.21	35.53	25.5	21.58	65.43	25.6	35.08	28.91
26.4	20.87	9.86	26.4	54.97	58.03	26.4	43.03	35.73	26.5	21.67	65.79	26.6	35.27	29.20
27.4	20.68	10.16	27.4	54.35	58.37	27.4	42.85	35.93	27.5	21.74	66.16	27.6	35.45	29.52
28.4	20.45	10.45	28.4	53.67	58.70	28.4	42.68	36.13	28.5	21.80	66.54	28.5	35.60	29.85
29.4	20.22	10.72	29.4	52.93	59.02	29.4	42.53	36.33	29.5	21.84	66.91	29.5	35.75	30.18
30.3	19.98	10.97	30.4	52.17	59.32	30.4	42.37	36.55	30.5	21.86	67.28	30.5	35.88	30.51
31.3	19.74	11.22	31.4	51.38	59.61	31.4	42.20	36.77	31.5	21.87	67.62	31.5	36.00	30.84
13.82		+13.79	52.02		+52.01	11.85		−11.81	12.34		+12.30	11.85		+11.80
0^h	57^m	$55^s.489$	1^h	33^m	$11^s.898$	1^h	41^m	$39^s.995$	4^h	11^m	$48^s.583$	5^h	37^m	$5^s.478$
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Nov.	5 45	−84 49	Nov.	6 46	−80 43	Nov.	7 5	+87 9	Nov.	7 14	−86 54	Nov.	7 15	+82 33
0.6	6.38	31.90	0.7	30.05	55.15	0.7	25.58	52.18	0.7	16.65	39.54	0.7	10.00	21.94
1.6	6.55	32.11	1.7	30.18	55.31	1.7	26.11	52.30	1.7	16.99	39.65	1.7	10.21	22.03
2.6	6.72	32.33	2.7	30.30	55.47	2.7	26.61	52.43	2.7	17.35	39.75	2.7	10.41	22.14
3.6	6.89	32.55	3.7	30.42	55.64	3.7	27.09	52.55	3.7	17.72	39.87	3.7	10.60	22.24
4.6	7.07	32.78	4.7	30.54	55.81	4.7	27.55	52.66	4.7	18.10	40.00	4.7	10.78	22.33
5.6	7.25	33.05	5.7	30.66	56.00	5.7	28.00	52.77	5.7	18.49	40.15	5.7	10.96	22.42
6.6	7.40	33.32	6.7	30.79	56.22	6.7	28.45	52.87	6.7	18.87	40.33	6.7	11.13	22.48
7.6	7.56	33.61	7.7	30.90	56.46	7.7	28.90	52.95	7.7	19.25	40.53	7.7	11.31	22.54
8.6	7.70	33.93	8.6	31.01	56.73	8.7	29.37	53.03	8.7	19.59	40.76	8.7	11.49	22.60
9.6	7.82	34.23	9.6	31.12	57.00	9.7	29.88	53.11	9.7	19.92	40.98	9.7	11.69	22.68
10.6	7.93	34.54	10.6	31.22	57.25	10.7	30.39	53.21	10.7	20.21	41.19	10.7	11.90	22.76
11.6	8.04	34.83	11.6	31.32	57.49	11.7	30.92	53.34	11.7	20.50	41.39	11.7	12.11	22.85
12.6	8.15	35.10	12.6	31.41	57.71	12.7	31.45	53.48	12.7	20.79	41.59	12.7	12.32	22.96
13.6	8.26	35.34	13.6	31.50	57.93	13.6	31.94	53.63	13.7	21.07	41.77	13.7	12.53	23.09
14.6	8.39	35.59	14.6	31.60	58.16	14.6	32.42	53.81	14.7	21.38	41.95	14.7	12.72	23.24
15.6	8.52	35.86	15.6	31.70	58.38	15.6	32.86	54.00	15.6	21.69	42.13	15.7	12.90	23.40
16.6	8.64	36.14	16.6	31.80	58.61	16.6	33.29	54.18	16.6	22.01	42.32	16.6	13.07	23.57
17.6	8.77	36.42	17.6	31.90	58.85	17.6	33.71	54.36	17.6	22.33	42.54	17.6	13.24	23.73
18.6	8.89	36.73	18.6	32.00	59.12	18.6	34.09	54.54	18.6	22.66	42.76	18.6	13.39	23.88
19.6	9.00	37.05	19.6	32.10	59.39	19.6	34.48	54.71	19.6	22.99	43.00	19.6	13.55	24.02
20.6	9.11	37.38	20.6	32.20	59.68	20.6	34.87	54.88	20.6	23.30	43.26	20.6	13.70	24.16
21.6	9.21	37.73	21.6	32.29	59.98	21.6	35.28	55.04	21.6	23.59	43.53	21.6	13.86	24.30
22.6	9.30	38.08	22.6	32.38	60.29	22.6	35.69	55.21	22.6	23.88	43.80	22.6	14.03	24.44
23.6	9.38	38.42	23.6	32.46	60.61	23.6	36.11	55.37	23.6	24.16	44.08	23.6	14.20	24.57
24.6	9.44	38.76	24.6	32.54	60.92	24.6	36.54	55.54	24.6	24.40	44.36	24.6	14.37	24.72
25.6	9.50	39.09	25.6	32.60	61.23	25.6	36.98	55.72	25.6	24.64	44.64	25.6	14.55	24.87
26.6	9.56	39.41	26.6	32.67	61.52	26.6	37.41	55.91	26.6	24.87	44.92	26.6	14.73	25.05
27.6	9.62	39.72	27.6	32.73	61.81	27.6	37.85	56.14	27.6	25.07	45.17	27.6	14.91	25.24
28.6	9.67	40.01	28.6	32.80	62.09	28.6	38.28	56.37	28.6	25.28	45.41	28.6	15.08	25.47
29.5	9.72	40.31	29.6	32.87	62.37	29.6	38.68	56.61	29.6	25.50	45.66	29.6	15.23	25.69
30.5	9.78	40.61	30.6	32.94	62.65	30.6	39.05	56.88	30.6	25.72	45.92	30.6	15.39	25.91
31.5	9.83	40.92	31.6	33.01	62.94	31.6	39.39	57.13	31.6	25.96	46.18	31.6	15.53	26.14
11.09		−11.05	6.21		−6.13	20.22		+20.19	18.56		−18.53	7.72		+7.65
$5^h\ 45^m\ 4^s.700$			$6^h\ 46^m\ 28^s.850$			$7^h\ 4^m\ 58^s.549$			$7^h\ 14^m\ 18^s.185$			$7^h\ 14^m\ 59^s.083$		
−84° 49′ 38″.84			−80° 44′ 2″.02			+87° 10′ 21″.62			−86° 54′ 45″.50			+82° 33′ 51″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Nov.	8 22	+88 51	Nov.	9 8	−85 21	Nov.	9 26	+81 39	Nov.	9 36	−80 35	Nov.	10 21	+82 56
0.7	10.06	17.90	0.8	6.38	21.30	0.8	15.45	33.38	0.8	12.12	40.39	0.8	46.53	32.22
1.7	11.41	17.89	1.8	6.62	21.27	1.8	15.63	33.24	1.8	12.25	40.33	1.8	46.72	32.01
2.7	12.71	17.89	2.8	6.87	21.23	2.8	15.81	33.12	2.8	12.38	40.27	2.8	46.91	31.81
3.7	13.95	17.89	3.8	7.14	21.19	3.8	15.97	33.03	3.8	12.50	40.21	3.8	47.09	31.61
4.7	15.14	17.89	4.8	7.42	21.17	4.8	16.14	32.92	4.8	12.64	40.16	4.8	47.26	31.43
5.7	16.30	17.89	5.8	7.70	21.17	5.8	16.29	32.82	5.8	12.78	40.11	5.8	47.43	31.25
6.7	17.44	17.87	6.8	7.99	21.20	6.8	16.44	32.70	6.8	12.92	40.10	6.8	47.59	31.06
7.7	18.59	17.84	7.7	8.29	21.23	7.8	16.60	32.57	7.8	13.07	40.10	7.8	47.75	30.84
8.7	19.79	17.81	8.7	8.58	21.29	8.8	16.77	32.42	8.8	13.22	40.14	8.8	47.93	30.62
9.7	21.07	17.78	9.7	8.86	21.38	9.8	16.94	32.27	9.8	13.37	40.19	9.8	48.11	30.39
10.7	22.39	17.75	10.7	9.13	21.46	10.8	17.12	32.12	10.8	13.51	40.24	10.8	48.29	30.17
11.7	23.74	17.75	11.7	9.37	21.53	11.8	17.32	31.98	11.8	13.65	40.30	11.8	48.49	29.97
12.7	25.12	17.77	12.7	9.61	21.59	12.7	17.51	31.88	12.8	13.78	40.35	12.8	48.70	29.77
13.7	26.46	17.81	13.7	9.86	21.65	13.7	17.70	31.78	13.8	13.91	40.37	13.8	48.91	29.58
14.7	27.76	17.87	14.7	10.11	21.70	14.7	17.89	31.72	14.7	14.04	40.39	14.8	49.12	29.43
15.7	29.01	17.95	15.7	10.37	21.75	15.7	18.07	31.67	15.7	14.16	40.43	15.8	49.32	29.30
16.7	30.20	18.02	16.7	10.64	21.80	16.7	18.25	31.63	16.7	14.30	40.45	16.8	49.51	29.19
17.7	31.35	18.08	17.7	10.91	21.87	17.7	18.41	31.59	17.7	14.44	40.48	17.8	49.70	29.07
18.7	32.46	18.14	18.7	11.19	21.95	18.7	18.58	31.56	18.7	14.58	40.53	18.8	49.89	28.95
19.7	33.56	18.21	19.7	11.47	22.05	19.7	18.73	31.52	19.7	14.72	40.59	19.8	50.06	28.82
20.7	34.66	18.27	20.7	11.75	22.17	20.7	18.89	31.48	20.7	14.87	40.67	20.8	50.23	28.70
21.7	35.77	18.33	21.7	12.03	22.29	21.7	19.04	31.44	21.7	15.02	40.76	21.8	50.41	28.57
22.7	36.89	18.39	22.7	12.31	22.42	22.7	19.22	31.38	22.7	15.17	40.86	22.8	50.60	28.44
23.7	38.05	18.45	23.7	12.58	22.57	23.7	19.38	31.33	23.7	15.31	40.99	23.8	50.79	28.30
24.7	39.23	18.51	24.7	12.82	22.73	24.7	19.56	31.28	24.7	15.45	41.12	24.8	50.98	28.17
25.7	40.45	18.59	25.7	13.07	22.89	25.7	19.74	31.23	25.7	15.59	41.25	25.8	51.18	28.05
26.7	41.70	18.68	26.7	13.31	23.05	26.7	19.93	31.19	26.7	15.72	41.39	26.7	51.40	27.94
27.7	42.95	18.80	27.7	13.54	23.21	27.7	20.11	31.18	27.7	15.84	41.53	27.7	51.62	27.84
28.7	44.19	18.93	28.7	13.77	23.36	28.7	20.30	31.19	28.7	15.97	41.66	28.7	51.84	27.75
29.7	45.39	19.06	29.7	14.00	23.49	29.7	20.49	31.23	29.7	16.09	41.78	29.7	52.05	27.68
30.7	46.53	19.21	30.7	14.22	23.62	30.7	20.67	31.26	30.7	16.21	41.90	30.7	52.26	27.63
31.6	47.62	19.37	31.7	14.46	23.76	31.7	20.84	31.30	31.7	16.35	42.02	31.7	52.46	27.59
50.04		+50.03	12.35		−12.31	6.89		+6.82	6.12		−6.04	8.14		+8.08
8h	21m	41s.998	9h	8m	8s.703	9h	26m	14s.295	9h	36m	12s.346	10h	21m	50s.081
+88°	51′	51″.95	−85°	21′	25″.35	+81°	40′	7″.28	−80°	35′	44″.11	+82°	57′	4″.81

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	10 59	−84 10	Nov.	12 13	+88 7	Nov.	12 46	−84 42	Nov.	12 48	+83 49	Nov.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
0.8	50.92	45.52	0.9	42.23	11.93	0.9	40.96	21.62	0.9	17.69	32.96	0.9	7.10	36.65
1.8	51.09	45.35	1.9	42.65	11.58	1.9	41.07	21.38	1.9	17.79	32.59	1.9	7.18	36.37
2.8	51.26	45.18	2.9	43.07	11.25	2.9	41.17	21.11	2.9	17.89	32.23	2.9	7.26	36.09
3.8	51.43	45.01	3.9	43.49	10.94	3.9	41.28	20.83	3.9	17.99	31.89	3.9	7.34	35.80
4.8	51.61	44.83	4.9	43.89	10.65	4.9	41.41	20.56	4.9	18.09	31.55	4.9	7.43	35.50
5.8	51.80	44.67	5.9	44.27	10.35	5.9	41.54	20.28	5.9	18.17	31.22	5.9	7.55	35.19
6.8	52.03	44.52	6.9	44.61	10.04	6.9	41.71	20.01	6.9	18.25	30.90	6.9	7.69	34.88
7.8	52.25	44.41	7.9	44.94	9.73	7.9	41.88	19.76	7.9	18.33	30.56	7.9	7.85	34.59
8.8	52.48	44.31	8.9	45.28	9.41	8.9	42.07	19.52	8.9	18.40	30.20	8.9	8.03	34.31
9.8	52.70	44.25	9.9	45.64	9.08	9.9	42.26	19.31	9.9	18.48	29.83	9.9	8.21	34.06
10.8	52.90	44.19	10.9	46.04	8.73	10.9	42.45	19.11	10.9	18.58	29.46	10.9	8.39	33.83
11.8	53.11	44.13	11.9	46.49	8.38	11.9	42.64	18.93	11.9	18.71	29.08	11.9	8.56	33.61
12.8	53.31	44.05	12.9	46.96	8.05	12.9	42.80	18.75	12.9	18.83	28.70	12.9	8.71	33.39
13.8	53 50	43.97	13.9	47.48	7.73	13.9	42.95	18.56	13.9	18.97	28.36	13.9	8.86	33.17
14.8	53.69	43.88	14.9	48.03	7.44	14.9	43.11	18.37	14.9	19.11	28.02	14.9	9.00	32.94
15.8	53.88	43.79	15.9	48.56	7.16	15.9	43.26	18.15	15.9	19.25	27.70	15.9	9.14	32.69
16.8	54.07	43.69	16.9	49.09	6.89	16.9	43.42	17.93	16.9	19.38	27.39	16.9	9.28	32.42
17.8	54.30	43.60	17.8	49.60	6.65	17.9	43.59	17.69	17.9	19.51	27.10	17.9	9.45	32.15
18.8	54.52	43.52	18.8	50.08	6.41	18.9	43.77	17.46	18.9	19.64	26.81	18.9	9.62	31.88
19.8	54.74	43.46	19.8	50.56	6.17	19.9	43.96	17.26	19.9	19.76	26.52	19.9	9.81	31.63
20.8	54.97	43.40	20.8	51.03	5.92	20.9	44.18	17.06	20.9	19.89	26.24	20.9	10.00	31.38
21.8	55.21	43.35	21.8	51.50	5.65	21.9	44.40	16.87	21.9	20.01	25.95	21.9	10.23	31.14
22.8	55.45	43.33	22.8	51.97	5.39	22.9	44.62	16.69	22.9	20.13	25.66	22.9	10.45	30.92
23.8	55.68	43.32	23.8	52.45	5.13	23.9	44.85	16.54	23.9	20.27	25.36	23.9	10.67	30.71
24.8	55.91	43.33	24.8	52.96	4.86	24.9	45.07	16.40	24.9	20.41	25.03	24.9	10.90	30.52
25.8	56.13	43.35	25.8	53.50	4.59	25.9	45.29	16.27	25.9	20.56	24.72	25.9	11.13	30.34
26.8	56.35	43.36	26.8	54.08	4.32	26.8	45.51	16.15	26.8	20.71	24.40	26.9	11.34	30.17
27.8	56.55	43.38	27.8	54.69	4.07	27.8	45.71	16.03	27.8	20.88	24.11	27.9	11.55	30.01
28.8	56.76	43.40	28.8	55.34	3.83	28.8	45.91	15.90	28.8	21.06	23.81	28.9	11.75	29.84
29.8	56.96	43.41	29.8	56.00	3.60	29.8	46.11	15.78	29.8	21.24	23.53	29.9	11.95	29.68
30.8	57.16	43.41	30.8	56.64	3.40	30.8	46.30	15.65	30.8	21.42	23.26	30.9	12.15	29.50
31.8	57.38	43.41	31.8	57.26	3.21	31.8	46.50	15.50	31.8	21.60	23.01	31.9	12.35	29.31
9.86		−9.81	30.46		+30.44	10.84		−10.79	9.30		+9.24	12.45		−12.41
10^h	59^m	$53^s.036$	12^h	14^m	$30^s.802$	12^h	46^m	$43^s.161$	12^h	48^m	$33^s.111$	13^h	28^m	$9^s.628$
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Nov.	14 14	−83 18	Nov.	15 0	+87 31	Nov.	15 25	−84 12	Nov.	16 53	+82 10	Nov.	17 17	−80 47
0.9	22.89	64.91	1.0	53.88	45.06	1.0	17.03	50.03	1.1	34.62	14.19	1.1	3.83	34.62
1.9	22.92	64.63	2.0	53.77	44.66	2.0	17.00	49.76	2.1	34.51	13.88	2.1	3.75	34.40
2.9	22.93	64.35	3.0	53.69	44.28	3.0	16.96	49.47	3.1	34.40	13.56	3.1	3.67	34.18
3.9	22.96	64.04	4.0	53.61	43.91	4.0	16.91	49.16	4.1	34.30	13.26	4.1	3.59	33.95
4.9	22.99	63.72	5.0	53.53	43.55	5.0	16.88	48.84	5.1	34.20	12.97	5.1	3.50	33.71
5.9	23.03	63.39	6.0	53.44	43.21	6.0	16.87	48.50	6.1	34.10	12.69	6.1	3.42	33.44
6.9	23.09	63.07	6.9	53.34	42.87	7.0	16.86	48.16	7.1	33.99	12.42	7.1	3.36	33.15
7.9	23.18	62.76	7.9	53.22	42.53	8.0	16.88	47.82	8.1	33.88	12.16	8.1	3.31	32.85
8.9	23.26	62.47	8.9	53.08	42.17	9.0	16.92	47.49	9.1	33.77	11.89	9.1	3.27	32.56
9.9	23.35	62.18	9.9	52.94	41.81	10.0	16.96	47.18	10.1	33.66	11.58	10.1	3.24	32.27
10.9	23.45	61.91	10.9	52.80	41.43	11.0	17.01	46.89	11.1	33.54	11.27	11.1	3.21	31.99
11.9	23.54	61.67	11.9	52.71	41.02	12.0	17.06	46.61	12.1	33.44	10.94	12.1	3.18	31.73
12.9	23.63	61.43	12.9	52.66	40.61	12.9	17.10	46.34	13.1	33.35	10.59	13.1	3.15	31.50
13.9	23.69	61.18	13.9	52.64	40.20	13.9	17.13	46.06	14.1	33.26	10.24	14.1	3.12	31.25
14.9	23.76	60.91	14.9	52.65	39.81	14.9	17.14	45.78	15.1	33.17	9.89	15.1	3.08	31.00
15.9	23.83	60.63	15.9	52.69	39.43	15.9	17.16	45.49	16.1	33.09	9.54	16.1	3.03	30.73
16.9	23.90	60.36	16.9	52.72	39.06	16.9	17.18	45.17	17.0	33.01	9.20	17.1	2.98	30.47
17.9	23.98	60.07	17.9	52.76	38.72	17.9	17.21	44.85	18.0	32.95	8.87	18.1	2.93	30.18
18.9	24.07	59.78	18.9	52.77	38.37	18.9	17.24	44.53	19.0	32.88	8.55	19.1	2.88	29.87
19.9	24.16	59.49	19.9	52.79	38.03	19.9	17.28	44.20	20.0	32.82	8.23	20.1	2.84	29.56
20.9	24.27	59.20	20.9	52.81	37.69	20.9	17.34	43.87	21.0	32.75	7.92	21.1	2.81	29.24
21.9	24.40	58.91	21.9	52.82	37.35	21.9	17.42	43.54	22.0	32.69	7.61	22.0	2.80	28.92
22.9	24.52	58.64	22.9	52.83	37.01	22.9	17.50	43.22	23.0	32.63	7.30	23.0	2.78	28.61
23.9	24.65	58.40	23.9	52.86	36.64	23.9	17.58	42.92	24.0	32.56	6.97	24.0	2.77	28.30
24.9	24.79	58.16	24.9	52.89	36.28	24.9	17.68	42.63	25.0	32.49	6.64	25.0	2.77	27.98
25.9	24.93	57.94	25.9	52.93	35.90	25.9	17.78	42.36	26.0	32.42	6.27	26.0	2.77	27.69
26.9	25.07	57.73	26.9	53.00	35.52	26.9	17.87	42.09	27.0	32.35	5.90	27.0	2.77	27.41
27.9	25.20	57.53	27.9	53.09	35.13	27.9	17.96	41.82	28.0	32.30	5.52	28.0	2.78	27.15
28.9	25.31	57.32	28.9	53.21	34.74	28.9	18.06	41.58	29.0	32.25	5.14	29.0	2.78	26.89
29.9	25.42	57.12	29.9	53.37	34.36	29.9	18.15	41.32	30.0	32.22	4.75	30.0	2.78	26.62
30.9	25.53	56.90	30.9	53.54	34.00	30.9	18.21	41.05	31.0	32.19	4.38	31.0	2.77	26.34
31.9	25.66	56.67	31.9	53.71	33.66	31.9	18.29	40.77	32.0	32.16	4.01	32.0	2.76	26.05
8.59		−8.53	23.18		+23.16	9.92		−9.87	7.34		+7.27	6.25		−6.17
14^h	14^m	$23^s.592$	15^h	1^m	$45^s.970$	15^h	25^m	$17^s.036$	16^h	53^m	$48^s.037$	17^h	17^m	$1^s.936$
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Nov.	17 56	+86 37	Nov.	18 9	−87 39	Nov.	18 53	+89 1	Nov.	19 36	−89 12	Nov.	20 48	+82 15
1.1	36.38	13.70	1.1	50.04	54.38	1.2	66.36	61.75	1.2	80.08	46.60	1.3	15.52	26.24
2.1	36.01	13.46	2.1	49.66	54.21	2.2	64.91	61.61	2.2	78.69	46.53	2.3	15.33	26.29
3.1	35.68	13.23	3.1	49.26	54.03	3.2	63.53	61.46	3.2	77.24	46.45	3.3	15.15	26.32
4.1	35.35	12.99	4.1	48.84	53.84	4.2	62.20	61.31	4.2	75.72	46.36	4.2	14.97	26.33
5.1	35.03	12.77	5.1	48.41	53.62	5.2	60.92	61.17	5.2	74.17	46.26	5.2	14.80	26.36
6.1	34.72	12.57	6.1	48.00	53.38	6.2	59.65	61.04	6.2	72.60	46.12	6.2	14.65	26.40
7.1	34.40	12.38	7.1	47.62	53.11	7.2	58.37	60.93	7.2	71.06	45.97	7.2	14.48	26.44
8.1	34.07	12.20	8.1	47.27	52.84	8.2	57.05	60.83	8.2	69.59	45.79	8.2	14.31	26.50
9.1	33.73	12.00	9.1	46.97	52.57	9.2	55.67	60.72	9.2	68.24	45.60	9.2	14.15	26.56
10.1	33.37	11.80	10.1	46.70	52.30	10.2	54.24	60.59	10.2	66.99	45.42	10.2	13.97	26.62
11.1	33.01	11.57	11.1	46.46	52.06	11.1	52.78	60.46	11.2	65.81	45.23	11.2	13.80	26.67
12.1	32.67	11.33	12.1	46.22	51.81	12.1	51.32	60.29	12.2	64.68	45.05	12.2	13.61	26.69
13.1	32.33	11.05	13.1	45.97	51.58	13.1	49.89	60.12	13.2	63.54	44.89	13.2	13.43	26.69
14.1	32.01	10.77	14.1	45.70	51.34	14.1	48.52	59.93	14.2	62.36	44.74	14.2	13.23	26.66
15.1	31.72	10.48	15.1	45.42	51.13	15.1	47.23	59.73	15.2	61.13	44.60	15.2	13.05	26.62
16.1	31.45	10.19	16.1	45.11	50.89	16.1	46.02	59.50	16.2	59.83	44.46	16.2	12.87	26.57
17.1	31.19	9.91	17.1	44.79	50.63	17.1	44.86	59.30	17.2	58.48	44.29	17.2	12.70	26.52
18.1	30.94	9.64	18.1	44.47	50.36	18.1	43.74	59.10	18.2	57.13	44.11	18.2	12.53	26.47
19.1	30.69	9.37	19.1	44.17	50.09	19.1	42.64	58.92	19.2	55.77	43.91	19.2	12.38	26.42
20.1	30.44	9.13	20.1	43.88	49.79	20.1	41.55	58.73	20.2	54.43	43.69	20.2	12.22	26.37
21.1	30.19	8.88	21.1	43.62	49.48	21.1	40.45	58.55	21.2	53.13	43.46	21.2	12.06	26.34
22.1	29.94	8.63	22.1	43.38	49.16	22.1	39.34	58.36	22.1	51.89	43.22	22.2	11.90	26.30
23.1	29.67	8.38	23.1	43.18	48.84	23.1	38.20	58.18	23.1	50.73	42.98	23.2	11.74	26.26
24.1	29.41	8.11	24.1	42.99	48.52	24.1	37.04	57.99	24.1	49.64	42.74	24.2	11.57	26.22
25.1	29.14	7.83	25.1	42.83	48.23	25.1	35.85	57.79	25.1	48.64	42.49	25.2	11.40	26.18
26.1	28.89	7.54	26.1	42.69	47.93	26.1	34.66	57.57	26.1	47.69	42.23	26.2	11.24	26.12
27.1	28.64	7.23	27.1	42.57	47.64	27.1	33.49	57.33	27.1	46.79	41.99	27.2	11.06	26.03
28.1	28.39	6.91	28.1	42.44	47.36	28.1	32.30	57.06	28.1	45.91	41.75	28.2	10.89	25.93
29.1	28.16	6.57	29.1	42.30	47.10	29.1	31.20	56.79	29.1	45.02	41.53	29.2	10.70	25.83
30.1	27.95	6.24	30.1	42.15	46.83	30.1	30.14	56.52	30.1	44.09	41.32	30.2	10.53	25.69
31.1	27.76	5.90	31.1	41.96	46.55	31.1	29.17	56.25	31.1	43.11	41.09	31.2	10.38	25.55
32.1	27.59	5.57	32.1	41.79	46.24	32.1	28.26	55.97	32.1	42.07	40.85	32.2	10.22	25.41
16.96		+16.93	24.54		−24.52	59.27		+59.26	72.75		−72.74	7.42		+7.35
$17^h\ 57^m\ 4^s.326$			$18^h\ 9^m\ 46^s.186$			$18^h\ 55^m\ 23^s.393$			$19^h\ 37^m\ 1^s.735$			$20^h\ 48^m\ 15^s.385$		
+86° 36′ 50″.43			−87° 39′ 48″.39			+89° 1′ 32″.83			−89° 12′ 41″.41			+82° 14′ 50″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Nov.	21 39	−83 4	Nov.	22 17	−86 21	Nov.	22 38	−81 47	Nov.	23 27	+86 53	Nov.	23 47	−82 26
1.3	21.61	30.87	1.3	30.24	39.83	1.3	21.68	9.97	1.4	68.18	27.80	1.4	43.27	46.96
2.3	21.46	30.96	2.3	29.96	39.97	2.3	21.57	10.14	2.4	67.86	28.08	2.4	43.18	47.19
3.3	21.29	31.06	3.3	29.68	40.10	3.3	21.44	10.31	3.4	67.54	28.34	3.4	43.07	47.44
4.3	21.12	31.15	4.3	29.37	40.24	4.3	21.31	10.48	4.4	67.23	28.59	4.4	42.95	47.68
5.3	20.94	31.24	5.3	29.05	40.36	5.3	21.17	10.63	5.4	66.94	28.84	5.4	42.83	47.93
6.3	20.75	31.29	6.3	28.69	40.47	6.3	21.02	10.78	6.4	66.65	29.09	6.4	42.70	48.17
7.3	20.56	31.33	7.3	28.33	40.56	7.3	20.87	10.89	7.3	66.38	29.36	7.4	42.57	48.37
8.3	20.38	31.34	8.3	27.99	40.62	8.3	20.73	11.00	8.3	66.12	29.62	8.4	42.43	48.57
9.3	20.20	31.33	9.3	27.64	40.67	9.3	20.58	11.08	9.3	65.86	29.90	9.4	42.28	48.75
10.3	20.04	31.31	10.3	27.30	40.70	10.3	20.44	11.14	10.3	65.57	30.19	10.4	42.14	48.89
11.3	19.89	31.30	11.3	26.99	40.72	11.3	20.31	11.20	11.3	65.25	30.48	11.3	42.02	49.04
12.3	19.74	31.28	12.3	26.70	40.75	12.3	20.19	11.25	12.3	64.92	30.77	12.3	41.90	49.18
13.3	19.59	31.27	13.3	26.42	40.79	13.3	20.07	11.33	13.3	64.55	31.02	13.3	41.77	49.34
14.3	19.44	31.28	14.3	26.13	40.83	14.3	19.95	11.41	14.3	64.18	31.27	14.3	41.66	49.50
15.3	19.27	31.29	15.3	25.82	40.88	15.3	19.82	11.51	15.3	63.81	31.49	15.3	41.55	49.67
16.2	19.10	31.30	16.3	25.51	40.93	16.3	19.68	11.60	16.3	63.44	31.69	16.3	41.42	49.85
17.2	18.93	31.31	17.3	25.18	41.00	17.3	19.54	11.69	17.3	63.08	31.88	17.3	41.28	50.04
18.2	18.75	31.32	18.3	24.84	41.06	18.3	19.39	11.78	18.3	62.74	32.07	18.3	41.14	50.22
19.2	18.56	31.31	19.3	24.47	41.09	19.3	19.24	11.86	19.3	62.40	32.25	19.3	40.99	50.39
20.2	18.38	31.27	20.3	24.11	41.10	20.3	19.09	11.92	20.3	62.07	32.43	20.3	40.83	50.55
21.2	18.19	31.23	21.3	23.75	41.10	21.3	18.93	11.97	21.3	61.74	32.62	21.3	40.66	50.70
22.2	18.01	31.17	22.3	23.39	41.10	22.3	18.78	11.99	22.3	61.41	32.82	22.3	40.50	50.83
23.2	17.83	31.08	23.3	23.04	41.07	23.3	18.63	12.00	23.3	61.07	33.02	23.3	40.35	50.94
24.2	17.67	30.99	24.3	22.70	41.03	24.3	18.48	12.00	24.3	60.74	33.22	24.3	40.19	51.04
25.2	17.51	30.90	25.3	22.37	40.99	25.3	18.33	11.99	25.3	60.37	33.42	25.3	40.05	51.13
26.2	17.36	30.80	26.2	22.05	40.92	26.3	18.20	11.98	26.3	60.00	33.62	26.3	39.90	51.20
27.2	17.22	30.71	27.2	21.74	40.87	27.3	18.07	11.96	27.3	59.62	33.81	27.3	39.76	51.28
28.2	17.08	30.62	28.2	21.45	40.82	28.3	17.95	11.96	28.3	59.20	33.99	28.3	39.63	51.35
29.2	16.94	30.53	29.2	21.16	40.78	29.3	17.83	11.95	29.3	58.78	34.14	29.3	39.50	51.43
30.2	16.79	30.46	30.2	20.87	40.75	30.3	17.69	11.94	30.3	58.35	34.28	30.3	39.35	51.52
31.2	16.64	30.39	31.2	20.55	40.72	31.2	17.55	11.94	31.3	57.94	34.41	31.3	39.21	51.61
32.2	16.47	30.31	32.2	20.23	40.68	32.2	17.41	11.95	32.3	57.53	34.51	32.3	39.07	51.70
8.29		−8.23	15.76		−15.73	7.00		−6.93	18.44		+18.42	7.61		−7.54
$21^h\ 39^m\ 16^s.433$			$22^h\ 17^m\ 21^s.969$			$22^h\ 38^m\ 16^s.769$			$23^h\ 27^m\ 42^s.388$			$23^h\ 47^m\ 38^s.028$		
−83° 4′ 28″.91			−86° 21′ 38″.42			−81° 47′ 9″.68			+86° 52′ 58″.09			−82° 26′ 48″.40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Dec.	0 58	+85 51	Dec.	1 34	+88 53	Dec.	1 41	−85 9	Dec.	4 12	+85 21	Dec.	5 37	+85 9
	s	″		s	″		s	″		s	″		s	″
0.3	19.98	10.97	0.4	52.17	59.32	0.4	42.37	36.55	0.5	21.86	7.28	0.5	35.88	30.51
1.3	19.74	11.22	1.4	51.38	59.61	1.4	42.20	36.77	1.5	21.87	7.62	1.5	36.00	30.84
2.3	19.51	11.44	2.4	50.62	59.86	2.4	42.01	37.01	2.5	21.88	7.96	2.5	36.10	31.16
3.3	19.28	11.64	3.4	49.91	60.11	3.4	41.81	37.24	3.5	21.88	8.28	3.5	36.20	31.45
4.3	19.08	11.86	4.4	49.25	60.38	4.4	41.59	37.47	4.5	21.91	8.59	4.5	36.31	31.73
5.3	18.89	12.09	5.4	48.65	60.64	5.4	41.36	37.67	5.5	21.94	8.90	5.5	36.44	32.00
6.3	18.70	12.32	6.4	48.05	60.92	6.4	41.12	37.86	6.5	21.99	9.21	6.5	36.58	32.28
7.3	18.51	12.56	7.4	47.43	61.21	7.4	40.89	38.01	7.5	22.04	9.54	7.5	36.72	32.57
8.3	18.30	12.83	8.4	46.76	61.53	8.4	40.65	38.16	8.5	22.09	9.90	8.5	36.87	32.89
9.3	18.07	13.08	9.4	46.00	61.82	9.4	40.42	38.30	9.5	22.13	10.26	9.5	37.01	33.21
10.3	17.83	13.33	10.4	45.18	62.12	10.3	40.22	38.43	10.5	22.14	10.63	10.5	37.14	33.55
11.3	17.56	13.57	11.3	44.29	62.40	11.3	40.02	38.56	11.5	22.13	11.01	11.5	37.24	33.90
12.3	17.28	13.77	12.3	43.35	62.65	12.3	39.81	38.69	12.4	22.10	11.37	12.5	37.33	34.25
13.3	17.00	13.95	13.3	42.38	62.90	13.3	39.61	38.84	13.4	22.06	11.72	13.5	37.39	34.60
14.3	16.72	14.13	14.3	41.43	63.12	14.3	39.39	39.01	14.4	22.01	12.05	14.5	37.45	34.95
15.3	16.44	14.29	15.3	40.49	63.32	15.3	39.17	39.18	15.4	21.95	12.37	15.5	37.49	35.28
16.3	16.17	14.44	16.3	39.58	63.52	16.3	38.93	39.33	16.4	21.90	12.68	16.5	37.53	35.60
17.3	15.92	14.57	17.3	38.68	63.71	17.3	38.69	39.48	17.4	21.84	12.99	17.5	37.57	35.91
18.3	15.68	14.71	18.3	37.82	63.90	18.3	38.44	39.63	18.4	21.79	13.28	18.5	37.61	36.20
19.3	15.43	14.85	19.3	36.97	64.09	19.3	38.17	39.76	19.4	21.74	13.58	19.5	37.65	36.50
20.3	15.18	14.99	20.3	36.11	64.29	20.3	37.91	39.86	20.4	21.70	13.87	20.5	37.71	36.81
21.3	14.94	15.15	21.3	35.24	64.49	21.3	37.65	39.96	21.4	21.66	14.19	21.5	37.77	37.12
22.3	14.69	15.30	22.3	34.37	64.71	22.3	37.39	40.06	22.4	21.62	14.51	22.5	37.83	37.43
23.3	14.42	15.46	23.3	33.44	64.93	23.3	37.14	40.12	23.4	21.57	14.84	23.5	37.89	37.76
24.3	14.14	15.61	24.3	32.46	65.15	24.3	36.89	40.18	24.4	21.52	15.17	24.5	37.94	38.09
25.3	13.85	15.76	25.3	31.42	65.35	25.3	36.65	40.22	25.4	21.44	15.51	25.5	37.99	38.45
26.3	13.54	15.90	26.3	30.32	65.55	26.3	36.41	40.26	26.4	21.35	15.85	26.5	38.01	38.81
27.3	13.23	16.02	27.3	29.17	65.71	27.3	36.19	40.31	27.4	21.24	16.19	27.5	38.01	39.18
28.3	12.91	16.12	28.3	28.02	65.86	28.3	35.96	40.37	28.4	21.11	16.50	28.5	37.99	39.53
29.3	12.59	16.19	29.3	26.89	66.00	29.3	35.73	40.44	29.4	20.98	16.79	29.5	37.95	39.87
30.3	12.30	16.25	30.3	25.79	66.11	30.3	35.46	40.52	30.4	20.85	17.08	30.5	37.92	40.19
31.3	12.01	16.30	31.3	24.75	66.22	31.3	35.20	40.59	31.4	20.74	17.35	31.5	37.89	40.49
13.83		+13.80	52.13		+52.12	11.85		−11.81	12.34		+12.30	11.85		+11.81
0^h	57^m	$55^s.489$	1^h	33^m	$11^s.898$	1^h	41^m	$39^s.995$	4^h	11^m	$48^s.583$	5^h	37^m	$5^s.478$
+85°	50′	41″.77	+88°	53′	34″.33	−85°	9′	32″.70	+85°	21′	5″.69	+85°	9′	42″.71

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Dec.	5 45	−84 49	Dec.	6 46	−80 14	Dec.	7 5	+87 9	Dec.	7 14	−86 54	Dec.	7 15	+82 33
0.5	9.78	40.61	0.6	32.94	2.65	0.6	39.05	56.88	0.6	25.72	45.92	0.6	15.39	25.91
1.5	9.83	40.92	1.6	33.01	2.94	1.6	39.39	57.13	1.6	25.96	46.18	1.6	15.53	26.14
2.5	9.90	41.24	2.6	33.08	3.25	2.6	39.72	57.38	2.6	26.20	46.45	2.6	15.67	26.37
3.5	9.95	41.60	3.6	33.15	3.57	3.6	40.03	57.61	3.6	26.43	46.75	3.6	15.80	26.57
4.5	10.00	41.97	4.6	33.22	3.92	4.6	40.35	57.82	4.6	26.66	47.07	4.6	15.94	26.77
5.5	10.02	42.36	5.6	33.27	4.29	5.6	40.68	58.02	5.6	26.86	47.40	5.6	16.07	26.95
6.5	10.03	42.73	6.6	33.32	4.66	6.6	41.05	58.23	6.6	27.04	47.74	6.6	16.22	27.13
7.5	10.03	43.10	7.6	33.36	5.02	7.6	41.43	58.45	7.6	27.19	48.08	7.6	16.38	27.32
8.5	10.01	43.44	8.6	33.40	5.36	8.6	41.81	58.68	8.6	27.32	48.41	8.6	16.54	27.52
9.5	10.00	43.77	9.6	33.44	5.71	9.6	42.19	58.92	9.6	27.44	48.73	9.6	16.70	27.75
10.5	9.98	44.09	10.6	33.47	6.04	10.6	42.57	59.20	10.6	27.56	49.04	10.6	16.85	27.99
11.5	9.97	44.40	11.6	33.51	6.35	11.6	42.91	59.48	11.6	27.68	49.33	11.6	17.00	28.26
12.5	9.96	44.69	12.6	33.55	6.66	12.6	43.23	59.78	12.6	27.81	49.62	12.6	17.14	28.53
13.5	9.96	45.00	13.6	33.59	6.97	13.6	43.51	60.08	13.6	27.94	49.91	13.6	17.26	28.81
14.5	9.97	45.33	14.5	33.62	7.29	14.6	43.76	60.38	14.6	28.09	50.22	14.6	17.36	29.08
15.5	9.97	45.67	15.5	33.66	7.63	15.6	44.00	60.67	15.6	28.24	50.53	15.6	17.46	29.35
16.5	9.97	46.01	16.5	33.70	7.99	16.6	44.23	60.95	16.6	28.38	50.86	16.6	17.56	29.62
17.5	9.94	46.37	17.5	33.73	8.35	17.6	44.45	61.22	17.6	28.51	51.20	17.6	17.66	29.86
18.5	9.91	46.73	18.5	33.76	8.72	18.6	44.67	61.48	18.6	28.62	51.56	18.6	17.75	30.11
19.5	9.87	47.10	19.5	33.77	9.09	19.6	44.90	61.74	19.6	28.72	51.92	19.6	17.85	30.35
20.5	9.83	47.47	20.5	33.79	9.47	20.5	45.14	62.01	20.6	28.81	52.29	20.6	17.95	30.59
21.5	9.77	47.83	21.5	33.80	9.85	21.5	45.39	62.27	21.6	28.87	52.65	21.6	18.05	30.84
22.5	9.71	48.17	22.5	33.81	10.22	22.5	45.64	62.54	22.5	28.92	53.01	22.6	18.16	31.11
23.5	9.63	48.50	23.5	33.81	10.59	23.5	45.89	62.83	23.5	28.95	53.36	23.5	18.27	31.37
24.5	9.55	48.82	24.5	33.81	10.92	24.5	46.14	63.14	24.5	28.96	53.70	24.5	18.39	31.65
25.5	9.47	49.13	25.5	33.80	11.26	25.5	46.38	63.46	25.5	28.97	54.02	25.5	18.50	31.96
26.5	9.40	49.42	26.5	33.80	11.59	26.5	46.59	63.80	26.5	28.98	54.33	26.5	18.60	32.27
27.5	9.33	49.72	27.5	38.80	11.90	27.5	46.79	64.15	27.5	29.00	54.63	27.5	18.68	32.60
28.5	9.26	50.02	28.5	33.80	12.23	28.5	46.94	64.49	28.5	29.04	54.95	28.5	18.74	32.92
29.5	9.19	50.33	29.5	33.80	12.57	29.5	47.07	64.82	29.5	29.08	55.28	29.5	18.80	33.23
30.5	9.12	50.66	30.5	33.80	12.93	30.5	47.17	65.15	30.5	29.11	55.62	30.5	18.86	33.53
31.5	9.03	51.02	31.5	33.80	13.31	31.5	47.27	65.44	31.5	29.12	55.99	31.5	18.91	33.81
11.10	−11.05		6.21	−6.13		20.23	+20.21		18.57	−18.55		7.72	+7.65	
$5^h\ 45^m\ 4^s.700$			$6^h\ 46^m\ 28^s.850$			$7^h\ 4^m\ 58^s.549$			$7^h\ 14^m\ 18^s.185$			$7^h\ 14^m\ 59^s.083$		
−84° 49′ 38″.84			−80° 44′ 2″.02			+87° 10′ 21″.62			−86° 54′ 45″.50			+82° 33′ 51″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Dec.	8 22	+88 51	Dec.	9 8	−85 21	Dec.	9 26	+81 39	Dec.	9 36	−80 35	Dec.	10 21	+82 56
0.7	46.53	19.21	0.7	14.22	23.62	0.7	20.67	31.26	0.7	16.21	41.90	0.7	52.26	27.63
1.6	47.62	19.37	1.7	14.46	23.76	1.7	20.84	31.30	1.7	16.35	42.02	1.7	52.46	27.59
2.6	48.65	19.52	2.7	14.71	23.93	2.7	21.00	31.34	2.7	16.48	42.15	2.7	52.65	27.56
3.6	49.63	19.67	3.7	14.97	24.11	3.7	21.16	31.38	3.7	16.61	42.29	3.7	52.84	27.52
4.6	50.61	19.80	4.7	15.22	24.31	4.7	21.31	31.40	4.7	16.75	42.47	4.7	53.02	27.48
5.6	51.62	19.93	5.7	15.46	24.54	5.7	21.47	31.41	5.7	16.90	42.67	5.7	53.20	27.42
6.6	52.67	20.04	6.7	15.71	24.78	6.7	21.64	31.42	6.7	17.04	42.90	6.7	53.39	27.36
7.6	53.78	20.16	7.7	15.94	25.03	7.7	21.81	31.43	7.7	17.16	43.13	7.7	53.59	27.29
8.6	54.94	20.29	8.7	16.14	25.29	8.7	21.99	31.44	8.7	17.28	43.36	8.7	53.81	27.22
9.6	56.12	20.44	9.7	16.34	25.53	9.7	22.17	31.48	9.7	17.39	43.58	9.7	54.03	27.16
10.6	57.27	20.62	10.7	16 52	25.77	10.7	22.36	31.53	10.7	17.50	43.80	10.7	54.25	27.12
11.6	58.38	20.82	11.7	16.71	25.99	11.7	22.54	31.61	11.7	17.62	44.00	11.7	54.47	27.12
12.6	59.43	21.02	12.7	16.90	26.21	12.7	22.72	31.71	12.7	17.72	44.19	12.7	54.68	27.14
13.6	60.42	21.25	13.7	17.10	26.42	13.7	22.88	31.82	13.7	17.83	44.38	13.7	54.88	27.17
14.6	61.32	21.47	14.6	17.30	26.64	14.7	23.02	31.93	14.7	17.96	44.58	14.7	55.07	27.22
15.6	62.20	21.67	15.6	17.51	26.86	15.7	23.17	32.06	15.7	18.08	44.80	15.7	55.26	27.26
16.6	63.03	21.89	16.6	17.72	27.10	16.7	23.32	32.18	16.7	18.19	45.02	16.7	55.45	27.30
17.6	63.85	22.11	17.6	17.93	27.36	17.7	23.46	32.29	17.7	18.31	45.24	17.7	55.63	27.34
18.6	64.67	22.30	18.6	18.14	27.63	18.7	23.60	32.40	18.7	18.43	45.50	18.7	55.81	27.37
19.6	65.49	22.50	19.6	18.34	27.92	19.6	23.74	32.50	19.7	18.55	45.76	19.7	55.98	27.41
20.6	66.34	22.70	20.6	18.53	28.22	20.6	23.89	32.61	20.7	18.66	46.04	20.7	56.16	27.44
21.6	67.21	22.92	21.6	18.72	28.53	21.6	24.04	32.72	21.6	18.76	46.32	21.7	56.35	27.47
22.6	68.10	23.13	22.6	18.89	28.84	22.6	24.20	32.82	22.6	18.86	46.62	22.7	56.54	27.51
23.6	69.02	23.34	23.6	19.04	29.15	23.6	24.37	32.95	23.6	18.96	46.91	23.7	56.74	27.56
24.6	69.94	23.57	24.6	19.18	29.44	24.6	24.53	33.08	24.6	19.06	47.20	24.7	56.94	27.61
25.6	70.84	23.83	25.6	19.32	29.72	25.6	24.69	33.23	25.6	19.15	47.48	25.7	57.15	27.69
26.6	71.70	24.11	26.6	19.45	30.00	26.6	24.84	33.40	26.6	19.24	47.76	26.7	57.36	27.78
27.6	72.51	24.39	27.6	19.58	30.27	27.6	24.99	33.59	27.6	19.33	48.02	27.7	57.56	27.89
28.6	73.24	24.67	28.6	19.72	30.55	28.6	25.13	33.78	28.6	19.41	48.29	28.7	57.75	28.02
29.6	73.91	24.96	29.6	19.87	30.83	29.6	25.26	33.98	29.6	19.50	48.56	29.7	57.93	28.15
30.6	74.52	25.23	30.6	20.03	31.14	30.6	25.39	34.18	30.6	19.59	48.83	30.7	58.10	28.29
31.6	75.11	25.49	31.6	20.19	31.46	31.6	25.50	34.37	31.6	19.69	49.13	31.7	58.26	28.41
50.09		+50.08	12.35		−12.31	6.89		+6.82	6.12		−6.04	8.14		+8.08
$8^h\ 21^m\ 41^s.998$			$9^h\ 8^m\ 8^s.703$			$9^h\ 26^m\ 14^s.295$			$9^h\ 36^m\ 12^s.346$			$10^h\ 21^m\ 50^s.081$		
+88° 51′ 51″.95			−85° 21′ 25″.35			+81° 40′ 7″.28			−80° 35′ 44″.11			+82° 57′ 4″.81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	10 59	−84 10	Dec.	12 13	+88 6	Dec.	12 46	−84 42	Dec.	12 48	+83 49	Dec.	13 28	−85 23
	s	″		s	″		s	″		s	″		s	″
0.8	57.16	43.41	0.8	56.64	63.40	0.8	46.30	15.65	0.8	21.42	23.26	0.9	12.15	29.50
1.8	57.38	43.41	1.8	57.26	63.21	1.8	46.50	15.50	1.8	21.60	23.01	1.9	12.35	29.31
2.8	57.60	43.41	2.8	57.87	63.03	2.8	46.73	15.36	2.8	21.78	22.78	2.9	12.58	29.11
3.8	57.83	43.43	3.8	58.43	62.85	3.8	46.96	15.22	3.8	21.93	22.56	3.9	12.82	28.92
4.8	58.08	43.47	4.8	58.98	62.67	4.8	47.20	15.11	4.8	22.08	22.34	4.9	13.09	28.73
5.8	58.32	43.55	5.8	59.52	62.48	5.8	47.47	15.02	5.8	22.22	22.10	5.9	13.36	28.58
6.7	58.56	43.65	6.8	60.06	62.27	6.8	47.74	14.95	6.8	22.39	21.84	6.8	13.65	28.44
7.7	58.81	43.76	7.8	60.64	62.05	7.8	48.00	14.91	7.8	22.56	21.57	7.8	13.93	28.33
8.7	59.04	43.89	8.8	61.27	61.83	8.8	48.25	14.86	8.8	22.73	21.30	8.8	14.22	28.23
9.7	59.24	44.01	9.8	61.93	61.63	9.8	48.49	14.83	9.8	22.92	21.04	9.8	14.49	28.14
10.7	59.45	44.11	10.8	62.63	61.43	10.8	48.72	14.80	10.8	23.13	20.79	10.8	14.73	28.06
11.7	59.65	44.21	11.8	63.33	61.25	11.8	48.94	14.76	11.8	23.34	20.55	11.8	14.97	27.96
12.7	59.85	44.30	12.8	64.05	61.10	12.8	49.17	14.71	12.8	23.55	20.35	12.8	15.22	27.86
13.7	60.05	44.38	13.8	64.76	60.97	13.8	49.40	14.66	13.8	23.75	20.16	13.8	15.46	27.75
14.7	60.27	44.46	14.8	65.44	60.87	14.8	49.63	14.59	14.8	23.95	19.99	14.8	15.70	27.62
15.7	60.49	44.55	15.8	66.10	60.76	15.8	49.87	14.53	15.8	24.15	19.83	15.8	15.96	27.51
16.7	60.71	44.65	16.8	66.75	60.66	16.8	50.12	14.47	16.8	24.35	19.68	16.8	16.24	27.40
17.7	60.93	44.77	17.8	67.37	60.56	17.8	50.37	14.42	17.8	24.54	19.53	17.8	16.51	27.29
18.7	61.16	44.90	18.8	67.99	60.46	18.8	50.63	14.40	18.8	24.72	19.37	18.8	16.80	27.20
19.7	61.39	45.05	19.8	68.60	60.36	19.8	50.91	14.39	19.8	24.90	19.21	19.8	17.10	27.11
20.7	61.62	45.22	20.8	69.24	60.25	20.8	51.18	14.38	20.8	25.08	19.06	20.8	17.40	27.05
21.7	61.84	45.40	21.8	69.88	60.12	21.8	51.45	14.41	21.8	25.27	18.88	21.8	17.71	27.00
22.7	62.04	45.59	22.8	70.54	60.00	22.8	51.71	14.44	22.8	25.48	18.71	22.8	18.01	26.98
23.7	62.25	45.78	23.8	71.23	59.89	23.8	51.97	14.49	23.8	25.69	18.53	23.8	18.30	26.97
24.7	62.45	45.97	24.7	71.96	59.79	24.8	52.22	14.54	24.8	25.91	18.37	24.8	18.59	26.96
25.7	62.63	46.16	25.7	72.70	59.71	25.8	52.45	14.59	25.8	26.13	18.22	25.8	18.87	26.95
26.7	62.81	46.35	26.7	73.46	59.64	26.8	52.69	14.64	26.8	26.36	18.08	26.8	19.13	26.94
27.7	62.99	46.52	27.7	74.22	59.59	27.8	52.91	14.67	27.8	26.59	17.98	27.8	19.39	26.92
28.7	63.17	46.69	28.7	74.97	59.56	28.8	53.15	14.70	28.8	26.83	17.88	28.8	19.65	26.89
29.7	63.36	46.86	29.7	75.68	59.55	29.8	53.38	14.74	29.8	27.04	17.79	29.8	19.92	26.86
30.7	63.55	47.04	30.7	76.36	59.54	30.8	53.63	14.77	30.8	27.24	17.73	30.8	20.20	26.83
31.7	63.76	47.24	31.7	76.99	59.53	31.8	53.90	14.81	31.8	27.45	17.66	31.8	20.51	26.82
9.86		−9.81	30.43		+30.42	10.83		−10.79	9.29		+9.24	12.45		−12.40
10^h	59^m	$53^s.036$	12^h	14^m	$30^s.802$	12^h	46^m	$43^s.161$	12^h	48^m	$33^s.111$	13^h	28^m	$9^s.628$
−84°	10′	46″.79	+88°	7′	36″.40	−84°	42′	20″.01	+83°	49′	52″.98	−85°	23′	33″.94

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	14 14	−83 18	Dec.	15 0	+87 31	Dec.	15 25	−84 12	Dec.	16 53	+82 9	Dec.	17 17	−80 47
	s	″		s	″		s	″		s	″		s	″
0.9	25.53	56.90	0.9	53.54	34.00	0.9	18.21	41.05	1.0	32.19	64.38	1.0	2.77	26.34
1.9	25.66	56.67	1.9	53.71	33.66	1.9	18.29	40.77	2.0	32.16	64.01	2.0	2.76	26.05
2.9	25.78	56.43	2.9	53.86	33.33	2.9	18.38	40.48	3.0	32.13	63.67	3.0	2.75	25.73
3.9	25.92	56.19	3.9	54.00	33.01	3.9	18.49	40.18	4.0	32.11	63.34	4.0	2.75	25.41
4.9	26.09	55.96	4.9	54.13	32.69	4.9	18.62	39.88	4.9	32.08	63.01	5.0	2.75	25.08
5.9	26.26	55.75	5.9	54.24	32.37	5.9	18.76	39.59	5.9	32.04	62.67	6.0	2.79	24.74
6.9	26.43	55.56	6.9	54.35	32.03	6.9	18.93	39.32	6.9	32.01	62.34	7.0	2.83	24.41
7.9	26.61	55.40	7.9	54.48	31.66	7.9	19.10	39.07	7.9	31.97	61.98	8.0	2.87	24.10
8.9	26.80	55.25	8.9	54.61	31.30	8.9	19.25	38.83	8.9	31.94	61.62	9.0	2.92	23.81
9.9	26.97	55.10	9.9	54.79	30.93	9.9	19.41	38.63	9.9	31.92	61.24	10.0	2.97	23.53
10.9	27.14	54.97	10.9	55.00	30.56	10.9	19.56	38.42	10.9	31.91	60.82	10.9	3.01	23.26
11.9	27.29	54.83	11.9	55.24	30.19	11.9	19.69	38.20	11.9	31.90	60.42	11.9	3.04	23.00
12.9	27.44	54.68	12.9	55.50	29.85	12.9	19.82	37.97	12.9	31.91	60.03	12.9	3.08	22.73
13.9	27.59	54.52	13.9	55.78	29.53	13.9	19.95	37.74	13.9	31.92	59.66	13.9	3.11	22.45
14.9	27.75	54.35	14.9	56.05	29.22	14.9	20.08	37.51	14.9	31.93	59.29	14.9	3.13	22.16
15.9	27.90	54.17	15.9	56.34	28.93	15.9	20.22	37.26	15.9	31.94	58.94	15.9	3.16	21.86
16.9	28.08	54.00	16.9	56.61	28.65	16.9	20.37	37.01	16.9	31.96	58.60	16.9	3.19	21.55
17.9	28.26	53.83	17.9	56.87	28.37	17.9	20.54	36.76	17.9	31.97	58.25	17.9	3.23	21.24
18.9	28.45	53.68	18.9	57.12	28.09	18.9	20.71	36.52	18.9	31.98	57.92	18.9	3.28	20.92
19.8	28.64	53.54	19.9	57.37	27.81	19.9	20.89	36.28	19.9	32.00	57.59	19.9	3.33	20.60
20.8	28.84	53.41	20.9	57.62	27.52	20.9	21.07	36.05	20.9	32.02	57.26	20.9	3.39	20.29
21.8	29.04	53.31	21.9	57.89	27.23	21.9	21.27	35.85	21.9	32.03	56.90	21.9	3.47	19.98
22.8	29.24	53.21	22.9	58.16	26.92	22.9	21.47	35.65	22.9	32.05	56.54	22.9	3.55	19.70
23.8	29.44	53.14	23.9	58.46	26.61	23.9	21.67	35.48	23.9	32.07	56.17	23.9	3.64	19.43
24.8	29.63	53.08	24.9	58.78	26.30	24.9	21.87	35.32	24.9	32.10	55.80	24.9	3.72	19.18
25.8	29.82	53.01	25.9	59.12	25.99	25.9	22.06	35.17	25.9	32.13	55.41	25.9	3.80	18.93
26.8	30.01	52.95	26.9	59.49	25.69	26.9	22.24	35.02	26.9	32.18	55.03	26.9	3.86	18.70
27.8	30.19	52.87	27.9	59.88	25.41	27.9	22.42	34.85	27.9	32.23	54.65	27.9	3.92	18.46
28.8	30.36	52.79	28.9	60.29	25.14	28.9	22.59	34.68	28.9	32.29	54.28	28.9	3.98	18.20
29.8	30.54	52.70	29.9	60.68	24.90	29.9	22.76	34.50	29.9	32.35	53.94	29.9	4.04	17.93
30.8	30.73	52.60	30.9	61.06	24.67	30.9	22.94	34.32	30.9	32.41	53.62	30.9	4.12	17.65
31.8	30.93	52.53	31.8	61.43	24.46	31.9	23.16	34.14	31.9	32.46	53.30	31.9	4.20	17.36
8.59		−8.53	23.15		+23.13	9.91		−9.86	7.34		+7.27	6.25		−6.17
14^h	14^m	$23^s.592$	15^h	1^m	$45^s.970$	15^h	25^m	$17^s.036$	16^h	53^m	$48^s.037$	17^h	17^m	$1^s.936$
−83°	19′	1″.42	+87°	31′	46″.68	−84°	12′	45″.34	+82°	9′	58″.64	−80°	47′	29″.50

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Dec.	17 56	+86 36	Dec.	18 9	−87 39	Dec.	18 53	+89 1	Dec.	19 36	−89 12	Dec.	20 48	+82 15
1.1	27.76	65.90	1.1	41.96	46.55	1.1	29.17	56.25	1.1	43.11	41.09	1.2	10.38	25.55
2.1	27.59	65.57	2.1	41.79	46.24	2.1	28.26	55.97	2.1	42.07	40.85	2.2	10.22	25.41
3.0	27.42	65.26	3.1	41.63	45.92	3.1	27.40	55.73	3.1	41.03	40.58	3.2	10.07	25.28
4.0	27.26	64.97	4.1	41.48	45.58	4.1	26.55	55.47	4.1	40.01	40.30	4.2	9.92	25.16
5.0	27.09	64.69	5.1	41.38	45.24	5.1	25.68	55.25	5.1	39.07	40.01	5.2	9.77	25.05
6.0	26.90	64.41	6.1	41.32	44.88	6.1	24.75	55.03	6.1	38.23	39.69	6.2	9.63	24.95
7.0	26.71	64.12	7.0	41.30	44.54	7.1	23.76	54.80	7.1	37.51	39.38	7.2	9.48	24.85
8.0	26.50	63.81	8.0	41.31	44.20	8.1	22.74	54.56	8.1	36.91	39.06	8.2	9.33	24.75
9.0	26.30	63.49	9.0	41.35	43.88	9.1	21.73	54.29	9.1	36.38	38.76	9.2	9.17	24.62
10.0	26.11	63.14	10.0	41.38	43.58	10.1	20.74	54.00	10.1	35.87	38.47	10.1	9.00	24.48
11.0	25.96	62.77	11.0	41.39	43.29	11.1	19.81	53.69	11.1	35.36	38.19	11.1	8.83	24.31
12.0	25.81	62.41	12.0	41.40	42.99	12.1	18.97	53.37	12.1	34.80	37.91	12.1	8.69	24.13
13.0	25.70	62.05	13.0	41.37	42.70	13.1	18.21	53.04	13.1	34.19	37.64	13.1	8.53	23.93
14.0	25.60	61.68	14.0	41.33	42.39	14.1	17.52	52.72	14.1	33.52	37.36	14.1	8.39	23.72
15.0	25.51	61.35	15.0	41.29	42.08	15.1	16.88	52.43	15.1	32.83	37.07	15.1	8.25	23.51
16.0	25.43	61.01	16.0	41.27	41.75	16.1	16.29	52.13	16.1	32.14	36.76	16.1	8.12	23.30
17.0	25.36	60.68	17.0	41.26	41.41	17.1	15.73	51.83	17.1	31.48	36.45	17.1	7.99	23.10
18.0	25.28	60.36	18.0	41.26	41.06	18.0	15.16	51.55	18.1	30.86	36.13	18.1	7.87	22.90
19.0	25.21	60.05	19.0	41.30	40.70	19.0	14.58	51.27	19.1	30.32	35.79	19.1	7.75	22.69
20.0	25.13	59.73	20.0	41.37	40.34	20.0	13.99	50.99	20.1	29.85	35.45	20.1	7.63	22.50
20.9	25.05	59.41	21.0	41.46	39.99	21.0	13.39	50.71	21.1	29.45	35.11	21.1	7.51	22.32
21.9	24.97	59.08	22.0	41.58	39.65	22.0	12.77	50.40	22.1	29.14	34.76	22.1	7.38	22.12
22.9	24.89	58.75	23.0	41.72	39.32	23.0	12.15	50.09	23.1	28.90	34.42	23.1	7.25	21.92
23.9	24.82	58.39	24.0	41.88	39.00	24.0	11.52	49.77	24.1	28.74	34.08	24.1	7.12	21.70
24.9	24.76	58.02	24.9	42.05	38.71	25.0	10.93	49.43	25.1	28.62	33.76	25.1	6.99	21.47
25.9	24.71	57.64	25.9	42.21	38.41	26.0	10.38	49.08	26.1	28.50	33.45	26.1	6.85	21.20
26.9	24.69	57.26	26.9	42.35	38.12	27.0	9.90	48.73	27.1	28.37	33.15	27.1	6.72	20.93
27.9	24.68	56.88	27.9	42.48	37.83	28.0	9.51	48.38	28.0	28.18	32.84	28.1	6.62	20.64
28.9	24.69	56.51	28.9	42.59	37.54	29.0	9.19	48.03	29.0	27.93	32.54	29.1	6.51	20.36
29.9	24.72	56.16	29.9	42.70	37.22	30.0	8.96	47.69	30.0	27.65	32.22	30.1	6.40	20.09
30.9	24.75	55.83	30.9	42.83	36.89	31.0	8.73	47.37	31.0	27.40	31.88	31.1	6.30	19.82
31.9	24.78	55.51	31.9	43.00	36.54	32.0	8.50	47.06	32.0	27.18	31.52	32.1	6.22	19.57
16.95		+16.92	24.51		−24.49	59.15		+59.14	72.56		−72.55	7.42		+7.35
17h 57m 4s.326			18h 9m 46s.186			18h 55m 23s.393			19h 37m 1s.735			20h 48m 15s.385		
+86° 36′ 50″.43			−87° 39′ 48″.39			+89° 1′ 32″.83			−89° 12′ 41″.41			+82° 14′ 50″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
Dec.	21 39	−83 4	Dec.	22 17	−86 21	Dec.	22 38	−81 47	Dec.	23 27	+86 53	Dec.	23 47	−82 26
1.2	16.64	30.39	1.2	20.55	40.72	1.2	17.55	11.94	1.3	57.94	34.41	1.3	39.21	51.61
2.2	16.47	30.31	2.2	20.23	40.68	2.2	17.41	11.95	2.3	57.53	34.51	2.3	39.07	51.70
3.2	16.29	30.21	3.2	19.89	40.63	3.2	17.26	11.94	3.3	57.15	34.61	3.3	38.89	51.79
4.2	16.12	30.09	4.2	19.52	40.55	4.2	17.10	11.90	4.3	56.78	34.71	4.3	38.72	51.85
5.2	15.95	29.95	5.2	19.16	40.45	5.2	16.94	11.85	5.3	56.43	34.83	5.3	38.54	51.91
6.2	15.80	29.77	6.2	18.83	40.32	6.2	16.79	11.77	6.3	56.08	34.96	6.3	38.36	51.93
7.2	15.64	29.59	7.2	18.50	40.18	7.2	16.65	11.67	7.3	55.72	35.10	7.3	38.21	51.93
8.2	15.51	29.40	8.2	18.20	40.03	8.2	16.52	11.56	8.3	55.34	35.26	8.3	38.05	51.92
9.2	15.38	29.20	9.2	17.91	39.88	9.2	16.39	11.44	9.3	54.93	35.41	9.3	37.90	51.90
10.2	15.27	29.02	10.2	17.64	39.73	10.2	16.27	11.33	10.3	54.50	35.52	10.3	37.77	51.88
11.2	15.15	28.87	11.2	17.37	39.59	11.2	16.16	11.23	11.3	54.06	35.62	11.3	37.63	51.87
12.2	15.03	28.72	12.2	17.11	39.47	12.2	16.03	11.15	12.3	53.61	35.69	12.3	37.48	51.87
13.2	14.90	28.56	13.2	16.83	39.36	13.2	15.91	11.07	13.2	53.16	35.74	13.3	37.34	51.87
14.2	14.76	28.41	14.2	16.54	39.25	14.2	15.78	10.99	14.2	52.74	35.79	14.3	37.19	51.88
15.2	14.62	28.24	15.2	16.22	39.12	15.2	15.65	10.91	15.2	52.32	35.82	15.3	37.02	51.89
16.2	14.47	28.07	16.2	15.90	38.99	16.2	15.51	10.82	16.2	51.91	35.83	16.3	36.85	51.91
17.2	14.32	27.89	17.2	15.58	38.85	17.2	15.37	10.72	17.2	51.53	35.86	17.3	36.69	51.91
18.2	14.17	27.69	18.2	15.27	38.68	18.2	15.22	10.60	18.2	51.15	35.90	18.2	36.52	51.88
19.2	14.02	27.47	19.2	14.96	38.51	19.2	15.07	10.46	19.2	50.77	35.93	19.2	36.35	51.85
20.2	13.89	27.25	20.2	14.65	38.33	20.2	14.93	10.31	20.2	50.39	35.96	20.2	36.18	51.80
21.2	13.76	27.01	21.2	14.36	38.11	21.2	14.80	10.16	21.2	50.01	36.00	21.2	36.02	51.72
22.2	13.65	26.76	22.2	14.09	37.89	22.2	14.68	9.98	22.2	49.62	36.04	22.2	35.85	51.64
23.1	13.54	26.50	23.2	13.83	37.66	23.2	14.57	9.80	23.2	49.21	36.07	23.2	35.70	51.55
24.1	13.44	26.25	24.2	13.59	37.46	24.2	14.46	9.61	24.2	48.79	36.08	24.2	35.56	51.45
25.1	13.35	26.01	25.2	13.36	37.25	25.2	14.35	9.42	25.2	48.34	36.10	25.2	35.42	51.34
26.1	13.26	25.78	26.2	13.14	37.04	26.2	14.25	9.24	26.2	47.89	36.10	26.2	35.29	51.24
27.1	13.17	25.56	27.2	12.93	36.83	27.2	14.14	9.08	27.2	47.44	36.07	27.2	35.16	51.16
28.1	13.08	25.34	28.2	12.70	36.64	28.2	14.04	8.93	28.2	47.00	36.03	28.2	35.01	51.08
29.1	12.97	25.11	29.2	12.45	36.44	29.2	13.93	8.76	29.2	46.57	35.97	29.2	34.86	50.99
30.1	12.86	24.88	30.2	12.18	36.24	30.2	13.80	8.59	30.2	46.18	35.91	30.2	34.71	50.91
31.1	12.75	24.62	31.2	11.91	36.01	31.2	13.68	8.41	31.2	45.79	35.84	31.2	34.56	50.82
32.1	12.64	24.35	32.2	11.64	35.78	32.2	13.55	8.20	32.2	45.42	35.78	32.2	34.38	50.72
8.29		−8.23	15.76		−15.72	7.00		−6.93	18.45		+18.42	7.61		−7.54
21^h	39^m	$16^s.433$	22^h	17^m	$21^s.969$	22^h	38^m	$16^s.769$	23^h	27^m	$42^s.388$	23^h	47^m	$38^s.028$
−83°	4′	28″.91	−86°	21′	38″.42	−81°	47′	9″.68	+86°	52′	58″.09	−82°	26′	48″.40

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	33 Piscium. Mag. 4.7		α Andromedæ. (*Alpheratz.*) Mag. 2.2		β Cassiopeiæ. Mag. 2.4		ϵ Phœnicis. Mag. 3.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 0 1 s	° ′ − 6 7 ″	h m 0 4 s	° ′ +28 39 ″	h m 0 5 s	° ′ +58 43 ″	h m 0 5 s	° ′ −46 9 ″
Jan. 0.2	23.330	82.05	24.288	63.06	4.200	46.31	29.373	96.99
	116	64	149	99	326	82	205	31
10.2	23.214	82.69	24.139	62.07	3.874	45.49	29.168	96.68
	108	53	144	123	312	130	191	74
20.2	23.106	83.22	23.995	60.84	3.562	44.19	28.977	95.94
	98	40	131	147	289	178	170	119
30.1	23.008	83.62	23.864	59.37	3.273	42.41	28.807	94.75
Feb. 9.1	80	23	113	159	250	218	142	157
	22.928	83.85	23.751	57.78	3.023	40.23	28.665	93.18
	60	8	90	169	204	249	110	196
19.1	22.868	83.93	23.661	56.09	2.819	37.74	28.555	91.22
	37	14	56	169	145	265	72	228
Mar. 1.1	22.831	83.79	23.605	54.40	2.674	35.09	28.483	88.94
	6	33	21	163	76	280	31	254
11.0	22.825	83.46	23.584	52.77	2.598	32.29	28.452	86.40
	28	58	22	146	0	275	17	277
21.0	22.853	82.88	23.606	51.31	2.598	29.54	28.469	83.63
	65	81	65	128	80	267	65	292
31.0	22.918	82.07	23.671	50.03	2.678	26.87	28.534	80.71
	105	105	113	100	158	237	117	304
Apr. 10.0	23.023	81.02	23.784	49.03	2.836	24.50	28.651	77.67
	144	128	156	67	235	208	170	307
19.9	23.167	79.74	23.940	48.36	3.071	22.42	28.821	74.60
	181	150	204	29	307	165	220	304
29.9	23.348	78.24	24.144	48.07	3.378	20.77	29.041	71.56
May 9.9	216	170	242	10	369	120	264	294
	23.564	76.54	24.386	48.17	3.747	19.57	29.305	68.62
19.8	249	184	277	49	421	71	310	279
	23.813	74.70	24.663	48.66	4.168	18.86	29.615	65.83
	274	195	303	87	460	15	346	258
29.8	24.087	72.75	24.966	49.53	4.628	18.71	29.961	63.25
	293	201	323	125	486	36	373	227
June 8.8	24.380	70.74	25.289	50.78	5.114	19.07	30.334	60.98
	304	202	334	154	498	88	391	194
18.8	24.684	68.72	25.623	52.32	5.612	19.95	30.725	59.04
	309	198	334	184	497	136	400	155
28.7	24.993	66.74	25.957	54.16	6.109	21.31	31.125	57.49
July 8.7	303	188	325	206	484	182	397	110
	25.296	64.86	26.282	56.22	6.593	23.13	31.522	56.39
	289	172	310	227	457	223	384	65
18.7	25.585	63.14	26.592	58.49	7.050	25.36	31.906	55.74
	267	154	288	239	420	259	359	17
28.7	25.852	61.60	26.880	60.88	7.470	27.95	32.265	55.57
	241	131	256	214	372	288	328	31
Aug. 7.6	26.093	60.29	27.136	63.32	7.842	30.83	32.593	55.88
	208	106	220	245	318	308	284	78
17.6	26.301	59.23	27.356	65.77	8.160	33.91	32.877	56.66
	171	78	182	241	258	326	236	121
27.6	26.472	58.45	27.538	68.18	8.418	37.17	33.113	57.87
	134	52	143	232	199	334	183	160
Sept 6.5	26.606	57.93	27.681	70.50	8.617	40.51	33.296	59.47
	95	23	102	218	133	336	126	192
16.5	26.701	57.70	27.783	72.68	8.750	43.87	33.422	61.39
	56	0	59	204	68	330	68	216
26.5	26.757	57.70	27.842	74.72	8.818	47.17	33.490	63.55
Oct. 6.5	20	25	22	180	8	319	12	235
	26.777	57.95	27.864	76.52	8.826	50.36	33.502	65.90
16.4	13	43	15	158	52	298	39	239
	26.764	58.38	27.849	78.10	8.774	53.34	33.463	68.29
	40	59	43	135	109	276	87	236
26.4	26.724	58.97	27.806	79.45	8.665	56.10	33.376	70.65
	66	73	74	103	161	243	129	223
Nov. 5.4	26.658	59.70	27.732	80.48	8.504	58.53	33.247	72.88
	84	79	95	77	204	207	161	200
15.4	26.574	60.49	27.637	81.25	8.300	60.60	33.086	74.88
	99	83	116	44	247	162	187	171
25.3	26.475	61.32	27.521	81.69	8.053	62.22	32.899	76.59
Dec. 5.3	110	84	133	15	280	115	204	133
	26.365	62.16	27.388	81.84	7.773	63.37	32.695	77.92
	116	82	141	20	306	63	213	93
15.3	26.249	62.98	27.247	81.64	7.467	64.00	32.482	78.85
	118	77	148	49	321	9	214	47
25.2	26.131	63.75	27.099	81.15	7.146	64.09	32.268	79.32
	116	68	150	81	327	43	210	0
35.2	26.015	64.43	26.949	80.34	6.819	63.66	32.058	79.32
Mean Place	23.683	77.95	24.224	55.26	3.554	30.44	30.388	80.64
Sec δ, Tan δ	1.006	−0.108	1.140	+0.547	1.927	+1.647	1.444	−1.042
$D_{\psi}a$, $D_{\omega}a$	+0.061	+0.007	+0.061	−0.036	+0.062	−0.110	+0.061	+0.069
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.40	+0.01	+0.40	+0.02	+0.40	+0.02	+0.40	+0.02

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 Andromedæ. Mag. 5.1		γ Pegasi. Mag. 2.9		σ Andromedæ. Mag. 4.5		ι Ceti. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 0 6 s	° ′ +45 38 ″	h m 0 9 s	° ′ +14 45 ″	h m 0 14 s	° ′ +36 21 ″	h m 0 15 s	° ′ − 9 14 ″
Jan. 0.2	19.128	50.39	16.043	22.89	18.265	39.90	29.992	68.15
	215	91	125	89	174	89	122	61
10.2	18.913	49.48	15.918	22.00	18.091	39.01	29.870	68.76
	208	133	121	102	170	122	115	48
20.2	18.705	48.15	15.797	20.98	17.921	37.79	29.755	69.24
	193	169	113	108	157	151	107	31
30.2	18.512	46.46	15.684	19.90	17.764	36.28	29.648	69.55
	167	199	96	111	141	174	93	11
Feb. 9.1	18.345	44.47	15.588	18.79	17.623	34.54	29.555	69.66
	135	221	75	108	114	189	73	8
19.1	18.210	42.26	15.513	17.71	17.509	32.65	29.482	69.58
	93	234	50	101	80	197	52	31
Mar. 1.1	18.117	39.92	15.463	16.70	17.429	30.68	29.430	69.27
	45	236	18	89	40	196	17	53
11.0	18.072	37.56	15.445	15.81	17.389	28.72	29.413	68.74
	9	229	18	70	5	186	12	73
21.0	18.081	35.27	15.463	15.11	17.394	26.86	29.425	68.01
	67	211	58	47	55	167	53	102
31.0	18.148	33.16	15.521	14.64	17.449	25.19	29.478	66.99
	126	187	102	18	106	113	89	125
Apr. 10.0	18.274	31.29	15.623	14.46	17.555	23.76	29.567	65.74
	185	151	140	10	157	109	132	143
19.9	18.459	29.78	15.763	14.56	17.712	22.67	29.699	64.31
	239	112	183	44	207	72	169	166
29.9	18.698	28.66	15.946	15.00	17.919	21.95	29.868	62.65
	289	68	221	71	251	32	208	182
May 9.9	18.987	27.98	16.167	15.71	18.170	21.63	30.076	60.83
	329	21	253	106	289	11	240	196
19.8	19.316	27.77	16.420	16.77	18.459	21.74	30.316	58.87
	362	28	279	132	320	54	267	204
29.8	19.678	28.05	16.699	18.09	18.779	22.28	30.583	56.83
	382	74	299	156	342	93	291	208
June 8.8	20.060	28.79	16.998	19.65	19.121	23.21	30.874	54.75
	394	119	310	179	354	133	303	206
18.8	20.454	29.98	17.308	21.44	19.475	24.54	31.177	52.69
	394	161	313	194	356	169	307	198
28.7	20.848	31.59	17.621	23.38	19.831	26.23	31.484	50.71
	384	198	307	205	348	199	306	186
July 8.7	21.232	33.57	17.928	25.43	20.179	28.22	31.790	48.85
	363	229	292	210	333	223	293	168
18.7	21.595	35.86	18.220	27.53	20.512	30.45	32.083	47.17
	336	256	272	210	309	242	275	146
28.7	21.931	38.42	18.492	29.63	20.821	32.87	32.358	45.71
	298	275	248	205	279	257	253	123
Aug. 7.6	22.229	41.17	18.740	31.68	21.100	35.44	32.611	44.48
	257	289	214	196	241	263	219	95
17.6	22.486	44.06	18.954	33.64	21.341	38.07	32.830	43.53
	210	296	176	182	201	266	185	63
27.6	22.696	47.02	19.130	35.46	21.542	40.73	33.015	42.90
	162	298	142	164	159	261	148	38
Sept. 6.5	22.858	50.00	19.272	37.10	21.701	43.34	33.163	42.52
	113	294	101	146	116	253	110	5
16.5	22.971	52.94	19.373	38.56	21.817	45.87	33.273	42.47
	65	282	64	126	73	241	73	19
26.5	23.036	55.76	19.437	39.82	21.890	48.28	33.346	42.66
	18	266	32	101	32	222	35	43
Oct. 6.5	23.054	58.42	19.469	40.83	21.922	50.50	33.381	43.09
	27	246	6	79	7	202	0	64
16.4	23.027	60.88	19.463	41.62	21.915	52.52	33.381	43.73
	67	220	32	57	41	176	26	78
26.4	22.960	63.08	19.431	42.19	21.874	54.28	33.355	44.51
	103	189	59	34	73	148	57	88
Nov. 5.4	22.857	64.97	19.372	42.53	21.801	55.76	33.298	45.39
	134	155	79	11	100	116	77	92
15.4	22.723	66.52	19.293	42.64	21.701	56.92	33.221	46.31
	162	114	96	7	124	83	92	97
25.3	22.561	67.66	19.197	42.57	21.577	57.75	33.129	47.28
	184	72	111	29	143	47	107	96
Dec. 5.3	22.377	68.38	19.086	42.28	21.434	58.22	33.022	48.24
	201	28	118	49	159	9	116	89
15.3	22.176	68.66	18.968	41.79	21.275	58.31	32.906	49.13
	211	17	126	64	169	29	120	80
25.2	21.965	68.49	18.842	41.15	21.106	58.02	32.786	49.93
	218	62	126	81	171	65	121	71
35.2	21.747	67.87	18.716	40.34	20.935	57.37	32.665	50.64
Mean Place	18.788	37.65	16.115	19.97	18.024	30.09	30.299	62.35
Sec δ, Tan δ	1.430	+1.023	1.034	+0.263	1.242	+0.736	1.013	−0.163
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.062	−0.068	+0.061	−0.018	+0.062	−0.049	+0.061	+0.011
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.40	+0.03	+0.40	+0.04	+0.40	+0.06	+0.40	+0.07

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Tucanæ. Mag. 4.3		44 Piscium. Mag. 6.0		β Hydri. Mag. 2.9		α Phœnicis. Mag. 2.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	0 16	−65 19	0 21	+ 1 30	0 21	−77 40	0 22	−42 43
	s	″	s	″	s	″	s	″
Jan. 0.2	2.58	57.23	27.136	45.53	40.37	98.12	28.162	43.26
	40	74	120	75	90	96	196	3
10.2	2.18	56.49	27.016	44.78	39.47	97.16	27.966	43.23
	38	127	116	71	84	153	186	48
20.2	1.80	55.22	26.900	44.07	38.63	95.63	27.780	42.75
	34	181	109	66	76	209	169	90
30.2	1.46	53.41	26.791	43.41	37.87	93.54	27.611	41.85
	30	228	96	57	67	255	149	132
Feb. 9.1	1.16	51.13	26.695	42.84	37.20	90.99	27.462	40.53
	24	269	78	45	54	299	121	171
19.1	0.92	48.44	26.617	42.39	36.66	88.00	27.341	38.82
	17	303	56	29	41	328	88	203
Mar. 1.1	0.75	45.41	26.561	42.10	36.25	84.72	27.253	36.79
	10	328	25	12	27	356	50	234
11.0	0.65	42.13	26.536	41.98	35.98	81.16	27.203	34.45
	2	347	7	10	11	370	7	257
21.0	0.63	38.66	26.543	42.08	35.87	77.46	27.196	31.88
	5	360	44	35	3	379	40	278
31.0	0.68	35.06	26.587	42.43	35.90	73.67	27.236	29.10
	14	363	85	59	20	379	89	292
Apr. 10.0	0.82	31.43	26.672	43.02	36.10	69.88	27.325	26.18
	22	359	126	84	35	369	140	300
19.9	1.04	27.84	26.798	43.86	36.45	66.19	27.465	23.18
	30	316	166	111	50	354	189	302
29.9	1.34	24.38	26.964	44.97	36.95	62.65	27.654	20.16
	37	329	203	133	64	327	236	296
May 9.9	1.71	21.09	27.167	46.30	37.59	59.38	27.890	17.20
	45	300	237	156	76	295	281	284
19.9	2.16	18.09	27.404	47.86	38.35	56.43	28.171	14.36
	50	268	266	172	88	259	317	268
29.8	2.66	15.41	27.670	49.58	39.23	53.84	28.488	11.68
	54	227	286	187	97	211	347	241
June 8.8	3.20	13.14	27.956	51.45	40.20	51.70	28.835	9.27
	59	183	299	195	104	167	367	212
18.8	3.79	11.31	28.255	53.40	41.24	50.03	29.202	7.15
	60	135	307	198	108	109	380	175
28.7	4.39	9.96	28.562	55.38	42.32	48.94	29.582	5.40
	60	79	302	197	109	54	381	135
July 8.7	4.99	9.17	28.864	57.35	43.41	48.40	29.963	4.05
	59	26	293	190	108	2	370	90
18.7	5.58	8.91	29.157	59.25	44.49	48.42	30.333	3.15
	56	31	274	178	103	59	352	43
28.7	6.14	9.22	29.431	61.03	45.52	49.01	30.685	2.72
	52	83	249	160	95	115	323	5
Aug. 7.6	6.66	10.05	29.680	62.63	46.47	50.16	31.008	2.77
	46	136	222	142	85	166	287	52
17.6	7.12	11.41	29.902	64.05	47.32	51.82	31.295	3.29
	38	185	185	118	72	215	242	95
27.6	7.50	13.26	30.087	65.23	48.04	53.97	31.537	4.24
	30	222	150	95	56	254	196	137
Sept. 6.6	7.80	15.48	30.237	66.18	48.60	56.51	31.733	5.61
	20	257	113	70	39	282	112	173
16.5	8.00	18.05	30.350	66.88	48.99	59.33	31.875	7.34
	12	277	76	44	20	306	90	200
26.5	8.12	20.82	30.426	67.32	49.19	62.39	31.965	9.34
	2	290	41	21	2	312	35	221
Oct. 6.5	8.14	23.72	30.467	67.53	49.21	65.51	32.000	11.55
	8	291	9	0	17	309	13	232
16.4	8.06	26.63	30.476	67.53	49.04	68.60	31.987	13.87
	16	281	21	20	35	293	58	234
26.4	7.90	29.44	30.455	67.33	48.69	71.53	31.929	16.21
	24	257	45	35	50	271	99	225
Nov. 5.4	7.66	32.01	30.410	66.98	48.19	74.24	31.830	18.46
	30	225	68	49	65	229	132	208
15.4	7.36	34.26	30.342	66.49	47.54	76.53	31.698	20.54
	35	182	85	59	77	180	158	182
25.3	7.01	36.08	30.257	65.90	46.77	78.33	31.540	22.36
	39	133	98	68	85	127	177	150
Dec. 5.3	6.62	37.41	30.159	65.22	45.92	79.60	31.363	23.86
	42	80	109	72	90	69	193	113
15.3	6.20	38.21	30.050	64.50	45.02	80.29	31.170	24.99
	42	22	116	75	92	5	196	68
25.3	5.78	38.43	29.934	63.75	44.10	80.34	30.974	25.67
	41	39	117	75	90	59	197	26
35.2	5.37	38.04	29.817	63.00	43.20	79.75	30.777	25.93
Mean Place	4.349	36.93	27.283	47.80	43.780	76.44	28.945	26.02
Sec δ, Tan δ	2.396	−2.177	1.000	+0.026	4.690	−4.582	1.361	−0.924
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.057	+0.145	+0.061	−0.002	+0.050	+0.304	+0.059	+0.061
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.40	+0.07	+0.40	+0.09	+0.40	+0.09	+0.40	+0.10

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	12 Ceti. Mag. 6.0		13 Ceti. Mag. 5.2		ζ Cassiopeiæ. Mag. 3.7		π Andromedæ. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	0 26	− 4 22	0 31	− 4 0	0 32	+53 28	0 32	+33 17
	s	″	s	″	s	″	s	″
Jan. 0.2	6.382	61.71	16.888	63.93	41.135	37.75	46.134	52.68
	121	69	121	69	273	52	166	78
10.2	6.261	62.40	16.767	64.62	40.862	37.23	45.968	51.90
	117	60	118	61	273	101	167	104
20.2	6.144	63.00	16.649	65.23	40.589	36.22	45.801	50.86
	110	49	114	49	260	117	160	133
30.2	6.034	63.49	16.535	65.72	40.329	34.75	45.641	49.53
	100	32	101	33	236	186	143	155
Feb. 9.1	5.934	63.81	16.434	66.05	40.093	32.89	45.498	47.98
	80	15	85	18	202	216	122	169
19.1	5.854	63.96	16.349	66.23	39.891	30.73	45.376	46.29
	59	3	62	0	158	240	95	175
Mar. 1.1	5.795	63.93	16.287	66.23	39.733	28.33	45.281	44.54
	31	21	34	22	101	251	56	177
11.1	5.764	63.69	16.253	66.01	39.632	25.82	45.225	42.77
	3	47	3	13	39	254	13	167
21.0	5.767	63.22	16.250	65.58	39.593	23.28	45.212	41.10
	41	68	35	68	29	214	33	151
31.0	5.808	62.54	16.285	64.90	39.622	20.84	45.245	39.59
	78	96	76	91	99	225	84	130
Apr. 10.0	5.886	61.58	16.361	63.99	39.721	18.59	45.329	38.29
	121	119	116	117	171	198	131	98
19.9	6.007	60.39	16.477	62.82	39.892	16.61	45.460	37.31
	160	141	157	138	237	162	184	66
29.9	6.167	58.98	16.634	61.44	40.129	14.99	45.644	36.65
	198	159	195	160	298	118	229	27
May 9.9	6.365	57.39	16.829	59.84	40.427	13.81	45.873	36.38
	235	179	230	176	350	76	266	11
19.9	6.600	55.60	17.059	58.08	40.777	13.05	46.139	36.49
	261	191	260	189	394	27	302	55
29.8	6.861	53.69	17.319	56.19	41.171	12.78	46.441	37.04
	283	198	283	199	425	23	326	89
June 8.8	7.144	51.71	17.602	54.20	41.596	13.01	46.767	37.93
	300	203	298	202	441	71	341	123
18.8	7.444	49.68	17.900	52.18	42.040	13.72	47.108	39.16
	306	201	307	201	449	119	349	160
28.8	7.750	47.67	18.207	50.17	42.489	14.91	47.457	40.76
	303	193	307	194	445	161	344	185
July 8.7	8.053	45.74	18.514	48.23	42.934	16.52	47.801	42.61
	294	179	293	182	431	199	332	211
18.7	8.347	43.95	18.807	46.41	43.365	18.51	48.133	44.72
	277	162	281	161	400	234	314	228
28.7	8.624	42.33	19.088	44.77	43.765	20.85	48.447	47.00
	256	142	257	141	367	262	287	239
Aug. 7.6	8.880	40.91	19.345	43.33	44.132	23.47	48.734	49.39
	223	119	229	118	325	284	255	247
17.6	9.103	39.72	19.574	42.15	44.457	26.31	48.989	51.86
	191	91	196	94	275	300	216	249
27.6	9.294	38.81	19.770	41.21	44.732	29.31	49.205	54.35
	158	62	161	65	222	310	178	244
Sept. 6.6	9.452	38.19	19.931	40.56	44.954	32.41	49.383	56.79
	117	36	123	38	170	313	138	236
16.5	9.569	37.83	20.054	40.18	45.124	35.54	49.521	59.15
	83	10	88	12	115	309	95	226
26.5	9.652	37.73	20.142	40.06	45.239	38.63	49.616	61.41
	43	16	51	13	61	300	56	208
Oct. 6.5	9.695	37.89	20.193	40.19	45.300	41.63	49.672	63.49
	13	33	18	33	8	286	19	186
16.5	9.708	38.22	20.211	40.52	45.308	44.49	49.691	65.35
	15	54	12	52	40	264	17	164
26.4	9.693	38.76	20.199	41.04	45.268	47.13	49.674	66.99
	41	66	38	66	89	238	46	140
Nov. 5.4	9.649	39.42	20.161	41.70	45.179	49.51	49.628	68.39
	67	78	62	75	133	204	76	110
15.4	9.582	40.20	20.099	42.45	45.046	51.55	49.552	69.49
	83	82	79	82	170	167	101	79
25.3	9.499	41.02	20.020	43.27	44.876	53.22	49.451	70.28
	99	85	94	85	204	125	123	48
Dec. 5.3	9.400	41.87	19.926	44.12	44.672	54.47	49.328	70.76
	109	83	107	83	233	78	140	12
15.3	9.291	42.70	19.819	44.95	44.439	55.25	49.188	70.88
	117	80	113	80	256	30	153	19
25.3	9.174	43.50	19.706	45.75	44.183	55.55	49.035	70.69
	119	73	116	73	272	21	163	56
35.2	9.055	44.23	19.590	46.48	43.911	55.34	48.872	70.13
Mean Place	6.569	57.15	17.039	59.28	40.378	24.09	45.813	44.52
Sec δ, Tan δ	1.003	−0.077	1.002	−0.070	1.680	+1.350	1.196	+0.657
$D_{\psi}a$, $D_{\omega}a$	+0.061	+0.005	+0.061	+0.005	+0.066	−0.089	+0.064	−0.043
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.40	+0.11	+0.39	+0.14	+0.39	+0.14	+0.39	+0.14

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Andromedæ. Mag. 4.5		δ Andromedæ. Mag. 3.5		α Cassiopeiæ. (*Schedir.*) Var. 2.2–2.8		μ Phœnicis. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 0 34 s	° +28 53 ″	h m 0 35 s	° +30 26 ″	h m 0 36 s	° +56 6 ″	h m 0 37 s	° −46 30 ″
Jan. 0.2	29.212	44.61	12.660	30.00	8.488	69.13	40.580	46.57
	155	76	157	77	298	44	223	4
10.2	29.057	43.85	12.503	29.23	8.190	68.69	40.357	46.61
	153	103	159	102	298	95	214	45
20.2	28.904	42.82	12.344	28.21	7.892	67.74	40.143	46.16
	148	126	150	126	288	145	201	93
30.2	28.756	41.56	12.194	26.95	7.604	66.29	39.942	45.23
Feb. 9.1	136	142	139	145	261	183	181	136
	28.620	40.14	12.055	25.50	7.343	64.46	39.761	43.87
	115	154	118	159	224	218	151	177
19.1	28.505	38.60	11.937	23.91	7.119	62.28	39.610	42.10
	89	159	91	164	175	241	119	215
Mar. 1.1	28.416	37.01	11.846	22.27	6.944	59.87	39.491	39.95
	54	157	56	163	117	237	80	246
11.1	28.362	35.44	11.790	20.64	6.827	57.30	39.411	37.49
	14	147	13	154	50	260	35	272
21.0	28.348	33.97	11.777	19.10	6.777	54.70	39.376	34.77
	— 31	129	— 31	136	— 22	256	— 15	293
31.0	28.379	32.68	11.808	17.74	6.799	52.14	39.391	31.84
	79	105	79	113	97	235	66	309
Apr. 10.0	28.458	31.63	11.887	16.61	6.896	49.79	39.457	28.75
	127	76	128	86	174	210	120	316
19.9	28.585	30.87	12.015	15.75	7.070	47.69	39.577	25.59
	174	44	175	51	245	175	175	318
29.9	28.759	30.43	12.190	15.24	7.315	45.94	39.752	22.41
May 9.9	219	6	223	15	308	135	226	313
	28.978	30.37	12.413	15.09	7.623	44.59	39.978	19.28
	257	— 30	260	— 23	366	87	274	300
19.9	29.235	30.67	12.673	15.32	7.989	43.72	40.252	16.28
	289	68	293	62	411	42	317	282
29.8	29.524	31.35	12.966	15.94	8.400	43.30	40.569	13.46
	314	103	317	97	447	10	351	255
June 8.8	29.838	32.38	13.283	16.91	8.847	43.40	40.920	10.91
	329	135	333	130	467	59	376	223
18.8	30.167	33.73	13.616	18.21	9.314	43.99	41.296	8.68
	335	165	342	162	475	110	393	186
28.8	30.502	35.38	13.958	19.83	9.789	45.09	41.689	6.82
July 8.7	333	188	337	187	470	152	397	142
	30.835	37.26	14.295	21.70	10.259	46.61	42.086	5.40
	323	209	326	208	453	192	392	96
18.7	31.158	39.35	14.621	23.78	10.712	48.53	42.478	4.44
	303	222	308	224	427	228	376	47
28.7	31.461	41.57	14.929	26.02	11.139	50.81	42.854	3.97
Aug. 7.6	278	230	283	233	389	261	349	4
	31.739	43.87	15.212	28.35	11.528	53.42	43.203	4.01
17.6	246	234	251	239	346	282	314	53
	31.985	46.21	15.463	30.74	11.874	56.24	43.517	4.54
27.6	211	232	214	237	295	303	270	101
	32.196	48.53	15.677	33.11	12.169	59.27	43.787	5.55
	173	225	177	232	240	314	221	145
Sept. 6.6	32.369	50.78	15.854	35.43	12.409	62.41	44.008	7.00
	134	214	137	222	187	319	168	182
16.5	32.503	52.92	15.991	37.65	12.596	65.60	44.176	8.82
	95	201	98	208	127	319	112	213
26.5	32.598	54.93	16.089	39.73	12.723	68.79	44.288	10.95
Oct. 6.5	57	182	60	193	67	310	55	235
	32.655	56.75	16.149	41.66	12.790	71.89	44.343	13.30
	21	162	22	170	12	296	2	249
16.5	32.676	58.37	16.171	43.36	12.802	74.85	44.345	15.79
	— 13	139	— 12	149	— 42	279	— 48	251
26.4	32.663	59.76	16.159	44.85	12.760	77.64	44.297	18.30
	41	114	41	125	91	250	93	243
Nov. 5.4	32.622	60.90	16.118	46.10	12.669	80.14	44.204	20.73
	69	89	70	97	141	218	133	227
15.4	32.553	61.79	16.048	47.07	12.528	82.32	44.071	23.00
	92	59	92	66	183	178	165	199
25.3	32.461	62.38	15.956	47.73	12.345	84.10	43.906	24.99
Dec. 5.3	113	30	115	38	221	138	189	165
	32.348	62.68	15.841	48.11	12.124	85.48	43.717	26.64
	128	2	132	5	252	92	208	125
15.3	32.220	62.70	15.709	48.16	11.872	86.40	43.509	27.89
	142	31	145	24	277	39	218	80
25.3	32.078	62.39	15.564	47.92	11.595	86.79	43.291	28.69
	151	59	155	58	294	— 11	218	32
35.2	31.927	61.80	15.409	47.34	11.301	86.68	43.073	29.01
Mean Place	28.946	37.94	12.368	22.85	7.611	55.01	41.313	28.71
Sec δ, Tan δ	1.142	+0.552	1.160	+0.588	1.794	+1.489	1.453	−1.054
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.063	−0.036	+0.064	−0.039	+0.067	−0.098	+0.057	+0.069
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.39	+0.15	+0.39	+0.15	+0.39	+0.16	+0.39	+0.16

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ceti. Mag. 2.2		o Cassiopeiæ. Mag. 4.7		21 Cassiopeiæ. Mag. 5.6		ζ Andromedæ. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	0 39	−18 24	0 40	+47 51	0 40	+74 33	0 43	+23 50
	s	″	s	″	s	″	s	″
Jan. 0.3	43.250	42.07	26.283	59.62	34.34	79.97	15.448	59.46
	135	55	231	50	74	2	143	74
10.2	43.115	42.62	26.052	59.12	33.60	79.95	15.305	58.72
	132	33	232	97	73	68	144	93
20.2	42.983	42.95	25.820	58.15	32.87	79.27	15.161	57.79
	126	4	226	137	70	126	112	112
30.2	42.857	42.99	25.594	56.78	32.17	78.01	15.019	56.67
	113	—	206	172	61	177	131	125
Feb. 9.1	42.744	42.78	25.388	55.06	31.53	76.24	14.888	55.42
	100	21	179	201	56	223	112	133
19.1	42.644	42.27	25.209	53.05	30.97	74.01	14.776	54.09
	73	77	142	220	45	261	89	134
Mar. 1.1	42.571	41.50	25.067	50.85	30.52	71.40	14.687	52.75
	49	103	92	230	31	286	59	128
11.1	42.522	40.47	24.975	48.55	30.21	68.54	14.628	51.47
	12	128	39	230	18	303	20	118
21.0	42.510	39.19	24.936	46.25	30.03	65.51	14.608	50.29
	—	153	—	220	2	304	—	100
31.0	23	37.66	21	44.05	30.01	62.47	23	49.29
	66	176	81	204	14	295	68	77
Apr. 10.0	42.599	35.90	25.038	42.01	30.15	59.52	14.699	48.52
	108	194	146	174	29	272	115	50
20.0	42.707	33.96	25.184	40.27	30.44	56.80	14.814	48.02
	150	213	207	141	44	243	160	17
29.9	42.857	31.83	25.391	38.86	30.88	54.37	14.974	47.85
	187	223	263	101	57	201	204	—
May 9.9	43.044	29.60	25.654	37.85	31.45	52.36	15.178	48.01
	229	231	312	59	67	158	241	16
19.9	43.273	27.29	25.966	37.26	32.12	50.78	15.419	48.51
	258	232	353	12	77	106	276	50
29.8	43.531	24.97	26.319	37.14	32.89	49.72	15.695	49.34
	286	229	382	35	83	53	301	83
June 8.8	43.817	22.68	26.701	37.49	33.72	49.19	15.996	50.49
	303	219	402	77	87	—	315	115
18.8	44.120	20.49	27.103	38.26	34.59	49.21	16.311	51.91
	314	209	410	121	89	2	326	142
28.8	44.434	18.40	27.513	39.47	35.48	49.79	16.637	53.59
	316	183	408	161	88	58	324	168
July 8.7	44.750	16.57	27.921	41.11	36.36	50.90	16.961	55.47
	308	158	394	195	86	111	317	188
18.7	45.058	14.99	28.315	43.06	37.22	159	17.278	202
	294	130	374	229	80	52.49	299	57.49
28.7	45.352	13.69	28.689	45.35	38.02	207	17.577	213
	271	99	341	250	74	54.56	276	59.62
Aug. 7.7	45.626	12.70	29.030	47.85	38.76	250	17.853	217
	243	60	305	272	65	57.06	246	61.79
17.6	45.869	12.10	29.335	50.57	39.41	284	18.099	217
	212	28	264	284	57	59.90	214	63.96
27.6	46.081	11.82	29.599	53.41	39.98	311	18.313	211
	176	—	217	289	15	63.01	178	66.07
Sept. 6.6	46.257	10	29.816	56.30	40.43	338	18.491	203
	137	11.92	167	292	35	66.39	141	68.10
16.5	46.394	42	29.983	59.22	40.78	355	18.632	189
	99	12.34	119	288	23	69.94	103	69.99
26.5	46.493	71	30.102	62.10	41.01	358	18.735	172
	58	13.05	70	278	11	73.52	67	71.71
Oct. 6.5	46.551	98	30.172	64.88	41.12	364	18.802	154
	23	14.03	27	261	—	77.16	32	73.25
16.5	46.574	118	30.199	67.49	41.11	356	18.834	134
	—	15.21	—	240	1	80.72	0	74.59
	12	129	19		13	342		111
26.4	46.562	16.50	30.180	69.89	40.98	84.14	18.834	75.70
	39	140	60	218	24	322	29	90
Nov. 5.4	46.523	17.90	30.120	72.07	40.74	87.36	18.805	76.60
	66	141	100	182	36	287	56	65
15.4	46.457	19.31	30.020	73.89	40.38	90.23	18.749	77.25
	86	136	133	149	46	251	79	40
25.4	46.371	20.67	29.887	75.38	39.92	92.74	18.670	77.65
	105	125	164	110	55	206	97	14
Dec. 5.3	46.266	21.92	29.723	76.48	39.37	94.80	18.573	77.79
	118	112	192	66	62	153	116	—
								10
15.3	46.148	23.04	29.531	77.14	38.75	96.33	18.457	77.69
	125	93	211	22	69	97	130	35
25.3	46.023	23.97	29.320	77.36	38.06	97.30	18.327	77.34
	132	67	226	—	72	36	139	59
35.2	45.891	24.64	29.094	77.13	37.34	97.66	18.188	76.75
Mean Place	43.517	32.12	25.618	47.67	31.996	62.90	15.201	54.82
Sec δ, Tan δ	1.054	−0.333	1.491	+1.105	3.758	+3.623	1.093	+0.442
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.060	+0.022	+0.066	−0.073	+0.078	−0.238	+0.063	−0.029
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.39	+0.17	+0.39	+0.18	+0.39	+0.18	+0.39	+0.19

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cassiopeiæ. Mag. 3.6		δ Piscium. Mag. 4.6		λ Hydri. Mag. 5.0		20 Ceti. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 0 44 s	° ′ +57 24 ″	h m 0 44 s	° ′ + 7 9 ″	h m 0 45 s	° ′ −75 20 ″	h m 0 49 s	° ′ − 1 33 ″
Jan. 0.3	26.902	44.75	41.188	57.49	53.60	54.26	4.244	47.46
	307	33	124	76	78	55	123	72
10.2	26.595	44.42	41.064	56.73	52.82	53.71	4.121	48.18
	309	86	125	78	76	115	124	66
20.2	26.286	43.56	40.939	55.95	52.06	52.56	3.997	48.84
	299	133	122	78	69	172	122	56
30.2	25.987	42.23	40.817	55.17	51.37	50.84	3.875	49.40
	278	176	112	74	64	224	112	44
Feb. 9.1	25.709	40.47	40.705	54.43	50.73	48.60	3.763	49.84
	241	213	99	66	55	268	100	28
19.1	25.468	38.34	40.606	53.77	50.18	45.92	3.663	50.12
	193	240	76	57	44	307	78	13
Mar. 1.1	25.275	35.94	40.530	53.20	49.74	42.85	3.585	50.25
	133	258	50	43	31	336	53	—
11.1	25.142	33.36	40.480	52.77	49.40	39.49	3.532	50.18
	64	263	16	22	20	357	19	7
21.0	25.078	30.73	40.464	52.55	49.20	35.92	3.513	49.89
	—	259	—	1	9	371	—	29
31.0	10	28.14	21	52.54	—	32.21	16	49.37
	25.088	244	40.485	—	49.11	377	3.529	52
	90		63	23	5		57	76
Apr. 10.0	25.178	25.70	40.548	52.77	49.16	28.44	3.586	48.61
	168	219	105	49	19	374	99	100
20.0	25.346	23.51	40.653	53.26	49.35	24.70	3.685	47.61
	242	187	148	76	32	363	139	125
29.9	25.588	21.64	40.801	54.02	49.67	21.07	3.824	46.36
	311	147	187	102	44	344	180	145
May 9.9	25.899	20.17	40.988	55.04	50.11	17.63	4.004	44.91
	372	101	225	127	56	318	218	166
19.9	26.271	19.16	41.213	56.31	50.67	14.45	4.222	43.25
	420	54	255	149	68	285	249	181
29.8	26.691	18.62	41.468	57.80	51.35	11.60	4.471	41.44
	458	4	280	169	76	213	274	193
June 8.8	27.149	18.58	41.748	59.49	52.11	9.17	4.745	39.51
	480	—	297	181	84	199	292	198
18.8	27.629	46	42.045	61.30	52.95	7.18	5.037	37.53
	493	19.04	307	191	88	117	302	200
28.8	28.122	94	42.352	63.21	53.83	5.71	5.339	35.53
	489	19.98	305	196	91	91	305	196
July 8.7	28.611	21.37	42.657	65.17	54.74	4.80	5.644	33.57
	475	139	300	195	92	35	299	186
		182				—		
18.7	29.086	23.19	42.957	67.12	55.66	4.45	5.943	31.71
	449	218	285	188	88	24	285	172
28.7	29.535	25.37	43.242	69.00	56.54	4.69	6.228	29.99
	413	251	262	178	84	81	264	153
Aug. 7.7	29.948	27.88	43.504	70.78	57.38	5.50	6.492	28.46
	370	277	238	162	77	137	239	131
17.6	30.318	30.65	43.742	72.40	58.15	6.87	6.731	27.15
	320	296	205	144	65	187	208	106
27.6	30.638	33.61	43.947	73.84	58.80	8.74	6.939	26.09
	266	310	171	123	51	232	175	79
Sept. 6.6	30.904	36.71	44.118	75.07	59.34	11.06	7.114	25.30
	208	317	136	102	40	269	140	54
16.5	31.112	39.88	44.254	76.09	59.74	13.75	7.254	24.76
	149	319	99	77	26	295	103	26
26.5	31.261	43.07	44.353	76.86	60.00	16.70	7.357	24.50
	89	314	65	56	9	311	69	2
Oct. 6.5	31.350	46.21	44.418	77.42	60.09	19.81	7.426	24.48
	33	300	33	32	—	316	35	—
16.5	31.383	49.21	44.451	77.74	6	22.97	7.461	24.69
	—	283	3	13	22	306	6	21
	25		—	—			—	39
26.4	31.358	52.04	44.454	77.87	59.81	26.03	7.467	25.08
	78	258	25	5	37	287	23	55
Nov. 5.4	31.280	54.62	44.429	77.82	59.44	28.90	7.444	25.63
	127	227	47	23	48	255	45	67
15.4	31.153	56.89	44.382	77.59	58.96	31.45	7.399	26.30
	175	191	69	36	59	212	68	74
25.4	30.978	58.80	44.313	77.23	58.37	33.57	7.331	27.04
	217	149	86	49	68	163	84	79
Dec. 5.3	30.761	60.29	44.227	76.74	57.69	35.20	7.247	27.83
	255	103	100	58	74	106	99	81
15.3	30.506	61.32	44.127	76.16	56.95	36.26	7.148	28.64
	279	50	113	66	77	45	111	80
25.3	30.227	61.82	44.014	75.50	56.18	36.71	7.037	29.44
	299	1	121	73	78	—	118	74
35.2	29.928	61.83	43.893	74.77	55.40	36.53	6.919	30.18
Mean Place	25.892	30.72	41.135	58.72	55.853	31.71	4.262	42.94
Sec δ, Tan δ	1.857	+1.564	1.008	+0.126	3.952	−3.823	1.000	−0.027
Dψα, Dωα	+0.069	−0.102	+0.062	−0.008	+0.041	+0.250	+0.061	+0.002
Dψδ, Dωδ	+0.39	+0.19	+0.39	+0.19	+0.39	+0.20	+0.39	+0.21

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cassiopeiæ. Mag. 2.2		μ Andromedæ. Mag. 3.9		α Sculptoris. Mag. 4.4		ε Piscium. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 0 52 s	° ′ +60 17 ″	h m 0 52 s	° ′ +38 4 ″	h m 0 54 s	° ′ −29 46 ″	h m 0 58 s	° ′ + 7 28 ″
Jan. 0.3	4.06	74.70	28.936	63.87	53.404	39.05	56.840	31.51
	35	18	183	53	159	50	126	73
10.2	3.71	74.52	28.753	63.34	53.245	39.55	56.714	30.78
	35	71	186	89	159	12	129	75
20.2	3.36	73.81	28.567	62.45	53.086	39.67	56.585	30.03
	34	126	182	121	156	23	129	78
30.2	3.02	72.55	28.385	61.24	52.930	39.44	56.456	29.25
	32	168	172	148	142	61	122	72
Feb. 9.2	2.70	70.87	28.213	59.76	52.788	38.83	56.334	28.53
	28	208	152	170	125	95	108	64
19.1	2.42	68.79	28.061	58.06	52.663	37.88	56.226	27.89
	23	236	121	182	103	128	87	55
Mar. 1.1	2.19	66.43	27.940	56.24	52.560	36.60	56.139	27.34
	17	258	88	188	73	161	63	45
11.1	2.02	63.85	27.852	54.36	52.487	34.99	56.076	26.89
	9	267	38	186	38	187	29	22
21.0	1.93	61.18	27.814	52.50	52.449	33.12	56.047	26.67
	1	266	9	174	1	214	7	1
31.0	1.92	58.52	27.823	50.76	52.450	30.98	56.054	26.66
	8	256	63	156	45	234	50	19
Apr. 10.0	2.00	55.96	27.886	49.20	52.495	28.64	56.104	26.85
	16	231	116	131	92	251	90	47
20.0	2.16	53.65	28.002	47.89	52.587	26.13	56.194	27.32
	24	201	171	96	136	265	136	70
29.9	2.40	51.64	28.173	46.93	52.723	23.48	56.330	28.02
	32	161	223	63	181	270	174	100
May 9.9	2.72	50.03	28.396	46.30	52.904	20.78	56.504	29.02
	38	118	265	21	223	271	213	124
19.9	3.10	48.85	28.661	46.09	53.127	18.07	56.717	30.26
	44	73	303	17	259	266	246	141
29.9	3.54	48.12	28.964	46.26	53.386	15.41	56.963	31.67
	48	21	333	58	291	253	274	165
June 8.8	4.02	47.91	29.297	46.84	53.677	12.88	57.237	33.32
	51	29	352	98	313	236	290	178
18.8	4.53	48.20	29.649	47.82	53.990	10.52	57.527	35.10
	52	79	364	130	329	212	303	187
28.8	5.05	48.99	30.013	49.12	54.319	8.40	57.830	36.97
	52	126	364	166	334	181	308	192
July 8.7	5.57	50.25	30.377	50.78	54.653	6.59	58.138	38.89
	51	171	351	192	331	146	302	192
18.7	6.08	51.96	30.731	52.70	54.984	5.13	58.440	40.81
	48	208	339	218	319	108	289	188
28.7	6.56	54.04	31.070	51.88	55.303	4.05	58.729	42.69
	46	245	313	233	299	67	269	177
Aug. 7.7	7.02	56.49	31.383	57.21	55.602	3.38	58.998	44.46
	40	272	283	247	273	25	215	161
17.6	7.42	59.21	31.666	59.68	55.875	3.13	59.243	46.07
	35	296	246	253	238	20	218	145
27.6	7.77	62.17	31.912	62.21	56.113	3.33	59.461	47.52
	29	311	209	255	201	61	182	126
Sept. 6.6	8.06	65.28	32.121	64.76	56.314	3.94	59.643	48.78
	24	323	167	251	160	98	151	101
16.6	8.30	68.51	32.288	67.27	56.474	4.92	59.794	49.79
	17	327	126	212	117	131	113	80
26.5	8.47	71.78	32.414	69.69	56.591	6.23	59.907	50.59
	11	323	85	230	76	157	80	56
Oct. 6.5	8.58	75.01	32.499	71.99	56.667	7.80	59.987	51.15
	4	316	43	212	35	181	47	38
16.5	8.62	78.17	32.542	74.11	56.702	9.61	60.034	51.53
	2	297	8	193	5	191	20	13
26.4	8.60	81.14	32.550	76.04	56.697	11.52	60.054	51.66
	8	274	28	170	39	195	11	6
Nov. 5.4	8.52	83.88	32.522	77.74	56.658	13.47	60.043	51.60
	14	247	63	142	71	190	36	20
15.4	8.38	86.35	32.459	79.16	56.587	15.37	60.007	51.40
	18	210	90	111	95	178	61	33
25.4	8.20	88.45	32.369	80.27	56.492	17.15	59.946	51.07
	24	167	119	78	118	161	77	48
Dec. 5.3	7.96	90.12	32.250	81.05	56.374	18.76	59.869	50.59
	28	119	141	44	134	133	96	57
15.3	7.68	91.31	32.109	81.49	56.240	20.09	59.773	50.02
	31	72	161	8	148	104	110	64
25.3	7.37	92.03	31.948	81.57	56.092	21.13	59.663	49.38
	34	17	175	32	153	68	120	71
35.3	7.03	92.20	31.773	81.25	55.939	21.81	59.543	48.67
Mean Place	2.841	60.41	28.396	55.13	53.709	24.92	56.700	33.23
Sec δ, Tan δ	2.019	+1.754	1.270	+0.784	1.152	−0.572	1.009	+0.131
Dψα, Dωα	+0.072	−0.114	+0.066	−0.051	+0.058	+0.037	+0.062	−0.008
Dψδ, Dωδ	+0.39	+0.23	+0.39	+0.23	+0.39	+0.24	+0.38	+0.25

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Phœnicis. Mag. 3.4		μ Cassiopeiæ. Mag. 5.3		η Ceti. Mag. 3.6		β Andromedæ. Mag. 2.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	1 2	−47 7	1 3	+54 32	1 4	−10 35	1 5	+35 12
	s	″	s	″	s	″	s	″
Jan. 0.3	38.371	71.32	9.115	48.69	42.947	32.16	25.445	52.86
10.2	38.137 234	71.61 29	8.849 266	48.49 20	42.819 128	32.90 74	25.275 170	52.39 47
20.2	37.905 232	71.40 21	8.573 276	47.80 69	42.688 131	33.45 55	25.099 176	51.60 79
30.2	37.680 225	70.69 71	8.299 274	46.64 116	42.557 131	33.80 35	24.922 177	50.51 109
Feb. 9.2	37.471 209	69.50 119	8.041 258	45.04 160	42.433 124	33.94 14	24.752 170	49.16 135
	185	160	231	193	111	8	151	153
19.1	37.286 156	67.90 202	7.810 191	43.11 222	42.322 94	33.86 32	24.601 126	47.63 167
Mar. 1.1	37.130 116	65.88 237	7.619 140	40.89 242	42.228 68	33.54 55	24.475 96	45.96 171
11.1	37.014 75	63.51 267	7.479 79	38.47 250	42.160 37	32.99 80	24.379 50	44.25 169
21.0	36.939 25	60.84 292	7.400 9	35.97 249	42.123 2	32.19 104	24.329 6	42.56 159
31.0	36.914 —	57.92 309	7.391 —	33.48 238	42.121 —	31.15 129	24.323 —	40.97 141
	26		62		40		47	
Apr. 10.0	36.940	54.83	7.453	31.10	42.161	29.86	24.370	39.56
20.0	37.024 84	51.63 320	7.590 137	28.95 215	42.242 81	28.35 151	24.471 101	38.39 117
29.9	37.163 139	48.36 327	7.799 209	27.08 187	42.366 124	26.63 172	24.620 149	37.51 88
May 9.9	37.357 194	45.12 324	8.076 277	25.58 150	42.532 166	24.74 189	24.824 204	36.96 55
19.9	37.602 245	41.96 316	8.412 336	24.49 109	42.738 206	22.70 204	25.072 248	36.80 16
	293	298	388	64	238	213	285	20
29.9	37.895	38.98	8.800	23.85	42.976	20.57	25.357	37.00
June 8.8	38.227 332	36.23 275	9.227 427	23.68 17	43.244 268	18.40 217	25.674 317	37.58 58
18.8	38.590 363	33.79 244	9.680 453	23.99 31	43.532 288	16.25 215	26.012 338	38.52 94
28.8	38.975 385	31.70 209	10.150 470	24.75 76	43.835 303	14.17 208	26.364 352	39.78 126
July 8.7	39.372 397	30.06 164	10.623 473	25.96 121	44.142 307	12.20 197	26.720 356	41.37 159
	397	120	464	162	303	179	348	185
18.7	39.769	28.86	11.087	27.58	44.445	10.41	27.068	43.22
28.7	40.155 386	28.16 70	11.532 445	29.56 198	44.739 294	8.85 156	27.402 334	45.27 205
Aug. 7.7	40.521 366	27.98 18	11.947 415	31.84 228	45.015 276	7.56 129	27.718 316	47.47 220
17.6	40.857 336	28.33 35	12.325 378	34.39 255	45.267 252	6.55 101	28.001 283	49.80 233
27.6	41.152 295	29.18 85	12.661 336	37.14 275	45.489 222	5.87 68	28.255 254	52.18 238
	251	132	287	289	192	35	217	237
Sept. 6.6	41.403 200	30.50	12.948	40.03	45.681	5.52	28.472	54.55
16.6	41.603 146	32.24 174	13.183 235	43.01 298	45.836 155	5.47 5	28.651 179	56.88 233
26.5	41.749 90	34.33 209	13.366 183	46.01 300	45.955 119	5.73 26	28.789 138	59.15 227
Oct. 6.5	41.839 36	36.70 237	13.494 128	48.97 296	46.039 84	6.26 53	28.888 99	61.28 213
16.5	41.875 —	39.24 254	13.570 76	51.84 287	46.090 51	7.02 76	28.950 62	63.26 198
	16	262	23	271	18	94	26	178
26.4	41.859	41.86	13.593 —	54.55	46.108 —	7.96	28.976 —	65.04
Nov. 5.4	41.793 66	44.45 259	13.565 28	57.04 249	46.096 12	9.02 106	28.965 11	66.60 156
15.4	41.686 107	46.90 245	13.488 77	59.25 221	46.059 37	10.16 114	28.923 42	67.89 129
25.4	41.540 146	49.11 221	13.366 122	61.15 190	45.997 62	11.33 117	28.849 74	68.93 104
Dec. 5.3	41.363 177	51.00 189	13.202 164	62.65 150	45.917 80	12.46 113	28.750 99	69.65 72
	200	152	202	108	98	106	125	43
15.3	41.163	52.52	13.000	63.73	45.819	13.52	28.625	70.08
25.3	40.945 218	53.59 107	12.766 234	64.34 61	45.708 111	14.48 96	28.479 146	70.13 5
35.3	40.717 228	54.17 58	12.510 256	64.45 11	45.586 122	15.30 82	28.319 160	69.90 23
Mean Place	38.880	52.37	8.045	36.16	42.967	23.88	24.876	45.58
Sec δ, Tan δ	1.470	−1.077	1.724	+1.404	1.017	−0.187	1.224	+0.706
$D_{\psi a}$, $D_{\omega a}$	+0.053	+0.069	+0.071	−0.090	+0.060	+0.012	+0.066	−0.045
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.38	+0.27	+0.38	+0.27	+0.38	+0.28	+0.38	+0.28

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Piscium. Mag. 4.7		ζ Piscium. Mag. 5.6		κ Tucanæ. Mag. 5.0		f Piscium. Mag. 5.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	1 7	+29 40	1 9	+ 7 9	1 13	−69 16	1 13	+ 3 12
	s	″	s	″	s	″	s	″
Jan. 0.3	25.369	57.99	42.591	64.55	8.50	89.42	49.724	29.78
10.2	25.216 153	57.46 53	42.468 123	63.83 72	7.94 56	89.38 4	49.601 123	29.03 75
20.2	25.055 161	56.66 80	42.338 130	63.09 74	7.40 54	88.75 63	49.470 131	28.33 70
30.2	24.893 162	55.64 102	42.207 131	62.36 73	6.88 52	87.54 121	49.339 131	27.68 65
Feb. 9.2	24.738 155	54.40 124	42.080 127	61.68 68	6.40 48	85.79 175	49.214 125	27.10 58
	142	137	114	63	44	225	117	48
19.1	24.596 118	53.03 145	41.966 97	61.05 53	5.96 37	83.54 268	49.097 99	26.62 35
Mar. 1.1	24.478 87	51.58 148	41.869 71	60.52 39	5.59 31	80.86 302	48.998 74	26.27 17
11.1	24.391 50	50.10 143	41.798 40	60.13 21	5.28 21	77.84 333	48.924 45	26.10 — 1
21.1	24.341 5	48.67 131	41.758 4	59.92 2	5.07 12	74.51 351	48.879 6	26.11 22
31.0	24.336 — 43	47.36 111	41.754 — 37	59.90 — 22	4.95 4	70.97 366	48.873 — 31	26.33 46
Apr. 10.0	24.379	46.25	41.791	60.12	4.91 —	67.31	48.904	26.79
20.0	24.472 93	45.37 88	41.872 81	60.58 46	4.98 7	63.59 372	48.977 73	27.49 70
29.9	24.615 143	44.80 57	41.997 125	61.30 72	5.15 17	59.89 370	49.097 120	28.44 95
May 9.9	24.806 191	44.56 — 24	42.164 167	62.26 96	5.42 27	56.32 357	49.259 162	29.62 118
19.9	25.040 234	44.65 9	42.370 206	63.48 122	5.78 36	52.92 340	49.456 197	31.00 138
	272	43	239	143	45	312	237	160
29.9	25.312	45.08	42.609	64.91	6.23	49.80	49.693	32.60
June 8.8	25.613 301	45.87 79	42.878 269	66.53 162	6.75 52	47.02 278	49.956 263	34.36 176
18.8	25.936 323	46.99 112	43.166 288	68.29 176	7.34 59	44.63 239	50.240 284	36.22 186
28.8	26.271 335	48.39 140	43.468 302	70.14 185	7.97 63	42.73 190	50.536 296	38.11 189
July 8.8	26.610 339	50.05 166	43.775 307	72.05 191	8.64 67	41.33 140	50.839 303	40.03 192
	334	187	302	190	67	84	302	190
18.7	26.944	51.92	44.077	73.95	9.31	40.49	51.141	41.93
28.7	27.265 321	53.94 202	44.370 293	75.80 185	9.98 67	40.23 — 26	51.434 293	43.72 179
Aug. 7.7	27.565 300	56.09 215	44.645 275	77.54 174	10.63 65	40.57 34	51.708 274	45.36 164
17.6	27.838 273	58.29 220	44.897 252	79.14 160	11.23 60	41.48 91	51.963 255	46.84 148
27.6	28.081 243	60.50 221	45.119 222	80.56 142	11.76 53	42.92 144	52.188 225	48.12 128
	208	217	194	121	46	196	197	102
Sept. 6.6	28.289	62.67	45.313	81.77	12.22	44.88	52.385	49.14
16.6	28.460 171	64.76 209	45.471 158	82.77 100	12.59 37	47.27 239	52.546 161	49.93 79
26.5	28.595 135	66.74 198	45.596 125	83.53 76	12.84 25	50.00 273	52.674 128	50.46 53
Oct. 6.5	28.693 98	68.58 184	45.688 92	84.06 53	13.00 16	52.98 298	52.769 95	50.78 32
16.5	28.754 61	70.24 166	45.746 58	84.37 31	13.04 — 4	56.09 311	52.830 61	50.84 — 6
	27	147	28	12	6	313	34	15
26.5	28.781 —	71.71	45.774	84.49 —	12.98	59.22	52.864	50.69
Nov. 5.4	28.777 4	72.95 124	45.776 — 2	84.42 7	12.80 18	62.22 300	52.865 — 1	50.40 29
15.4	28.742 35	73.97 102	45.749 27	84.18 24	12.54 26	65.01 279	52.842 23	49.95 45
25.4	28.679 63	74.73 76	45.700 49	83.82 36	12.19 35	67.46 245	52.794 48	49.40 55
Dec. 5.3	28.592 87	75.23 50	45.630 70	83.35 47	11.77 42	69.47 201	52.724 70	48.75 65
	111	22	89	57	48	150	87	71
15.3	28.481	75.45 —	45.541	82.78	11.29	70.97	52.637	48.04
25.3	28.351 130	75.39 6	45.436 105	82.15 63	10.78 51	71.90 93	52.534 103	47.33 71
35.3	28.205 146	75.07 32	45.320 116	81.47 68	10.25 53	72.22 32	52.418 116	46.60 73
Mean Place	24.882	52.51	42.392	66.83	9.541	66.52	49.546	33.61
Sec δ, Tan δ	1.151	+0.570	1.008	+0.126	2.827	−2.644	1.002	+0.056
$D_{\psi a}$, $D_{\omega a}$	+0.066	−0.036	+0.062	−0.008	+0.039	+0.167	+0.062	−0.004
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.38	+0.29	+0.38	+0.30	+0.38	+0.31	+0.38	+0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Piscium. Mag. 4.7		θ Ceti. Mag. 3.8		δ Cassiopeiæ. Mag. 2.8		γ Phœnicis. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 1 15 s	° ′ +26 51 ″	h m 1 20 s	° ′ − 8 34 ″	h m 1 20 s	° ′ +59 49 ″	h m 1 24 s	° ′ −43 42 ″
Jan. 0.3	14.260	39.39	10.526	57.14	47.356	81.69	61.112	64.28
	147	53	128	79	328	16	217	59
10.3	14.113	38.86	10.398	57.93	47.028	81.85	60.895	64.87
	155	73	135	61	344	35	221	10
20.2	13.958	38.13	10.263	58.54	46.684	81.50	60.674	64.97
	158	96	134	46	347	88	220	38
30.2	13.800	37.17	10.129	59.00	46.337	80.62	60.454	64.59
	153	113	131	23	334	135	209	85
Feb. 9.2	13.647	36.04	9.998	59.23	46.003	79.27	60.245	63.74
	140	124	124	2	307	178	194	130
19.1	13.507	34.80	9.874	59.25	45.696	77.49	60.051	62.44
	119	132	104	18	265	210	168	172
Mar. 1.1	13.388	33.48	9.770	59.07	45.431	75.39	59.883	60.72
	92	133	80	44	208	239	138	209
11.1	13.296	32.15	9.690	58.63	45.223	73.00	59.745	58.63
	55	127	54	69	141	254	99	241
21.1	13.241	30.88	9.636	57.94	45.082	70.46	59.646	56.22
	11	113	15	88	61	258	53	271
31.0	13.230	29.75	9.621	57.06	45.021	67.88	59.593	53.51
	34	97	23	117	22	252	4	291
Apr. 10.0	13.264	28.78	9.644	55.89	45.043	65.36	59.589	50.60
	83	72	67	140	107	237	50	309
20.0	13.347	28.06	9.711	54.49	45.150	62.99	59.639	47.51
	132	44	109	158	192	213	104	318
30.0	13.479	27.62	9.820	52.91	45.342	60.86	59.743	44.33
	179	13	152	179	270	180	158	321
May 9.9	13.658	27.49	9.972	51.12	45.612	59.06	59.901	41.12
	222	19	189	195	341	140	210	318
19.9	13.880	27.68	10.161	49.17	45.956	57.66	60.111	37.94
	260	54	228	205	404	97	258	304
29.9	14.140	28.22	10.389	47.12	46.360	56.69	60.369	34.90
	292	85	258	210	455	51	298	288
June 8.8	14.432	29.07	10.647	45.02	46.815	56.18	60.667	32.02
	312	115	281	213	491	2	332	260
18.8	14.744	30.22	10.928	42.89	47.306	56.16	60.999	29.42
	327	140	293	209	514	46	357	228
28.8	15.071	31.62	11.221	40.80	47.820	56.62	61.356	27.14
	333	166	303	199	523	92	372	191
July 8.8	15.404	33.28	11.524	38.81	48.343	57.54	61.728	25.23
	328	184	304	184	519	136	377	146
18.7	15.732	35.12	11.828	36.97	48.862	58.90	62.105	23.77
	319	197	294	162	501	177	373	99
28.7	16.051	37.09	12.122	35.35	49.363	60.67	62.478	22.78
	298	206	279	139	476	213	357	47
Aug. 7.7	16.349	39.15	12.401	33.96	49.839	62.80	62.835	22.31
	274	210	261	108	439	245	332	4
17.7	16.623	41.25	12.662	32.88	50.278	65.25	63.167	22.35
	245	209	231	80	393	270	300	55
27.6	16.868	43.34	12.893	32.08	50.671	67.95	63.467	22.90
	212	205	200	49	344	290	260	105
Sept. 6.6	17.080	45.39	13.093	31.59	51.015	70.85	63.727	23.95
	176	194	171	16	287	304	216	149
16.6	17.256	47.33	13.264	31.43	51.302	73.89	63.943	25.44
	143	182	133	15	228	312	169	188
26.5	17.399	49.15	13.397	31.58	51.530	77.01	64.112	27.32
	104	166	101	40	170	315	117	221
Oct. 6.5	17.503	50.81	13.498	31.98	51.700	80.16	64.229	29.53
	70	150	65	65	106	309	67	242
16.5	17.573	52.31	13.563	32.63	51.806	83.25	64.296	31.95
	36	130	35	87	47	298	18	257
26.5	17.609	53.61	13.598	33.50	51.853	86.23	64.314	34.52
	5	109	1	97	17	280	29	257
Nov. 5.4	17.614	54.70	13.599	34.47	51.836	89.03	64.285	37.09
	25	88	20	110	75	259	72	251
15.4	17.589	55.58	13.579	35.57	51.761	91.62	64.213	39.60
	51	63	49	113	133	225	109	234
25.4	17.538	56.21	13.530	36.70	51.628	93.87	64.104	41.94
	79	40	70	112	187	191	142	205
Dec. 5.4	17.459	56.61	13.460	37.82	51.441	95.78	63.962	43.99
	100	15	90	105	235	147	170	172
15.3	17.359	56.76	13.370	38.87	51.206	97.25	63.792	45.71
	121	9	107	99	278	101	192	131
25.3	17.238	56.67	13.263	39.86	50.928	98.26	63.600	47.02
	139	36	121	84	315	51	207	86
35.3	17.099	56.31	13.142	40.70	50.613	98.77	63.393	47.88
Mean Place	13.771	35.19	10.431	48.95	45.872	68.96	61.357	45.47
Sec δ, Tan δ	1.121	+0.506	1.011	−0.151	1.990	+1.721	1.383	−0.956
$D_{\psi a}$, $D_{\omega a}$	+0.065	−0.032	+0.060	+0.009	+0.077	−0.108	+0.052	+0.059
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.38	+0.32	+0.37	+0.34	+0.37	+0.35	+0.37	+0.36

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	38 Cassiopeiæ. Mag. 6.0		η Piscium. Mag. 3.7		υ Andromedæ. Mag. 4.2		40 Cassiopeiæ. Mag. 5.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 1 25 s	° ′ +69 51 ″	h m 1 27 s	° ′ +14 56 ″	h m 1 32 s	° ′ +41 1 ″	h m 1 32 s	° ′ +72 38 ″
Jan. 0.3	30.75	82.71	21.967	57.43	17.089	22.93	22.68	68.53
	52	46	128	64	184	14	61	62
10.3	30.23	83.17	21.839	56.79	16.905	22.79	22.07	69.15
	54	12	138	72	200	52	64	2
20.2	29.69	83.05	21.701	56.07	16.705	22.27	21.43	69.17
	55	69	141	79	206	86	65	56
30.2	29.14	82.36	21.560	55.28	16.499	21.41	20.78	68.61
	53	125	141	84	204	119	62	114
Feb. 9.2	28.61	81.11	21.419	54.44	16.295	20.22	20.16	67.47
	49	175	129	85	191	144	59	166
19.1	28.12	79.36	21.290	53.59	16.104	18.78	19.57	65.81
	41	217	116	81	168	167	51	211
Mar. 1.1	27.71	77.19	21.174	52.78	15.936	17.11	19.06	63.70
	34	251	89	75	131	180	42	248
11.1	27.37	74.68	21.085	52.03	15.802	15.31	18.64	61.22
	24	272	61	61	92	185	30	272
21.1	27.13	71.96	21.024	51.42	15.710	13.46	18.34	58.50
	13	284	19	49	43	183	17	288
31.0	27.00	69.12	21.005	50.93	15.667	11.63	18.17	55.62
	1	283	19	26	12	171	3	289
Apr. 10.0	27.01	66.29	21.024	50.67	15.679	9.92	18.14	52.73
	12	273	67	1	70	154	11	281
20.0	27.13	63.56	21.091	50.66	15.749	8.38	18.25	49.92
	23	251	112	22	129	128	25	263
30.0	27.36	61.05	21.203	50.88	15.878	7.10	18.50	47.29
	36	220	155	50	186	98	38	233
May 9.9	27.72	58.85	21.358	51.38	16.064	6.12	18.88	44.96
	46	183	196	76	237	63	50	198
19.9	28.18	57.02	21.554	52.14	16.301	5.49	19.38	42.98
	55	139	236	101	283	26	60	153
29.9	28.73	55.63	21.790	53.18	16.584	5.23	19.98	41.45
	61	91	265	125	320	13	69	108
June 8.8	29.34	54.72	22.055	54.43	16.904	5.36	20.67	40.37
	67	40	288	147	349	52	75	58
18.8	30.01	54.32	22.343	55.90	17.253	5.88	21.42	39.79
	71	11	305	166	367	87	80	5
28.8	30.72	54.43	22.648	57.56	17.620	6.75	22.22	39.74
	72	62	310	176	376	123	82	46
July 8.8	31.44	55.05	22.958	59.32	17.996	7.98	23.04	40.20
	71	111	311	183	376	154	82	96
18.7	32.15	56.16	23.269	61.15	18.372	9.52	23.86	41.16
	70	157	302	187	366	180	79	144
28.7	32.85	57.73	23.571	63.02	18.738	11.32	24.65	42.60
	67	200	286	187	318	203	77	188
Aug. 7.7	33.52	59.73	23.857	64.89	19.086	13.35	25.42	44.48
	62	238	266	176	324	220	71	229
17.7	34.14	62.11	24.123	66.65	19.410	15.55	26.13	46.77
	55	270	210	167	292	232	65	263
27.6	34.69	64.81	24.363	68.32	19.702	17.87	26.78	49.40
	48	208	211	152	258	240	57	294
Sept. 6.6	35.17	67.79	24.574	69.84	19.960	20.27	27.35	52.34
	41	318	179	135	220	242	49	315
16.6	35.58	70.97	24.753	71.19	20.180	22.69	27.84	55.49
	33	332	144	118	180	240	39	334
26.5	35.91	74.29	24.897	72.37	20.360	25.09	28.23	58.83
	24	341	112	96	142	234	29	343
Oct. 6.5	36.15	77.70	25.009	73.33	20.502	27.43	28.52	62.26
	15	341	83	78	100	223	18	348
16.5	36.30	81.11	25.092	74.11	20.602	29.66	28.70	65.74
	4	334	47	58	60	208	9	342
26.5	36.34	84.45	25.139	74.69	20.662	31.74	28.79	69.16
	3	320	18	39	22	190	3	331
Nov. 5.4	36.31	87.65	25.157	75.08	20.684	33.64	28.76	72.47
	13	298	11	20	16	168	14	313
15.4	36.18	90.63	25.146	75.28	20.668	35.32	28.62	75.60
	21	270	34	6	53	142	24	283
25.4	35.97	93.33	25.112	75.34	20.615	36.74	28.38	78.43
	30	232	62	14	86	113	34	248
Dec. 5.4	35.67	95.65	25.050	75.20	20.529	37.87	28.04	80.91
	38	188	83	27	120	81	44	205
15.3	35.29	97.53	24.967	74.93	20.409	38.68	27.60	82.96
	45	138	99	42	147	47	52	155
25.3	34.84	98.91	24.868	74.51	20.262	39.15	27.08	84.51
	49	83	119	52	171	9	58	101
35.3	34.35	99.74	24.749	73.99	20.091	39.24	26.50	85.52
Mean Place	28.352	68.55	21.575	57.72	16.218	15.31	19.765	54.38
Sec δ, Tan δ	2.906	+2.729	1.035	+0.267	1.326	+0.870	3.353	+3.201
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.088	−0.169	+0.064	−0.017	+0.070	−0.053	+0.094	−0.196
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.37	+0.36	+0.37	+0.37	+0.37	+0.39	+0.37	+0.39

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Piscium. Mag. 5.6		υ Persei. Mag. 3.8		α Eridani. (*Achernar.*) Mag. 0.6		ω Cassiopeiæ. Mag. 5.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 1 33 s	° ′ +11 44 ″	h m 1 33 s	° ′ +48 14 ″	h m 1 34 s	° ′ −57 37 ″	h m 1 36 s	° ′ +67 39 ″
Jan. 0.3	1.200	51.43	16.460	28.52	50.517	61.58	39.13	28.81
	124	64	220	1	329	51	45	54
10.3	1.076	50.79	16.240	28.53	50.188	62.09	38.68	29.35
	136	70	237	39	337	8	48	3
20.2	0.940	50.09	16.003	28.14	49.851	62.01	38.20	29.32
	140	74	247	82	334	62	49	57
30.2	0.800	49.35	15.756	27.32	49.517	61.39	37.71	28.75
	140	75	238	121	321	116	48	113
Feb. 9.2	0.660	48.60	15.518	26.11	49.196	60.23	37.23	27.62
	132	72	226	155	294	169	45	162
19.2	0.528	47.88	15.292	24.56	48.902	58.54	36.78	26.00
	116	67	198	181	263	212	40	204
Mar. 1.1	0.412	47.21	15.094	22.75	48.639	56.42	36.38	23.96
	94	58	159	202	220	255	32	238
11.1	0.318	46.63	14.935	20.73	48.419	53.87	36.06	21.58
	63	46	111	210	169	286	24	262
21.1	0.255	46.17	14.824	18.63	48.250	51.01	35.82	18.96
	27	27	53	215	110	316	13	274
31.0	0.228	45.90	14.771	16.48	48.140	47.85	35.69	16.22
	15	8	8	204	45	337	3	276
Apr. 10.0	0.243	45.82	14.779	14.44	48.095	44.48	35.66	13.46
	59	17	74	188	25	352	9	267
20.0	0.302	45.99	14.853	12.56	48.120	40.96	35.75	10.79
	104	40	139	165	94	356	20	247
30.0	0.406	46.39	14.992	10.91	48.214	37.40	35.95	8.32
	149	67	203	133	162	353	30	220
May 9.9	0.555	47.06	15.195	9.58	48.376	33.87	36.25	6.12
	190	92	260	98	232	343	40	183
19.9	0.745	47.98	15.455	8.60	48.608	30.44	36.65	4.29
	226	117	310	90	295	327	49	141
29.9	0.971	49.15	15.765	8.00	48.903	27.17	37.14	2.88
	259	137	353	17	351	300	55	95
June 8.9	1.230	50.52	16.118	7.83	49.254	24.17	37.69	1.93
	282	155	385	24	400	267	61	48
18.8	1.512	52.07	16.503	8.07	49.654	21.50	38.30	1.45
	300	171	406	67	435	229	64	4
28.8	1.812	53.78	16.909	8.74	50.089	19.21	38.94	1.49
	308	178	416	105	462	183	66	52
July 8.8	2.120	55.56	17.325	9.79	50.551	17.38	39.60	2.01
	307	184	415	142	471	132	66	101
18.7	2.427	57.40	17.740	11.21	51.022	16.06	40.26	3.02
	299	183	404	175	473	79	65	147
28.7	2.726	59.23	18.144	12.96	51.495	15.27	40.91	4.49
	287	179	386	203	459	21	62	188
Aug. 7.7	3.013	61.02	18.530	14.99	51.954	15.06	41.53	6.37
	265	167	359	226	432	34	59	227
17.7	3.278	62.69	18.889	17.25	52.386	15.40	42.12	8.64
	242	155	326	246	395	92	52	258
27.6	3.520	64.24	19.215	19.71	52.781	16.32	42.64	11.22
	212	139	286	256	346	145	47	286
Sept. 6.6	3,732	65.63	19.501	22.27	53.127	17.77	43.11	14.08
	180	119	246	266	287	192	41	307
16.6	3.912	66.82	19.747	24.93	53.414	19.69	43.52	17.15
	149	99	202	268	224	233	32	321
26.6	4.061	67.81	19.949	27.61	53.638	22.02	43.84	20.36
	116	77	157	266	158	264	26	331
Oct. 6.5	4.177	68.58	20.106	30.27	53.796	24.66	44.10	23.67
	84	58	111	259	87	288	17	331
16.5	4.261	69.16	20.217	32.86	53.883	27.54	44.27	26.98
	53	38	64	246	14	298	8	327
26.5	4.314	69.54	20.281	35.32	53.897	30.52	44.35	30.25
	24	18	20	229	53	297	1	316
Nov. 5.4	4.338	69.72	20.301	37.61	53.844	33.49	44.36	33.41
	4	2	22	206	116	284	8	295
15.4	4.334	69.74	20.279	39.67	53.728	36.33	44.28	36.36
	31	12	66	181	171	262	17	268
25.4	4.303	69.62	20.213	41.48	53.557	38.95	44.11	39.04
	54	25	106	148	222	230	24	232
Dec. 5.4	4.249	69.37	20.107	42.96	53.335	41.25	43.87	41.36
	78	39	145	111	263	183	31	192
15.3	4.171	68.98	19.962	44.07	53.072	43.08	43.56	43.28
	97	48	178	74	294	136	38	144
25.3	4.074	68.50	19.784	44.81	52.778	44.44	43.18	44.72
	113	56	206	32	318	84	43	91
35.3	3.961	67.94	19.578	45.13	52.460	45.28	42.75	45.63
Mean Place	0.814	53.09	15.376	19.04	50.866	39.77	36.857	15.59
Sec δ, Tan δ	1.021	+0.208	1.502	+1.120	1.868	−1.577	2.630	+2.433
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.063	−0.013	+0.073	−0.069	+0.044	+0.096	+0.088	−0.148
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.37	+0.39	+0.37	+0.40	+0.36	+0.40	+0.36	+0.41

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Piscium. Mag. 4.7		φ Persei. Mag. 4.2		τ Ceti. Mag. 3.6		o Piscium. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 1 37 s	° ′ + 5 5 ″	h m 1 38 s	° ′ +50 17 ″	h m 1 40 s	° ′ −16 20 ″	h m 1 41 s	° ′ + 8 46 ″
Jan. 0.3	25.674	50.43	50.643	74.97	29.540	44.36	19.906	11.43
10.3	25.553 121	49.73 70	50.411 232	75.11 − 14	29.405 135	45.16 80	19.785 121	10.77 66
20.2	25.421 132	49.04 69	50.160 251	74.80 31	29.258 147	45.72 56	19.650 135	10.10 67
30.2	25.283 138	48.38 66	49.901 259	74.07 73	29.107 151	46.02 30	19.511 139	9.41 69
Feb. 9.2	25.145 138	47.78 60	49.644 257	72.91 116	28.958 149	46.04 − 2	19.369 142	8.73 68
	131	52	242	150	143	25	132	61
19.2	25.014 116	47.26 40	49.402	71.41	28.815	45.79	19.237 121	8.12
Mar. 1.1	24.898 95	46.86 25	49.188 214	69.60 181	28.689 126	45.23 56	19.116 97	7.58 54
11.1	24.803 66	46.61 10	49.013 175	67.59 201	28.583 106	44.40 83	19.019 72	7.14 44
21.1	24.737 31	46.51 − 10	48.887 126	65.42 217	28.508 75	43.29 111	18.947 33	6.85 29
31.0	24.706 − 9	46.61 10	48.822 65	63.24 218	28.467 41	41.92 137	18.914 − 6	6.76 − 9
		33	1	214	0	163		10
Apr. 10.0	24.715	46.94	48.821 − −	61.10	28.467	40.29	18.920	6.86
20.0	24.767 52	47.49 55	48.889 68	59.12 198	28.510 43	38.46 183	18.972 52	7.19 33
30.0	24.864 97	48.29 80	49.024 135	57.36 176	28.596 86	36.41 205	19.065 93	7.78 59
May 9.9	25.004 140	49.32 103	49.225 201	55.89 147	28.727 131	34.20 221	19.204 139	8.60 82
19.9	25.186 182	50.59 127	49.488 263	54.78 111	28.902 175	31.89 231	19.384 180	9.65 105
	220	145	316	72	213	240	220	126
29.9	25.406	52.04	49.804	54.06	29.115	29.49	19.604	10.91
June 8.9	25.657 251	53.68 164	50.164 360	53.75 − 31	29.358 243	27.09 240	19.855 251	12.37 146
18.8	25.932 275	55.43 175	50.559 395	53.86 11	29.630 272	24.75 234	20.131 276	14.01 164
28.8	26.225 293	57.27 184	50.976 417	54.41 55	29.921 291	22.52 223	20.425 294	15.74 173
July 8.8	26.526 301	59.14 187	51.405 429	55.34 93	30.222 301	20.43 209	20.729 304	17.56 182
	304	186	432	132	305	184	305	183
18.7	26.830	61.00	51.837	56.66	30.527	18.59	21.034	19.39
28.7	27.127 297	62.78 178	52.258 421	58.34 168	30.828 301	16.99 160	21.334 300	21.19 180
Aug. 7.7	27.412 285	64.44 166	52.660 402	60.31 197	31.115 287	15.74 125	21.621 287	22.90 171
17.7	27.676 264	65.96 152	53.036 376	62.54 223	31.385 270	14.82 92	21.889 268	24.50 160
27.6	27.917 241	67.28 132	53.377 341	64.96 242	31.630 245	14.27 55	22.136 247	25.95 145
	212	109	306	258	215	18	216	124
Sept. 6.6	28.129	68.37 87	53.683	67.54	31.845	14.09 −	22.352	27.19
16.6	28.312 183	69.24 62	53.944 261	70.23 269	32.028 183	14.27 18	22.539 187	28.23 104
26.6	28.462 150	69.86 39	54.160 216	72.95 272	32.177 149	14.82 55	22.695 156	29.05 82
Oct. 6.5	28.580 118	70.25 15	54.330 170	75.68 273	32.291 114	15.66 84	22.821 126	29.65 60
16.5	28.667 87	70.40 − 3	54.454 124	78.34 266	32.369 78	16.77 111	22.912 91	30.02 37
	55		75	257	44	131	62	18
26.5	28.722	70.37	54.529	80.91	32.413	18.08	22.974	30.20
Nov. 5.4	28.748 − 1	70.14 23	54.559 − 30	83.30 239	32.426 − 13	19.52 144	23.005 31	30.20 0
15.4	28.747 28	69.78 36	54.539 20	85.49 219	32.409 17	21.03 151	23.009 − 4	30.06 14
25.4	28.719 50	69.30 48	54.476 63	87.43 194	32.364 45	22.52 149	22.983 26	29.77 29
Dec. 5.4	28.669 74	68.72 58	54.369 107	89.04 161	32.296 68	23.96 144	22.938 45	29.36 41
		63	147	125	91	132	73	51
15.3	28.595	68.09	54.222	90.29	32.205	25.28	22.865	28.85
25.3	28.501 94	67.42 67	54.037 185	91.15 86	32.093 112	26.42 114	22.772 93	28.29 56
35.3	28.392 109	66.73 69	53.822 215	91.58 43	31.965 128	27.38 96	22.661 111	27.66 63
Mean Place	25.338	54.57	49.446	65.31	29.414	32.75	19.510	14.47
Sec δ, Tan δ	1.004	+0.089	1.566	+1.205	1.042	−0.293	1.012	+0.154
$D_{\psi a}$, $D_{\omega a}$	+0.062	−0.005	+0.075	−0.073	+0.058	+0.018	+0.063	−0.009
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.36	+0.41	+0.36	+0.42	+0.36	+0.42	+0.36	+0.43

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sculptoris. Mag. 5.4		ζ Ceti. Mag. 3.9		α Trianguli. Mag. 3.6		ε Cassiopeiæ. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	1 42	−25 25	1 47	−10 42	1 48	+29 12	1 48	+63 17
	s	″	s	″	s	″	s	″
Jan. 0.3	2.194	86.88	39.786	63.17	41.956	19.09	52.22	41.85
	150	87	127	85	144	27	36	59
10.3	2.044	87.75	39.659	64.02	41.812	18.82	51.86	42.44
	158	55	138	67	159	53	39	5
20.2	1.886	88.30	39.521	64.69	41.653	18.29	51.47	42.49
	164	18	144	49	170	76	41	49
30.2	1.722	88.48	39.377	65.18	41.483	17.53	51.06	42.00
	162	18	145	25	171	93	40	101
Feb. 9.2	1.560	88.30	39.232	65.43	41.312	16.60	50.66	40.99
	155	52	139	1	165	111	38	146
19.2	1.405	87.78	39.093	65.42	41.147	15.49	50.28	39.53
	138	87	126	23	148	122	34	189
Mar. 1.1	1.267	86.91	38.967	65.19	40.999	14.27	49.94	37.64
	115	121	106	50	124	129	28	221
11.1	1.152	85.70	38.861	64.69	40.875	12.98	49.66	35.43
	85	151	79	75	89	129	22	245
21.1	1.067	84.19	38.782	63.94	40.786	11.69	49.44	32.98
	51	179	43	99	51	121	13	258
31.1	1.016	82.40	38.739	62.95	40.735	10.48	49.31	30.40
	7	205	4	126	2	109	4	260
Apr. 10.0	1.009	80.35	38.735	61.69	40.733	9.39	49.27	27.80
	37	228	37	145	49	90	6	253
20.0	1.046	78.07	38.772	60.24	40.782	8.49	49.33	25.27
	83	217	81	171	99	65	15	235
30.0	1.129	75.60	38.853	58.53	40.881	7.84	49.48	22.92
	129	257	123	190	150	41	24	208
May 9.9	1.258	73.03	38.976	56.63	41.031	7.43	49.72	20.84
	176	266	168	202	196	7	33	176
19.9	1.434	70.37	39.144	54.61	41.227	7.36	50.05	19.08
	215	268	206	213	239	21	40	136
29.9	1.649	67.69	39.350	52.48	41.466	7.57	50.45	17.72
	249	264	241	220	276	55	47	92
June 8.9	1.898	65.05	39.591	50.28	41.742	8.12	50.92	16.80
	281	251	267	221	304	83	52	46
18.8	2.179	62.54	39.858	48.07	42.046	8.95	51.44	16.34
	301	234	286	215	324	111	55	2
28.8	2.480	60.20	40.144	45.92	42.370	10.06	51.99	16.36
	315	211	298	206	334	136	57	48
July 8.8	2.795	58.09	40.442	43.86	42.704	11.42	52.56	16.84
	320	180	304	186	338	157	58	95
18.8	3.115	56.29	40.746	42.00	43.042	12.99	53.14	17.79
	318	147	300	166	332	175	57	138
28.7	3.433	54.82	41.046	40.34	43.374	14.74	53.71	19.17
	307	106	289	111	318	187	55	178
Aug. 7.7	3.740	53.76	41.335	38.93	43.692	16.61	54.26	20.95
	286	67	273	110	300	194	51	212
17.7	4.026	53.09	41.608	37.83	43.992	18.55	54.77	23.07
	263	23	250	78	273	197	48	245
27.6	4.289	52.86	41.858	37.05	44.265	20.52	55.25	25.52
	233	20	222	44	246	194	43	269
Sept. 6.6	4.522	53.06	42.080	36.61	44.511	22.46	55.68	28.21
	198	62	193	11	214	191	37	290
16.6	4.720	53.68	42.273	36.50	44.725	24.37	56.05	31.11
	162	99	159	22	179	181	31	304
26.6	4.882	54.67	42.432	36.72	44.904	26.18	56.36	34.15
	125	133	127	53	148	170	25	312
Oct. 6.5	5.007	56.00	42.559	37.25	45.052	27.88	56.61	37.27
	87	160	93	80	109	157	18	315
16.5	5.094	57.60	42.652	38.05	45.161	29.45	56.79	40.42
	49	179	60	97	78	141	11	309
26.5	5.143	59.39	42.712	39.02	45.239	30.86	56.90	43.51
	15	191	29	117	43	123	4	300
Nov. 5.5	5.158	61.30	42.741	40.19	45.282	32.09	56.94	46.51
	20	195	1	126	13	104	3	280
15.4	5.138	63.25	42.740	41.45	45.295	33.13	56.91	49.31
	47	189	24	130	21	84	9	258
25.4	5.091	65.14	42.716	42.75	45.274	33.97	56.82	51.89
	77	177	53	128	51	61	17	223
Dec. 5.4	5.014	66.91	42.663	44.03	45.223	34.58	56.65	54.12
	101	160	77	121	81	38	23	185
15.3	4.913	68.51	42.586	45.24	45.142	34.96	56.42	55.97
	122	133	96	110	106	14	29	142
25.3	4.791	69.84	42.490	46.34	45.036	35.10	56.13	57.39
	140	106	115	96	131	11	34	93
35.3	4.651	70.90	42.375	47.30	44.905	34.99	55.79	58.32
Mean Place	2.117	72.56	39.545	53.31	41.233	15.77	50.224	30.13
Sec δ, Tan δ	1.107	−0.476	1.018	−0.189	1.146	+0.559	2.225	+1.988
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.056	+0.029	+0.059	+0.011	+0.068	−0.033	+0.085	−0.118
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.36	+0.43	+0.35	+0.45	+0.35	+0.46	+0.35	+0.46

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Piscium. Mag. 4.8		β Arietis. Mag. 2.7		ψ Phœnicis. Mag. 4.4		α Hydri. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	1 49	+ 2 48	1 50	+20 25	1 50	−46 40	1 56	−61 56
Jan. 0.3	34.427	23.30	23.508	56.47	33.382	66.93	20.02	61.88
	119	73	130	46	234	84	39	71
10.3	34.308	22.57	23.378	56.01	33.148	67.77	19.63	62.59
	132	69	114	58	245	32	41	12
20.2	34.176	21.88	23.234	55.43	32.903	68.09	19.22	62.71
	140	62	153	73	250	20	40	46
30.2	34.036	21.26	23.081	54.70	32.653	67.89	18.82	62.25
Feb. 9.2	141	53	156	84	245	68	40	102
	33.895	20.73	22.925	53.86	32.408	67.21	18.42	61.23
	138	44	148	90	231	118	37	155
19.2	33.757	20.29	22.777	52.96	32.177	66.03	18.05	59.68
	124	31	135	96	211	162	35	203
Mar. 1.1	33.633	19.98	22.642	52.00	31.966	64.41	17.70	57.65
	104	14	115	92	180	203	29	247
11.1	33.529	19.84	22.527	51.08	31.786	62.38	17.41	55.18
	76	4	81	85	141	240	24	287
21.1	33.453	19.88	22.446	50.23	31.645	59.98	17.17	52.31
	43	23	47	75	98	271	19	314
31.1	33.410	20.11	22.399	49.48	31.547	57.27	16.98	49.17
	2	46	3	61	46	296	10	339
Apr. 10.0	33.408	20.57	22.396	48.87	31.501	54.31	16.88	45.78
	39	69	46	38	8	315	3	358
20.0	33.447	21.26	22.442	48.49	31.509	51.16	16.85	42.20
	85	91	92	13	67	329	5	361
30.0	33.532	22.17	22.534	48.36	31.576	47.87	16.90	38.59
May 9.9	129	115	139	11	124	333	13	363
	33.661	23.32	22.673	48.47	31.700	44.54	17.03	34.96
19.9	171	133	181	40	182	332	21	357
	33.832	24.65	22.854	48.87	31.882	41.22	17.24	31.39
	208	156	225	66	234	322	28	339
29.9	34.040	26.21	23.079	49.53	32.116	38.00	17.52	28.00
	241	169	259	93	281	304	35	317
June 8.9	34.281	27.90	23.338	50.46	32.397	34.96	17.87	24.83
	269	180	287	114	320	280	41	283
18.8	34.550	29.70	23.625	51.60	32.717	32.16	18.28	22.00
	287	186	305	138	353	248	45	246
28.8	34.837	31.56	23.930	52.98	33.070	29.68	18.73	19.54
July 8.8	299	189	315	155	374	210	50	200
	35.136	33.45	24.245	54.53	33.444	27.58	19.23	17.54
	302	184	319	170	386	166	51	151
18.8	35.438	35.29	24.564	56.23	33.830	25.92	19.74	16.03
	297	176	314	177	388	116	53	95
28.7	35.735	37.05	24.878	58.00	34.218	24.76	20.27	15.08
Aug. 7.7	288	162	302	180	378	66	51	36
	36.023	38.67	25.180	59.80	34.596	24.10	20.78	14.72
17.7	269	146	283	179	360	10	50	22
	36.292	40.13	25.463	61.59	34.956	24.00	21.28	14.94
27.6	218	123	263	174	332	43	46	82
	36.540	41.36	25.726	63.33	35.288	24.43	21.74	15.76
	221	9	233	166	294	98	41	137
Sept. 6.6	36.761	42.35	25.959	64.99	35.582	25.41	22.15	17.13
	193	75	204	153	252	145	36	188
16.6	36.954	43.10	26.163	66.52	35.834	26.86	22.51	19.01
	160	48	169	141	206	189	28	234
26.6	37.114	43.58	26.332	67.93	36.040	28.75	22.79	21.35
Oct. 6.5	131	25	141	123	154	221	21	266
	37.245	43.83	26.473	69.16	36.194	30.99	23.00	24.01
16.5	96	1	108	106	102	253	14	296
	37.341	43.84	26.581	70.22	36.296	33.52	23.14	26.97
	68	20	75	90	49	269	5	310
26.5	37.409	43.64	26.656	71.12	36.345	36.21	23.19	30.07
	38	37	43	70	1	276	3	312
Nov. 5.5	37.447	43.27	26.699	71.82	36.344	38.97	23.16	33.19
	11	50	16	51	50	272	11	302
15.4	37.458	42.77	26.715	72.33	36.294	41.69	23.05	36.21
	19	62	16	36	94	257	17	282
25.4	37.439	42.15	26.699	72.69	36.200	44.26	22.88	39.03
Dec. 5.4	42	70	42	17	134	231	24	249
	37.397	41.45	26.657	72.86	36.066	46.57	22.64	41.52
	67	73	72	1	169	200	29	208
15.3	37.330	40.72	26.585	72.85	35.897	48.57	22.35	43.60
	87	75	94	18	196	157	34	159
25.3	37.243	39.97	26.491	72.67	35.701	50.14	22.01	45.19
	108	71	115	31	221	112	37	104
35.3	37.135	39.23	26.376	72.36	35.480	51.26	21.64	46.23
Mean Place	34.048	28.70	22.913	56.01	33.420	46.91	20.135	39.10
Sec δ, Tan δ	1.001	+0.049	1.067	+0.373	1.458	−1.060	2.126	−1.876
Dψα, Dωα	+0.062	−0.003	+0.066	−0.022	+0.048	+0.063	+0.037	+0.109
Dψδ, Dωδ	+0.35	+0.46	+0.35	+0.46	+0.35	+0.46	+0.35	+0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Ceti. Mag. 4.2		50 Cassiopeiæ. Mag. 4.1		γ Andromedæ *pr.* Mag. 2.3		α Arietis. Mag. 2.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 1 56 s	° ′ −21 26 ″	h m 1 56 s	° ′ +72 2 ″	h m 1 59 s	° ′ +41 57 ″	h m 2 2 s	° ′ +23 5 ″
Jan. 0.3	22.778	74.55	52.61	71.21	10.968	45.97	50.391	57.29
	140	96	56	92	180	14	129	34
10.3	22.638	75.51	52.05	72.13	10.788	46.11	50.262	56.95
	151	66	61	36	199	—	147	52
20.3	22.487	76.17	51.44	72.49	10.589	45.86	50.115	56.43
	161	35	62	—	212	25	156	65
30.2	22.326	76.52	50.82	72.25	10.377	45.25	49.959	55.78
	161	0	63	24	216	61	164	80
Feb. 9.2	22.165	76.52	50.19	71.42	10.161	44.31	49.795	54.98
	157	31	59	83	211	94	160	90
19.2	22.008	76.21	49.60	70.08	9.950	43.09	49.635	54.08
	143	65	54	134	192	122	146	97
Mar. 1.1	21.865	75.56	49.06	68.22	9.758	41.62	49.489	53.11
	121	96	45	186	161	147	125	99
11.1	21.744	74.60	48.61	66.00	9.597	39.96	49.364	52.12
	96	128	36	222	124	166	94	97
21.1	21.648	73.32	48.25	63.44	9.473	38.22	49.270	51.15
	60	154	23	256	75	174	60	86
31.1	21.588	71.78	48.02	60.70	9.398	36.44	49.210	50.29
	21	181	10	274	22	178	13	72
Apr. 10.0	21.567	69.97	47.92	57.89	9.376	34.72	49.197	49.57
	—		—	283	—	172	—	57
20.0	21.590	67.92	47.95	55.06	9.415	33.13	49.227	49.00
	23	205	3	267	39	159	30	32
30.0	21.658	65.68	48.12	52.39	9.513	31.76	49.308	48.68
	68	224	17	244	98	137	81	8
May 10.0	21.775	63.26	48.43	49.95	9.668	30.63	49.439	48.60
	117	242	31	215	155	113	131	—
19.9	21.933	60.74	48.85	47.80	9.881	29.82	49.612	48.79
	158	252	42	174	213	81	173	19
	201	256	54		263	50	220	46
29.9	22.134	58.18	49.39	46.06	10.144	29.32	49.832	49.25
	237	256	63	134	302	12	255	74
June 8.9	22.371	55.62	50.02	44.72	10.446	29.20	50.087	49.99
	267	247	70	84	339	—	284	98
18.8	22.638	53.15	50.72	43.88	10.785	29.44	50.371	50.97
	290	235	76	36	361	64	302	123
28.8	22.928	50.80	51.48	43.52	11.146	30.08	50.673	52.20
	305	215	79	—	377	92	318	140
July 8.8	23.233	48.65	52.27	43.67	11.523	31.00	50.991	53.60
	313	190	80	15	384	127	325	159
18.8	23.546	46.75	53.07	44.28	11.907	32.27	51.316	55.19
	311	159	80	114	378	155	321	169
28.7	23.857	45.16	53.87	45.42	12.285	33.82	51.637	56.88
	302	122	77	158	365	179	310	174
Aug. 7.7	24.159	43.94	54.64	47.00	12.650	35.61	51.947	58.62
	286	85	74	199	348	199	292	178
17.7	24.445	43.09	55.38	48.99	12.998	37.60	52.239	60.40
	265	45	68	236	322	212	275	175
27.7	24.710	42.64	56.06	51.35	13.320	39.72	52.514	62.15
	236	1	62	267	288	224	246	170
Sept. 6.6	24.946	42.63	56.68	54.02	13.608	41.96	52.760	63.85
	207	—	54	294	255	229	217	159
16.6	25.153	43.01	57.22	56.96	13.863	44.25	52.977	65.44
	171	38	46	314	219	232	187	150
26.6	25.324	43.77	57.68	60.10	14.082	46.57	53.164	66.94
	140	76	36	333	180	229	156	134
Oct. 6.5	25.464	44.87	58.04	63.43	14.262	48.86	53.320	68.28
	100	110	27	339	141	222	124	118
16.5	25.564	46.26	58.31	66.82	14.403	51.08	53.444	69.46
	67	139	17	337	100	211	90	101
26.5	25.631	47.86	58.48	70.19	14.503	53.19	53.534	70.47
	32	175	6	332	60	197	58	87
Nov. 5.5	25.663	49.61	58.54	73.51	14.563	55.16	53.592	71.34
	0	181	—	317	20	178	29	67
15.4	25.663	51.42	58.50	76.68	14.583	56.94	53.621	72.01
	30	181	4	295	—	156	—	52
25.4	25.633	53.23	58.34	79.63	14.561	58.50	53.617	72.53
	58	171	16	265	22	131	4	32
Dec. 5.4	25.575	54.94	58.08	82.28	14.503	59.81	53.584	72.85
	85	159	26	225	58	102	33	17
			36		93		64	—
15.4	25.490	56.53	57.72	84.53	14.410	60.83	53.520	73.02
	108	135	44	179	132	70	88	4
25.3	25.382	57.88	57.28	86.32	14.278	61.53	53.432	72.98
	128	111	53	127	161	35	113	23
35.3	25.254	58.99	56.75	87.59	14.117	61.88	53.319	72.75
Mean Place	22.572	61.05	49.450	58.67	9.903	39.58	49.691	56.58
Sec δ, Tan δ	1.074	−0.393	3.245	+3.087	1.345	+0.899	1.087	+0.426
Dψα, Dωα	+0.056	+0.023	+0.101	−0.180	+0.073	−0.052	+0.067	−0.024
Dψδ, Dωδ	+0.35	+0.49	+0.35	+0.49	+0.35	+0.50	+0.34	+0.51

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Trianguli. Mag. 3.1		55 Cassiopeiæ. Mag. 6.2		6 Persei. Mag. 5.4		ξ¹ Ceti. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 4 s	° ′ +34 37 ″	h m 2 8 s	° ′ +66 9 ″	h m 2 8 s	° ′ +50 42 ″	h m 2 8 s	° ′ + 8 29 ″
Jan. 0.3	58.266	29.67	27.45	63.14	29.834	40.16	55.518	5.52
	150	3	39	90	217	45	115	63
10.3	58.116	29.64	27.06	64.04	29.617	40.61	55.403	4.89
	173	34	43	36	244	1	131	64
20.3	57.943	29.30	26.63	64.40 —	29.373	40.62 —	55.272	4.25
	183	59	46	18	263	41	143	64
30.2	57.760	28.71	26.17	64.22	29.110	40.21	55.129	3.61
	193	86	46	72	268	84	149	61
Feb. 9.2	57.567	27.85	25.71	63.50	28.842	39.37	54.980	3.00
	185	110	45	125	261	121	147	56
19.2	57.382	26.75	25.26	62.25	28.581	38.16	54.833	2.44
	173	125	41	169	243	155	138	49
Mar. 1.1	57.209	25.50	24.85	60.56	28.338	36.61	54.695	1.95
	144	140	36	207	208	180	119	38
11.1	57.065	24.10	24.49	58.49	28.130	34.81	54.576	1.57
	114	143	28	236	163	199	94	24
21.1	56.951	22.67	24.21	56.13	27.967	32.82	54.482	1.33
	71	143	19	255	108	209	60	9
31.1	56.880	21.24	24.02	53.58	27.859	30.73	54.422	1.24 —
	22	134	9	265	43	210	20	10
Apr. 10.0	56.858 —	19.90	23.93 —	50.93	27.816 —	28.63	54.402	1.34
	30	121	1	261	24	202	22	32
20.0	56.888	18.69	23.94	48.32	27.840	26.61	54.424	1.66
	85	100	12	250	95	185	68	54
30.0	56.973	17.69	24.06	45.82	27.935	24.76	54.492	2.20
	141	75	22	229	164	161	114	79
May 10.0	57.114	16.94	24.28	43.53	28.099	23.15	54.606	2.99
	188	46	32	199	229	131	157	99
19.9	57.302	16.48	24.60	41.54	28.328	21.84	54.763	3.98
	237	13	41	164	288	98	197	122
29.9	57.539	16.35 —	25.01	39.90	28.616	20.86	54.960	5.20
	279	19	48	121	338	58	232	140
June 8.9	57.818	16.54	25.49	38.69	28.954	20.28	55.192	6.60
	306	50	55	79	378	19	262	155
18.8	58.124	17.04	26.04	37.90	29.332	20.09 —	55.454	8.15
	333	82	59	32	409	21	283	167
28.8	58.457	17.86	26.63	37.58 —	29.741	20.30	55.737	9.82
	318	109	62	15	427	60	297	172
July 8.8	58.805	18.95	27.25	37.73	30.168	20.90	56.034	11.54
	352	135	63	62	437	98	303	176
18.8	59.157	20.30	27.88	38.35	30.605	21.88	56.337	13.30
	351	159	64	108	434	133	301	172
28.7	59.508	21.89	28.52	39.43	31.039	23.21	56.638	15.02
	339	175	62	150	422	165	294	161
Aug. 7.7	59.847	23.64	29.14	40.93	31.461	24.86	56.932	16.66
	325	190	59	186	402	191	280	153
17.7	60.172	25.54	29.73	42.79	31.863	26.77	57.212	18.19
	298	195	55	224	375	215	259	138
27.7	60.470	27.49	30.28	45.03	32.238	28.92	57.471	19.57
	273	201	51	251	342	232	236	118
Sept. 6.6	60.743	29.50	30.79	47.54	32.580	31.24	57.707	20.75
	239	203	45	277	303	246	208	97
16.6	60.982	31.53	31.24	50.31	32.883	33.70	57.915	21.72
	208	200	38	295	263	256	179	75
26.6	61.190	33.53	31.62	53.26	33.146	36.26	58.094	22.47
	173	191	32	309	219	259	150	54
Oct. 6.5	61.363	35.44	31.94	56.35	33.365	38.85	58.244	23.01
	138	183	24	316	173	256	119	31
16.5	61.501	37.27	32.18	59.51	33.538	41.41	58.363	23.32
	101	169	18	315	127	252	90	13
26.5	61.602	38.96	32.36	62.66	33.665	43.93	58.453	23.45
	67	154	9	310	80	242	59	5
Nov. 5.5	61.669	40.50	32.45	65.76	33.745	46.35	58.512	23.40
	28	138	1	297	30	225	30	21
15,4	61.697 —	41.88	32.46 —	68.73	33.775 —	48.60	58.542	23.19
	5	118	7	276	18	204	2	33
25.4	61.692	43.06	32.39	71.49	33.757	50.64	58.544 —	22.86
	40	95	15	249	66	177	26	43
Dec. 5.4	61.652	44.01	32.24	73.98	33.691	52.41	58.518	22.43
	74	69	23	212	113	148	52	50
15.4	61.578	44.70	32.01	76.10	33.578	53.89	58.466	21.93
	107	42	30	170	157	111	78	56
25.3	61.471	45.12	31.71	77.80	33.421	55.00	58.388	21.37
	133	17	36	124	195	72	99	59
35.3	61.338	45.29	31.35	79.04	33.226	55.72	58.289	20.78
Mean Place	57.344	25.60	24.999	52.20	28.414	32.18	54.975	9.78
Sec δ, Tan δ	1.215	+0.690	2.475	+2.264	1.579	+1.222	1.011	+0.149
Dψα, Dωα	+0.071	−0.039	+0.093	−0.128	+0.078	−0.069	+0.063	−0.008
Dψδ, Dωδ	+0.34	+0.52	+0.34	+0.53	+0.34	+0.53	+0.34	+0.53

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Fornacis. Mag. 5.2		γ Trianguli. Mag. 4.1		67 Ceti. Mag. 5.7		ϕ Eridani. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 9 s	° ′ −31 4 ″	h m 2 12 s	° ′ +33 29 ″	h m 2 13 s	° ′ − 6 46 ″	h m 2 13 s	° ′ −51 51 ″
Jan. 0.3	30.965	82.10	44.788	33.94	8.902	44.47	45.568	86.94
	160	108	143	1	119	91	268	106
10.3	30.805	83.18	44.645	33.93	8.783	45.38	45.300	88.00
	176	69	167	29	133	78	285	52
20.3	30.629	83.87	44.478	33.64	8.650	46.16	45.015	88.52
	186	28	181	54	146	57	295	3
30.2	30.443	84.15	44.297	33.10	8.504	46.73	44.720	88.49
	189	12	188	80	150	39	295	56
Feb. 9.2	30.254	84.03	44.109	32.30	8.354	47.12	44.425	87.93
	184	54	187	101	149	17	286	108
19.2	30.070	83.49	43.922	31.29	8.205	47.29	44.139	86.85
	171	92	175	119	141	5	265	157
Mar. 1.2	29.899	82.57	43.747	30.10	8.064	47.24	43.874	85.28
	152	129	151	130	122	24	238	201
11.1	29.747	81.28	43.596	28.80	7.942	47.00	43.636	83.27
	121	167	119	136	97	52	198	241
21.1	29.626	79.61	43.477	27.44	7.845	46.48	43.438	80.86
	88	196	78	135	69	73	152	275
31.1	29.538	77.65	43.399	26.09	7.776	45.75	43.286	78.11
	46	225	31	128	28	98	96	304
Apr. 10.0	29.492	75.40	43.368	24.81	7.748	44.77	43.190	75.07
	0	250	21	114	13	123	37	325
20.0	29.492	72.90	43.389	23.67	7.761	43.54	43.153	71.82
	51	268	75	96	58	144	25	339
30.0	29.543	70.22	43.464	22.71	7.819	42.10	43.178	68.43
	98	282	130	71	101	161	91	347
May 10.0	29.641	67.40	43.594	22.00	7.920	40.49	43.269	64.96
	148	289	181	43	147	182	154	347
19.9	29.789	64.51	43.775	21.57	8.067	38.67	43.423	61.49
	190	290	228	12	187	197	214	339
29.9	29.979	61.61	44.003	21.45	8.254	36.70	43.637	58.10
	234	283	269	19	221	202	271	322
June 8.9	30.213	58.78	44.272	21.64	8.475	34.68	43.908	54.88
	267	274	302	49	250	209	317	297
18.9	30.480	56.04	44.574	22.13	8.725	32.59	44.225	51.91
	296	253	326	80	274	210	359	266
28.8	30.776	53.51	44.900	22.93	8.999	30.49	44.584	49.25
	314	225	341	108	290	202	389	227
July 8.8	31.090	51.26	45.241	24.01	9.289	28.47	44.973	46.98
	325	194	349	131	299	190	409	181
18.8	31.415	49.32	45.590	25.32	9.588	26.57	45.382	45.17
	328	156	347	152	298	171	417	132
28.7	31.743	47.76	45.937	26.84	9.886	24.86	45.799	43.85
	323	113	339	170	291	151	415	77
Aug. 7.7	32.066	46.63	46.276	28.54	10.177	23.35	46.214	43.08
	309	68	322	181	278	122	400	22
17.7	32.375	45.95	46.598	30.35	10.455	22.13	46.614	42.86
	288	20	300	189	262	95	377	37
27.7	32.663	45.75	46.898	32.24	10.717	21.18	46.991	43.23
	260	28	275	193	237	61	342	93
Sept. 6.6	32.923	46.03	47.173	34.17	10.954	20.54	47.333	44.16
	229	74	244	194	210	29	301	146
16.6	33.152	46.77	47.417	36.11	11.164	20.25	47.634	45.62
	195	118	213	189	182	1	251	194
26.6	33.347	47.95	47.630	38.00	11.346	20.26	47.885	47.56
	156	155	178	183	151	31	198	233
Oct. 6.6	33.503	49.50	47.808	39.83	11.497	20.57	48.083	49.89
	117	185	145	173	121	57	140	265
16.5	33.620	51.35	47.953	41.56	11.618	21.14	48.223	52.54
	78	209	110	161	87	82	83	286
26.5	33.698	53.44	48.063	43.17	11.705	21.96	48.306	55.40
	41	222	74	147	57	97	24	296
Nov. 5.5	33.739	55.66	48.137	44.64	11.762	22.93	48.330	58.36
	1	228	39	131	27	110	32	295
15.4	33.740	57.94	48.176	45.95	11.789	24.03	48.298	61.31
	32	223	5	111	1	119	86	282
25.4	33.708	60.17	48.181	47.06	11.788	25.22	48.212	64.13
	67	212	30	91	27	119	136	257
Dec. 5.4	33.641	62.29	48.151	47.97	11.761	26.41	48.076	66.70
	96	190	66	67	57	116	180	223
15.4	33.545	64.19	48.085	48.64	11.704	27.57	47.896	68.93
	123	162	97	44	82	108	218	182
25.3	33.422	65.81	47.988	49.08	11.622	28.65	47.678	70.75
	147	128	126	17	104	97	249	136
35.3	33.275	67.09	47.862	49.25	11.518	29.62	47.429	72.11
Mean Place	30.733	65.56	43.849	30.62	8.479	35.11	45.401	65.66
Sec δ, Tan δ	1.168	−0.603	1.199	+0.662	1.007	−0.119	1.620	−1.274
$D\psi a$, $D\omega a$	+0.053	+0.034	+0.071	−0.037	+0.059	+0.007	+0.043	+0.071
$D\psi\delta$, $D\omega\delta$	+0.34	+0.54	+0.33	+0.55	+0.33	+0.55	+0.33	+0.55

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o Ceti. (*Mira.*) Var. 1.7–9.6		κ Fornacis. Mag. 5.4		δ Hydri. Mag. 4.3		ι Cassiopeiæ. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 15 s	° ′ − 3 19 ″	h m 2 19 s	° ′ −24 9 ″	h m 2 20 s	° ′ −69 0 ″	h m 2 22 s	° ′ +67 3 ″
Jan. 0.3	27.791	43.61	1.452	71.69	22.64	57.59	44.67	36.43
	115	86	139	111	54	93	40	109
10.3	27.676	44.47	1.313	72.80	22.10	58.52	44.27	37.52
	132	75	157	80	56	33	44	56
20.3	27.544	45.22	1.156	73.60	21.54	58.85	43.83	38.08
	143	60	170	45	58	—	48	1
30.2	27.401	45.82	0.986	74.05	20.96	58.58	43.35	38.09
	150	44	174	9	57	85	48	—
Feb. 9.2	27.251	46.26	0.812	74.14	20.39	57.73	42.87	37.56
	149	29	173	—	56	142	48	53
				28				105
19.2	27.102	46.55	0.639	73.86	19.83	56.31	42.39	36.51
	141	8	162	62	51	193	44	153
Mar. 1.2	26.961	46.63	0.477	73.24	19.32	54.38	41.95	34.98
	122	—	146	96	46	239	39	193
11.1	26.839	46.52	0.331	72.28	18.86	51.99	41.56	33.05
	100	32	119	130	40	278	32	226
21.1	26.739	46.20	0.212	70.98	18.46	49.21	41.24	30.79
	67	55	86	161	33	313	23	218
31.1	26.672	45.65	0.126	69.37	18.13	46.08	41.01	28.31
	30	77	49	188	22	338	13	262
Apr. 10.0	26.642	44.88	0.077	67.49	17.91	42.70	40.88	25.69
	12	102	3	213	13	357	2	263
20.0	26.654	43.86	0.074	65.36	17.78	39.13	40.86	23.06
	56	124	42	234	3	368	9	254
30.0	26.710	42.62	0.116	63.02	17.75	35.45	40.95	20.52
	103	112	90	251	—	370	19	237
May 10.0	26.813	41.20	0.206	60.51	17.81	31.75	41.14	18.15
	144	162	137	263	6	366	30	211
19.9	26.957	39.58	0.343	57.88	17.99	28.09	41.44	16.04
	186	179	181	268	18	350	39	177
					28			
29.9	27.143	37.79	0.524	55.20	18.27	24.59	41.83	14.27
	221	190	220	267	37	329	48	139
June 8.9	27.364	35.89	0.744	52.53	18.64	21.30	42.31	12.88
	250	197	254	260	45	299	55	98
18.9	27.614	33.92	0.998	49.93	19.09	18.31	42.86	11.90
	274	200	281	217	53	261	59	51
28.8	27.888	31.92	1.279	47.46	19.62	15.70	43.45	11.39
	289	195	300	226	58	216	64	5
July 8.8	28.177	29.97	1.579	45.20	20.20	13.54	44.09	11.34
	298	186	310	199	62	166	65	41
18.8	28.475	28.11	1.889	43.21	20.82	11.88	44.74	11.75
	299	172	315	167	65	110	66	87
28.7	28.774	26.39	2.204	41.54	21.47	10.78	45.40	12.62
	291	155	308	129	66	51	65	129
Aug. 7.7	29.065	24.84	2.512	40.25	22.13	10.27	46.05	13.91
	277	130	297	90	65	—	62	169
17.7	29.342	23.54	2.809	39.35	22.78	10.35	46.67	15.60
	261	104	279	45	60	70	59	205
27.7	29.603	22.50	3.088	38.90	23.38	11.05	47.26	17.65
	237	75	255	—	55	129	55	236
				2				
Sept. 6.6	29.840	21.75	3.343	38.88	23.93	12.34	47.81	20.01
	213	45	227	43	50	183	49	263
16.6	30.053	21.30	3.570	39.31	24.43	14.17	48.30	22.64
	181	16	194	83	41	231	43	284
26.6	30.234	21.14	3.764	40.14	24.84	16.48	48.73	25.48
	152	—	160	120	31	272	36	302
Oct. 6.6	30.386	21.28	3.924	41.34	25.15	19.20	49.09	28.50
	121	38	125	152	21	301	30	310
16.5	30.507	21.66	4.049	42.86	25.36	22.21	49.39	31.60
	92	61	91	176	11	319	21	314
26.5	30.599	22.27	4.140	44.62	25.47	25.40	49.60	34.74
	61	78	54	193		326	14	312
Nov. 5.5	30.660	23.05	4.194	46.55	25.47	28.66	49.74	37.86
	32	91	20	201	0	319	4	300
15.4	30.692	23.96	4.214	48.56	25.35	31.85	49.78	40.86
	1	100	—	201	12	301	—	285
25.4	30.693	24.96	4.201	50.57	25.15	34.86	49.74	43.71
	—	104	13	193	20	270	4	258
Dec. 5.4	25	26.00	43	52.50	30	37.56	12	46.29
	30.668	103	4.158	178	24.85	230	49.62	227
	53		74		39		21	
15.4	30.615	27.03	4.084	54.28	24.46	39.86	49.41	48.56
	78	98	101	155	45	181	28	187
25.3	30.537	28.01	3.983	55.83	24.01	41.67	49.13	50.43
	99	92	126	130	50	126	35	142
35.3	30.438	28.93	3.857	57.13	23.51	42.93	48.78	51.85
Mean Place	27.327	35.28	1.114	56.90	22.376	33.94	41.967	26.34
Sec δ, Tan δ	1.002	−0.058	1.096	−0.449	2.792	−2.606	2.565	+2.362
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.060	+0.003	+0.054	+0.025	+0.021	+0.142	+0.098	−0.128
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.33	+0.56	+0.33	+0.57	+0.33	+0.57	+0.32	+0.58

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Ceti. Mag. 4.3		σ Ceti. Mag. 4.8		36 H. Cassiopeiæ. Mag. 5.3		ν Ceti. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 24 s	° ′ + 8 6 ″	h m 2 28 s	° ′ −15 34 ″	h m 2 30 s	° ′ +72 28 ″	h m 2 31 s	° ′ + 5 15 ″
Jan. 0.3	4.356	51.49	26.614	66.59	44.19	68.33	50.468	22.97
	111	63	123	109	53	134	107	70
10.3	4.245	50.86	26.491	67.68	43.66	69.67	50.361	22.27
	130	64	140	84	59	80	126	66
20.3	4.115	50.22	26.351	68.52	43.07	70.47	50.235	21.61
	144	61	155	58	63	22	143	62
30.2	3.971	49.61	26.196	69.10	42.44	70.69	50.092	20.99
	152	58	164	28	65	−35	152	55
Feb. 9.2	3.819	49.03	26.032	69.38	41.79	70.34	49.940	20.44
	153	53	163	1	65	93	155	46
19.2	3.666	48.50	25.869	69.39	41.14	69.41	49.785	19.98
	144	44	157	29	60	143	149	36
Mar. 1.2	3.522	48.06	25.712	69.10	40.54	67.98	49.636	19.62
	129	36	141	59	54	189	131	23
11.1	3.393	47.70	25.571	68.51	40.00	66.09	49.502	19.39
	105	22	118	87	44	227	111	8
21.1	3.288	47.48	25.453	67.64	39.56	63.82	49.391	19.31
	75	3	85	116	33	256	80	−8
31.1	3.213	47.45	25.368	66.48	39.23	61.26	49.311	19.39
	34	−12	50	142	21	270	43	29
Apr. 10.1	3.179	47.57	25.318	65.06	39.02	58.56	49.268	19.68
	7	32	8	167	7	278	0	48
20.0	3.186	47.89	25.310	63.39	38.95	55.78	49.268	20.16
	55	56	37	189	8	272	43	71
30.0	3.241	48.45	25.347	61.50	39.03	53.06	49.311	20.87
	98	75	83	210	21	259	90	92
May 10.0	3.339	49.20	25.430	59.40	39.24	50.47	49.401	21.79
	144	100	128	222	34	235	134	113
19.9	3.483	50.20	25.558	57.18	39.58	48.12	49.535	22.92
	185	117	171	234	47	204	176	131
29.9	3.668	51.37	25.729	54.84	40.05	46.08	49.711	24.23
	220	137	210	239	58	167	214	149
June 8.9	3.888	52.74	25.939	52.45	40.63	44.41	49.925	25.72
	252	153	241	237	66	124	245	162
18.9	4.140	54.27	26.180	50.08	41.29	43.17	50.170	27.34
	276	162	266	231	74	80	269	170
28.8	4.416	55.89	26.446	47.77	42.03	42.37	50.439	29.04
	293	170	290	218	79	−30	287	176
July 8.8	4.709	57.59	26.736	45.59	42.82	42.07	50.726	30.80
	300	171	298	199	82	−15	297	174
18.8	5.009	59.30	27.034	43.60	43.64	42.22	51.023	32.54
	302	170	301	174	83	65	299	168
28.8	5.311	61.00	27.335	41.86	44.47	42.87	51.322	34.22
	295	160	299	143	82	110	295	158
Aug. 7.7	5.606	62.60	27.634	40.43	45.29	43.97	51.617	35.80
	284	150	288	110	81	153	285	144
17.7	5.890	64.10	27.922	39.33	46.10	45.50	51.902	37.24
	266	130	272	73	76	194	267	124
27.7	6.156	65.40	28.194	38.60	46.86	47.44	52.169	38.48
	248	114	249	−34	71	228	248	103
Sept. 6.6	6,404	66.54	28.443	38.26	47.57	49.72	52.417	39.51
	218	94	224	5	64	260	223	80
16.6	6.622	67.48	28.667	38.31	48.21	52.32	52.640	40.31
	193	72	194	41	57	286	198	56
26.6	6.815	68.20	28.861	38.72	48.78	55.18	52.838	40.87
	165	47	165	77	49	307	168	31
Oct. 6.6	6.980	68.67	29.026	39.49	49.27	58.25	53.006	41.18
	134	29	132	108	39	318	141	10
16.5	7.114	68.96	29.158	40.57	49.66	61.43	53.147	41.28
	105	6	101	132	29	329	110	−11
26.5	7.219	69.02	29.259	41.89	49.95	64.72	53.257	41.17
	77	10	68	149	18	328	82	30
Nov. 5.5	7.296	68.92	29.327	43.38	50.13	68.00	53.339	40.87
	44	26	36	163	7	324	52	43
15.5	7.340	68.66	29.363	45.01	50.20	71.24	53.391	40.44
	17	34	6	166	4	308	22	54
25.4	7.357	68.32	29.369	46.67	50.16	74.32	53.413	39.90
	−15	46	−25	162	16	284	−8	63
Dec. 5.4	7.342	67.86	29.344	48.29	50.00	77.16	53.405	39.27
	41	54	55	155	28	252	35	67
15.4	7.301	67.32	29.289	49.84	49.72	79.68	53.370	38.60
	70	58	80	140	38	215	64	69
25.3	7.231	66.74	29.209	51.24	49.34	81.83	53.306	37.91
	94	62	106	119	47	168	89	67
35.3	7.137	66.12	29.103	52.43	48.87	83.51	53.217	37.24
Mean Place	3.739	56.48	26.166	54.11	40.520	58.09	49.840	29.13
Sec δ, Tan δ	1.010	+0.143	1.038	−0.279	3.322	+3.168	1.004	+0.092
$D_{\psi a}$, $D_{\omega a}$	+0.063	−0.008	+0.057	+0.015	+0.112	−0.167	+0.063	−0.005
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.32	+0.59	+0.32	+0.60	+0.32	+0.61	+0.31	+0.62

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Hydri. Mag. 5.3		ν Arietis. Mag. 5.4		δ Ceti. Mag. 4.0		ϵ Hydri. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 33 s	° ′ −79 26 ″	h m 2 34 s	° ′ +21 37 ″	h m 2 35 s	° ′ 0 0 ″	h m 2 38 s	° ′ −68 35 ″
Jan. 0.3	16.64	68.22 91	27.264	43.93	32.646	−17.99	24.56	71.51 119
10.3	15.50 114	69.13 33	27.150 114	43.68 25	32.539 107	18.79 80	24.04 52	72.70 61
20.3	14.30 120	69.46 — 26	27.013 137	43.31 37	32.412 127	19.55 76	23.49 55	73.31 — 1
30.2	13.07 123	69.20 89	26.857 156	42.79 52	32.269 143	20.17 62	22.92 57	73.30 58
Feb. 9.2	11.85 122	68.31 144	26.691 166	42.16 63	32.115 154	20.68 51	22.34 58	72.72 116
19.2	10.67 118	66.87	26.522 169	41.45 71	31.960 155	−21.04 36	21.78 56	71.56
Mar. 1.2	9.57 110	64.92 195	26.359 163	40.67 78	31.811 149	21.24 20	21.24 54	69.87 169
11.1	8.56 101	62.52 240	26.213 146	39.86 81	31.674 137	21.26 — 2	20.75 49	67.70 217
21.1	7.68 88	59.72 280	26.092 121	39.06 80	31.561 113	21.13 13	20.32 43	65.10 260
31.1	6.95 73	56.56 316	26.004 88	38.33 73	31.479 82	20.75 38	19.97 35	62.14 296
	56	340	47	61	49	58	28	325
Apr. 10.1	6.39	53.16	25.957	37.72	31.430 6	−20.17	19.69 17	58.89
20.0	5.98 41	49.59 357	25.956 — 1	37.24 48	31.424 — 38	19.40 77	19.52 8	55.41 348
30.0	5.78 20	45.91 368	26.005 49	36.96 28	31.462 83	18.38 102	19.44 — 2	51.79 362
May 10.0	5.78 0	42.22 369	26.102 97	36.90 — 6	31.545 129	17.13 125	19.46 12	48.10 360
19.9	5.97 19	38.57 365	26.246 114	37.08 18	31.674 171	15.75 138	19.58 22	44.42 368
	38	317	188	42		159		356
29.9	6.35	35.10	26.434	37.50	31.845	−14.16	19.80	40.86
June 8.9	6.92 57	31.84 326	26.663 229	38.16 66	32.052 207	12.42 174	20.13 33	37.47 339
18.9	7.65 73	28.88 296	26.925 262	39.05 89	32.290 238	10.61 181	20.54 41	34.36 311
28.8	8.53 88	26.30 258	27.213 288	40.14 109	32.554 264	8.75 186	21.03 49	31.58 278
July 8.8	9.54 101	24.17 213	27.518 305	41.41 127	32.837 283	6.87 188	21.58 55	29.22 236
	111	158	317	140	294	185	59	185
18.8	10.65	22.59	27.835	42.81	33.131	− 5.02	22.17	27.37
28.8	11.82 117	21.51 108	28.153 318	44.33 152	33.428 297	3.34 168	22.80 63	26.04 133
Aug. 7.7	13.02 120	21.03 — 48	28.468 315	45.90 157	33.721 293	1.78 156	23.44 61	25.30 74
17.7	14.21 119	21.16 74	28.771 303	47.49 159	34.005 284	− 0.43 135	24.08 61	25.15 — 15
27.7	15.36 115	21.90 131	29.058 287	49.05 156	34.272 267	+ 0.70 113	24.69 61	25.64 49
	107		264	149	249	87	57	107
Sept. 6.6	16.43	23.21	29.322	50.54 141	34.521	+ 1.57	25.26	26.71
16.6	17.38 95	25.06 185	29.562 240	51.95 129	34.747 226	2.16 59	25.78 52	28.36 165
26.6	18.19 81	27.42 236	29.775 213	53.24 115	34.946 199	2.47 31	26.22 41	30.52 216
Oct. 6.6	18.81 62	30.16 274	29.960 185	54.39 101	35.116 170	2.51 — 4	26.57 35	33.11 259
16.5	19.24 43	33.21 305	30.114 154	55.40 87	35.259 143	2.31 20	26.82 25	36.05 294
	21	323	125		112	43	15	316
26.5	19.45 —	36.44	30.239	56.27	35.371	+ 1.88	26.97	39.21
Nov. 5.5	19.44 1	39.75 331	30.332 93	56.99 72	35.455 84	1.26 62	27.01 — 4	42.49 328
15.5	19.22 22	42.98 323	30.394 62	57.55 56	35.508 53	+ 0.50 76	26.95 6	45.75 326
25.4	18.77 45	46.02 304	30.423 — 29	57.98 43	35.530 — 22	− 0.36 86	26.78 17	48.86 311
Dec. 5.4	18.14 63	48.75 273	30.420 3	58.27 29	35.522 8	1.26 90	26.53 25	51.72 286
	82	233	35	14	35	93	35	249
15.4	17.32	51.08	30.385	58.41	35.487	− 2.19	26.18	54.21
25.3	16.36 96	52.91 183	30.319 66	58.41 0	35.423 64	3.10 91	25.76 42	56.25 204
35.3	15.28 108	54.18 127	30.225 94	58.27 14	35.334 89	− 3.94 84	25.29 47	57.77 152
Mean Place	15.686	43.99	26.426	45.20	32.048	−10.05	23.955	48.03
Sec δ, Tan δ	5.460	−5.367	1.076	+0.396	1.000	0.000	2.740	−2.551
$D_{\psi\alpha}$, $D_{\omega\alpha}$	−0.027	+0.281	+0.068	−0.021	+0.061	0.000	+0.018	+0.131
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.31	+0.62	+0.31	+0.62	+0.31	+0.63	+0.31	+0.64

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Persei. Mag. 4.2		γ Ceti *seq.* Mag. 3.7		π Ceti. Mag. 4.4		μ Ceti. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 38	° ′ +48 54	h m 2 39	° ′ + 2 54	h m 2 40	° ′ −14 10	h m 2 40	° ′ + 9 47
	s	″ ′	s	″	s	″	s	″
Jan. 0.3	57.403	19.46	19.158	36.31	27.918	74.86	47.310	18.75
10.3	57.219 184	20.11 65	19.055 103	35.55 76	27.802 116	75.98 112	47.208 102	18.18 57
20.3	56.999 220	20.39 — 28	18.929 126	34.86 69	27.664 138	76.87 89	47.082 126	17.59 59
30.3	56.754 245	20.26 13	18.787 142	34.23 63	27.511 153	77.52 65	46.939 143	17.01 58
Feb. 9.2	56.492 262	19.76 50	18.633 154	33.70 53	27.346 165	77.88 36	46.784 155	16.45 56
	261	89	157	42	167	8	159	54
19.2	56.231	18.87	18.476	33.28	27.179	77.96 —	46.625	15.91
Mar. 1.2	55.980 251	17.64 123	18.324 152	33.00 28	27.017 162	77.76 20	46.472 153	15.44 47
11.1	55.753 227	16.14 150	18.184 140	32.85 — 15	26.870 147	77.26 50	46.331 141	15.05 39
21.1	55.566 187	14.40 174	18.068 116	32.86 1	26.745 125	76.49 77	46.215 116	14.77 28
31.1	55.427 139	12.52 188	17.981 87	33.07 21	26.649 96	75.44 105	46.127 88	14.63 — 14
	80	193	52	39	60	132	51	3
Apr. 10.1	55.347	10.59	17.929	33.46	26.589	74.12	46.076	14.66
20.0	55.328 — 19	8.72 187	17.921 — 8	34.08 62	26.570 — 19	72.55 157	46.069 — 7	14.88 22
30.0	55.379 51	6.94 178	17.956 35	34.90 82	26.595 25	70.76 179	46.106 37	15.30 42
May 10.0	55.496 117	5.32 162	18.037 81	35.94 104	26.668 73	68.77 199	46.190 84	15.95 65
20.0	55.679 183	3.96 136	18.163 126	37.19 125	26.786 118	66.61 216	46.321 131	16.79 81
	246	108	169	142	161	227	172	106
29.9	55.925	2.88	18.332	38.61	26.947	64.34	46.493	17.85
June 8.9	56.222 297	2.14 74	18.538 206	40.18 157	27.146 199	62.00 234	46.703 210	19.08 123
18.9	56.566 344	1.74 40	18.776 238	41.88 170	27.380 234	59.67 233	46.948 245	20.47 139
28.8	56.945 379	1.72 — 2	19.041 265	43.64 176	27.640 260	57.38 229	47.216 268	21.99 152
July 8.8	57.349 404	2.04 32	19.323 282	45.43 179	27.921 281	55.21 217	47.503 287	23.58 159
	418	67	294	176	294	201	300	163
18.8	57.767	2.71	19.617	47.19	28.215	53.20	47.803	25.21
28.8	58.190 423	3.73 102	19.914 297	48.87 168	28.515 300	51.43 177	48.105 302	26.84 163
Aug. 7.7	58.612 422	5.04 131	20.208 294	50.43 156	28.812 297	49.93 150	48.405 300	28.40 156
17.7	59.018 406	6.63 159	20.493 285	51.83 140	29.102 290	48.77 116	48.695 290	29.87 147
27.7	59.406 388	8.48 185	20.763 270	53.00 117	29.376 274	47.96 81	48.970 275	31.19 132
	362	198	250	96	256	42	255	115
Sept. 6.7	59.768	10.46	21.013	53.96	29.632	47.54	49.225	32.34
16.6	60.099 331	12.62 216	21.241 228	54.65 69	29.863 231	47.50 — 4	49.458 233	33.30 96
26.6	60.396 297	14.89 227	21.443 202	55.09 44	30.069 206	47.82 32	49.666 208	34.04 74
Oct. 6.6	60.652 256	17.23 234	21.617 174	55.26 — 17	30.242 173	48.51 69	49.846 180	34.57 53
16.5	60.866 214	19.56 233	21.763 146	55.21 5	30.387 145	49.49 98	49.998 152	34.90 33
	172	231	117	28	113	125	122	14
26.5	61.038	21.87	21.880	54.93	30.500	50.74	50.120	35.04 —
Nov. 5.5	61.167 129	24.15 228	21.968 88	54.49 44	30.581 81	52.17 143	50.215 95	35.01 3
15.5	61.247 80	26.32 217	22.025 57	53.90 59	30.630 49	53.75 158	50.278 63	34.84 17
25.4	61.278 — 31	28.34 202	22.053 — 28	53.19 71	30.647 — 17	55.37 162	50.311 33	34.54 30
Dec. 5.4	61.260 18	30.14 180	22.052 1	52.43 76	30.634 13	56.99 162	50.313 — 2	34.16 38
	69	156	32	80	44	155	27	46
15.4	61.191	31.70	22.020	51.63	30.590	58.54	50.286	33.70
25.4	61.076 115	32.94 124	21.959 61	50.84 79	30.517 73	59.95 141	50.229 57	33.19 51
35.3	60.918 158	33.86 92	21.873 86	50.08 76	30.418 99	61.17 122	50.143 86	32.65 54
Mean Place	55.876	13.79	18.515	43.47	27.392	62.55	46.593	23.86
Sec δ, Tan δ	1.522	+1.147	1.001	+0.051	1.031	−0.253	1.015	+0.172
Dψα, Dωα	+0.081	−0.059	+0.062	−0.003	+0.057	+0.013	+0.064	−0.009
Dψδ, Dωδ	+0.31	+0.64	+0.31	+0.64	+0.30	+0.64	+0.30	+0.65

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Persei. Mag. 3.9		41 Arietis. Mag. 3.7		β Fornacis. Mag. 4.5		σ Arietis. Mag. 5.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	2 45	+55 34	2 45	+26 56	2 45	−32 43	2 47	+14 45
Jan. 0.3	6.001	44.08	27.762	38.53	52.580	60.80	15.085	51.92
	223	96	114	4	155	139	102	
10.3	5.778	45.04	27.648	38.49	52.425	62.19	14.983	51.50 42
	265	52	142	22	178	99	126	
20.3	5.513	45.56	27.506	38.27	52.247	63.18	14.857	51.02 48
	297	8	163	39	194	57	146	
30.3	5.216	45.64 —	27.343	37.88	52.053	63.75	14.711	50.49 53
	314	38	176	58	205	15	159	
Feb. 9.2	4.902	45.26	27.167	37.30	51.848	63.90 —	14.552	49.93 56
	318	82	181	70	207	29	161	58
19.2	4.584	44.44	26.986	36.60	51.641	63.61	14.388	49.35
	305	122	177	85	201	71	161	
Mar. 1.2	4.279	43.22	26.809	35.75	51.440	62.90	14.227	48.77 58
	278	157	161	92	181	113	148	
11.1	4.001	41.65	26.648	34.83	51.256	61.77	14.079	48.23 54
	234	183	135	96	161	151	124	
21.1	3.767	39.82	26.513	33.87	51.095	60.26	13.955	47.76 47
	178	204	101	95	127	185	96	
31.1	3.589	37.78	26.412	32.92	50.968	58.41	13.859	47.38 38
	112	216	62	89	90	217	56	24
Apr. 10.1	3.477	35.62	26.350	32.03	50.878	56.24	13.803	47.14
	37	217	12	75	43	245	14	8
20.0	3.440 —	33.45	26.338 —	31.28	50.835 —	53.79	13.789 —	47.06 —
	40	209	39	63	3	267	33	11
30.0	3.480	31.36	26.377	30.65	50.838	51.12	13.822	47.17
	118	194	89	40	55	281	80	33
May 10.0	3.598	29.42	26.466	30.25	50.893	48.28	13.902	47.50
	195	172	140	18	108	297	127	53
20.0	3.793	27.70	26.606	30.07 —	51.001	45.31	14.029	48.03
	264	141	186	9	154	299	171	76
29.9	4.057	26.26	26.792	30.16	51.155	42.32	14.200	48.79
	328	110	228	32	200	298	210	
June 8.9	4.385	25.16	27.020	30.48	51.355	39.34	14.410	49.75 96
	380	73	264	58	238	288	243	
18.9	4.765	24.43	27.284	31.06	51.593	36.46	14.653	50.90 115
	421	35	293	80	273	271	272	
28.8	5.186	24.08 —	27.577	31.86	51.866	33.75	14.925	52.20 130
	454	4	313	102	299	216	290	
July 8.8	5.640	24.12	27.890	32.88	52.165	31.29	15.215	53.62 142
	472	43	324	122	315	216	302	150
18.8	6.112	24.55	28.214	34.10	52.480	29.13	15.517	55.12
	480	81	330	136	326	178	308	
28.8	6.592	25.36	28.544	35.46	52.806	27.35	15.825	56.65 153
	478	117	326	146	327	136	303	
Aug. 7.7	7.070	26.53	28.870	36.92	53.133	25.99	16.128	58.18 153
	466	148	318	154	323	90	296	
17.7	7.536	28.01	29.188	38.46	53.456	25.09	16.424	59.65 147
	444	177	301	157	306	39	282	
27.7	7.980	29.78	29.489	40.03	53.762	24.70 —	16.706	61.04 139
	418	203	282	155	285	10	263	126
Sept. 6.7	8.398	31.81	29.771	41.58	54.047	24.80	16.969	62.30
	382	222	259	152	260	61	241	
16.6	8.780	34.03	30.030	43.10	54.307	25.41	17.210	63.41 111
	341	239	230	145	228	107	215	
26.6	9.124	36.42	30.260	44.55	54.535	26.48	17.425	64.36 95
	301	250	204	137	195	150	190	
Oct. 6.6	9.425	38.92	30.464	45.92	54.730	27.98	17.615	65.11 75
	253	259	172	125	158	187	161	
16.5	9.678	41.51	30.636	47.17	54.888	29.85	17.776	65.71 60
	204	260	143	113	119	215	133	42
26.5	9.882	44.11	30.779	48.30	55.007	32.00	17.909	66.13
	151	257	109	101	80	235	102	
Nov. 5.5	10.033	46.68	30.888	49.31	55.087	34.35	18.011	66.39 26
	93	249	76	89	40	215	71	
15.5	10.126	49.17	30.964	50.20	55.127	36.80	18.082	66.52 13
	37	236	42	74	2	246	42	
25.4	10.163 —	51.53	31.006	50.94	55.129 —	39.26	18.124	66.52 0
	22	216	8	59	37	236	9	
Dec. 5.4	10.141	53.69	31.014 —	51.53	55.092	41.62	18.133 —	66.41 11
	82	191	27	44	71	219	22	21
15.4	10.059	55.60	30.987	51.97	55.021	43.81	18.111	66.20
	140	158	62	27	105	191	53	28
25.4	9.919	57.18	30.925	52.24	54.916	45.72	18.058	65.92
	194	122	94	10	137	160	83	35
35.3	9.725	58.40	30.831	52.34	54.779	47.32	17.975	65.57
Mean Place	4.111	37.51	26.788	38.82	52.089	43.46	14.280	55.80
Sec δ, Tan δ	1.769	+1.459	1.122	+0.508	1.189	−0.643	1.034	+0.264
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.087	−0.073	+0.070	−0.025	+0.050	+0.032	+0.066	−0.013
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.30	+0.66	+0.30	+0.66	+0.30	+0.66	+0.30	+0.67

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^3 Eridani. Mag. 4.8		τ Persei. Mag. 4.1		η Eridani. Mag. 4.0		ϵ Arietis (*mean*). Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 47 s	° ′ −21 18 ″	h m 2 48 s	° ′ +52 26 ″	h m 2 52 s	° ′ − 9 12 ″	h m 2 54 s	° ′ +21 1 ″
Jan. 0.3	33.187	88.56	48.989	60.29	40.533	24.73	49.215	57.21
	126	127	198	89	105	109	101	21
10.3	33.061	89.83	48.791	61.18	40.428	25.82	49.114	57.00
	147	98	238	47	130	90	130	31
20.3	32.914	90.81	48.553	61.65	40.298	26.72	48.984	56.69
	166	63	268	6	147	67	152	43
30.3	32.748	91.44	48.285	61.71	40.151	27.39	48.832	56.26
	175	33	288	36	158	46	167	52
Feb. 9.2	32.573	91.77	47.997	61.35	39.993	27.85	48.665	55.74
	180	4	290	78	166	24	173	62
19.2	32.393	91.73	47.707	60.57	39.827	28.09	48.492	55.12
	174	37	283	117	162	2	172	68
Mar. 1.2	32.219	91.36	47.424	59.40	39.665	28.07	48.320	54.44
	163	71	256	148	151	26	157	70
11.2	32.056	90.65	47.168	57.92	39.514	27.81	48.163	53.74
	139	106	219	174	129	53	136	70
21.1	31.917	89.59	46.949	56.18	39.385	27.28	48.027	53.04
	112	134	166	192	105	77	104	66
31.1	31.805	88.25	46.783	54.26	39.280	26.51	47.923	52.38
	73	165	106	202	66	103	66	56
Apr. 10.1	31.732	86.60	46.677	52.24	39.214	25.48	47.857	51.82
	31	191	38	202	27	128	21	43
20.0	31.701	84.69	46.639	50.22	39.187	24.20	47.836	51.39
	13	215	35	195	17	148	26	26
30.0	31.714	82.54	46.674	48.27	39.204	22.72	47.862	51.13
	61	235	108	180	63	170	76	7
May 10.0	31.775	80.19	46.782	46.47	39.267	21.02	47.938	51.06
	108	248	178	158	108	189	125	15
20.0	31.883	77.71	46.960	44.89	39.375	19.13	48.063	51.21
	152	258	246	130	152	200	171	37
29.9	32.035	75.13	47.206	43.59	39.527	17.13	48.234	51.58
	194	260	304	99	190	211	212	59
June 8.9	32.229	72.53	47.510	42.60	39.717	15.02	48.446	52.17
	230	258	351	63	225	216	247	82
18.9	32.459	69.95	47.864	41.97	39.942	12.86	48.693	52.99
	258	248	395	27	251	214	275	101
28.9	32.717	67.47	48.259	41.70	40.193	10.72	48.968	54.00
	282	230	424	10	275	208	296	118
July 8.8	32.999	65.17	48.683	41.80	40.468	8.64	49.264	55.18
	298	210	443	48	288	196	311	130
18.8	33.297	63.07	49.126	42.28	40.756	6.68	49.575	56.48
	305	180	450	83	295	176	315	140
28.8	33.602	61.27	49.576	43.11	41.051	4.92	49.890	57.88
	304	148	450	117	296	154	314	145
Aug. 7.7	33.906	59.79	50.026	44.28	41.347	3.38	50.204	59.33
	299	107	437	146	287	125	306	146
17.7	34.205	58.72	50.463	45.74	41.634	2.13	50.510	60.79
	284	66	421	171	275	94	294	144
27.7	34.489	58.06	50.884	47.45	41.909	1.19	50.804	62.23
	266	24	394	195	260	59	276	138
Sept. 6.7	34.755	57.82	51.278	49.40	42.169	0.60	51.080	63.61
	241	20	363	213	235	25	253	128
16.6	34.996	58.02	51.641	51.53	42.404	0.35	51.338	64.89
	214	63	328	228	212	12	229	116
26.6	35.210	58.65	51.969	53.81	42.616	0.47	51.562	66.05
	187	100	286	238	185	42	203	105
Oct. 6.6	35.397	59.65	52.255	56.19	42.801	0.89	51.765	67.10
	152	134	246	244	156	75	174	91
16.6	35.549	60.99	52.501	58.63	42.957	1.64	51.939	68.01
	118	163	197	245	126	98	146	76
26.5	35.667	62.62	52.698	61.08	43.083	2.62	52.085	68.77
	86	183	149	242	96	118	115	63
Nov. 5.5	35.753	64.45	52.847	63.50	43.179	3.80	52.200	69.40
	51	195	100	233	64	134	83	51
15.5	35.804	66.40	52.947	65.83	43.243	5.14	52.283	69.91
	18	199	43	220	34	141	52	38
25.4	35.822	68.39	52.990	68.03	43.277	6.55	52.335	70.29
	16	195	10	202	2	142	17	24
Dec. 5.4	35.806	70.34	52.980	70.05	43.279	7.97	52.352	70.53
	48	184	64	177	29	139	18	14
15.4	35.758	72.18	52.916	71.82	43.250	9.36	52.334	70.67
	79	166	119	148	59	129	49	2
25.4	35.679	73.84	52.797	73.30	43.191	10.65	52.285	70.69
	107	143	170	113	87	117	81	10
35.3	35.572	75.27	52.627	74.43	43.104	11.82	52.204	70.59
Mean Place	32.654	74.12	47.247	54.59	39.912	13.60	48.293	59.62
Sec δ, Tan δ	1.074	−0.390	1.641	+1.301	1.013	−0.162	1.071	+0.385
$D_{\psi a}$, $D_{\omega a}$	+0.054	+0.019	+0.084	−0.064	+0.058	+0.008	+0.068	−0.019
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.30	+0.67	+0.29	+0.67	+0.29	+0.68	+0.29	+0.69

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Eridani. Mag. 3.4		47 H. Cephei. Mag. 5.7		α Ceti. Mag. 2.8		τ³ Eridani. Mag. 4.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	2 55	−40 36	2 55	+79 6	2 58	+ 3 47	2 58	−23 55
	s	″	s	″	s	″	s	″
Jan. 0.3	21.189	64.50	53.22	68.28	15.868	11.05	60.409	46.77
	182	154	82	183	96	76	125	140
10.3	21.007	66.04	52.40	70.11	15.772	10.29	60.284	48.17
	208	108	94	128	122	69	150	107
20.3	20.799	67.12	51.46	71.39	15.650	9.60	60.134	49.24
	228	61	103	71	142	61	171	72
30.3	20.571	67.73	50.43	72.10	15.508	8.99	59.963	49.96
	240	12	108	8	155	54	182	36
Feb. 9.2	20.331	67.85	49.35	72.18	15.353	8.45	59.781	50.32
	242	36	108	53	161	42	189	0
19.2	20.089	67.49	48.27	71.65	15.192	8.03	59.592	50.32
	236	83	104	109	160	31	186	38
Mar. 1.2	19.853	66.66	47.23	70.56	15.032	7.72	59.406	49.94
	220	130	95	161	148	17	173	74
11.2	19.633	65.36	46.28	68.95	14.884	7.55	59.233	49.20
	194	170	83	208	130	1	153	109
21.1	19.439	63.66	45.45	66.87	14.754	7.54	59.080	48.11
	160	209	66	245	101	14	125	140
31.1	19.279	61.57	44.79	64.42	14.653	7.68	58.955	46.71
	120	242	46	268	67	35	88	173
Apr. 10.1	19.159	59.15	44.33	61.74	14.586	8.03	58.867	44.98
	71	271	26	286	25	56	47	200
20.0	19.088	56.44	44.07	58.88	14.561	8.59	58.820	42.98
	18	294	4	290	16	74	2	223
30.0	19.070	53.50	44.03	55.98	14.577	9.33	58.818	40.75
	36	311	19	282	65	95	46	243
May 10.0	19.106	50.39	44.22	53.16	14.642	10.28	58.864	38.32
	92	320	39	270	109	117	94	259
20.0	19.198	47.19	44.61	50.46	14.751	11.45	58.958	35.73
	144	324	60	243	153	132	141	267
29.9	19.342	43.95	45.21	48.03	14.904	12.77	59.099	33.06
	196	319	78	211	192	148	183	270
June 8.9	19.538	40.76	45.99	45.92	15.096	14.25	59.282	30.36
	240	307	93	173	223	162	221	267
18.9	19.778	37.69	46.92	44.19	15.319	15.87	59.503	27.69
	279	285	106	130	254	167	254	256
28.9	20.057	34.84	47.98	42.89	15.573	17.54	59.757	25.13
	309	258	117	83	274	173	277	240
July 8.8	20.366	32.26	49.15	42.06	15.847	19.27	60.034	22.73
	332	223	123	36	291	171	295	215
18.8	20.698	30.03	50.38	41.70	16.138	20.98	60.329	20.58
	346	180	128	14	295	164	305	187
28.8	21.044	28.23	51.66	41.84	16.433	22.62	60.634	18.71
	352	135	130	62	295	154	308	150
Aug. 7.7	21.396	26.88	52.96	42.46	16.728	24.16	60.942	17.21
	347	82	128	111	288	136	302	109
17.7	21.743	26.06	54.24	43.57	17.016	25.52	61.244	16.12
	335	30	124	154	277	117	291	66
27.7	22.078	25.76	55.48	45.11	17.293	26.69	61.535	15.46
	315	25	118	194	260	95	274	21
Sept. 6.7	22.393	26.01	56.66	47.05	17.553	27.64	61.809	15.25
	287	80	110	231	242	70	252	24
16.6	22.680	26.81	57.76	49.36	17.795	28.34	62.061	15.49
	255	131	99	268	216	45	226	69
26.6	22.935	28.12	58.75	52.04	18.011	28.79	62.287	16.18
	219	177	86	291	191	21	195	110
Oct. 6.6	23.154	29.89	59.61	54.95	18.202	29.00	62.482	17.28
	176	216	73	316	165	4	164	145
16.6	23.330	32.05	60.34	58.11	18.367	28.96	62.646	18.73
	134	246	57	334	136	24	130	176
26.5	23.464	34.51	60.91	61.45	18.503	28.72	62.776	20.49
	90	266	39	340	107	44	98	196
Nov. 5.5	23.554	37.17	61.30	64.85	18.610	28.28	62.874	22.45
	44	277	22	342	77	59	62	211
15.5	23.598	39.94	61.52	68.27	18.687	27.69	62.936	24.56
	3	276	2	334	48	67	26	215
25.4	23.595	42.70	61.54	71.61	18.735	27.02	62.962	26.71
	45	265	18	320	14	75	9	210
Dec. 5.4	23.550	45.35	61.36	74.81	18.749	26.27	62.953	28.81
	86	244	37	291	16	79	43	199
15.4	23.464	47.79	60.99	77.72	18.733	25.48	62.910	30.80
	125	213	55	258	47	78	76	180
25.4	23.339	49.92	60.44	80.30	18.686	24.70	62.834	32.60
	161	177	73	215	77	74	106	153
35.3	23.178	51.69	59.71	82.45	18.609	23.96	62.728	34.13
Mean Place	20.624	45.40	46.841	59.32	15.125	18.58	59.814	31.55
Sec δ, Tan δ	1.317	−0.858	5.297	+5.201	1.002	+0.066	1.094	−0.444
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.045	+0.041	+0.157	−0.250	+0.062	−0.003	+0.053	+0.021
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.29	+0.69	+0.29	+0.69	+0.28	+0.70	+0.28	+0.70

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Persei. Mag. 3.1		ρ Persei. Var. 3.4–4.2		μ Horologii. Mag. 5.2		θ Hydri. Mag. 5.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 2 59	° ′ ″ +53 12	h m s 3 0	° ′ ″ +38 32	h m s 3 1	° ′ ″ −60 1	h m s 3 1	° ′ ″ −72 11
Jan. 0.3	14.359	27.25	15.431	36.17	48.42	91.04	66.18	94.70
	193	101	130	44	34	161	62	147
10.3	14.166	28.26	15.301	36.61	48.08	92.65	65.56	96.17
	237	60	162	19	36	104	67	88
20.3	13.929	28.86	15.139	36.80	47.72	93.69	64.89	97.05
	270	17	192	12	40	48	70	31
30.3	13.659	29.03	14.947	36.68	47.32	94.17	64.19	97.36
	293	24	209	38	41	11	72	31
Feb. 9.2	13.366	28.79	14.738	36.30	46.91	94.06	63.47	97.05
	300	66	216	68	41	66	72	87
19.2	13.066	28.13	14.522	35.62	46.50	93.40	62.75	96.18
	293	105	213	90	40	121	69	145
Mar. 1.2	12.773	27.08	14.309	34.72	46.10	92.19	62.06	94.73
	271	139	198	113	38	171	64	194
11.2	12.502	25.69	14.111	33.59	45.72	90.48	61.42	92.79
	233	167	172	128	33	218	59	238
21.1	12.269	24.02	13.939	32.31	45.39	88.30	60.83	90.41
	181	188	131	137	20	256	50	278
31.1	12.085	22.14	13.808	30.94	45.10	85.74	60.33	87.63
	123	199	88	139	23	293	41	311
Apr. 10.1	11.962	20.15	13.720	29.55	44.87	82.81	59.92	84.52
	54	203	35	136	15	321	30	336
20.0	11.908	18.12	13.685	28.19	44.72	79.60	59.62	81.16
	18	198	22	125	9	342	19	355
30.0	11.926	16.14	13.707	26.94	44.63	76.18	59.43	77.61
	95	185	81	109	1	355	7	365
May 10.0	12.021	14.29	13.788	25.85	44.62	72.63	59.36	73.96
	165	165	138	89	7	361	5	368
20.0	12.186	12.64	13.926	24.96	44.69	69.02	59.41	70.28
	234	111	192	65	15	358	18	361
29.9	12.420	11.23	14.118	24.31	44.84	65.44	59.59	66.67
	295	108	239	37	22	346	29	346
June 8.9	12.715	10.15	14.357	23.94	45.06	61.98	59.88	63.21
	349	78	283	8	29	328	40	325
18.9	13.064	9.37	14.640	23.86	45.35	58.70	60.28	59.96
	393	39	315	21	35	300	50	291
28.9	13.457	8.98	14.955	24.07	45.70	55.70	60.78	57.05
	423	2	342	50	40	264	59	253
July 8.8	13.880	8.96	15.297	24.57	46.10	53.06	61.37	54.52
	416	32	358	74	44	220	67	208
18.8	14.326	9.28	15.655	25.31	46.54	50.86	62.04	52.44
	456	68	365	102	48	172	70	155
28.8	14.782	9.96	16.020	26.33	47.02	49.14	62.74	50.89
	458	104	366	122	48	116	74	97
Aug. 7.7	15.240	11.00	16.386	27.55	47.50	47.98	63.48	49.92
	449	131	358	140	48	57	75	38
17.7	15.689	12.31	16.744	28.95	47.98	47.41	64.23	49.54
	434	161	314	156	48	4	74	25
27.7	16.123	13.92	17.088	30.51	48.46	47.45	64.97	49.79
	409	184	326	164	45	65	69	86
Sept. 6.7	16.532	15.76	17.414	32.15	48.91	48.10	65.66	50.65
	380	204	302	173	41	123	64	146
16.6	16.912	17.80	17.716	33.88	49.32	49.33	66.30	52.11
	316	220	274	178	37	180	56	199
26.6	17.258	20.00	17.990	35.66	49.69	51.13	66.86	54.10
	307	231	244	178	30	229	47	248
Oct. 6.6	17.565	22.31	18.234	37.44	49.99	53.42	67.33	56.58
	264	239	212	175	25	268	36	286
16.6	17.829	24.70	18.446	39.19	50.24	56.10	67.69	59.44
	218	243	177	171	17	299	25	313
26.5	18.047	27.13	18.623	40.90	50.41	59.09	67.94	62.57
	169	242	141	165	10	318	10	329
Nov. 5.5	18.216	29.55	18.764	42.55	50.51	62.27	68.04	65.86
	118	235	103	155	2	325	2	334
15.5	18.334	31.90	18.867	44.10	50.53	65.52	68.02	69.20
	62	226	62	143	5	318	14	324
25.4	18.396	34.16	18.929	45.53	50.48	68.70	67.88	72.44
	6	208	21	128	12	302	28	302
Dec. 5.4	18.402	36.24	18.950	46.81	50.36	71.72	67.60	75.46
	51	184	22	109	19	273	38	269
15.4	18.351	38.08	18.928	47.90	50.17	74.45	67.22	78.15
	109	159	64	88	25	234	48	228
25.4	18.242	39.67	18.864	48.78	49.92	76.79	66.74	80.43
	162	123	106	64	30	190	56	178
35.3	18.080	40.90	18.758	49.42	49.62	78.69	66.18	82.21
Mean Place	12.522	22.13	14.139	34.28	47.627	68.80	64.947	71.33
Sec δ, Tan δ	1.670	+1.337	1.279	+0.797	2.002	−1.734	3.273	−3.115
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.086	−0.063	+0.076	−0.038	+0.028	+0.081	+0.002	+0.146
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.28	+0.70	+0.28	+0.71	+0.28	+0.71	+0.28	+0.71

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Persei. (*Algol.*) Var. 2.1–3.2		δ Arietis. Mag. 4.5		12 Eridani. Mag. 4.0		ζ Arietis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	3 3	+40 39	3 7	+19 26	3 8	−29 17	3 10	+20 45
	s	″	s	″	s	″	s	″
Jan. 0.4	10.460	38.58	14.304	8.16	48.588	40.44	29.282	32.69
	136	53	94	23	135	154	92	17
10.3	10.324	39.11	14.210	7.93	48.453	41.98	29.190	32.52
	169	27	123	31	160	115	121	28
20.3	10.155	39.38	14.087	7.62	48.293	43.13	29.066	32.24
	199	5	149	40	183	78	148	36
30.3	9.956	39.33	13.938	7.22	48.110	43.91	28.918	31.88
	216	33	163	49	197	37	167	46
Feb. 9.2	9.740	39.00	13.775	6.73	47.913	44.28	28.751	31.42
	226	64	173	56	203	4	175	55
19.2	9.514	38.36	13.602	6.17	47.710	44.24	28.576	30.87
	225	92	173	59	203	47	176	60
Mar. 1.2	9.289	37.44	13.429	5.58	47.507	43.77	28.400	30.27
	207	113	162	63	191	85	166	64
11.2	9.082	36.31	13.267	4.95	47.316	42.92	28.234	29.63
	179	132	143	59	170	125	146	64
21.1	8.903	34.99	13.124	4.36	47.146	41.67	28.088	28.99
	141	144	113	56	143	158	117	60
31.1	8.762	33.55	13.011	3.80	47.003	40.09	27.971	28.39
	94	147	75	45	107	191	79	53
Apr. 10.1	8.668	32.08	12.936	3.35	46.896	38.18	27.892	27.86
	41	144	33	35	63	222	36	41
20.1	8.627	30.64	12.903	3.00	46.833	35.96	27.856	27.45
	19	135	14	17	17	218	11	25
30.0	8.646	29.29	12.917	2.83	46.816	33.48	27.867	27.20
	80	122	63	2	32	266	60	8
May 10.0	8.726	28.07	12.980	2.85	46.848	30.82	27.927	27.12
	138	101	113	21	82	281	109	11
20.0	8.864	27.06	13.093	3.06	46.930	28.01	28.036	27.23
	191	78	157	43	130	289	156	34
29.9	9.055	26.28	13.250	3.49	47.060	25.12	28.192	27.57
	242	49	199	63	176	291	198	54
June 8.9	9.297	25.79	13.449	4.12	47.236	22.21	28.390	28.11
	287	21	237	82	216	286	235	76
18.9	9.584	25.58	13.686	4.94	47.452	19.35	28.625	28.87
	321	11	265	102	250	272	266	93
28.9	9.905	25.69	13.951	5.96	47.702	16.63	28.891	29.80
	348	40	288	116	278	255	288	109
July 8.8	10.253	26.09	14.239	7.12	47.980	14.08	29.179	30.89
	366	66	304	128	300	226	305	122
18.8	10.619	26.75	14.543	8.40	48.280	11.82	29.484	32.11
	374	92	311	136	312	194	312	131
28.8	10.993	27.67	14.854	9.76	48.592	9.88	29.796	33.42
	375	116	313	140	316	155	311	136
Aug. 7.8	11.368	28.83	15.167	11.16	48.908	8.33	30.110	34.78
	369	138	306	138	315	111	308	137
17.7	11.737	30.21	15.473	12.54	49.223	7.22	30.418	36.15
	354	152	295	136	305	63	298	134
27.7	12.091	31.73	15.768	13.90	49.528	6.59	30.716	37.49
	336	167	280	126	288	15	282	128
Sept. 6.7	12.427	33.40	16.048	15.16	49.816	6.44	30.998	38.77
	313	176	260	118	268	34	263	119
16.6	12.740	35.16	16.308	16.34	50.084	6.78	31.261	39.96
	284	183	237	105	212	83	211	107
26.6	13.024	36.99	16.545	17.39	50.326	7.61	31.502	41.03
	254	183	212	92	211	128	216	96
Oct. 6.6	13.278	38.82	16.757	18.31	50.537	8.89	31.718	41.99
	220	185	185	78	178	165	190	83
16.6	13.498	40.67	16.942	19.09	50.715	10.54	31.908	42.82
	185	181	156	63	143	197	160	69
26.5	13.683	42.48	17.098	19.72	50.858	12.51	32.068	43.51
	148	176	128	49	107	220	133	57
Nov. 5.5	13.831	44.24	17.226	20.21	50.965	14.71	32.201	44.08
	108	167	96	38	69	235	101	45
15.5	13.939	45.91	17.322	20.59	51.034	17.06	32.302	44.53
	67	155	64	28	32	239	67	34
25.5	14.006	47.46	17.386	20.87	51.066	19.45	32.369	44.87
	22	139	31	15	6	235	33	22
Dec. 5.4	14.028	48.85	17.417	21.02	51.060	21.80	32.402	45.09
	21	122	6	4	43	220	1	13
15.4	14.007	50.07	17.411	21.06	51.017	24.00	32.401	45.22
	66	101	39	4	79	200	37	4
25.4	13.941	51.08	17.372	21.02	50.938	26.00	32.364	45.26
	108	75	73	14	115	171	72	9
35.3	13.833	51.83	17.299	20.88	50.823	27.71	32.292	45.17
Mean Place	9.095	36.35	13.351	11.58	47.936	23.87	28.297	35.91
Sec δ, Tan δ	1.318	+0.859	1.060	+0.353	1.147	−0.561	1.070	+0.379
$D_{\psi a}$, $D_{\omega a}$	+0.077	−0.040	+0.068	−0.016	+0.050	+0.025	+0.069	−0.017
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.28	+0.72	+0.27	+0.73	+0.27	+0.73	+0.27	+0.74

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	48 H. Cephei. Mag. 5.5		38 G. Horologii. Mag. 5.7		ζ Eridani. Mag. 4.9		τ Arietis. Mag. 5.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 3 10	° ′ ″ +77 26	h m s 3 10	° ′ ″ −57 36	h m s 3 12	° ′ ″ − 9 6	h m s 3 16	° ′ ″ +20 52
Jan. 0.4	35.17	81.94 196	36.742 297	56.35 171	6.227	28.80	47.704	9.97
10.3	34.52 65	83.90 140	36.445 335	58.06 119	6.131 96	29.93 113	47.614 90	9.82 15
20.3	33.74 78	85.30 84	36.110 363	59.25 63	6.007 124	30.91 98	47.493 121	9.56 26
30.3	32.88 86	86.14 28	35.747 379	59.88 6	5.861 146	31.65 74	47.346 147	9.23 33
Feb. 9.2	31.96 92	86.42 —	35.368	59.94 —	5.701 160	32.17 52	47.181 165	8.80 43
	94	33	382	51	170	28	177	51
19.2	31.02	86.09	34.986	59.43	5.531	32.45	47.004	8.29
Mar. 1.2	30.11 91	85.16 93	34.611 375	58.39 104	5.361 170	32.48 — 3	46.826 178	7.71 58
11.2	29.26 85	83.73 143	34.257 354	56.84 155	5.200 161	32.28 20	46.657 169	7.10 61
21.1	28.51 75	81.83 190	33.937 320	54.82 202	5.057 143	31.80 48	46.507 150	6.48 62
31.1	27.90 61	79.52 231	33.661 276	52.38 244	4.938 119	31.09 71	46.386 121	5.89 59
	46	257	222	280	85	99	85	52
Apr. 10.1	27.44	76.95	33.439	49.58	4.853	30.10	46.301 43	5.37
20.1	27.16 28	74.18 277	33.278 161	46.47 311	4.808 45	28.87 123	46.258 — 5	4.96 41
30.0	27.08 — 8	71.35 283	33.188 90	43.15 332	4.806 — 2	27.42 145	46.263 54	4.70 26
May 10.0	27.19 11	68.55 280	33.168 — 20	39.66 349	4.850 44	25.76 166	46.317 104	4.60 — 10
20.0	27.49 30	65.87 268	33.225 57	36.09 357	4.939 89	23.91 185	46.421 149	4.70 31
	47	247	129	358	134	197		
29.9	27.96	63.40	33.354	32.51	5.073	21.94	46.570	5.01
June 8.9	28.60 64	61.23 217	33.554 200	29.04 347	5.247 174	19.85 209	46.764 194	5.52 51
18.9	29.38 78	59.40 183	33.819 265	25.73 331	5.455 208	17.70 215	46.994 230	6.24 72
28.9	30.29 91	57.97 143	34.142 323	22.66 307	5.696 211	15.56 214	47.256 262	7.13 89
July 8.8	31.29 100	57.00 97	34.514 372	19.96 270	5.959 263	13.47 209	47.541 285	8.18 105
	107	51	412	231	280	197	303	119
18.8	32.36	56.49 3	34.926	17.65 182	6.239	11.50	47.844	9.37
28.8	33.48 112	56.46 — 43	35.366 440	15.83 130	6.530 291	9.71 179	48.155 311	10.64 127
Aug. 7.8	34.62 114	56.89 89	35.821 455	14.53 71	6.825 295	8.14 157	48.469 314	11.96 132
17.7	35.76 114	57.78 134	36.279 458	13.82 11	7.113 288	6.85 129	48.779 310	13.29 133
27.7	36.88 112	59.12 175	36.728 449	13.71 — 51	7.392 279	5.87 98	49.078 299	14.60 131
	106		429		266	64	286	125
Sept. 6.7	37.94	60.87	37.157	14.22	7.658	5.23	49.364	15.85
16.6	38.94 100	63.00 213	37.553 396	15.31 109	7.906 248	4.95 — 28	49.630 266	17.00 115
26.6	39.86 92	65.46 246	37.907 354	16.96 165	8.131 225	5.04 9	49.876 246	18.06 106
Oct. 6.6	40.68 82	68.23 277	38.210 303	19.12 216	8.331 200	5.45 41	50.097 221	19.00 94
16.6	41.38 70	71.24 301	38.455 245	21.71 259	8.504 173	6.18 73	50.293 198	19.81 81
	57	318	181	290	144	99	167	67
26.5	41.95	74.42	38.636	24.61	8.648	7.17	50.460	20.48
Nov. 5.5	42.38 43	77.73 331	38.750 114	27.75 314	8.763 115	8.37 120	50.600 140	21.04 56
15.5	42.65 27	81.05 332	38.794 — 44	30.97 322	8.846 83	9.73 136	50.708 108	21.49 45
25.5	42.75 — 10	84.34 329	38.770 24	34.16 319	8.898 52	11.18 145	50.782 74	21.82 33
Dec. 5.4	42.68 7	87.52 318	38.677 93	37.21 305	8.919 — 21	12.65 147	50.822 40	22.04 22
	25	293	156	279	14	144	5	14
15.4	42.43	90.45	38.521	40.00	8.905	14.09	50.827	22.18
25.4	42.02 41	93.09 264	38.306 215	42.43 243	8.860 45	15.44 135	50.795 32	22.22 — 4
35.3	41.45 57	95.33 224	38.041 265	44.43 200	8.783 77	16.66 122	50.728 67	22.17 5
Mean Place	29.472	74.30	35.884	34.59	5.504	17.31	46.690	13.46
Sec δ, Tan δ	4.604	+4.494	1.867	−1.577	1.013	−0.160	1.070	+0.381
Dψa, Dωa	+0.149	−0.202	+0.030	+0.071	+0.058	+0.007	+0.069	−0.017
Dψδ, Dωδ	+0.27	+0.74	+0.27	+0.74	+0.27	+0.74	+0.26	+0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Eridani. Mag. 4.3		ι Hydri. Mag. 5.5		α Persei. Mag. 1.9		o Tauri. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 3 16 s	° ′ −43 21 ″	h m 3 17 s	° ′ −77 39 ″	h m 3 18 s	° ′ +49 35 ″	h m 3 20 s	° ′ + 8 45 ″
Jan. 0.4	51.897	67.88	53.02	96.51	50.717	21.20	40.906	25.11
	176	175	90	160	156	102	84	59
10.3	51.721	69.63	52.12	98.11	50.561	22.22	40.822	24.52
	208	130	98	105	198	68	111	58
20.3	51.513	70.93	51.14	99.16	50.363	22.90	40.711	23.94
	232	80	105	43	236	27	139	54
30.3	51.281	71.73	50.09	99.59	50.127	23.17	40.572	23.40
	249	31	108	14	262	9	155	52
Feb. 9.3	51.032	72.04	49.01	99.45	49.865	23.08	40.417	22.88
	257	20	108	73	277	47	167	45
19.2	50.775	71.84	47.93	98.72	49.588	22.61	40.250	22.43
	255	70	101	130	273	81	168	38
Mar. 1.2	50.520	71.14	46.89	97.42	49.315	21.80	40.082	22.05
	241	118	99	179	261	115	163	31
11.2	50.279	69.96	45.90	95.63	49.054	20.65	39.919	21.74
	219	162	91	224	229	142	144	19
21.1	50.060	68.34	44.99	93.39	48.825	19.23	39.775	21.55
	188	202	80	269	186	162	118	6
31.1	49.872	66.32	44.19	90.70	48.639	17.61	39.657	21.49
	145	239	67	300	134	176	85	8
Apr. 10.1	49.727	63.93	43.52	87.70	48.505	15.85	39.572	21.57
	97	270	53	326	74	182	47	25
20.1	49.630	61.23	42.99	84.44	48.431	14.03	39.525	21.82
	44	296	38	347	9	177	1	43
30.0	49.586	58.27	42.61	80.97	48.422	12.26	39.524	22.25
	11	315	21	360	64	172	45	63
May 10.0	49.597	55.12	42.40	77.37	48.486	10.54	39.569	22.88
	68	328	3	366	130	153	92	80
20.0	49.665	51.84	42.37	73.71	48.616	9.01	39.661	23.68
	126	333	13	358	195	132	135	101
30.0	49.791	48.51	42.50	70.13	48.811	7.69	39.796	24.69
	179	330	31	347	257	104	177	116
June 8.9	49.970	45.21	42.81	66.66	49.068	6.65	39.973	25.85
	228	321	47	325	307	75	215	132
18.9	50.198	42.00	43.28	63.41	49.375	5.90	40.188	27.17
	272	300	62	296	350	45	241	140
28.9	50.470	39.00	43.90	60.45	49.725	5.45	40.429	28.57
	308	276	75	260	384	8	268	149
July 8.8	50.778	36.24	44.65	57.85	50.109	5.37	40.697	30.06
	336	241	86	216	410	23	285	152
18.8	51.114	33.83	45.51	55.69	50.519	5.60	40.982	31.58
	355	198	95	165	423	54	294	150
28.8	51.469	31.85	46.46	54.04	50.942	6.14	41.276	33.08
	365	152	100	106	430	84	297	145
Aug. 7.8	51.834	30.33	47.46	52.98	51.372	6.98	41.573	34.53
	366	100	104	48	425	114	293	133
17.7	52.200	29.33	48.50	52.50	51.797	8.12	41.866	35.86
	359	44	104	10	414	135	286	118
27.7	52.559	28.89	49.54	52.60	52.211	9.47	42.152	37.04
	342	12	99	74	399	158	271	101
Sept. 6.7	52.901	29.01	50.53	53.34	52.610	11.05	42.423	38.05
	320	69	93	137	372	178	256	82
16.7	53.221	29.70	51.46	54.71	52.982	12.83	42.679	38.87
	288	123	83	190	344	194	234	60
26.6	53.509	30.93	52.29	56.61	53.326	14.77	42.913	39.47
	253	172	70	236	311	201	212	38
Oct. 6.6	53.762	32.65	52.99	58.97	53.637	16.78	43.125	39.85
	216	215	55	278	275	213	187	18
16.6	53.978	34.80	53.54	61.75	53.912	18.91	43.312	40.03
	170	250	38	310	236	213	160	3
26.5	54.148	37.30	53.92	64.85	54.148	21.04	43.472	40.00
	123	272	20	327	191	216	132	18
Nov. 5.5	54.271	40.02	54.12	68.12	54.339	23.20	43.604	39.82
	76	288	1	334	144	212	102	31
15.5	54.347	42.90	54.13	71.46	54.483	25.32	43.706	39.51
	28	290	19	330	94	205	73	44
25.5	54.375	45.80	53.94	74.76	54.577	27.37	43.779	39.07
	19	281	37	308	40	191	38	51
Dec. 5.4	54.356	48.61	53.57	77.84	54.617	29.28	43.817	38.56
	67	262	54	280	14	175	6	55
15.4	54.289	51.23	53.03	80.64	54.603	31.03	43.823	38.01
	111	235	69	239	69	149	29	57
25.4	54.178	53.58	52.34	83.03	54.534	32.52	43.794	37.44
	151	198	83	191	124	124	62	57
35.4	54.027	55.56	51.51	84.94	54.410	33.76	43.732	36.87
Mean Place	51.144	48.45	50.771	73.29	48.964	18.15	40.019	31.99
Sec δ, Tan δ	1.376	−0.945	4.684	−4.576	1.542	+1.174	1.012	+0.154
$D_{\psi}a$, $D_{\omega}a$	+0.042	+0.041	−0.031	+0.198	+0.085	−0.051	+0.064	−0.007
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.26	+0.76	+0.26	+0.76	+0.26	+0.76	+0.25	+0.77

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 H. Camelop. Mag. 4.4		ξ Tauri. Mag. 3.8		f Tauri. Mag. 4.3		ϵ Eridani. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 3 22	° ′ ″ +59 40	h m s 3 22	° ′ ″ + 9 27	h m s 3 26	° ′ ″ +12 40	h m s 3 29	° ′ ″ − 9 42
Jan. 0.4	51.660	28.93	60.525	47.42	38.112	19.75	18.883	76.57
	214	144	81	57	82	45	92	123
10.3	51.446	30.37	60.444	46.85	38.030	19.30	18.791	77.80
	273	103	112	56	110	47	122	101
20.3	51.173	31.40	60.332	46.29	37.920	18.83	18.669	78.81
	320	59	136	53	137	16	146	79
30.3	50.853	31.99	60.196	45.76	37.783	18.37	18.523	79.60
Feb. 9.3	354	12	155	50	157	47	161	55
	50.499	32.11	60.041	45.26	37.626	17.90	18.359	80.15
	369	— 36	168	45	170	48	174	31
19.2	50.130	31.75	59.873	44.81	37.456	17.44	18.185	80.46
	369	79	170	39	172	43	176	6
Mar. 1.2	49.761	30.96	59.703	44.42	37.284	17.01	18.009	80.52
	319	122	162	31	166	38	169	— 21
11.2	49.412	29.74	59.541	44.11	37.118	16.63	17.840	80.31
	311	158	146	21	147	32	157	48
21.1	49.101	28.16	59.395	43.90	36.971	16.31	17.683	79.83
	256	187	120	10	124	22	130	72
31.1	48.845	26.29	59.275	43.80	36.847	16.09	17.553	79.11
	192	207	87	— 4	90	12	97	99
Apr. 10.1	48.653	24.22	59.188	43.84	36.757	15.97	17.456	78.12
	112	218	49	21	53	5	61	124
20.1	48.541	22.04	59.139	44.05	36.704	16.02	17.395	76.88
	29	223	3	39	4	20	17	145
30.0	48.512	19.81	59.136	44.44	36.700	16.22	17.378	75.43
May 10.0	59	216	43	57	— 40	39	— 23	167
	48.571	17.65	59.179	45.01	36.740	16.61	17.407	73.76
20.0	145	204	90	77	90	55	74	185
	48.716	15.61	59.269	45.78	36.830	17.16	17.481	71.91
	227	181	135	95	132	79	118	199
30.0	48.943	13.80	59.404	46.73	36.962	17.95	17.599	69.92
	302	156	176	113	177	91	159	210
June 8.9	49.245	12.24	59.580	47.86	37.139	18.89	17.758	67.82
	370	125	213	126	209	107	195	215
18.9	49.615	10.99	59.793	49.12	37.348	19.96	17.953	65.67
	425	90	242	138	244	122	228	215
28.9	50.040	10.09	60.035	50.50	37.592	21.18	18.181	63.52
July 8.8	469	53	268	145	268	131	255	210
	50.509	9.56	60.303	51.95	37.860	22.49	18.436	61.42
	503	15	284	150	287	139	271	196
18.8	51.012	9.41	60.587	53.45	38.147	23.88	18.710	59.46
	522	22	294	148	297	140	281	179
28.8	51.534	9.63	60.881	54.93	38.444	25.28	18.994	57.67
	533	63	297	142	300	139	291	158
Aug. 7.8	52.067	10.26	61.178	56.35	38.744	26.67	19.285	56.09
	529	95	296	133	300	129	288	127
17.7	52.596	11.21	61.474	57.68	39.044	27.96	19.573	54.82
	519	130	286	118	289	120	282	97
27.7	53.115	12.51	61.760	58.86	39.333	29.16	19.855	53.85
	499	158	274	102	278	107	268	61
Sept. 6.7	53.614	14.09	62.034	59.88	39.611	30.23	20.123	53.24
	472	188	256	83	266	92	252	26
16.7	54.086	15.97	62.290	60.71	39.877	31.15	20.375	52.98
	437	207	236	61	210	73	232	— 11
26.6	54.523	18.04	62.526	61.32	40.117	31.88	20.607	53.09
	394	229	214	41	219	53	209	45
Oct. 6.6	54.917	20.33	62.740	61.73	40.336	32.41	20.816	53.54
	350	243	189	20	195	36	185	77
16.6	55.267	22.76	62.929	61.93	40.531	32.77	21.001	54.31
	296	255	163	2	170	19	155	107
26.5	55.563	25.31	63.092	61.95	40.701	32.96	21.156	55.38
	240	261	136	14	143	4	126	128
Nov. 5.5	55.803	27.92	63.228	61.81	40.844	33.00	21.282	56.66
	176	261	105	29	113	— 9	95	144
15.5	55.979	30.53	63.333	61.52	40.957	32.91	21.377	58.10
	112	255	75	39	78	20	63	154
25.5	56.091	33.08	63.408	61.13	41.035	32.71	21.440	59.64
Dec. 5.4	41	243	43	46	46	26	32	156
	56.132	35.51	63.451	60.67	41.081	32.45	21.472	61.20
	— 32	226	7	51	12	35	— 6	153
15.4	56.100	37.77	63.458	60.16	41.093	32.10	21.466	62.73
	105	200	26	54	23	39	40	145
25.4	55.995	39.77	63.432	59.62	41.070	31.71	21.426	64.18
	174	168	60	54	58	41	72	129
35.4	55.821	41.45	63.372	59.08	41.012	31.30	21.354	65.47
Mean Place	49.285	24.41	59.622	54.18	37.162	25.80	18.094	64.48
Sec δ, Tan δ	1.980	+1.709	1.014	+0.167	1.025	+0.225	1.015	−0.171
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.096	−0.072	+0.065	−0.007	+0.066	−0.009	+0.058	+0.007
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.25	+0.77	+0.25	+0.77	+0.25	+0.78	+0.24	+0.79

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^5 Eridani. Mag. 4.3		δ Persei. Mag. 3.1		δ Eridani. Mag. 3.7		ν Persei. Mag. 3.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 3 30 s	° ′ −21 53 ″	h m 3 37 s	° ′ +47 32 ″	h m 3 39 s	° ′ −10 1 ″	h m 3 39 s	° ′ +42 20 ″
Jan. 0.4	23.876	40.40	27.816	35.01	34.385	36.07	58.947	12.22
	105	159	127	105	83	125	107	85
10.3	23.771	41.99	27.689	36.06	34.302	37.32	58.840	13.07
	135	126	175	77	113	106	150	60
20.3	23.636	43.25	27.514	36.83	34.189	38.38	58.690	13.67
	161	94	212	41	140	85	190	31
30.3	23.475	44.19	27.302	37.24	34.049	39.23	58.500	13.98
	180	59	246	7	161	59	217	0
Feb. 9.3	23.295	44.78	27.056	37.31	33.888	39.82	58.283	13.98
	190	22	261	−30	174	34	236	31
19.2	23.105	45.00	26.795	37.01	33.714	40.16	58.047	13.67
	194	14	269	62	179	10	212	57
Mar. 1.2	22.911	44.86	26.526	36.39	33.535	40.26	57.805	13.10
	187	47	258	95	175	−18	231	87
11.2	22.724	44.39	26.268	35.44	33.360	40.08	57.571	12.23
	170	84	233	121	161	43	214	109
21.2	22.554	43.55	26.035	34.23	33.199	39.65	57.357	11.14
	147	117	197	142	139	71	179	126
31.1	22.407	42.38	25.838	32.81	33.060	38.94	57.178	9.88
	114	148	149	160	108	94	136	137
Apr. 10.1	22.293	40.90	25.689	31.21	32.952	38.00	57.042	8.51
	75	178	92	166	71	121	84	142
20.1	22.218	39.12	25.597	29.55	32.881	36.79	56.958	7.09
	32	204	29	166	27	144	27	140
30.0	22.186	37.08	25.568	27.89	32.852	35.35	56.931	5.69
	−15	225	−36	159	−16	167	−33	132
May 10.0	22.201	34.83	25.604	26.30	32.868	33.68	56.964	4.37
	63	212	104	147	62	184	95	119
20.0	22.264	32.41	25.708	24.83	32.930	31.84	57.059	3.18
	110	256	166	129	107	200	155	103
30.0	22.374	29.85	25.874	23.54	33.037	29.84	57.214	2.15
	154	263	225	107	149	212	208	78
June 8.9	22.528	27.22	26.099	22.47	33.186	27.72	57.422	1.37
	192	262	279	77	186	217	257	54
18.9	22.720	24.60	26.378	21.70	33.372	25.55	57.679	0.83
	229	256	323	49	221	218	299	28
28.9	22.949	22.04	26.701	21.21	33.593	23.37	57.978	0.55
	257	244	358	−22	218	212	332	0
July 8.9	23.206	19.60	27.059	20.99	33.841	21.25	58.310	0.55
	277	222	386	−8	267	202	358	25
18.8	23.483	17.38	27.445	21.07	34.108	19.23	58.668	0.80
	292	198	405	40	281	185	373	53
28.8	23.775	15.40	27.850	21.47	34.389	17.38	59.041	1.33
	300	164	412	67	289	162	381	76
Aug. 7.8	24.075	13.76	28.262	22.14	34.678	15.76	59.422	2.09
	300	126	415	95	289	135	383	96
17.7	24.375	12.50	28.677	23.09	34.967	14.41	59.805	3.05
	294	84	405	113	284	102	375	115
27.7	24.669	11.66	29.082	24.22	35.251	13.39	60.180	4.20
	283	−40	394	137	275	67	365	131
Sept. 6.7	24.952	11.26	29.476	25.59	35.526	12.72	60.545	5.51
	265	5	374	154	258	−31	346	143
16.7	25.217	11.31	29.850	27.13	35.784	12.41	60.891	6.94
	215	49	350	170	242	−7	323	154
26.6	25.462	11.80	30.200	28.83	36.026	12.48	61.214	8.48
	221	93	320	180	219	42	299	161
Oct. 6.6	25.683	12.73	30.520	30.63	36.245	12.90	61.513	10.09
	191	131	289	189	196	76	268	166
16.6	25.874	14.04	30.809	32.52	36.441	13.66	61.781	11.75
	161	164	255	192	169	103	237	168
26.6	26.035	15.68	31.064	34.44	36.610	14.69	62.018	13.43
	130	188	214	196	142	127	201	169
Nov. 5.5	26.165	17.56	31.278	36.40	36.752	15.96	62.219	15.12
	97	206	167	195	110	144	161	165
15.5	26.262	19.62	31.445	38.35	36.862	17.40	62.380	16.77
	61	216	120	190	78	155	119	160
25.5	26.323	21.78	31.565	40.25	36.940	18.95	62.499	18.37
	24	215	69	183	46	158	72	150
Dec. 5.4	26.347	23.93	31.634	42.08	36.986	20.53	62.571	19.87
	−12	206	15	168	9	156	22	139
15.4	26.335	25.99	31.649	43.76	36.995	22.09	62.593	21.26
	48	192	38	146	26	147	26	122
25.4	26.287	27.91	31.611	45.22	36.969	23.56	62.567	22.48
	83	167	93	123	62	134	78	101
35.4	26.204	29.58	31.518	46.45	36.907	24.90	62.489	23.49
Mean Place	23.093	25.56	26.077	33.63	33.534	23.94	57.388	12.03
Sec δ, Tan δ	1.078	−0.402	1.482	+1.093	1.015	−0.177	1.353	+0.911
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.053	+0.016	+0.085	−0.042	+0.057	+0.007	+0.081	−0.035
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.24	+0.79	+0.23	+0.81	+0.23	+0.82	+0.23	+0.82

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	5 H. Camelop. Mag. 4.7		η Tauri. (Alcyone.) Mag. 3.0		τ⁶ Eridani. Mag. 4.3		g Eridani. Mag. 4.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 3 42 s	° ′ +71 5 ″	h m 3 42 s	° ′ +23 51 ″	h m 3 43 s	° ′ −23 28 ″	h m 3 46 s	° ′ −36 25 ″
Jan. 0.4	16.18	52.81	55.369	61.24	32.936	47.27	35.323	74.59
	34	203	76	4	100	169	136	196
10.4	15.84	54.84	55.293	61.28	32.836	48.96	35.187	76.55
	44	158	109	4	134	139	170	159
20.3	15.40	56.42	55.184	61.24	32.702	50.35	35.017	78.14
	52	112	142	19	162	107	201	115
30.3	14.88	57.54	55.042	61.05	32.540	51.42	34.816	79.29
Feb. 9.3	57	56	166	27	183	68	222	70
	14.31	58.10	54.876	60.78	32.357	52.10	34.594	79.99
	61	1	183	39	196	33	236	21
19.2	13.70	58.11	54.693	60.39	32.161	52.43	34.358	80.20
	61	50	188	49	201	8	242	24
Mar. 1.2	13.09	57.61	54.505	59.90	31.960	52.35	34.116	79.96
	59	105	183	57	197	42	236	69
11.2	12.50	56.56	54.322	59.33	31.763	51.93	33.880	79.27
	54	150	171	61	183	79	221	115
21.2	11.96	55.06	54.151	58.72	31.580	51.14	33.659	78.12
	45	192	140	63	159	115	195	154
31.1	11.51	53.14	54.011	58.09	31.421	49.99	33.464	76.58
	37	219	110	59	128	147	162	191
Apr. 10.1	11.14	50.95	53.901	57.50	31.293	48.52	33.302	74.67
	25	246	67	53	91	177	120	227
20.1	10.89	48.49	53.834	56.97	31.202	46.75	33.182	72.40
	12	258	22	41	47	203	72	256
30.1	10.77	45.91	53.812	56.56	31.155	44.72	33.110	69.84
May 10.0	0	259	28	30	0	229	22	280
	10.77	43.32	53.840	56.26	31.155	42.43	33.088	67.04
20.0	14	253	81	15	48	246	32	297
	10.91	40.79	53.921	56.11	31.203	39.97	33.120	64.07
	26	236	126	6	95	258	82	308
30.0	11.17	38.43	54.047	56.17	31.298	37.39	33.202	60.99
	38	218	173	24	139	266	134	313
June 8.9	11.55	36.25	54.220	56.41	31.437	34.73	33.336	57.86
	49	188	213	41	181	267	181	308
18.9	12.04	34.37	54.433	56.82	31.618	32.06	33.517	54.78
	58	156	218	63	219	263	223	296
28.9	12.62	32.81	54.681	57.45	31.837	29.43	33.740	51.82
July 8.9	65	115	276	76	246	247	259	278
	13.27	31.66	54.957	58.21	32.083	26.96	33.999	49.04
	72	75	296	91	271	228	287	251
18.8	13.99	30.91	55.253	59.12	32.354	24.68	34.286	46.53
	76	33	311	102	289	203	309	216
28.8	14.75	30.58	55.564	60.14	32.643	22.65	34.595	44.37
Aug. 7.8	79	9	316	110	298	168	324	175
	15.54	30.67	55.880	61.24	32.941	20.97	34.919	42.62
17.8	80	55	317	114	301	131	329	128
	16.34	31.22	56.197	62.38	33.242	19.66	35.248	41.34
27.7	79	91	314	115	297	88	327	78
	17.13	32.13	56.511	63.53	33.539	18.78	35.575	40.56
	77	129	301	111	289	41	320	23
Sept. 6.7	17.90	33.42	56.812	64.64	33.828	18.37	35.895	40.33
	74	170	287	109	273	5	303	31
16.7	18.64	35.12	57.099	65.73	34.101	18.42	36.198	40.64
	70	203	271	101	254	52	281	85
26.6	19.34	37.15	57.370	66.74	34.355	18.94	36.479	41.49
Oct. 6.6	64	229	246	93	231	94	255	136
	19.98	39.44	57.616	67.67	34.586	19.88	36.734	42.85
16.6	57	255	224	82	204	136	222	183
	20.55	41.99	57.840	68.49	34.790	21.24	36.956	44.68
	49	278	198	74	175	171	189	220
26.6	21.04	44.77	58.038	69.23	34.965	22.95	37.145	46.88
	41	293	170	63	143	196	149	249
Nov. 5.5	21.45	47.70	58.208	69.86	35.108	24.91	37.294	49.37
	30	300	140	55	108	218	109	268
15.5	21.75	50.70	58.348	70.41	35.216	27.09	37.403	52.05
	19	302	104	47	73	226	65	280
25.5	21.94	53.72	58.452	70.88	35.289	29.35	37.468	54.85
Dec. 5.5	8	299	67	38	35	228	21	277
	22.02	56.71	58.519	71.26	35.324	31.63	37.489	57.62
	3	280	31	31	3	220	22	266
15.4	21.99	59.51	58.550	71.57	35.321	33.83	37.467	60.28
	16	257	12	22	39	207	68	245
25.4	21.83	62.08	58.538	71.79	35.282	35.90	37.399	62.73
	27	227	48	12	78	183	109	216
35.4	21.56	64.35	58.490	71.91	35.204	37.73	37.290	64.89
Mean Place	12.213	48.37	54.217	65.22	32.079	32.07	34.395	56.87
Sec δ, Tan δ	3.086	+2.920	1.094	+0.442	1.090	−0.434	1.243	−0.738
$D_{\psi a}$, $D_{\omega a}$	+0.125	−0.110	+0.071	−0.017	+0.052	+0.016	+0.045	+0.027
$D_{\psi\delta}$ $D_{\omega\delta}$	+0.23	+0.82	+0.22	+0.83	+0.22	+0.83	+0.22	+0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydri. Mag. 3.2		ζ Persei. Mag. 2.9		9 H. Camelop. Mag. 5.2		ϵ Persei. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	3 48	−74 28	3 49	+31 39	3 50	+60 52	3 52	+39 47
Jan. 0.4	27.30	52.93	18.549	19.59	36.11	68.06	42.430	18.44
10.4	26.65 65	54.99 206	18.472 77	19.99 40	35.93 18	69.76 170	42.340 90	19.24 80
20.3	25.92 73	56.49 150	18.353 119	20.25 26	35.68 25	71.09 133	42.208 132	19.83 59
30.3	25.12 80	57.46 97	18.200 153	20.33 8	35.36 32	72.02 93	42.035 173	20.14 31
Feb. 9.3	24.27 85	57.84 38	18.023 177	20.19 14	35.01 35	72.49 47	41.831 204	20.21 7
	87	20	201	31	39	0	223	22
19.2	23.40	57.64	17.822	19.88	34.62	72.49	41.608	19.99
Mar. 1.2	22.54 86	56.88 76	17.617 205	19.40 48	34.23 39	72.02 47	41.376 232	19.51 48
11.2	21.70 84	55.54 134	17.415 202	18.75 65	33.85 38	71.12 90	41.149 227	18.77 74
21.2	20.92 78	53.73 181	17.231 184	17.96 79	33.50 35	69.81 131	40.936 213	17.87 90
31.1	20.21 71	51.47 226	17.069 162	17.12 84	33.19 31	68.16 165	40.757 179	16.77 110
	62	266	121	90	24	191	142	122
Apr. 10.1	19.59	48.81	16.948	16.22	32.95	66.25	40.615	15.55
20.1	19.08 51	45.82 299	16.869 79	15.33 89	32.79 16	64.17 208	40.520 95	14.29 126
30.1	18.68 40	42.57 325	16.838 31	14.49 84	32.71 8	61.98 219	40.481 39	13.06 123
May 10.0	18.42 26	39.07 350	16.862 24	13.73 76	32.72 1	59.79 219	40.501 20	11.88 118
20.0	18.30 12	35.50 357	16.938 76	13.13 60	32.81 9	57.64 215	40.578 77	10.82 106
	1	360	128	41	19	197	135	90
30.0	18.31	31.90	17.066	12.72	33.00	55.67	40.713	9.92
June 8.9	18.47 16	28.36 354	17.244 178	12.46 26	33.26 26	53.90 177	40.903 190	9.19 73
18.9	18.76 29	24.93 343	17.466 222	12.44 2	33.60 34	52.37 153	41.140 237	8.70 49
28.9	19.18 42	21.76 317	17.724 258	12.61 17	34.00 40	51.17 120	41.418 278	8.46 24
July 8.9	19.72 54	18.88 288	18.013 289	13.01 40	34.46 46	50.29 88	41.729 311	8.45 1
	63	219	312	57	50	51	339	22
18.8	20.35	16.39	18.325	13.58	34.96	49.78	42.068	8.67
28.8	21.07 72	14.35 204	18.654 329	14.34 76	35.48 52	49.62 16	42.425 357	9.16 49
Aug. 7.8	21.86 79	12.83 152	18.990 336	15.23 89	36.03 55	49.83 21	42.792 367	9.84 68
17.8	22.69 83	11.90 93	19.329 339	16.24 101	36.60 57	50.40 57	43.163 371	10.69 85
27.7	23.53 84	11.58 32	19.662 333	17.34 110	37.13 53	51.30 90	43.528 365	11.71 102
	83	30	323	113	54	124	357	118
Sept. 6.7	24.36	11.88	19.985	18.47	37.67	52.54	43.885	12.89
16.7	25.15 79	12.83 95	20.294 309	19.66 119	38.18 51	54.05 151	44.225 340	14.15 126
26.6	25.88 73	14.34 151	20.590 296	20.83 117	38.67 49	55.83 178	44.550 325	15.53 138
Oct. 6.6	26.52 64	16.41 207	20.859 269	22.02 119	39.12 45	57.83 200	44.851 301	16.94 141
16.6	27.06 54	18.95 254	21.106 247	23.14 112	39.53 41	60.04 221	45.123 272	18.41 147
	42	294	219	111	36	236	243	145
26.6	27.48	21.89	21.325	24.25	39.89	62.40	45.366	19.86
Nov. 5.5	27.76 28	25.07 318	21.515 190	25.31 106	40.19 30	64.88 248	45.577 211	21.35 149
15.5	27.88 12	28.43 336	21.668 153	26.30 99	40.43 24	67.43 255	45.749 172	22.82 147
25.5	27.86 2	31.83 340	21.787 119	27.23 93	40.60 17	69.97 254	45.883 134	24.22 140
Dec. 5.5	27.68 18	35.13 330	21.867 80	28.10 87	40.70 10	72.47 250	45.971 88	25.57 135
	32	306	38	77	2	237	41	124
15.4	27.36	38.19	21.905	28.87	40.72	74.84	46.012	26.81
25.4	26.91 45	40.94 275	21.896 9	29.52 65	40.66 6	77.04 220	46.000 12	27.91 110
35.4	26.33 58	43.27 233	21.846 50	30.05 53	40.52 14	78.97 193	45.944 56	28.88 97
Mean Place	24.754	30.94	17.236	22.17	33.520	65.52	40.909	19.58
Sec δ, Tan δ	3.736	−3.600	1.175	+0.617	2.055	+1.795	1.301	+0.833
Dψa, Dωa	−0.019	+0.130	+0.075	−0.022	+0.101	−0.064	+0.080	−0.029
Dψδ, Dωδ	+0.22	+0.84	+0.21	+0.84	+0.21	+0.84	+0.21	+0.85

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Persei. Mag. 4.0		γ Eridani. Mag. 3.2		λ Tauri. Var. 3.3–4.2		δ Reticuli. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 3 53	° ′ ″ +35 34	h m s 3 54	° ′ ″ −13 43	h m s 3 56	° ′ ″ +12 16	h m s 3 57	° ′ ″ −61 36
Jan. 0.4	59.271	12.44	27.094	49.00	25.788	18.71	32.78	81.86
	79	61	80	146	61	44	30	228
10.4	59.192	13.05	27.014	50.46	25.727	18.27	32.48	84.14
	122	44	111	125	94	44	36	177
20.3	59.070	13.49	26.903	51.71	25.633	17.83	32.12	85.91
	158	21	143	98	127	44	40	124
30.3	58.912	13.70	26.760	52.69	25.506	17.39	31.72	87.15
	190	1	161	73	152	41	44	67
Feb. 9.3	58.722	13.69	26.599	53.42	25.354	16.98	31.28	87.82
	209	24	178	42	169	39	46	10
19.3	58.513	13.45	26.421	53.84	25.185	16.59	30.82	87.92
	217	46	186	11	178	35	46	47
Mar. 1.2	58.296	12.99	26.235	53.95	25.007	16.24	30.36	87.45
	216	66	185	17	177	32	45	101
11.2	58.080	12.33	26.050	53.78	24.830	15.92	29.91	86.44
	197	84	171	47	165	26	43	152
21.2	57.883	11.49	25.879	53.31	24.665	15.66	29.48	84.92
	172	97	152	76	112	17	39	199
31.1	57.711	10.52	25.727	52.55	24.523	15.49	29.09	82.93
	133	103	121	106	113	6	34	242
Apr. 10.1	57.578	9.49	25.606	51.49	24.410	15.43	28.75	80.51
	89	107	88	129	77	7	28	278
20.1	57.489	8.42	25.518	50.20	24.333	15.50	28.47	77.73
	37	102	45	156	32	20	20	311
30.1	57.452	7.40	25.473	48.64	24.301	15.70	28.27	74.62
	18	97	0	179	12	37	13	332
May 10.0	57.470	6.43	25.473	46.85	24.313	16.07	28.14	71.30
	74	83	45	200	60	54	4	350
20.0	57.544	5.60	25.518	44.85	24.373	16.61	28.10	67.80
	129	68	91	211	106	70	3	357
30.0	57.673	4.92	25.609	42.74	24.479	17.31	28.13	64.23
	179	47	133	225	119	86	12	357
June 8.9	57.852	4.45	25.742	40.49	24.628	18.17	28.25	60.66
	226	28	174	229	188	100	19	347
18.9	58.078	4.17	25.916	38.20	24.816	19.17	28.44	57.19
	265	3	208	229	222	112	27	330
28.9	58.343	4.14	26.124	35.91	25.038	20.29	28.71	53.89
	298	17	235	222	219	121	31	303
July 8.9	58.641	4.31	26.359	33.69	25.287	21.50	29.05	50.86
	322	39	260	210	272	127	39	268
18.8	58.963	4.70	26.619	31.59	25.559	22.77	29.44	48.18
	339	59	277	190	287	128	44	225
28.8	59.302	5.29	26.896	29.69	25.846	24.05	29.88	45.93
	350	77	288	164	295	126	47	175
Aug. 7.8	59.652	6.06	27.184	28.05	26.141	25.31	30.35	44.18
	351	92	290	136	297	118	49	120
17.8	60.003	6.98	27.474	26.69	26.438	26.49	30.84	42.98
	349	103	288	101	293	108	51	59
27.7	60.352	8.01	27.762	25.68	26.731	27.57	31.35	42.39
	338	112	281	61	286	95	49	4
Sept. 6.7	60.690	9.13	28.043	25.07	27.017	28.52	31.84	42.43
	325	120	268	22	275	77	48	66
16.7	61.015	10.33	28.311	24.85	27.292	29.29	32.32	43.09
	308	124	252	18	260	59	44	128
26.6	61.323	11.57	28.563	25.03	27.552	29.88	32.76	44.37
	285	128	230	57	210	40	40	185
Oct. 6.6	61.608	12.85	28.793	25.60	27.792	30.28	33.16	46.22
	261	127	211	91	218	25	31	235
16.6	61.869	14.12	29.004	26.51	28.010	30.53	33.50	48.57
	232	126	181	126	196	6	28	278
26.6	62.101	15.38	29.185	27.77	28.206	30.59	33.78	51.35
	202	124	157	149	169	8	21	310
Nov. 5.5	62.303	16.62	29.342	29.26	28.375	30.51	33.99	54.45
	167	122	122	168	142	20	13	330
15.5	62.470	17.84	29.464	30.94	28.517	30.31	34.12	57.75
	129	116	90	182	109	29	5	337
25.5	62.599	19.00	29.554	32.76	28.626	30.02	34.17	61.12
	87	108	56	185	78	36	3	333
Dec. 5.5	62.686	20.08	29.610	34.61	28.704	29.66	34.14	64.45
	41	101	19	181	40	40	12	316
15.4	62.727	21.09	29.629	36.42	28.744	29.26	34.02	67.61
	2	89	16	170	3	42	19	288
25.4	62.725	21.98	29.613	38.12	28.747	28.84	33.83	70.49
	50	74	56	157	36	43	26	249
35.4	62.675	22.72	29.557	39.69	28.711	28.41	33.57	72.98
Mean Place	57.858	14.50	26.182	35.88	24.735	25.95	31.219	61.11
Sec δ, Tan δ	1.229	+0.715	1.029	−0.244	1.023	+0.218	2.104	−1.851
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.077	−0.025	+0.056	+0.008	+0.066	−0.007	+0.019	+0.063
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.21	+0.85	+0.21	+0.85	+0.20	+0.86	+0.20	+0.86

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Tauri. Mag. 3.9		A Tauri. Mag. 4.5		c Persei. Mag. 4.0		p Tauri. Mag. 5.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 3 59	° ′ ″ + 5 46	h m s 4 0	° ′ ″ +21 52	h m s 4 3	° ′ ″ +47 30	h m s 4 6	° ′ ″ +26 16
Jan. 0.4	4.531	27.31	9.581	16.51	5.755	29.60	9.540	47.63
	59	73	59	1	100	120	58	20
10.4	4.472	26.58	9.522	16.50	5.655	30.80	9.482	47.83
	94	67	97	8	150	95	97	11
20.3	4.378	25.91	9.425	16.42	5.505	31.75	9.385	47.94
	125	60	132	17	197	66	135	1
30.3	4.253	25.31	9.293	16.25	5.308	32.41	9.250	47.95
Feb. 9.3	150	50	160	23	232	29	161	— 12
	4.103	24.81	9.133	16.02	5.076	32.70	9.086	47.83
	167	41	178	32	260	— 3	185	26
19.3	3.936	24.40	8.955	15.70	4.816	32.67	8.901	47.57
	176	32	187	38	272	36	196	36
Mar. 1.2	3.760	24.08	8.768	15.32	4.544	32.31	8.705	47.21
	175	19	187	46	269	71	195	47
11.2	3.585	23.89	8.581	14.86	4.275	31.60	8.510	46.74
	164	9	175	48	251	97	184	56
21.2	3.421	23.80	8.406	14.38	4.024	30.63	8.326	46.18
	144	— 7	152	49	220	125	162	60
31.1	3.277	23.87	8.254	13.89	3.804	29.38	8.164	45.58
	115	21	121	46	174	141	129	63
Apr. 10.1	3.162	24.08	8.133	13.43	3.630	27.97	8.035	44.95
	78	39	81	41	122	152	90	61
20.1	3.084	24.47	8.052	13.02	3.508	26.45	7.945	44.34
	37	55	36	32	63	159	41	54
30.1	3.047	25.02	8.016	12.70	3.445	24.86	7.901	43.80
	— 8	74	— 12	19	— 2	157	— 6	44
May 10.0	3.055	25.76	8.028	12.51	3.447	23.29	7.907	43.36
	54	91	61	4	69	150	57	32
20.0	3.109	26.67	8.089	12.47	3.516	21.79	7.964	43.04
	98	107	109	— 11	134	137	107	15
30.0	3.207	27.74	8.198	12.58	3.650	20.42	8.071	42.89
	141	121	155	29	196	116	151	1
June 9.0	3.348	28.95	8.353	12.87	3.816	19.26	8.225	42.90
	180	135	197	46	248	97	198	19
18.9	3.528	30.30	8.550	13.33	4.094	18.29	8.423	43.09
	214	144	231	62	298	71	231	36
28.9	3.742	31.74	8.781	13.95	4.392	17.58	8.657	43.45
July 8.9	212	116	261	77	339	43	266	52
	3.984	33.20	9.042	14.72	4.731	17.15	8.923	43.97
	263	119	285	88	369	16	289	68
18.8	4.247	34.69	9.327	15.60	5.100	16.99	9.212	44.65
	279	146	301	97	394	11	307	79
28.8	4.526	36.15	9.628	16.57	5.494	17.10	9.519	45.44
Aug. 7.8	287	138	309	103	408	37	317	88
	4.813	37.53	9.937	17.60	5.902	17.47	9.836	46.32
17.8	292	123	312	105	412	63	322	94
	5.105	38.76	10.249	18.65	6.314	18.10	10.158	47.26
27.7	288	107	309	103	412	85	318	98
	5.393	39.83	10.558	19.68	6.726	18.95	10.476	48.24
	280	87	301	100	404	107	313	98
Sept. 6.7	5.673	40.70	10.859	20.68	7.130	20.02	10.789	49.22
	269	64	290	93	390	127	301	96
16.7	5.942	41.34	11.149	21.61	7.520	21.29	11.090	50.18
	255	40	275	85	372	140	287	92
26.7	6.197	41.74	11.424	22.46	7.892	22.69	11.377	51.10
Oct. 6.6	238	16	256	74	345	154	270	86
	6.435	41.90	11.680	23.20	8.237	24.23	11.647	51.96
16.6	215	— 8	235	64	319	166	247	80
	6.650	41.82	11.915	23.84	8.556	25.89	11.894	52.76
	192	26	210	51	285	173	224	73
26.6	6.842	41.56	12.125	24.38	8.841	27.62	12.118	53.49
	167	46	186	47	250	181	197	66
Nov. 5.5	7.009	41.10	12.311	24.85	9.091	29.43	12.315	54.15
	139	60	155	37	207	182	166	61
15.5	7.148	40.50	12.466	25.22	9.298	31.25	12.481	54.76
	108	70	122	29	160	183	132	56
25.5	7.256	39.80	12.588	25.51	9.458	33.08	12.613	55.32
Dec. 5.5	76	77	86	22	106	179	96	49
	7.332	39.03	12.674	25.73	9.564	34.87	12.709	55.81
	40	77	48	17	54	169	55	44
15.4	7.372	38.26	12.722	25.90	9.618	36.56	12.764	56.25
	1	78	8	12	5	155	13	37
25.4	7.373	37.48	12.730	26.02	9.613	38.11	12.777	56.62
	— 35	75	— 33	6	61	137	— 29	28
35.4	7.338	36.73	12.697	26.08	9.552	39.48	12.748	56.90
Mean Place	3.521	36.11	8.403	21.76	3.938	30.03	8.278	52.23
Sec δ, Tan δ	1.005	+0.101	1.078	+0.401	1.480	+1.092	1.115	+0.494
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.063	−0.003	+0.070	−0.013	+0.086	−0.036	+0.073	−0.016
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.20	+0.86	+0.20	+0.87	+0.19	+0.87	+0.19	+0.88

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o^1 Eridani. Mag. 4.1		μ Tauri. Mag. 4.3		α Horologii. Mag. 3.8		α Reticuli. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 4 8	° ′ ″ − 7 2	h m s 4 11	° ′ ″ + 8 41	h m s 4 11	° ′ ″ −42 28	h m s 4 13	° ′ ″ −62 39
Jan. 0.4	7.335	26.01	22.151	53.74	28.165	80.26	27.50	78.97
	62	127	48	60	140	228	30	247
10.4	7.273	27.28	22.103	53.14	28.025	82.54	27.20	81.44
	97	110	87	58	182	190	36	193
20.3	7.176	28.38	22.016	52.56	27.843	84.44	26.84	83.37
	126	93	120	52	219	144	42	143
30.3	7.050	29.31	21.896	52.04	27.624	85.88	26.42	84.80
	155	70	146	45	248	96	45	90
Feb. 9.3	6.895	30.01	21.750	51.59	27.376	86.84	25.97	85.70
	170	46	167	39	267	46	48	32
19.3	6.725	30.47	21.583	51.20	27.109	87.30	25.49	86.02
	180	25	177	31	277	4	49	25
Mar. 1.2	6.545	30.72	21.406	50.89	26.832	87.26	25.00	85.77
	183	—	179	23	275	56	48	80
11.2	6.362	30.70	21.227	50.66	26.557	86.70	24.52	84.97
	172	26	169	14	263	101	46	132
21.2	6.190	30.44	21.058	50.52	26.294	85.69	24.06	83.65
	154	48	151	3	240	148	43	181
31.2	6.036	29.96	20.907	50.49	26.054	84.21	23.63	81.84
	124	74	123	9	207	187	37	226
Apr. 10.1	5.912	29.22	20.784	50.58	25.847	82.34	23.26	79.58
	91	97	87	24	166	227	32	265
20.1	5.821	28.25	20.697	50.82	25.681	80.07	22.94	76.93
	53	120	48	38	117	258	25	298
30.1	5.768	27.05	20.649	51.20	25.564	77.49	22.69	73.95
	7	139	2	55	66	285	16	323
May 10.0	5.761	25.66	20.647	51.75	25.498	74.64	22.53	70.72
	—	160	—	72	8	307	9	343
20.0	5.796	24.06	20.691	52.47	25.490	71.57	22.44	67.29
	35	178	44	87	—	319	0	355
	82		89		46			
30.0	5.878	22.28	20.780	53.34	25.536	68.38	22.44	63.74
	125	189	133	101	102	327	8	357
June 9.0	6.003	20.39	20.913	54.35	25.638	65.11	22.52	60.17
	163	196	173	116	155	325	17	350
18.9	6.166	18.43	21.086	55.51	25.793	61.86	22.69	56.67
	199	201	207	125	202	315	25	337
28.9	6.365	16.42	21.293	56.76	25.995	58.71	22.94	53.30
	226	198	235	131	216	296	31	313
July 8.9	6.591	14.44	21.528	58.07	26.241	55.75	23.25	50.17
	252	191	261	134	281	270	38	280
18.9	6.843	12.53	21.789	59.41	26.522	53.05	23.63	47.37
	270	178	276	133	309	234	43	238
28.8	7.113	10.75	22.065	60.74	26.831	50.71	24.06	44.99
	280	158	286	127	331	193	48	192
Aug. 7.8	7.393	9.17	22.351	62.01	27.162	48.78	24.54	43.07
	287	133	291	116	315	145	49	135
17.8	7.680	7.84	22.642	63.17	27.507	47.33	25.03	41.72
	285	105	290	103	348	91	52	77
27.7	7.965	6.79	22.932	64.20	27.855	46.42	25.55	40.95
	279	73	285	86	345	35	51	15
Sept. 6.7	8.244	6.06	23.217	65.06	28.200	46.07	26.06	40.80
	268	40	276	65	334	24	50	50
16.7	8.512	5.66	23.493	65.71	28.534	46.31	26.56	41.30
	257	3	262	45	317	80	47	111
26.7	8.769	5.63	23.755	66.16	28.851	47.11	27.03	42.41
	238	31	246	23	290	137	43	170
Oct. 6.6	9.007	5.94	24.001	66.39	29.141	48.48	27.46	44.11
	220	65	227	2	261	187	38	224
16.6	9.227	6.59	24.228	66.41	29.402	50.35	27.84	46.35
	194	92	205	17	225	231	32	269
26.6	9.421	7.51	24.433	66.24	29.627	52.66	28.16	49.04
	170	117	181	32	184	265	24	305
Nov. 5.6	9.591	8.68	24.614	65.92	29.811	55.31	28.40	52.09
	139	135	153	46	139	289	16	328
15.5	9.730	10.03	24.767	65.46	29.950	58.20	28.56	55.37
	107	145	122	55	91	304	8	341
25.5	9.837	11.48	24.889	64.91	30.041	61.24	28.64	58.78
	74	153	90	61	41	305	0	339
Dec. 5.5	9.911	13.01	24.979	64.30	30.082	64.29	28.64	62.17
	39	153	52	64	—	296	9	326
					9			
15.4	9.950	14.54	25.031	63.66	30.073	67.25	28.55	65.43
	3	145	14	64	62	277	18	302
25.4	9.953	15.99	25.045	63.02	30.011	70.02	28.37	68.45
	—	135	—	62	107	249	25	268
	36		24					
35.4	9.917	17.34	25.021	62.40	29.904	72.51	28.12	71.13
Mean Place	6.354	14.26	21.080	62.23	26.997	62.18	25.667	58.79
Sec δ, Tan δ	1.008	−0.124	1.012	+0.153	1.356	−0.916	2.178	−1.935
$D_{\psi a}$, $D_{\omega a}$	+0.058	+0.004	+0.065	−0.005	+0.040	+0.028	+0.015	+0.058
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.19	+0.88	+0.18	+0.89	+0.18	+0.89	+0.18	+0.89

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tauri. Mag. 3.9		δ Tauri. Mag. 3.9		υ^5 Eridani. Mag. 4.1		δ Mensæ. Mag. 5.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	4 15	+15 26	4 18	+17 21	4 21	−34 11	4 22	−80 23
Jan. 0.4	25.695	27.01	30.672	40.19	9.782	58.58	73.54	64.52
10.4	25.650 45	26.71 30	30.629 43	39.98 21	9.681 101	60.79 221	72.55 99	66.90 238
20.3	25.565 85	26.41 30	30.547 82	39.76 22	9.540 141	62.65 186	71.41 114	68.81 191
30.3	25.446 119	26.10 31	30.426 121	39.51 25	9.362 178	64.11 146	70.13 128	70.19 138
Feb. 9.3	25.299 147	25.78 32	30.278 148	39.25 26	9.154 208	65.14 103	68.75 138	71.03 84
	171	32	171	29	228	58	145	28
19.3	25.128	25.46	30.107	38.96	8.926	65.72	67.30	71.31
Mar. 1.2	24.946 182	25.15 31	29.924 183	38.66 30	8.687 239	65.84 12	65.84 146	71.02 29
11.2	24.763 183	24.84 31	29.739 185	38.33 33	8.447 240	65.51 33	64.41 143	70.20 82
21.2	24.588 175	24.55 29	29.561 178	38.01 32	8.215 232	64.73 78	63.02 139	68.86 134
31.2	24.433 155	24.32 23	29.402 159	37.72 29	8.003 212	63.54 119	61.72 130	67.04 182
	127	17	129	24	184	159	118	221
Apr. 10.1	24.306 93	24.15 9	29.273 94	37.48 16	7.819 117	61.95 194	60.54 102	64.80 263
20.1	24.213 49	24.06 — 3	29.179 53	37.32 6	7.672 104	60.01 227	59.52 86	62.17 233
30.1	24.164 4	24.09 17	29.126 8	37.26 — 6	7.568 56	57.74 255	58.66 67	59.24 318
May 10.0	24.160 — 44	24.26 31	29.118 — 43	37.32 20	7.512 6	55.19 276	57.99 45	56.06 337
20.0	24.204 90	24.57 46	29.161 89	37.52 35	7.506 — 46	52.43 292	57.54 23	52.69 346
30.0	24.294	25.03	29.250	37.87	7.552	49.51	57.31	49.23
June 9.0	24.429 135	25.64 61	29.383 133	38.36 49	7.648 96	46.49 302	57.30 — 1	45.74 349
18.9	24.605 176	26.41 77	29.558 175	39.00 64	7.791 143	43.46 303	57.51 21	42.31 343
28.9	24.817 212	27.30 89	29.768 210	39.77 77	7.977 186	40.48 298	57.94 43	39.04 327
July 8.9	25.057 240	28.28 98	30.009 241	40.63 86	8.202 225	37.63 285	58.57 63	36.01 303
	266	106	267	96	258	261	82	271
18.9	25.323	29.34	30.276	41.59	8.460	35.02	59.39	33.30
28.8	25.606 283	30.44 110	30.560 284	42.61 102	8.743 283	32.68 234	60.38 99	31.00 230
Aug. 7.8	25.899 293	31.53 109	30.857 297	43.64 103	9.046 303	30.72 196	61.50 112	29.17 183
17.8	26.198 299	32.58 105	31.158 301	44.64 100	9.359 313	29.19 153	62.72 122	27.88 129
27.7	26.496 298	33.56 98	31.459 301	45.59 95	9.677 318	28.15 104	64.01 129	27.17 71
	294	88	298	89	317	52	131	9
Sept. 6.7	26.790	34.44	31.757	46.48	9.994	27.63	65.32	27.08
16.7	27.074 284	35.17 73	32.045 288	47.23 75	10.301 307	27.66 3	66.61 129	27.62 54
26.7	27.346 272	35.78 61	32.323 278	47.86 63	10.595 294	28.23 57	67.83 122	28.77 115
Oct. 6.6	27.602 256	36.23 45	32.582 259	48.35 49	10.869 274	29.33 110	68.94 111	30.50 173
16.6	27.839 237	36.52 29	32.826 244	48.71 36	11.117 248	30.91 158	69.92 98	32.76 226
	214	15	219	23	220	201	79	270
26.6	28.053	36.67	33.045	48.94	11.337	32.92	70.71	35.46
Nov. 5.6	28.245 192	36.70 — 3	33.242 197	49.07 13	11.525 188	35.27 235	71.28 57	38.50 304
15.5	28.408 163	36.63 7	33.409 167	49.09 — 2	11.673 148	37.89 262	71.63 35	41.77 327
25.5	28.540 132	36.48 15	33.547 138	49.06 3	11.780 107	40.65 276	71.73 — 10	45.14 337
Dec. 5.5	28.639 99	36.27 21	33.649 102	48.96 10	11.844 64	43.46 281	71.58 15	48.50 336
	60	25	65	13	19	276	41	323
15.4	28.699 21	36.02 25	33.714 25	48.83 15	11.863 27	46.22	71.17	51.73
25.4	28.720 — 19	35.77 26	33.739 — 19	48.68 18	11.836 72	48.82 260	70.53 64	54.69 296
35.4	28.701	35.51	33.720	48.50	11.764	51.17 235	69.67 86	57.30 261
Mean Place	24.550	34.24	29.500	47.15	8.657	41.98	68.180	44.14
Sec δ, Tan δ	1.037	+0.276	1.048	+0.313	1.209	−0.680	5.995	−5.911
$D_{\psi}a$, $D_{\omega}a$	+0.068	−0.008	+0.069	−0.009	+0.045	+0.019	−0.082	+0.162
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.18	+0.90	+0.17	+0.90	+0.17	+0.91	+0.16	+0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Tauri. Mag. 3.6		m Persei. Mag. 6.1		α Tauri. (*Aldebaran.*) Mag. 1.1		α Doradus. Mag. 3.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 4 24 s	° ′ +19 0 ″	h m 4 27 s	° ′ +42 53 ″	h m 4 31 s	° ′ +16 21 ″	h m 4 32 s	° ′ −55 11 ″
Jan. 0.4	8.299	32.32	61.255	60.25	31.196	12.93	21.544	92.66
	36	12	57	109	32	26	195	264
10.4	8.263	32.20	61.198	61.34	31.164	12.67	21.349	95.30
	82	15	111	91	75	26	252	220
20.4	8.181	32.05	61.087	62.25	31.089	12.41	21.097	97.50
	119	17	159	68	111	25	301	171
30.3	8.062	31.88	60.928	62.93	30.978	12.16	20.796	99.21
	148	22	200	43	143	26	339	119
Feb. 9.3	7.914	31.66	60.728	63.36	30.835	11.90	20.457	100.40
	172	26	228	14	167	28	368	65
19.3	7.742	31.40	60.500	63.50	30.668	11.62	20.089	101.05
	184	28	247	15	182	28	383	9
Mar. 1.2	7.558	31.12	60.253	63.35	30.486	11.34	19.706	101.14
	188	32	251	42	188	28	383	45
11.2	7.370	30.80	60.002	62.93	30.298	11.06	19.323	100.69
	180	34	241	70	180	26	373	97
21.2	7.190	30.46	59.761	62.23	30.118	10.80	18.950	99.72
	163	32	217	92	164	23	346	147
31.2	7.027	30.14	59.544	61.31	29.954	10.57	18.604	98.25
	136	28	181	109	137	18	312	193
Apr. 10.1	6.891	29.86	59.363	60.22	29.817	10.39	18.292	96.32
	98	22	136	123	103	11	265	235
20.1	6.793	29.64	59.227	58.99	29.714	10.28	18.027	93.97
	56	16	83	130	62	1	209	270
30.1	6.737	29.48	59.144	57.69	29.652	10.29	17.818	91.27
	12	2	25	131	22	10	146	300
May 10.1	6.725	29.46	59.119	56.38	29.630	10.39	17.672	88.27
	35	9	36	126	29	24	80	324
20.0	6.760	29.55	59.155	55.12	29.659	10.63	17.592	85.03
	85	23	98	115	74	38	10	340
30.0	6.845	29.78	59.253	53.97	29.733	11.01	17.582	81.63
	130	39	154	102	121	50	58	348
June 9.0	6.975	30.17	59.407	52.95	29.854	11.51	17.640	78.15
	171	52	208	85	161	66	128	317
18.9	7.146	30.69	59.615	52.10	30.015	12.17	17.768	74.68
	209	66	255	64	200	75	191	337
28.9	7.355	31.35	59.870	51.46	30.215	12.92	17.959	71.31
	238	76	295	43	228	85	251	319
July 8.9	7.593	32.11	60.165	51.03	30.443	13.77	18.210	68.12
	265	85	328	20	256	95	304	291
18.9	7.858	32.96	60.493	50.83	30.699	14.72	18.514	65.21
	284	91	353	2	276	96	347	256
28.8	8.142	33.87	60.846	50.85	30.975	15.68	18.861	62.65
	297	96	370	21	290	99	382	212
Aug. 7.8	8.439	34.83	61.216	51.09	31.265	16.67	19.243	60.53
	301	92	381	43	295	96	408	161
17.8	8.740	35.75	61.597	51.52	31.560	17.63	19.651	58.92
	304	92	383	61	299	88	423	105
27.8	9.044	36.67	61.980	52.13	31.859	18.51	20.074	57.87
	303	85	381	79	300	78	427	43
Sept. 6.7	9.347	37.52	62.361	52.92	32.159	19.29	20.501	57.44
	292	72	372	93	290	67	419	19
16.7	9.639	38.24	62.733	53.85	32.449	19.96	20.920	57.63
	281	64	360	105	281	52	402	83
26.7	9.920	38.88	63.093	54.90	32.730	20.48	21.322	58.46
	267	53	342	117	265	38	376	142
Oct. 6.6	10.187	39.41	63.435	56.07	32.995	20.86	21.698	59.88
	252	40	320	126	253	28	340	199
16.6	10.439	39.81	63.755	57.33	33.248	21.14	22.038	61.87
	226	28	293	133	228	12	293	246
26.6	10.665	40.09	64.048	58.66	33.476	21.26	22.331	64.33
	204	19	263	140	208	2	240	286
Nov. 5.6	10.869	40.28	64.311	60.06	33.684	21.24	22.571	67.19
	175	12	226	144	177	7	181	314
15.5	11.044	40.40	64.537	61.50	33.861	21.17	22.752	70.33
	144	3	185	147	151	16	119	333
25.5	11.188	40.43	64.722	62.97	34.012	21.01	22.871	73.66
	111	1	139	145	115	20	48	338
Dec. 5.5	11.299	40.42	64.861	64.42	34.127	20.81	22.919	77.04
	69	4	87	142	76	22	20	330
15.5	11.368	40.38	64.948	65.84	34.203	20.59	22.899	80.34
	31	6	33	135	37	23	86	311
25.4	11.399	40.32	64.981	67.19	34.240	20.36	22.813	83.45
	14	8	21	121	8	23	157	281
35.4	11.385	40.24	64.960	68.40	34.232	20.13	22.656	86.26
Mean Place	7.094	39.17	59.554	63.12	30.001	20.55	19.880	74.01
Sec δ, Tan δ	1.058	+0.344	1.365	+0.929	1.042	+0.293	1.752	−1.439
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.070	−0.009	+0.084	−0.024	+0.068	−0.007	+0.026	+0.036
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.16	+0.91	+0.16	+0.92	+0.15	+0.93	+0.15	+0.93

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Eridani. Mag. 4.1		53 Eridani. Mag. 4.0		τ Tauri. Mag. 4.3		α Cœli. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	4 32	− 3 30	4 34	−14 27	4 37	+22 48	4 38	−42 0
	s	″	s	″	s	″	s	″
Jan. 0.4	29.285	42.82	40.199	25.72	38.573	30.93	6.044	54.88
10.4	29.244 41	44.02 120	40.150 49	27.39 167	38.544 29	31.02 9	5.931 113	57.39 251
20.4	29.166 78	45.09 107	40.061 89	28.87 148	38.469 75	31.05 3	5.770 161	59.53 214
30.3	29.052 114	45.99 90	39.937 124	30.06 119	38.357 112	31.03 2	5.567 203	61.24 171
Feb. 9.3	28.908 144	46.70 71	39.783 154	30.99 93	38.212 145	30.95 8	5.331 236	62.49 125
	164	50	178	62	174	13	263	76
19.3	28.744	47.20	39.605	31.61	38.038	30.82	5.068	63.25
Mar. 1.3	28.563 181	47.51 31	39.413 192	31.93 32	37.847 191	30.60 22	4.791 277	63.51 26
11.2	28.379 184	47.61 10	39.219 194	31.93 0	37.652 195	30.33 27	4.510 281	63.27 24
21.2	28.200 179	47.50 11	39.029 190	31.64 29	37.461 191	30.00 33	4.236 274	62.55 72
31.2	28.036 164	47.18 32	38.855 174	31.03 61	37.289 172	29.61 39	3.979 257	61.37 118
	139	54	152	89	146	40	227	163
Apr. 10.1	27.897	46.64	38.703	30.14	37.143	29.21	3.752	59.74
20.1	27.790 107	45.89 75	38.586 117	28.97 117	37.029 114	28.87 34	3.560 192	57.73 201
30.1	27.721 69	44.93 96	38.503 83	27.53 144	36.961 68	28.54 33	3.414 146	55.36 237
May 10.1	27.693 28	43.77 116	38.464 39	25.85 168	36.938 23	28.29 25	3.319 95	52.67 269
20.0	27.710 17	42.42 135	38.469 5	23.95 190	36.961 23	28.15 14	3.277 42	49.74 293
	61	150	52	204	70	0	13	310
30.0	27.771	40.92	38.521	21.91	37.031	28.15	3.290	46.64
June 9.0	27.877 106	39.28 164	38.617 96	19.72 219	37.152 121	28.27 12	3.358 68	43.44 320
19.0	28.022 145	37.53 175	38.752 135	17.45 227	37.315 163	28.51 24	3.479 121	40.21 323
28.9	28.203 181	35.75 178	38.927 175	15.17 228	37.518 203	28.91 40	3.650 171	37.02 319
July 8.9	28.415 212	33.95 180	39.133 206	12.93 224	37.751 233	29.43 52	3.866 216	33.98 304
	237	176	234	213	263	61	254	281
18.9	28.652	32.19	39.367	10.80	38.014	30.04	4.120	31.17
28.8	28.909 257	30.54 165	39.623 256	8.83 197	38.300 286	30.74 70	4.407 287	28.66 251
Aug. 7.8	29.182 273	29.04 150	39.894 271	7.11 172	38.596 296	31.49 75	4.720 313	26.55 211
17.8	29.462 280	27.74 130	40.175 281	5.66 145	38.904 308	32.29 80	5.050 330	24.89 166
27.8	29.745 283	26.71 103	40.460 285	4.57 109	39.214 310	33.05 76	5.391 341	23.74 115
	280	76	285	71	309	75	343	59
Sept. 6.7	30.025	25.95	40.745	3.86	39.523	33.80	5.734	23.15
16.7	30.300 275	25.50 45	41.023 278	3.54 32	39.828 305	34.47 67	6.072 338	23.15 0
26.7	30.564 264	25.39 11	41.291 268	3.65 11	40.122 294	35.11 64	6.399 327	23.73 58
Oct. 6.7	30.816 252	25.58 19	41.546 255	4.18 53	40.402 280	35.65 54	6.705 306	24.89 116
16.6	31.052 236	26.10 52	41.782 236	5.09 91	40.668 266	36.11 46	6.987 282	26.58 169
	214	78	215	126	247	38	250	216
26.6	31.266	26.88	41.997	6.35	40.915	36.49	7.237	28.74
Nov. 5.6	31.457 191	27.91 103	42.188 191	7.89 154	41.136 221	36.84 35	7.449 212	31.29 255
15.5	31.621 164	29.12 121	42.350 162	9.67 178	41.329 193	37.11 27	7.621 172	34.14 285
25.5	31.756 135	30.45 133	42.480 130	11.59 192	41.490 161	37.34 23	7.746 125	37.19 305
Dec. 5.5	31.855 99	31.84 139	42.575 95	13.59 200	41.619 129	37.53 19	7.821 75	40.29 310
	66	140	56	199	85	17	24	306
15.5	31.921 26	33.24	42.631 18	15.58	41.704 45	37.70	7.845	43.35
25.4	31.947 15	34.59 135	42.649 23	17.48 190	41.749 1	37.86 16	7.816 29	46.27 292
35.4	31.932	35.85 126	42.626	19.25 177	41.748	38.00 14	7.736 80	48.93 266
Mean Place	28.208	31.52	39.121	12.51	37.287	37.62	4.706	37.80
Sec δ, Tan δ	1.002	−0.061	1.033	−0.258	1.085	+0.420	1.346	−0.901
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.060	+0.002	+0.055	+0.006	+0.072	−0.010	+0.039	+0.021
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.15	+0.93	+0.14	+0.93	+0.14	+0.94	+0.14	+0.94

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 848. Mag. 6.0		4 Camelop. Mag. 5.4		μ Eridani. Mag. 4.2		π^3 Orionis. Mag. 3.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 4 38	° ′ ″ +75 47	h m s 4 41	° ′ ″ +56 37	h m s 4 41	° ′ ″ − 3 23	h m s 4 45	° ′ ″ + 6 49
Jan. 0.4	32.06	73.39	37.314	17.91	40.192	52.12	40.669	31.61
10.4	31.77 29	75.99 260	37.235 79	19.73 182	40.159 33	53.34 122	40.647 22	30.86 75
20.4	31.32 45	78.26 227	37.084 151	21.31 158	40.087 72	54.43 109	40.583 64	30.20 66
30.3	30.74 58	80.10 184	36.867 217	22.57 126	39.978 109	55.35 92	40.481 102	29.62 58
Feb. 9.3	30.04 70	81.47 137	36.596 271	23.49 92	39.839 139	56.07 72	40.348 133	29.14 48
	78	84	316	51	165	53	159	39
19.3	29.26	82.31	36.280	24.00	39.674	56.60	40.189	28.75
Mar. 1.3	28.44 82	82.58 — 27	35.941 339	24.12 — 12	39.495 179	56.92 32	40.014 175	28.46 29
11.2	27.61 83	82.30 28	35.593 348	23.82 30	39.310 185	57.05 — 13	39.831 183	28.28 18
21.2	26.80 81	81.47 83	35.255 338	23.13 69	39.128 182	56.97 8	39.652 179	28.21 — 7
31.2	26.06 74	80.13 134	34.945 310	22.07 106	38.961 167	56.67 30	39.486 166	28.25 4
	64	178	266	138	145	51	144	16
Apr. 10.1	25.42	78.35	34.679	20.69	38.816	56.16	39.342	28.41
20.1	24.90 52	76.23 212	34.469 210	19.08 161	38.703 113	55.43 73	39.231 111	28.72 31
30.1	24.53 37	73.81 242	34.326 143	17.28 180	38.626 77	54.51 92	39.158 73	29.17 45
May 10.1	24.32 21	71.22 259	34.259 67	15.37 191	38.591 35	53.37 114	39.126 — 32	29.77 60
20.0	24.27 — 5	68.53 269	34.270 — 11	13.44 193	38.600 — 9	52.06 131	39.139 13	30.53 76
	12	268	87	189	52	147	57	90
30.0	24.39	65.85	34.357	11.55	38.652	50.59	39.196	31.43
June 9.0	24.67 28	63.24 261	34.521 164	9.77 178	38.749 97	48.97 162	39.296 100	32.46 103
19.0	25.11 44	60.81 243	34.755 234	8.14 163	38.886 137	47.26 171	39.437 141	33.61 115
28.9	25.69 58	58.60 221	35.054 299	6.71 143	39.060 174	45.49 177	39.616 179	34.85 124
July 8.9	26.40 71	56.70 190	35.409 355	5.52 119	39.266 206	43.71 178	39.827 211	36.13 128
	81	159	403	92	231	173	236	130
18.9	27.21	55.11	35.812	4.60	39.497	41.98	40.063	37.43
28.8	28.11 90	53.91 120	36.250 438	3.98 62	39.750 253	40.35 163	40.321 258	38.70 127
Aug. 7.8	29.08 97	53.10 81	36.718 468	3.64 34	40.018 268	38.86 149	40.593 272	39.89 119
17.8	30.10 102	52.73 37	37.203 485	3.61 — 3	40.295 277	37.58 128	40.875 282	40.98 109
27.8	31.15 105	52.72 — 1	37.698 495	3.87 26	40.576 281	36.54 104	41.162 287	41.91 93
	105	43	497	52	281	75	286	74
Sept. 6.7	32.20	53.15	38.195	4.39	40.857	35.79	41.448	42.65
16.7	33.25 105	54.00 85	38.686 491	5.20 81	41.134 277	35.34 45	41.731 283	43.18 53
26.7	34.27 102	55.24 124	39.165 479	6.27 107	41.402 268	35.22 — 12	42.005 274	43.47 29
Oct. 6.7	35.24 97	56.86 162	39.622 457	7.56 129	41.657 255	35.44 22	42.268 263	43.54 — 7
16.6	36.14 90	58.82 196	40.054 432	9.08 152	41.897 240	35.95 51	42.517 249	43.38 16
	82	230	398	172	220	79	231	36
26.6	36.96	61.12	40.452	10.80	42.117	36.74	42.748	43.02
Nov. 5.6	37.69 73	63.68 256	40.807 355	12.68 188	42.316 199	37.77 103	42.956 208	42.49 53
15.5	38.29 60	66.47 279	41.115 308	14.70 202	42.489 173	39.00 123	43.140 184	41.82 67
25.5	38.75 46	69.42 295	41.367 252	16.83 213	42.633 144	40.34 134	43.296 156	41.04 78
Dec. 5.5	39.07 32	72.46 304	41.555 188	19.00 217	42.743 110	41.75 141	43.418 122	40.22 82
	15	305	120	216	73	142	86	83
15.5	39.22	75.51	41.675	21.16	42.816	43.17	43.504	39.39
25.4	39.20 2	78.47 296	41.720 45	23.27 211	42.850 34	44.55 138	43.551 47	38.58 81
35.4	39.02 18	81.25 278	41.690 30	25.22 195	42.844 6	45.83 128	43.555 4	37.82 76
Mean Place	26.534	73.40	34.941	19.92	39.086	40.76	39.515	41.30
Sec δ, Tan δ	4.077	+3.952	1.818	+1.518	1.002	−0.059	1.007	+0.120
$D_{\psi a}$, $D_{\omega a}$	+0.159	−0.092	+0.099	−0.034	+0.060	+0.001	+0.064	−0.003
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.14	+0.94	+0.13	+0.94	+0.13	+0.94	+0.13	+0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	9 Camelop. Mag. 4.4		i Tauri. Mag. 5.1		π^5 Orionis. Mag. 3.9		ι Aurigæ. Mag. 2.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 4 46	° ′ ″ +66 12	h m s 4 46	° ′ ″ +18 42	h m s 4 50	° ′ ″ + 2 18	h m s 4 51	° ′ ″ +33 2
Jan. 0.4	26.45	49.00	53.315	28.46	15.519	46.46	60.063	38.25
10.4	26.32 13	51.27 227	53.294 21	28.33 13	15.497 22	45.47 99	60.043 20	38.92 67
20.4	26.10 22	53.28 201	53.230 64	28.19 14	15.433 64	44.59 88	59.970 73	39.46 54
30.3	25.79 31	54.92 164	53.126 104	28.06 13	15.333 100	43.86 73	59.854 116	39.90 44
Feb. 9.3	25.40 39	56.13 121	52.985 141	27.90 16	15.199 134	43.26 60	59.699 155	40.23 33
	44	77	163	17	160	46	190	12
19.3	24.96	56.90 27	52.822	27.73	15.039	42.80	59.509	40.35 —
Mar. 1.3	24.48 48	57.17 — 22	52.639 183	27.51 22	14.862 177	42.47 33	59.300 209	40.32 3
11.2	23.99 49	56.95 67	52.447 192	27.28 23	14.678 184	42.31 16	59.084 216	40.09 23
21.2	23.51 48	56.28 114	52.259 188	27.04 24	14.497 181	42.30 — 1	58.871 213	39.69 40
31.2	23.07 44	55.14 152	52.087 172	26.79 25	14.329 168	42.46 16	58.674 197	39.17 52
	38		148	23	147	30	174	65
Apr. 10.2	22.69	53.62	51.939	26.56	14.182	42.76	58.500	38.52
20.1	22.38 31	51.76 186	51.822 117	26.39 17	14.065 117	43.25 49	58.367 133	37.79 73
30.1	22.16 22	49.68 208	51.749 73	26.28 11	13.987 78	43.91 66	58.276 91	37.02 77
May 10.1	22.03 13	47.42 226	51.714 35	26.27 1	13.947 40	44.73 82	58.234 — 42	36.26 76
20.0	22.01 — 2	45.09 233	51.729 — 15	26.36 — 9	13.951 — 4	45.72 99	58.244 10	35.55 71
	9	232	62	22	51	115	63	63
30.0	22.10	42.77	51.791	26.58	14.002	46.87	58.307	34.92
June 9.0	22.29 19	40.55 222	51.900 109	26.89 31	14.094 92	48.14 127	58.423 116	34.39 53
19.0	22.57 28	38.44 211	52.049 149	27.36 47	14.227 133	49.52 138	58.585 162	34.00 39
28.9	22.94 37	36.57 187	52.237 188	27.94 58	14.398 171	50.98 146	58.792 207	33.75 25
July 8.9	23.39 45	34.94 163	52.459 222	28.59 65	14.600 202	52.47 149	59.032 240	33.65 — 10
	51	134	247	77	229	148	277	5
18.9	23.90	33.60 103	52.706	29.36	14.829	53.95	59.309	33.70
28.9	24.47 57	32.57 67	52.978 272	30.18 82	15.078 249	55.38 143	59.609 300	33.89 19
Aug. 7.8	25.08 61	31.90 33	53.264 286	31.00 82	15.345 267	56.69 131	59.927 318	34.21 32
17.8	25.72 64	31.57 — 6	53.562 298	31.81 81	15.622 277	57.85 116	60.259 332	34.62 41
27.8	26.37 65	31.63 39	53.863 301	32.57 76	15.905 283	58.83 98	60.595 336	35.13 51
	67		301	71	283	73	339	60
Sept. 6.7	27.04	32.02	54.164	33.28	16.188	59.56	60.934	35.73
16.7	27.70 66	32.74 72	54.462 298	33.87 59	16.466 278	60.04 48	61.270 336	36.35 62
26.7	28.34 64	33.85 111	54.753 291	34.38 51	16.739 273	60.26 — 22	61.597 327	37.02 67
Oct. 6.7	28.95 61	35.25 140	55.031 278	34.75 37	17.001 262	60.19 7	61.915 318	37.72 70
16.6	29.53 58	36.93 168	55.293 262	35.02 27	17.249 248	59.86 33	62.214 299	38.42 70
	54	196	248	15	230	57	282	74
26.6	30.07	38.89	55.541	35.17	17.479	59.29	62.496	39.16
Nov. 5.6	30.55 48	41.12 223	55.762 221	35.23 6	17.687 208	58.53 76	62.753 257	39.90 74
15.5	30.95 40	43.53 241	55.961 199	35.23 0	17.872 185	57.60 93	62.979 226	40.68 78
25.5	31.28 33	46.06 253	56.128 167	35.16 7	18.027 155	56.56 104	63.173 194	41.46 78
Dec. 5.5	31.53 25	48.67 261	56.261 133	35.09 7	18.148 121	55.45 111	63.328 155	42.25 79
	14	263	95	11	87	112	109	78
15.5	31.67	51.30	56.356	34.98	18.235	54.33	63.437	43.03
25.4	31.72 — 5	53.90 260	56.408 52	34.88 10	18.281 46	53.26 107	63.499 62	43.79 76
35.4	31.66 — 6	56.31 241	56.417 9	34.76 12	18.286 5	52.24 102	63.511 12	44.52 73
Mean Place	23.146	50.42	52.059	36.22	14.374	56.96	58.583	44.04
Sec δ, Tan δ	2.479	+2.268	1.056	+0.339	1.001	+0.040	1.193	+0.650
$D_{\psi a}$, $D_{\omega a}$	+0.118	−0.048	+0.070	−0.007	+0.062	−0.001	+0.078	−0.013
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.13	+0.95	+0.12	+0.95	+0.12	+0.95	+0.12	+0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Aurigæ. Var. 3.0–4.5		β Camelop. Mag. 4.2		ζ Aurigæ. Mag. 3.9		ι Tauri. Mag. 4.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	4 56	+43 42	4 56	+60 19	4 57	+40 57	4 58	+21 28
	s	″	s	″	s	″	s	″
Jan. 0.4	28.198	34.44	36.31	51.21	7.223	48.98	30.824	44.34
	26	123	7	207	20	110	10	2
10.4	28.172	35.67	36.24	53.28	7.203	50.08	30.814	44.36
	84	110	15	184	77	96	55	3
20.4	28.088	36.77	36.09	55.12	7.126	51.04	30.759	44.39
	138	90	23	153	130	79	98	1
30.3	27.950	37.67	35.86	56.65	6.996	51.83	30.661	44.38
	185	67	30	117	174	59	136	3
Feb. 9.3	27.765	38.34	35.56	57.82	6.822	52.42	30.525	44.35
	221	41	34	76	210	34	164	9
19.3	27.544	38.75	35.22	58.58	6.612	52.76	30.361	44.26
	247	12	38	35	234	10	186	12
Mar. 1.3	27.297	38.87	34.84	58.93	6.378	52.86	30.175	44.14
	257	17	39	12	246	17	195	20
11.2	27.040	38.70	34.45	58.81	6.132	52.69	29.980	43.94
	253	45	39	55	241	41	194	23
21.2	26.787	38.25	34.06	58.26	5.891	52.28	29.786	43.71
	236	71	36	94	225	65	179	27
31.2	26.551	37.54	33.70	57.32	5.666	51.63	29.607	43.44
	205	90	31	131	197	84	159	27
Apr. 10.2	26.346	36.64	33.39	56.01	5.469	50.79	29.448	43.17
	166	109	26	160	156	99	124	27
20.1	26.180	35.55	33.13	54.41	5.313	49.80	29.324	42.90
	113	121	19	181	109	109	87	22
30.1	26.067	34.34	32.94	52.57	5.204	48.71	29.237	42.68
	59	127	10	199	55	114	42	15
May 10.1	26.008	33.07	32.84	50.58	5.149	47.57	29.195	42.53
	1	128	2	206	3	114	3	8
20.0	26.009	31.79	32.82	48.52	5.152	46.43	29.198	42.45
	62	124	6	207	60	108	53	2
30.0	26.071	30.55	32.88	46.45	5.212	45.35	29.251	42.47
	120	113	15	201	117	100	99	14
June 9.0	26.191	29.42	33.03	44.44	5.329	44.35	29.350	42.61
	178	104	22	186	171	87	142	26
19.0	26.369	28.38	33.25	42.58	5.500	43.48	29.492	42.87
	226	86	30	169	218	71	182	37
28.9	26.595	27.52	33.55	40.89	5.718	42.77	29.674	43.24
	271	67	37	118	261	54	217	48
July 8.9	26.866	26.85	33.92	39.41	5.979	42.23	29.891	43.72
	308	49	42	121	297	36	244	55
18.9	27.174	26.36	34.34	38.20	6.276	41.87	30.135	44.27
	338	29	46	93	324	18	270	63
28.9	27.512	26.07	34.80	37.27	6.600	41.69	30.405	44.90
	360	9	50	62	317	1	287	67
Aug. 7.8	27.872	25.98	35.30	36.65	6.947	41.68	30.692	45.57
	376	10	53	32	361	18	299	67
17.8	28.248	26.08	35.83	36.33	7.308	41.86	30.991	46.24
	385	29	51	0	369	32	304	66
27.8	28.633	26.37	36.37	36.33	7.677	42.18	31.295	46.90
	387	45	55	30	372	47	305	60
Sept. 6.7	29.020	26.82	36.92	36.63	8.049	42.65	31.600	47.50
	385	60	54	60	370	60	305	55
16.7	29.405	27.42	37.46	37.23	8.419	43.25	31.905	48.05
	378	77	54	89	363	72	308	46
26.7	29.783	28.19	38.00	38.12	8.782	43.97	32.203	48.51
	365	87	52	117	351	82	288	38
Oct. 6.7	30.148	29.06	38.52	39.29	9.133	44.79	32.491	48.89
	348	101	49	143	334	91	275	28
16.6	30.496	30.07	39.01	40.72	9.467	45.70	32.766	49.17
	324	111	46	168	313	99	259	20
26.6	30.820	31.18	39.47	42.40	9.780	46.69	33.025	49.37
	299	122	41	188	287	108	237	15
Nov. 5.6	31.119	32.40	39.88	44.28	10.067	47.77	33.262	49.52
	264	128	36	207	255	116	212	9
15.6	31.383	33.68	40.24	46.35	10.322	48.93	33.474	49.61
	223	137	31	220	218	120	182	5
25.5	31.606	35.05	40.55	48.55	10.540	50.13	33.656	49.66
	179	139	23	231	174	121	148	5
Dec. 5.5	31.785	36.44	40.78	50.86	10.714	51.37	33.804	49.71
	127	143	16	233	125	126	109	4
15.5	31.912	37.87	40.94	53.19	10.839	52.63	33.913	49.75
	71	139	7	230	71	123	65	4
25.4	31.983	39.26	41.01	55.49	10.910	53.86	33.978	49.79
	12	133	2	219	16	116	20	5
35.4	31.995	40.59	40.99	57.68	10.926	55.02	33.998	49.84
Mean Place	26.433	39.07	33.642	54.02	5.544	54.01	29.517	52.12
Sec δ, Tan δ	1.383	+0.956	2.020	+1.755	1.324	+0.868	1.075	+0.393
$D_{\psi a}$, $D_{\omega a}$	+0.086	−0.017	+0.106	−0.032	+0.083	−0.016	+0.071	−0.007
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.11	+0.96	+0.11	+0.96	+0.11	+0.96	+0.11	+0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Orionis. Mag. 4.6		η Aurigæ. Mag. 3.3		ϵ Leporis. Mag. 3.3		β Eridani. Mag. 2.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	5 0	+15 17	5 1	+41 7	5 2	−22 28	5 4	− 5 11
Jan. 0.4	11.309	44.48	8.444	49.32	13.259	38.51	5.008	17.06
	8	32	18	110	39	213	18	139
10.4	11.301	44.16	8.426	50.42	13.220	40.64	4.990	18.45
	53	29	75	99	81	188	56	122
20.4	11.248	43.87	8.351	51.41	13.139	42.52	4.934	19.67
	93	25	124	82	125	156	99	104
30.4	11.155	43.62	8.227	52.23	13.014	44.08	4.835	20.71
	130	21	173	62	157	123	132	84
Feb. 9.3	11.025	43.41	8.054	52.85	12.857	45.31	4.703	21.55
	159	21	208	39	185	87	160	63
19.3	10.866	43.20	7.846	53.24	12.672	46.18	4.543	22.18
	178	20	235	12	204	48	176	39
Mar. 1.3	10.688	43.00	7.611	53.36	12.468	46.66	4.367	22.57
	189	18	244	13	213	13	189	16
11.2	10.499	42.82	7.367	53.23	12.255	46.79	4.178	22.73
	187	16	244	39	211	25	186	4
21.2	10.312	42.66	7.123	52.84	12.044	46.54	3.992	22.69
	176	13	227	62	200	62	177	29
31.2	10.136	42.53	6.896	52.22	11.844	45.92	3.815	22.40
	153	8	200	81	179	97	158	52
Apr. 10.2	9.983	42.45	6.696	51.41	11.665	44.95	3.657	21.88
	123	3	160	98	151	130	128	74
20.1	9.860	42.42	6.536	50.43	11.514	43.65	3.529	21.14
	85	5	114	107	116	162	94	96
30.1	9.775	42.47	6.422	49.36	11.398	42.03	3.435	20.18
	43	15	58	113	73	190	58	116
May 10.1	9.732	42.62	6.364	48.23	11.325	40.13	3.377	19.02
	2	28	4	114	30	213	11	133
20.1	9.734	42.90	6.360	47.09	11.295	38.00	3.366	17.69
	48	38	56	110	17	233	33	150
30.0	9.782	43.28	6.416	45.99	11.312	35.67	3.399	16.19
	91	50	113	101	61	248	73	165
June 9.0	9.873	43.78	6.529	44.98	11.373	33.19	3.472	14.54
	135	61	167	92	106	255	116	176
19.0	10.008	44.39	6.696	44.06	11.479	30.64	3.588	12.78
	174	72	214	74	147	259	150	178
28.9	10.182	45.11	6.910	43.32	11.626	28.05	3.738	11.00
	207	80	256	58	182	252	186	181
July 8.9	10.389	45.91	7.166	42.74	11.808	25.53	3.924	9.19
	235	85	294	39	215	241	216	177
18.9	10.624	46.76	7.460	42.35	12.023	23.12	4.140	7.42
	258	88	324	23	240	221	236	167
28.9	10.882	47.64	7.784	42.12	12.263	20.91	4.376	5.75
	275	87	316	5	262	196	256	151
Aug. 7.8	11.157	48.51	8.130	42.07	12.525	18.95	4.632	4.24
	286	82	360	12	277	163	270	131
17.8	11.443	49.33	8.490	42.19	12.802	17.32	4.902	2.93
	292	74	369	27	288	123	278	106
27.8	11.735	50.07	8.859	42.46	13,090	16.09	5.180	1.87
	295	65	374	43	291	80	280	74
Sept. 6.8	12.030	50.72	9.233	42.89	13.381	15.29	5.460	1.13
	294	52	373	55	291	31	279	43
16.7	12.324	51.24	9.606	43.44	13.672	14.95	5.739	0.70
	287	37	365	67	284	15	273	8
26.7	12.611	51.61	9.971	44.11	13.956	15.10	6.012	0.62
	278	21	353	79	274	63	265	26
Oct. 6.7	12.889	51.82	10.324	44.90	14.230	15.73	6.277	0.88
	266	7	338	87	261	108	252	59
16.6	13.155	51.89	10.662	45.77	14.491	16.81	6.529	1.47
	249	5	318	97	240	149	235	89
26.6	13.404	51.84	10.980	46.74	14.731	18.30	6.764	2.36
	229	17	292	106	215	186	217	115
Nov. 5.6	13.633	51.67	11.272	47.80	14.946	20.16	6.981	3.51
	205	27	260	112	189	213	192	135
15.6	13.838	51.40	11.532	48.92	15.135	22.29	7.173	4.86
	176	32	222	119	154	234	163	148
25.5	14.014	51.08	11.754	50.11	15.289	24.63	7.336	6.34
	144	34	180	123	117	244	129	160
Dec. 5.5	14.158	50.74	11.934	51.34	15.406	27.07	7.465	7.94
	105	36	130	126	78	245	94	158
15.5	14.263	50.38	12.064	52.60	15.484	29.52	7.559	9.52
	64	34	76	123	34	238	51	154
25.5	14.327	50.04	12.140	53.83	15.518	31.90	7.610	11.06
	20	30	21	119	11	223	12	146
35.4	14.347	49.74	12.161	55.02	15.507	34.13	7.622	12.52
Mean Place	10.065	53.22	6.755	54.56	12.043	24.54	3.844	5.33
Sec δ, Tan δ	1.037	+0.274	1.328	+0.873	1 082	−0.414	1.004	−0.091
Dψα, Dωα	+0.068	−0.005	+0.084	−0.015	+0.051	+0.007	+0.059	+0.001
Dψδ, Dωδ	+0.10	+0.97	+0.10	+0.97	+0.10	+0.97	+0.10	+0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aurigæ. Mag. 4.8		μ Leporis. Mag. 3.3		19 H. Camelop. Mag. 5.2		β Orionis. (*Rigel.*) Mag. 0.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 5 8 s	° ′ +38 23 ″	h m 5 9 s	° ′ −16 17 ″	h m 5 9 s	° ′ +79 8 ″	h m 5 10 s	° ′ − 8 17 ″
Jan. 0 4	10.973	35.09	29.530	57.35	57.46	43.93	51.371	34.28
10.4	10.966 7	36.06 97	29.508 22	59.27 192	57.20 26	46.81 288	51.356 15	35.85 157
20.4	10.904 62	36.95 89	29.440 68	60.96 169	56.73 47	49.43 262	51.301 55	37.23 138
30.4	10.791 113	37.69 74	29.333 107	62.40 144	56.06 67	51.68 225	51.204 97	38.40 117
Feb. 9.3	10.632 159	38.26 57	29.192 141	63.53 113	55.22 84	53.49 181	51.072 132	39.34 94
	197	38	171	83	98	130	157	69
19.3	10.435	38.64	29.021	64.36	54.24	54.79	50.915	40.03
Mar. 1.3	10.214 221	38.79 −15	28.830 191	64.88 52	53.18 106	55.55 76	50.735 180	40.47 44
11.2	9.980 234	38.70 9	28.630 200	65.05 −17	52.09 109	55.71 −16	50.544 191	40.66 −19
21.2	9.746 234	38.39 31	28.429 201	64.90 15	50.99 110	55.31 40	50.353 191	40.58 8
31.2	9.524 222	37.87 52	28.237 192	64.44 46	49.96 103	54.36 95	50.172 181	40.28 30
	195	70	171	78	94	145	164	58
Apr. 10.2	9.329	37.17	28.066	63.66	49.02	52.91	50.008	39.70
20.1	9.171 158	36.35 82	27.921 145	62.58 108	48.23 79	51.03 188	49.873 135	38.88 82
30.1	9.057 114	35.41 94	27.811 110	61.23 135	47.60 63	48.78 225	49.773 100	37.81 107
May 10.1	8.993 64	34.43 98	27.741 70	59.61 162	47.16 44	46.26 252	49.708 65	36.56 125
20.1	8.984 9	33.44 99	27.713 28	57.77 184	46.93 23	43.57 269	49.687 21	35.08 148
	47	94	16	203	2	278	22	165
30.0	9.031	32.50	27.729	55.74	46.91	40.79	49.709	33.43
June 9.0	9.134 103	31.61 89	27.790 61	53.56 218	47.11 20	38.02 277	49.775 66	31.63 180
19.0	9.287 153	30.85 76	27.893 103	51.28 228	47.51 40	35.33 269	49.883 108	29.74 189
28.9	9.486 199	30.21 64	28.034 141	48.97 231	48.10 59	32.81 252	50.026 143	27.81 193
July 8.9	9.729 243	29.74 47	28.212 178	46.67 230	48.88 78	30.51 230	50.207 181	25.87 194
	277	33	209	220	92	201	208	189
18.9	10.006	29.41	28.421	44.47	49.80	28.50	50.415	23.98
28.9	10.312 306	29.23 18	28.654 233	42.43 204	50.87 107	26.82 168	50.645 230	22.21 177
Aug. 7.8	10.642 330	29.23 0	28.909 255	40.60 183	52.04 117	25.52 130	50.897 252	20.59 162
17.8	10.988 346	29.36 13	29.177 268	39.07 153	53.31 127	24.59 93	51.165 268	19.23 136
27.8	11.342 354	29.61 25	29.456 279	37.87 120	54.63 132	24.09 50	51.441 276	18.14 109
	360	37	283	81	137	8	280	77
Sept. 6.8	11.702	29.98	29.739	37.06	56.00	24.01	51.721	17.37
16.7	12.060 358	30.46 48	30.023 284	36.67 39	57.37 137	24.36 35	52.000 279	16.94 43
26.7	12.414 354	31.02 56	30.303 280	36.72 −5	58.73 136	25.13 77	52.276 276	16.89 −5
Oct. 6.7	12.759 345	31.68 66	30.574 271	37.20 48	60.05 132	26.33 120	52.543 267	17.21 32
16.6	13.088 329	32.40 72	30.831 257	38.10 90	61.31 126	27.90 157	52.799 256	17.90 69
	313	81	241	128	116	196	240	99
26.6	13.401	33.21	31.072	39.38	62.47	29.86	53.039	18.89
Nov. 5.6	13.690 289	34.08 87	31.292 220	41.00 162	63.52 105	32.18 232	53.262 223	20.18 129
15.6	13.949 259	35.01 93	31.486 194	42.87 187	64.43 91	34.78 260	53.458 196	21.68 150
25.5	14.172 223	35.99 98	31.649 163	44.93 206	65.17 74	37.63 285	53.626 168	23.35 167
Dec. 5.5	14.354 182	37.03 104	31.777 128	47.09 216	65.72 55	40.65 302	53.759 133	25.11 176
	138	107	90	219	34	311	99	177
15.5	14.492	38.10	31.867	49.28	66.06	43.76	53.858	26.88
25.5	14.576 84	39.17 107	31.916 49	51.40 212	66.17 11	46.87 311	53.913 55	28.61 173
35.4	14.605 29	40.21 104	31.922 6	53.38 198	66.06	49.88 301	53.930 17	30.25 164
Mean Place	9.355	41.11	28.326	44.26	50.252	46.52	50.186	22.17
Sec δ, Tan δ	1.276	+0.792	1.042	−0.292	5.310	+5.215	1.011	−0.146
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.082	−0.012	+0.054	+0.004	+0.196	−0.076	+0.057	+0.002
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.09	+0.97	+0.09	+0.98	+0.09	+0.98	+0.08	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Aurigæ. (*Capella.*) Mag. 0.2		λ Aurigæ. Mag. 4.8		τ Orionis. Mag. 3.7		o Columbæ. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 5 10	° ′ ″ +45 55	h m s 5 13	° ′ ″ +40 1	h m s 5 13	° ′ ″ − 6 55	h m s 5 14	° ′ ″ −34 58
Jan. 0.4	61.732	11.42	44.993	49.74	53.217	47.30	43.657	26.67
	10	136	1	105	9	151	54	262
10.4	61.722	12.78	44.994	50.79	53.208	48.81	43.603	29.29
	75	124	57	97	52	134	103	233
20.4	61.647	14.02	44.937	51.76	53.156	50.15	43.500	31.62
	131	107	111	83	92	113	148	196
30.4	61.516	15.09	44.826	52.59	53.064	51.28	43.352	33.58
	183	83	159	64	129	92	186	155
Feb. 9.3	61.333	15.92	44.667	53.23	52.935	52.20	43.166	35.13
	223	56	196	45	157	67	218	112
19.3	61.110	16.48	44.471	53.68	52.778	52.87	42.948	36.25
	251	30	225	20	178	45	239	67
Mar. 1.3	60.859	16.78	44.246	53.88	52.600	53.32	42.709	36.92
	266	5	239	4	190	19	252	22
11.3	60.593	16.73	44.007	53.84	52.410	53.51	42.457	37.14
	268	31	240	29	190	4	253	26
21.2	60.325	16.42	43.767	53.55	52.220	53.47	42.204	36.88
	251	63	228	51	182	30	241	69
31.2	60.074	15.79	43.539	53.04	52.038	53.17	41.963	36.19
	225	88	202	73	163	52	221	113
Apr. 10.2	59.849	14.91	43.337	52.31	51.875	52.65	41.742	35.06
	186	107	166	87	137	77	193	152
20.1	59.663	13.84	43.171	51.44	51.738	51.88	41.549	33.54
	134	121	121	99	102	98	154	189
30.1	59.529	12.63	43.050	50.45	51.636	50.90	41.395	31.65
	79	133	69	106	64	121	112	223
May 10.1	59.450	11.30	42.981	49.39	51.572	49.69	41.283	29.42
	18	138	15	108	22	139	65	251
20.1	59.432	9.92	42.966	48.31	51.550	48.30	41.218	26.91
	42	136	42	106	21	158	15	272
30.0	59.474	8.56	43.008	47.25	51.571	46.72	41.203	24.19
	105	130	99	99	65	170	31	289
June 9.0	59.579	7.26	43.107	46.26	51.636	45.02	41.237	21.30
	163	122	151	89	105	181	83	297
19.0	59.742	6.04	43.258	45.37	51.741	43.21	41.320	18.33
	216	106	199	76	143	187	123	300
29.0	59.958	4.98	43.457	44.61	51.884	41.34	41.449	15.33
	263	91	242	62	177	188	171	293
July 8.9	60.221	4.07	43.699	43.99	52.061	39.46	41.620	12.40
	302	71	279	47	208	183	211	278
18.9	60.523	3.36	43.978	43.52	52.269	37.63	41.831	9.62
	340	53	310	30	230	172	2 2	254
28.9	60.863	2.83	44.288	43.22	52.499	35.91	42.073	7.08
	362	33	333	14	251	155	270	223
Aug. 7.8	61.225	2.50	44.621	43.08	52.750	34.36	42.343	4.85
	383	14	351	1	265	135	291	184
17.8	61.608	2.36	44.972	43.09	53.015	33.01	42.634	3.01
	394	8	362	14	274	107	306	140
27.8	62.002	2.44	45.334	43.23	53.289	31.94	42.940	1.61
	401	25	367	29	278	76	315	89
Sept. 6.8	62.403	2.69	45.701	43.52	53.567	31.18	43.255	0.72
	401	42	369	40	279	43	316	34
16.7	62.804	3.11	46.070	43.92	53.846	30.75	43.571	0.38
	398	60	364	50	275	7	314	21
26.7	63.202	3.71	46.434	44.42	54.121	30.68	43.885	0.59
	386	75	354	60	269	30	302	78
Oct. 6.7	63.588	4.46	46.788	45.02	54.390	30.98	44.187	1.37
	372	87	343	71	256	64	288	132
16.6	63.960	5.33	47.131	45.73	54.646	31.62	44.475	2.69
	351	104	325	79	243	95	266	180
26.6	64.311	6.37	47.456	46.52	54.889	32.57	44.741	4.49
	325	117	301	88	223	124	239	224
Nov. 5.6	64.636	7.54	47.757	47.40	55.112	33.81	44.980	6.73
	291	129	271	96	199	115	205	257
15.6	64.927	8.83	48.028	48.36	55.311	35.26	45.185	9.30
	250	139	237	103	170	161	168	281
25.5	65.177	10.22	48.265	49.39	55.481	36.87	45.353	12.11
	205	146	194	109	140	169	125	295
Dec. 5.5	65.382	11.68	48.459	50.48	55.621	38.56	45.478	15.06
	149	149	147	114	101	171	79	299
15.5	65.531	13.17	48.606	51.62	55.722	40.27	45.557	18.05
	91	150	93	115	61	165	29	291
25.5	65.622	14.67	48.699	52.77	55.783	41.92	45.586	20.96
	31	146	37	111	19	156	21	274
35.4	65.653	16.13	48.736	53.88	55.802	43.48	45.565	23.70
Mean Place	59.883	16.73	43.330	55.89	52.027	35.38	42.246	11.79
Sec δ, Tan δ	1.437	+1.033	1.306	+0.840	1.007	−0.122	1 220	−0.699
$D_{\psi}a$, $D_{\omega}a$	+0.088	−0.015	+0.083	−0.011	+0.058	+0.002	+0.043	+0.009
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.08	+0.98	+0.08	+0.98	+0.08	+0.98	+0.08	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Orionis. (*Bellatrix.*) Mag. 1.7		β Tauri. Mag. 1.8		17 Camelop. Mag. 5.8		β Leporis. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	5 20	+ 6 16	5 21	+28 32	5 22	+62 59	5 24	−20 49
Jan. 0.4	61.236	41.54	26.813	29.89	56.51	73.02	58.043	24.58
	7	84	10	43	2	228	17	217
10.4	61.243	40.70	26.823	30.32	56.49	75.30	58.026	26.75
	38	74	38	40	13	209	62	195
20.4	61.205	39.96	26.785	30.72	56.36	77.39	57.964	28.70
	79	64	88	34	21	183	104	166
30.4	61.126	39.32	26.697	31.06	56.15	79.22	57.860	30.36
	119	51	129	29	30	151	141	135
Feb. 9.3	61.007	38.81	26.568	31.35	55.85	80.73	57.719	31.71
	147	40	166	21	35	112	174	100
19.3	60.860	38.41	26.402	31.56	55.50	81.85	57.545	32.71
	172	29	192	7	40	68	196	64
Mar. 1.3	60.688	38.12	26.210	31.63	55.10	82.53	57.349	33.35
	183	15	205	5	43	23	208	28
11.3	60.505	37.97	26.005	31.58	54.67	82.76	57.141	33.63
	187	6	208	16	43	23	212	8
21.2	60.318	37.91	25.797	31.42	54.24	82.53	56.929	33.55
	178	7	198	27	42	67	205	43
31.2	60.140	37.98	25.599	31.15	53.82	81.86	56.724	33.12
	160	18	178	39	37	108	187	79
Apr. 10.2	59.980	38.16	25.421	30.76	53.45	80.78	56.537	32.33
	133	32	149	44	32	143	161	111
20.1	59.847	38.48	25.272	30.32	53.13	79.35	56.376	31.22
	101	45	109	48	25	173	128	142
30.1	59.746	38.93	25.163	29.84	52.88	77.62	56.248	29.80
	61	58	65	49	16	195	89	172
May. 10.1	59.685	39.51	25.098	29.35	52.72	75.67	56.159	28.08
	21	73	19	45	9	209	48	195
20.1	59.664	40.24	25.079	28.90	52.63	73.58	56.111	26.13
	24	85	30	40	2	216	4	217
30.0	59.688	41.09	25.109	28.50	52.65	71.42	56.107	23.96
	67	96	80	34	10	216	42	233
June 9.0	59.755	42.05	25.189	28.16	52.75	69.26	56.149	21.63
	110	107	128	22	19	211	84	243
19.0	59.865	43.12	25.317	27.94	52.94	67.15	56.233	19.20
	146	117	169	13	27	195	126	248
29.0	60.011	44.29	25.486	27.81	53.21	65.20	56.359	16.72
	180	119	208	3	35	179	162	246
July 8.9	60.191	45.48	25.694	27.78	53.56	63.41	56.521	14.26
	210	120	239	7	41	158	195	237
18.9	60.401	46.68	25.933	27.85	53.97	61.83	56.716	11.89
	235	118	268	16	47	130	224	219
28.9	60.636	47.86	26.201	28.01	54.44	60.53	56.940	9.70
	252	110	288	25	51	103	216	197
Aug. 7.8	60.888	48.96	26.489	28.26	54.95	59.50	57.186	7.73
	268	98	307	28	55	74	265	166
17.8	61.156	49.94	26.796	28.54	55.50	58.76	57.451	6.07
	277	84	315	34	58	43	277	130
27.8	61.433	50.78	27.111	28.88	56.08	58.33	57.728	4.77
	282	62	322	36	59	10	285	88
Sept. 6.8	61.715	51.40	27.433	29.24	56.67	58.23	58.013	3.89
	284	43	323	37	59	21	288	44
16.7	61.999	51.83	27.756	29.61	57.26	58.44	58.301	3.45
	281	18	323	35	60	54	287	4
26.7	62.280	52.01	28.079	29.96	57.86	58.98	58.588	3.49
	276	5	314	35	58	83	280	51
Oct. 6.7	62.556	51.96	28.393	30.31	58.44	59.81	58.868	4.00
	265	28	304	33	56	114	269	97
16.7	62.821	51.68	28.697	30.64	59.00	60.95	59.137	4.97
	253	50	289	33	53	141	253	138
26.6	63.074	51.18	28.986	30.97	59.53	62.36	59.390	6.35
	234	68	271	31	49	170	234	176
Nov. 5.6	63.308	50.50	29.257	31.28	60.02	64.06	59.624	8.11
	215	80	247	36	44	194	207	207
15.6	63.523	49.70	29.504	31.64	60.46	66.00	59.831	10.18
	186	91	217	36	38	213	177	226
25.5	63.709	48.79	29.721	32.00	60.84	68.13	60.008	12.44
	156	96	179	38	30	229	142	240
Dec. 5.5	63.865	47.83	29.900	32.38	61.14	70.42	60.150	14.84
	117	98	140	41	22	239	102	244
15.5	63.982	46.85	30.040	32.79	61.36	72.81	60.252	17.28
	79	93	95	45	12	242	59	240
25.5	64.061	45.92	30.135	33.24	61.48	75,23	60.311	19.68
	35	88	45	45	4	237	12	225
35.4	64.096	45.04	30.180	33.69	61.52	77.60	60.323	21.93
Mean Place	60.014	51.92	25.385	37.71	53.610	77.70	56.762	11.33
Sec δ, Tan δ	1.006	+0.110	1.138	+0.544	2.203	+1.963	1.070	−0.380
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.064	−0.001	+0.075	−0.006	+0.113	−0.021	+0.051	+0.004
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.07	+0.99	+0.07	+0.99	+0.06	+0.99	+0.06	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Aurigæ. Mag. 4.9		δ Orionis. Mag. 2.5		α Leporis. Mag. 2.7		Groombridge 966. Mag. 6.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 5 27	° ′ +32 8	h m 5 28	° ′ − 0 21	h m 5 29	° ′ −17 52	h m 5 29	° ′ +74 59
	s	″	s	″	s	″	s	″
Jan. 0.5	44.390 16	3.49 64	5.543 7	29.09	21.303	48.01	30.28	40.26
10.4	44.406 — 34	4.13 62	5.550 — 33	30.30 121	21.293 10.	50.09 208	30.20 8	43.04 278
20.4	44.372 88	4.75 55	5.517 79	31.38 108	21.241 52	51.92 183	29.94 26	45.64 260
30.4	44.284 132	5.30 44	5.438 118	32.31 93	21.145 96	53.54 162	29.53 41	47.92 228
Feb. 9.3	44.152 168	5.74 33	5.320 145	33.06 75 57	21.008 137 165	54.82 128 98	28.98 55 65	49.84 192 146
19.3	43.984	6.07 20	5.175	33.63 38	20.843	55.80 63	28.33	51.30
Mar. 1.3	43.786 198	6.27 1	5.003 172	34.01 21	20.653 190	56.43 32	27.60 73	52.27 97
11.3	43.572 214	6.28 — 13	4.819 184	34.22 3	20.450 203	56.75 — 6	26.82 78	52.64 — 37
21.2	43.355 217	6.15 28	4.633 186	34.25 — 15	20.245 205	56.69 38	26.03 79	52.50 14
31.2	43.147 208 188	5.87 43	4.453 180 167	34.10 34	20.046 199 182	56.31 72	25.27 76 70	51.83 67 116
Apr. 10.2	42.959 160	5.44 50	4.286 139	33.76 53	19.864	55.59	24.57	50.67
20.2	42.799 119	4.94 60	4.147 107	33.23 71	19.706 158	54.60 99	23.97 60	49.05 162
30.1	42.680 73	4.34 64	4.040 71	32.52 87	19.581 125	53.27 133	23.48 49	47.08 197
May 10.1	42.607 24	3.70 63	3.969 27	31.65 104	19.490 91	51.70 157	23.11 37	44.79 229
20.1	42.583 — 24	3.07 60	3.942 — 14	30.61 118	19.443 47 — 4	49.87 183 201	22.90 21 — 6	42.30 249 261
30.0	42.607	2.47	3.956	29.43	19.439	47.86	22.84	39.69
June 9.0	42.681 74	1.94 53	4.010 54	28.10 133	19.478 39	45.66 220	22.94 10	37.04 265
19.0	42.806 125	1.49 45	4.109 99	26.66 144	19.561 83	43.37 229	23.19 25	34.42 262
29.0	42.975 169	1.11 38	4.241 132	25.18 148	19.683 122	41.02 235	23.59 40	31.93 249
July 8.9	43.180 205 244	0.86 25 16	4.412 171 199	23.65 153 149	19.842 159 191	38.68 234 224	24.11 52 65	29.61 232 207
18.9	43.424	0.70 2	4.611	22.16	20.033	36.44	24.76	27.54
28.9	43.696 272	0.68 — 5	4.834 223	20.72 144	20.251 218	34.32 212	25.51 75	25.74 180
Aug. 7.9	43.992 296	0.73 12	5.079 245	19.40 132	20.494 243	32.43 189	26.35 84	24.26 148
17.8	44.303 311	0.85 22	5.340 261	18.25 115	20.754 260	30.82 161	27.26 91	23.14 112
27.8	44.627 324 334	1.07 26	5.610 270 279	17.30 95 69	21.028 274 282	29.56 126 87	28.22 96 100	22.41 73 — 36
Sept. 6.8	44.961	1.33	5.889[1]	16.61	21.310	28.69	29.22	22.05
16.7	45.296 335	1.61 28	6.170 281	16.18 43	21.595 285	28.24 — 45	30.23 101	22.11 6
26.7	45.631 335	1.94 33	6.448 278	16.09 — 9	21.880 285	28.25 1	31.25 102	22.57 46
Oct. 6.7	45.957 326	2.29 35	6.721 273	16.25 16	22.159 279	28.68 43	32.25 100	23.43 86
16.7	46.276 319 305	2.68 39 40	6.986 265 252	16.74 49 75	22.427 268 255	29.55 87 130	33.21 96 91	24.69 126 160
26.6	46.581	3.08	7.238	17.49	22.682	30.85	34.12	26.29
Nov. 5.6	46.864 283	3.54 46	7.475 237	18.44 95	22.918 236	32.50 165	34.95 83	28.24 195
15.6	47.127 263	4.00 46	7.689 214	19.61 117	23.131 213	34.43 193	35.69 74	30.54 230
25.6	47.357 230	4.55 55	7.878 189	20.89 128	23.311 180	36.57 214	36.31 62	33.10 256
Dec. 5.5	47.550 193 151	5.13 58 63	8.033 155 120	22.26 137 137	23.458 147 107	38.85 228 231	36.81 50 34	35.82 272 290
15.5	47.701	5.76	8.153	23.63	23.565	41.16	37.15	38.72
25.5	47.806 105	6.42 66	8.232 79	24.97 134	23.631 66	43.45 229	37.34 19	41.65 293
35.4	47.858 52	7.08 66	8.268 36	26.23 126	23.654 23	45.60 215	37.35 1	44.54 289
Mean Place	42.897	11.23	4.324	17.92	20.031	35.14	25.137	44.74
Sec δ, Tan δ	1.181	+0.628	1.000	−0.006	1.051	−0.323	3.862	+3.730
$D_{\psi a}$, $D_{\omega a}$	+0.078	−0.006	+0.061	0.000	+0.053	+0.003	+0.159	−0.033
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.06	+0.99	+0.06	+0.99	+0.05	+0.99	+0.05	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ^1 Orionis. Mag. 4.5		ι Orionis. Mag. 2.9		ε Orionis. Mag. 1.8		ζ Tauri. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 5 30 s	° ′ + 9 26 ″	h m 5 31 s	° ′ − 5 57 ″	h m 5 32 s	° ′ − 1 14 ″	h m 5 33 s	° ′ +21 5 ″
Jan. 0.5	36.785	8.52	41.193	45.50	19.564	70.89	3.870	39.34
	18	67	7	153	10	128	23	1
10.4	36.803	7.85	41.200	47.03	19.574	72.17	3.893	39.33
	29	60	36	135	32	113	25	3
20.4	36.774	7.25	41.164	48.38	19.542	73.30	3.868	39.36
	73	50	80	115	77	98	73	4
30.4	36.701	6.75	41.084	49.53	19.465	74.28	3.795	39.40
	112	40	119	95	114	78	115	5
Feb. 9.3	36.589	6.35	40.965	50.48	19.351	75.06	3.680	39.45
	143	31	149	72	145	59	150	3
19.3	36.446	6.04	40.816	51.20	19.206	75.65	3.530	39.48
	170	22	173	47	170	42	177	0
Mar. 1.3	36.276	5.82	40.643	51.67	19.036	76.07	3.353	39.48
	184	14	188	25	184	23	192	3
11.3	36.092	5.68	40.455	51.92	18.852	76.30	3.161	39.45
	188	6	191	2	187	2	197	9
21.2	35.904	5.62	40.264	51.94	18.665	76.32	2.964	39.36
	181	2	185	23	182	16	190	11
31.2	35.723	5.64	40.079	51.71	18.483	76.16	2.774	39.25
	164	12	168	45	169	35	173	15
Apr. 10.2	35.559	5.76	39.911	51.26	18.314	75.81	2.601	39.10
	140	22	145	69	141	55	146	15
20.2	35.419	5.98	39.766	50.57	18.173	75.26	2.455	38.95
	106	31	114	88	109	73	112	14
30.1	35.313	6.29	39.652	49.69	18.064	74.53	2.343	38.81
	68	43	76	111	75	87	70	11
May 10.1	35.245	6.72	39.576	48.58	17.989	73.66	2.273	38.70
	26	54	37	130	32	108	29	6
20.1	35.219	7.26	39.539	47.28	17.957	72.58	2.244	38.64
	17	67	7	146	9	124	20	1
30.0	35.236	7.93	39.546	45.82	17.966	71.34	2.264	38.65
	61	77	49	161	52	136	65	9
June 9.0	35.297	8.70	39.595	44.21	18.018	69.98	2.329	38.74
	103	87	88	171	92	147	110	19
19.0	35.400	9.57	39.683	42.50	18.110	68.51	2.439	38.93
	140	94	128	178	129	152	148	26
29.0	35.540	10.51	39.811	40.72	18.239	66.99	2.587	39.19
	175	99	164	179	165	154	186	33
July 8.9	35.715	11.50	39.975	38.93	18.404	65.45	2.773	39.52
	206	102	194	174	196	154	218	40
18.9	35.921	12.52	40.169	37.19	18.600	63.91	2.991	39.92
	230	100	219	166	220	147	244	45
28.9	36.151	13.52	40.388	35.53	18.820	62.44	3.235	40.37
	252	95	239	153	242	135	267	46
Aug. 7.9	36.403	14.47	40.627	34.00	19.062	61.09	3.502	40.83
	265	86	256	129	257	116	283	45
17.8	36.668	15.33	40.883	32.71	19.319	59.93	3.785	41.28
	277	71	269	105	270	97	294	44
27.8	36.945	16.04	41.152	31.66	19.589	58.96	4.079	41.72
	284	57	275	77	277	69	301	38
Sept. 6.8	37.229	16.61	41.427	30.89	19.866	58.27	4.380	42.10
	285	38	279	43	280	42	304	31
16.7	37.514	16.99	41.706	30.46	20.146	57.85	4.684	42.41
	286	17	278	8	279	12	304	24
26.7	37.800	17.16	41.984	30.38	20.425	57.73	4.988	42.65
	280	3	274	27	274	20	299	12
Oct. 6.7	38.080	17.13	42.258	30.65	20.699	57.93	5.287	42.77
	273	23	265	61	266	53	291	6
16.7	38.353	16.90	42.523	31.26	20.965	58.46	5.578	42.83
	260	41	254	93	254	77	280	0
26.6	38.613	16.49	42.777	32.19	21.219	59.23	5.858	42.83
	246	57	235	121	240	101	263	10
Nov. 5.6	38.859	15.92	43.012	33.40	21.459	60.24	6.121	42.73
	224	70	215	142	216	120	242	12
15.6	39.083	15.22	43.227	34.82	21.675	61.44	6.363	42.61
	198	77	187	160	192	137	215	12
25.6	39.281	14.45	43.414	36.42	21.867	62.81	6.578	42.49
	166	80	157	168	158	142	182	12
Dec. 5.5	39.447	13.65	43.571	38.10	22.025	64.23	6.760	42.37
	130	81	118	170	123	144	144	9
15.5	39.577	12.84	43.689	39.80	22.148	65.67	6.904	42.28
	91	77	80	167	84	140	102	4
25.5	39.668	12.07	43.769	41.47	22.232	67.07	7.006	42.24
	46	69	35	157	38	132	54	1
35.4	39.714	11.38	43.804	43.04	22.270	68.39	7.060	42.23
Mean Place	35.535	18.72	39.965	33.77	18.338	59.62	2.531	48.42
Sec δ, Tan δ	1.014	+0.166	1.005	−0.104	1.000	−0.022	1.072	+0.386
$D_{\psi a}$ $D_{\omega a}$	+0.066	−0.001	+0.058	+0.001	+0.061	0.000	+0.071	−0.003
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.05	+0.99	+0.05	+0.99	+0.05	+0.99	+0.05	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Columbæ. Mag. 2.8		ζ Orionis. Mag. 2.0		o Aurigæ. Mag. 5.5		ζ Leporis. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	5 36	−34 6	5 36	− 1 58	5 39	+49 47	5 43	−14 50
	s	″	s	″	s	″	s	″
Jan. 0.5	53.134	65.89	53.625	67.71	57.971	32.02	29.238	70.88
10.4	53.104 30	68.60 271	53.640 15	69.04 133	57.996 25	33.68 166	29.246 8	72.89 201
20.4	53.022 82	71.09 249	53.610 30	70.22 118	57.951 45	35.23 155	29.210 36	74.69 180
30.4	52.895 127	73.20 211	53.537 73	71.23 101	57.839 112	36.65 142	29.129 81	76.25 156
Feb. 9.3	52.725 170	74.92 172	53.425 112	72.06 83	57.667 172	37.84 119	29.006 123	77.53 128
	204	134	144	62	224	91	153	99
19.3	52.521	76.26 87	53.281	72.68 44	57.443	38.78 62	28.853	78.52 67
Mar. 1.3	52.289 232	77.13 41	53.112 169	73.12 22	57.180 263	39.40 31	28.672 181	79.19 37
11.3	52.041 248	77.54 — 3	52.928 184	73.34 4	56.895 285	39.71 — 5	28.475 197	79.56 4
21.2	51.791 250	77.51 48	52.739 189	73.38 — 17	56.602 293	39.66 36	28.273 202	79.60 — 27
31.2	51.547 244	77.03 92	52.555 184	73.21 35	56.316 286	39.30 69	28.077 196	79.33 57
	228		168		262		184	
Apr. 10.2	51.319	76.11	52.387	72.86	56.054	38.61	27.893	78.76
20.2	51.117 202	74.81 130	52.242 145	72.31 55	55.827 227	37.66 95	27.732 161	77.89 87
30.1	50.948 169	73.09 172	52.129 113	71.57 74	55.650 177	36.49 117	27.603 129	76.75 114
May 10.1	50.822 126	71.04 205	52.052 77	70.65 92	55.531 119	35.15 134	27.507 96	75.34 141
20.1	50.735 87	68.70 234	52.015 37	69.54 111	55.466 65	33.68 147	27.452 55	73.70 164
	38	258	5	125	4	153	12	184
30.0	50.697	66.12	52.020	68.29	55.470	32.15	27.440	71.86
June 9.0	50.707 10	63.32 280	52.067 47	66.91 138	55.538 68	30.63 152	27.471 31	69.85 201
19.0	50.766 59	60.42 290	52.155 88	65.43 148	55.669 131	29.13 150	27.541 70	67.74 211
29.0	50.872 106	57.47 295	52.281 126	63.87 156	55.857 188	27.74 139	27.654 113	65.56 218
July 8.9	51.019 147	54.56 291	52.442 161	62.29 158	56.100 243	26.46 128	27.800 146	63.38 218
	187	280	191	156	290	112	182	214
18.9	51.206	51.76	52.633	60.73	56.390	25.34	27.982	61.24
28.9	51.428 222	49.16 260	52.851 218	59.24 149	56.722 332	24.39 95	28.190 208	59.24 200
Aug. 7.9	51.679 251	46.86 230	53.089 238	57.87 137	57.084 362	22.65 74	28.421 231	57.44 180
17.8	51.954 275	44.90 196	53.344 255	56.69 118	57.475 391	23.10 55	28.671 250	55.87 157
27.8	52.249 295	43.37 153	53.610 266	55.72 97	57.884 409	22.74 36	28.937 266	54.64 123
	307	103	275	70	422	15	276	88
Sept. 6.8	52.556	42.34 53	53.885	55.02 42	58.306	22.59 — 5	29.213	53.76 49
16.7	52.870 314	41.81 — 4	54.164 279	54.60 9	58.736 430	22.64 27	29.494 281	53.27 — 5
26.7	53.184 314	41.85 62	54.443 279	54.51 — 22	59.167 431	22.91 44	29.777 283	53.22 37
Oct. 6.7	53.494 310	42.47 117	54.718 275	54.73 52	59.596 429	23.35 67	30.056 279	53.59 80
16.7	53.790 296	43.64 163	54.986 268	55.25 82	60.012 416	24.02 83	30.328 272	54.39 118
	279		256		399		261	
26.6	54.069	45.27	55.242	56.07	60.411	24.85	30.589	55.57
Nov. 5.6	54.326 257	47.37 210	55.483 241	57.13 106	60.787 376	25.89 104	30.834 245	57.09 152
15.6	54.553 227	49.85 248	55.702 219	58.39 126	61.131 344	27.11 122	31.056 222	58.91 182
25.6	54.745 192	52.61 276	55.896 194	59.78 139	61.437 306	28.50 139	31.251 195	60.92 201
Dec. 5.5	54.896 151	55.55 294	56.060 164	61.26 148	61.693 256	30.01 151	31.412 161	63.08 216
	104	300	128	150	202	162	125	220
15.5	55.000	58.55	56.188	62.76	61.895	31.63	31.537	65.28
25.5	55.055 55	61.50 295	56.275 87	64.22 146	62.033 138	33.31 168	31.620 83	67.45 217
35.4	55.058 3	64.32 282	56.319 44	65.55 133	62.103 70	35.01 170	31.658 38	69.52 207
Mean Place	51.645	52.05	52.390	56.36	55.981	38.93	27.952	58.58
Sec δ, Tan δ	1.208	−0.677	1.001	−0.035	1.549	+1.183	1.035	−0.265
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.043	+0.005	+0.060	0.000	+0.092	−0.007	+0.054	+0.001
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.04	+0.99	+0.04	+0.99	+0.03	+1.00	+0.03	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Orionis. Mag. 2.2		δ Doradus. Mag. 4.5		ν Aurigæ. Mag. 4.2		δ Leporis. Mag. 3.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	5 44	− 9 41	5 44	−65 45	5 46	+39 7	5 47	−20 52
	s	″	s	″	s	″	s	″
Jan. 0.5	7.519	57.18	41.06	66.43	10.778	31.02	61.906	77.25
	13	176	18	330	39	106	6	231
10.4	7.532	58.94	40.88	69.73	10.817	32.08	61.912	79.56
	— 33	158	28	299	— 21	102	— 41	208
20.4	7.499	60.52	40.60	72.72	10.796	33.10	61.871	81.64
	73	137	36	258	78	95	87	183
30.4	7.426	61.89	40.24	75.30	10.718	34.05	61.784	83.47
	116	110	43	216	131	83	128	150
Feb. 9.4	7.310	62.99	39.81	77.46	10.587	34.88	61.656	84.97
	147	86	49	163	176	66	163	117
19.3	7.163	63.85	39.32	79.09	10.411	35.54	61.493	86.14
	173	59	54	111	210	46	188	81
Mar. 1.3	6.990	64.44	38.78	80.20	10.201	36.00	61.305	86.95
	189	32	57	— 55	231	24	206	47
11.3	6.801	64.76	38.21	80.75	9.970	36.24	61.099	87.42
	195	— 6	57	— 1	210	— 1	213	— 8
21.2	6.606	64.82	37.64	80.74	9.730	36.25	60.886	87.50
	190	— 21	56	53	235	— 23	208	— 27
31.2	6.416	64.61	37.08	80.21	9.495	36.02	60.678	87.23
	176	49	54	106	215	42	195	62
Apr. 10.2	6.240	64.12	36.54	79.15	9.280	35.60	60.483	86.61
	155	75	50	156	188	62	172	95
20.2	6.085	63.37	36.04	77.59	9.092	34.98	60.311	85.66
	122	95	44	200	148	77	143	127
30.1	5.963	62.42	35.60	75.59	8.944	34.21	60.168	84.39
	91	122	38	243	101	88	106	157
May 10.1	5.872	61.20	35.22	73.16	8.843	33.33	60.062	82.82
	49	143	30	276	49	95	68	183
20.1	5.823	59.77	34.92	70.40	8.794	32.38	59.994	80.99
	— 6	161	22	308	— 5	97	— 23	206
30.1	5.817	58.16	34.70	67.32	8.799	31.41	59.971	78.93
	33	174	12	327	58	95	19	222
June 9.0	5.850	56.42	34.58	64.05	8.857	30.46	59.990	76.71
	75	187	— 2	342	111	91	63	235
19.0	5.925	54.55	34.56	60.63	8.968	29.55	60.053	74.36
	116	194	5	316	160	84	103	242
29.0	6.041	52.61	34.61	57.17	9.128	28.71	60.156	71.94
	147	195	15	340	205	72	141	242
July 8.9	6.188	50.66	34.76	53.77	9.333	27.99	60.297	69.52
	181	191	23	327	244	63	176	235
18.9	6.369	48.75	34.99	50.50	9.577	27.36	60.473	67.17
	209	179	31	303	277	50	205	221
28.9	6.578	46.96	35.30	47.47	9.854	26.86	60.678	64.96
	230	164	39	270	306	39	231	199
Aug. 7.9	6.808	45.32	35.69	44.77	10.160	26.47	60.909	62.97
	251	114	45	229	327	25	253	170
17.8	7.059	43.88	36.14	42.48	10.487	26.22	61.162	61.27
	263	111	50	178	343	15	267	135
27.8	7.322	42.77	36.64	40.70	10.830	26.07	61.429	59.92
	274	82	54	121	356	— 4	279	96
Sept. 6.8	7.596	41.95	37.18	39.49	11.186	26.03	61.708	58.96
	279	46	56	58	361	7	287	52
16.8	7.875	41.49	37.74	38.91	11.547	26.10	61.995	58.44
	281	— 6	56	— 5	363	16	288	— 4
26.7	8.156	41.43	38.30	38.96	11.910	26.26	62.283	58.40
	276	— 31	56	71	361	27	286	— 44
Oct. 6.7	8.432	41.74	38.86	39.67	12.271	26.53	62.569	58.84
	270	69	54	136	353	36	280	91
16.7	8.702	42.43	39.40	41.03	12.624	26.89	62.849	59.75
	263	105	50	196	342	46	268	134
26.6	8.965	43.48	39.90	42.99	12.966	27.35	63.117	61.09
	243	134	42	246	325	57	249	174
Nov. 5.6	9.208	44.82	40.32	45.45	13.291	27.92	63.366	62.83
	221	160	36	292	300	68	228	205
15.6	9.429	46.42	40.68	48.37	13.591	28.60	63.594	64.88
	199	180	28	326	268	78	199	229
25.6	9.628	48.22	40.96	51.63	13.859	29.38	63.793	67.17
	162	189	19	348	230	89	165	244
Dec. 5.5	9.790	50.11	41.15	55.11	14.089	30.27	63.958	69.61
	128	194	— 9	358	184	98	126	251
15.5	9.918	52.05	41.24	58.69	14.273	31.25	64.084	72.12
	90	192	2	355	133	104	82	249
25.5	10.008	53.97	41.22	62.24	14.406	32.29	64.166	74.61
	44	179	12	341	76	108	37	238
35.5	10.052	55.76	41.10	65.65	14.482	33.37	64.203	76.99
Mean Place	6.256	45.27	37.928	51.95	9.144	39.13	60.562	64.65
Sec δ, Tan δ	1.014	−0.171	2.436	−2.222	1.289	+0.813	1.070	−0.382
$D_{\psi a}$, $D_{\omega a}$	+0.057	+0.001	+0.002	+0.010	+0.083	−0.003	+0.051	+0.001
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.03	+1.00	+0.03	+1.00	+0.02	+1.00	+0.02	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Orionis. (*Betelgeux.*) Var. 1.0–1.4		η Leporis. Mag. 3.8		δ Aurigæ. Mag. 3.9		β Aurigæ. Mag. 2.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 5 50	° ′ ″ + 7 23	h m s 5 52	° ′ ″ −14 10	h m s 5 53	° ′ ″ +54 16	h m s 5 53	° ′ ″ +44 56
Jan. 0.5	61.435	27.53	55.157	62.69	13.476	43.12	54.667	20.36
	33	84	18	200	43	190	48	140
10.4	61.468	26.69	55.175	64.69	13.519	45.02	54.715	21.76
	13	73	28	181	37	182	20	136
20.4	61.455	25.96	55.147	66.50	13.482	46.84	54.695	23.12
	58	61	74	157	110	167	83	124
30.4	61.397	25.35	55.073	68.07	13.372	48.51	54.612	24.36
Feb. 9.4	100	49	114	130	181	147	138	109
	61.297	24.86	54.959	69.37	13.191	49.98	54.474	25.45
	133	37	148	101	239	117	192	90
19.3	61.164	24.49	54.811	70.38	12.952	51.15	54.282	26.35
	161	26	177	70	284	85	226	66
Mar. 1.3	61.003	24.23	54.634	71.08	12.668	52.00	54.056	27.01
	180	14	193	41	315	49	254	37
11.3	60.823	24.09	54.441	71.49	12.353	52.49	53.802	27.38
	187	4	201	9	327	13	265	11
21.3	60.636	24.05	54.240	71.58	12.026	52.62	53.537	27.49
	185	7	197	22	322	27	260	20
31.2	60.451	24.12	54.043	71.36	11.704	52.35	53.277	27.29
	169	16	186	51	300	63	243	49
Apr. 10.2	60.282	24.28	53.857	70.85	11.404	51.72	53.034	26.80
	147	28	164	81	265	94	211	70
20.2	60.135	24.56	53.693	70.04	11.139	50.78	52.823	26.10
	118	39	135	109	213	122	174	92
30.1	60.017	24.95	53.558	68.95	10.926	49.56	52.649	25.18
May 10.1	85	52	100	133	157	144	122	106
	59.932	25.47	53.458	67.62	10.769	48.12	52.527	24.12
20.1	45	62	61	158	92	161	66	120
	59.887	26.09	53.397	66.04	10.677	46.51	52.461	22.92
	1	75	20	177	21	172	9	126
30.1	59.886	26.84	53.377	64.27	10.656	44.79	52.452	21.66
	41	85	22	194	49	176	47	127
June 9.0	59.927	27.69	53.399	62.33	10.705	43.03	52.499	20.39
	82	89	64	206	117	174	106	124
19.0	60.009	28.58	53.463	60.27	10.822	41.29	52.605	19.15
	120	101	103	214	184	168	163	120
29.0	60.129	29.59	53.566	58.13	11.006	39.61	52.768	17.95
July 8.9	156	104	138	214	212	159	207	109
	60.285	30.63	53.704	55.99	11.248	38.02	52.975	16.86
	186	106	173	208	297	144	252	98
18.9	60.471	31.69	53.877	53.91	11.545	36.58	53.227	15.88
	212	102	202	198	345	124	294	84
28.9	60.683	32.71	54.079	51.93	11.890	35.34	53.521	15.04
Aug. 7.9	237	95	224	180	381	106	324	69
	60.920	33.66	54.303	50.13	12.274	34.28	53.845	14.35
17.8	254	84	245	155	414	87	351	56
	61.174	34.50	54.548	48.58	12.688	33.41	54.196	13.79
27.8	267	71	261	125	441	62	367	36
	61.441	35.21	54.809	47.33	13.129	32.79	54.563	13.43
	277	52	272	90	458	39	385	25
Sept. 6.8	61.718	35.73	55.081	46.43	13.587	32.40	54.948	13.18
	283	33	279	50	470	17	394	7
16.8	62.001	36.06	55.360	45.93	14.057	32.23	55.342	13.11
	285	8	281	9	476	9	397	7
26.7	62.286	36.14	55.641	45.84	14.533	32.32	55.739	13.18
Oct. 6.7	284	13	281	34	473	31	396	24
	62.570	36.01	55.922	46.18	15.006	32.63	56.135	13.42
16.7	281	34	276	77	461	57	388	39
	62.851	35.67	56.198	46.95	15.470	33.20	56.523	13.81
	268	55	265	115	448	80	380	55
26.6	63.119	35.12	56.463	48.10	15.918	34.00	56.903	14.36
	256	72	249	149	426	105	357	70
Nov. 5.6	63.375	34.40	56.712	49.59	16.344	35.05	57.260	15.06
	240	88	230	178	392	128	333	89
15.6	63.615	33.52	56.942	51.37	16.736	36.33	57.593	15.95
	212	94	202	199	349	147	300	103
25.6	63.827	32.58	57.144	53.36	17.085	37.80	57.893	16.98
Dec. 5.5	185	99	172	214	299	167	257	118
	64.012	31.59	57.316	55.50	17.384	39.47	58.150	18.16
	148	99	134	218	237	180	207	127
15.5	64.160	30.60	57.450	57.68	17.621	41.27	58.357	19.43
	108	94	94	216	168	190	149	139
25.5	64.268	29.66	57.544	59.84	17.789	43.17	58.506	20.82
35.5	64	89	49	206	94	194	89	141
	64.332	28.77	57.593	61.90	17.883	45.11	58.595	22.23
Mean Place	60.171	38.18	53.855	50.62	11.289	50.66	52.876	28.51
Sec δ, Tan δ	1.008	+0.130	1.031	−0.253	1.713	+1.391	1.413	+0.998
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.065	0.000	+0.054	+0.001	+0.098	−0.003	+0.088	−0.002
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.02	+1.00	+0.01	+1.00	+0.01	+1.00	+0.01	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aurigæ. Mag. 2.7		1 Geminorum. Mag. 4.3		1 G. Puppis. Mag. 6.2		ν Orionis. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 5 54 s	° ′ +37 12 ″	h m 5 59 s	° ′ +23 15 ″	h m 6 2 s	° ′ −45 1 ″	h m 6 3 s	° ′ +14 46 ″
Jan. 0.5	29.819	22.33	27.757	57.79	17.303	82.47	11.871	33.71
	50	95	52	9	28	315	47	42
10.5	29.869	23.28	27.809	57.88	17.275	85.62	11.918	33.29
	— 14	93	— 2	15	89	290	— 3	33
20.4	29.855	24.21	27.807	58.03	17.186	88.52	11.921	32.96
	68	90	51	18	147	257	49	27
30.4	29.787	25.11	27.756	58.21	17.039	91.09	11.872	32.69
	118	78	96	20	198	217	91	17
Feb. 9.4	29.669	25.89	27.660	58.41	16.841	93.26	11.781	32.52
	165	62	138	19	239	172	128	11
19.3	29.504	26.51	27.522	58.60	16.602	94.98	11.653	32.41
	201	48	169	15	274	124	160	7
Mar. 1.3	29.303	26.99	27.353	58.75	16.328	96.22	11.493	32.34
	218	26	190	10	296	75	180	2
11.3	29.085	27.25	27.163	58.85	16.032	96.97	11.313	32.32
	232	9	199	4	307	24	189	— 1
21.3	28.853	27.34	26.964	58.89	15.725	97.21	11.124	32.33
	232	— 16	198	— 2	303	— 26	188	3
31.2	28.621	27.18	26.766	58.87	15.422	96.95	10.936	32.36
	212	32	185	8	292	75	176	7
Apr. 10.2	28.409	26.86	26.581	58.79	15.130	96.20	10.760	32.43
	183	52	161	13	267	121	156	9
20.2	28.226	26.34	26.420	58.66	14.863	94.99	10.604	32.52
	150	65	130	15	235	166	126	15
30.1	28.076	25.69	26.290	58.51	14.628	93.33	10.478	32.67
	104	77	93	17	193	205	90	21
May 10.1	27.972	24.92	26.197	58.34	14.435	91.28	10.388	32.88
	56	84	49	15	148	241	50	27
20.1	27.916	24.08	26.148	58.19	14.287	88.87	10.338	33.15
	— 6	86	— 5	12	96	272	— 10	32
30.1	27.910	23.22	26.143	58.07	14.191	86.15	10.328	33.47
	51	85	41	7	42	293	34	41
June 9.0	27.961	22.37	26.184	58.00	14.149	83.22	10.362	33.88
	98	81	85	2	— 11	312	74	49
19.0	28.059	21.56	26.269	57.98	14.160	80.10	10.436	34.37
	148	74	127	— 5	64	320	117	53
29.0	28.207	20.82	26.396	58.03	14.224	76.90	10.553	34.90
	192	70	165	11	115	319	150	57
July 9.0	28.399	20.12	26.561	58.14	14.339	73.71	10.703	35.47
	228	56	198	15	164	309	184	61
18.9	28.627	19.56	26.759	58.29	14.503	70.62	10.887	36.08
	262	48	227	19	209	292	210	61
28.9	28.889	19.08	26.986	58.48	14.712	67.70	11.097	36.69
	295	36	253	22	249	264	238	59
Aug. 7.9	29.184	18.72	27.239	58.70	14.961	65.06	11.335	37.28
	312	30	271	21	283	228	254	50
17.8	29.496	18.42	27.510	58.91	15.244	62.78	11.589	37.78
	333	18	288	19	311	183	271	44
27.8	29.829	18.24	27.798	59.10	15.555	60.95	11.860	38.22
	346	7	298	16	332	133	282	34
Sept. 6.8	30.175	18.17	28.096	59.26	15.887	59.62	12.142	38.56
	353	0	306	11	349	76	231	19
16.8	30.528	18.17	28.402	59.37	16.236	58.86	12.433	38.75
	356	5	310	4	355	16	293	1
26.7	30.884	18.22	28.712	59.41	16.591	58.70	12.726	38.76
	354	16	309	— 3	354	— 47	295	— 10
Oct. 6.7	31.238	18.38	29.021	59.38	16.945	59.17	13.021	38.66
	349	26	305	8	346	107	290	24
16.7	31.587	18.64	29.326	59.30	17.291	60.24	13.311	38.42
	341	30	298	13	330	165	284	43
26.7	31.928	18.94	29.624	59.17	17.621	61.89	13.595	37.99
	322	42	286	17	305	217	273	49
Nov. 5.6	32.250	19.36	29.910	59.00	17.926	64.06	13.868	37.50
	301	52	266	17	273	263	255	57
15.6	32.551	19.88	30.176	58.83	18.199	66.69	14.123	36.93
	272	62	243	15	231	294	233	63
25.6	32.823	20.50	30.419	58.68	18.430	69.63	14.356	36.30
	232	74	211	11	185	320	201	61
Dec. 5.5	33.055	21.24	30.630	58.57	18.615	72.83	14.557	35.69
	190	83	174	— 5	131	333	168	59
15.5	33.245	22.07	30.804	58.52	18.746	76.16	14.725	35.10
	141	87	130	1	72	334	126	52
25.5	33.386	22.94	30.934	58.53	18.818	79.50	14.851	34.58
	87	95	84	8	10	325	81	45
35.5	33.473	23.89	31.018	58.61	18.828	82.75	14.932	34.13
Mean Place	28.235	31.02	26.391	67.57	15.438	69.59	10.569	44.07
Sec δ, Tan δ	1.256	+0.759	1.089	+0.430	1.415	−1.001	1.034	+0.264
$D_{\psi a}$, $D_{\omega a}$	+0.081	−0.001	+0.073	0.000	+0.035	−0.001	+0.068	0.000
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.01	+1.00	0.00	+1.00	0.00	+1.00	−0.01	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Geminorum. Var. 3.2–4.2		22 H. Camelop. Mag. 4.7		2 Lyncis. Mag. 4.4		ζ Canis Majoris. Mag. 3.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 10 s	° ′ +22 31 ″	h m 6 10 s	° ′ +69 20 ″	h m 6 12 s	° ′ +59 2 ″	h m 6 17 s	° ′ −30 1 ″
Jan. 0.5	15.190	39.40	25.51	49.43	52.425	18.40	22.875	54.94
	61	4	7	262	75	215	22	279
10.5	15.251	39.44	25.58	52.05	52.500	20.55	22.897	57.73
	8	10	—	254	—	210	—	259
20.4	15.259	39.54	25.52	54.59	52.486	22.65	22.866	60.32
	—	17	19	238	103	199	82	229
30.4	15.219	39.71	25.33	56.97	52.383	24.64	22.784	62.61
	40	17	30	213	184	178	127	197
Feb. 9.4	15.129	39.88	25.03	59.10	52.199	26.42	22.657	64.58
	90	19	40	175	255	150	168	160
	130							
19.3	14.999	40.07	24.63	60.85	51.944	27.92	22.489	66.18
	163	17	48	133	312	116	199	117
Mar. 1.3	14.836	40.24	24.15	62.18	51.632	29.08	22.290	67.35
	185	14	53	88	352	78	222	77
11.3	14.651	40.38	23.62	63.06	51.280	29.86	22.068	68.12
	196	10	56	39	372	36	234	34
21.3	14.455	40.48	23.06	63.45	50.908	30.22	21.834	68.46
	196	2	56	—	373	—	235	—
31.2	14.259	40.50	22.50	63.32	50.535	30.18	21.599	68.37
	188	—	54	62	355	47	226	49
		2						
Apr. 10.2	14.071	40.48	21.96	62.70	50.180	29.71	21.373	67.88
	164	6	48	107	321	85	207	89
20.2	13.907	40.42	21.48	61.63	49.859	28.86	21.166	66.99
	135	8	42	114	273	119	180	130
30.2	13.772	40.34	21.06	60.19	49.586	27.67	20.986	65.69
	98	10	33	181	210	146	148	163
May 10.1	13.674	40.24	20.73	58.38	49.376	26.21	20.838	64.06
	60	9	23	209	140	170	109	196
20.1	13.614	40.15	20.50	56.29	49.236	24.51	20.729	62.10
	15	9	12	227	66	186	66	223
	—				—			
30.1	13.599	40.06	20.38	54.02	49.170	22.65	20.663	59.87
	30	2	1	211	13	196	22	245
June 9.0	13.629	40.04	20.37	51.61	49.183	20.69	20.641	57.42
	71	1	10	216	89	199	22	262
19.0	13.700	40.05	20.47	49.15	49.272	18.70	20.663	54.80
	118	5	21	211	164	198	64	271
29.0	13.818	40.10	20.68	46.71	49.436	16.72	20.727	52.09
	150	10	31	235	233	190	108	273
July 9.0	13.968	40.20	20.99	44.36	49.669	14.82	20.835	49.36
	188	16	41	220	297	179	145	270
18.9	14.156	40.36	21.40	42.16	49.966	13.03	20.980	46.66
	216	19	49	202	353	162	181	255
28.9	14.372	40.55	21.89	40.14	50.319	11.41	21.161	44.11
	244	16	56	178	403	141	211	233
Aug. 7.9	14.616	40.71	22.45	38.36	50.722	9.97	21.375	41.78
	262	18	63	152	443	122	238	205
17.9	14.878	40.89	23.08	36.84	51.165	8.75	21.613	39.73
	281	17	67	121	476	99	262	167
27.8	15.159	41.06	23.75	35.63	51.641	7.76	21.875	38.06
	294	8	72	90	501	73	282	122
Sept. 6.8	15.453	41.14	24.47	34.73	52.145	7.03	22.157	36.84
	300	4	75	55	520	48	294	76
16.8	15.753	41.18	25.22	34.18	52.665	6.55	22.451	36.08
	309	—	76	17	534	20	303	22
26.7	16.062	41.14	25.98	34.01	53.199	6.35	22.754	35.86
	310	4	76	—	535	—	306	—
Oct. 6.7	16.372	41.05	26.74	34.16	53.734	6.43	23.060	36.18
	309	9	76	15	532	8	303	32
16.7	16.681	40.87	27.50	34.72	54.266	6.81	23.363	37.04
	301	18	73	56	518	38	294	86
		22		89		67		137
26.7	16.982	40.65	28.23	35.61	54.784	7.48	23.657	38.41
	288	26	70	131	496	95	279	182
Nov. 5.6	17.270	40.39	28.93	36.92	55.280	8.43	23.936	40.23
	273	27	64	161	461	124	258	225
15.6	17.543	40.12	29.57	38.53	55.741	9.67	24.194	42.48
	251	23	57	195	418	150	229	256
25.6	17.794	39.89	30.14	40.48	56.159	11.17	24.423	45.04
	222	22	49	219	362	174	193	278
Dec. 5.6	18.016	39.67	30.63	42.67	56.521	12.91	24.616	47.82
	183	14	38	244	295	194	152	291
15.5	18.199	39.53	31.01	45.11	56.816	14.85	24.768	50.73
	140	7	27	258	216	210	105	293
25.5	18.339	39.46	31.28	47.69	57.032	16.95	24.873	53.66
	93	—	15	266	133	216	54	285
35.5	18.432	39.47	31.43	50.35	57.165	19.11	24.927	56.51
Mean Place	13.835	49.55	21.932	57.52	49.993	27.10	21.341	43.21
Sec δ, Tan δ	1.083	+0.415	2.835	+2.653	1.944	+1.667	1.155	−0.578
$D_{\psi a}$, $D_{\omega a}$	+0.072	+0.001	+0.131	+0.008	+0.105	+0.006	+0.046	−0.003
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.02	+1.00	−0.02	+1.00	−0.02	+1.00	−0.03	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Geminorum. Mag. 3.2		ψ¹ Aurigæ. Mag. 5.1		β Canis Majoris. Mag. 2.0		8 Monocerotis. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 18 s	° ′ +22 33 ″	h m 6 18 s	° ′ +49 19 ″	h m 6 19 s	° ′ −17 54 ″	h m 6 19 s	° ′ + 4 37 ″
Jan. 0.5	19.521	5.73	60.189	34.73	19.881	71.17	42.579	48.41
	69	3	81	163	39	230	59	108
10.5	19.590	5.76	60.270	36.36	19.920	73.47	42.638	47.33
	17	9	10	163	11	209	11	94
20.4	19.607	5.85	60.280	37.99	19.909	75.56	42.649	46.39
	−	17	−	156	55	186	−	80
30.4	19.575	6.02	60.219	39.55	19.854	77.42	42.615	45.59
	32	19	61	145	102	157	34	63
Feb. 9.4	19.493	6.21	60.091	41.00	19.752	78.99	42.536	44.96
	82	21	128	120	140	127	79	48
	124		185				120	
19.3	19.369	6.42	59.906	42.20	19.612	80.26	42.416	44.48
	160	20	232	99	171	94	150	34
Mar. 1.3	19.209	6.62	59.674	43.19	19.441	81.20	42.266	44.14
	184	16	268	67	192	59	172	18
11.3	19.025	6.78	59.406	43.86	19.249	81.79	42.094	43.96
	193	15	284	36	205	27	184	5
21.3	18.832	6.93	59.122	44.22	19.044	82.06	41.910	43.91
	197	5	288	4	205	−	187	−
31.2	18.635	6.98	58.834	44.26	18.839	81.97	41.723	44.00
	190	0	275	−	197	40	176	21
				28				
Apr. 10.2	18.445	6.98	58.559	43.98	18.642	81.57	41.547	44.21
	168	4	245	61	178	73	160	34
20.2	18.277	6.94	58.314	43.37	18.464	80.84	41.387	44.55
	138	4	212	86	155	103	133	46
30.2	18.139	6.90	58.102	42.51	18.309	79.81	41.254	45.01
	104	10	161	110	121	132	101	60
May 10.1	18.035	6.80	57.941	41.41	18.188	78.49	41.153	45.61
	65	8	104	125	87	158	64	71
20.1	17.970	6.72	57.837	40.16	18.101	76.91	41.089	46.32
	23	9	17	140	47	181	28	83
	—		—				—	
30.1	17.947	6.63	57.790	38.76	18.054	75.10	41.061	47.15
	23	4	15	147	5	200	11	91
June 9.0	17.970	6.59	57.805	37.29	18.049	73.10	41.075	48.06
	65	0	75	151	35	213	55	102
19.0	18.035	6.59	57.880	35.78	18.084	70.97	41.130	49.08
	108	1	135	151	75	223	93	107
29.0	18.143	6.60	58.015	34.27	18.159	68.74	41.223	50.15
	144	9	186	147	112	225	128	111
July 9.0	18.287	6.69	58.201	32.80	18.271	66.49	41.351	51.26
	180	12	239	134	147	221	161	110
18.9	18.467	6.81	58.440	31.46	18.418	64.28	41.512	52.36
	210	12	287	125	179	212	187	107
28.9	18.677	6.93	58.727	30.21	18.597	62.16	41.699	53.43
	239	11	321	110	206	193	213	98
Aug. 7.9	18.916	7.04	59.048	29.11	18.803	60.23	41.912	54.41
	257	15	354	95	229	169	236	88
17.9	19.173	7.19	59.402	28.16	19.032	58.54	42.148	55.29
	277	9	380	80	219	139	250	69
27.8	19.450	7.28	59.782	27.36	19.281	57.15	42.398	55.98
	292	3	405	62	265	101	264	49
		—						
Sept. 6.8	19.742	7.31	60.187	26.74	19.546	56.14	42.662	56.47
	298	1	416	42	276	60	275	27
16.8	20.040	7.30	60.603	26.32	19.822	55.54	42.937	56.74
	308	11	426	27	284	18	280	2
26.7	20.348	7.19	61.029	26.05	20.106	55.36	43.217	56.76
	311	16	431	4	288	30	286	−
Oct. 6.7	20.659	7.03	61.460	26.01	20.394	55.66	43.503	56.52
	311	26	432	−	286	74	283	24
16.7	20.970	6.77	61.892	16	20.680	56.40	43.786	56.04
	304	25	421	26.17	279	119	278	48
				37				73
26.7	21.274	6.52	62.313	26.54	20.959	57.59	44.064	55.31
	294	32	406	58	267	155	271	91
Nov. 5.6	21.568	6.20	62.719	27.12	21.226	59.14	44.335	54.40
	281	31	383	79	250	189	254	108
15.6	21.849	5.89	63.102	27.91	21.476	61.03	44.589	53.32
	255	29	349	104	226	216	235	118
25.6	22.104	5.60	63.451	28.95	21.702	63.19	44.824	52.14
	229	28	307	122	195	233	207	124
Dec. 5.6	22.333	5.32	63.758	30.17	21.897	65.52	45.031	50.90
	190	17	254	141	158	242	172	125
15.5	22.523	5.15	64.012	31.58	22.055	67.94	45.203	49.65
	150	9	196	150	116	242	134	121
25.5	22.673	5.06	64.208	33.08	22.171	70.36	45.337	48.44
	101	0	128	164	70	233	90	110
35.5	22.774	5.06	64.336	34.72	22.241	72.69	45.427	47.34
Mean Place	18.170	16.11	58.292	44.18	18.505	59.71	41.306	59.36
Sec δ, Tan δ	1.083	+0.415	1.534	+1.164	1.051	−0.323	1.003	+0.081
Dψa, Dωa	+0.072	+0.002	+0.092	+0.006	+0.053	−0.002	+0.063	0.000
Dψδ, Dωδ	−0.03	+1.00	−0.03	+1.00	−0.03	+1.00	−0.03	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Argus. (*Canopus*.) Mag. −0.9		10 Monocerotis. Mag. 5.0		ν Geminorum. Mag. 4.1		8 Lyncis. Mag. 6.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 22 s	° ′ −52 39 ″	h m 6 24 s	° ′ − 4 42 ″	h m 6 24 s	° ′ +20 15 ″	h m 6 30 s	° ′ +61 32 ″
Jan. 0.5	16.844	23.08	10.794	59.21	24.811	33.37	42.10	53.39
	24	341	57	161	75	13	11	227
10.5	16.820	26.52	10.851	60.82	24.886	33.24	42.21	55.66
	97	321	9	147	23	4	1	225
20.4	16.723	29.73	10.860	62.29	24.909	33.20	42.22	57.91
	165	287	38	128	28	4	8	217
30.4	16.558	32.60	10.822	63.57	24.881	33.24	42.14	60.08
	222	249	80	106	76	11	17	199
Feb. 9.4	16.336	35.09	10.742	64.63	24.805	33.35	41.97	62.07
	278	204	122	84	119	14	26	171
19.4	16.058	37.13	10.620	65.47	24.686	33.49	41.71	63.78
	317	158	152	61	154	15	32	141
Mar. 1.3	15.741	38.71	10.468	66.08	24.532	33.64	41.39	65.19
	318	106	174	38	177	15	37	100
11.3	15.393	39.77	10.294	66.46	24.355	33.79	41.02	66.19
	363	51	188	14	192	12	40	58
21.3	15.030	40.28	10.106	66.60	24.163	33.91	40.62	66.77
	366	1	188	7	195	10	41	14
31.2	14.664	40.29	9.918	66.53	23.968	34.01	40.21	66.91
	355	51	182	28	186	6	39	27
Apr. 10.2	14.309	39.78	9.736	66.25	23.782	34.07	39.82	66.64
	334	103	165	51	167	4	36	70
20.2	13.975	38.75	9.571	65.71	23.615	34.11	39.46	65.94
	301	115	140	70	142	1	32	111
30.2	13.674	37.30	9.431	65.01	23.473	34.12	39.14	64.83
	263	191	109	90	106	1	26	139
May 10.1	13.411	35.36	9.322	64.14	23.367	34.13	38.88	63.44
	212	233	73	107	67	3	18	170
20.1	13.199	33.03	9.249	63.07	23.300	34.16	38.70	61.74
	156	267	36	126	26	4	11	190
30.1	13.043	30.36	9.213	61.81	23.274	34.20	38.59	59.84
	100	295	3	138	16	8	3	203
June 9.1	12.943	27.41	9.216	60.43	23.290	34.28	38.56	57.81
	37	313	45	149	59	11	6	212
19.0	12.906	24.28	9.261	58.94	23.349	34.39	38.62	55.69
	23	325	81	157	100	16	14	214
29.0	12.929	21.03	9.342	57.37	23.449	34.55	38.76	53.55
	81	330	117	159	137	19	21	211
July 9.0	13.013	17.73	9.459	55.78	23.586	34.74	38.97	51.44
	141	325	149	159	172	22	28	202
18.9	13.154	14.48	9.608	54.19	23.758	34.96	39.25	49.42
	197	308	180	152	202	23	35	190
28.9	13.351	11.40	9.788	52.67	23.960	35.19	39.60	47.52
	247	285	204	110	227	22	40	170
Aug. 7.9	13.598	8.55	9.992	51.27	24.187	35.41	40.00	45.82
	291	250	225	122	250	19	45	152
17.9	13.889	6.05	10.217	50.05	24.437	35.60	40.45	44.30
	330	206	215	100	268	13	49	129
27.8	14.219	3.99	10.462	49.05	24.705	35.73	40.94	43.01
	364	155	258	72	282	7	53	103
Sept. 6.8	14.583	2.44	10.720	48.33	24.987	35.80	41.47	41.98
	386	99	270	42	293	2	55	77
16.8	14.969	1.45	10.990	47.91	25.280	35.78	42.02	41.21
	400	36	277	7	301	12	56	47
26.8	15.369	1.09	11.267	47.84	25.581	35.66	42.58	40.74
	406	25	282	26	306	22	58	18
Oct. 6.7	15.775	1.34	11.549	48.10	25.887	35.44	43.16	40.56
	399	92	281	61	304	30	58	15
16.7	16.174	2.26	11.830	48.71	26.191	35.14	43.74	40.71
	386	153	277	92	302	38	56	44
26.7	16.560	3.79	12.107	49.63	26.493	34.76	44.30	41.15
	362	210	266	121	293	43	55	79
Nov. 5.6	16.922	5.89	12.373	50.84	26.786	34.33	44.85	41.94
	324	257	254	144	279	45	52	110
15.6	17.246	8.46	12.627	52.28	27.065	33.88	45.37	43.04
	275	300	231	162	257	45	47	142
25.6	17.521	11.46	12.858	53.90	27.322	33.43	45.84	44.46
	224	329	205	174	230	41	41	169
Dec. 5.6	17.745	14.75	13.063	55.64	27.552	33.02	46.25	46.15
	159	348	169	177	195	35	35	194
15.5	17.904	18.23	13.232	57.41	27.747	32.67	46.60	48.09
	90	353	131	176	153	25	26	212
25.5	17.994	21.76	13.363	59.17	27.900	32.42	46.86	50.21
	22	348	86	166	106	16	17	225
35.5	18.016	25.24	13.449	60.83	28.006	32.26	47.03	52.46
Mean Place	14.557	11.61	9.503	48.07	23.482	43.98	39.551	63.29
Sec δ, Tan δ	1.648	−1.311	1.003	−0.082	1.066	+0.369	2.099	+1.846
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.027	−0.008	+0.059	−0.001	+0.071	+0.003	+0.110	+0.016
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.04	+1.00	−0.04	+0.99	−0.04	+0.99	−0.05	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Canis Majoris. Mag. 4.5		23 H. Camelop. Mag. 5.6		γ Geminorum. Mag. 1.9		51 Aurigæ. Mag. 5.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 31 s	° ′ −22 54 ″	h m 6 33 s	° ′ +79 38 ″	h m 6 33 s	° ′ +16 27 ″	h m 6 33 s	° ′ +39 27 ″
Jan. 0.5	51.231	19.27	14.11	55.46	17.164	47.60	21.064	26.28
	46	256	17	301	82	40	97	104
10.5	51.277	21.83	14.28	58.47	17.246	47.20	21.161	27.32
	— 6	236	— 8	297	28	26	— 35	110
20.4	51.271	24.19	14.20	61.44	17.274	46.94	21.196	28.42
	53	212	33	282	— 18	16	28	111
30.4	51.218	26.31	13.87	64.26	17.256	46.78	21.168	29.53
	99	182	55	256	70	8	87	105
Feb. 9.4	51.119	28.13	13.32	66.82	17.186	46.70	21.081	30.58
	141	150	77	222	111	0	140	96
19.4	50.978	29.63	12.55	69.04	17.075	46.70	20.941	31.54
	174	113	92	176	143	4	183	79
Mar. 1.3	50.804	30.76	11.63	70.80	16.932	46.74	20.758	32.33
	197	77	104	128	171	10	214	61
11.3	50.607	31.53	10.59	72.08	16.761	46.84	20.544	32.94
	211	39	112	72	187	10	233	41
21.3	50.396	31.92	9.47	72.80	16.574	46.94	20.311	33.35
	217	1	115	14	190	14	239	15
31.2	50.179	31.93	8.32	72.94	16.384	47.08	20.072	33.50
	208	— 35	112	— 41	183	13	230	— 6
Apr. 10.2	49.971	31.58	7.20	72.53	16.201	47.21	19.842	33.44
	192	70	105	96	167	12	211	28
20.2	49.779	30.88	6.15	71.57	16.034	47.33	19.631	33.16
	169	105	95	144	140	15	179	49
30.2	49.610	29.83	5.20	70.13	15.894	47.48	19.452	32.67
	138	137	77	189	111	16	140	66
May 10.1	49.472	28.46	4.43	68.24	15.783	47.64	19.312	32.01
	104	167	61	223	72	20	96	79
20.1	49.368	26.79	3.82	66.01	15.711	47.84	19.216	31.22
	64	192	42	252	33	24	46	90
30.1	49.304	24.87	3.40	63.49	15.678	48.08	19.170	30.32
	24	213	22	272	5	29	5	96
June 9.1	49.280	22.74	3.18	60.77	15.683	48.37	19.175	29.36
	— 18	229	0	281	50	30	55	99
19.0	49.298	20.45	3.18	57.93	15.733	48.67	19.230	28.37
	59	240	22	288	87	36	107	98
29.0	49.357	18.05	3.40	55.05	15.820	49.03	19.337	27.39
	97	244	41	285	126	39	152	96
July 9.0	49.454	15.61	3.81	52.20	15.946	49.42	19.489	26.43
	133	240	61	272	159	40	192	92
18.9	49.587	13.21	4.42	49.48	16.105	49.82	19.681	25.51
	167	230	80	256	186	36	232	85
28.9	49.754	10.91	5.22	46.92	16.291	50.18	19.913	24.66
	197	214	94	234	217	37	265	78
Aug. 7.9	49.951	8.77	6.16	44.58	16.508	50.55	20.178	23.88
	223	186	110	207	241	32	293	69
17.9	50.174	6.91	7.26	42.51	16.749	50.87	20.471	23.19
	244	155	121	174	254	23	317	62
27.8	50.418	5.36	8.47	40.77	17.003	51.10	20.788	22.57
	264	115	131	140	273	10	336	54
Sept. 6.8	50.682	4.21	9.78	39.37	17.276	51.20	21.124	22.03
	278	73	139	100	286	0	351	44
16.8	50.960	3.48	11.17	38.37	17.562	51.20	21.475	21.59
	288	26	143	58	293	14	362	35
26.8	51.248	3.22	12.60	37.79	17.855	51.06	21.837	21.24
	293	25	146	18	299	29	368	26
Oct. 6.7	51.541	3.47	14.06	37.61	18.154	50.77	22.205	20.98
	294	73	146	27	300	40	369	16
16.7	51.835	4.20	15.52	37.88	18.454	50.37	22.574	20.82
	289	121	142	72	298	49	367	3
26.7	52.124	5.41	16.94	38.60	18.752	49.88	22.941	20.79
	278	165	136	117	289	63	357	12
Nov. 5.6	52.402	7.06	18.30	39.77	19.041	49.25	23.298	20.91
	262	200	127	158	277	65	340	26
15.6	52.664	9.06	19.57	41.35	19.318	48.60	23.638	21.17
	237	231	113	199	258	68	316	42
25.6	52.901	11.37	20.70	43.34	19.576	47.92	23.954	21.59
	206	251	98	236	231	67	281	59
Dec. 5.6	53.107	13.88	21.68	45.70	19.807	47.25	24.235	22.18
	169	265	78	263	200	61	242	74
15.5	53.276	16.53	22.46	48.33	20.007	46.64	24.477	22.92
	127	266	57	288	159	52	192	89
25.5	53.403	19.19	23.03	51.21	20.166	46.12	24.669	23.81
	77	263	33	300	111	45	136	101
35.5	53.480	21.82	23.36	54.21	20.277	45.67	24.805	24.82
Mean Place	49.780	8.23	7.316	65.07	15.865	58.47	19.491	36.80
Sec δ, Tan δ	1.086	−0.423	5.565	+5.475	1.043	+0.296	1.295	+0.823
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.050	−0.004	+0.205	+0.052	+0.069	+0.003	+0.083	+0.008
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.06	+0.99	−0.06	+0.99	−0.06	+0.99	−0.06	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Argus. Mag. 3.2		S Monocerotis. Mag. 4.7		ϵ Geminorum. Mag. 3.2		ξ Geminorum. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 35 s	° ′ −43 7 ″	h m 6 36 s	° ′ + 9 57 ″	h m 6 39 s	° ′ +25 12 ″	h m 6 40 s	° ′ +12 58 ″
Jan. 0.5	26.314	50.78	45.548	54.40	13.102	20.56	59.387	36.59
	20	329	80	79	90	12	86	62
10.5	26.334	54.07	45.628	53.61	13.192	20.68	59.473	35.97
	— 42	307	31	66	40	25	36	50
20.4	26.292	57.14	45.659	52.95	13.232	20.93	59.509	35.47
	102	280	19	53	13	32	14	38
30.4	26.190	59.94	45.640	52.42	13.219	21.25	59.495	35.09
	155	245	64	39	69	39	62	26
Feb. 9.4	26.035	62.39	45.576	52.03	13.150	21.64	59.433	34.83
	204	205	107	28	111	38	105	15
19.4	25.831	64.44	45.469	51.75	13.039	22.02	59.328	34.68
	242	159	142	16	150	36	140	5
Mar. 1.3	25.589	66.03	45.327	51.59	12.889	22.38	59.188	34.63
	270	111	166	6	178	34	166	— 2
11.3	25.319	67.14	45.161	51.53	12.711	22.72	59.022	34.65
	287	63	181	— 2	194	24	181	6
21.3	25.032	67.77	44.980	51.55	12.517	22.96	58.841	34.71
	291	15	187	10	200	20	188	13
31.3	24.741	67.92	44.793	51.65	12.317	23.16	58.653	34.84
	286	— 35	179	18	196	8	182	16
Apr. 10.2	24.455	67.57	44.614	51.83	12.121	23.24	58.471	35.00
	269	82	165	25	177	0	168	21
20.2	24.186	66.75	44.449	52.08	11.944	23.24	58.303	35.21
	242	128	141	31	154	5	142	25
30.2	23.944	65.47	44.308	52.39	11.790	23.19	58.161	35.46
	208	168	110	40	118	13	114	29
May 10.1	23.736	63.79	44.198	52.79	11.672	23.06	58.047	35.75
	169	208	74	48	83	17	77	34
20.1	23.567	61.71	44.124	53.27	11.589	22.89	57.970	36.09
	122	242	39	54	39	19	41	40
30.1	23.445	59.29	44.085	53.81	11.550	22.70	57.929	36.49
	75	268	3	62	2	19	0	45
June 9.1	23.370	56.61	44.088	54.43	11.552	22.51	57.929	36.94
	24	290	44	68	48	18	40	49
19.0	23.346	53.71	44.132	55.11	11.600	22.33	57.969	37.43
	— 26	301	80	72	87	16	79	55
29.0	23.372	50.67	44.212	55.83	11.687	22.17	58.048	37.98
	76	309	117	75	126	15	115	56
July 9.0	23.448	47.58	44.329	56.58	11.813	22.02	58.163	38.54
	123	305	149	75	165	15	149	56
19.0	23.571	44.53	44.478	57.33	11.978	21.87	58.312	39.10
	169	294	180	74	194	10	179	54
28.9	23.740	41.59	44.658	58.07	12.172	21.77	58.491	39.64
	209	273	204	68	226	11	203	50
Aug. 7.9	23.949	38.86	44.862	58.75	12.398	21.66	58.694	40.14
	245	210	228	56	247	14	228	42
17.9	24.194	36.46	45.090	59.31	12.645	21.52	58.922	40.56
	279	203	245	46	270	14	246	32
27.8	24.473	34.43	45.335	59.77	12.915	21.38	59.168	40.88
	306	155	262	30	288	19	264	17
Sept. 6.8	24.779	32.88	45.597	60.07	13.203	21.19	59.432	41.05
	326	102	274	11	299	22	277	2
16.8	25.105	31.86	45.871	60.18	13.502	20.97	59.709	41.07
	343	44	284	9	310	24	286	14
26.8	25.448	31.42	46.155	60.09	13.812	20.73	59.995	40.93
	349	— 15	289	29	315	33	292	31
Oct. 6.7	25.797	31.57	46.444	59.80	14.127	20.40	60.287	40.62
	349	78	292	49	319	34	296	49
16.7	26.146	32.35	46.736	59.31	14.446	20.06	60.583	40.13
	340	137	289	67	318	39	291	63
26.7	26.486	33.72	47.025	58.64	14.764	19.67	60.877	39.50
	325	192	283	80	314	37	289	77
Nov. 5.7	26.811	35.64	47.308	57.84	15.078	19.30	61.166	38.73
	298	240	271	93	297	35	276	83
15.6	27.109	38.04	47.579	56.91	15.375	18.95	61.442	37.90
	267	281	252	100	277	30	259	89
25.6	27.376	40.85	47.831	55.91	15.652	18.65	61.701	37.01
	223	309	226	103	252	22	232	88
Dec. 5.6	27.599	43.94	48.057	54.88	15.904	18.43	61.933	36.13
	172	329	194	101	214	12	201	86
15.5	27.771	47.23	48.251	53.87	16.118	18.31	62.134	35.27
	118	337	155	93	176	1	161	77
25.5	27.889	50.60	48.406	52.94	16.294	18.32	62.295	34.50
	58	333	110	86	126	9	118	67
35.5	27.947	53.93	48.516	52.08	16.420	18.41	62.413	33.83
Mean Place	24.403	40.15	44.273	65.35	11.746	31.47	58.106	47.58
Sec δ, Tan δ	1.370	−0.937	1.015	+0.176	1.105	+0.471	1.026	+0.230
$D_{\psi a}$, $D_{\omega a}$	+0.037	−0.010	+0.066	+0.002	+0.073	+0.005	+0.067	+0.003
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.06	+0.99	−0.06	+0.99	−0.07	+0.99	−0.07	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ^5 Aurigæ. Mag. 5.3		α Canis Majoris. (*Sirius.*) Mag. −1.6		18 Monocerotis. Mag. 4.7		43 Camelop. Mag. 5.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 6 41	° ′ ″ +43 39	h m s 6 41	° ′ ″ −16 36	h m s 6 43	° ′ ″ + 2 29	h m s 6 45	° ′ ″ +68 58
Jan. 0.5	13.252	9.41	46.547	46.60	52.003	40.39	28.04	38.00
	110	128	55	232	81	125	17	260
10.5	13.362	10.69	46.602	48.92	52.084	39.14	28.21	40.60
	44	135	8	215	33	113	4	259
20.4	13.406	12.04	46.610	51.07	52.117	38.01	28.25	43.19
	22	135	39	193	15	94	10	253
30.4	13.384	13.39	46.571	53.00	52.102	37.07	28.15	45.72
	86	128	84	161	62	79	22	236
Feb. 9.4	13.298	14.67	46.487	54.64	52.040	36.28	27.93	48.08
	144	117	128	134	105	58	32	207
19.4	13.154	15.84	46.359	55.98	51.935	35.70	27.61	50.15
	189	100	160	102	138	42	42	172
Mar. 1.3	12.965	16.84	46.199	57.00	51.797	35.28	27.19	51.87
	227	77	185	71	163	26	48	129
11.3	12.738	17.61	46.014	57.71	51.634	35.02	26.71	53.16
	218	53	198	38	179	8	53	84
21.3	12.490	18.14	45.816	58.09	51.455	34.94	26.18	54.00
	255	25	203	3	185	6	55	33
31.3	12.235	18.39	45.613	58.12	51.270	35.00	25.63	54.33
	251	1	197	26	180	22	55	15
Apr. 10.2	11.984	18.38	45.416	57.86	51.090	35.22	25.08	54.18
	229	30	182	60	167	35	51	64
20.2	11.755	18.08	45.234	57.26	50.923	35.57	24.57	53.54
	199	52	159	89	112	50	45	108
30.2	11.556	17.56	45.075	56.37	50.781	36.07	24.12	52.46
	159	76	129	116	115	63	39	148
May 10.1	11.397	16.80	44.946	55.21	50.666	36.70	23.73	50.98
	112	92	95	141	83	76	29	181
20.1	11.285	15.88	44.851	53.80	50.583	37.46	23.44	49.17
	61	105	62	164	44	88	19	210
30.1	11.224	14.83	44.789	52.16	50.539	38.34	23.25	47.07
	7	117	21	183	7	98	10	228
June 9.1	11.217	13.66	44.768	50.33	50.532	39.32	23.15	44.79
	49	121	20	197	31	106	1	242
19.0	11.266	12.45	44.788	48.36	50.563	40.38	23.16	42.37
	99	122	59	205	68	112	12	247
29.0	11.365	11.23	44.847	46.31	50.631	41.50	23.28	39.90
	149	121	95	210	106	115	23	247
July 9.0	11.514	10.02	44.942	44.21	50.737	42.65	23.51	37.43
	195	117	129	208	137	115	31	241
19.0	11.709	8.85	45.071	42.13	50.874	43.80	23.82	35.02
	234	110	162	197	167	111	41	229
28.9	11.943	7.75	45.233	40.16	51.041	44.91	24.23	32.73
	272	103	190	183	193	102	48	210
Aug. 7.9	12.215	6.72	45.423	38.33	51.234	45.93	24.71	30.63
	301	94	216	160	215	90	55	191
17.9	12.519	5.78	45.639	36.73	51.449	46.83	25.26	28.72
	329	83	238	130	236	70	62	165
27.8	12.848	4.95	45.877	35.43	51.685	47.53	25.88	27.07
	352	71	254	96	251	49	66	137
Sept. 6.8	13.200	4.24	46.131	34.47	51.936	48.02	26.54	25.70
	368	61	268	57	267	26	70	106
16.8	13.568	3.63	46.399	33.90	52.203	48.28	27.24	24.64
	381	47	278	16	275	2	75	72
26.8	13.949	3.16	46.677	33.74	52.478	48.26	27.99	23.92
	391	34	285	30	284	29	75	38
Oct. 6.7	14.340	2.82	46.962	34.04	52.762	47.97	28.74	23.54
	394	18	289	75	285	57	75	1
16.7	14.734	2.64	47.251	34.79	53.047	47.40	29.49	23.53
	391	3	284	118	286	82	75	39
26.7	15.125	2.61	47.535	35.97	53.333	46.58	30.24	23.92
	383	18	274	154	279	104	72	77
Nov. 5.7	15.508	2.79	47.809	37.51	53.612	45.54	30.96	24.69
	367	34	260	189	268	123	68	115
15.6	15.875	3.13	48.069	39.40	53.880	44.31	31.64	25.84
	340	55	239	215	249	136	63	152
25.6	16.215	3.68	48.308	41.55	54.129	42.95	32.27	27.36
	307	75	209	234	228	142	56	186
Dec. 5.6	16.522	4.43	48.517	43.89	54.357	41.53	32.83	29.22
	264	93	174	244	193	144	47	217
15.5	16.786	5.36	48.691	46.33	54.550	40.09	33.30	31.39
	211	112	135	244	155	141	36	239
25.5	16.997	6.48	48.826	48.77	54.705	38.68	33.66	33.78
	152	125	88	239	111	132	24	256
35.5	17.149	7.73	48.914	51.16	54.816	37.36	33.90	36.34
Mean Place	11.597	20.27	45.294	34.35	50.731	51.32	24.765	48.78
Sec δ, Tan δ	1.382	+0.954	1.044	−0.298	1.001	+0.044	2.787	+2.602
$D\psi\alpha$, $D\omega\alpha$	+0.086	+0.011	+0.053	−0.004	+0.062	+0.001	+0.129	+0.034
$D\psi\delta$, $D\omega\delta$	−0.07	+0.98	−0.07	+0.98	−0.08	+0.98	−0.08	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pictoris. Mag. 3.3		θ Geminorum. Mag. 3.6		τ Argus. Mag. 2.8		θ Canis Majoris. Mag. 4.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	6 47	−61 51	6 47	+34 3	6 48	−50 31	6 50	−11 56
	s	″	s	″	s	″	s	″
Jan. 0.5	27.30	40.39	44.437	8.77	3.776	31.46	38.120	38.08
	2	362	107	69	22	349	76	209
10.5	27.28	44.01	44.544	9.46	3.798	34.95	38.196	40.17
	11	345	51	78	—	332	27	193
20.5	27.17	47.46	44.595	10.24	3.749	38.27	38.223	42.10
	20	319	6	84	49	305	—	172
30.4	26.97	50.65	44.589	11.08	3.632	41.32	38.201	43.82
	28	283	67	82	117	271	22	149
Feb. 9.4	26.69	53.48	44.522	11.90	3.453	44.03	38.131	45.31
	34	243	115	81	179	230	70	120
					234		110	
19.4	26.35	55.91	44.407	12.71	3.219	46.33	38.021	46.51
	41	195	159	71	278	185	144	92
Mar. 1.3	25.94	57.86	44.248	13.42	2.941	48.18	37.877	47.43
	44	146	189	60	314	136	171	63
11.3	25.50	59.32	44.059	14.02	2.627	49.54	37.706	48.06
	48	94	213	42	333	86	188	35
21.3	25.02	60.26	43.846	14.44	2.294	50.40	37.518	48.41
	48	39	219	25	343	35	194	6
31.3	24.54	60.65	43.627	14.69	1.951	50.75	37.324	48.47
	48	—	215	10	339	—	191	—
		15		—		17		22
Apr. 10.2	24.06	60.50	43.412	14.79	1.612	50.58	37.133	48.25
	46	67	197	9	324	68	178	50
20.2	23.60	59.83	43.215	14.70	1.288	49.90	36.955	47.75
	43	119	172	23	297	116	158	75
30.2	23.17	58.64	43.043	14.47	0.991	48.74	36.797	47.00
	39	164	140	40	263	161	129	101
May 10.2	22.78	57.00	42.903	14.07	0.728	47.13	36.668	45.99
	33	211	97	51	220	204	98	124
20.1	22.45	54.89	42.806	13.56	0.508	45.09	36.570	44.75
	27	219	54	61	173	239	63	143
30.1	22.18	52.40	42.752	12.95	0.335	42.70	36.507	43.32
	20	281	7	63	119	272	25	161
June 9.1	21.98	49.59	42.745	12.32	0.216	39.98	36.482	41.71
	13	308	—	69	65	297	—	177
19.0	21.85	46.51	42.784	11.63	0.151	37.01	36.497	39.94
	6	325	83	70	7	312	15	184
29.0	21.79	43.26	42.867	10.93	0.144	33.89	36.548	38.10
	—	335	129	71	—	322	51	190
July 9.0	21.82	39.91	42.996	10.22	0.193	30.67	36.636	36.20
	3	331	168	69	49	320	88	188
	10				105		121	
19.0	21.92	36.57	43.164	9.53	0.298	27.47	36.757	34.32
	17	326	201	64	157	310	152	181
28.9	22.09	33.31	43.365	8.89	0.455	24.37	36.909	32.51
	25	305	237	60	208	291	182	168
Aug. 7.9	22.34	30.26	43.602	8.29	0.663	21.46	37.091	30.83
	31	275	263	58	251	261	204	148
17.9	22.65	27.51	43.865	7.71	0.917	18.85	37.295	29.35
	37	234	286	56	294	222	228	123
27.9	23.02	25.17	44.151	7.15	1.211	16.63	37.523	28.12
	42	188	309	49	329	176	216	93
Sept. 6.8	23.44	23.29	44.460	6.66	1.540	14.87	37.769	27.19
	46	131	323	50	357	121	260	56
16.8	23.90	21.98	44.783	6.16	1.897	13.66	38.029	26.63
	48	70	333	43	377	61	275	19
26.8	24.38	21.28	45.116	5.73	2.274	13.05	38.304	26.44
	51	7	345	40	389	—	281	—
Oct. 6.7	24.89	21.21	45.461	5.33	2.663	2	38.585	26.67
	50	—	349	36	392	13.07	287	23
16.7	25.39	21.82	45.810	4.97	3.055	65	38.872	27.30
	49	61	347	32	385	13.72	284	63
		127				127		102
26.7	25.88	23.09	46.157	4.65	3.440	14.99	39.156	28.32
	47	187	344	16	369	188	280	137
Nov. 5.7	26.35	24.96	46.501	4.49	3.809	16.87	39.436	29.69
	42	243	327	9	339	239	267	170
15.6	26.77	27.39	46.828	4.40	4.148	19.26	39.703	31.39
	37	289	308	—	301	283	249	192
25.6	27.14	30.28	47.136	4.47	4.449	22.09	39.952	33.31
	30	325	280	20	254	319	223	211
Dec. 5.6	27.44	33.53	47.416	4.67	4.703	25.28	40.175	35.42
	21	351	243	34	197	340	190	218
15.6	27.65	37.04	47.659	5.01	4.900	28.68	40.365	37.60
	13	364	195	49	132	353	152	220
25.5	27.78	40.68	47.854	5.50	5.032	32.21	40.517	39.80
	4	364	147	63	65	352	104	214
35.5	27.82	44.32	48.001	6.13	5.097	35.73	40.621	41.94
Mean Place	24.180	31.16	42.992	19.96	1.514	21.94	36.775	27.56
Sec δ, Tan δ	2.120	−1.870	1.207	+0.676	1.573	−1.214	1.022	−0.212
$D_\psi\alpha$, $D_\omega\alpha$	+0.013	−0.026	+0.079	+0.009	+0.030	−0.017	+0.056	−0.003
$D_\psi\delta$, $D_\omega\delta$	−0.08	+0.98	−0.08	+0.98	−0.08	+0.98	−0.09	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Lyncis. Mag. 4.5		ϵ Canis Majoris. Mag. 1.6		ζ Geminorum. Var. 3.7–4.3		o^2 Canis Majoris. Mag. 3.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 50 s	° ′ +58 31 ″	h m 6 55 s	° ′ −28 51 ″	h m 6 59 s	° ′ +20 40 ″	h m 6 59 s	° ′ −23 43 ″
Jan. 0.5	39.269 144	20.89 208	37.533 65	68.65 288	33.901 108	52.84 17	50.035 76	20.97 269
10.5	39.413 57	22.97 213	37.598 12	71.53 275	34.009 59	52.67 5	50.111 24	23.66 252
20.5	39.470 — 37	25.10 212	37.610 — 42	74.28 218	34.068 — 4	52.62 — 7	50.135 — 28	26.18 230
30.4	39.433 122	27.22 198	37.568 88	76.76 219	34.072 — 45	52.69 15	50.107 77	28.48 202
Feb. 9.4	39.311 202	29.20 177	37.480 137	78.95 185	34.027 93	52.84 23	50.030 121	30.50 169
19.4	39.109	30.97 151	37.343	80.80 146	33.934	53.07	49.909	32.19 135
Mar. 1.3	38.842 267	32.48 117	37.168 175	82.26 106	33.803 131	53.33 26	49.750 159	33.54 99
11.3	38.523 319	33.65 79	36.967 201	83.32 68	33.641 162	53.61 28	49.564 186	34.53 60
21.3	38.173 350	34.44 38	36.748 219	84.00 24	33.458 183	53.87 26	49.360 204	35.13 23
31.3	37.808 365 360	34.82 — 3	36.523 225 227	84.24 — 17	33.266 192 186	54.10 23 19	49.146 214 211	35.36 — 15
Apr. 10.2	37.448	34.79	36.296	84.07	33.080	54.29	48.935	35.21
20.2	37.110 338	34.35 44	36.082 214	83.52 55	32.902 178	54.48 19	48.734 201	34.71 50
30.2	36.811 299	33.55 80	35.891 191	82.57 95	32.746 156	54.59 11	48.553 181	33.84 87
May 10.2	36.562 249	32.40 115	35.725 166	81.23 134	32.620 126	54.67 8	48.400 153	32.65 119
20.1	36.374 188 120	30.98 142 168	35.595 130 98	79.61 162 195	32.525 95 51	54.73 6 4	48.278 122 87	31.14 151 178
30.1	36.254	29.30	35.497	77.66	32.471	54.77	48.191	29.36
June 9.1	36.205 — 49 25	27.46 184	35.442 55	75.45 221	32.459 — 12 24	54.83 6 6	48.142 49 8	27.35 201
19.0	36.230 95	25.49 197	35.430 — 12 25	73.04 241	32.483 64	54.89 5	48.134 — 31	25.15 220
29.0	36.325 166	23.48 201	35.455 69	70.51 253	32.547 105	54.94 6	48.165 69	22.83 232
July 9.0	36.491 230	21.45 203 198	35.524 106	67.92 259 260	32.652 138	55.00 7	48.234 106	20.43 240 240
19.0	36.721	19.47	35.630	65.32	32.790	55.07 5	48.340	18.03
28.9	37.013 292	17.58 189	35.773 143	62.80 252	32.961 171	55.12 2	48.479 139	15.71 232
Aug. 7.9	37.357 344	15.80 178	35.952 179	60.45 235	33.158 197	55.14 — 4	48.651 172	13.55 216
17.9	37.747 390	14.19 161	36.155 203	58.31 214	33.385 227	55.10 8	48.852 201	11.59 196
27.9	38.178 431 465	12.76 143 122	36.391 236 258	56.53 178 140	33.629 244 266	55.02 17	49.077 225 249	9.96 163 128
Sept. 6.8	38.643	11.54 98	36.649	55.13 92	33.895	54.85	49.326	8.68
16.8	39.136 493	10.56 74	36.927 278	54.21 44	34.175 280	54.62 23	49.593 267	7.83 85
26.8	39.650 514	9.82 46	37.220 293	53.77 — 8	34.471 296	54.25 37	49.874 281	7.44 — 39
Oct. 6.7	40.177 527	9.36 19	37.523 303	53.85 62	34.775 304	53.82 43	50.167 293	7.55 11
16.7	40.710 533 530	9.17 — 13	37.830 307 306	54.47 117	35.086 311 312	53.26 56 59	50.464 297 299	8.16 61 110
26.7	41.240	9.30	38.136	55.64	35.398	52.67	50.763	9.26
Nov. 5.7	41.759 519	9.73 43	38.434 298	57.27 163	35.707 309	52.01 66	51.056 293	10.81 155
15.6	42.255 496	10.49 76	38.717 283	59.32 205	36.007 300	51.35 66	51.336 280	12.77 196
25.6	42.716 461	11.56 107	38.979 262	61.75 243	36.290 283	50.72 63	51.594 258	15.05 228
Dec. 5.6	43.130 414 354	12.92 136 164	39.208 229 191	64.45 270 287	36.549 259 226	50.14 58 48	51.827 233 195	17.59 254 268
15.6	43.484	14.56	39.399	67.32	36.775	49.66	52.022	20.27
25.5	43.768 284	16.43 187	39.549 150	70.29 297	36.965 190	49.29 37	52.177 155	23.02 275
35.5	43.969 201	18.46 203	39.646 97	73.21 292	37.109 144	49.04 25	52.285 108	25.74 272
Mean Place	37.037	32.15	35.962	58.91	32.610	64.20	48.550	11.23
Sec δ, Tan δ	1.915	+1.633	1.142	−0.551	1.069	+0.377	1.092	−0.439
$D_{\psi a}$, $D_{\omega a}$	+0.103	+0.024	+0.047	−0.009	+0.071	+0.006	+0.050	−0.008
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.09	+0.98	−0.10	+0.97	−0.10	+0.97	−0.10	+0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Canis Majoris. Mag. 4.1		δ Canis Majoris. Mag. 2.0		63 Aurigæ. Mag. 5.1		51 Geminorum. Mag. 5.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 7 0	° ′ −15 31	h m 7 5	° ′ −26 16	h m 7 6	° ′ +39 26	h m 7 8	° ′ +16 17
	s	″	s	″	s	″	s	″
Jan. 0.5	17.888	16.62	17.092	21.40	23.269	39.45	58.360	15.84
	83	229	77	282	137	97	117	50
10.5	17.971	18.91	17.169	24.22	23.406	40.42	58.477	15.34
	33	215	27	266	73	107	66	35
20.5	18.004	21.06	17.196	26.88	23.479	41.49	58.543	14.99
	16	194	29	243	12	115	13	19
30.4	17.988	23.00	17.167	29.31	23.491	42.64	58.556	14.80
Feb. 9.4	17.924	24.68	17.092	31.48	23.440	43.80	58.519	14.72
	64	168	75	217	51	116	37	8
	108	140	122	182	108	114	83	2
19.4	17.816	26.08	16.970	33.30	23.332	44.94	58.436	14.74
	143	108	160	146	158	100	123	11
Mar. 1.4	17.673	27.16	16.810	34.76	23.174	45.94	58.313	14.85
	172	78	190	108	193	84	154	17
11.3	17.501	27.94	16.620	35.84	22.981	46.78	58.159	15.02
	188	45	208	69	220	67	175	21
21.3	17.313	28.39	16.412	36.53	22.761	47.45	57.984	15.23
	198	14	218	31	234	44	185	22
31.3	17.115	28.53	16.194	36.84	22.527	47.89	57.799	15.45
	195	17	217	10	233	21	185	23
Apr. 10.2	16.920	28.36	15.977	36.74	22.294	48.10	57.614	15.68
	185	46	208	48	220	3	175	22
20.2	16.735	27.90	15.769	36.26	22.074	48.07	57.439	15.90
	164	77	189	84	194	22	154	23
30.2	16.571	27.13	15.580	35.42	21.880	47.85	57.285	16.13
May 10.2	16.432	26.09	15.419	34.20	21.717	47.41	57.158	16.37
	139	104	161	122	163	44	127	24
20.1	16.324	24.79	15.289	32.69	21.595	46.78	57.062	16.61
	108	130	130	151	122	63	96	24
	74	152	99	182	77	80	60	24
30.1	16.250	23.27	15.190	30.87	21.518	45.98	57.002	16.85
	37	172	58	206	32	86	22	28
June 9.1	16.213	21.55	15.132	28.81	21.486	45.12	56.980	17.13
	2	188	17	227	17	99	18	28
19.1	16.215	19.67	15.115	26.54	21.503	44.13	56.998	17.41
	40	197	21	241	68	102	55	30
29.0	16.255	17.70	15.136	24.13	21.571	43.11	57.053	17.71
July 9.0	16.331	15.66	15.197	21.65	21.683	42.06	57.145	18.01
	76	201	61	218	112	105	92	30
	110	203	100	248	154	104	125	29
19.0	16.441	13.63	15.297	19.17	21.837	41.02	57.270	18.30
	143	197	132	241	194	103	157	26
28.9	16.584	11.66	15.429	16.76	22.031	39.99	57.427	18.56
Aug. 7.9	16.755	9.83	15.597	14.50	22.263	38.99	57.612	18.77
	171	183	168	226	232	100	185	21
17.9	16.953	8.19	15.792	12.44	22.526	38.03	57.822	18.93
	198	161	195	206	263	96	210	16
27.9	17.174	6.83	16.018	10.72	22.817	37.15	58.054	18.98
	221	136	226	172	291	88	232	5
	243	104	248	136	311	89	253	6
Sept. 6.8	17.417	5.79	16.266	9.36	23.131	36.26	58.307	18.92
	259	67	268	93	337	80	269	20
16.8	17.676	5.12	16.534	8.43	23.468	35.46	58.576	18.72
	273	25	285	46	350	69	283	33
26.8	17.949	4.87	16.819	7.97	23.818	34.77	58.859	18.39
Oct. 6.8	18.233	5.04	17.117	8.00	24.184	34.15	59.153	17.92
	281	63	298	60	366	62	294	47
16.7	18.522	5.67	17.419	8.60	24.556	33.64	59.455	17.31
	289	103	302	110	372	51	302	61
	290		304		375	38	305	74
26.7	18.812	6.70	17.723	9.70	24.931	33.26	59.760	16.57
	286	142	298	156	372	25	304	81
Nov. 5.7	19.098	8.12	18.021	11.26	25.303	33.01	60.064	15.76
	273	178	284	198	362	6	296	87
15.6	19.371	9.90	18.305	13.24	25.665	32.95	60.360	14.89
	256	204	265	234	342	15	282	88
25.6	19.627	11.94	18.570	15.58	26.007	33.10	60.642	14.01
Dec. 5.6	19.858	14.19	18.809	18.17	26.324	33.41	60.901	13.16
	231	225	239	259	317	31	259	85
	198	236	201	279	274	52	231	79
15.6	20.056	16.55	19.010	20.96	26.598	33.93	61.132	12.37
	159	239	160	285	230	71	192	67
25.5	20.215	18.94	19.170	23.81	26.828	34.64	61.324	11.70
	113	235	110	283	177	90	146	55
35.5	20.328	21.29	19.280	26.64	27.005	35.54	61.470	11.15
Mean Place	16.508	6.54	15.560	12.08	21.783	51.44	57.104	27.18
Sec δ, Tan δ	1.038	−0.278	1.115	−0.494	1.295	+0.823	1.042	+0.292
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.054	−0.005	+0.049	−0.009	+0.082	+0.016	+0.069	+0.006
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.10	+0.97	−0.11	+0.96	−0.11	+0.96	−0.12	+0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^2 Volantis. Mag. 3.9		λ Geminorum. Mag. 3.6		π Argus. Mag. 2.7		δ Geminorum. Mag. 3.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 7 9 s	° ′ −70 22 ″	h m 7 13 s	° ′ +16 40 ″	h m 7 14 s	° ′ −36 57 ″	h m 7 15 s	° ′ +22 7 ″
Jan. 0.5	28.83	33.97	41.420	38.22	27.174	39.49	32.869	19.74
	1	371	122	49	79	324	128	13
10.5	28.82	37.68	41.542	37.73	27.253	42.73	32.997	19.61
	13	359	70	33	20	309	75	2
20.5	28.69	41.27	41.612	37.40	27.273	45.82	33.072	19.63
	26	340	19	18	38	286	22	13
30.4	28.43	44.67	41.631	37.22	27.235	48.68	33.094	19.76
	38	309	33	6	91	260	31	23
Feb. 9.4	28.05	47.76	41.598	37.16	27.144	51.28	33.063	19.99
	47	272	80	5	142	223	79	30
19.4	27.58	50.48	41.518	37.21	27.002	53.51	32.984	20.29
	55	229	121	14	185	184	122	38
Mar. 1.4	27.03	52.77	41.397	37.35	26.817	55.35	32.862	20.67
	62	182	151	18	217	141	155	38
11.3	26.41	54.59	41.246	37.53	26.600	56.76	32.707	21.05
	66	131	174	24	240	98	179	35
21.3	25.75	55.90	41.072	37.77	26.360	57.74	32.528	21.40
	69	78	184	23	252	51	191	34
31.3	25.06	56.68	40.888	38.00	26.108	58.25	32.337	21.74
	69	25	185	24	253	6	189	25
Apr. 10.3	24.37	56.93	40.703	38.24	25.855	58.31	32.148	21.99
	68	29	175	25	244	39	180	20
20.2	23.69	56.64	40.528	38.49	25.611	57.92	31.968	22.19
	65	81	156	21	226	82	163	18
30.2	23.04	55.83	40.372	38.73	25.385	57.10	31.805	22.37
	60	131	130	24	201	125	136	9
May 10.2	22.44	54.52	40.242	38.97	25.184	55.85	31.669	22.46
	54	179	99	23	171	162	103	4
20.1	21.90	52.73	40.143	39.20	25.013	54.23	31.566	22.50
	47	221	63	24	130	198	66	0
30.1	21.43	50.52	40.080	39.44	24.883	52.25	31.500	22.50
	37	259	26	25	92	229	28	2
June 9.1	21.06	47.93	40.054	39.69	24.791	49.96	31.472	22.48
	27	290	12	25	49	252	11	4
19.1	20.79	45.03	40.066	39.94	24.742	47.44	31.483	22.44
	18	314	51	27	5	271	52	4
29.0	20.61	41.89	40.117	40.21	24.737	44.73	31.535	22.40
	8	328	88	26	38	282	88	5
July 9.0	20.53	38.61	40.205	40.47	24.775	41.91	31.623	22.35
	4	334	120	25	81	283	123	8
19.0	20.57	35.27	40.325	40.72	24.856	39.08	31.746	22.27
	15	330	154	23	121	278	157	10
29.0	20.72	31.97	40.479	40.95	24.977	36.30	31.903	22.17
	25	316	180	17	162	266	184	12
Aug. 7.9	20.97	28.81	40.659	41.12	25.139	33.64	32.087	22.05
	35	291	207	10	197	239	215	19
17.9	21.32	25.90	40.866	41.22	25.336	31.25	32.302	21.86
	44	256	230	0	229	209	238	24
27.9	21.76	23.34	41.096	41.22	25.565	29.16	32.540	21.62
	53	213	250	10	259	168	257	32
Sept. 6 8	22.29	21.21	41.346	41.12	25.824	27.48	32.797	21.30
	59	161	268	22	286	120	276	39
16.8	22.88	19.60	41.614	40.90	26.110	26.28	33.073	20.91
	63	101	282	37	306	69	293	50
26.8	23.51	18.59	41.896	40.53	26.416	25.59	33.366	20.41
	69	37	294	51	319	11	305	57
Oct. 6.8	24.20	18.22	42.190	40.02	26.735	25.48	33.671	19.84
	70	29	302	64	330	47	313	62
16.7	24.90	18.51	42.492	39.38	27.065	25.95	33.984	19.22
	67	96	307	75	331	104	317	71
26.7	25.57	19.47	42.799	38.63	27.396	26.99	34.301	18.51
	65	159	305	82	325	159	318	72
Nov. 5.7	26.22	21.06	43.104	37.81	27.721	28.58	34.619	17.79
	60	217	299	87	311	209	309	74
15.7	26.82	23.23	43.403	36.94	28.032	30.67	34.928	17.05
	52	269	286	89	289	250	297	66
25.6	27.34	25.92	43.689	36.05	28.321	33.17	35.225	16.39
	43	312	264	87	256	286	272	60
Dec. 5.6	27.77	29.04	43.953	35.18	28.577	36.03	35.497	15.79
	31	343	233	78	216	309	245	49
15.6	28.08	32.47	44.186	34.40	28.793	39.12	35.742	15.30
	19	361	197	68	167	322	205	34
25.5	28.27	36.08	44.383	33.72	28.960	42.34	35.947	14.96
	8	367	153	55	115	323	162	23
35.5	28.35	39.75	44.536	33.17	29.075	45.57	36.109	14.73
Mean Place	24.263	27.11	40.171	49.62	25.394	31.33	31.602	31.43
Sec δ, Tan δ	2.978	−2.805	1.044	+0.300	1.252	−0.752	1.079	+0.406
$D_{\psi a}$, $D_{\omega a}$	−0.010	−0.056	+0.069	+0.006	+0.042	−0.016	+0.071	+0.009
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.12	+0.95	−0.13	+0.95	−0.13	+0.95	−0.13	+0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Volantis. Mag. 4.0		ι Geminorum. Mag. 3.9		η Canis Majoris. Mag. 2.4		Groombridge 1308. Mag. 5.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 7 16 s	° ′ −67 48 ″	h m 7 20 s	° ′ +27 56 ″	h m 7 21 s	° ′ −29 9 ″	h m 7 22 s	° ′ +68 37 ″
Jan. 0.5	56.91	65.21	58.113	56.68	4.605	15.44	56.04	16.87
	3		139	21	93		26	219
10.5	56.94	68.95 374	58.252	56.89	4.698	18.40 296	56.30	19.36
	— 10		85	36	40		13	259
20.5	56.84	72.59 364	58.337	57.25	4.738	21.24 284	56.43	21.95
	20		28	49	— 14		0	261
30.4	56.64	76.02 313	58.365	57.74	4.724	23.85 261	56.43	24.56
	30		— 27	57	67		12	251
Feb. 9.4	56.34	79.19 317	58.338	58.31	4.657	26.21 236	56.31	27.07
	40	280	79	62	115	202	25	236
19.4	55.94	81.99	58.259	58.93	4.542	28.23	56.06	29.43
	47	238	125	63	155	167	34	208
Mar. 1.4	55.47	84.37	58.134	59.56	4.387	29.90	55.72	31.51
	53	191	159	58	187	127	42	169
11.3	54.94	86.28	57.975	60.14	4.200	31.17	55.30	33.20
	58	141	186	52	210	88	49	126
21.3	54.36	87.69	57.789	60.66	3.990	32.05	54.81	34.46
	60	87	198	42	222	46	52	81
31.3	53.76	88.56	57.591	61.08	3.768	32.51	54.29	35.27
	61	35	201	32	223	7	53	33
Apr. 10.3	53.15	88.91	57.390	61.40	3.545	32.58	53.76	35.60
	60	19	190	18	216	34	52	16
20.2	52.55	88.72	57.200	61.58	3.329	32.24	53.24	35.44
	57	73	172	7	200	74	48	64
30.2	51.98	87.99	57.028	61.65	3.129	31.50	52.76	34.80
	53	124	146	— 5	176	112	43	110
May 10.2	51.45	86.75	56.882	61.60	2.953	30.38	52.33	33.70
	48	170	113	15	148	145	35	147
20.1	50.97	85.05	56.769	61.45	2.805	28.93	51.98	32.23
	41	214	74	21	113	177	27	183
30.1	50.56	82.91	56.695	61.24	2.692	27.16	51.71	30.40
	33	253	31	30	75	205	18	208
June 9.1	50.23	80.38	56.661	60.94	2.617	25.11	51.53	28.32
	25	285	— 6	35	37	227	7	232
19.1	49.98	77.53	56.667	60.59	2.580	22.84	51.46	26.00
	16	310	48	39	— 2	243	— 2	246
29.0	49.82	74.43	56.715	60.20	2.582	20.41	51.48	23.54
	7	325	86	43	42	253	12	253
July 9.0	49.75	71.18	56.801	59.77	2.624	17.88	51.60	21.01
	— 3	332	125	43	80	257	22	255
19.0	49.78	67.86	56.926	59.34	2.704	15.31	51.82	18.46
	12	331	160	46	118	252	31	251
29.0	49.90	64.55	57.086	58.88	2.822	12.79	52.13	15.95
	22	317	189	48	152	238	39	241
Aug. 7.9	50.12	61.38	57.275	58.40	2.974	10.41	52.52	13.54
	30	293	219	50	183	217	47	226
17.9	50.42	58.45	57.494	57.90	3.157	8.24	52.99	11.28
	39	262	244	53	214	188	54	211
27.9	50.81	55.83	57.738	57.37	3.371	6.36	53.53	9.17
	46	217	267	58	241	150	59	185
Sept. 6.8	51.27	53.66 167	58.005	56.79	3.612	4.86	54.12	7.32
	53		286	61	264	108	65	159
16.8	51.80	51.99 108	58.291	56.18	3.876	3.78 58	54.77	5.73
	57		304	64	283		70	128
26.8	52.37	50.91	58.595	55.54	4.159	3.20	55.47	4.45
	61	44	315	67	298	— 7	72	96
Oct. 6.8	52.98	50.47 — 21	58.910	54.87	4.457	3.13	56.19	3.49
	62		328	70	309	48	74	58
16.7	53.60	50.68	59.238	54.17	4.766	3.61	56.93	2.91
	61	88	332	67	312	100	75	21
26.7	54.21	51.56	59.570	53.50	5.078	4.61	57.68	2.70
	60	153	333	64	309	151	74	20
Nov. 5.7	54.81	53.09	59.903	52.86	5.387	6.12	58.42	2.90
	55	212	327	58	299	197	72	62
15.7	55.36	55.21	60.230	52.28	5.686	8.09	59.14	3.52
	48	263	313	49	280	234	68	103
25.6	55.84	57.84	60.543	51.79	5.966	10.43	59.82	4.55
	41	308	290	35	253	265	62	142
Dec. 5.6	56.25	60.92	60.833	51.44	6.219	13.08	60.44	5.97
	31	342	260	22	217	286	54	180
15.6	56.56	64.34	61.093	51.22	6.436	15.94	60.98	7.77
	21	361	220	4	176	296	44	212
25.5	56.77	67.95	61.313	51.18	6.612	18.90	61.42	9.89
	10	372	174	— 13	126	299	34	238
35.5	56.87	71.67	61.487	51.31	6.738	21.89	61.76	12.27
Mean Place	52.835	58.97	56.818	68.77	3.013	7.16	53.135	30.22
Sec δ, Tan δ	2.649	−2.453	1.132	+0.530	1.145	−0.558	2.743	+2.554
$D_{\psi\alpha}$, $D_{\omega\alpha}$	0.000	−0.054	+0.074	+0.012	+0.047	−0.013	+0.125	+0.060
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.13	+0.94	−0.14	+0.94	−0.14	+0.94	−0.14	+0.94

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Canis Minoris. Mag. 3.1		ρ Geminorum. Mag. 4.2		σ Argus. Mag. 3.3		α^2 Geminorum. (*Castor.*) Mag. 2.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 7 22 s	° ′ + 8 26 ″	h m 7 24 s	° ′ +31 56 ″	h m 7 26 s	° ′ −43 8 ″	h m 7 29 s	° ′ +32 3 ″
Jan. 0.5	59.807	33.16	11.012	8.57	49.207	48.27	42.704	20.26
	125	101	149	46	88	342	152	44
10.5	59.932	32.15	11.161	9.03	49.295	51.69	42.856	20.70
	72	86	92	62	26	333	98	59
20.5	60.004	31.29	11.253	9.65	49.321	55.02	42.954	21.29
	25	69	32	72	—	312	38	73
30.5	60.029	30.60	11.285	10.37	49.284	58.14	42.992	22.02
	—	54	—	81	37	285	—	80
Feb. 9.4	60.001	30.06	11.261	11.18	49.186	60.99	42.971	22.82
	28	36	24	83	98	249	21	84
	70		80		152		73	
19.4	59.931	29.70	11.181	12.01	49.034	63.48	42.898	23.66
	111	22	127	81	199	210	125	85
Mar. 1.4	59.820	29.48	11.054	12.82	48.835	65.58	42.773	24.51
	143	7	163	74	236	167	160	77
11.3	59.677	29.41	10.891	13.56	48.599	67.25	42.613	25.28
	165	—	191	63	262	121	189	64
21.3	59.512	29.45	10.700	14.19	48.337	68.46	42.424	25.92
	179	14	206	50	278	73	204	51
31.3	59.333	29.59	10.494	14.69	48.059	69.19	42.220	26.46
	178	23	208	35	282	25	206	38
Apr. 10.3	59.155	29.82	10.286	15.04	47.777	69.44	42.014	26.84
	170	32	199	18	276	23	201	21
20.2	58.985	30.14	10.087	15.22	47.501	69.21	41.813	27.05
	155	38	181	4	258	71	183	6
30.2	58.830	30.52	9.906	15.26	47.243	68.50	41.630	27.11
	132	16	153	—	237	115	160	—
May 10.2	58.698	30.98	9.753	15.13	47.006	67.35	41.470	27.00
	104	51	120	13	203	158	122	11
20.2	58.594	31.49	9.633	14.87	46.803	65.77	41.348	26.77
	68	57	81	26	165	197	86	23
30.1	58.526	32.06	9.552	14.49	46.638	63.80	41.262	26.38
	34	63	40	38	124	229	48	39
June 9.1	58.492	32.69	9.512	14.01	46.514	61.51	41.214	25.91
	0	69	—	48	81	258	4	47
19.1	58.492	33.38	9.514	13.45	46.433	58.93	41.210	25.34
	39	79	2	56	34	280	—	57
29.0	58.531	34.08	9.562	12.84	46.399	56.13	41.251	24.72
	72	73	48	61	—	294	41	62
July 9.0	58.603	34.81	9.648	12.20	46.412	53.19	41.330	24.05
	106	70	86	64	13	299	79	67
			125	67	60		117	70
19.0	58.709	35.51	9.773	11.53	46.472	50.20	41.447	23.35
	135	67	163	69	105	296	158	72
29.0	58.844	36.18	9.936	10.84	46.577	47.24	41.605	22.63
	166	58	193	70	150	284	185	74
Aug. 7.9	59.010	36.76	10.129	10.14	46.727	44.40	41.790	21.89
	188	49	226	72	191	261	220	77
17.9	59.198	37.25	10.355	9.42	46.918	41.79	42.010	21.12
	215	35	251	72	230	230	246	79
27.9	59.413	37.60	10.606	8.70	47.148	39.49	42.256	20.33
	233	17	275	74	265	190	271	79
Sept. 6.9	59.646	37.77	10.881	7.96	47.413	37.59	42.527	19.54
	253	2	296	75	296	144	294	82
16.8	59.899	37.75	11.177	7.21	47.709	36.15	42.821	18.72
	270	24	314	74	321	88	309	78
26.8	60.169	37.51	11.491	6.47	48.030	35.27	43.130	17.94
	283	46	329	74	341	30	329	80
Oct. 6.8	60.452	37.05	11.820	5.73	48.371	34.97	43.459	17.14
	291	67	339	70	353	31	339	77
16.7	60.743	36.38	12.159	5.03	48.724	35.28	43.798	16.37
	297	86	346	65	357	93	347	70
26.7	61.040	35.52	12.505	4.38	49.081	36.21	44.145	15.67
	297	104	347	59	352	151	347	65
Nov. 5.7	61.337	34.48	12.852	3.79	49.433	37.72	44.492	15.02
	291	117	341	47	339	205	342	52
15.7	61.628	33.31	13.193	3.32	49.772	39.77	44.834	14.50
	279	124	327	34	313	252	330	39
25.6	61.907	32.07	13.520	2.98	50.085	42.29	45.164	14.11
	259	128	304	19	281	291	310	23
Dec. 5.6	62.166	30.79	13.824	2.79	50.366	45.20	45.474	13.88
	231	126	274	0	236	318	277	4
15.6	62.397	29.53	14.098	2.79	50.602	48.38	45.751	13.84
	197	121	231	18	184	335	238	16
25.6	62.594	28.32	14.329	2.97	50.786	51.73	45.989	14.00
	155	108	183	37	126	340	188	35
35.5	62.749	27.24	14.512	3.34	50.912	55.13	46.177	14.35
Mean Place	58.581	44.12	9.690	20.95	47.211	41.42	41.397	32.79
Sec δ, Tan δ	1.011	+0.148	1.178	+0.623	1.371	−0.937	1.180	+0.626
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.065	+0.004	+0.077	+0.015	+0.038	−0.023	+0.077	+0.016
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.14	+0.94	−0.14	+0.93	−0.15	+0.93	−0.15	+0 92

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	25 Monocerotis. Mag. 5.2		α Canis Minoris. (*Procyon.*) Mag. 0.5		24 Lyncis. Mag. 5.0		κ Geminorum. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	7 33	− 3 56	7 35	+ 5 25	7 36	+58 53	7 39	+24 34
Jan. 0.5	28.215	26.26	17.522	13.64	32.093	18.12	49.350	49.45
	124	177	130	126	229	196	156	6
10.5	28.339	28.03	17.652	12.38	32.322	20.08	49.506	49.39
	76	162	78	109	139	210	103	11
20.5	28.415	29.65	17.730	11.29	32.461	22.18	49.609	49.50
	26	144	29	93	46	220	46	25
30.5	28.441	31.09	17.759	10.36	32.507	24.38	49.655	49.75
	24	123	20	73	46	219	7	40
Feb. 9.4	28.417	32.32	17.739	9.63	32.461	26.57	49.648	50.15
	69	99	68	55	133	209	60	48
19.4	28.348	33.31	17.671	9.08	32.328	28.66	49.588	50.63
	108	77	105	34	211	187	105	51
Mar. 1.4	28.240	34.08	17.566	8.74	32.117	30.53	49.483	51.17
	142	53	140	20	272	163	142	54
11.4	28.098	34.61	17.426	8.54	31.845	32.16	49.341	51.71
	163	32	161	6	321	130	170	51
21.3	27.935	34.93	17.265	8.48	31.524	33.46	49.171	52.22
	176	9	176	9	351	90	186	47
31.3	27.759	35.02	17.089	8.57	31.173	34.36	48.985	52.69
	181	12	177	21	361	50	192	39
Apr. 10.3	27.578	34.90	16.912	8.78	30.812	34.86	48.793	53.08
	173	31	171	29	354	8	185	31
20.2	27.405	34.59	16.741	9.07	30.458	34.94	48.608	53.39
	161	52	158	41	331	31	172	21
30.2	27.244	34.07	16.583	9.48	30.127	34.63	48.436	53.60
	137	69	135	51	295	72	117	12
May 10.2	27.107	33.38	16.448	9.99	29.832	33.91	48.289	53.72
	114	86	106	60	243	108	118	4
20.2	26.993	32.52	16.342	10.59	29.589	32.83	48.171	53.76
	80	101	75	65	186	137	86	5
30.1	26.913	31.51	16.267	11.24	29.403	31.46	48.085	53.71
	49	115	43	73	122	166	48	10
June 9.1	26.864	30.36	16.224	11.97	29.281	29.80	48.037	53.61
	14	124	8	78	51	186	9	17
19.1	26.850	29.12	16.216	12.75	29.230	27.94	48.028	53.44
	21	133	27	82	15	200	28	21
29.1	26.871	27.79	16.243	13.57	29.245	25.94	48.056	53.23
	55	137	63	82	87	211	66	25
July 9.0	26.926	26.42	16.306	14.39	29.332	23.83	48.122	52.98
	88	137	95	81	149	217	103	28
19.0	27.014	25.05	16.401	15.20	29.481	21.66	48.225	52.70
	118	132	124	77	213	216	135	33
29.0	27.132	23.73	16.525	15.97	29.694	19.50	48.360	52.37
	147	123	153	68	271	212	168	38
Aug. 7.9	27.279	22.50	16.678	16.65	29.965	17.38	48.528	51.99
	173	109	181	56	325	206	194	43
17.9	27.452	21.41	16.859	17.21	30.290	15.32	48.722	51.56
	198	89	204	40	372	191	223	49
27.9	27.650	20.52	17.063	17.61	30.662	13.41	48.945	51.07
	221	63	226	21	416	175	215	55
Sept. 6.9	27.871	19.89	17.289	17.82	31.078	11.66	49.190	50.52
	210	37	211	0	456	158	267	65
16.8	28.111	19.52	17.533	17.82	31.534	10.08	49.457	49.87
	258	4	262	24	486	137	287	71
26.8	28.369	19.48	17.795	17.58	32.020	8.71	49.744	49.16
	273	28	276	48	513	110	302	78
Oct. 6.8	28.642	19.76	18.071	17.10	32.533	7.61	50.046	48.38
	284	63	288	73	532	84	315	81
16.8	28.926	20.39	18.359	16.37	33.065	6.77	50.361	47.57
	290	91	293	97	542	51	321	86
26.7	29.216	21.33	18.652	15.40	33.607	6.26	50.685	46.71
	293	124	295	116	543	20	328	86
Nov. 5.7	29.509	22.57	18.947	14.24	34.150	6.06	51.013	45.85
	287	149	291	133	534	17	326	82
15.7	29.796	24.06	19.238	12.91	34.684	6.23	51.339	45.03
	276	169	280	142	510	52	315	76
25.6	30.072	25.75	19.518	11.49	35.194	6.75	51.654	44.27
	259	182	262	149	470	90	295	65
Dec. 5.6	30.331	27.57	19.780	10.00	35.669	7.65	51.949	43.62
	229	190	233	149	424	124	270	50
15.6	30.560	29.47	20.013	8.51	36.093	8.89	52.219	43.12
	196	189	199	144	361	156	231	34
25.6	30.756	31.36	20.212	7.07	36.454	10.45	52.450	42.78
	154	182	159	131	286	184	189	16
35.5	30.910	33.18	20.371	5.76	36.740	12.29	52.639	42.62
Mean Place	26.954	16.45	16.327	23.65	30.125	32.11	48.131	61.69
Sec δ, Tan δ	1.002	−0.069	1.004	+0.095	1.935	+1.657	1.100	+0.457
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.059	−0.002	+0.063	+0.003	+0.101	+0.045	+0.072	+0.013
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.16	+0.92	−0.16	+0.91	−0.16	+0.91	−0.17	+0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Geminorum. (*Pollux*.) Mag. 1.2		4 Puppis. Mag. 5.1		ξ Argus. Mag. 3.5		φ Geminorum. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	7 40	+28 12	7 42	−14 22	7 46	−24 39	7 48	+26 57
Jan. 0.5	37.659	35.74	25.490	41.01	4.847	63.43	48.493	46.51
	158	15	127	235	121	283	169	4
10.5	37.817	35.89	25.617	43.36	4.971	66.26	48.662	46.55
	105	33	77	223	73	273	115	24
20.5	37.922	36.22	25.694	45.59	5.044	68.99	48.777	46.79
	49	49	25	202	19	253	59	40
30.5	37.971	36.71	25.719	47.61	5.063	71.52	48.836	47.19
	11	59	24	180	34	230	1	53
Feb. 9.4	37.960	37.30	25.695	49.41	5.029	73.82	48.837	47.72
	62	68	71	152	82	200	52	63
19.4	37.898	37.98	25.624	50.93	4.947	75.82	48.785	48.35
	108	70	112	124	125	167	100	66
Mar. 1.4	37.790	38.68	25.512	52.17	4.822	77.49	48.685	49.01
	145	68	144	95	160	131	138	67
11.4	37.645	39.36	25.368	53.12	4.662	78.80	48.547	49.68
	177	61	169	61	184	97	169	64
21.3	37.468	39.97	25.199	53.76	4.478	79.77	48.378	50.32
	193	54	183	33	200	58	186	56
31.3	37.275	40.51	25.016	54.09	4.278	80.35	48.192	50.88
	199	43	188	4	206	20	194	46
Apr. 10.3	37.076	40.94	24.828	54.13	4.072	80.55	47.998	51.34
	191	30	184	25	203	16	190	35
20.2	36.885	41.24	24.644	53.88	3.869	80.39	47.808	51.69
	181	20	171	53	192	53	177	22
30.2	36.704	41.44	24.473	53.35	3.677	79.86	47.631	51.91
	155	2	153	81	171	88	154	11
May 10.2	36.549	41.46	24.320	52.54	3.506	78.98	47.477	52.02
	124	8	126	105	147	120	126	0
20.2	36.425	41.38	24.194	51.49	3.359	77.78	47.351	52.02
	92	20	97	129	117	150	93	11
30.1	36.333	41.18	24.097	50.20	3.242	76.28	47.258	51.91
	52	23	64	148	84	177	56	21
June 9.1	36.281	40.95	24.033	48.72	3.158	74.51	47.202	51.70
	10	35	31	165	49	198	18	26
19.1	36.271	40.60	24.002	47.07	3.109	72.53	47.184	51.44
	24	42	3	178	13	217	21	34
29.1	36.295	40.18	24.005	45.29	3.096	70.36	47.205	51.10
	64	46	38	185	23	228	58	39
July 9.0	36.359	39.72	24.043	43.44	3.119	68.08	47.263	50.71
	105	50	72	187	59	232	94	45
19.0	36.464	39.22	24.115	41.57	3.178	65.76	47.357	50.26
	137	51	104	184	93	230	129	50
29.0	36.601	38.68	24.219	39.73	3.271	63.46	47.486	49.76
	169	59	134	171	128	220	162	54
Aug. 7.9	36.770	38.09	24.353	37.99	3.399	61.26	47.648	49.22
	200	63	163	157	159	201	189	60
17.9	36.970	37.46	24.516	36.42	3.558	59.25	47.837	48.62
	225	67	189	135	189	177	218	65
27.9	37.195	36.79	24.705	35.07	3.747	57.48	48.055	47.97
	252	71	214	105	217	145	213	72
Sept. 6.9	37.447	36.08	24.919	34.02	3.964	56.03	48.298	47.25
	274	76	236	71	212	105	266	78
16.8	37.721	35.32	25.155	33.31	4.206	54.98	48.564	46.47
	295	82	257	33	265	61	287	83
26.8	38.016	34.50	25.412	32.98	4.471	54.37	48.851	45.64
	308	82	273	9	283	12	305	88
Oct. 6.8	38.324	33.68	25.685	33.07	4.754	54.25	49.156	44.76
	325	85	286	51	297	38	319	91
16.8	38.649	32.83	25.971	33.58	5.051	54.63	49.475	43.85
	333	84	294	93	307	88	330	92
26.7	38.982	31.99	26.265	34.51	5.358	55.51	49.805	42.93
	337	80	297	133	309	135	335	89
Nov. 5.7	39.319	31.19	26.562	35.84	5.667	56.86	50.140	42.04
	333	75	293	168	303	181	334	84
15.7	39.652	30.44	26.855	37.52	5.970	58.67	50.474	41.20
	326	61	282	197	291	218	326	73
25.6	39.978	29.83	27.137	39.49	6.261	60.85	50.800	40.47
	305	50	261	221	269	248	307	61
Dec. 5.6	40.283	29.33	27.398	41.70	6.530	63.33	51.107	39.86
	276	31	235	233	239	269	282	44
15.6	40.559	29.02	27.633	44.03	6.769	66.02	51.389	39.42
	239	14	197	240	201	281	245	25
25.6	40.798	28.88	27.830	46.43	6.970	68.83	51.634	39.17
	192	7	156	237	154	282	200	6
35.5	40.990	28.95	27.986	48.80	7.124	71.65	51.834	39.11
Mean Place	36.420	48.27	24.144	32.51	3.351	56.20	47.291	59.10
Sec δ, Tan δ	1.135	+0.536	1.032	−0.256	1.100	−0.459	1.122	+0.509
$D_{\psi a}$, $D_{\omega a}$	+0.074	+0.015	+0.055	−0.007	+0.050	−0.014	+0.073	+0.015
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.17	+0.91	−0.17	+0.90	−0.18	+0.89	−0.18	+0.89

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	26 Lyncis. Mag. 5.7		Groombridge 1374. Mag. 5.6		χ Argus. Mag. 3.6		ω Cancri. Mag. 5.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 7 49 s	° ′ +47 45 ″	h m 7 50 s	° ′ +74 7 ″	h m 7 54 s	° ′ −52 46 ″	h m 7 56 s	° ′ +25 35 ″
Jan. 0.6	8.290	42.20	64.15	18.34	51.789	35.30	17.644	64.50
	209	129	41	258	124	367	175	8
10.5	8.499	43.49	64.56	20.92	51.913	38.97	17.819	64.42
	110	148	25	275	51	363	122	—
20.5	8.639	44.97	64.81	23.67	51.964	42.60	17.941	64.55
	68	163	8	284	—	348	66	13
30.5	8.707	46.60	64.89	26.51	51.940	46.08	18.007	64.86
	—	169	—	280	24	328	10	31
Feb. 9.4	7	48.29	9	29.31	96	49.36	—	65.31
	8.700		64.80		51.844		18.017	45
	76	166	26	269	164	296	44	56
19.4	8.624	49.95	64.54	32.00	51.680	52.32	17.973	65.87
	140	158	39	241	222	259	92	63
Mar. 1.4	8.484	51.53	64.15	34.41	51.458	54.91	17.881	66.50
	189	111	52	209	268	218	132	65
11.4	8.295	52.94	63.63	36.50	51.190	57.09	17.749	67.15
	230	119	61	165	307	169	162	62
21.3	8.065	54.13	63.02	38.15	50.883	58.78	17.587	67.77
	256	92	68	120	329	122	181	57
31.3	7.809	55.05	62.34	39.35	50.554	60.00	17.406	68.34
	266	62	72	65	343	72	189	49
Apr. 10.3	7.543	55.67	61.62	40.00	50.211	60.72	17.217	68.83
	261	29	71	14	344	20	187	39
20.3	7.282	55.96	60.91	40.14	49.867	60.92	17.030	69.22
	248	—	68	—	332	—	176	28
30.2	7.034	2	60.23	38	49.535	31	16.854	69.50
	218	55.94	63	39.76	313	60.61	154	17
May 10.2	6.816	35	59.60	88	49.222	81	16.700	69.67
	183	55.59	55	38.88	282	59.80	127	6
20.2	6.633	63	59.05	134	48.940	128	16.573	69.73
	139	54.96	15	37.54	216	58.52	97	—
		89		176		173		3
30.1	6.494	54.07	58.60	35.78	48.694	56.79	16.476	69.70
	91	112	34	210	204	212	60	12
June 9.1	6.403	52.95	58.26	33.68	48.490	54.67	16.416	69.58
	41	129	22	239	155	249	23	19
19.1	6.362	51.66	58.04	31.29	48.335	52.18	16.393	69.39
	—	145	9	261	105	276	—	28
29.1	12	50.21	—	28.68	48.230	49.42	14	69.11
	6.374	155	57.95	276	50	297	16.407	32
July 9.0	62	48.66	4	25.92	—	46.45	49	68.79
	6.436		57.99		48.180		16.456	
	113	163	17	283	5	310	86	38
19.0	6.549	47.03	58.16	23.09	48.185	43.35	16.542	68.41
	159	166	29	285	59	313	120	44
29.0	6.708	45.37	58.45	20.24	48.244	40.22	16.662	67.97
	203	167	41	278	117	308	152	49
Aug. 8.0	6.911	43.70	58.86	17.46	48.361	37.14	16.814	67.48
	244	163	52	267	172	289	180	56
17.9	7.155	42.07	59.38	14.79	48.533	34.25	16.994	66.92
	280	161	62	252	223	266	209	63
27.9	7.435	40.46	60.00	12.27	48.756	31.59	17.203	66.29
	315	153	71	230	273	227	234	71
Sept. 6.9	7.750	38.93	60.71	9.97	49.029	29.32	17.437	65.58
	346	144	79	205	315	182	258	77
16.8	8.096	37.49	61.50	7.92	49.344	27.50	17.695	64.81
	372	132	86	174	355	129	278	85
26.8	8.468	36.17	62.36	6.18	49.699	26.21	17.973	63.96
	396	117	91	140	384	71	298	91
Oct. 6.8	8.864	35.00	63.27	4.78	50.083	25.50	18.271	63.05
	413	101	95	99	407	9	314	95
16.8	9.277	33.99	64.22	3.79	50.490	25.41	18.585	62.10
	426	79	98	55	418	—	326	98
26.7	9.703	33.20	65.20	3.24	50.908	57	18.911	61.12
	432	56	98	14	418	25.98	332	98
Nov. 5.7	10.135	32.64	66.18	3.10	51.326	27.19	19.243	60.14
	428	30	96	—	406	121	333	93
15.7	10.563	32.34	67.14	33	51.732	29.00	19.576	59.21
	416	1	92	3.43	382	181	326	84
25.7	10.979	32.33	68.06	81	52.114	31.36	19.902	58.37
	391	—	85	4.24	344	236	308	71
Dec. 5.6	11.370	30	68.91	126	52.458	34.20	20.210	57.66
	357	32.63	76	5.50	295	284	285	56
	60			172		319		
15.6	11.727	33.23	69.67	7.22	52.753	37.39	20.495	57.10
	309	89	65	208	236	346	249	37
25.6	12.036	34.12	70.32	9.30	52.989	40.85	20.744	56.73
	252	117	51	243	170	361	204	17
35.5	12.288	35.29	70.83	11.73	53.159	44.46	20.948	56.56
Mean Place	6.812	56.33	60.698	33.44	49.298	31.62	16.474	77.07
Sec δ, Tan δ	1.488	+1.101	3.656	+3.516	1.653	−1.317	1.109	+0.479
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.087	+0.034	+0.144	+0.109	+0.031	−0.042	+0.072	+0.016
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.18	+0.89	−0.19	+0.89	−0.19	+0.88	−0.19	+0.87

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Geminorum. Mag. 5.0		27 Lyncis. Mag. 4.9		ρ Argus. Mag. 2.9		3 H. Ursæ Majoris. Mag. 5.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	7 58	+28 0	8 2	+51 43	8 4	−24 4	8 5	+68 41
	s	″	s	″	s	″	s	″
Jan. 0.6	48.749 180	27.95 7	42.066 242	33.62 144	17.330 145	59.13 283	12.72 36	53.77 225
10.5	48.929 128	28.02 27	42.308 167	35.06 168	17.475 91	61.96 277	13.08 21	56.02 248
20.5	49.057 69	28.29 46	42.475 89	36.74 183	17.566 40	64.73 257	13.32 12	58.50 263
30.5	49.126 12	28.75 59	42.564 8	38.57 191	17.606 — 15	67.30 234	13.44 — 1	61.13 266
Feb. 9.5	49.138 — 43	29.34 69	42.572 — 65	40.48 189	17.591 65	69.64 206	13.43 15	63.79 256
19.4	49.095	30.03	42.507	42.37	17.526	71.70	13.28	66.35
Mar. 1.4	49.005 90	30.77 74	42.370 137	44.17 180	17.422 104	73.46 176	13.03 25	68.75 240
11.4	48.872 133	31.53 76	42.176 194	45.81 164	17.278 144	74.88 142	12.67 36	70.86 211
21.3	48.708 164	32.24 71	41.935 241	47.21 140	17.105 173	75.92 104	12.24 43	72.60 174
31.3	48.525 183	32.87 63	41.664 271	48.31 110	16.913 192	76.62 70	11.76 48	73.93 133
	194	52	288	77	198	32	52	86
Apr. 10.3	48.331	33.39	41.376	49.08	16.715	76.94	11.24	74.79
20.3	48.140 191	33.80 41	41.089 287	49.50 42	16.518 197	76.91 3	10.72 52	75.15 — 36
30.2	47.961 179	34.07 27	40.813 276	49.55 — 5	16.326 192	76.51 40	10.21 51	75.02 13
May 10.2	47.800 161	34.21 14	40.565 248	49.27 28	16.153 173	75.75 76	9.74 47	74.40 62
20.2	47.668 132	34.21 0	40.351 214	48.63 64	15.999 154	74.70 105	9.33 41	73.34 106
	100	11	169	94	121	138	35	116
30.2	47.568	34.10	40.182	47.69	15.875	73.32	8.98	71.88
June 9.1	47.504 64	33.89 21	40.062 120	46.48 121	15.780 95	71.68 164	8.71 27	70.06 182
19.1	47.476 — 28	33.57 32	39.996 66	45.05 143	15.717 63	69.81 187	8.54 17	67.94 212
29.1	47.485 9	33.17 40	39.983 — 13	43.44 161	15.689 — 28	67.75 206	8.47 — 7	65.59 235
July 9.0	47.535 50	32.70 47	40.026 43	41.69 175	15.695 6	65.57 218	8.48 1	63.07 252
	84	53	96	186	11	222	11	263
19.0	47.619	32.17	40.122	39.83	15.736	63.35	8.59	60.44
29.0	47.739 120	31.58 59	40.269 147	37.92 191	15.813 77	61.11 224	8.79 20	57.75 269
Aug. 8.0	47.891 152	30.94 64	40.465 196	35.99 193	15.921 108	58.93 218	9.08 29	55.08 267
17.9	48.072 181	30.23 71	40.707 242	34.06 193	16.064 143	56.93 200	9.45 37	52.47 261
27.9	48.283 211	29.47 76	40.992 285	32.19 187	16.237 173	55.18 175	9.90 45	49.97 250
	238	82	321	179	200	147	51	233
Sept. 6.9	48.521	28.65	41.313	30.40	16.437	53.71	10.41	47.64
16.8	48.782 261	27.77 88	41.672 359	28.71 169	16.667 230	52.62 109	10.99 58	45.52 212
26.8	49.066 284	26.84 93	42.062 390	27.16 155	16.921 254	51.95 67	11.63 64	43.65 187
Oct. 6.8	49.368 302	25.85 99	42.478 416	25.77 139	17.197 276	51.75 — 20	12.31 68	42.09 156
16.8	49.688 320	24.86 99	42.918 440	24.59 118	17.491 294	52.05 30	13.02 71	40.86 123
	332	100	457	94	306	79	74	85
26.7	50.020	23.86	43.375	23.65	17.797	52.84	13.76	40.01
Nov. 5.7	50.360 340	22.91 95	43.840 465	22.99 66	18.107 310	54.11 127	14.52 76	39.56 45
15.7	50.699 339	22.02 89	44.304 464	22.61 38	18.416 309	55.81 170	15.26 74	39.55 — 1
25.7	51.031 332	21.24 78	44.757 453	22.58 — 3	18.715 299	57.90 209	15.99 73	40.00 45
Dec. 5.6	51.347 316	20.60 64	45.187 430	22.88 30	18.994 279	60.33 243	16.67 68	40.90 90
	292	45	394	65	256	263	62	134
15.6	51.639	20.15	45.581	23.53	19.250	62.96	17.29	42.24
25.6	51.896 257	19.88 27	45.928 347	24.51 98	19.467 217	65.75 279	17.83 54	43.99 175
35.5	52.109 213	19.85 3	46.215 287	25.81 130	19.641 174	68.61 286	18.27 44	46.07 208
Mean Place	47.576	40.80	40.564	48.54	15.865	52.88	10.278	69.56
Sec δ, Tan δ	1.133	+0.532	1.614	+1.267	1.095	−0.447	2.753	+2.565
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.073	+0.018	+0.090	+0.043	+0.051	−0.015	+0.119	+0.089
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.20	+0.87	−0.20	+0.86	−0.21	+0.86	−0.21	+0.85

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 2.2		ζ Cancri (*mean*). Mag. 4.7		20 Puppis. Mag. 5.0		Bradley 1147. Mag. 5.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	8 7	−47 6	8 7	+17 52	8 9	−15 33	8 9	+75 59
Jan. 0.6	11.811 144	36.33 359	49.020 177	40.62 59	48.941 153	26.19 247	58.28 52	22.50 253
10.5	11.955 77	39.92 354	49.197 127	40.03 40	49.094 104	28.66 236	58.80 34	25.03 275
20.5	12.032 10	43.46 341	49.324 73	39.63 20	49.198 52	31.02 216	59.14 16	27.78 289
30.5	12.042 — 57	46.87 321	49.397 20	39.43 3	49.250 1	33.18 196	59.30 — 4	30.67 291
Feb. 9.5	11.985 117	50.08 293	49.417 — 31	39.40 — 11	49.251 — 47	35.14 170	59.26 22	33.58 282
19.4	11.868	53.01	49.386	39.54	49.204	36.84	59.04	36.40
Mar. 1.4	11.694 174	55.57 256	49.309 77	39.80 26	49.116 88	38.25 141	58.65 39	39.01 261
11.4	11.477 217	57.74 217	49.192 117	40.15 35	48.989 127	39.36 111	58.11 54	41.30 229
21.3	11.222 255	59.46 172	49.046 146	40.55 40	48.835 154	40.16 80	57.45 66	43.19 189
31.3	10.946 276 292	60.72 126 77	48.879 167 175	40.98 43 43	48.662 173 182	40.66 50 20	56.71 74 80	44.61 142 92
Apr. 10.3	10.654	61.49	48.704	41.41	48.480	40.86 —	55.91	45.53
20.3	10.360 294	61.77 — 28	48.529 175	41.82 41	48.298 182	40.74 12	55.10 81	45.90 — 37
30.2	10.076 284	61.57 20	48.364 165	42.20 38	48.124 174	40.34 40	54.31 79	45.75 15
May 10.2	9.806 270	60.88 69	48.215 149	42.54 34	47.965 159	39.65 69	53.57 74	45.06 69
20.2	9.562 244 215	59.73 115 158	48.091 124 97	42.84 30 26	47.828 137 113	38.72 93 117	52.90 67 56	43.88 118 162
30.2	9.347	58.15	47.994	43.10	47.715	37.55	52.34	42.26
June 9.1	9.171 176	56.18 197	47.930 64	43.31 21	47.633 82	36.15 140	51.89 45	40.24 202
19.1	9.036 135	53.85 233	47.899 — 31	43.50 19	47.579 54	34.58 157	51.57 32	37.89 235
29.1	8.943 93	51.25 260	47.901 2	43.64 14	47.560 — 19	32.87 171	51.38 19	35.28 261
July 9.0	8.899 — 44 1	48.43 282 295	47.938 37 71	43.74 10 4	47.573 — 13 45	31.06 181 185	51.35 — 3 10	32.50 278 292
19.0	8.900	45.48	48.009	43.78	47.618	29.21	51.45	29.58
29.0	8.952 52	42.49 299	48.110 101	43.77 1	47.694 76	27.38 183	51.70 25	26.63 295
Aug. 8.0	9.052 100	39.55 294	48.242 132	43.68 9	47.802 108	25.63 175	52.08 38	23.67 296
17.9	9.198 146	36.75 280	48.402 160	43.49 19	47.940 138	24.01 162	52.59 51	20.81 286
27.9	9.392 194 236	34.19 256 222	48.589 187 212	43.20 29 41	48.106 166 192	22.62 139 112	53.21 62 74	18.07 274 255
Sept. 6.9	9.628	31.97	48.801	42.79	48.298	21.50	53.95	15.52
16.9	9.906 278	30.19 178	49.037 236	42.24 55	48.518 220	20.70 80	54.79 84	13.23 229
26.8	10.218 312	28.91 128	49.295 258	41.54 70	48.762 244	20.27 — 43	55.71 92	11.20 203
Oct. 6.8	10.562 344	28.18 73	49.573 278	40.72 82	49.025 263	20.28 1	56.70 99	9.55 165
16.8	10.928 366 379	28.07 — 11 50	49.867 294 309	39.77 95 107	49.307 282 294	20.70 42 85	57.75 105 108	8.25 130 86
26.7	11.307	28.57	50.176	38.70	49.601	21.55	58.83	7.39
Nov. 5.7	11.691 384	29.70 113	50.493 317	37.57 113	49.903 302	22.80 125	59.92 109	6.99 — 40
15.7	12.071 380	31.42 172	50.812 319	36.39 118	50.206 303	24.44 164	61.01 109	7.08 9
25.7	12.432 361	33.69 227	51.126 314	35.23 116	50.500 294	26.39 195	62.07 106	7.65 57
Dec. 5.6	12.765 333 290	36.40 271 309	51.426 300 278	34.12 111 100	50.780 280 255	28.61 222 238	63.06 99 89	8.71 106 156
15.6	13.055	39.49	51.704	33.12	51.035	30.99	63.95	10.27
25.6	13.296 241	42.83 334	51.950 246	32.25 87	51.258 223	33.47 248	64.73 78	12.23 196
35.6	13.479 183	46.33 350	52.156 206	31.57 68	51.440 182	35.95 248	65.36 63	14.59 236
Mean Place	9.645	33.15	47.905	52.41	47.619	19.05	54.725	38.70
Sec δ, Tan δ	1.469	−1.077	1.051	+0.322	1.038	−0.278	4.131	+4.008
$D_{\psi a}$, $D_{\omega a}$	+0.037	−0.038	+0.068	+0.011	+0.055	−0.010	+0.151	+0.143
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.21	+0.85	−0.21	+0.85	−0.21	+0.84	−0.21	+0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cancri. Mag. 3.8		31 Lyncis. Mag. 4.4		d^1 Cancri. Mag. 5.9		ϵ Argus. Mag. 1.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 8 12	° ′ ″ + 9 25	h m s 8 17	° ′ ″ +43 25	h m s 8 18	° ′ ″ +18 34	h m s 8 20	° ′ ″ −59 15
Jan. 0.6	21.563 169	15.40 112	35.608 233	56.45 90	58.526 188	37.77 59	59.104 175	41.54 371
10.5	21.732 124	14.28 93	35.841 170	57.35 114	58.714 138	37.18 38	59.279 91	45.25 377
20.5	21.856 72	13.35 73	36.011 105	58.49 135	58.852 85	36.80 18	59.370 3	49.02 369
30.5	21.928 22	12.62 56	36.116 33	59.84 147	58.937 31	36.62 — 1	59.373 — 82	52.71 353
Feb. 9.5	21.950 — 30	12.06 35	36.149 — 33	61.31 154	58.968 — 21	36.63 18	59.291 162	56.24 330
19.4	21.920	11.71 17	36.116	62.85 153	58.947 68	36.81 31	59.129	59.54 294
Mar. 1.4	21.849 71	11.54 — 3	36.022 94	64.38 145	58.879 108	37.12 40	58.897 232	62.48 257
11.4	21.739 110	11.51 — 11	35.875 147	65.83 129	58.771 130	37.52 46	58.604 293	65.05 213
21.4	21.598 141	11.62 21	35.686 189	67.12 108	58.632 163	37.98 49	58.264 340	67.18 166
31.3	21.440 158 167	11.83 31	35.469 217 235	68.20 84	58.469 172	38.47 48	57.889 375 398	68.84 114
Apr. 10.3	21.273	12.14	35.234	69.04 56	58.297	38.95	57.491	69.98 61
20.3	21.105 168	12.49 35	34.997 237	69.60 30	58.122 175	39.41 46	57.084 407	70.62 11
30.2	20.944 161	12.91 42	34.769 228	69.90 — 2	57.956 166	39.83 42	56.681 403	70.73 — 42
May 10.2	20.799 145	13.38 47	34.560 209	69.88 27	57.805 151	40.19 36	56.290 391	70.31 92
20.2	20.675 124 97	13.88 50 53	34.379 181 147	69.61 56	57.675 130 102	40.51 32 26	55.927 363 330	69.39 140
30.2	20.578	14.41	34.232	69.05	57.573	40.77	55.597	67.99
June 9.1	20.513 65	14.05 51	34.126 106	68.27 78	57.501 72	40.97 20	55.310 287	66.13 186
19.1	20.477 36	15.53 58	34.063 63	67.27 100	57.461 40	41.13 16	55.072 238	63.88 225
29.1	20.473 — 4	16.10 57	34.046 — 17	66.09 118	57.454 — 7	41.24 11	54.889 183	61.27 261
July 9.1	20.502 29 60	16.68 58 51	34.071 25 71	64.78 131 113	57.481 27 59	41.29 — 5 1	54.765 124 50	58.40 287 307
19.0	20.562	17.19	34.142	63.35	57.540	41.28	54.706 —	55.33
29.0	20.653 91	17.67 48	34.258 116	61.84 151	57.631 91	41.20 8	54.711 5	52.16 317
Aug. 8.0	20.773 120	18.06 39	34.411 153	60.25 159	57.753 122	41.03 17	54.786 75	48.99 317
17.9	20.922 149	18.34 28	34.604 193	58.65 160	57.902 149	40.77 26	54.926 140	45.92 307
27.9	21.096 174 199	18.46 — 12 2	34.835 231 264	57.02 163 161	58.080 178 204	40.40 37 45	55.134 208 270	43.07 285 256
Sept. 6,9	21.295	18.44	35.099	55.41	58.284	39.91	55.404	40.51
16.9	21.518 223	18.22 22	35.395 296	53.82 159	58.512 228	39.28 63	55.733 329	38.36 215
26.8	21.763 245	17.80 42	35.719 324	52.31 151	58.764 252	38.51 77	56.115 382	36.70 166
Oct. 6.8	22.030 267	17.14 66	36.072 353	50.87 144	59.037 273	37.61 90	56.539 424	35.62 108
16.8	22.313 283 296	16.29 85 103	36.445 373 392	49.55 132 116	59.329 292 308	36.58 103 112	56.999 460 480	35.16 — 46 29
26.8	22.609	15.26	36.837	48.39	59.637	35.46	57.479	35.36
Nov. 5.7	22.915 306	14.06 120	37.241 404	47.43 96	59.955 318	34.25 121	57.967 488	36.21 85
15.7	23.223 308	12.72 134	37.648 407	46.70 73	60.277 322	33.03 122	58.447 480	37.70 149
25.7	23.526 303	11.30 142	38.051 403	46.22 48	60.596 319	31.82 121	58.906 459	39.79 209
Dec. 5.6	23.814 288 270	9.85 145 142	38.436 385 360	46.02 — 20 14	60.902 306 287	30.69 113 104	59.325 419 366	42.40 261 306
15.6	24.084	8.43	38.796	46.16	61.189	29.65	59.691	45.46
25.6	24.323 239	7.11 132	39.116 320	46.59 43	61.444 255	28.77 88	59.991 300	48.85 339
35.6	24.522 199	5.93 118	39.387 271	47.33 74	61.660 216	28.08 69	60.217 226	52.47 362
Mean Place	20.447	26.04	34.371	71.25	57.447	49.66	56.114	40.88
Sec δ, Tan δ	1.014	+0.166	1.377	+0.947	1.055	+0.336	1.957	−1.632
$D\psi\alpha$, $D\omega\alpha$	+0.065	+0.006	+0.082	+0.036	+0.068	+0.013	+0.025	−0.065
$D\psi\delta$, $D\omega\delta$	−0.22	+0.84	−0.22	+0.83	−0.23	+0.82	−0.23	+0.82

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Monocerotis. Mag. 4.0		θ Chamæleontis. Mag. 4.3		o Ursæ Majoris. Mag. 3.5		Groombridge 1450. Mag. 6.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	8 21	− 3 39	8 22	−77 14	8 23	+60 58	8 27	+38 16
Jan. 0.6	50.033	23.71	65.82	11.39	54.66	21.20	56.102	39.33
	169	189	26	368	32	180	231	55
10.5	50.202	25.60	66.08	15.07	54.98	23.00	56.333	39.88
	124	173	8	377	24	205	173	80
20.5	50.326	27.33	66.16	18.84	55.22	25.05	56.506	40.68
	72	154	12	376	14	225	111	100
30.5	50.398	28.87	66.04	22.60	55.36	27.30	56.617	41.68
	21	134	30	364	4	235	47	119
Feb. 9.5	50.422	30.21	65.74	26.24	55.40	29.65	56.664	42.87
	27	111	46	345	6	236	16	129
19.4	50.395	31.32	65.28	29.69	55.34	32.01	56.648	44.16
	69	87	62	314	15	225	75	132
Mar. 1.4	50.326	32.19	64.66	32.83	55.19	34.26	56.573	45.48
	105	61	75	279	23	207	123	130
11.4	50.221	32.80	63.91	35.62	54.96	36.33	56.450	46.78
	137	40	86	239	29	177	165	118
21.4	50.084	33.20	63.05	38.01	54.67	38.10	56.285	47.96
	155	18	93	192	33	145	191	105
31.3	49.929	33.38	62.12	39.93	54.34	39.55	56.091	49.01
	165	0	100	146	37	108	210	86
Apr. 10.3	49.764	33.38	61.12	41.39	53.97	40.63	55.881	49.87
	168	22	102	91	38	62	215	64
20.3	49.596	33.16	60.10	42.30	53.59	41.25	55.666	50.51
	162	40	102	39	37	18	207	40
30.2	49.434	32.76	59.08	42.69	53.22	41.43	55.459	50.91
	149	58	101	14	34	24	193	17
May 10.2	49.285	32.18	58.07	42.55	52.88	41.19	55.266	51.08
	129	72	96	72	31	67	168	10
20.2	49.156	31.46	57.11	41.83	52.57	40.52	55.098	50.98
	105	88	90	118	26	107	137	31
30.2	49.051	30.58	56.21	40.65	52.31	39.45	54.961	50.67
	76	99	81	166	20	110	102	53
June 9.1	48.975	29.59	55.40	38.99	52.11	38.05	54.859	50.14
	49	110	70	212	11	171	63	74
19.1	48.926	28.49	54.70	36.87	51.97	36.34	54.796	49.40
	19	115	58	219	8	196	24	88
29.1	48.907	27.34	54.12	34.38	51.89	34.38	54.772	48.52
	12	122	44	280	0	217	15	104
July 9.1	48.919	26.12	53.68	31.58	51.89	32.21	54.787	47.48
	43	122	28	305	6	232	58	115
19.0	48.962	24.90	53.40	28.53	51.95	29.89	54.845	46.33
	74	122	13	319	13	240	95	126
29.0	49.036	23.68	53.27	25.34	52.08	27.49	54.940	45.07
	103	109	4	324	20	246	133	123
Aug. 8.0	49.139	22.59	53.31	22.10	52.28	25.03	55.073	43.74
	131	99	21	318	25	241	169	140
17.9	49.270	21.60	53.52	18.92	52.53	22.59	55.242	42.34
	157	80	37	302	31	241	202	144
27.9	49.427	20.80	53.89	15.90	52.84	20.18	55.444	40.90
	186	57	51	276	37	231	235	147
Sept. 6.9	49.613	20.23	54.43	13.14	53.21	17.87	55.679	39.43
	210	32	67	238	41	216	265	148
16.9	49.823	19.91	55.10	10.76	53.62	15.71	55.944	37.95
	234	1	81	189	47	199	294	147
26.8	50.057	19.90	55.91	8.87	54.09	13.72	56.238	36.48
	254	31	90	135	49	176	329	146
Oct. 6.8	50.311	20.21	56.81	7.52	54.58	11.96	56.558	35.02
	274	64	98	75	54	149	311	137
16.8	50.585	20.85	57.79	6.77	55.12	10.47	56.902	33.65
	289	95	102	11	56	118	363	127
26.8	50.874	21.80	58.81	6.66	55.68	9.29	57.265	32.38
	298	127	103	60	57	81	376	114
Nov. 5.7	51.172	23.07	59.84	7.26	56.25	8.45	57.641	31.24
	302	151	100	122	58	41	381	94
15.7	51.474	24.58	60.84	8.48	56.83	8.01	58.022	30.30
	299	174	94	184	57	4	379	74
25.7	51.773	26.32	61.78	10.32	57.40	7.97	58.401	29.56
	286	188	83	242	55	37	368	48
Dec. 5.6	52.059	28.20	62.61	12.74	57.95	8.34	58.769	29.08
	265	197	70	288	51	81	313	23
15.6	52.324	30.17	63.31	15.62	58.46	9.15	59.112	28.85
	235	199	55	326	45	124	310	9
25.6	52.559	32.16	63.86	18.88	58.91	10.39	59.422	28.94
	200	191	37	355	38	158	266	38
35.6	52.759	34.07	64.23	22.43	59.29	11.97	59.688	29.32
Mean Place	48.864	15.24	58.588	12.40	52.980	37.57	54.983	53.85
Sec δ, Tan δ	1.002	−0.064	4.528	−4.416	2.061	+1.802	1.274	+0.789
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.060	−0.002	−0.034	−0.172	+0.100	+0.071	+0.078	+0.032
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.23	+0.81	−0.23	+0.81	−0.23	+0.81	−0.24	+0.80

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cancri. Mag. 5.5		Groombridge 1446. Mag. 6.3		δ Hydræ. Mag. 4.2		σ Hydræ. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	8 28	+20 41	8 31	+73 53	8 33	+ 5 58	8 34	+ 3 36
	s	″	s	″	s	″	s	″
Jan. 0.6	16.595 202	61.20 51	13.83 54	44.99 229	35.954 188	13.82 139	45.151 187	36.69 153
10.6	16.797 150	60.69 27	14.37 37	47.28 258	36.142 142	12.43 120	45.338 141	35.16 135
20.5	16.947 94	60.42 7	14.74 22	49.86 277	36.284 91	11.23 100	45.479 90	33.81 114
30.5	17.041 43	60.35 − 12	14.96 4	52.63 286	36.375 40	10.23 78	45.569 40	32.67 94
Feb. 9.5	17.084 —	60.47 29	15.00 —	55.49 283	36.415 —	9.45 58	45.609 —	31.73 71
	11		11		10		9	
19.4	17.073	60.76	14.89	58.32	36.405	8.87	45.600	31.02
Mar. 1.4	17.013 60	61.20 44	14.62 27	61.00 268	36.350 55	8.51 36	45.545 55	30.52 50
11.4	16.913 100	61.71 51	14.22 40	63.43 213	36.257 93	8.32 19	45.452 93	30.22 30
21.4	16.776 137	62.27 56	13.69 53	65.52 209	36.131 126	8.30 — 2	45.327 125	30.10 — 12
31.3	16.617 159	62.85 58	13.08 61	67.18 166	35.984 147	8.42 12	45.181 146	30.14 4
	169	56	66	118	160	25	159	19
Apr. 10.3	16.448	63.41	12.42	68.36 67	35.824	8.67	45.022	30.33
20.3	16.272 176	63.93 52	11.73 69	69.03 13	35.659 165	9.01 34	44.859 163	30.64 31
30.3	16.103 169	64.38 45	11.04 69	69.16 — 38	35.501 158	9.44 43	44.700 159	31.06 42
May 10.2	15.948 155	64.77 39	10.38 66	68.78 88	35.354 147	9.94 50	44.553 147	31.57 51
20.2	15.812 136	65.07 30	9.78 60	67.90 137	35.225 129	10.51 57	44.425 128	32.17 60
	110	20	52		105	62	106	69
30.2	15.702 78	65.27 17	9.26 44	66.53 178	35.120 78	11.13 67	44.319 80	32.86 73
June 9.1	15.624 49	65.44 8	8.82 32	64.75 214	35.042 50	11.80 69	44.239 52	33.59 79
19.1	15.575 17	65.52 0	8.50 22	62.61 243	34.992 21	12.49 72	44.187 22	34.38 82
29.1	15.558 — 20	65.52 9	8.28 10	60.18 267	34.971 — 9	13.21 70	44.165 — 7	35.20 82
July 9.1	15.578	65.43	8.18 —	57.51	34.980	13.91	44.172	36.02
	50	15	4	283	39	68	37	81
19.0	15.628	65.28	8.22	54.68	35.019	14.59	44.209	36.83
29.0	15.709 81	65.06 22	8.37 15	51.75 293	35.089 70	15.21 62	44.276 67	37.58 75
Aug. 8.0	15.822 113	64.75 31	8.63 26	48.79 296	35.185 96	15.75 54	44.370 94	38.25 67
18.0	15.965 143	64.33 42	9.02 39	45.84 295	35.311 126	16.17 12	44.493 123	38.80 55
27.9	16.137 172	63.79 54	9.50 48	42.98 286	35.465 154	16.43 26	44.643 150	39.20 40
	199	66	58	272	178	9	177	20
Sept. 6.9	16.336	63.13	10.08	40.26	35.643	16.52	44.820	39.40
16.9	16.562 226	62.38 75	10.76 68	37.74 252	35.847 204	16.39 13	45.023 203	39.38 2
26.8	16.811 249	61.48 90	11.52 76	35.47 227	36.076 229	16.04 35	45.250 227	39.11 27
Oct. 6.8	17.083 272	60.48 100	12.35 83	33.51 196	36.329 253	15.42 62	45.501 251	38.58 53
16.8	17.377 294	59.34 114	13.24 89	31.91 160	36.601 272	14.58 84	45.771 270	37.78 80
	310	119	93	121	289	108	288	106
26.8	17.687	58.15	14.17	30.70	36.890	13.50	46.059	36.72
Nov. 5.7	18.008 321	56.92 123	15.13 96	29.93 77	37.192 302	12.21 129	46.358 299	35.43 129
15.7	18.335 327	55.65 127	16.09 96	29.63 — 30	37.500 308	10.76 145	46.665 307	33.96 147
25.7	18.661 326	54.44 121	17.04 95	29.83 71	37.806 306	9.19 157	46.970 305	32.33 163
Dec. 5.7	18.979 318	53.33 111	17.94 90	30.54 120	38.104 298	7.56 163	47.266 296	30.63 170
	295	98	83		280	163	279	173
15.6	19.274	52.35	18.77	31.74	38.384	5.93	47.545	28.90
25.6	19.541 267	51.51 84	19.51 74	33.41 167	38.635 251	4.36 157	47.795 250	27.23 167
35.6	19.767 226	50.88 63	20.14 63	35.49 208	38.848 213	2.91 145	48.009 214	25.66 157
Mean Place	15.551	73.38	11.094	62.23	34.886	23.59	44.072	46.02
Sec δ, Tan δ	1.069	+0.378	3.605	+3.464	1.005	+0.105	1.002	+0.063
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.069	+0.015	+0.134	+0.142	+0.063	+0.004	+0.062	+0.003
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.24	+0.80	−0.24	+0.79	−0.25	+0.78	−0.25	+0.78

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		γ Cancri. Mag. 4.7		δ Cancri. Mag. 4.2		α Pyxidis. Mag. 3.7		ι Cancri. Mag. 4.2	
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
		h m	° ′	h m	° ′	h m	° ′	h m	° ′
		8 38	+21 44	8 40	+18 25	8 40	−32 54	8 42	+29 2
		s	″	s	″	s	″	s	″
Jan.	0.6	51.015	34.79	19.735	65.86	31.449	31.67	3.556	19.74
		211	49	207	69	183	317	224	7
	10.6	51.226	34.30	19.942	65.17	31.632	34.84	3.780	19.67
		161	24	160	47	128	315	174	19
	20.5	51.387	34.06	20.102	64.70	31.760	37.99	3.954	19.86
		108	3	106	25	73	306	119	41
	30.5	51.495	34.03	20.208	64.45	31.833	41.05	4.073	20.27
		53	18	53	3	15	286	59	63
Feb.	9.5	51.548	34.21	20.261	64.42	31.848	43.91	4.132	20.90
		1	35	1	16	38	263	3	80
	19.4	51.547	34.56	20.262	64.58	31.810	46.54	4.135	21.70
		50	49	48	30	87	232	50	89
Mar.	1.4	51.497	35.05	20.214	64.88	31.723	48.86	4.085	22.59
		93	59	89	42	131	198	96	94
	11.4	51.404	35.64	20.125	65.30	31.592	50.84	3.989	23.53
		129	64	126	50	166	159	135	94
	21.4	51.275	36.28	19.999	65.80	31.426	52.43	3.854	24.47
		153	65	150	54	190	121	162	89
	31.3	51.122	36.93	19.849	66.34	31.236	53.64	3.692	25.36
		170	62	163	54	206	80	179	79
Apr.	10.3	50.952	37.55	19.686	66.88	31.030	54.44	3.513	26.15
		171	57	169	54	212	39	185	67
	20.3	50.778	38.12	19.517	67.42	30.818	54.83	3.328	26.82
		170	50	166	48	211	3	182	51
	30.3	50.608	38.62	19.351	67.90	30.607	54.80	3.146	27.33
		157	41	151	44	200	43	170	38
May	10.2	50.451	39.03	19.197	68.34	30.407	54.37	2.976	27.71
		139	32	131	39	184	81	151	18
	20.2	50.312	39.35	19.063	68.73	30.223	53.56	2.825	27.89
		114	22	114	31	163	120	124	5
	30.2	50.198	39.57	18.949	69.04	30.060	52.36	2.701	27.94
		86	13	83	25	136	153	96	12
June	9.1	50.112	39.70	18.866	69.29	29.924	50.83	2.605	27.82
		55	4	55	18	109	184	63	27
	19.1	50.057	39.74	18.811	69.47	29.815	48.99	2.542	27.55
		24	4	24	11	74	208	30	40
	29.1	50.033	39.70	18.787	69.58	29.741	46.91	2.512	27.15
		10	13	6	3	41	229	4	53
July	9.1	50.043	39.57	18.793	69.61	29.700	44.62	2.516	26.62
		10	23	40	4	5	242	40	64
	19.0	50.083	39.34	18.833	69.57	29.695	42.20	2.556	25.98
		73	31	70	13	30	248	74	75
	29.0	50.156	39.03	18.903	69.44	29.725	39.72	2.630	25.23
		103	41	100	21	67	246	107	84
Aug.	8.0	50.259	38.62	19.003	69.23	29.792	37.26	2.737	24.39
		134	49	128	32	104	236	137	93
	18.0	50.393	38.13	19.131	68.91	29.896	34.90	2.874	23.46
		162	62	158	45	139	217	169	103
	27.9	50.555	37.51	19.289	68.46	30.035	32.73	3.043	22.43
		190	75	183	59	177	188	200	113
Sept.	6.9	50.745	36.76	19.472	67.87	30.212	30.85	3.243	21.30
		218	86	212	73	211	154	229	121
	16.9	50.963	35.90	19.684	67.14	30.423	29.31	3.472	20.09
		213	99	238	87	241	112	254	127
	26.8	51.206	34.91	19.922	66.27	30.667	28.19	3.726	18.82
		267	110	262	101	274	63	283	132
Oct.	6.8	51.473	33.81	20.184	65.26	30.941	27.56	4.009	17.50
		289	120	283	115	300	9	303	136
	16.8	51.762	32.61	20.467	64.11	31.241	27.47	4.312	16.14
		309	127	303	127	318	45	325	134
	26.8	52.071	31.34	20.770	62.84	31.559	27.92	4.637	14.80
Nov.	5.7	52.393	30.03	21.086	61.51	31.890	28.90	4.978	13.46
		322	131	316	133	331	98	341	134
	15.7	52.724	28.72	21.409	60.16	32.227	30.42	5.326	12.24
		331	131	323	135	337	152	348	122
	25.7	53.054	27.46	21.734	58.81	32.557	32.41	5.677	11.13
		330	126	325	135	330	199	351	111
Dec.	5.7	53.376	26.31	22.051	57.54	32.875	34.81	6.017	10.20
		322	115	317	127	318	240	340	93
		304	102	299	117	292	275	324	74
	15.6	53.680	25.29	22.350	56.37	33.167	37.56	6.341	9.46
		277	83	272	100	257	297	294	48
	25.6	53.957	24.46	22.622	55.37	33.424	40.53	6.635	8.98
		237	58	234	82	214	312	255	23
	35.6	54.194	23.88	22.856	54.55	33.638	43.65	6.890	8.75
Mean Place		50.012	47.14	18.735	77.66	29.851	29.08	2.557	33.24
Sec δ, Tan δ		1.077	+0.399	1.054	+0.333	1.191	−0.647	1.144	+0.555
$D_{\psi\alpha}$, $D_{\omega\alpha}$		+0.069	+0.017	+0.068	+0.014	+0.048	−0.028	+0.072	+0.024
$D_{\psi\delta}$, $D_{\omega\delta}$		−0.25	+0.77	−0.26	+0.77	−0.26	+0.76	−0.26	+0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Argus. Mag. 2.0		ϵ Hydræ. Mag. 3.5		σ^2 Cancri (*mean*). Mag. 5.5		ζ Hydræ. Mag. 3.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 8 42 s	° ′ −54 25 ″	h m 8 42 s	° ′ + 6 41 ″	h m 8 49 s	° ′ +30 51 ″	h m 8 51 s	° ′ + 6 14 ″
Jan. 0.6	36.955	32.57	43.050	58.61	34.058	65.54	20.553	12.71
10.6	37.160 205	36.21 364	43.247 197	57.24 137	34.295 237	65.52 — 2	20.759 206	11.29 142
20.5	37.292 132	39.92 371	43.398 151	56.05 119	34.479 184	65.79 27	20.916 157	10.05 124
30.5	37.347 — 55	43.59 367	43.499 101	55.07 98	34.607 128	66.29 50	21.025 109	9.03 102
Feb. 9.5	37.324 23	47.13 354	43.548 49	54.31 76	34.677 70	67.03 74	21.081 56	8.21 82
	95	332	0	54	11	89	9	58
19.5	37.229	50.45	43.548	53.77	34.688	67.92	21.090	7.63
Mar. 1.4	37.068 161	53.49 304	43.501 47	53.43 34	34.645 43	68.93 101	21.051 39	7.25 38
11.4	36.850 218	56.18 269	43.414 87	53.28 — 15	34.554 91	69.98 105	20.972 79	7.07 18
21.4	36.585 265	58.43 225	43.294 120	53.29 1	34.422 132	71.02 104	20.860 112	7.06 — 1
31.3	36.284 301	60.25 182	43.152 142	53.43 14	34.261 161	72.01 99	20.722 138	7.21 15
	323	134	156	28	178	88	152	26
Apr. 10.3	35.961	61.59 83	42.996	53.71	34.083	72.89	20.570	7.47
20.3	35.623 338	62.42	42.835 161	54.07 36	33.896 187	73.62 73	20.412 158	7.82 35
30.3	35.285 338	62.76 — 34	42.676 159	54.51 44	33.710 186	74.20 58	20.255 157	8.26 44
May 10.2	34.954 331	62.57 19	42.529 147	55.01 50	33.536 174	74.59 39	20.108 147	8.79 53
20.2	34.642 312	61.90 67	42.398 131	55.57 56	33.380 156	74.79 20	19.976 132	9.35 56
	288	117	109	60	132	3	111	62
30.2	34.354	60.73	42.289	56.17	33.248	74.82	19.865	9.97
June 9.2	34.101 253	59.11 162	42.205 84	56.81 64	33.146 102	74.66 16	19.776 89	10.62 65
19.1	33.887 214	57.09 202	42.149 56	57.46 65	33.076 70	74.34 32	19.716 60	11.29 67
29.1	33.717 170	54.70 239	42.122 — 27	58.13 67	33.039 37	73.87 47	19.682 31	11.95 66
July 9.1	33.597 120	52.03 267	42.124 2	58.78 65	33.036 — 3	73.27 60	19.677 — 5	12.62 67
	70	290	32	62	32	75	23	63
19.0	33.527	49.13	42.156	59.40	33.068	72.52	19.700	13.25
29.0	33.513 — 14	46.10 303	42.216 60	59.96 56	33.135 67	71.66 86	19.753 53	13.81 56
Aug. 8.0	33.557 44	43.04 306	42.305 89	60.44 48	33.234 99	70.70 96	19.834 81	14.29 48
18.0	33.657 100	40.04 300	42.423 118	60.80 36	33.366 132	69.63 107	19.943 109	14.68 39
27.9	33.817 160	37.21 283	42.567 144	61.00 20	33.530 164	68.46 117	20.080 137	14.88 20
	216	257	171	2	194	125	163	2
Sept. 6.9	34.033	34.64	42.738	61.02 —	33.724	67.21	20.243	14.90 —
16.9	34.303 270	32.45 219	42.936 198	60.83 19	33.949 225	65.89 132	20.434 191	14.72 18
26.9	34.623 320	30.70 175	43.159 223	60.43 40	34.204 255	64.50 139	20.652 218	14.31 41
Oct. 6.8	34.987 364	29.50 120	43.407 248	59.77 66	34.484 280	63.07 143	20.895 243	13.65 66
16.8	35.388 401	28.88 — 62	43.675 268	58.88 89	34.790 306	61.63 144	21.159 264	12.77 88
	425	4	287	112	327	143	286	114
26.8	35.813	28.92	43.962	57.76	35.117	60.20	21.445	11.63
Nov. 5.7	36.254 441	29.60 68	44.264 302	56.44 132	35.461 344	58.82 138	21.745 300	10.31 132
15.7	36.696 442	30.90 130	44.573 309	54.97 147	35.816 355	57.54 128	22.055 310	8.79 152
25.7	37.127 431	32.82 192	44.883 310	53.39 158	36.173 357	56.41 113	22.365 310	7.18 161
Dec. 5.7	37.530 403	35.27 215	45.184 301	51.74 165	36.522 349	55.47 94	22.670 305	5.49 169
	364	291	285	164	333	71	289	167
15.6	37.894	38.18	45.469	50.10	36.855	54.76	22.959	3.82
25.6	38.205 311	41.43 325	45.727 258	48.54 156	37.159 304	54.30 46	23.223 264	2.21 161
35.6	38.452 247	44.96 353	45.950 223	47.09 145	37.426 267	54.15 15	23.453 230	0.71 150
Mean Place	34.411	33.38	42.017	68.33	33.092	79.37	19.547	22.14
Sec δ, Tan δ	1.719	−1.398	1.007	+0.118	1.165	+0.598	1.006	+0.109
$D\psi\alpha$, $D\omega\alpha$	+0.033	−0.061	+0.064	+0.005	+0.073	+0.027	+0.063	+0.005
$D\psi\delta$, $D\omega\delta$	−0.26	+0.76	−0.26	+0.76	−0.27	+0.74	−0.27	+0.73

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Ursæ Majoris. Mag. 3.1		α Cancri. Mag. 4.3		b^1 Carinæ. Mag. 5.1		κ Ursæ Majoris. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	8 53	+48 20	8 54	+12 9	8 55	−58 55	8 58	+47 27
Jan. 0.6	57.754	25.78	17.661	13.33	8.186	52.40	23.681	27.26
	294	92	212	111	240	364	296	85
10.6	58.048	26.70	17.873	12.22	8.426	56.04	23.977	28.11
	229	126	167	90	157	375	233	119
20.5	58.277	27.96	18.040	11.32	8.583	59.79	24.210	29.30
	160	150	116	66	72	375	165	146
30.5	58.437	29.46	18.156	10.66	8.655	63.54	24.375	30.76
	84	172	65	45	12	367	90	168
Feb. 9.5	58.521	31.18	18.221	10.21	8.643	67.21	24.465	32.44
	11	184	12	24	93	348	18	180
19.5	58.532	33.02	18.233	9.97	8.550	70.69	24.483	34.24
	61	186	34	4	168	323	50	184
Mar. 1.4	58.471	34.88	18.199	9.93	8.382	73.92	24.433	36.08
	122	183	77	11	233	289	113	182
11.4	58.349	36.71	18.122	10.07	8.149	76.81	24.320	37.90
	172	168	110	25	287	249	162	169
21.4	58.177	38.39	18.012	10.32	7.862	79.30	24.158	39.59
	212	150	137	36	328	206	205	151
31.4	57.965	39.89	17.875	10.68	7.534	81.36	23.953	41.10
	239	121	152	43	360	158	232	125
Apr. 10.3	57.726	41.10	17.723	11.11	7.174	82.94	23.721	42.35
	254	93	159	47	379	108	245	97
20.3	57.472	42.03	17.564	11.58	6.795	84.02	23.476	43.32
	253	59	158	50	385	55	247	64
30.3	57.219	42.62	17.406	12.08	6.410	84.57	23.229	43.96
	240	25	149	51	380	4	237	31
May 10.2	56.979	42.87	17.257	12.59	6.030	84.61	22.992	44.27
	222	7	134	50	365	47	218	2
20.2	56.757	42.80	17.123	13.09	5.665	84.14	22.774	44.25
	194	43	112	49	342	97	188	37
30.2	56.563	42.37	17.011	13.58	5.323	83.17	22.586	43.88
	156	74	90	48	307	145	155	67
June 9.2	56.407	41.63	16.921	14.06	5.016	81.72	22.431	43.21
	116	103	62	41	268	190	114	97
19.1	56.291	40.60	16.859	14.50	4.748	79.82	22.317	42.24
	69	129	35	42	221	228	72	122
29.1	56.222	39.31	16.824	14.92	4.527	77.54	22.245	41.02
	28	147	5	37	171	261	30	143
July 9.1	56.194	37.84	16.819	15.29	4.356	74.93	22.215	39.59
	19	169	23	30	111	286	16	162
19.1	56.213	36.15	16.842	15.59	4.245	72.07	22.231	37.97
	66	183	53	22	50	304	60	179
29.0	56.279	34.32	16.895	15.81	4.195	69.03	22.291	36.18
	111	195	82	13	15	311	105	189
Aug. 8.0	56.390	32.37	16.977	15.94	4.210	65.92	22.396	34.29
	151	202	111	0	80	309	146	199
18.0	56.541	30.35	17.088	15.94	4.290	62.83	22.542	32.30
	196	207	137	13	148	295	189	205
27.9	56.737	28.28	17.225	15.81	4.438	59.88	22.731	30.25
	237	211	166	29	215	272	229	207
Sept. 6.9	56.974	26.17	17.391	15.52	4.653	57.16	22.960	28.18
	278	207	193	49	278	237	268	206
16.9	57.252	24.10	17.584	15.03	4.931	54.79	23.228	26.12
	315	201	220	67	337	194	304	203
26.9	57.567	22.09	17.804	14.36	5.268	52.85	23.532	24.09
	350	190	246	86	390	143	342	193
Oct. 6.8	57.917	20.19	18.050	13.50	5.658	51.42	23.874	22.16
	380	176	269	106	434	84	371	179
16.8	58.297	18.43	18.319	12.44	6.092	50.58	24.245	20.37
	406	160	289	124	467	19	399	164
26.8	58.703	16.83	18.608	11.20	6.559	50.39	24.644	18.73
	426	135	306	136	486	45	421	141
Nov. 5.8	59.129	15.48	18.914	9.84	7.045	50.84	25.065	17.32
	441	108	314	150	491	111	432	115
15.7	59.570	14.40	19.228	8.34	7.536	51.95	25.497	16.17
	443	76	318	153	479	173	438	84
25.7	60.013	13.64	19.546	6.81	8.015	53.68	25.935	15.33
	433	44	313	154	455	230	430	48
Dec. 5.7	60.446	13.20	19.859	5.27	8.470	55.98	26.365	14.85
	411	3	297	147	410	281	410	14
15.6	60.857	13.17	20.156	3.80	8.880	58.79	26.775	14.71
	379	33	272	137	353	318	378	26
25.6	61.236	13.50	20.428	2.43	9.233	61.97	27.153	14.97
	330	73	239	121	286	348	332	64
35.6	61.566	14.23	20.667	1.22	9.519	65.45	27.485	15.61
Mean Place	56.681	42.05	16.697	23.85	5.306	54.95	22.649	43.55
Sec δ, Tan δ	1.504	+1.124	1.023	+0.215	1.938	−1.660	1.479	+1.090
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.083	+0.052	+0.065	+0.010	+0.029	−0.077	+0.082	+0.051
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.27	+0.73	−0.27	+0.72	−0.28	+0.72	−0.28	+0.71

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cancri. Mag. 5.1		σ² Ursæ Majoris. Mag. 4.9		λ Argus. Mag. 2.2		θ Hydræ. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	9 3	+10 58	9 3	+67 26	9 5	−43 7	9 10	+ 2 38
Jan. 0.6	35.671	33.96	40.11	36.56	11.659	15.69	22.562	15.75
	218	120	47	178	219	339	217	168
10.6	35.889	32.76	40.58	38.34	11.878	19.08	22.779	14.07
	175	100	37	214	161	347	174	151
20.6	36.064	31.76	40.95	40.48	12.039	22.55	22.953	12.56
	125	76	25	240	99	313	126	129
30.5	36.189	31.00	41.20	42.88	12.138	25.98	23.079	11.27
	73	54	14	261	35	332	76	108
Feb. 9.5	36.262	30.46	41.34	45.49	12.173	29.30	23.155	10.19
	22	31	1	268	25	312	24	84
19.5	36.284	30.15	41.35	48.17	12.148	32.42	23.179	9.35
	26	11	11	264	83	283	21	60
Mar. 1.4	36.258	30.04	41.24	50.81	12.065	35.25	23.158	8.75
	69	6	22	251	133	253	64	39
11.4	36.189	30.10	41.02	53.32	11.932	37.78	23.094	8.36
	102	22	30	227	173	214	95	19
21.4	36.087	30.32	40.72	55.59	11.759	39.92	22.999	8.17
	131	33	38	193	205	173	125	3
31.4	35.956	30.65	40.34	57.52	11.554	41.65	22.874	8.14
	147	11	44	154	229	130	142	15
Apr. 10.3	35.809	31.06	39.90	59.06	11.325	42.95	22.732	8.29
	156	47	46	110	243	84	150	28
20.3	35.653	31.53	39.44	60.16	11.082	43.79	22.582	8.57
	156	51	18	62	246	39	151	41
30.3	35.497	32.04	38.96	60.78	10.836	44.18	22.431	8.98
	118	53	46	10	240	7	145	49
May 10.3	35.349	32.57	38.50	60.88	10.596	44.11	22.286	9.47
	135	53	44	35	230	52	133	58
20.2	35.214	33.10	38.06	60.53	10.366	43.59	22.153	10.05
	116	53	40	84	213	97	117	67
30.2	35.098	33.63	37.66	59.69	10.153	42.62	22.036	10.72
	93	51	34	127	187	137	99	75
June 9.2	35.005	34.14	37.32	58.42	9.966	41.25	21.937	11.47
	67	49	27	165	162	176	72	76
19.1	34.938	34.63	37.05	56.77	9.804	39.49	21.865	12.23
	42	46	20	200	128	209	48	78
29.1	34.896	35.09	36.85	54.77	9.676	37.40	21.817	13.01
	13	42	12	231	92	236	19	79
July 9.1	34.883	35.51	36.73	52.46	9.584	35.04	21.798	13.80
	16	36	4	251	55	257	2	78
19.1	34.899	35.87	36.69	49.95	9.529	32.47	21.800	14.58
	43	27	5	272	13	268	35	71
29.0	34.942	36.14	36.74	47.23	9.516	29.79	21.835	15.29
	72	18	12	281	28	275	62	64
Aug. 8.0	35.014	36.32	36.86	44.42	9.544	27.04	21.897	15.93
	99	5	21	288	73	271	86	51
18.0	35.113	36.37	37.07	41.54	9.617	24.33	21.983	16.44
	129	9	28	289	116	256	117	41
28.0	35.242	36.28	37.35	38.65	9.733	21.77	22.100	16.85
	157	26	37	282	161	231	145	16
Sept. 6.9	35.399	36.02	37.72	35.83	9.894	19.46	22.245	17.01
	184	44	43	272	205	200	176	6
16.9	35.583	35.58	38.15	33.11	10.099	17.46	22.421	16.95
	212	66	50	256	246	159	202	30
26.9	35.795	34.92	38.65	30.55	10.345	15.87	22.623	16.65
	237	85	56	232	288	109	229	56
Oct. 6.8	36.032	34.07	39.21	28.23	10.633	14.78	22.852	16.09
	263	106	61	204	319	57	254	85
16.8	36.295	33.01	39.82	26.19	10.952	14.21	23.106	15.24
	284	126	66	172	348	5	276	110
26.8	36.579	31.75	40.48	24.47	11.300	14.26	23.382	14.14
	303	140	69	134	366	62	296	134
Nov. 5.8	36.882	30.35	41.17	23.13	11.666	14.88	23.678	12.80
	314	152	71	91	375	124	308	155
15.7	37.196	28.83	41.88	22.22	12.041	16.12	23.986	11.25
	318	159	72	44	375	178	313	173
25.7	37.514	27.24	42.60	21.78	12.416	17.90	24.299	9.52
	314	161	69	6	361	230	308	184
Dec. 5.7	37.828	25.63	43.29	21.84	12.777	20.20	24.607	7.68
	300	156	67	55	336	270	297	185
15.6	38.128	24.07	43.96	22.39	13.113	22.90	24.904	5.83
	278	146	61	105	299	304	273	182
25.6	38.406	22.61	44.57	23.44	13.412	25.94	25.177	4.01
	242	130	53	150	253	329	242	173
35.6	38.648	21.31	45.10	24.94	13.665	29.23	25.419	2.28
Mean Place	34.737	44.10	38.535	54.84	9.789	16.74	21.600	23.94
Sec δ, Tan δ	1.019	+0.194	2.607	+2.408	1.370	−0.937	1.001	+0.046
$D_{\psi a}$, $D_{\omega a}$	+0.065	+0.009	+0.106	+0.115	+0.044	−0.045	+0.062	+0.002
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.29	+0.70	−0.29	+0.70	−0.29	+0.69	−0.29	+0.67

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		β Argus. Mag. 1.8		83 Cancri. Mag. 6.6		ι Argus. Mag. 2.2		40 Lyncis. Mag. 3.3	
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
		h m 9 12 s	° ′ −69 23 ″	h m 9 14 s	° ′ +18 1 ″	h m 9 15 s	° ′ −58 57 ″	h m 9 16 s	° ′ +34 42 ″
Jan.	0.6	25.95	54.36	42.103	45.83	4.418	1.56	23.011	53.99
		35	357	237	88	275	356	267	6
	10.6	26.30	57.93	42.340	44.95	4.693	5.12	23.278	54.05
		22	375	191	62	196	371	221	36
	20.6	26.52	61.68	42.531	44.33	4.889	8.83	23.499	54.41
		11	385	143	35	114	376	161	66
	30.5	26.63	65.53	42.674	43.98	5.003	12.59	23.660	55.07
		—	381	88	14	28	371	102	88
Feb.	9.5	26.62	69.34	42.762	43.84	5.031	16.30	23.762	55.95
		1	371	35	—	—	356	43	111
		12		—	11	53		—	
	19.5	26.50	73.05	42.797	43.95	4.978	19.86	23.805	57.06
Mar.	1.4	26.27	76.53	42.782	44.25	4.849	23.21	23.786	58.32
		23	348	15	30	129	335	19	126
	11.4	25.95	79.75	42.722	44.71	4.652	26.25	23.717	59.65
		32	322	60	46	197	304	69	133
	21.4	25.54	82.61	42.626	45.26	4.397	28.92	23.606	60.96
		41	286	96	55	255	267	111	131
	31.4	25.06	85.07	42.499	45.88	4.096	31.19	23.456	62.21
		48	246	127	62	301	227	150	125
		52	198	146	66	336	181	175	115
Apr.	10.3	24.54	87.05	42.353	46.54	3.760	33.00	23.281	63.36
		56	151	156	65	360	133	186	97
	20.3	23.98	88.56	42.197	47.19	3.400	34.33	23.095	64.33
		58	98	160	62	372	83	190	78
	30.3	23.40	89.54	42.037	47.81	3.028	35.16	22.905	65.11
		59	45	154	55	372	31	184	54
May	10.3	22.81	89.99	41.883	48.36	2.656	35.47	22.721	65.65
		57	7	141	49	365	21	171	34
	20.2	22.24	89.92	41.742	48.85	2.291	35.26	22.550	65.99
		56	64	123	41	344	72	153	7
	30.2	21.68	89.28	41.619	49.26	1.947	34.54	22.397	66.06
June	9.2	21.17	88.15	41.518	49.60	1.628	33.34	22.270	65.93
		51	113	101	34	319	120	127	13
	19.1	20.70	86.52	41.442	49.85	1.342	31.66	22.172	65.55
		47	163	76	25	286	168	98	38
	29.1	20.30	84.44	41.390	50.02	1.100	29.58	22.109	64.99
		40	208	52	17	242	208	63	56
July	9.1	19.96	81.98	41.369	50.07	0.905	27.14	22.077	64.22
		34	246	21	—	195	211	32	77
		25	274	—	5	140	272	0	93
	19.1	19.71	79.24	41.375	50.03	0.765	24.42	22.077	63.29
		16	300	36	15	84	294	37	109
	29.0	19.55	76.24	41.411	49.88	0.681	21.48	22.114	62.20
		7	316	66	26	20	306	71	124
Aug.	8.0	19.48	73.08	41.477	49.62	0.661	18.42	22.185	60.96
		—	319	92	39	—	307	105	134
	18.0	19.51	69.89	41.569	49.23	0.706	15.35	22.290	59.62
		14	311	123	54	45	299	136	149
	28.0	19.65	66.75	41.692	48.69	0.819	12.36	22.426	58.13
		21	297	150	68	113	280	173	158
						181			
Sept.	6.9	19.89	63.78	41.842	48.01	1.000	9.56	22.599	56.55
		34	268	182	84	247	249	205	165
	16.9	20.23	61.10	42.024	47.17	1.247	7.07	22.804	54.90
		44	228	210	101	310	209	211	169
	26.9	20.67	58.82	42.234	46.16	1.557	4.98	23.045	53.21
		52	180	239	116	368	161	269	176
Oct.	6.8	21.19	57.02	42.473	45.00	1.925	3.37	23.314	51.45
		59	122	265	132	418	105	301	174
	16.8	21.78	55.80	42.738	43.68	2.343	2.32	23.615	49.71
		61	63	288	141	457	42	326	170
			—				—		
	26.8	22.42	55.17	43.026	42.27	2.800	1.90	23.941	48.01
Nov.	5.8	23.09	55.21	43.335	40.76	3.283	2.11	24.291	46.39
		67	4	309	151	483	21	350	162
	15.7	23.78	55.93	43.657	39.20	3.780	3.00	24.657	44.90
		69	72	322	156	497	89	366	149
	25.7	24.45	57.32	43.985	37.63	4.271	4.51	25.030	43.60
		67	139	328	157	491	151	373	130
Dec.	5.7	25.08	59.31	44.312	36.15	4.743	6.60	25.399	42.55
		63	199	327	148	472	209	369	105
		58	254	317	138	434	262	357	78
	15.7	25.66	61.85	44.629	34.77	5.177	9.22	25.756	41.77
		50	300	293	120	384	305	331	48
	25.6	26.16	64.85	44.922	33.57	5.561	12.27	26.090	41.29
		41	335	263	100	324	342	299	18
	35.6	26.57	68.20	45.185	32.57	5.885	15.69	26.389	41.11
Mean Place		21.673	59.76	41.249	57.25	1.614	5.93	22.178	68.64
Sec δ, Tan δ		2.843	−2.661	1.052	+0.325	1.939	−1.661	1.216	+0.693
$D_{\psi a}$, $D_{\omega a}$		+0.014	−0.132	+0.067	+0.016	+0.032	−0.083	+0.073	+0.035
$D_{\psi\delta}$, $D_{\omega\delta}$		−0.30	+0.67	−0.30	+0.66	−0.30	+0.66	−0.30	+0.66

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pyxidis. Mag. 4.9		α Hydræ. Mag. 2.2		h Ursæ Majoris. Mag. 3.8		ψ Argus. Mag. 3.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 9 18 s	° ′ −25 38 ″	h m 9 23 s	° ′ − 8 19 ″	h m 9 25 s	° ′ +63 23 ″	h m 9 27 s	° ′ −40 7 ″
Jan. 0.6	6.110	16.53	49.263	31.76	29.86	40.01	41.517	43.62
	219	289	223	222	45	139	242	326
10.6	6.329	19.42	49.486	33.98	30.31	41.40	41.759	46.88
	172	288	180	210	37	180	188	335
20.6	6.501	22.30	49.666	36.08	30.68	43.20	41.947	50.23
	121	280	132	196	27	212	129	335
30.5	6.622	25.10	49.798	38.04	30.95	45.32	42.076	53.58
	67	264	83	175	17	240	69	326
Feb. 9.5	6.689	27.74	49.881	39.79	31.12	47.72	42.145	56.84
	14	243	34	150	6	254	10	307
	—		—		—		—	
19.5	6.703	30.17	49.915	41.29	31.18	50.26	42.155	59.91
	36	216	14	125	4	258	44	283
Mar. 1.5	6.667	32.33	49.901	42.54	31.14	52.84	42.111	62.74
	78	187	55	100	14	252	96	255
11.4	6.589	34.20	49.846	43.54	31.00	55.36	42.015	65.29
	115	154	90	75	22	232	137	219
21.4	6.474	35.74	49.756	44.29	30.78	57.68	41.878	67.48
	144	120	120	48	28	209	174	181
31.4	6.330	36.94	49.636	44.77	30.50	59.77	41.704	69.29
	164	85	136	28	35	171	197	141
Apr. 10.3	6.166	37.79	49.500	45.05	30.15	61.51	41.507	70.70
	175	51	149	0	37	135	212	99
20.3	5.991	38.30	49.351	45.05	29.78	62.86	41.295	71.69
	178	14	153	20	39	90	221	54
30.3	5.813	38.44	49.198	44.85	29.39	63.76	41.074	72.23
	176	21	148	41	39	45	221	10
May 10.3	5.637	38.23	49.050	44.44	29.00	64.21	40.853	72.33
	165	55	140	60	38	3	216	31
20.2	5.472	37.68	48.910	43.84	28.62	64.18	40.637	72.02
	151	86	125	75	34	50	200	74
30.2	5.321	36.82	48.785	43.09	28.28	63.68	40.437	71.28
	133	117	110	91	30	93	181	116
June 9.2	5.188	35.65	48.675	42.18	27.98	62.75	40.256	70.12
	110	143	86	106	25	135	160	152
19.2	5.078	34.22	48.589	41.12	27.73	61.40	40.096	68.60
	85	168	61	117	19	169	132	187
29.1	4.993	32.54	48.528	39.95	27.54	59.71	39.964	66.73
	57	185	41	124	14	202	104	213
July 9.1	4.936	30.69	48.487	38.71	27.40	57.69	39.860	64.60
	28	199	13	127	6	231	67	236
	—		—					
19.1	4.908	28.70	48.474	37.44	27.34	55.38	39.793	62.24
	2	207	15	127	0	249	33	251
29.0	4.910	26.63	48.489	36.17	27.34	52.89	39.760	59.73
	34	208	42	124	7	269	5	260
Aug. 8.0	4.944	24.55	48.531	34.93	27.41	50.20	39.765	57.13
	67	200	69	112	14	278	47	256
18.0	5.011	22.55	48.600	33.81	27.55	47.42	39.812	54.57
	99	187	100	98	20	284	88	247
28.0	5.110	20.68	48.700	32.83	27.75	44.58	39.900	52.10
	135	164	130	74	27	284	130	226
Sept. 6.9	5.245	19.04	48.830	32.09	28.02	41.74	40.030	49.84
	169	136	158	51	33	278	176	198
16.9	5.414	17.68	48.988	31.58	28.35	38.96	40.206	47.86
	203	98	190	24	39	268	216	160
26.9	5.617	16.70	49.178	31.34	28.74	36.28	40.422	46.26
	234	56	221	12	45	253	257	116
Oct. 6.9	5.851	16.14	49.399	31.46	29.19	33.75	40.679	45.10
	266	11	244	48	51	229	294	64
16.8	6.117	16.03	49.643	31.94	29.70	31.46	40.973	44.46
	291	38	273	83	54	201	325	7
		—						—
26.8	6.408	16.41	49.916	32.77	30.24	29.45	41.298	44.39
	312	87	292	119	59	167	348	49
Nov. 5.8	6.720	17.28	50.208	33.96	30.83	27.78	41.646	44.88
	321	135	307	149	61	128	365	107
15.7	7.044	18.63	50.515	35.45	31.44	26.50	42.011	45.95
	328	178	312	179	62	85	367	162
25.7	7.372	20.41	50.827	37.24	32.06	25.65	42.378	47.57
	323	217	309	199	62	37	362	211
Dec. 5.7	7.695	22.58	51.136	39.23	32.68	25.28	42.740	49.68
	307	249	300	215	60	12	342	254
15.7	8.002	25.07	51.436	41.38	33.28	25.40	43.082	52.22
	281	270	277	221	56	64	312	290
25.6	8.283	27.77	51.713	43.59	33.84	26.04	43.394	55.12
	244	281	246	224	50	111	272	313
35.6	8.527	30.58	51.959	45.83	34.34	27.15	43.666	58.25
Mean Place	4.792	15.04	48.242	26.59	28.747	58.61	39.840	45.88
Sec δ, Tan δ	1.109	−0.480	1.011	−0.146	2.233	+1.997	1.308	−0.843
$D_{\psi a}$, $D_{\omega a}$	+0.053	−0.024	+0.059	−0.008	+0.094	+0.104	+0.047	−0.044
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.30	+0.65	−0.31	+0.63	−0.31	+0.62	−0.31	+0.62

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*d* Ursæ Majoris. Mag. 4.6		*θ* Ursæ Majoris. Mag. 3.3		*ξ* Leonis. Mag. 5.1		10 Leonis Minoris. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	9 27	+70 9	9 27	+52 1	9 27	+11 38	9 29	+36 43
	s	″	s	″	s	″	s	″
Jan. 0.6	43.67	52.74	43.937	27.80	48.694	19.93	31.510	70.17
10.6	44.24 57	54.39 165	44.287 350	28.65 85	48.934 240	18.68 125	31.797 287	70.26 9
20.6	44.70 46	56.46 207	44.573 286	29.88 123	49.130 196	17.63 105	32.034 237	70.64 38
30.5	45.05 35	58.87 241	44.789 216	31.43 155	49.279 149	16.84 79	32.215 181	71.38 74
Feb. 9.5	45.25 20	61.54 267	44.928 139	33.26 183	49.377 98	16.29 55	32.335 120	72.37 99
	7	277	58	202	45	30	58	123
19.5	45.32	64.31	44.986	35.28	49.422	15.99	32.393	73.60
Mar. 1.5	45.26 6	67.11 280	44.969 17	37.37 209	49.421 1	15.90 9	32.392 1	74.96 136
11.4	45.08 18	69.83 272	44.882 87	39.48 211	49.375 46	16.00 10	32.334 58	76.41 145
21.4	44.78 30	72.34 251	44.732 150	41.50 202	49.291 84	16.27 27	32.232 102	77.86 145
31.4	44.39 39	74.55 221	44.530 202	43.32 182	49.177 114	16.66 39	32.091 141	79.24 138
	47	181	237	159	134	47	168	126
Apr. 10.3	43.92	76.36	44.293	44.91	49.043	17.13	31.923	80.50
20.3	43.41 51	77.73 137	44.034 259	46.18 127	48.897 146	17.66 53	31.737 186	81.61 111
30.3	42.88 53	78.65 92	43.764 270	47.12 94	48.747 150	18.23 57	31.544 193	82.51 90
May 10.3	42.34 54	79.04 39	43.496 268	47.68 56	48.600 147	18.80 57	31.355 189	83.16 65
20.2	41.82 52	78.92 12	43.239 257	47.83 15	48.463 137	19.37 57	31.178 177	83.54 38
	48	62	234	21	121	55	163	16
30.2	41.34	78.30	43.005	47.62	48.342	19.92	31.015	83.70
June 9.2	40.91 43	77.18 112	42.804 201	47.02 60	48.239 103	20.44 52	30.879 136	83.58 12
19.2	40.55 36	75.66 152	42.637 167	46.07 95	48.159 80	20.92 48	30.769 110	83.21 37
29.1	40.26 29	73.75 191	42.511 126	44.83 124	48.101 58	21.35 43	30.689 80	82.59 62
July 9.1	40.05 21	71.47 228	42.427 84	43.26 157	48.069 32	21.72 37	30.643 46	81.77 82
	12	254	32	178	6	30	14	101
19.1	39.93	68.93	42.395	41.48	48.063	22.02	30.629	80.76
29.0	39.90 3	66.14 279	42.407 12	39.47 201	48.084 21	22.21 19	30.651 22	79.55 121
Aug. 8.0	39.96 6	63.20 294	42.466 59	37.29 218	48.134 50	22.30 9	30.708 57	78.20 135
18.0	40.12 16	60.16 304	42.574 108	34.96 233	48.210 76	22.27 3	30.797 89	76.67 153
28.0	40.36 24	57.09 307	42.727 153	32.57 239	48.314 104	22.07 20	30.921 124	75.04 163
	33	307	199	245	133	36	162	175
Sept. 6.9	40.69	54.02	42.926	30.12	48.447	21.71	31.083	73.29
16.9	41.11 42	51.05 297	43.173 247	27.68 244	48.611 164	21.16 55	31.279 196	71.47 182
26.9	41.61 50	48.22 283	43.465 292	25.26 242	48.803 192	20.41 75	31.512 233	69.60 187
Oct. 6.9	42.19 58	45.57 265	43.798 333	22.92 234	49.025 222	19.45 96	31.776 264	67.70 190
16.8	42.83 64	43.21 236	44.169 371	20.71 221	49.275 250	18.28 117	32.072 296	65.80 190
	70	204	410	199	274	134	328	185
26.8	43.53	41.17	44.579	18.72	49.549	16.94	32.400	63.95
Nov. 5.8	44.28 75	39.53 164	45.019 440	16.96 176	49.846 297	15.44 150	32.751 351	62.20 175
15.7	45.06 78	38.31 122	45.479 460	15.49 147	50.158 312	13.81 163	33.121 370	60.60 160
25.7	45.86 80	37.59 72	45.954 475	14.37 112	50.479 321	12.12 169	33.503 382	59.22 138
Dec. 5.7	46.65 79	37.37 22	46.422 468	13.64 73	50.801 322	10.43 169	33.886 383	58.08 114
	76	32	456	32	311	164	371	84
15.7	47.41	37.69	46.878	13.32	51.112	8.79	34.257	57.24
25.6	48.12 71	38.54 85	47.307 429	13.46 14	51.404 292	7.25 154	34.605 348	56.73 51
35.6	48.76 64	39.91 137	47.694 387	14.05 59	51.665 261	5.89 136	34.922 317	56.57 16
Mean Place	42.288	71.88	43.080	45.23	47.866	29.73	30.754	85.23
Sec δ, Tan δ	2.947	+2.772	1.625	+1.281	1.021	+0.206	1.248	+0.746
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.107	+0.146	+0.082	+0.067	+0.065	+0.011	+0.073	+0.039
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.31	+0.62	−0.31	+0.62	−0.31	+0.62	−0.32	+0.61

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o Leonis. Mag. 3.8		θ Antliæ. Mag. 5.0		ϵ Leonis. Mag. 3.1		υ Argus. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 9 37	° ′ +10 14	h m 9 40	° ′ −27 24	h m 9 41	° ′ +24 7	h m 9 45	° ′ −64 42
	s	″	s	″	s	″	s	″
Jan. 0.6	3.393	27.23	47.391	58.40	29.755	33.57	13.97	44.89
	244	137	242	291	267	69	37	340
10.6	3.637	25.86	47.633	61.31	30.022	32.88	14.34	48.29
	204	114	196	293	223	41	28	365
20.6	3.841	24.72	47.829	64.24	30.245	32.47	14.62	51.94
	156	91	145	288	173	7	19	378
30.5	3.997	23.81	47.974	67.12	30.418	32.40	14.81	55.72
	106	66	92	276	122	21	9	382
Feb. 9.5	4.103	23.15	48.066	69.88	30.540	32.61	14.90	59.54
	55	41	40	258	66	43	0	375
19.5	4.158	22.74	48.106	72.46	30.606	33.04	14.90	63.29
	7	17	12	233	13	67	10	360
Mar. 1.5	4.165	22.57	48.094	74.79	30.619	33.71	14.80	66.89
	38	3	55	204	32	82	18	337
11.4	4.127	22.60	48.039	76.83	30.587	34.53	14.62	70.26
	76	20	96	173	77	91	25	307
21.4	4.051	22.80	47.943	78.56	30.510	35.44	14.37	73.33
	105	34	127	140	111	95	32	271
31.4	3.946	23.14	47.816	79.96	30.399	36.39	14.05	76.04
	128	44	150	104	138	97	37	228
Apr. 10.4	3.818	23.58	47.666	81.00	30.261	37.36	13.68	78.32
	141	51	165	70	153	89	41	183
20.3	3.677	24.09	47.501	81.70	30.108	38.25	13.27	80.15
	147	56	173	33	157	82	43	132
30.3	3.530	24.65	47.328	82.03	29.951	39.07	12.84	81.47
	144	58	174	4	159	69	44	82
May 10.3	3.386	25.23	47.154	81.99	29.792	39.76	12.40	82.29
	137	60	168	39	149	59	45	28
20.2	3.249	25.83	46.986	81.60	29.643	40.35	11.95	82.57
	122	58	159	70	136	42	44	23
30.2	3.127	26.41	46.827	80.90	29.507	40.77	11.51	82.34
	106	56	142	103	118	26	42	76
June 9.2	3.021	26.97	46.685	79.87	29.389	41.03	11.09	81.58
	86	53	123	132	97	13	39	127
19.2	2.935	27.50	46.562	78.55	29.292	41.16	10.70	80.31
	62	49	102	154	71	5	34	173
29.1	2.873	27.99	46.460	77.01	29.221	41.11	10.36	78.58
	39	43	77	174	46	19	30	214
July 9.1	2.834	28.42	46.383	75.27	29.175	40.92	10.06	76.44
	13	36	51	194	20	34	25	251
19.1	2.821	28.78	46.332	73.33	29.155	40.58	9.81	73.93
	13	27	21	204	10	52	17	279
29.1	2.834	29.05	46.311	71.29	29.165	40.06	9.64	71.14
	38	16	9	208	40	65	11	299
Aug. 8.0	2.872	29.21	46.320	69.21	29.205	39.41	9.53	68.15
	67	2	42	204	69	81	2	309
18.0	2.939	29.23	46.362	67.17	29.274	38.60	9.51	65.06
	94	12	76	193	100	96	5	309
28.0	3.033	29.11	46.438	65.24	29.374	37.64	9.56	61.97
	121	31	113	173	128	112	14	298
Sept. 6.9	3.157	28.80	46.551	63.51	29.502	36.52	9.70	58.99
	154	49	148	148	163	126	23	277
16.9	3.311	28.31	46.699	62.03	29.665	35.26	9.93	56.22
	181	70	185	113	194	139	31	242
26.9	3.492	27.61	46.884	60.90	29.859	33.87	10.24	53.80
	214	92	221	73	226	152	39	201
Oct. 6.9	3.706	26.69	47.105	60.17	30.085	32.35	10.63	51.79
	242	115	254	28	258	163	46	148
16.8	3.948	25.54	47.359	59.89	30.343	30.72	11.09	50.31
	269	134	285	21	286	169	51	90
26.8	4.217	24.20	47.644	60.10	30.629	29.03	11.60	49.41
	292	151	308	70	307	172	56	27
Nov. 5.8	4.509	22.69	47.952	60.80	30.936	27.31	12.16	49.14
	310	165	326	118	331	173	58	39
15.8	4.819	21.04	48.278	61.98	31.267	25.58	12.74	49.53
	319	173	335	166	341	165	58	106
25.7	5.138	19.31	48.613	63.64	31.608	23.93	13.32	50.59
	322	175	323	205	344	154	58	168
Dec. 5.7	5.460	17.56	48.946	65.69	31.952	22.39	13.90	52.27
	313	172	323	241	337	133	54	227
15.7	5.773	15.84	49.269	68.10	32.289	21.06	14.44	54.54
	295	162	298	265	320	112	49	276
25.6	6.068	14.22	49.567	70.75	32.609	19.94	14.93	57.30
	267	147	267	283	290	84	41	317
35.6	6.335	12.75	49.834	73.58	32.899	19.10	15.34	60.47
Mean Place	2.597	36.48	46.120	58.79	29.053	45.98	10.693	52.85
Sec δ, Tan δ	1.016	+0.181	1.127	−0.519	1.096	+0.448	2.342	−2.117
$D_{\psi a}$, $D_{\omega a}$	+0.064	+0.010	+0.053	−0.028	+0.068	+0.025	+0.030	−0.117
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.32	+0.58	−0.33	+0.57	−0.33	+0.57	−0.33	+0.55

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Ursæ Majoris. Mag. 3.9		6 Sextantis. Mag. 6.0		μ Leonis. Mag. 4.1		Groombridge 1586. Mag. 6.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 9 45	° ′ +59 23	h m 9 47	° ′ − 3 52	h m 9 48	° ′ +26 21	h m 9 51	° ′ +73 14
	s	″	s	″	s	″	s	″
Jan. 0.6	32.545	47.87	22.158	59.68	23.907	60.38	33.25	27.73
10.6	32.978 433	48.88 101	22.401 243	61.73 205	24.183 276	59.77 61	33.96 71	29.24 151
20.6	33.339 361	50.33 145	22.604 203	63.67 194	24.418 235	59.48 29	34.55 59	31.21 197
30.6	33.618 279	52.17 184	22.763 159	65.40 173	24.602 184	59.50 2	35.01 46	33.59 238
Feb. 9.5	33.808 190	54.30 213	22.871 108	66.94 154	24.732 130	59.82 32	35.32 31	36.25 266
	99	236	59	128	75	57	15	286
19.5	33.907	56.66	22.930	68.22	24.807	60.39	35.47	39.11
Mar. 1.5	33.913 − 6	59.11 245	22.942 − 12	69.26 104	24.828 − 21	61.18 79	35.47 0	42.04 293
11.4	33.832 81	61.57 246	22.911 31	70.07 81	24.799 29	62.13 95	35.32 15	44.93 289
21.4	33.675 157	63.92 235	22.845 66	70.62 55	24.725 74	63.17 104	35.02 30	47.66 273
31.4	33.451 224	66.08 216	22.747 98	70.96 34	24.617 108	64.24 107	34.61 41	50.09 243
	272	188	121	12 −	134	106	50	209
Apr. 10.4	33.179	67.96	22.626	71.08	24.483	65.30	34.11	52.18
20.3	32.869 310	69.49 153	22.491 135	71.01 7	24.330 153	66.29 99	33.53 58	53.84 166
30.3	32.541 328	70.64 115	22.351 140	70.75 26	24.170 160	67.18 89	32.91 62	55.02 118
May 10.3	32.207 334	71.33 69	22.209 142	70.34 41	24.008 162	67.93 75	32.27 64	55.65 63
20.2	31.884 323	71.59 − 26	22.074 135	69.78 56	23.853 155	68.53 60	31.64 63	55.78 − 13
	304	18	125	68	141	42	60	41
30.2	31.580	71.41	21.949	69.10	23.712	68.95	31.04	55.37
June 9.2	31.307 273	70.79 62	21.840 109	68.30 80	23.588 124	69.19 24	30.48 56	54.46 91
19.2	31.073 234	69.75 104	21.746 94	67.42 88	23.485 103	69.26 − 7	29.99 49	53.07 139
29.1	30.883 190	68.35 140	21.675 71	66.48 94	23.408 77	69.15 11	29.58 41	51.24 183
July 9.1	30.745 138	66.59 176	21.623 52	65.48 100	23.355 53	68.86 29	29.25 33	49.01 223
	85	204	28	101	25 −	45	23	253
19.1	30.660	64.55	21.595	64.47	23.330	68.41	29.02	46.48
29.1	30.631 − 29	62.26 229	21.594 − 1	63.48 99	23.332 2	67.79 62	28.90 12	43.66 282
Aug. 8.0	30.657 26	59.75 251	21.616 22	62.54 94	23.365 33	67.00 79	28.88 − 2	40.63 303
18.0	30.743 86	57.10 265	21.666 50	61.72 82	23.427 62	66.06 94	28.97 9	37.47 316
28.0	30.886 143	54.33 277	21.745 79	61.03 69	23.519 92	64.95 111	29.16 19	34.21 326
	200	281	108	49	125	125	30	327
Sept. 6.9	31.086	51.52	21.853	60.54	23.644	63.70	29.46	30.94
16.9	31.344 258	48.71 281	21.991 138	60.27 − 27	23.801 157	62.31 139	29.86 40	27.72 322
26.9	31.658 314	45.94 277	22.161 170	60.29 2	23.990 189	60.78 153	30.37 51	24.62 310
Oct. 6.9	32.025 367	43.29 265	22.363 202	60.59 30	24.213 223	59.13 165	30.97 60	21.71 291
16.8	32.442 417	40.80 249	22.594 231	61.22 63	24.468 255	57.40 173	31.66 69	19.02 269
	466	224	259	94	284	179	76	233
26.8	32.908	38.56	22.853	62.16	24.752	55.61	32.42	16.69
Nov. 5.8	33.412 504	36.60 196	23.137 284	63.41 125	25.064 312	53.81 180	33.25 83	14.72 197
15.8	33.947 535	34.98 162	23.440 303	64.93 152	25.396 332	52.04 177	34.13 88	13.20 152
25.7	34.498 551	33.79 119	23.752 312	66.70 177	25.741 345	50.36 168	35.04 91	12.17 103
Dec. 5.7	35.056 558	33.03 76	24.069 317	68.64 194	26.092 351	48.82 154	35.96 92	11.68 − 49
	545	28 −	307	207	345	133	89	6
15.7	35.601	32.75	24.376	70.71	26.437	47.49	36.85	11.74
25.6	36.118 517	32.97 22	24.668 292	72.82 211	26.765 328	46.41 108	37.70 85	12.39 65
35.6	36.590 472	33.69 72	24.933 265	74.91 209	27.066 301	45.62 79	38.48 78	13.57 118
Mean Place	31.763	66.48	21.283	54.40	23.252	73.26	32.113	47.60
Sec δ, Tan δ	1.964	+1.691	1.002	−0.068	1.116	+0.496	3.469	+3.321
$D_{\psi a}$, $D_{\omega a}$	+0.086	+0.094	+0.060	−0.004	+0.068	+0.028	+0.108	+0.188
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.33	+0.55	−0.33	+0.55	−0.33	+0.54	−0.34	+0.53

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	19 Leonis Minoris. Mag. 5.2		ϕ Argus. Mag. 3.7		π Leonis. Mag. 4.9		η Leonis. Mag. 3.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 9 52 s	° ′ +41 24 ″	h m 9 54 s	° ′ −54 11 ″	h m 9 56 s	° ′ + 8 24 ″	h m 10 3 s	° ′ +17 7 ″
Jan. 0.6	59.100	67.33	11.602	56.73	9.468	43.20	8.751	69.21
	323	11	316	331	259	154	273	113
10.6	59.423	67.44	11.918	60.04	9.727	41.66	9.024	68.08
	276	49	252	354	217	130	232	88
20.6	59.699	67.93	12.170	63.58	9.944	40.36	9.256	67.20
	218	88	181	364	172	105	186	57
30.6	59.917	68.81	12.351	67.22	10.116	39.31	9.442	66.63
	155	119	108	366	124	82	139	31
Feb. 9.5	60.072	70.00	12.459	70.88	10.240	38.49	9.581	66.32
	91	144	34	356	75	55	85	1
19.5	60.163	71.44	12.493	74.44	10.315	37.94	9.666	66.31
	26	164	35	340	25	34	36	23
Mar. 1.5	60.189	73.08	12.458	77.84	10.340	37.60	9.702	66.54
	33	173	101	316	19	8	12	42
11.4	60.156	74.81	12.357	81.00	10.321	37.52	9.690	66.96
	87	175	156	286	57	12	54	59
21.4	60.069	76.56	12.201	83.86	10.264	37.64	9.636	67.55
	131	168	203	250	88	28	86	70
31.4	59.938	78.24	11.998	86.36	10.176	37.92	9.550	68.25
	165	156	242	210	115	38	113	76
Apr. 10.4	59.773	79.80	11.756	88.46	10.061	38.30	9.437	69.01
	188	136	271	165	131	49	132	80
20.3	59.585	81.16	11.485	90.11	9.930	38.79	9.305	69.81
	200	112	288	118	137	56	141	77
30.3	59.385	82.28	11.197	91.29	9.793	39.35	9.164	70.58
	203	83	298	70	138	59	141	74
May 10.3	59.182	83.11	10.899	91.99	9.655	39.94	9.020	71.32
	197	55	300	20	135	61	140	67
20.3	58.985	83.66	10.599	92.19	9.520	40.55	8.880	71.99
	183	22	293	30	125	64	129	58
30.2	58.802	83.88	10.306	91.89	9.395	41.19	8.751	72.57
	163	7	278	77	109	62	117	49
June 9.2	58.639	83.81	10.028	91.12	9.286	41.81	8.634	73.06
	138	39	257	125	93	58	100	39
19.2	58.501	83.42	9.771	89.87	9.193	42.39	8.534	73.45
	108	68	231	167	75	56	79	27
29.1	58.393	82.74	9.540	88.20	9.118	42.95	8.455	73.72
	78	94	196	206	52	49	58	14
July 9.1	58.315	81.80	9.344	86.14	9.066	43.44	8.397	73.86
	45	119	158	238	29	43	35	2
19.1	58.270	80.61	9.186	83.76	9.037	43.87	8.362	73.88
	9	142	113	264	7	39	10	12
29.1	58.261	79.19	9.073	81.12	9.030	44.26	8.352	73.76
	27	162	63	281	22	23	16	27
Aug. 8.0	58.288	77.57	9.010	78.31	9.052	44.49	8.368	73.49
	62	179	10	290	46	9	44	42
18.0	58.350	75.78	9.000	75.41	9.098	44.58	8.412	73.07
	100	194	48	289	77	7	72	59
28.0	58.450	73.84	9.048	72.52	9.175	44.51	8.484	72.48
	137	205	107	277	103	21	101	75
Sept. 7.0	58.587	71.79	9.155	69.75	9.278	44.30	8.585	71.73
	178	216	169	254	134	44	134	95
16.9	58.765	69.63	9.324	67.21	9.412	43.86	8.719	70.78
	216	220	228	221	167	66	166	114
26.9	58.981	67.43	9.552	65.00	9.579	43.20	8.885	69.64
	255	223	288	179	197	89	198	131
Oct. 6.9	59.236	65.20	9.840	63.21	9.776	42.31	9.083	68.33
	292	220	340	130	230	113	231	148
16.8	59.528	63.00	10.180	61.91	10.006	41.18	9.314	66.85
	327	212	386	71	260	133	261	162
26.8	59.855	60.88	10.566	61.20	10.266	39.85	9.575	65.23
	358	200	421	11	282	154	289	174
Nov. 5.8	60.213	58.88	10.987	61.09	10.548	38.31	9.864	63.49
	383	181	447	52	304	168	311	180
15.8	60.596	57.07	11.434	61.61	10.852	36.63	10.175	61.69
	399	156	456	115	315	180	327	181
25.7	60.995	55.51	11.890	62.76	11.167	34.83	10.502	59.88
	406	127	451	174	322	185	333	177
Dec. 5.7	61.401	54.24	12.341	64.50	11.489	32.98	10.835	58.11
	399	93	433	228	318	183	331	166
15.7	61.800	53.31	12.774	66.78	11.807	31.15	11.166	56.45
	382	54	397	275	302	175	317	152
25.7	62.182	52.77	13.171	69.53	12.109	29.40	11.483	54.93
	352	15	351	313	279	163	292	128
35.6	62.534	52.62	13.522	72.66	12.388	27.77	11.775	53.65
Mean Place	58.498	83.30	9.372	63.80	8.750	51.45	8.129	79.59
Sec δ, Tan δ	1.334	+0.882	1.710	−1.387	1.011	+0.148	1.046	+0.308
$D_{\psi a}$, $D_{\omega a}$	+0.073	+0.050	+0.042	−0.079	+0.068	+0.008	+0.065	+0.018
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.34	+0.53	−0.34	+0.52	−0.34	+0.51	−0.35	+0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. (*Regulus*.) Mag. 1.3		λ Hydræ. Mag. 3.8		q Velorum. Mag. 4.1		ζ Leonis. Mag. 3.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	10 4	+12 20	10 6	−11 58	10 11	−41 44	10 12	+23 47
	s	″	s	″	s	″	s	″
Jan. 0.6	17.058	29.69	50.943	24.47	31.498	18.19	25.217	53.94
10.6	17.324 266	28.29 140	51.199 256	26.84 237	31.790 292	21.29 310	25.506 289	53.06 88
20.6	17.549 225	27.18 111	51.417 218	29.15 231	32.034 244	24.55 326	25.756 250	52.51 55
30.6	17.732 183	26.31 87	51.590 173	31.34 219	32.224 190	27.88 333	25.960 204	52.29 — 22
Feb. 9.5	17.867 135	25.73 58	51.714 124	33.37 203	32.353 129	31.19 331	26.113 153	52.37 8
	84	32	76	179	70	323	100	38
19.5	17.951	25.41	51.790	35.16	32.423	34.42	26.213	52.75
Mar. 1.5	17.986 — 35	25.32 — 9	51.818 — 28	36.72 156	32.437 — 14	37.45 303	26.260 — 47	53.37 62
11.5	17.975 11	25.47 15	51.801 17	38.02 130	32.397 40	40.24 279	26.256 4	54.19 82
21.4	17.923 52	25.80 33	51.748 53	39.05 103	32.311 86	42.75 251	26.210 46	55.15 96
31.4	17.842 81	26.28 48	51.662 86	39.82 77	32.183 128	44.93 218	26.126 84	56.19 104
	111	54	110	51	159	180	112	106
Apr. 10.4	17.731	26.82	51.552	40.33	32.024	46.73	26.014	57.25
20.3	17.602 129	27.45 63	51.424 128	40.60 27	31.841 183	48.15 142	25.880 134	58.29 104
30.3	17.465 137	28.13 68	51.287 137	40.61 — 1	31.642 199	49.14 99	25.735 145	59.26 97
May 10.3	17.327 138	28.80 67	51.146 141	40.41 20	31.434 208	49.70 56	25.585 150	60.12 86
20.3	17.191 136	29.47 67	51.008 138	39.98 43	31.224 210	49.83 — 13	25.437 148	60.83 71
	127	61	132	62	206	29	138	58
30.2	17.064	30.08	50.876	39.36	31.018	49.54	25.299	61.41
June 9.2	16.950 114	30.66 58	50.756 120	38.55 81	30.822 196	48.82 72	25.173 126	61.82 41
19.2	16.850 100	31.15 49	50.649 107	37.60 95	30.640 182	47.72 110	25.064 109	62.05 23
29.2	16.772 78	31.57 42	50.561 88	36.49 111	30.476 164	46.24 148	24.973 91	62.12 — 7
July 9.1	16.716 56	31.93 36	50.490 71	35.29 120	30.337 139	44.43 181	24.906 67	61.99 13
	36	26	49	129	114	208	47	28
19.1	16.680	32.19	50.441	34.00	30.223	42.35	24.859	61.71
29.1	16.666 — 11	32.32 — 13	50.416 — 25	32.68 132	30.142 81	40.04 231	24.842 — 17	61.25 46
Aug. 8.0	16.681 15	32.33 — 1	50.417 1	31.38 130	30.095 47	37.60 244	24.849 7	60.60 65
18.0	16.721 40	32.18 15	50.442 25	30.16 122	30.086 — 9	35.09 251	24.885 36	59.79 81
28.0	16.790 69	31.89 29	50.499 57	29.05 111	30.120 34	32.61 248	24.950 65	58.79 100
	98	49	86	94	79	237	96	118
Sept. 7.0	16.888	31.40	50.585	28.11	30.199	30.24	25.046	57.61
16.9	17.015 127	30.72 68	50.705 120	27.42 69	30.323 124	28.08 216	25.176 130	56.29 132
26.9	17.177 162	29.84 88	50.857 152	26.98 44	30.496 173	26.24 184	25.339 163	54.78 151
Oct. 6.9	17.369 192	28.74 110	51.043 186	26.91 — 7	30.716 220	24.78 146	25.536 197	53.14 164
16.9	17.595 226	27.44 130	51.264 221	27.17 26	30.980 264	23.78 100	25.768 232	51.36 178
	255	147	252	63	305	49	264	186
26.8	17.850	25.97	51.516	27.80	31.285	23.29 —	26.032	49.50
Nov. 5.8	18.134 284	24.34 163	51.795 279	28.82 102	31.625 340	23.35 6	26.327 295	47.59 191
15.8	18.439 305	22.58 176	52.096 301	30.18 136	31.989 364	24.00 65	26.646 319	45.68 191
25.7	18.757 318	20.76 182	52.411 315	31.89 171	32.367 378	25.21 121	26.984 338	43.83 185
Dec. 5.7	19.084 327	18.93 183	52.731 320	33.84 195	32.751 384	26.95 174	27.329 345	42.09 174
	323	178	316	218	375	222	345	159
15.7	19.407	17.15	53.047	36.02	33.126	29.17	27.674	40.50
25.7	19.717 310	15.50 165	53.348 301	38.32 230	33.478 352	31.79 262	28.006 332	39.16 134
35.6	20.002 285	13.98 152	53.624 276	40.66 234	33.796 318	34.73 294	28.316 310	38.11 105
Mean Place	16.407	38.76	50.052	22.28	29.967	24.10	24.686	65.86
Sec δ, Tan δ	1.024	+0.219	1.022	−0.212	1.340	−0.892	1.093	+0.441
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.064	+0.013	+0.058	−0.012	+0.050	−0.053	+0.066	+0.026
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.35	+0.48	−0.35	+0.47	−0.35	+0.46	−0.35	+0.45

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Ursæ Majoris. Mag. 3.5		32 Ursæ Majoris. Mag. 5.7		γ Leonis *pr.* Mag. 2.6		μ Ursæ Majoris. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 10 12 s	° ′ +43 17 ″	h m 10 12 s	° ′ +65 29 ″	h m 10 15 s	° ′ +20 13 ″	h m 10 17 s	° ′ +41 52 ″
Jan. 0.7	28.130	42.20	28.31	15.98	44.337	42.87	45.370	58.44
	346	2	55	97	286	106	345	9
10.6	28.476	42.22	28.86	16.95	44.623	41.81	45.715	58.35
	302	45	46	148	248	76	302	35
20.6	28.778	42.67	29.32	18.43	44.871	41.05	46.017	58.70
	243	88	39	192	203	46	247	76
30.6	29.021	43.55	29.71	20.35	45.074	40.59	46.264	59.46
	183	121	28	228	153	15	186	111
Feb. 9.5	29.204	44.76	29.99	22.63	45.227	40.44	46.450	60.57
	118	151	17	255	101	15	122	143
19.5	29.322	46.27	30.16	25.18	45.328	40.59	46.572	62.00
	51	170	5	269	50	40	58	166
Mar. 1.5	29.373	47.97	30.21	27.87	45.378	40.99	46.630	63.66
	9	186	4	275	2	61	1	179
11.5	29.364	49.83	30.17	30.62	45.380	41.60	46.629	65.45
	68	190	15	267	42	77	58	186
21.4	29.296	51.73	30.02	33.29	45.338	42.37	46.571	67.31
	114	185	23	248	78	87	105	183
31.4	29.182	53.58	29.79	35.77	45.260	43.24	46.466	69.14
	151	174	30	221	105	93	144	173
Apr. 10.4	29.031	55.32	29.49	37.98	45.155	44.17	46.322	70.87
	182	154	36	186	127	93	171	156
20.4	28.849	56.86	29.13	39.84	45.028	45.10	46.151	72.43
	198	129	41	144	138	89	190	133
30.3	28.651	58.15	28.72	41.28	44.890	45.99	45.961	73.76
	207	103	41	98	143	83	198	106
May 10.3	28.444	59.18	28.31	42.26	44.747	46.82	45.763	74.82
	205	71	41	50	141	71	198	75
20.3	28.239	59.89	27.90	42.76	44.606	47.53	45.565	75.57
	194	37	39	1	134	61	188	43
30.2	28.045	60.26	27.51	42.77	44.472	48.14	45.377	76.00
	176	3	38	50	120	48	174	11
June 9.2	27.869	60.29	27.13	42.27	44.352	48.62	45.203	76.11
	159	31	34	95	106	34	154	22
19.2	27.710	59.98	26.79	41.32	44.246	48.96	45.049	75.89
	131	61	29	138	89	18	129	54
29.2	27.579	59.37	26.50	39.94	44.157	49.14	44.920	75.35
	101	93	21	179	67	4	102	84
July 9.1	27.478	58.44	26.26	38.15	44.090	49.18	44.818	74.51
	70	121	18	214	45	12	71	112
19.1	27.408	57.23	26.08	36.01	44.045	49.06	44.747	73.39
	38	147	11	244	20	29	41	137
29.1	27.370	55.76	25.97	33.57	44.025	48.77	44.706	72.02
	2	168	4	270	4	44	5	161
Aug. 8.0	27.372	54.08	25.93	30.87	44.029	48.33	44.701	70.41
	36	190	3	290	33	62	29	183
18.0	27.408	52.18	25.96	27.97	44.062	47.71	44.730	68.58
	77	207	10	305	61	79	68	200
28.0	27.485	50.11	26.06	24.92	44.123	46.92	44.798	66.58
	114	223	17	312	90	96	104	216
Sept. 7.0	27.599	47.88	26.23	21.80	44.213	45.96	44.902	64.42
	156	233	24	314	123	116	116	228
16.9	27.755	45.55	26.47	18.66	44.336	44.80	45.048	62.14
	196	239	31	311	157	133	186	235
26.9	27.951	43.16	26.78	15.55	44.493	43.47	45.234	59.79
	239	243	38	300	190	149	227	241
Oct. 6.9	28.190	40.73	27.16	12.55	44.683	41.98	45.461	57.38
	278	242	45	283	225	166	269	240
16.9	28.468	38.31	27.61	9.72	44.908	40.32	45.730	54.98
	320	232	53	258	258	177	307	235
26.8	28.788	35.99	28.14	7.14	45.166	38.55	46.037	52.63
	355	219	58	228	286	186	344	222
Nov. 5.8	29.143	33.80	28.72	4.86	45.452	36.69	46.381	50.41
	383	200	61	191	312	191	372	206
15.8	29.526	31.80	29.33	2.95	45.764	34.78	46.753	48.35
	404	175	65	147	330	188	396	182
25.7	29.930	30.05	29.98	1.48	46.094	32.90	47.149	46.53
	412	146	66	98	339	182	406	153
Dec. 5.7	30.342	28.59	30.64	0.50	46.433	31.08	47.555	45.00
	412	107	66	44	339	167	407	116
15.7	30.754	27.52	31.30	0.06	46.772	29.41	47.962	43.84
	400	68	64	9	328	148	394	77
25.7	31.154	26.84	31.94	0.15	47.100	27.93	48.356	43.07
	373	20	58	67	303	122	371	35
35.6	31.527	26.64	32.52	0.82	47.403	26.71	48.727	42.72
Mean Place	27.672	58.50	27.764	35.55	43.803	53.80	44.951	74.45
Sec δ, Tan δ	1.374	+0.942	2.410	+2.193	1.066	+0.368	1.343	+0.897
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.072	+0.056	+0.087	+0.130	+0.065	+0.022	+0.071	+0.054
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.35	+0.45	−0.35	+0.45	−0.36	+0.44	−0.36	+0.43

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 H. Ursæ Majoris. Mag. 4.9		μ Hydræ. Mag. 4.1		31 Leonis Minoris. Mag. 4.4		α Antliæ. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	10 18	+65 56	10 22	−16 26	10 23	+37 5	10 23	−30 40
Jan. 0.7	36.76	63.81	22.825	33.73	26.640	53.07	38.721	28.45
10.6	37.32 56	64.73 92	23.092 267	36.23 250	26.970 330	52.73 — 34	39.003 282	31.31 286
20.6	37.82 50	66.18 145	23.320 228	38.70 247	27.258 288	52.79 6	39.245 242	34:26 295
30.6	38.21 39	68.07 189	23.511 191	41.11 241	27.498 240	53.24 45	39.437 192	37.23 297
Feb. 9.5	38.51 30	70.34 227	23.652 141	43.36 225	27.681 183	54.07 83	39.579 142	40.14 291
	19	254	89	209	124	115	90	277
19.5	38.70 7	72.88	23.741 44	45.45	27.805 65	55.22	39.669	42.91
Mar. 1.5	38.77 — 3	75.59 271	23.785 — 3	47.28 183	27.870 6	56.59 137	39.708 — 9	45.49 258
11.5	38.74 14	78.36 277	23.782 38	48.87 159	27.876 — 46	58.14 155	39.699 54	47.85 236
21.4	38.60 23	81.07 271	23.744 76	50.18 131	27.830 88	59.79 165	39.645 89	49.91 206
31.4	38.37 30	83.60 253	23.668 101	51.20 102	27.742 125	61.46 167	39.556 117	51.64 173
		228		79		160		144
Apr. 10.4	38.07	85.88	23.567	51.99	27.617	63.06	39.439	53.08
20.4	37.72 35	87.79 191	23.448 119	52.46 47	27.464 153	64.52 146	39.298 141	54.14 106
30.3	37.32 40	89.31 152	23.314 134	52.67 — 21	27.295 169	65.82 130	39.143 155	54.87 73
May 10.3	36.90 42	90.36 105	23.176 138	52.65 2	27.116 179	66.88 106	38.982 161	55.23 36
20.3	36.48 42	90.93 57	23.035 141	52.35 30	26.938 178	67.70 82	38.815 167	55.24 — 1
	12	6	135	53	171	51	162	36
30.2	36.06	90.99	22.900	51.82	26.767	68.21	38.653	54.88
June 9.2	35.68 38	90.57 42	22.774 126	51.06 76	26.607 160	68.45 — 24	38.496 157	54.17 71
19.2	35.32 36	89.67 90	22.658 116	50.13 93	26.465 142	68.40 5	38.349 147	53.19 98
29.2	35.03 29	88.33 134	22.557 101	49.01 112	26.346 119	68.09 31	38.221 128	51.87 132
July 9.1	34.77 26	86.57 176	22.471 86	47.72 129	26.248 98	67.44 65	38.110 111	50.31 156
	20	211	63	137	68	86	92	176
19.1	34.57 13	84.46	22.408 44	46.35	26.180 41	66.58	38.018 62	48.55
29.1	34.44 5	82.02 244	22.364 17	44.90 145	26.139 7	65.44 114	37.956 40	46.61 194
Aug. 8.1	34.39 — 1	79.33 269	22.347 7	43.44 146	26.132 — 21	64.09 135	37.916 3	44.56 205
18.0	34.40 8	76.40 293	22.354 41	42.03 141	26.153 59	62.53 156	37.913 — 26	42.51 205
28.0	34.48 16	73.34 306	22.395 71	40.71 132	26.212 92	60.76 177	37.939 67	40.49 202
		315		117		193		189
Sept. 7.0	34.64	70.19	22.466	39.54	26.304	58.83	38.006	38.60
16.9	34.87 23	67.01 318	22.570 104	38.60 94	26.436 132	56.76 207	38.112 106	36.92 168
26.9	35.17 30	63.85 316	22.709 139	37.94 66	26.607 171	54.59 217	38.259 147	35.53 139
Oct. 6.9	35.55 38	60.78 307	22.885 176	37.59 — 35	26.815 208	52.31 228	38.444 185	34.49 104
16.9	36.00 45	57.90 288	23.097 212	37.62 3	27.063 248	50.02 229	38.673 229	33.88 61
	51	266	246	43	288	231	266	17
26.8	36.51	55.24	23.343	38.05	27.351	47.71	38.939	33.71 —
Nov. 5.8	37.08 57	52.88 236	23.618 275	38.87 82	27.671 320	45.50 221	39.239 300	34.05 34
15.8	37.70 62	50.90 198	23.919 301	40.09 122	28.023 352	43.42 208	39.562 323	34.88 83
25.8	38.36 66	49.35 155	24.236 317	41.70 161	28.392 369	41.51 191	39.904 342	36.23 135
Dec. 5.7	39.02 66	48.29 106	24.562 326	43.60 190	28.776 384	39.86 165	40.252 348	38.02 179
	67	51	326	217	386	136	345	215
15.7	39.69	47.78 — 2	24.888	45.77	29.162	38.50	40.597	40.17
25.7	40.34 65	47.80 59	25.198 310	48.13 236	29.538 376	37.50 100	40.926 329	42.66 249
35.6	40.95 61	48.39	25.484 286	50.57 244	29.888 350	36.93 57	41.231 305	45.40 274
Mean Place	36.299	83.48	21.941	33.63	26.244	68.02	37.572	32.45
Sec δ, Tan δ	2.454	+2.241	1.043	−0.295	1.254	+0.756	1.163	−0.593
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.087	+0.135	+0.058	−0.018	+0.069	+0.046	+0.055	−0.036
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.36	+0.43	−0.36	+0.41	−0.36	+0.41	−0.36	+0.41

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	36 Ursæ Majoris. Mag. 4.8		9 H. Draconis. Mag. 5.0		ρ Leonis. Mag. 3.8		33 Sextantis. Mag. 6.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 10 25	° ′ +56 21	h m 10 28	° ′ +76 6	h m 10 28	° ′ + 9 41	h m 10 37	° ′ − 1 20
	s	″	s	″	s	″	s	″
Jan. 0.7	43.047	74.79	36.22	16.75	46.072	64.45	29.759	13.93
	444	46	91	115	279	157	276	203
10.6	43.491	75.25	37.13	17.90	46.351	62.88	30.035	15.96
	390	97	80	171	245	135	244	187
20.6	43.881	76.22	37.93	19.61	46.596	61.53	30.279	17.83
	321	142	66	218	203	108	204	169
30.6	44.202	77.64	38.59	21.79	46.799	60.45	30.483	19.52
	245	182	49	257	156	81	159	147
Feb. 9.6	44.447	79.46	39.08	24.36	46.955	59.64	30.642	20.99
	162	211	32	284	108	53	110	122
19.5	44.609	81.57	39.40	27.20	47.063	59.11	30.752	22.21
	79	233	13	301	59	26	65	96
Mar. 1.5	44.688	83.90	39.53	30.21	47.122	58.85	30.817	23.17
	— 2	216	— 5	304	13	3	19	71
11.5	44.686	86.36	39.48	33.25	47.135	58.82	30.836	23.88
	80	244	23	294	— 27	— 19	— 20	46
21.4	44.606	88.80	39.25	36.19	47.108	59.01	30.816	24.34
	144	235	38	277	62	36	52	26
31.4	44.462	91.15	38.87	38.96	47.046	59.37	30.764	24.60
	199	216	51	242	89	49	82	1
Apr. 10.4	44.263	93.31	38.36	41.38	46.957	59.86	30.682	24.64
	242	190	62	206	110	58	102	11
20.4	44.021	95.21	37.74	43.44	46.847	60.44	30.580	24.50
	269	155	70	160	124	65	115	28
30.3	43.752	96.76	37.04	45.04	46.723	61.09	30.465	24.22
	287	117	75	111	128	68	124	42
May 10.3	43.465	97.93	36.29	46.15	46.595	61.77	30.341	23.80
	291	73	77	55	130	69	125	52
20.3	43.174	98.66	35.52	46.70	46.465	62.46	30.216	23.28
	282	32	77	2	125	67	122	63
30.3	42.892	98.98	34.75	46.72	46.340	63.13	30.094	22.65
	267	11	73	54	115	63	116	70
June 9.2	42.625	98.87	34.02	46.18	46.225	63.76	29.978	21.95
	240	57	68	107	104	60	107	74
19.2	42.385	98.30	33.34	45.11	46.121	64.36	29.871	21.21
	211	97	61	153	89	53	94	79
29.2	42.174	97.33	32.73	43.58	46.032	64.89	29.777	20.42
	173	135	52	200	70	45	78	80
July 9.1	42.001	95.98	32.21	41.58	45.962	65.34	29.699	19.62
	132	170	42	239	53	37	61	80
19.1	41.869	94.28	31.79	39.19	45.909	65.71	29.638	18.82
	87	201	31	274	31	26	42	77
29.1	41.782	92.27	31.48	36.45	45.878	65.97	29.596	18.05
	42	229	18	302	9	13	21	68
Aug. 8.1	41.740	89.98	31.30	33.43	45.869	66.10	29.575	17.37
	— 10	252	— 7	322	— 16	0	— 5	60
18.0	41.750	87.46	31.23	30.21	45.885	66.10	29.580	16.77
	59	270	6	335	42	18	31	46
28.0	41.809	84.76	31.29	26.86	45.927	65.92	29.611	16.31
	113	283	19	319	73	36	59	29
Sept. 7.0	41.922	81.93	31.48	23.37	46.000	65.56	29.670	16.02
	169	291	32	347	103	56	91	7
17.0	42.091	79.02	31.80	19.90	46.103	65.00	29.761	15.95
	222	293	44	343	135	79	124	16
26.9	42.313	76.09	32.24	16.47	46.238	64.21	29.885	16.11
	278	291	57	325	171	101	160	45
Oct. 6.9	42.591	73.18	32.81	13.22	46.409	63.20	30.045	16.56
	332	281	69	309	201	125	194	74
16.9	42.923	70.37	33.50	10.13	46.613	61.95	30.239	17.30
	382	266	80	278	237	144	230	102
26.8	43.305	67.71	34.30	7.35	46.850	60.51	30.469	18.32
	430	242	89	243	269	165	260	130
Nov. 5.8	43.735	65.29	35.19	4.92	47.119	58.86	30.729	19.62
	469	213	98	200	294	179	287	158
15.8	44.204	63.16	36.17	2.92	47.413	57.07	31.016	21.20
	497	178	103	155	314	189	307	179
25.8	44.701	61.38	37.20	1.37	47.727	55.18	31.323	22.99
	515	135	106	96	325	194	319	194
Dec. 5.7	45.216	60.03	38.26	0.41	48.052	53.24	31.642	24.93
	518	88	108	37	326	192	320	207
15.7	45.734	59.15	39.34	0.04	48.378	51.32	31.962	27.00
	505	37	104	19	316	184	314	209
25.7	46.239	58.78	40.38	0.23	48.694	49.48	32.276	29.09
	473	14	98	83	298	168	294	206
35.7	46.712	58.92	41.36	1.06	48.992	47.80	32.570	31.15
Mean Place	42.717	93.32	35.776	37.21	45.526	72.08	29.148	9.99
Sec δ, Tan δ	1.806	+1.504	4.166	+4.043	1.014	+0.171	1.000	−0.023
$D_{\psi a}$, $D_{\omega a}$	+0.077	+0.092	+0.103	+0.249	+0.063	+0.011	+0.061	−0.001
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.36	+0.40	−0.37	+0.39	−0.37	+0.39	−0.37	+0.35

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Leonis Minoris. Mag. 5.0				θ Argus. Mag. 3.0				42 Leonis Minoris. Mag. 5.4				η Argus. Var. 1.6–6.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m s 10 39		° ′ ″ +23 35		h m s 10 40		° ′ ″ −63 59		h m s 10 41		° ′ ″ +31 4		h m s 10 42		° ′ ″ −59 16	
Jan. 0.7	14.348		19.81		15.00		16.33		35.568		64.58		6.416		34.08	
10.6	14.652	304	18.76	105	15.47	47	19.30	297	35.893	325	63.82	76	6.833	417	37.05	297
20.6	14.922	270	18.05	71	15.86	39	22.61	331	36.179	286	63.46	36	7.189	356	40.33	328
30.6	15.150	228	17.69	36	16.17	31	26.17	356	36.423	244	63.48	2	7.474	285	43.88	355
Feb. 9.6	15.329	179	17.65	4	16.39	22	29.89	372	36.614	191	63.88	40	7.681	207	47.52	364
		127		31		14		376		138		74		130		369
19.5	15.456	76	17.96	57	16.53	4	33.65	371	36.752	83	64.62	101	7.811	52	51.21	363
Mar. 1.5	15.532	25	18.53	82	16.57	4	37.36	360	36.835	29	65.63	125	7.863	22	54.84	348
11.5	15.557	20	19.35	98	16.53	12	40.96	337	36.864	21	66.88	138	7.841	92	58.32	327
21.4	15.537	59	20.33	109	16.41	19	44.33	313	36.843	63	68.26	147	7.749	150	61.59	299
31.4	15.478	89	21.42	115	16.22	25	47.46	277	36.780	98	69.73	146	7.599	205	64.58	265
Apr. 10.4	15.389		22.57		15.97		50.23		36.682		71.19		7.394		67.23	
20.4	15.273	116	23.71	114	15.66	31	52.61	238	36.559	123	72.60	141	7.146	248	69.50	227
30.3	15.143	130	24.80	109	15.32	34	54.57	196	36.415	144	73.89	129	6.864	282	71.32	182
May 10.3	15.003	140	25.80	100	14.95	37	56.04	147	36.262	153	75.01	112	6.557	307	72.69	137
20.3	14.861	142	26.66	86	14.56	39	57.03	99	36.105	157	75.94	93	6.232	325	73.58	89
		139		71		40		47		154		71		331		38
30.3	14.722		27.37		14.16		57.50		35.951		76.65		5.901		73.96	
June 9.2	14.592	130	27.91	54	13.75	41	57.44	6	35.806	145	77.12	47	5.569	332	73.86	10
19.2	14.474	118	28.27	36	13.36	39	56.87	57	35.673	133	77.33	21	5.246	323	73.22	64
29.2	14.370	104	28.43	16	12.99	37	55.81	106	35.558	115	77.28	5	4.942	304	72.12	110
July 9.1	14.284	86	28.41	2	12.64	35	54.26	155	35.460	98	76.99	29	4.659	283	70.58	154
		65		23		30		196		74		55		218		196
19.1	14.219	13	28.18	41	12.34	26	52.30	235	35.386	52	76.44	77	4.411	210	68.62	234
29.1	14.176	19	27.77	62	12.08	20	49.95	263	35.334	26	75.67	102	4.201	160	66.28	259
Aug. 8.1	14.157	6	27.15	81	11.88	13	47.32	287	35.308	4	74.65	123	4.041	103	63.69	279
18.0	14.163	36	26.34	100	11.75	5	44.45	297	35.312	33	73.42	143	3.938	42	60.90	290
28.0	14.199	66	25.34	120	11.70	2	41.48	300	35.345	67	71.99	163	3.896	28	58.00	288
Sept. 7.0	14.265		24.14		11.72		38.48		35.412		70.36		3.924		55.12	
17.0	14.363	98	22.75	139	11.83	11	35.58	290	35.514	102	68.55	181	4.023	99	52.32	280
26.9	14.497	134	21.18	157	12.03	20	32.87	271	35.652	138	66.60	195	4.200	177	49.76	256
Oct 6.9	14.667	170	19.45	173	12.31	28	30.50	237	35.830	178	64.51	209	4.448	248	47.48	228
16.9	14.875	208	17.58	187	12.68	37	28.53	197	36.047	217	62.31	220	4.768	320	45.66	182
		244		198		44		146		254		223		383		134
26.8	15.119		15.60		13.12		27.07		36.301		60.08		5.151		44.32	
Nov. 5.8	15.395	276	13.55	205	13.62	50	26.18	89	36.590	289	57.83	225	5.587	436	43.56	76
15.8	15.701	306	11.48	207	14.17	55	25.90	28	36.912	322	55.66	217	6.070	483	43.39	17
25.8	16.029	328	9.45	203	14.75	58	26.29	39	37.257	345	53.57	209	6.577	507	43.87	48
Dec. 5.7	16.372	343	7.53	192	15.34	59	27.31	102	37.619	362	51.70	187	7.096	519	44.97	110
		348		176		57		164		366		163		514		171
15.7	16.720		5.77		15.91		28.95		37.985		50.07		7.610		46.68	
25.7	17.060	340	4.25	152	16.46	55	31.15	220	38.345	360	48.73	134	8.100	490	48.92	224
35.7	17.384	324	3.00	125	16.96	50	33.83	268	38.687	342	47.74	99	8.547	447	51.64	272
Mean Place	13.973		31.12		12.289		28.90		35.262		77.81		4.166		46.00	
Sec δ, Tan δ	1.091		+0.437		2.281		−2.050		1.168		+0.603		1.958		−1.683	
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.065		+0.027		+0.043		−0.128		+0.067		+0.038		+0.046		−0.106	
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.37		+0.35		−0.37		+0.34		−0.37		+0.34		−0.38		+0.33	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Argus. Mag. 2.8		δ² Chamæleontis. Mag. 4.6		l Leonis. Mag. 5.3		ν Hydræ. Mag. 3.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	10 43	−49 0	10 45	−80 7	10 45	+10 56	10 45	−15 47
	s	″	s	″	s	″	s	″
Jan. 0.7	28.832	38.08	11.81	47.69	13.168	63.12	50.197	23.47
	352	297	103	271	289	159	284	244
10.6	29.184	41.05	12.84	50.40	13.457	61.53	50.481	25.91
	305	321	88	314	259	131	250	243
20.6	29.489	44.26	13.72	53.54	13.716	60.19	50.731	28.34
	246	339	68	346	217	106	209	236
30.6	29.735	47.65	14.40	57.00	13.933	59.13	50.940	30.70
	185	346	47	370	173	78	164	222
Feb. 9.6	29.920	51.11	14.87	60.70	14.106	58.35	51.104	32.92
	120	345	27	383	121	49	117	203
19.5	30.040	54.56	15.14	64.53	14.230	57.86	51.221	34.95
	59	334	4	386	78	20	69	183
Mar. 1.5	30.099	57.90	15.18	68.39	14.308	57.66	51.290	36.78
	— 3	318	— 16	381	30	— 1	24	156
11.5	30.096	61.08	15.02	72.20	14.338	57.67	51.314	38.34
	56	292	36	368	11	26	16	132
21.5	30.040	64.00	14.66	75.88	14.327	57.93	51.298	39.66
	105	265	53	315	47	45	50	105
31.4	29.935	66.65	14.13	79.33	14.280	58.38	51.248	40.71
	145	229	69	315	75	58	80	77
Apr. 10.4	29.790	68.94	13.44	82.48	14.205	58.96	51.168	41.48
	179	194	85	283	99	68	101	52
20.4	29.611	70.88	12.59	85.31	14.106	59.64	51.067	42.00
	202	152	95	239	115	72	117	25
30.3	29.409	72.40	11.64	87.70	13.991	60.36	50.950	42.25
	221	107	101	193	121	75	127	3
May 10.3	29.188	73.47	10.60	89.63	13.870	61.11	50.823	42.28
	233	63	112	144	127	73	131	— 24
20.3	28.955	74.10	9.48	91.07	13.743	61.84	50.692	42.04
	238	18	116	89	121	71	130	42
30.3	28.717	74.28	8.32	91.96	13.619	62.55	50.562	41.62
	236	28	119	36	119	66	126	66
June 9.2	28.481	74.00	7.13	92.32	13.500	63.21	50.436	40.96
	227	72	117	20	108	59	117	84
19.2	28.254	73.28	5.96	92.12	13.392	63.80	50.319	40.12
	215	117	112	75	97	52	107	101
29.2	28.039	72.11	4.84	91.37	13.295	64.32	50.212	39.11
	195	155	105	127	82	41	94	116
July 9.2	27.844	70.56	3.79	90.10	13.213	64.73	50.118	37.95
	172	191	95	177	61	35	77	126
19.1	27.672	68.65	2.84	88.33	13.149	65.08	50.041	36.69
	140	220	82	221	44	19	59	134
29.1	27.532	66.45	2.02	86.12	13.105	65.27	49.982	35.35
	107	243	66	258	24	4	38	136
Aug. 8.1	27.425	64.02	1.36	83.54	13.081	65.31	49.944	33.99
	61	258	48	286	2	— 10	12	133
18.0	27.364	61.44	0.88	80.68	13.083	65.21	49.932	32.66
	17	263	28	308	26	27	17	126
28.0	27.347	58.81	0.60	77.60	13.109	64.94	49.949	31.40
	— 34	261	— 5	315	58	46	46	111
Sept. 7.0	27.381	56.20	0.55	74.45	13.167	64.48	49.995	30.29
	88	247	17	311	86	67	81	92
17.0	27.469	53.73	0.72	71.31	13.253	63.81	50.076	29.37
	116	225	40	299	122	88	117	65
26.9	27.615	51.48	1.12	68.32	13.375	62.93	50.193	28.72
	205	189	62	273	155	111	155	35
Oct. 6.9	27.820	49.59	1.74	65.59	13.530	61.82	50.348	28.37
	259	149	84	238	192	132	193	1
16.9	28.079	48.10	2.58	63.21	13.722	60.50	50.541	28.36
	311	100	101	190	227	154	229	— 37
26.9	28.390	47.10	3.59	61.31	13.949	58.96	50.770	28.73
	355	45	116	135	260	172	261	77
Nov. 5.8	28.745	46.65	4.75	59.96	14.209	57.24	51.034	29.50
	393	— 12	127	74	288	187	291	115
15.8	29.138	46.77	6.02	59.22	14.497	55.37	51.325	30.65
	416	74	134	7	310	195	314	150
25.8	29.554	47.51	7.36	59.15	14.807	53.42	51.639	32.15
	428	131	135	— 58	323	199	326	182
Dec. 5.7	29.982	48.82	8.71	59.73	15.130	51.43	51.965	33.97
	423	185	133	123	329	196	328	210
15.7	30.405	50.67	10.04	60.96	15.459	49.47	52.293	36.07
	409	234	125	185	323	186	320	227
25.7	30.814	53.01	11.29	62.81	15.782	47.61	52.613	38.34
	378	273	113	240	305	171	301	240
35.7	31.192	55.74	12.42	65.21	16.087	45.90	52.914	40.74
Mean Place	27.206	48.02	4.551	62.56	12.722	70.57	49.441	24.41
Sec δ, Tan δ	1.525	−1.151	5.838	−5.752	1.018	+0.194	1.039	−0.283
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.051	−0.072	+0.012	−0.363	+0.063	+0.012	+0.059	−0.018
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.38	+0.33	−0.38	+0.32	−0.38	+0.32	−0.38	+0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	46 Leonis Minoris. Mag. 3.9		54 Leonis. Mag. 4.5		ι Antliæ. Mag. 4.7		Groombridge 1706. Mag. 6.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 10 49	° ′ +34 37	h m 10 51	° ′ +25 9	h m 10 53	° ′ −36 43	h m 10 53	° ′ +78 10
	s	″	s	″	s	″	s	″
Jan. 0.7	0.878	35.49	27.120	27.46	9.023	17.36	50.25	38.49
	338	67	315	106	318	279	111	90
10.6	1.216	34.82	27.435	26.40	9.341	20.15	51.36	39.39
	303	25	281	71	281	298	99	148
20.6	1.519	34.57	27.716	25.69	9.622	23.13	52.35	40.87
	258	16	240	35	232	309	84	200
30.6	1.777	34.73	27.956	25.34	9.854	26.22	53.19	42.87
	207	56	193	3	182	308	67	244
Feb. 9.6	1.984	35.29	28.149	25.37	10.036	29.30	53.86	45.31
	151	90	142	35	127	301	48	278
19.5	2.135	36.19	28.291	25.72	10.163	32.31	54.34	48.09
	92	120	90	65	74	289	25	301
Mar. 1.5	2.227	37.39	28.381	26.37	10.237	35.20	54.59	51.10
	38	113	40	90	24	268	5	310
11.5	2.265	38.82	28.421	27.27	10.261	37.88	54.64	54.20
	14	157	8	107	24	244	16	306
21.5	2.251	40.39	28.413	28.34	10.237	40.32	54.48	57.26
	58	165	48	121	64	216	35	293
31.4	2.193	42.04	28.365	29.55	10.173	42.48	54.13	60.19
	96	162	82	125	97	184	53	266
Apr. 10.4	2.097	43.66	28.283	30.80	10.076	44.32	53.60	62.85
	126	156	106	126	125	150	66	230
20.4	1.971	45.22	28.177	32.06	9.951	45.82	52.94	65.15
	146	142	125	118	146	113	77	189
30.3	1.825	46.64	28.052	33.24	9.805	46.95	52.17	67.04
	158	121	138	108	160	77	85	137
May 10.3	1.667	47.85	27.914	34.32	9.645	47.72	51.32	68.41
	165	100	140	95	171	38	90	85
20.3	1.502	48.85	27.774	35.27	9.474	48.10	50.42	69.26
	162	74	111	78	173	1	92	30
30.3	1.340	49.59	27.633	36.05	9.301	48.11	49.50	69.56
	155	46	134	58	172	38	89	26
June 9.2	1.185	50.05	27.499	36.63	9.129	47.73	48.61	69.30
	143	18	125	39	166	75	86	81
19.2	1.042	50.23	27.374	37.02	8.963	46.98	47.75	68.49
	128	12	110	18	156	109	79	132
29.2	0.914	50.11	27.264	37.20	8.807	45.89	46.96	67.17
	108	38	96	5	144	140	71	181
July 9.2	0.806	49.73	27.168	37.15	8.663	44.49	46.25	65.36
	87	68	75	25	124	168	59	224
19.1	0.719	49.05	27.093	36.90	8.539	42.81	45.66	63.12
	62	92	55	47	103	190	49	263
29.1	0.657	48.13	27.038	36.43	8.436	40.91	45.17	60.49
	35	119	32	69	76	208	35	295
Aug. 8.1	0.622	46.94	27.006	35.74	8.360	38.83	44.82	57.54
	7	142	6	89	46	217	22	320
18.0	0.615	45.52	27.000	34.85	8.314	36.66	44.60	54.34
	26	164	22	111	10	219	6	341
28.0	0.641	43.88	27.022	33.74	8.304	34.47	44.54	50.93
	59	183	54	129	31	213	7	354
Sept. 7.0	0.700	42.05	27.076	32.45	8.335	32.34	44.61	47.39
	94	201	87	151	73	198	23	359
17.0	0.794	40.04	27.163	30.94	8.408	30.36	44.84	43.80
	135	217	120	168	119	174	39	357
26.9	0.929	37.87	27.283	29.26	8.527	28.62	45.23	40.23
	174	228	160	184	166	143	54	346
Oct. 6.9	1.103	35.59	27.443	27.42	8.693	27.19	45.77	36.77
	215	236	197	198	213	103	68	331
16.9	1.318	33.23	27.640	25.44	8.906	26.16	46.45	33.46
	256	239	236	209	258	57	83	305
26.9	1.574	30.84	27.876	23.35	9.164	25.59	47.28	30.41
	294	237	271	215	298	8	95	272
Nov. 5.8	1.868	28.47	28.147	21.20	9.462	25.51	48.23	27.69
	325	229	302	218	331	45	105	232
15.8	2.193	26.18	28.449	19.02	9.793	25.96	49.28	25.37
	354	213	328	210	356	97	115	184
25.8	2.547	24.05	28.777	16.92	10.149	26.93	50.43	23.53
	371	193	345	201	369	147	120	130
Dec. 5.7	2.918	22.12	29.122	14.91	10.518	28.40	51.63	22.23
	378	164	351	180	371	192	123	72
15.7	3.296	20.48	29.473	13.11	10.889	30.32	52.86	21.51
	374	131	347	156	359	231	122	10
25.7	3.670	19.17	29.820	11.55	11.248	32.63	54.08	21.41
	356	93	331	128	339	264	117	52
35.7	4.026	18.24	30.151	10.27	11.587	35.27	55.25	21.93
Mean Place	0.646	49.49	26.832	38.91	7.888	24.88	50.490	59.07
Sec δ, Tan δ	1.215	+0.691	1.105	+0.470	1.248	−0.746	4.882	+4.778
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.067	+0.044	+0.065	+0.030	+0.055	−0.048	+0.097	+0.306
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.38	+0.30	−0.38	+0.29	−0.38	+0.29	−0.38	+0.29

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Crateris. Mag. 4.2		δ Leonis. Mag. 5.0		β Ursæ Majoris. Mag. 2.4		α Ursæ Majoris. Mag. 2.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 10 56 s	° ′ −17 53 ″	h m 10 56 s	° ′ + 4 1 ″	h m 10 57 s	° ′ +56 47 ″	h m 10 58 s	° ′ +62 9 ″
Jan. 0.7	1.997	17.07	35.526	47.40	12.411	25.33	59.40	42.10
10.7	2.287 290	19.53 246	35.815 289	45.54 186	12.885 474	25.45 12	59.94 54	42.40 30
20.6	2.545 258	22.02 249	36.076 261	43.86 168	13.314 429	26.13 68	60.43 49	43.24 84
30.6	2.765 220	24.45 243	36.297 221	42.40 146	13.681 367	27.32 119	60.85 42	44.64 140
Feb. 9.6	2.937 172	26.78 233	36.477 180	41.20 120	13.977 296	28.94 162	61.18 33	46.48 184
	126	214	132	92	217	202	25	223
19.5	3.063 78	28.92 196	36.609 86	40.28 64	14.194 134	30.96 229	61.43 15	48.71 250
Mar. 1.5	3.141 34	30.88 171	36.695 40	39.64 40	14.328 51	33.25 218	61.58 6	51.21 267
11.5	3.175 7	32.59 145	36.735 0	39.24 15	14.382 28	35.73 256	61.64 3	53.88 274
21.5	3.168 42	34.04 119	36.735 35	39.09 5	14.354 97	38.29 251	61.61 12	56.62 265
31.4	3.126 73	35.23 91	36.700 65	39.14 24	14.257 157	40.80 239	61.49 20	59.27 252
Apr. 10.4	3.053	36.14 64	36.635	39.38	14.100	43.19	61.29	61.79
20.4	2.958 95	36.78 38	36.547 88	39.75 37	13.893 207	45.35 216	61.05 24	64.04 225
30.4	2.845 113	37.16 12	36.444 103	40.25 50	13.647 246	47.22 187	60.75 30	65.97 193
May 10.3	2.721 124	37.28 − 11	36.329 115	40.82 57	13.378 269	48.70 148	60.42 33	67.50 153
20.3	2.590 131	37.17 36	36.211 118	41.46 64	13.095 283	49.82 112	60.07 35	68.57 107
	130		120	67	288	64	35	61
30.3	2.460	36.81	36.091	42.13	12.807	50.46	59.72	69.18
June 9.2	2.330 130	36.21 60	35.975 116	42.82 69	12.528 279	50.68 − 22	59.38 34	69.32 − 14
19.2	2.207 123	35.41 80	35.867 108	43.50 68	12.265 263	50.44 24	59.05 33	68.97 35
29.2	2.093 114	34.43 98	35.768 99	44.18 68	12.025 240	49.76 68	58.75 30	68.14 83
July 9.2	1.991 102	33.29 111	35.683 85	44.80 62	11.814 211	48.64 112	58.49 26	66.87 127
	87	127	71	59	176	149	23	167
19.1	1.904	32.02	35.612	45.39	11.638	47.15	58.26	65.20
29.1	1.834 70	30.63 139	35.558 54	45.90 51	11.500 138	45.30 185	58.08 18	63.16 204
Aug. 8.1	1.786 48	29.23 140	35.524 34	46.31 41	11.406 94	43.10 220	57.96 12	60.74 212
18.1	1.761 − 25	27.83 140	35.513 − 11	46.59 28	11.357 − 49	40.65 245	57.89 7	58.08 266
28.0	1.765 4	26.50 133	35.527 14	46.71 − 12	11.359 2	37.94 271	57.88 − 1	55.15 293
	36	122	42	6	53	288	5	309
Sept. 7.0	1.801	25.28 103	35.569	46.65	11.412	35.06	57.93	52.06
17.0	1.870 69	24.25 77	35.643 74	46.39 26	11.521 109	32.04 302	58.04 11	48.87 319
26.9	1.977 107	23.48 49	35.752 109	45.89 50	11.689 168	28.95 309	58.22 18	45.60 327
Oct. 6.9	2.123 146	22.99 12	35.893 141	45.16 73	11.913 224	25.83 312	58.48 26	42.33 327
16.9	2.306 183	22.87 25	36.072 179	44.14 102	12.197 284	22.77 306	58.80 32	39.14 319
	221		216	126	342	293	38	301
26.9	2.530	23.12	36.288	42.88	12.539	19.84	59.18	36.13
Nov. 5.8	2.788 258	23.76 64	36.537 249	41.39 149	12.934 395	17.09 275	59.63 45	33.32 281
15.8	3.077 289	24.82 106	36.817 280	39.67 172	13.375 441	14.60 249	60.13 50	30.82 250
25.8	3.389 312	26.24 142	37.121 304	37.80 187	13.857 482	12.44 216	60.68 55	28.69 213
Dec. 5.8	3.716 327	28.00 176	37.438 317	35.81 199	14.363 506	10.70 174	61.26 58	27.02 167
	330	205	326	204	522	126	59	117
15.7	4.046 324	30.05 227	37.764 321	33.77 204	14.885 518	9.44 77	61.85 59	25.85 64
25.7	4.370 308	32.32 241	38.085 305	31.73 194	15.403 499	8.67 20	62.44 57	25.21 6
35.7	4.678	34.73	38.390	29.79	15.902	8.47	63.01	25.15
Mean Place	1.263	19.21	35.074	52.28	12.420	43.75	59.480	61.27
Sec δ, Tan δ	1.051	−0.323	1.002	+0.070	1.826	+1.528	2.142	+1.894
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.059	−0.021	+0.062	+0.005	+0.072	+0.098	+0.074	+0.122
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.38	+0.28	−0.38	+0.27	−0.38	+0.27	−0.38	+0.26

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Leonis. Mag. 4.7		p^4 Leonis. Mag. 5.7		ψ Ursæ Majoris. Mag. 3.2		β Crateris. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	11 1	+ 7 44	11 2	+ 2 22	11 5	+44 54	11 7	−22 24
	s	″	s	″	s	″	s	″
Jan. 0.7	3.169	63.95	59.048	22.15	20.564	43.67	52.855	15.01
10.7	3.463 294	62.20 175	59.342 294	20.22 193	20.953 389	43.26 41	53.158 303	17.53 252
20.6	3.728 265	60.66 154	59.602 260	18.46 176	21.304 351	43.36 10	53.429 271	20.12 259
30.6	3.954 226	59.39 127	59.826 224	16.91 155	21.611 307	43.91 55	53.661 232	22.72 260
Feb. 9.6	4.138 184	58.39 100	60.009 183	15.62 129	21.863 252	44.93 102	53.849 188	25.23 251
	139	71	138	104	189	141	140	238
19.5	4.277 91	57.68 42	60.147 91	14.58 77	22.052 122	46.34 173	53.989 92	27.61 219
Mar. 1.5	4.368 44	57.26 18	60.238 45	13.81 51	22.174 61	48.07 194	54.081 46	29.80 198
11.5	4.412 6	57.08 — 8	60.283 7	13.30 25	22.235 2	50.01 210	54.127 6	31.78 174
21.5	4.418 — 32	57.16 26	60.290 — 30	13.05 3	22.237 54	52.11 214	54.133 — 31	33.52 147
31.4	4.386 63	57.42 42	60.260 62	13.02 — 12	22.183 103	54.25 208	54.102 61	34.99 118
Apr. 10.4	4.323	57.84	60.198	13.14	22.080	56.33	54.038	36.17
20.4	4.237 86	58.39 55	60.117 81	13.44 30	21.940 140	58.29 196	53.950 88	37.07 90
30.4	4.135 102	59.03 64	60.018 99	13.89 45	21.774 166	60.05 176	53.842 108	37.69 62
May 10.3	4.020 115	59.73 70	59.906 112	14.40 51	21.587 187	61.55 150	53.721 121	38.03 34
20.3	3.902 118	60.45 72	59.790 116	15.02 62	21.388 199	62.72 117	53.591 130	38.09 — 6
	121	71	120	66	202	84	134	21
30.3	3.781	61.16	59.670	15.68	21.186	63.56	53.457	37.88
June 9.2	3.663 118	61.86 70	59.554 116	16.38 70	20.989 197	64.06 50	53.324 133	37.41 47
19.2	3.554 109	62.51 65	59.445 109	17.07 69	20.803 186	64.16 — 10	53.194 130	36.68 73
29.2	3.452 102	63.11 60	59.343 102	17.78 71	20.632 171	63.89 27	53.071 123	35.74 94
July 9.2	3.364 88	63.63 52	59.253 90	18.44 66	20.479 153	63.23 66	52.959 112	34.58 116
	74	16	75	63	126	98	101	132
19.1	3.290 56	64.09 35	59.178 59	19.07 57	20.353 102	62.25 133	52.858 83	33.26 146
29.1	3.234 38	64.44 20	59.119 39	19.64 47	20.251 69	60.92 161	52.775 62	31.80 152
Aug. 8.1	3.196 16	64.64 7	59.080 20	20.11 39	20.182 39	59.31 190	52.713 39	30.28 156
18.1	3.180 10	64.71 — 10	59.060 — 8	20.50 19	20.143 1	57.41 215	52.674 9	28.72 152
28.0	3.190 39	64.61 27	59.068 35	20.69 4	20.142 — 38	55.26 238	52.665 — 21	27.20 143
Sept. 7.0	3.229	64.34	59.103	20.73	20.180	52.88	52.686	25.77
17.0	3.298 69	63.84 50	59.170 67	20.58 15	20.264 84	50.34 254	52.744 58	24.50 127
26.9	3.402 104	63.13 71	59.270 100	20.15 43	20.390 126	47.65 269	52.841 97	23.48 102
Oct. 6.9	3.540 138	62.16 97	59.408 138	19.48 67	20.562 172	44.89 276	52.978 137	22.74 74
16.9	3.716 176	60.97 119	59.581 173	18.56 92	20.785 223	42.09 280	53.157 179	22.35 39
	213	142	211	118	267	276	220	0
26.9	3.929	59.55	59.792	17.38	21.052	39.33	53.377	22.35
Nov. 5.8	4.175 246	57.91 164	60.033 241	15.94 144	21.365 313	36.64 269	53.633 256	22.77 42
15.8	4.454 279	56.09 182	60.310 277	14.25 169	21.718 353	34.12 252	53.924 291	23.61 84
25.8	4.756 302	54.15 194	60.611 301	12.40 185	22.106 388	31.83 229	54.240 316	24.87 126
Dec. 5.8	5.074 318	52.12 203	60.925 314	10.42 198	22.516 410	29.85 198	54.572 332	26.51 164
	326	202	324	206	422	161	339	197
15.7	5.400	50.10	61.249	8.36	22.938	28.24	54.911	28.48
25.7	5.723 323	48.11 199	61.569 320	6.30 206	23.359 421	27.07 117	55.244 333	30.72 224
35.7	6.033 310	46.26 185	61.876 307	4.29 201	23.766 407	26.36 71	55.565 321	33.17 245
Mean Place	2.780	69.85	58.613	26.23	20.538	59.76	52.114	19.20
Sec δ, Tan δ	1.009	+0.136	1.001	+0.041	1.412	+0.997	1.082	−0.412
$D_{\psi a}$, $D_{\omega a}$	+0.062	+0.009	+0.061	+0.003	+0.067	+0.065	+0.059	−0.027
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.38	+0.25	−0.39	+0.25	−0.39	+0.24	−0.39	+0.23

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Leonis. Mag. 2.6		θ Leonis. Mag. 3.4		ν Ursæ Majoris. Mag. 3.7		δ Crateris. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 11 10 s	° ′ +20 56 ″	h m 11 10 s	° ′ +15 50 ″	h m 11 14 s	° ′ +33 30 ″	h m 11 15 s	° ′ −14 21 ″
Jan. 0.7	1.204	35.05	12.318	54.24	19.545	39.86	29.935	40.02
	316	133	308	152	344	91	300	233
10.7	1.520	33.72	12.626	52.72	19.889	38.95	30.235	42.35
	285	102	278	122	317	46	270	234
20.6	1.805	32.70	12.904	51.50	20.206	38.49	30.505	44.69
	247	63	242	92	277	6	235	227
30.6	2.052	32.07	13.146	50.58	20.483	38.43	30.740	46.96
	205	31	199	56	227	39	191	214
Feb. 9.6	2.257	31.76	13.345	50.02	20.710	38.82	30.931	49.10
	156	5	152	26	180	74	147	196
19.6	2.413	31.81	13.497	49.76	20.890	39.56	31.078	51.06
	108	35	104	4	120	110	101	178
Mar. 1.5	2.521	32.16	13.601	49.80	21.010	40.66	31.179	52.84
	61	63	57	33	70	134	55	152
11.5	2.582	32.79	13.658	50.13	21.080	42.00	31.234	54.36
	14	87	15	55	15	155	18	125
21.5	2.596	33.66	13.673	50.68	21.095	43.55	31.252	55.61
	27	97	24	71	30	167	19	103
31.4	2.569	34.63	13.649	51.42	21.065	45.22	31.233	56.64
	60	112	58	85	69	170	51	77
Apr. 10.4	2.509	35.75	13.591	52.27	20.996	46.92	31.182	57.41
	85	115	83	93	101	166	77	50
20.4	2.424	36.90	13.508	53.20	20.895	48.58	31.105	57.91
	107	113	100	96	125	155	93	30
30.4	2.317	38.03	13.408	54.16	20.770	50.13	31.012	58.21
	121	108	115	96	142	139	109	4
May 10.3	2.196	39.11	13.293	55.12	20.628	51.52	30.903	58.25
	127	101	122	89	151	118	117	14
20.3	2.069	40.12	13.171	56.01	20.477	52.70	30.786	58.11
	131	84	125	81	157	94	122	36
30.3	1.938	40.96	13.046	56.82	20.320	53.64	30.664	57.75
	127	70	121	72	154	66	122	56
June 9.3	1.811	41.66	12.925	57.54	20.166	54.30	30.542	57.19
	122	53	117	59	117	40	120	73
19.2	1.689	42.19	12.808	58.13	20.019	54.70	30.422	56.46
	112	35	106	45	136	9	112	89
29.2	1.577	42.54	12.702	58.58	19.883	54.79	30.310	55.57
	100	18	97	33	123	20	104	99
July 9.2	1.477	42.72	12.605	58.91	19.760	54.59	30.206	54.58
	86	4	80	16	105	50	93	112
19.1	1.391	42.68	12.525	59.07	19.655	54.09	30.113	53.46
	65	21	64	1	85	79	79	117
29.1	1.326	42.44	12.461	59.06	19.570	53.30	30.034	52.29
	46	44	46	19	59	101	57	119
Aug. 8.1	1.280	42.00	12.415	58.87	19.511	52.26	29.977	51.10
	25	66	23	37	38	131	37	119
18.1	1.255	41.34	12.392	58.50	19.473	50.95	29.940	49.91
	3	88	3	58	4	156	13	110
28.0	1.258	40.46	12.395	57.92	19.469	49.39	29.927	48.81
	33	106	31	77	29	177	17	101
Sept. 7.0	1.291	39.40	12.426	57.15	19.498	47.62	29.944	47.80
	64	130	62	98	62	198	52	80
17.0	1.355	38.10	12.488	56.17	19.560	45.64	29.996	47.00
	101	119	97	122	104	218	87	60
27.0	1.456	36.61	12.585	54.95	19.664	43.46	30.083	46.40
	135	171	134	140	141	232	127	30
Oct. 6.9	1.591	34.90	12.719	53.55	19.805	41.14	30.210	46.10
	177	185	172	163	185	242	165	3
16.9	1.768	33.05	12.891	51.92	19.990	38.72	30.375	46.13
	215	197	210	179	228	248	206	35
26.9	1.983	31.08	13.101	50.13	20.218	36.24	30.581	46.48
	250	213	246	193	268	249	244	73
Nov. 5.8	2.233	28.95	13.347	48.20	20.486	33.75	30.825	47.21
	287	217	278	205	306	244	275	110
15.8	2.520	26.78	13.625	46.15	20.792	31.31	31.100	48.31
	312	220	306	212	336	234	304	143
25.8	2.832	24.58	13.931	44.03	21.128	28.97	31.404	49.74
	331	209	325	208	360	212	319	175
Dec. 5.8	3.163	22.49	14.256	41.95	21.488	26.85	31.723	51.49
	341	199	334	203	372	188	331	200
15.7	3.504	20.50	14.590	39.92	21.860	24.97	32.054	53.49
	343	180	333	188	374	155	326	219
25.7	3.847	18.70	14.923	38.04	22.234	23.42	32.380	55.68
	329	150	322	166	359	117	316	231
35.7	4.176	17.20	15.245	36.38	22.593	22.25	32.696	57.99
Mean Place	0.991	44.76	12.060	62.38	19.478	53.03	29.362	42.01
Sec δ, Tan δ	1.071	+0.383	1.040	+0.284	1.199	+0.662	1.032	−0.256
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.063	+0.025	+0.063	+0.018	+0.065	+0.043	+0.060	−0.017
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.39	+0.22	−0.39	+0.22	−0.39	+0.20	−0.39	+0.19

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Leonis. Mag. 4.1		π Centauri. Mag. 4.3		ι Leonis. Mag. 4.0		τ Leonis. Mag. 5.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	11 17	+ 6 26	11 17	−54 3	11 19	+10 56	11 23	+ 3 16
	s	″	s	″	s	″	s	″
Jan. 0.7	10.343	60.99	30.964	54.50	54.913	66.50	58.979	46.27
10.7	10.642 299	59.16 183	31.382 418	57.16 266	55.218 305	64.80 170	59.282 303	44.32 195
20.6	10.917 275	57.53 163	31.752 370	60.18 302	55.498 280	63.33 147	59.557 275	42.56 176
30.6	11.155 238	56.14 139	32.068 316	63.43 325	55.743 245	62.15 118	59.798 241	41.02 154
Feb. 9.6	11.353 198	55.05 109	32.320 252	66.86 343	55.946 203	61.27 88	59.999 201	39.74 128
	155	83	186	350	158	56	160	101
19.6	11.508	54.22	32.506	70.36	56.104	60.71	60.159	38.73
Mar. 1.5	11.614 106	53.70 52	32.625 119	73.83 347	56.216 112	60.45 26	60.270 111	38.00 73
11.5	11.676 62	53.44 26	32.679 54	77.20 337	56.283 67	60.46 −1	60.340 70	37.55 45
21.5	11.697 21	53.44 0	32.671 −8	80.41 321	56.307 24	60.73 27	60.367 27	37.33 22
31.4	11.681 −16	53.64 20	32.608 63	83.39 298	56.293 −14	61.19 46	60.359 −8	37.35 −2
	47	36	112	269	44	62	41	22
Apr. 10.4	11.634	54.00	32.496	86.08	56.249	61.81	60.318	37.57
20.4	11.561 73	54.52 52	32.341 155	88.42 234	56.177 72	62.54 73	60.253 65	37.90 33
30.4	11.472 89	55.13 61	32.149 192	90.41 199	56.086 91	63.34 80	60.168 85	38.39 49
May 10.3	11.366 106	55.82 69	31.931 218	91.96 155	55.981 105	64.17 83	60.070 98	38.97 58
20.3	11.255 111	56.53 71	31.689 242	93.08 112	55.868 113	65.00 83	59.962 108	39.62 65
	116	73	255	66	116	79	113	70
30.3	11.139	57.26	31.431	93.74	55.752	65.79	59.849	40.32
June 9.3	11.023 116	57.97 71	31.170 261	93.93 19	55.635 117	66.52 73	59.735 114	41.02 70
19.2	10.912 111	58.66 69	30.905 265	93.65 −28	55.522 113	67.18 66	59.625 110	41.73 71
29.2	10.808 104	59.29 63	30.644 261	92.92 −73	55.416 106	67.75 57	59.520 105	42.41 68
July 9.2	10.713 95	59.87 58	30.395 249	91.72 −120	55.320 96	68.21 46	59.422 98	43.06 65
	83	48	229	159	84	35	89	62
19.1	10.630	60.35	30.166	90.13	55.236	68.56	59.333	43.68
29.1	10.563 67	60.75 40	29.963 203	88.16 197	55.166 70	68.76 20	59.264 69	44.18 50
Aug. 8.1	10.514 49	61.03 28	29.793 170	85.91 225	55.114 52	68.82 6	59.210 54	44.61 43
18.1	10.483 31	61.16 13	29.666 127	83.41 250	55.083 31	68.72 −10	59.172 38	44.88 27
28.0	10.479 −4	61.13 −3	29.587 79	80.77 264	55.076 −7	68.42 30	59.161 11	45.02 14
	22	22	22	270	21	48	14	3
Sept. 7.0	10.501	60.91	29.565	78.07	55.097	67.94	59.175	44.99
17.0	10.554 53	60.47 44	29.604 39	75.43 261	55.147 50	67.23 71	59.223 48	44.74 25
27.0	10.641 87	59.82 65	29.706 102	72.93 250	55.232 85	66.31 92	59.303 80	44.26 48
Oct. 6.9	10.763 122	58.92 90	29.877 171	70.68 225	55.355 123	65.15 116	59.420 117	43.54 72
16.9	10.926 163	57.78 114	30.116 239	68.79 189	55.515 160	63.78 137	59.574 154	42.58 96
	200	138	301	145	200	160	195	126
26.9	11.126	56.40	30.417	67.34	55.715	62.18	59.769	41.32
Nov. 5.8	11.362 236	54.78 162	30.776 359	66.39 −95	55.950 235	60.39 179	60.001 232	39.83 149
15.8	11.631 269	52.98 180	31.184 408	66.01 −38	56.220 270	58.45 194	60.263 262	38.13 170
25.8	11.929 298	51.03 195	31.627 443	66.22 21	56.518 298	56.40 205	60.557 294	36.24 189
Dec. 5.8	12.243 314	49.00 203	32.093 466	67.04 82	56.836 318	54.30 210	60.870 313	34.24 200
	325	208	472	139	329	207	324	208
15.7	12.568	46.92	32.565	68.43	57.165	52.23	61.194	32.16
25.7	12.893 325	44.88 204	33.028 463	70.36 193	57.495 330	50.24 199	61.519 325	30.08 208
35.7	13.208 315	42.95 193	33.467 439	72.76 240	57.815 320	48.40 184	61.833 314	28.07 201
Mean Place	10.029	65.86	29.365	67.93	54.661	72.75	58.670	49.80
Sec δ, Tan δ	1.006	+0.113	1.704	−1.380	1.018	+0.194	1.002	+0.057
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.062	+0.007	+0.054	−0.090	+0.062	+0.013	+0.061	+0.004
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.39	+0.19	−0.39	+0.18	−0.39	+0.17	−0.39	+0.16

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Draconis. Mag. 4.1		ξ Hydræ. Mag. 3.7		λ Centauri. Mag. 3.3		υ Leonis. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	11 26	+69 44	11 29	−31 25	11 32	−62 35	11 33	− 0 23
	s	″	s	″	s	″	s	″
Jan. 0.7	50.51	62.76	13.468	45.33	15.16	21.31	0.671	56.43
10.7	51.24 73	62.95 19	13.799 331	47.85 252	15.68 52	23.77 246	0.978 307	58.47 204
20.6	51.90 66	63.77 82	14.097 298	50.56 271	16.14 46	26.64 287	1.256 278	60.37 190
30.6	52.50 60	65.17 140	14.358 261	53.36 280	16.55 41	29.84 320	1.502 246	62.10 173
Feb. 9.6	52.99 49	67.08 191	14.573 215	56.16 280	16.88 33	33.27 343	1.709 207	63.57 147
	53.37 38	69.39 231	14.741 168	58.91 275	17.12 24	36.87 360	1.874 165	64.84 127
19.6	53.63 26	72.05 266	14.858 117	61.55 264	17.29 17	40.51 364	1.996 122	65.80 96
Mar. 1.5	53.77 14	74.92 287	14.930 72	64.01 246	17.38 9	44.11 360	2.073 77	66.47 67
11.5	53.79 2	77.88 296	14.958 28	66.24 223	17.39 1	47.60 349	2.109 36	66.91 44
21.5	53.68 — 11	80.82 294	14.943 — 15	68.23 199	17.33 — 6	50.90 330	2.109 0	67.09 18
31.5	53.47 21	83.65 283	14.896 47	69.96 173	17.21 12	53.97 307	2.078 31	67.09 0
Apr. 10.4	53.17 30	86.19 254	14.816 80	71.37 141	17.02 19	56.72 275	2.022 56	66.89 20
20.4	52.79 38	88.43 224	14.716 100	72.49 112	16.79 23	59.10 238	1.944 78	66.57 32
30.4	52.36 43	90.26 183	14.595 121	73.28 79	16.52 27	61.08 198	1.851 93	66.13 44
May 10.3	51.88 48	91.59 133	14.460 135	73.74 46	16.21 31	62.62 154	1.749 102	65.59 54
20.3	51.39 49	92.46 87	14.316 144	73.87 — 13	15.87 34	63.67 105	1.639 110	64.95 64
30.3	50.89 50	92.79 — 33	14.168 148	73.69 18	15.52 35	64.22 55	1.527 112	64.27 68
June 9.3	50.39 50	92.61 18	14.018 150	73.18 51	15.16 36	64.29 — 7	1.416 111	63.56 71
19.2	49.93 46	91.87 74	13.872 146	72.36 82	14.80 36	63.84 45	1.309 107	62.83 73
29.2	49.50 43	90.68 119	13.732 140	71.28 108	14.44 36	62.91 93	1.208 101	62.11 72
July 9.2	49.11 39	89.00 168	13.602 130	69.92 136	14.11 33	61.50 141	1.116 92	61.42 69
19.2	48.78 33	86.91 209	13.489 113	68.36 156	13.81 30	59.66 184	1.039 77	60.78 64
29.1	48.52 26	84.41 250	13.392 97	66.65 171	13.55 26	57.46 220	0.976 63	60.20 58
Aug. 8.1	48.32 20	81.59 282	13.322 70	64.82 183	13.34 21	54.96 250	0.930 46	59.72 48
18.1	48.20 12	78.48 311	13.279 43	62.97 185	13.20 14	52.23 273	0.910 — 20	59.37 35
28.0	48.17 — 3	75.19 329	13.274 — 5	61.15 182	13.12 8	49.39 284	0.914 4	59.21 — 16
Sept. 7.0	48.22 5	71.74 345	13.306 32	59.45 170	13.12 0	46.52 287	0.953 39	59.23 2
17.0	48.37 15	68.21 353	13.382 76	57.90 155	13.21 9	43.72 280	1.024 71	59.48 25
27.0	48.61 24	64.66 355	13.501 119	56.66 124	13.39 18	41.15 257	1.132 108	60.00 52
Oct. 6.9	48.94 33	61.17 349	13.672 171	55.73 93	13.65 26	38.86 229	1.279 147	60.77 77
16.9	49.37 43	57.84 333	13.886 214	55.18 55	14.00 35	37.00 186	1.463 184	61.82 105
26.9	49.88 51	54.73 311	14.141 255	55.10 — 8	14.42 42	35.62 138	1.689 226	63.13 131
Nov. 5.9	50.48 60	51.97 276	14.439 298	55.48 38	14.90 48	34.81 81	1.947 258	64.71 158
15.8	51.14 66	49.58 239	14.764 325	56.33 85	15.43 53	34.56 — 25	2.235 288	66.51 180
25.8	51.86 72	47.65 193	15.112 348	57.62 129	16.00 57	34.97 — 41	2.545 310	68.46 195
Dec. 5.8	52.61 75	46.27 138	15.470 358	59.36 174	16.58 58	36.00 103	2.867 322	70.53 207
15.7	53.37 76	45.46 81	15.830 360	61.42 206	17.14 56	37.62 162	3.191 324	72.65 212
25.7	54.12 75	45.27 19	16.172 342	63.82 240	17.69 55	39.76 214	3.508 317	74.74 209
35.7								
Mean Place	51.176	82.43	12.687	53.52	13.157	37.41	0.371	54.53
Sec δ, Tan δ	2.889	+2.711	1.172	−0.611	2.173	−1.929	1.000	−0.007
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.072	+0.179	+0.059	−0.040	+0.055	−0.128	+0.061	0.000
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.39	+0.14	−0.39	+0.13	−0.40	+0.12	−0.40	+0.12

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Chamæleontis. Mag. 5.7		3 Draconis. Mag. 5.5		ζ Crateris. Mag. 4.9		χ Ursæ Majoris. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 11 34	° ′ −75 27	h m 11 38	° ′ +67 9	h m 11 40	° ′ −17 55	h m 11 41	° ′ +48 11
	s	″	s	″	s	″	s	″
Jan. 0.7	8.38	55.03	10.86	56.91	51.935	16.93	59.193	66.97
	86	223	66	2	316	233	425	65
10.7	9.24	57.26	11.52	56.89	52.251	19.26	59.618	66.32
	78	273	62	57	289	239	395	15
20.7	10.02	59.99	12.14	57.46	52.540	21.65	60.013	66.17
	67	313	55	118	256	235	355	40
30.6	10.69	63.12	12.69	58.64	52.796	24.00	60.368	66.57
	55	344	47	171	216	228	302	91
Feb. 9.6	11.24	66.56	13.16	60.35	53.012	26.28	60.670	67.48
	40	365	37	217	173	213	245	136
19.6	11.64	70.21	13.53	62.52	53.185	28.41	60.915	68.84
	26	377	27	253	128	196	179	177
Mar. 1.5	11.90	73.98	13.80	65.05	53.313	30.37	61.094	70.61
	13	381	15	278	85	173	115	203
11.5	12.03	77.79	13.95	67.83	53.398	32.10	61.209	72.64
	2	376	5	291	42	152	51	227
21.5	12.01	81.55	14.00	70.74	53.440	33.62	61.260	74.91
	14	361	6	293	6	124	11	237
31.5	11.87	85.16	13.94	73.67	53.446	34.86	61.249	77.28
	26	341	16	282	25	100	64	237
Apr. 10.4	11.61	88.57	13.78	76.49	53.421	35.86	61.185	79.65
	38	312	24	263	54	76	110	225
20.4	11.23	91.69	13.54	79.12	53.367	36.62	61.075	81.90
	48	278	31	231	77	51	148	211
30.4	10.75	94.47	13.23	81.43	53.290	37.13	60.927	84.01
	55	237	37	195	91	27	179	185
May 10.4	10.20	96.84	12.86	83.38	53.196	37.40	60.748	85.86
	63	192	40	150	106	4	196	154
20.3	9.57	98.76	12.46	84.88	53.090	37.44	60.552	87.40
	68	144	43	103	115	19	211	117
30.3	8.89	100.20	12.03	85.91	52.975	37.25	60.341	88.57
	72	90	43	52	119	37	212	79
June 9.3	8.17	101.10	11.60	86.43	52.856	36.88	60.129	89.36
	75	37	44	1	122	60	215	41
19.2	7.42	101.47	11.16	86.44	52.734	36.28	59.914	89.77
	75	18	41	53	121	77	204	2
29.2	6.67	101.29	10.75	85.91	52.613	35.51	59.710	89.75
	73	72	39	100	116	93	193	43
July 9.2	5.94	100.57	10.36	84.91	52.497	34.58	59.517	89.32
	69	124	36	148	107	107	174	84
19.2	5.25	99.33	10.00	83.43	52.390	33.51	59.343	88.48
	64	173	30	192	97	117	152	124
29.1	4.61	97.60	9.70	81.51	52.293	32.34	59.191	87.24
	55	217	26	232	81	124	125	156
Aug. 8.1	4.06	95.43	9.44	79.19	52.212	31.10	59.066	85.68
	45	254	19	267	60	125	91	192
18.1	3.61	92.89	9.25	76.52	52.152	29.85	58.972	83.76
	33	281	13	297	39	121	60	221
28.1	3.28	90.08	9.12	73.55	52.113	28.64	58.912	81.55
	20	301	5	320	8	115	20	249
Sept. 7.0	3.08	87.07	9.07	70.35	52.105	27.49	58.892	79.06
	4	310	2	339	24	99	28	271
17.0	3.04	83.97	9.09	66.96	52.129	26.50	58.920	76.35
	11	305	10	350	61	79	72	286
27.0	3.15	80.92	9.19	63.46	52.190	25.71	58.992	73.49
	27	291	19	354	105	53	123	301
Oct. 6.9	3.42	78.01	9.38	59.92	52.295	25.18	59.115	70.48
	43	263	27	350	144	23	176	307
16.9	3.85	75.38	9.65	56.42	52.439	24.95	59.291	67.41
	59	226	36	339	187	12	230	307
26.9	4.44	73.12	10.01	53.03	52.626	25.07	59.521	64.34
	71	179	44	320	229	49	285	301
Nov. 5.9	5.15	71.33	10.45	49.83	52.855	25.56	59.806	61.33
	82	124	53	290	266	87	331	287
15.8	5.97	70.09	10.98	46.93	53.121	26.43	60.137	58.46
	90	62	57	256	297	124	376	263
25.8	6.87	69.47	11.55	44.37	53.418	27.67	60.513	55.83
	95	3	64	211	320	156	410	233
Dec. 5.8	7.82	69.50	12.19	42.26	53.738	29.23	60.923	53.50
	98	67	67	158	332	186	431	195
15.8	8.80	70.17	12.86	40.68	54.070	31.09	61.354	51.55
	95	130	69	103	335	211	443	152
25.7	9.75	71.47	13.55	39.65	54.405	33.20	61.797	50.03
	91	193	68	41	326	228	437	100
35.7	10.66	73.40	14.23	39.24	54.731	35.48	62.234	49.03
Mean Place	4.471	73.09	11.606	76.08	51.458	21.38	59.519	82.96
Sec δ, Tan δ	3.986	−3.859	2.577	+2.375	1.051	−0.323	1.500	+1.118
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.050	−0.255	+0.067	+0.158	+0.060	−0.021	+0.063	+0.074
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.40	+0.11	−0.40	+0.10	−0.40	+0.08	−0.40	+0.08

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Leonis. (*Denebola.*) Mag. 2.2		β Virginis. Mag. 3.8		Groombridge 1830. Mag. 6.5		γ Ursæ Majoris. Mag. 2.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 11 45 s	° ′ +14 59 ″	h m 11 46 s	° ′ + 2 11 ″	h m 11 48 s	° ′ +38 15 ″	h m 11 49 s	° ′ +54 6 ″
Jan. 0.7	8.085	62.57	41.252	53.22	32.574	63.82	46.851	65.39
	318	170	312	200	384	121	474	55
10.7	8.403	60.87	41.564	51.22	32.958	62.61	47.325	64.84
	296	141	288	184	382	73	443	0
20.7	8.699	59.46	41.852	49.38	33.320	61.88	47.768	64.84
	265	106	259	162	326	24	401	55
30.6	8.964	58.40	42.111	47.76	33.646	61.64	48.169	65.39
	225	77	220	141	281	24	346	108
Feb. 9.6	9.189	57.63	42.331	46.35	33.927	61.88	48.515	66.47
	186	38	179	109	231	68	283	160
19.6	9.375	57.25	42.510	45.26	34.158	62.56	48.798	68.07
	137	8	138	84	176	107	209	196
Mar. 1.6	9.512	57.17	42.648	44.42	34.334	63.63	49.007	70.03
	93	24	93	54	120	141	138	231
11.5	9.605	57.41	42.741	43.88	34.454	65.04	49.145	72.34
	48	51	52	30	67	164	63	249
21.5	9.653	57.92	42.793	43.58	34.521	66.68	49.208	74.83
	10	69	15	4	16	180	4	259
31.5	9.663	58.61	42.808	43.54	34.537	68.48	49.204	77.42
	23	88	18	15	30	185	68	258
Apr. 10.4	9.640	59.49	42.790	43.69	34.507	70.33	49.136	80.00
	55	96	43	31	68	182	123	244
20.4	9.585	60.45	42.747	44.00	34.439	72.15	49.013	82.44
	74	104	66	46	98	174	168	228
30.4	9.511	61.49	42.681	44.46	34.341	73.89	48.845	84.72
	95	103	84	55	124	157	204	200
May 10.4	9.416	62.52	42.597	45.01	34.217	75.46	48.641	86.72
	107	101	94	63	139	133	229	164
20.3	9.309	63.53	42.503	45.64	34.078	76.79	48.412	88.36
	116	94	104	67	153	107	250	125
30.3	9.193	64.47	42.399	46.31	33.925	77.86	48.162	89.61
	116	82	108	70	155	74	254	81
June 9.3	9.077	65.29	42.291	47.01	33.770	78.60	47.908	90.42
	118	72	108	71	158	43	256	41
19.3	8.959	66.01	42.183	47.72	33.612	79.03	47.652	90.83
	116	57	107	69	152	8	247	7
29.2	8.843	66.58	42.076	48.41	33.460	79.11	47.405	90.76
	111	46	102	66	143	26	234	54
July 9.2	8.732	67.04	41.974	49.07	33.317	78.85	47.171	90.22
	101	24	96	62	130	63	217	95
19.2	8.631	67.28	41.878	49.69	33.187	78.22	46.954	89.27
	86	7	84	53	113	95	192	136
29.1	8.545	67.35	41.794	50.22	33.074	77.27	46.762	87.91
	73	10	69	44	93	127	159	179
Aug. 8.1	8.472	67.25	41.725	50.66	32.981	76.00	46.603	86.12
	56	31	54	33	70	160	127	211
18.1	8.416	66.94	41.671	50.99	32.911	74.40	46.476	84.01
	32	51	32	18	42	188	84	244
28.1	8.384	66.43	41.639	51.17	32.869	72.52	46.392	81.57
	6	73	5	0	8	215	43	272
Sept. 7.0	8.378	65.70	41.634	51.17	32.861	70.37	46.349	78.85
	25	96	24	19	28	240	9	294
17.0	8.403	64.74	41.658	50.98	32.889	67.97	46.358	75.91
	61	120	59	43	68	260	63	312
27.0	8.464	63.54	41.717	50.55	32.957	65.37	46.421	72.79
	96	141	94	66	113	277	121	322
Oct. 7.0	8.560	62.13	41.811	49.89	33.070	62.60	46.542	69.57
	136	161	135	93	159	289	180	328
16.9	8.696	60.52	41.946	48.96	33.229	59.71	46.722	66.29
	177	184	175	119	207	297	241	327
26.9	8.873	58.68	42.121	47.77	33.436	56.74	46.963	63.02
	218	199	216	144	255	297	301	318
Nov. 5.9	9.091	56.69	42.337	46.33	33.691	53.77	47.264	59.84
	255	214	252	167	298	291	357	297
15.8	9.346	54.55	42.589	44.66	33.989	50.86	47.621	56.87
	287	220	283	187	337	278	407	274
25.8	9.633	52.35	42.872	42.79	34.326	48.08	48.028	54.13
	311	222	307	201	368	257	445	236
Dec. 5.8	9.944	50.13	43.179	40.78	34.694	45.51	48.473	51.77
	327	215	322	211	389	227	473	198
15.8	10.271	47.98	43.501	38.67	35.083	43.24	48.946	49.79
	334	204	325	211	399	192	487	146
25.7	10.605	45.94	43.826	36.56	35.482	41.32	49.433	48.33
	328	186	321	207	396	151	486	94
35.7	10.933	44.08	44.147	34.49	35.878	39.81	49.919	47.39
Mean Place	8.025	69.20	41.062	55.45	32.807	77.28	47.360	82.35
Sec δ, Tan δ	1.035	+0.268	1.001	+0.038	1.274	+0.789	1.706	+1.382
Dψα, Dωα	+0.062	+0.018	+0.061	+0.003	+0.062	+0.053	+0.063	+0.092
Dψδ, Dωδ	−0.40	+0.06	−0.40	+0.06	−0.40	+0.05	−0.40	+0.04

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Virginis. Mag. 4.6		o Virginis. Mag. 4.2		δ Centauri. Mag. 2.9		ε Corvi. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 11 56	° ′ + 7 2	h m 12 1	° ′ + 9 9	h m 12 4	° ′ −50 17	h m 12 6	° ′ −22 11
	s	″	s	″	s	″	s	″
Jan. 0.7	55.702	33.79	17.277	33.84	22.575	22.26	10.080	22.70
10.7	56.017 315	31.87 192	17.594 317	31.97 187	23.005 430	24.50 224	10.409 329	24.98 228
20.7	56.311 294	30.19 168	17.891 297	30.31 166	23.401 396	27.08 258	10.718 309	27.33 235
30.6	56.579 268	28.71 148	18.162 271	28.93 138	23.758 357	29.96 288	10.995 277	29.74 241
Feb. 9.6	56.807 228	27.56 115	18.394 232	27.88 105	24.064 306	33.04 308	11.237 242	32.10 236
	191	87	193	78	249	319	199	228
19.6	56.998 115	26.69 55	18.587 153	27.10 42	24.313 192	36.23 325	11.436 158	34.38 214
Mar. 1.6	57.143 104	26.14 24	18.740 106	26.68 13	24.505 135	39.48 321	11.594 111	36.52 195
11.5	57.247 62	25.90 0	18.846 67	26.55 — 14	24.640 76	42.69 308	11.705 72	38.47 175
21.5	57.309 22	25.90 25	18.913 28	26.69 38	24.716 25	45.77 293	11.777 33	40.22 154
31.5	57.331 — 9	26.15 45	18.941 — 5	27.07 57	24.741 — 23	48.70 272	11.810 — 1	41.76 126
Apr. 10.5	57.322	26.60	18.936	27.64	24.718	51.42	11.809	43.02
20.4	57.283 39	27.19 59	18.901 35	28.32 68	24.650 68	53.86 244	11.779 30	44.03 101
30.4	57.224 59	27.89 70	18.843 58	29.14 82	24.543 107	55.98 212	11.724 55	44.84 81
May 10.4	57.143 81	28.65 76	18.764 79	30.02 88	24.403 140	57.75 177	11.645 79	45.35 51
20.3	57.053 90	29.45 80	18.672 92	30.90 88	24.235 168	59.16 141	11.551 94	45.63 28
	104	81	101	87	191	100	106	5
30.3	56.949	30.26	18.571	31.77	24.044	60.16	11.445	45.68
June 9.3	56.841 108	31.05 79	18.461 110	32.59 82	23.835 209	60.74 58	11.328 117	45.48 20
19.3	56.729 112	31.80 75	18.349 112	33.35 76	23.614 221	60.89 — 15	11.204 124	45.06 42
29.2	56.618 111	32.47 67	18.236 113	34.02 67	23.386 228	60.60 29	11.076 128	44.44 62
July 9.2	56.511 107	33.07 60	18.127 109	34.62 60	23.155 231	59.90 70	10.950 126	43.60 84
	101	51	103	44	223	111	125	100
19.2	56.410	33.58	18.024	35.06	22.932	58.79	10.825	42.60
29.2	56.317 93	33.97 39	17.927 97	35.38 32	22.718 214	57.31 148	10.710 115	41.45 115
Aug. 8.1	56.239 78	34.22 25	17.846 81	35.54 16	22.529 189	55.49 182	10.607 103	40.21 124
18.1	56.178 61	34.30 8	17.781 65	35.55 — 1	22.366 163	53.39 210	10.519 88	38.88 133
28.1	56.134 44	34.23 7	17.733 48	35.36 19	22.242 124	51.10 229	10.457 62	37.54 134
	15	26	19	40	81	242	37	131
Sept. 7.0	56.119	33.97	17.714	34.96	22.161	48.68	10.420	36.23
17.0	56.132 13	33.47 50	17.720 6	34.34 62	22.133 — 28	46.24 244	10.418 — 2	35.03 120
27.0	56.180 48	32.78 69	17.764 44	33.52 82	22.164 31	43.86 238	10.452 34	34.02 101
Oct. 7.0	56.263 83	31.82 96	17.842 78	32.44 108	22.259 95	41.63 223	10.531 79	33.21 81
16.9	56.389 126	30.62 120	17.963 121	31.13 131	22.418 159	39.68 195	10.655 124	32.69 52
	164	141	160	153	224	160	169	19
26.9	56.553	29.21	18.123	29.60	22.642	38.08	10.824	32.50
Nov. 5.9	56.760 207	27.53 168	18.325 202	27.83 177	22.929 287	36.89 119	11.038 214	32.68 18
15.9	57.003 213	25.67 186	18.564 239	25.90 193	23.272 343	36.21 68	11.290 252	33.26 58
25.8	57.281 278	23.66 201	18.842 278	23.81 209	23.661 389	36.07 — 14	11.580 290	34.21 95
Dec. 5.8	57.584 303	21.53 213	19.144 302	21.65 216	24.083 422	36.48 41	11.897 317	35.51 130
	320	214	318	217	444	96	335	166
15.8	57.904	19.39	19.462	19.48	24.527	37.44	12.232	37.17
25.7	58.231 327	17.27 212	19.790 328	17.37 211	24.977 450	38.91 147	12.574 342	39.12 195
35.7	58.555 324	15.26 201	20.114 324	15.37 200	25.417 440	40.87 196	12.912 338	41.31 219
Mean Place	55.625	37.27	17.249	37.87	21.570	37.62	9.698	29.81
Sec δ, Tan δ	1.008	+0.124	1.013	+0.161	1.565	−1.204	1.080	−0.408
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.061	+0.008	+0.061	+0.011	+0.062	−0.080	+0.061	−0.027
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.40	+0.01	−0.40	−0.01	−0.40	−0.02	−0.40	−0.03

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 H. Draconis. Mag. 5.1		δ Crucis. Mag. 3.1		δ Ursæ Majoris. Mag. 3.4		γ Corvi. Mag. 2.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 12 8	° ′ ″ +78 2	h m s 12 11	° ′ ″ −58 18	h m s 12 11	° ′ ″ +57 27	h m s 12 11	° ′ ″ −17 6
Jan. 0.7	34.36	19.40	4.396	58.21	36.694	20.54	50.871	46.22
10.7	35.53 117	19.27 13	4.899 503	60.26 205	37.205 511	19.80 74	51.199 325	48.43 221
20.7	36.65 112	19.79 52	5.369 470	62.75 249	37.696 491	19.66 14	51.504 305	50.70 227
30.6	37.68 103	20.95 116	5.790 421	65.59 284	38.146 450	20.11 45	51.781 277	52.95 225
Feb. 9.6	38.60 92	22.68 173	6.154 364	68.71 312	38.543 397	21.15 104	52.022 241	55.13 218
	75	224	301	330	332	154	201	204
19.6	39.35 58	24.92	6.455	72.01	38.875	22.69	52.223	57.17
Mar. 1.6	39.93 39	27.54 262	6.686 231	75.40 339	39.134 259	24.68 199	52.382 159	59.05 188
11.5	40.32 17	30.49 295	6.851 165	78.82 312	39.316 182	27.03 235	52.499 117	60.72 167
21.5	40.49 — 2	33.58 309	6.949 98	82.18 336	39.421 105	29.63 260	52.576 77	62.17 145
31.5	40.47	36.74 316	6.983 34	85.42 324	39.449 28	32.35 272	52.616 40	63.38 121
	21	308	25	303	43	274	6 —	99
Apr. 10.5	40.26	39.82	6.958	88.45	39.406	35.09	52.622	64.37
20.4	39.88 38	42.70 288	6.878 80	91.25 280	39.301 105	37.76 267	52.598 24	65.11 74
30.4	39.34 54	45.28 258	6.749 129	93.73 248	39.141 160	40.23 247	52.550 48	65.64 53
May 10.4	38.67 67	47.50 222	6.577 172	95.87 214	38.936 205	42.45 222	52.481 69	65.94 30
20.3	37.90 77	49.26 176	6.366 211	97.63 176	38.694 242	44.31 186	52.395 86	66.04 — 10
	84	125	240	133	264	148	98	11
30.3	37.06	50.51	6.126	98.96	38.430	45.79	52.297	65.93
June 9.3	36.17 89	51.24 73	5.857 269	99.84 88	38.149 281	46.83 104	52.189 108	65.63 30
19.3	35.27 90	51.40 — 16	5.571 286	100.26 — 42	37.860 289	47.41 58	52.073 116	65.16 47
29.2	34.36 91	51.03 37	5.275 296	100.20 6	37.573 287	47.50 — 9	51.954 119	64.51 65
July 9.2	33.50 86	50.11 92	4.973 302	99.68 52	37.294 279	47.12 38	51.833 121	63.72 79
	82	144	297	99	262	84	116	91
19.2	32.68	48.67	4.676	98.69	37.032	46.28	51.717	62.81
29.2	31.93 75	46.73 194	4.394 282	97.28 141	36.793 239	44.99 129	51.606 111	61.79 102
Aug. 8.1	31.28 65	44.36 237	4.137 257	95.48 180	36.580 213	43.26 173	51.506 100	60.71 108
18.1	30.73 55	41.59 277	3.915 222	93.33 215	36.404 176	41.15 211	51.420 86	59.59 112
28.1	30.29 44	38.51 308	3.738 177	90.92 241	36.265 139	38.70 245	51.356 64	58.49 110
	30	339	122	259	91	277	39	103
Sept. 7.0	29.99 16	35.12	3.616 59	88.33	36.174 38	35.93	51.317 7	57.46
17.0	29.83 1	31.54 358	3.557 — 15	85.66 267	36.136 — 22	32.90 303	51.310 — 29	56.54 92
27.0	29.82 — 15	27.84 370	3.572 94	83.00 266	36.158 82	29.68 322	51.339 70	55.81 73
Oct. 7.0	29.97 31	24.07 377	3.666 171	80.47 253	36.240 148	26.31 337	51.409 114	55.29 52
16.9	30.28 48	20.31 376	3.837 252	78.15 232	36.388 216	22.87 344	51.523 159	55.06 — 23
		363		198		344		8
26.9	30.76	16.68	4.089	76.17	36.604	19.43	51.682	55.14
Nov. 5.9	31.38 62	13.26 342	4.417 328	74.61 156	36.888 284	16.08 335	51.885 203	55.56 42
15.9	32.16 78	10.09 317	4.810 393	73.55 106	37.234 346	12.89 319	52.129 244	56.34 78
25.8	33.08 92	7.33 276	5.262 452	73.03 — 52	37.641 407	9.96 293	52.408 279	57.48 114
Dec. 5.8	34.11 103	5.01 232	5.754 492	73.10 7	38.096 455	7.37 259	52.717 309	58.93 145
	112	179	517	66	491	217	327	175
15.8	35.23	3.22	6.271	73.76	38.587	5.20	53.044	60.68
25.7	36.40 117	2.06 116	6.796 525	74.98 122	39.102 515	3.51 169	53.379 335	62.65 197
35.7	37.59 119	1.50 56	7.313 517	76.74 176	39.623 521	2.40 111	53.711 332	64.81 216
Mean Place	36.701	38.64	3.130	75.69	37.514	37.41	50.598	51.85
Sec δ, Tan δ	4.826	+4.722	1.904	−1.620	1.859	+1.567	1.046	−0.308
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.056	+0.314	+0.063	−0.108	+0.059	+0.104	+0.062	−0.020
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.40	−0.04	−0.40	−0.05	−0.40	−0.05	−0.40	−0.05

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 Canum Venat. Mag. 5.8		β Chamæleontis. Mag. 4.4		η Virginis. Mag. 4.0		α^1 Crucis. Mag. 1.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	12 12	+41 4	12 13	−78 52	12 15	− 0 14	12 22	−62 40
	s	″	s	″	s	″	s	″
Jan. 0.7	15.992	65.53	51.50	44.13	58.031	20.58	19.43	2.46
10.7	16.384 392	64.33 120	52.71 121	45.79 166	58.351 320	22.64 206	20.00 57	4.31 185
20.7	16.758 374	63.64 69	53.82 111	47.97 218	58.649 298	24.56 192	20.54 54	6.64 233
30.7	17.101 343	63.47 17	54.83 101	50.65 268	58.921 272	26.29 173	21.02 48	9.37 273
Feb. 9.6	17.403 302	63.82 35	55.70 87	53.73 308	59.163 242	27.83 154	21.45 43	12.40 303
	253	83	71	338	202	125	36	329
19.6	17.656 200	64.65	56.41 54	57.11	59.365	29.08 98	21.81 28	15.69
Mar. 1.6	17.856 144	65.92 127	56.95 37	60.73 362	59.528 163	30.06 72	22.09 21	19.12 343
11.5	18.000 87	67.56 164	57.32 20	64.47 374	59.648 120	30.78 42	22.30 13	22.58 346
21.5	18.087 35	69.47 191	57.52 3	68.24 377	59.730 82	31.20 19	22.43 6	26.05 347
31.5	18.122 —	71.57 210	57.55 —	71.98 374	59.773 43	31.39 —	22.49 —	29.44 339
	13	219	14	361	10	3	1	321
Apr. 10.5	18.109	73.76	57.41	75.59	59.783 —	31.36	22.48	32.65
20.4	18.052 57	75.96 220	57.11 30	79.03 344	59.766 17	31.17 19	22.40 8	35.65 300
30.4	17.960 92	78.06 210	56.67 44	82.18 315	59.723 43	30.81 36	22.27 13	38.37 272
May 10.4	17.838 122	80.00 194	56.10 57	84.99 281	59.661 62	30.30 51	22.08 19	40.73 236
20.4	17.693 145	81.72 172	55.40 70	87.40 241	59.582 79	29.72 58	21.85 23	42.74 201
	161	144	80	198	93	64	27	160
30.3	17.532	83.16	54.60	89.38	59.489	29.08	21.58	44.34
June 9.3	17.361 171	84.27 111	53.72 88	90.89 151	59.391 98	28.42 66	21.27 31	45.44 110
19.3	17.185 176	85.03 76	52.78 94	91.86 97	59.284 107	27.71 71	20.94 33	46.10 66
29.2	17.008 177	85.41 38	51.80 98	92.26 — 40	59.174 110	27.00 71	20.59 35	46.26 — 16
July 9.2	16.835 173	85.43 — 2	50.81 99	92.13 13	59.064 110	26.31 69	20.23 36	45.92 34
	162	37	97	67	107	65	36	80
19.2	16.673	85.06	49.84	91.46	58.957	25.66	19.87	45.12
29.2	16.522 151	84.32 74	48.91 93	90.23 123	58.854 103	25.03 63	19.53 34	43.84 128
Aug. 8.1	16.389 133	83.21 111	48.06 85	88.54 169	58.763 91	24.52 51	19.21 32	42.13 171
18.1	16.279 110	81.78 143	47.32 74	86.37 217	58.685 78	24.09 43	18.93 28	40.08 205
28.1	16.195 84	80.00 178	46.72 60	83.85 252	58.628 57	23.81 28	18.70 23	37.68 240
	53	208	45	282	38	15	17	261
Sept. 7.1	16.142 15	77.92	46.27 25	81.03	58.590 4	23.66 7	18.53 9	35.07
17.0	16.127 — 26	75.58 234	46.02 — 6	78.01 302	58.586 — 25	23.73 28	18.44 — 1	32.34 273
27.0	16.153 72	73.01 257	45.96 15	74.91 310	58.611 66	24.01 53	18.43 7	29.56 278
Oct. 7.0	16.225 121	70.25 276	46.11 37	71.87 304	58.677 105	24.54 75	18.50 17	26.88 268
16.9	16.346 172	67.35 290	46.48 58	68.94 293	58.782 146	25.29 105	18.67 26	24.38 250
26.9	16.518	64.36	47.06	66.31	58.928	26.34	18.93	22.17
Nov. 5.9	16.742 224	61.35 301	47.83 77	64.05 226	59.119 191	27.64 130	19.28 35	20.36 181
15.9	17.014 272	58.39 296	48.77 94	62.29 176	59.349 230	29.18 154	19.70 42	19.03 133
25.8	17.331 317	55.56 283	49.84 107	61.07 122	59.614 265	30.96 178	20.20 50	18.22 81
Dec. 5.8	17.686 355	52.95 261	51.02 118	60.46 — 61	59.909 295	32.91 195	20.74 54	18.01 — 21
	380	232	124	3	313	206	57	39
15.8	18.066	50.63	52.26	60.49	60.222	34.97	21.31	18.40
25.8	18.464 398	48.69 194	53.51 125	61.17 68	60.548 326	37.09 212	21.90 59	19.38 98
35.7	18.864 400	47.17 152	54.74 123	62.47 130	60.872 324	39.17 208	22.48 58	20.91 153
Mean Place	16.445	78.89	47.568	64.89	57.985	20.45	18.075	21.37
Sec δ, Tan δ	1.327	+0.872	5.188	−5.090	1.000	−0.004	2.178	−1.935
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.060	+0.058	+0.069	−0.339	+0.061	0.000	+0.066	−0.128
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.40	−0.05	−0.40	−0.06	−0.40	−0.07	−0.40	−0.10

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	20 Comæ. Mag. 5.7		δ Corvi. Mag. 3.1		γ Crucis. Mag. 1.6		8 Canum Venat. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	12 25	+21 18	12 25	−16 5	12 26	−56 40	12 30	+41 46
	s	″	s	″	s	″	s	″
Jan. 0.7	51.063	73.32	52.849	6.98	53.876	37.37	4.871	19.37
	337	174	327	217	496	190	394	132
10.7	51.400	71.58	53.176	9.15	54.372	39.27	5.265	18.05
	322	141	310	219	467	232	382	84
20.7	51.722	70.17	53.486	11.34	54.839	41.59	5.647	17.21
	297	102	284	217	426	270	353	28
30.7	52.019	69.15	53.770	13.51	55.265	44.29	6.000	16.93
	264	60	250	212	375	298	318	24
Feb. 9.6	52.283	68.55	54.020	15.63	55.640	47.27	6.318	17.17
	225	21	216	201	316	317	270	77
19.6	52.508	68.34	54.236	17.64	55.956	50.44	6.588	17.94
	182	19	172	181	255	328	221	120
Mar. 1.6	52.690	68.53	54.408	19.45	56.211	53.72	6.809	19.14
	139	55	133	160	189	332	164	161
11.6	52.829	69.08	54.541	21.05	56.400	57.04	6.973	20.75
	94	81	90	139	127	329	110	192
21.5	52.923	69.92	54.631	22.44	56.527	60.33	7.083	22.67
	51	110	56	119	66	317	54	214
31.5	52.974	71.02	54.687	23.63	56.593	63.50	7.137	24.81
	16	127	20	93	9	300	9	227
Apr. 10.5	52.990	72.29	54.707	24.56	56.602	66.50	7.146	27.08
	19	139	7	69	44	279	37	229
20.4	52.971	73.68	54.700	25.25	56.558	69.29	7.109	29.37
	46	143	35	50	93	251	79	222
30.4	52.925	75.11	54.665	25.75	56.465	71.80	7.030	31.59
	70	142	57	26	137	219	110	209
May 10.4	52.855	76.53	54.608	26.01	56.328	73.99	6.920	33.68
	89	134	76	8	176	183	135	187
20.4	52.766	77.87	54.532	26.09	56.152	75.82	6.785	35.55
	103	125	92	9	210	112	157	162
30.3	52.663	79.12	54.440	26.00	55.942	77.24	6.628	37.17
	115	107	99	28	237	100	171	127
June 9.3	52.548	80.19	54.341	25.72	55.705	78.24	6.457	38.44
	121	91	112	17	260	56	179	96
19.3	52.427	81.10	54.229	25.25	55.445	78.80	6.278	39.40
	126	70	118	57	274	9	184	55
29.3	52.301	81.80	54.111	24.68	55.171	78.89	6.094	39.95
	125	47	120	74	283	36	182	17
July 9.2	52.176	82.27	53.991	23.94	54.888	78.53	5.912	40.12
	123	23	123	85	283	82	179	24
19.2	52.053	82.50	53.868	23.09	54.605	77.71	5.733	39.88
	115	2	114	93	275	125	167	63
29.2	51.938	82.48	53.754	22.16	54.330	76.46	5.566	39.25
	106	26	106	100	255	163	153	101
Aug. 8.1	51.832	82.22	53.648	21.16	54.075	74.83	5.413	38.24
	91	54	91	102	227	199	135	137
18.1	51.741	81.68	53.554	20.14	53.848	72.84	5.278	36.87
	72	77	75	100	186	225	108	171
28.1	51.669	80.91	53.479	19.14	53.662	70.59	5.170	35.16
	49	104	50	96	138	246	78	204
Sept. 7.1	51.620	79.87	53.429	18.18	53.524	68.13	5.092	33.12
	18	128	21	82	79	257	41	231
17.0	51.602	78.59	53.408	17.36	53.445	65.56	5.051	30.81
	14	154	16	69	11	257	1	259
27.0	51.616	77.05	53.424	16.67	53.434	62.99	5.050	28.22
	55	179	56	44	63	249	45	280
Oct. 7.0	51.671	75.26	53.480	16.23	53.497	60.50	5.095	25.42
	94	199	102	19	141	229	97	295
17.0	51.765	73.27	53.582	16.04	53.638	58.21	5.192	22.47
	140	219	143	11	218	199	147	305
26.9	51.905	71.08	53.725	16.15	53.856	56.22	5.339	19.42
	185	235	191	45	295	160	202	310
Nov. 5.9	52.090	68.73	53.916	16.60	54.151	54.62	5.541	16.32
	228	244	234	78	361	114	253	306
15.9	52.318	66.29	54.150	17.38	54.512	53.48	5.794	13.26
	267	250	266	113	419	62	298	297
25.8	52.585	63.79	54.416	18.51	54.931	52.86	6.092	10.29
	301	245	302	142	466	4	342	274
Dec. 5.8	52.886	61.34	54.718	19.93	55.397	52.82	6.434	7.55
	324	236	321	171	497	51	372	244
15.8	53.210	58.98	55.039	21.64	55.894	53.33	6.806	5.11
	338	219	333	192	508	108	393	212
25.8	53.548	56.79	55.372	23.56	56.402	54.41	7.199	2.99
	342	194	332	212	506	161	396	164
35.7	53.890	54.85	55.704	25.68	56.908	56.02	7.595	1.35
Mean Place	51.324	80.45	52.676	12.89	52.865	55.26	5.470	32.25
Sec δ, Tan δ	1.074	+0.390	1.041	−0.288	1.821	−1.521	1.341	+0.893
$D_{\psi a}$, $D_{\omega a}$	+0.060	+0.026	+0.062	−0.019	+0.066	−0.101	+0.058	+0.059
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.40	−0.11	−0.40	−0.11	−0.40	−0.12	−0.39	−0.13

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Draconis. Mag. 3.9		β Corvi. Mag. 2.8		24 Comæ *seq.* Mag. 5.2		α Muscæ. Mag. 2.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	12 30	+70 12	12 30	−22 58	12 31	+18 47	12 32	−68 42
Jan. 0.7	10.63	27.19	20.517	7.53	15.831	56.34	35.99	21.02
	75	−63	337	216	333	181	70	161
10.7	11.38	26.56	20.854	9.69	16.164	54.53	36.69	22.63
	74	0	321	225	320	151	67	213
20.7	12.12	26.56	21.175	11.94	16.484	53.02	37.36	24.76
	69	63	296	232	295	113	61	257
30.7	12.81	27.19	21.471	14.26	16.779	51.89	37.97	27.33
	62	127	260	231	265	74	54	294
Feb. 9.6	13.43	28.46	21.731	16.57	17.044	51.15	38.51	30.27
	53	184	225	225	225	34	46	323
19.6	13.96	30.30	21.956	18.82	17.269	50.81	38.97	33.50
	42	229	181	211	185	4	37	344
Mar. 1.6	14.38	32.59	22.137	20.93	17.454	50.85	39.34	36.94
	31	263	141	199	141	39	27	355
11.6	14.69	35.22	22.278	22.92	17.595	51.24	39.61	40.49
	19	292	100	176	100	70	19	357
21.5	14.88	38.14	22.378	24.68	17.695	51.94	39.80	44.06
	6	304	58	156	57	94	9	353
31.5	14.94	41.18	22.436	26.24	17.752	52.88	39.89	47.59
	5	305	29	133	22	115	1	341
Apr. 10.5	14.89	44.23	22.465	27.57	17.774	54.03	39.90	51.00
	15	295	6	112	12	127	8	323
20.4	14.74	47.18	22.459	28.69	17.762	55.30	39.82	54.23
	26	274	32	87	39	134	16	298
30.4	14.48	49.92	22.427	29.56	17.723	56.64	39.66	57.21
	34	244	57	62	62	134	22	266
May 10.4	14.14	52.36	22.370	30.18	17.661	57.98	39.44	59.87
	40	205	76	38	83	129	30	228
20.4	13.74	54.41	22.294	30.56	17.578	59.27	39.14	62.15
	46	164	92	17	97	120	34	188
30.3	13.28	56.05	22.202	30.73	17.481	60.47	38.80	64.03
	50	113	108	6	109	107	40	142
June 9.3	12.78	57.18	22.094	30.67	17.372	61.54	38.40	65.45
	51	60	118	29	117	92	43	94
19.3	12.27	57.78	21.976	30.38	17.255	62.46	37.97	66.39
	53	7	126	51	121	74	47	44
29.3	11.74	57.85	21.850	29.87	17.134	63.20	37.50	66.83
	51	48	130	67	123	52	47	9
July 9.2	11.23	57.37	21.720	29.20	17.011	63.72	37.03	66.74
	49	97	130	88	121	32	48	61
19.2	10.74	56.40	21.590	28.32	16.890	64.04	36.55	66.13
	47	146	128	105	116	8	47	110
29.2	10.27	54.94	21.462	27.27	16.774	64.12	36.08	65.03
	41	197	118	115	106	16	43	158
Aug. 8.1	9.86	52.97	21.344	26.12	16.668	63.96	35.65	63.45
	37	237	101	124	94	40	39	198
18.1	9.49	50.60	21.240	24.88	16.574	63.56	35.26	61.47
	31	276	86	127	75	65	33	236
28.1	9.18	47.84	21.154	23.61	16.499	62.91	34.93	59.11
	22	306	55	126	52	88	25	263
Sept. 7.1	8.96	44.78	21.099	22.35	16.447	62.03	34.68	56.48
	15	335	30	119	24	113	16	281
17.0	8.81	41.43	21.069	21.16	16.423	60.90	34.52	53.67
	6	357	9	105	9	140	5	289
27.0	8.75	37.86	21.078	20.11	16.432	59.50	34.47	50.78
	4	367	53	88	49	164	5	287
Oct. 7.0	8.79	34.19	21.131	19.23	16.481	57.86	34.52	47.91
	14	374	100	58	89	187	18	273
17.0	8.93	30.45	21.231	18.65	16.570	55.99	34.70	45.18
	25	369	145	32	132	205	29	248
26.9	9.18	26.76	21.376	18.33	16.702	53.94	34.99	42.70
	35	358	193	6	178	225	40	210
Nov. 5.9	9.53	23.18	21.569	18.39	16.880	51.69	35.39	40.60
	45	337	238	41	222	236	50	166
15.9	9.98	19.81	21.807	18.80	17.102	49.33	35.89	38.94
	55	308	277	82	261	243	58	113
25.8	10.53	16.73	22.084	19.62	17.363	46.90	36.47	37.81
	63	269	307	114	295	243	66	54
Dec. 5.8	11.16	14.04	22.391	20.76	17.658	44.47	37.13	37.27
	69	220	332	151	317	235	69	7
15.8	11.85	11.84	22.723	22.27	17.975	42.12	37.82	37.34
	74	167	342	180	333	222	72	69
25.8	12.59	10.17	23.065	24.07	18.308	39.90	38.54	38.03
	76	103	346	204	338	200	72	127
35.7	13.35	9.14	23.411	26.11	18.646	37.90	39.26	39.30
Mean Place	12.375	45.08	20.283	16.00	16.094	62.42	34.353	41.42
Sec δ, Tan δ	2.954	+2.779	1.086	−0.424	1.056	+0.340	2.754	−2.566
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.051	+0.184	+0.063	−0.028	+0.060	+0.022	+0.071	−0.169
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.39	−0.13	−0.39	−0.13	−0.39	−0.14	−0.39	−0.14

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Virginis. Mag. 4.8		γ Centauri. Mag. 2.4		γ Virginis (*mean*). Mag. 2.9		ρ Virginis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	12 35	− 7 34	12 37	−48 31	12 37	− 1 1	12 37	+10 39
	s	″	s	″	s	″	s	″
Jan. 0.7	16.217	16.10	16.371	57.44	45.458	37.19	59.065	31.58
	323	209	436	190	320	206	325	197
10.7	16.540	18.19	16.807	59.34	45.778	39.25	59.390	29.61
	307	205	411	227	306	195	314	172
20.7	16.847	20.24	17.218	61.61	46.084	41.20	59.704	27.89
	285	196	379	257	284	178	289	144
30.7	17.132	22.20	17.597	64.18	46.368	42.98	59.993	26.45
	253	181	335	281	254	155	262	110
Feb. 9.6	17.385	24.01	17.932	66.99	46.622	44.53	60.255	25.35
	218	159	290	295	218	131	223	76
19.6	17.603	25.60	18.222	69.94	46.840	45.84	60.478	24.59
	179	137	236	303	180	103	185	41
Mar. 1.6	17.782	26.97	18.458	72.97	47.020	46.87	60.663	24.18
	140	112	182	303	141	75	146	9
11.6	17.922	28.09	18.640	76.00	47.161	47.62	60.809	24.09
	100	88	131	296	101	49	102	22
21.5	18.022	28.97	18.771	78.96	47.262	48.11	60.911	24.31
	64	63	79	284	65	23	67	46
31.5	18.086	29.60	18.850	81.80	47.327	48.34	60.978	24.77
	30	42	31	268	31	1	30	69
Apr. 10.5	18.116	30.02	18.881	84.48	47.358	48.35	61.008	25.46
	1	20	13	245	2	19	1	85
20.4	18.117	30.22	18.868	86.93	47.360	48.16	61.007	26.31
	25	2	54	218	25	34	28	94
30.4	18.092	30.24	18.814	89.11	47.335	47.82	60.979	27.25
	47	14	89	190	16	46	51	101
May 10.4	18.045	30.10	18.725	91.01	47.289	47.36	60.928	28.26
	66	29	123	156	66	56	69	103
20.4	17.979	29.81	18.602	92.57	47.223	46.80	60.859	29.29
	80	39	150	120	80	64	86	100
30.3	17.899	29.42	18.452	93.77	47.143	46.16	60.773	30.29
	93	50	175	82	92	67	96	96
June 9.3	17.806	28.92	18 277	94.59	47 051	45.49	60.677	31.25
	102	60	194	43	101	71	106	87
19.3	17.704	28.32	18.083	95.02	46.950	44.78	60.571	32.12
	109	65	209	1	108	70	112	75
29.3	17.595	27.67	17.874	95.03	46.842	44.08	60.459	32.87
	114	71	217	39	113	68	117	62
July 9.2	17.481	26.96	17.657	94.64	46.729	43.40	60.342	33.49
	114	73	220	77	113	65	115	49
19.2	17.367	26.23	17.437	93.87	46.616	42.75	60.227	33.98
	112	75	217	117	111	61	112	33
29.2	17.255	25.48	17.220	92.70	46.505	42.14	60.115	34.31
	105	73	204	149	105	53	104	13
Aug. 8.1	17.150	24.75	17.016	91.21	46.400	41.61	60.011	34.44
	93	68	185	180	94	14	93	4
18.1	17.057	24.07	16.831	89.41	46.306	41.17	59.918	34.40
	76	62	155	202	77	32	77	24
28.1	16.981	23.45	16.676	87.39	46.229	40.85	59.841	34.16
	55	50	117	220	56	16	55	45
Sept. 7.1	16.926	22.95	16.559	85.19	46.173	40.69	59.786	33.71
	26	36	68	228	28	1	29	69
17.0	16.900	22.59	16.491	82.91	46.145	40.70	59.757	33.02
	7	17	15	227	3	23	4	91
27.0	16.907	22.42	16.476	80.64	46.148	40.93	59.761	32.11
	44	5	42	217	41	15	43	117
Oct. 7.0	16.951	22.47	16.518	78.47	46.189	41.38	59.804	30.94
	87	32	111	197	83	71	82	140
17.0	17.038	22.79	16.629	76.50	46.272	42.09	59.886	29.54
	132	60	176	169	126	97	125	165
26.9	17.170	23.39	16.805	74.81	46.398	43.06	60.011	27.89
	176	88	241	131	171	121	171	186
Nov. 5.9	17.346	24.27	17.046	73.50	46.569	44.30	60.182	26.03
	218	118	300	88	213	149	212	203
15.9	17.564	25.45	17.346	72.62	46.782	45.79	60.394	24.00
	258	144	352	39	252	171	251	217
25.8	17.822	26.89	17.698	72.23	47.034	47.50	60.645	21.83
	288	170	395	13	282	191	285	225
Dec. 5.8	18.110	28.59	18.093	72.36	47.316	49.41	60.930	19.58
	312	189	423	65	307	204	309	227
15.8	18.422	30.48	18.516	73.01	47.623	51.45	61.239	17.31
	324	202	440	117	321	210	325	221
25.8	18.746	32.50	18.956	74.18	47.944	53.55	61.564	15.10
	327	211	438	163	325	210	328	210
35.7	19.073	34.61	19.394	75.81	48.269	55.65	61.892	13.00
Mean Place	16.201	19.38	15.733	73.90	45.530	38.25	59.272	34.61
Sec δ, Tan δ	1.009	−0.133	1.510	−1.132	1.000	−0.018	1.018	+0.188
$D_{\psi a}$, $D_{\omega a}$	+0.062	−0.009	+0.066	−0.074	+0.061	−0.001	+0.060	+0.012
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.39	−0.15	−0.39	−0.16	−0.39	−0.16	−0.39	−0.16

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	76 Ursæ Majoris. Mag. 5.9		β Crucis. Mag. 1.5		31 Comæ. Mag. 5.1		n Centauri. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 12 38 s	° ′ +63 7 ″	h m 12 43 s	° ′ −59 15 ″	h m 12 47 s	° ′ +27 57 ″	h m 12 49 s	° ′ −39 45 ″
Jan. 0.8	11.07	51.43	13.476	46.34	56.460	25.43	10.299	22.97
	59	93	534	165	349	178	391	188
10.7	11.66	50.50	14.010	47.99	56.809	23.65	10.690	24.85
	58	30	510	212	341	135	374	219
20.7	12.24	50.20	14.520	50.11	57.150	22.30	11.064	27.04
	54	34	472	251	319	92	318	243
30.7	12.78	50.54	14.992	52.62	57.469	21.38	11.412	29.47
	49	94	422	284	288	45	312	258
Feb. 9.6	13.27	51.48	15.414	55.46	57.757	20.93	11.724	32.05
	43	153	364	308	252	1	274	267
19.6	13.70	53.01	15.778	58.54	58.009	20.94	11.998	34.72
	34	201	298	321	213	46	227	271
Mar. 1.6	14.04	55.02	16.076	61.75	58.222	21.40	12.225	37.43
	26	242	234	331	164	85	180	266
11.6	14.30	57.44	16.310	65.06	58.386	22.25	12.405	40.09
	17	269	169	331	124	117	136	258
21.5	14.47	60.13	16.479	68.37	58.510	23.42	12.541	42.67
	8	289	103	324	76	145	92	243
31.5	14.55	63.02	16.582	71.61	58.586	24.87	12.633	45.10
	1	295	10	312	37	166	49	224
Apr. 10.5	14.54	65.97	16.622	74.73	58.623	26.53	12.682	47.34
	9	289	19	293	2	176	12	204
20.5	14.45	68.86	16.603	77.66	58.621	28.29	12.694	49.38
	16	274	73	268	33	178	24	180
30.4	14.29	71.60	16.530	80.34	58.588	30.07	12.670	51.18
	22	247	123	237	62	176	54	153
May 10.4	14.07	74.07	16.407	82.71	58.526	31.83	12.616	52.71
	27	215	168	204	84	164	83	124
20.4	13.80	76.22	16.239	84.75	58.442	33.47	12.533	53.95
	31	173	209	164	104	151	107	94
30.3	13.49	77.95	16.030	86.39	58.338	34.98	12.426	54.89
	34	129	214	123	119	130	130	60
June 9.3	13.15	79.24	15.786	87.62	58.219	36.28	12.296	55.49
	36	82	273	80	130	107	149	28
19.3	12.79	80.06	15.513	88.42	58.089	37.35	12.147	55.77
	37	31	295	33	136	81	161	8
29.3	12.42	80.37	15.218	88.75	57.953	38.16	11.986	55.69
	37	21	309	14	112	19	173	40
July 9.2	12.05	80.16	14.909	88.61	57.811	38.65	11.813	55.29
	35	70	313	62	111	23	177	73
19.2	11.70	79.46	14.596	87.99	57.670	38.88	11.636	54.56
	34	119	311	105	140	10	177	103
29.2	11.36	78.27	14.285	86.94	57.530	38.78	11.459	53.53
	30	167	292	147	129	43	170	133
Aug. 8.2	11.06	76.60	13.993	85.47	57.401	38.35	11.289	52.20
	27	208	267	187	116	70	157	151
18.1	10.79	74.52	13.726	83.60	57.285	37.65	11.132	50.66
	23	249	226	216	99	104	133	174
28.1	10.56	72.03	13.500	81.44	57.186	36.61	10.999	48.92
	18	283	179	212	77	130	103	185
Sept. 7.1	10.38	69.20	13.321	79.02	57.109	35.31	10.896	47.07
	11	311	115	257	47	163	65	190
17.0	10.27	66.09	13.206	76.45	57.062	33.68	10.831	45.17
	5	336	43	263	13	187	22	188
27.0	10.22	62.73	13.163	73.82	57.049	31.81	10.809	43.29
	2	352	31	258	28	212	31	176
Oct. 7.0	10.24	59.21	13.197	71.24	57.077	29.69	10.840	41.53
	10	363	118	243	70	235	87	158
17.0	10.34	55.58	13.315	68.81	57.147	27.34	10.927	39.95
	18	363	204	218	117	251	111	128
26.9	10.52	51.95	13.519	66.63	57.264	24.80	11.071	38.67
	27	358	284	182	165	266	202	95
Nov. 5.9	10.79	48.37	13.803	64.81	57.429	22.14	11.273	37.72
	34	342	363	139	215	273	258	54
15.9	11.13	44.95	14.166	63.42	57.644	19.41	11.531	37.18
	42	317	428	91	255	276	304	9
25.9	11.55	41.78	14.594	62.51	57.899	16.65	11.835	37.09
	48	282	481	33	295	268	346	37
Dec. 5.8	12.03	38.96	15.075	62.18	58.194	13.97	12.181	37.46
	54	241	520	23	322	253	373	83
15.8	12.57	36.55	15.595	62.41	58.516	11.44	12.554	38.29
	57	189	540	80	344	229	391	127
25.8	13.14	34.66	16.135	63.21	58.860	9.15	12.945	39.56
	60	134	540	134	354	202	395	168
35.7	13.74	33.32	16.675	64.55	59.214	7.13	13.340	41.24
Mean Place	12.429	68.16	12.560	65.49	56.948	33.71	9.948	37.51
Sec δ, Tan δ	2.213	+1.974	1.957	−1.682	1.132	+0.531	1.301	−0.832
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.052	+0.130	+0.070	−0.110	+0.058	+0.035	+0.066	−0.054
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.39	−0.17	−0.39	−0.19	−0.39	−0.21	−0.39	−0.21

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		ε Ursæ Majoris. (*Alioth.*) Mag. 1.7		δ Virginis. Mag. 3.7		α Can. Ven. *seq.* Mag. 2.9		δ Muscæ. Mag. 3.6	
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
		h m	° ′	h m	° ′	h m	° ′	h m	° ′
		12 50	+56 22	12 51	+ 3 48	12 52	+38 43	12 56	−71 7
		s	″	s	″	s	″	s	″
Jan.	0.8	37.644	23.91	43.225	56.12	25.015	50.97	58.12	40.28
		500	125	321	205	383	163	80	122
	10.7	38.144	22.66	43.546	54.07	25.398	49.34	58.92	41.50
		490	64	312	187	372	110	77	177
	20.7	38.634	22.02	43.858	52.20	25.770	48.24	59.69	43.27
		465	2	290	164	353	59	72	225
	30.7	39.099	22.00	44.148	50.56	26.123	47.65	60.41	45.52
		424	59	264	140	322	6	66	267
Feb.	9.6	39.523	22.59	44.412	49.16	26.445	47.59	61.07	48.19
		373	117	229	110	282	45	57	301
	19.6	39.896	23.76	44.641	48.06	26.727	48.04	61.64	51.20
		309	168	193	80	235	95	47	325
Mar.	1.6	40.205	25.44	44.834	47.26	26.962	48.99	62.11	54.45
		240	211	156	48	185	135	39	343
	11.6	40.445	27.55	44.990	46.78	27.147	50.34	62.50	57.88
		168	246	115	21	136	173	28	354
	21.5	40.613	30.01	45.105	46.57	27.283	52.07	62.78	61.42
		96	267	80	7	83	199	19	355
	31.5	40.709	32.68	45.185	46.64	27.366	54.06	62.97	64.97
		25	279	43	29	39	213	9	346
Apr.	10.5	40.734	35.47	45.228	46.93	27.405	56.19	63.06	68.43
		40	280	15	18	6	224	2	335
	20.5	40.694	38.27	45.243	47.41	27.399	58.43	63.04	71.78
		98	271	13	62	46	222	10	314
	30.4	40.596	40.98	45.230	48.03	27.353	60.65	62.94	74.92
		149	249	36	72	79	215	19	289
May	10.4	40.447	43.47	45.194	48.75	27.274	62.80	62.75	77.81
		191	223	57	79	107	197	27	255
	20.4	40.256	45.70	45.137	49.54	27.167	64.77	62.48	80.36
		228	187	74	82	120	172	34	217
	30.3	40.028	47.57	45.063	50.36	27.038	66.49	62.14	82.53
		252	148	88	82	118	146	42	175
June	9.3	39.776	49.05	44.975	51.18	26.890	67.95	61.72	84.28
		269	103	99	79	163	115	46	129
	19.3	39.507	50.08	44.876	51.97	26.727	69.10	61.26	85.57
		282	58	107	75	169	77	51	79
	29.3	39.225	50.66	44.769	52.72	26.558	69.87	60.75	86.36
		284	7	115	68	175	41	53	26
July	9.2	38.941	50.73	44.654	53.40	26.383	70.28	60.22	86.62
		280	40	116	60	171	1	55	25
	19.2	38.661	50.33	44.538	54.00	26.209	70.29	59.67	86.37
		269	88	115	49	168	36	54	77
	29.2	38.392	49.45	44.423	54.49	26.041	69.93	59.13	85.60
		251	131	111	40	160	73	53	126
Aug.	8.2	38.141	48.14	44.312	54.89	25.881	69.20	58.60	84.34
		226	177	103	23	146	113	48	173
	18.1	37.915	46.37	44.209	55.12	25.735	68.07	58.12	82.61
		194	216	87	10	123	115	42	214
	28.1	37.721	44.21	44.122	55.22	25.612	66.62	57.70	80.47
		155	253	66	10	100	182	34	247
Sept.	7.1	37.566	41.68	44.056	55.12	25.512	64.80	57.36	78.00
		108	285	13	29	64	210	25	272
	17.0	37.458	38.83	44.013	54.83	25.448	62.70	57.11	75.28
		56	311	8	51	29	242	14	287
	27.0	37.402	35.72	44.005	54.32	25.419	60.28	56.97	72.41
		4	332	26	75	17	262	1	292
Oct.	7.0	37.406	32.40	44.031	53.57	25.436	57.66	56.96	69.49
		70	347	68	99	64	286	13	285
	17.0	37.476	28.93	44.099	52.58	25.500	54.80	57.09	66.64
		138	353	112	124	117	300	25	265
	26.9	37.614	25.40	44.211	51.34	25.617	51.80	57.34	63.99
		208	351	157	149	169	308	38	236
Nov.	5.9	37.822	21.86	44.368	49.85	25.786	48.72	57.72	61.63
		276	345	199	172	221	309	50	196
	15.9	38.098	18.41	44.567	48.13	26.007	45.63	58.22	59.67
		343	326	240	191	271	303	62	147
	25.9	38.441	15.15	44.807	46.22	26.278	42.60	58.84	58.20
		397	296	275	205	312	287	69	91
Dec.	5.8	38.838	12.19	45.082	44.17	26.590	39.73	59.53	57.29
		447	260	301	214	318	265	76	33
	15.8	39.285	9.59	45.383	42.03	26.938	37.08	60.29	56.96
		481	215	317	216	370	229	79	28
	25.8	39.766	7.44	45.700	39.87	27.308	34.79	61.08	57.24
		498	161	324	212	383	194	80	88
	35.7	40.264	5.83	46.024	37.75	27.691	32.85	61.88	58.12
Mean Place		38.817	39.03	43.434	56.19	25.715	62.12	56.736	61.95
Sec δ, Tan δ		1.806	+1.504	1.002	+0.067	1.282	+0.802	3.093	−2.927
$D_{\psi\alpha}$, $D_{\omega\alpha}$		+0.052	+0.098	+0.061	+0.004	+0.056	+0.052	+0.080	−0.189
$D_{\psi\delta}$, $D_{\omega\delta}$		−0.39	−0.22	−0.39	−0.22	−0.39	−0.23	−0.39	−0.25

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Virginis. Mag. 3.0		θ Virginis. Mag. 4.4		43 Comæ. Mag. 4.3		20 Canum Venat. Mag. 4.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 12 58	° ′ +11 22	h m 13 5	° ′ − 5 7	h m 13 8	° ′ +28 15	h m 13 14	° ′ +40 58
	s	″	s	″	s	″	s	″
Jan. 0.8	20.298	19.21	57.460	38.16	16.311	57.86	4.720	28.96
	325	201	323	206	348	187	388	178
10.7	20.623	17.20	57.783	40.22	16.659	55.99	5.108	27.18
	317	175	316	198	343	148	386	127
20.7	20.940	15.45	58.099	42.20	17.002	54.51	5.494	25.91
	298	147	297	187	327	103	370	74
30.7	21.238	13.98	58.396	44.07	17.329	53.48	5.864	25.17
	272	112	271	169	300	53	342	17
Feb. 9.7	21.510	12.86	58.667	45.76	17.629	52.95	6.206	25.00
	238	78	240	147	266	6	307	38
19.6	21.748	12.08	58.907	47.23	17.895	52.89	6.513	25.38
	202	42	208	121	226	40	263	90
Mar. 1.6	21.950	11.66	59.115	48.44	18.121	53.29	6.776	26.28
	164	6	166	101	185	82	214	137
11.6	22.114	11.60	59.281	49.45	18.306	54.11	6.990	27.65
	123	23	133	71	140	117	164	176
21.6	22.237	11.83	59.414	50.16	18.446	55.28	7.154	29.41
	87	51	95	47	100	147	112	205
31.5	22.324	12.34	59.509	50.63	18.546	56.75	7.266	31.46
	49	76	62	24	55	171	64	226
Apr. 10.5	22.373	13.10	59.571	50.87	18.601	58.46	7.330	33.72
	21	91	31	5	20	184	18	238
20.5	22.394	14.01	59.602	50.92	18.621	60.30	7.348	36.10
	12	104	5	13	17	190	24	238
30.4	22.382	15.05	59.607	50.79	18.604	62.20	7.324	38.48
	33	111	23	29	44	188	62	232
May 10.4	22.349	16.16	59.584	50.50	18.560	64.08	7.262	40.80
	58	112	42	40	71	180	94	215
20.4	22.291	17.28	59.542	50.10	18.489	65.88	7.168	42.95
	76	109	63	51	92	165	122	194
30.4	22.215	18.37	59.479	49.59	18.397	67.53	7.046	44.89
	89	102	78	54	112	146	145	165
June 9.3	22.126	19.39	59.401	49.05	18,285	68.99	6.901	46.54
	101	96	92	63	126	123	163	132
19.3	22.025	20.35	59.309	48.42	18.159	70.22	6.738	47.86
	112	82	105	66	137	97	175	96
29.3	21.913	21.17	59.204	47.76	18.022	71.19	6.563	48.82
	118	68	113	68	146	66	185	57
July 9.3	21.795	21.85	59.091	47.08	17.876	71.85	6.378	49.39
	121	52	118	67	149	36	189	16
19.2	21.674	22.37	58.973	46.41	17.727	72.21	6.189	49.55
	121	35	120	64	148	3	188	23
29.2	21.553	22.72	58.853	45.77	17.579	72.24	6.001	49.32
	117	18	116	61	144	27	182	64
Aug. 8.2	21.436	22.90	58.737	45.16	17.435	71.97	5.819	48.68
	107	3	110	56	133	63	170	105
18.1	21.329	22.87	58.627	44.60	17.302	71.34	5.649	47.63
	94	25	99	46	119	92	153	141
28.1	21.235	22.62	58.528	44.14	17.183	70.42	5.496	46.22
	76	46	77	37	100	123	128	179
Sept. 7.1	21.159	22.16	58.451	43.77	17.083	69.19	5.368	44.43
	49	70	57	19	71	154	98	214
17.1	21.110	21.46	58.394	43.58	17.012	67.65	5.270	42.29
	16	96	19	0	39	183	60	242
27.0	21.094	20.50	58.375	43.58	16.973	65.82	5.210	39.87
	19	117	13	22	1	210	16	271
Oct. 7.0	21.113	19.33	58.388	43.80	16.974	63.72	5.194	37.16
	62	145	57	44	45	233	33	292
17.0	21.175	17.88	58.445	44.24	17.019	61.39	5.227	34.24
	105	168	102	69	92	252	87	310
26.9	21.280	16.20	58.547	44.93	17.111	58.87	5.314	31.14
	150	188	147	96	141	268	143	320
Nov. 5.9	21.430	14.32	58.694	45.89	17.252	56.19	5.457	27.94
	193	208	193	126	190	278	198	323
15.9	21.623	12.24	58.887	47.15	17.442	53.41	5.655	24.71
	237	221	232	149	237	280	251	318
25.9	21.860	10.03	59.119	48.64	17.679	50.61	5.906	21.53
	270	229	269	171	279	275	300	304
Dec. 5.8	22.130	7.74	59.388	50.35	17.958	47.86	6.206	18.49
	300	231	299	189	309	263	340	281
15.8	22.430	5.43	59.687	52.24	18.267	45.23	6.546	15.68
	319	226	316	199	336	239	368	248
25.8	22.749	3.17	60.003	54.23	18.603	42.84	6.914	13.20
	327	213	324	206	348	211	387	207
35.8	23.076	1.04	60.327	56.29	18.951	40.73	7.301	11.13
Mean Place	20.632	21.64	57.657	41.85	16.932	65.32	5.617	39.64
Sec δ, Tan δ	1.020	+0.201	1.004	−0.090	1.135	+0.538	1.324	+0.868
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.060	+0.013	+0.062	−0.006	+0.057	+0.034	+0.054	+0.055
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.39	−0.25	−0.38	−0.28	−0.38	−0.29	−0.38	−0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		γ Hydræ. Mag. 3.3		ι Centauri. Mag. 2.9		ζ¹ Ursæ Majoris. (*Mizar.*) Mag. 2.4		α Virginis. (*Spica.*) Mag. 1.2	
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
		h m 13 14 s	° ′ −22 45 ″	h m 13 16 s	° ′ −36 18 ″	h m 13 20 s	° ′ +55 19 ″	h m 13 21 s	° ′ −10 45 ″
		43.812	46.38	15.723	9.23	48.377	24.19	7.806	29.01
Jan.	0.8	344	188	380	169	479	163	327	198
	10.7	44.156	48.26	16.103	10.92	48.856	22.56	8.133	30.99
		335	202	372	195	480	102	321	198
	20.7	44.491	50.28	16.475	12.87	49.336	21.54	8.454	32.97
		318	211	350	220	467	41	305	193
	30.7	44.809	52.39	16.825	15.07	49.803	21.13	8.759	34.90
Feb.	9.7	291	211	324	233	437	24	283	181
		45.100	54.50	17.149	17.40	50.240	21.37	9.042	36.71
		260	207	286	241	393	84	254	166
	19.6	45.360	56.57	17.435	19.81	50.633	22.21	9.296	38.37
Mar.	1.6	224	197	249	244	310	138	218	147
		45.584	58.54	17.684	22.25	50.973	23.59	9.514	39.84
	11.6	186	184	207	241	277	190	185	123
		45.770	60.38	17.891	24.66	51.250	25.49	9.699	41.07
	21.6	150	167	163	232	212	228	148	101
		45.920	62.05	18.054	26.98	51.462	27.77	9.847	42.08
	31.5	110	150	124	221	144	259	111	78
		46.030	63.55	18.178	29.19	51.606	30.36	9.958	42.86
		76	128	85	205	76	276	80	60
		46.106	64.83	18.263	31.24	51.682	33.12	10.038	43.46
Apr.	10.5	44	110	16	187	11	285	47	37
		46.150	65.93	18.309	33.11	51.693	35.97	10.085	43.83
	20.5	14	89	13	165	48	280	21	19
		46.164	66.82	18.322	34.76	51.645	38.77	10.106	44.02
	30.4	13	70	21	143	101	269	8	2
		46.151	67.52	18.301	36.19	51.544	41.46	10.098	44.04
May	10.4	38	47	47	117	150	245	28	13
		46.113	67.99	18.254	37.36	51.394	43.91	10.070	43.91
	20.4	61	30	77	94	190	215	52	26
		46.052	68.29	18.177	38.30	51.204	46.06	10.018	43.65
	30.4	81	9	100	63	222	178	71	35
		45.971	68.38	18.077	38.93	50.982	47.84	9.947	43.30
June	9.3	96	11	123	35	249	139	86	47
		45.875	68.27	17.954	39.28	50.733	49.23	9.861	42.83
	19.3	114	28	111	5	266	92	101	51
		45.761	67.99	17.813	39.33	50.467	50.15	9.760	42.32
	29.3	125	48	156	24	280	45	114	61
July	9.3	45.636	67.51	17.657	39.09	50.187	50.60	9.646	41.71
		135	64	166	53	283	3	121	66
	19.2	45.501	66.87	17.491	38.56	49.904	50.57	9.525	41.05
		139	79	172	81	281	52	126	70
	29.2	45.362	66.08	17.319	37.75	49.623	50.05	9.399	40.35
Aug.	8.2	137	92	170	106	272	99	128	70
		45.225	65.16	17.149	36.69	49.351	49.06	9.271	39.65
	18.1	130	102	164	129	254	144	121	68
		45.095	64.14	16.985	35.40	49.097	47.62	9.150	38.97
	28.1	118	108	145	146	229	188	109	65
		44.977	63.06	16.840	33.94	48.868	45.74	9.041	38.32
		98	111	122	159	198	228	93	59
		44.879	61.95	16.718	32.35	48.670	43.46	8.948	37.73
Sept.	7.1	70	107	90	166	155	264	68	46
		44.809	60.88	16.628	30.69	48.515	40.82	8.880	37.27
	17.1	36	100	49	165	107	296	40	34
		44.773	59.88	16.579	29.04	48.408	37.86	8.840	36.93
	27.0	5	83	2	156	51	322	1	13
		44.778	59.05	16.577	27.48	48.357	34.64	8.839	36.80
Oct.	7.0	53	64	51	141	10	342	44	10
		44.831	58.41	16.628	26.07	48.367	31.22	8.883	36.90
	17.0	100	40	108	118	80	354	89	31
		44.931	58.01	16.736	24.89	48.447	27.68	8.972	37.21
	27.0	151	8	165	88	150	361	134	63
		45.082	57.93	16.901	24.01	48.597	24.07	9.106	37.84
Nov.	5.9	200	24	221	52	221	356	183	87
		45.282	58.17	17.122	23.49	48.818	20.51	9.289	38.71
	15.9	245	57	271	11	287	344	229	119
		45.527	58.74	17.393	23.38	49.105	17.07	9.518	39.90
	25.9	284	93	314	30	352	322	261	142
Dec.	5.8	45.811	59.67	17.707	23.68	49.457	13.85	9.779	41.32
		315	125	348	70	404	289	295	166
	15.8	46.126	60.92	18.055	24.38	49.861	10.96	10.074	42.98
		336	154	371	114	445	248	315	184
	25.8	46.462	62.46	18.426	25.52	50.306	8.48	10.389	44.82
		344	177	380	149	475	198	327	193
	35.8	46.806	64.23	18.806	27.01	50.781	6.50	10.716	46.75
Mean Place		43.877	56.48	15.645	23.68	49.777	37.61	8.036	35.23
Sec δ, Tan δ		1.084	−0.420	1.241	−0.735	1.758	+1.446	1.018	−0.190
$D_{\psi\alpha}$, $D_{\omega\alpha}$		+0.065	−0.026	+0.068	−0.046	+0.048	+0.090	+0.063	−0.012
$D_{\psi\delta}$, $D_{\omega\delta}$		−0.38	−0.32	−0.38	−0.33	−0.37	−0.35	−0.37	−0.35

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2001. Mag. 6.1		70 Virginis. Mag. 5.2		ζ Virginis. Mag. 3.4		17 H. Canum Venat. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	13 24	+72 46	13 24	+14 11	13 30	− 0 12	13 31	+37 34
Jan. 0.8	7.12	71.99	39.312	20.28	45.670	6.62	20.725	26.69
	82	131	327	208	320	204	373	197
10.8	7.94	70.68	39.639	18.20	45.990	8.66	21.098	24.72
	84	66	322	181	318	193	372	151
20.7	8.78	70.02	39.961	16.39	46.308	10.59	21.470	23.21
	82	1	310	151	304	173	359	96
30.7	9.60	70.03	40.271	14.88	46.612	12.32	21.829	22.25
	77	67	286	113	283	156	338	43
Feb. 9.7	10.37	70.70	40.557	13.75	46.895	13.88	22.167	21.82
	70	130	258	75	255	126	308	12
19.6	11.07	72.00	40.815	13.00	47.150	15.14	22.475	21.94
	61	187	224	37	221	103	268	65
Mar. 1.6	11.68	73.87	41.039	12.63	47.371	16.17	22.743	22.59
	50	235	188	3	192	71	224	113
11.6	12.18	76.22	41.227	12.66	47.563	16.88	22.967	23.72
	37	273	150	35	154	39	179	151
21.6	12.55	78.95	41.377	13.01	47.717	17.27	23.146	25.23
	23	298	110	67	119	17	130	188
31.5	12.78	81.93	41.487	13.68	47.836	17.44	23.276	27.11
	11	314	77	90	84	7	88	211
Apr. 10.5	12.89	85.07	41.564	14.58	47.920	17.37	23.364	29.22
	3	311	43	110	53	27	41	227
20.5	12.86	88.21	41.607	15.68	47.973	17.10	23.405	31.49
	15	305	14	122	26	46	1	233
30.5	12.71	91.26	41.621	16.90	47.999	16.64	23.406	33.82
	27	284	16	130	2	57	37	228
May 10.4	12.44	94.10	41.605	18.20	47.997	16.07	23.369	36.10
	36	255	37	130	23	68	69	218
20.4	12.08	96.65	41.568	19.50	47.974	15.39	23.300	38.28
	16	217	61	126	47	72	98	199
30.4	11.62	98.82	41.507	20.76	47.927	14.67	23.202	40.27
	51	174	79	118	65	74	119	173
June 9.3	11.11	100.56	41.428	21.94	47.862	13.93	23.083	42.00
	57	124	95	107	83	76	144	149
19.3	10.54	101.80	41.333	23.01	47.779	13.17	22.939	43.49
	61	72	108	92	97	75	157	112
29.3	9.93	102.52	41.225	23.93	47.682	12.42	22.782	44.61
	64	19	120	75	111	72	173	75
July 9.3	9.29	102.71	41.105	24.68	47.571	11.70	22.609	45.36
	63	35	127	56	119	65	177	39
19.2	8.66	102.36	40.978	25.24	47.452	11.05	22.432	45.75
	62	88	131	37	125	58	182	2
29.2	8.04	101.48	40.847	25.61	47.327	10.47	22.250	45.73
	60	111	129	14	126	50	180	42
Aug. 8.2	7.44	100.07	40.718	25.75	47.201	9.97	22.070	45.31
	56	187	126	10	123	39	170	80
18.2	6.88	98.20	40.592	25.65	47.078	9.58	21.900	44.51
	51	231	113	32	114	26	160	117
28.1	6.37	95.86	40.479	25.33	46.964	9.32	21.740	43.34
	44	274	100	57	96	10	136	155
Sept. 7.1	5.93	93.12	40.379	24.76	46.868	9.22	21.604	41.79
	36	307	73	81	74	8	110	189
17.1	5.57	90.05	40.306	23.95	46.794	9.30	21.494	39.90
	26	338	44	108	48	24	77	224
27.0	5.31	86.67	40.262	22.87	46.746	9.54	21.417	37.66
	16	361	9	134	10	50	32	251
Oct. 7.0	5.15	83.06	40.253	21.53	46.736	10.04	21.385	35.15
	5	375	32	160	29	70	11	275
17.0	5.10	79.31	40.285	19.93	46.765	10.74	21.396	32.40
	8	382	77	183	75	96	65	297
27.0	5.18	75.49	40.362	18.10	46.840	11.70	21.461	29.43
	20	383	123	205	123	124	119	312
Nov. 5.9	5.38	71.66	40.485	16.05	46.963	12.94	21.580	26.31
	32	370	171	223	168	147	172	318
15.9	5.70	67.96	40.656	13.82	47.131	14.41	21.752	23.13
	46	348	214	236	212	169	228	316
25.9	6.16	64.48	40.870	11.46	47.343	16.10	21.980	19.97
	56	319	254	243	248	186	273	307
Dec. 5.9	6.72	61.29	41.124	9.03	47.591	17.96	22.253	16.90
	67	279	288	244	283	199	316	288
15.8	7.39	58.50	41.412	6.59	47.874	19.95	22.569	14.02
	75	229	311	237	307	205	316	261
25.8	8.14	56.21	41.723	4.22	48.181	22.00	22.915	11.41
	81	172	324	222	315	208	368	226
35.8	8.95	54.49	42.047	2.00	48.496	24.08	23.283	9.15
Mean Place	10.063	87.52	39.831	22.54	46.064	9.52	21.660	35.65
Sec δ, Tan δ	3.380	+3.228	1.031	+0.253	1.000	−0.004	1.262	+0.769
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.030	+0.201	+0.059	+0.016	+0.061	0.000	+0.053	+0.047
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.37	−0.36	−0.37	−0.36	−0.37	−0.39	−0.37	−0.39

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Centauri. Mag. 2.6		m Virginis. Mag. 5.2		τ Boötis. Mag. 4.5		η Ursæ Majoris. (*Alkaid.*) Mag. 1.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 13 34 s	° ′ −53 4 ″	h m 13 37 s	° ′ − 8 18 ″	h m 13 43 s	° ′ +17 50 ″	h m 13 44 s	° ′ +49 41 ″
Jan. 0.8	59.958	12.91	33.721	47.98	35.503	21.11	29.184	38.36
	482	114	324	194	326	214	426	197
10.8	60.440	14.05	34.045	49.92	35.829	18.97	29.610	36.39
	476	157	320	194	327	181	430	139
20.7	60.916	15.62	34.365	51.86	36.156	17.16	30.040	35.00
	455	195	310	185	317	150	423	81
30.7	61.371	17.57	34.675	53.71	36.473	15.66	30.463	34.19
	427	228	288	173	297	107	403	19
Feb. 9.7	61.798	19.85	34.963	55.44	36.770	14.59	30.866	34.00
	386	251	261	153	271	67	370	42
19.7	62.184	22.36	35.224	56.97	37.041	13.92	31.236	34.42
	340	271	230	134	241	24	328	102
Mar. 1.6	62.524	25.07	35.454	58.31	37.282	13.68	31.564	35.44
	289	283	200	109	205	16	278	149
11.6	62.813	27.90	35.654	59.40	37.487	13.84	31.842	36.93
	237	286	158	85	168	56	224	197
21.6	63.050	30.76	35.812	60.25	37.655	14.40	32.066	38.90
	187	287	129	64	132	86	165	233
31.5	63.237	33.63	35.941	60.89	37.787	15.26	32.231	41.23
	134	280	95	40	95	114	106	256
Apr. 10.5	63.371	36.43	36.036	61.29	37.882	16.40	32.337	43.79
	83	268	64	20	61	133	53	270
20.5	63.454	39.11	36.100	61.49	37.943	17.73	32.390	46.49
	35	252	34	2	28	147	1	276
30.5	63.489	41.63	36.134	61.51	37.971	19.20	32.391	49.25
	14	231	10	12	0	152	50	270
May 10.4	63.475	43.94	36.144	61.39	37.971	20.72	32.341	51.95
	56	205	18	27	25	155	93	254
20.4	63.419	45.99	36.126	61.12	37.946	22.27	32.248	54.49
	99	175	37	36	52	149	133	229
30.4	63.320	47.74	36.089	60.76	37.894	23.76	32.115	56.78
	139	143	61	46	73	137	166	198
June 9.4	63.181	49.17	36.028	60.30	37.821	25.13	31.949	58.76
	173	106	79	51	91	125	192	166
19.3	63.008	50.23	35.949	59.79	37.730	26.38	31.757	60.42
	205	71	92	59	109	106	217	120
29.3	62.803	50.94	35.857	59.20	37.621	27.44	31.540	61.62
	229	28	110	59	122	87	231	82
July 9.3	62.574	51.22	35.747	58.61	37.499	28.31	31.309	62.44
	249	13	120	64	134	63	215	32
19.2	62.325	51.09	35.627	57.97	37.365	28.94	31.064	62.76
	260	51	130	63	139	40	249	14
29.2	62.065	50.55	35.497	57.34	37.226	29.34	30.815	62.62
	263	92	130	63	143	15	247	58
Aug. 8.2	61.802	49.63	35.367	56.71	37.083	29.49	30.568	62.04
	252	130	126	59	138	12	238	104
18.2	61.550	48.33	35.241	56.12	36.945	29.37	30.330	61.00
	234	162	118	55	131	39	222	149
28.1	61.316	46.71	35.123	55.57	36.814	28.98	30.108	59.51
	202	192	106	45	116	66	195	190
Sept. 7.1	61.114	44.79	35.017	55.12	36.698	28.32	29.913	57.61
	160	210	80	34	94	93	164	231
17.1	60.954	42.69	34.937	54.78	36.604	27.39	29.749	55.30
	108	224	52	18	66	123	125	265
27.1	60.846	40.45	34.885	54.60	36.538	26.16	29.624	52.65
	43	228	17	1	32	148	76	293
Oct. 7.0	60.803	38.17	34.868	54.61	36.506	24.68	29.548	49.72
	27	222	26	20	10	176	24	320
17.0	60.830	35.95	34.894	54.81	36.516	22.92	29.524	46.52
	100	207	70	48	56	200	40	339
27.0	60.930	33.88	34.964	55.29	36.572	20.92	29.564	43.13
	178	181	119	72	102	221	102	350
Nov. 5.9	61.108	32.07	35.083	56.01	36.674	18.71	29.666	39.63
	252	149	166	98	151	239	167	354
15.9	61.360	30.58	35.249	56.99	36.825	16.32	29.833	36.09
	322	111	212	127	198	251	233	349
25.9	61.682	29.47	35.461	58.26	37.023	13.81	30.066	32.60
	380	61	249	149	240	257	291	331
Dec. 5.9	62.062	28.86	35.710	59.75	37.263	11.24	30.357	29.29
	426	14	285	170	277	255	344	307
15.8	62.488	28.72	35.995	61.45	37.540	8.69	30.701	26.22
	461	36	309	185	304	246	386	272
25.8	62.949	29.08	36.304	63.30	37.844	6.23	31.087	23.50
	476	86	320	193	321	229	414	231
35.8	63.425	29.94	36.624	65.23	38.165	3.94	31.501	21.19
Mean Place	59.828	32.27	34.075	53.93	36.176	23.73	30.546	49.43
Sec δ, Tan δ	1.665	−1.331	1.011	−0.146	1.051	+0.322	1.546	+1.179
$D_{\psi a}$, $D_{\omega a}$	+0.075	−0.081	+0.063	−0.009	+0.057	+0.019	+0.047	+0.071
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.36	−0.40	−0.36	−0.41	−0.36	−0.44	−0.36	−0.44

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	89 Virginis. Mag. 5.1		ζ Centauri. Mag. 3.1		η Boötis. Mag. 2.8		11 Boötis. Mag. 6.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	13 45	−17 44	13 50	−46 54	13 51	+18 46	13 57	+27 45
	s	″	s	″	s	″	s	″
Jan. 0.8	40.697	54.71	43.484	18.15	0.380	56.74	40.157	23.32
	334	178	434	111	327	216	338	220
10.8	41.031	56.49	43.918	19.26	0.707	54.58	40.495	21.12
	332	187	433	117	327	186	341	182
20.7	41.363	58.36	44.351	20.73	1.034	52.72	40.836	19.30
	321	191	420	183	320	152	336	138
30.7	41.684	60.27	44.771	22.56	1.354	51.20	41.172	17.92
	300	188	393	209	302	109	320	91
Feb. 9.7	41.984	62.15	45.164	24.65	1.656	50.11	41.492	17.01
	274	178	361	231	277	68	295	41
19.7	42.258	63.93	45.525	26.96	1.933	49.43	41.787	16.60
	243	167	323	246	248	25	265	10
Mar. 1.6	42.501	65.60	45.848	29.42	2.181	49.18	42.052	16.70
	210	152	282	255	213	19	227	57
11.6	42.711	67.12	46.130	31.97	2.394	49.37	42.279	17.27
	175	133	235	257	176	57	191	99
21.6	42.886	68 45	46.365	34.54	2.570	49.94	42.470	18.26
	141	112	191	255	142	88	149	136
31.6	43.027	69.57	46.556	37.09	2.712	50.82	42.619	19.62
	106	95	148	247	101	118	113	164
Apr. 10.5	43.133	70.52	46.704	39.56	2.813	52.00	42.732	21.26
	76	78	101	237	71	139	74	186
20.5	43.209	71.30	46.805	41.93	2.884	53.39	42.806	23.12
	47	58	60	222	37	150	39	197
30.5	43.256	71.88	46.865	44.15	2.921	54.89	42.845	25.09
	18	41	19	204	6	159	5	198
May 10.4	43.274	72.29	46.884	46.19	2.927	56.48	42.850	27.07
	9	26	22	181	22	159	26	203
20.4	43.265	72.55	46.862	48.00	2.905	58.07	42.824	29.10
	32	9	59	155	43	156	54	189
30.4	43.233	72.64	46.803	49.55	2.862	59.63	42.770	30.99
	56	5	95	127	69	142	79	173
June 9.4	43.177	72.59	46.708	50.82	2.793	61.05	42.691	32.72
	78	19	129	96	90	129	101	153
19.3	43.099	72.40	46.579	51.78	2.703	62.34	42.590	34.25
	95	29	158	62	106	110	121	127
29.3	43.004	72.11	46.421	52.40	2.597	63.44	42.469	35.52
	113	44	185	28	123	91	139	98
July 9.3	42.891	71.67	46.236	52.68	2.474	64.35	42.330	36.50
	126	54	205	9	133	68	150	68
19.3	42.765	71.13	46.031	52.59	2.341	65.03	42.180	37.18
	136	64	218	43	141	41	159	36
29.2	42.629	70.49	45.813	52.16	2.200	65.44	42.021	37.54
	140	72	225	78	146	14	163	1
Aug. 8.2	42.489	69.77	45.588	51.38	2.054	65.58	41.858	37.55
	139	78	223	113	142	12	161	33
18.2	42.350	68.99	45.365	50.25	1.912	65.46	41.697	37.22
	130	81	209	139	138	39	154	67
28.1	42.220	68.18	45.156	48.86	1.774	65.07	41.543	36.55
	116	80	185	165	120	71	141	100
Sept. 7.1	42.104	67.38	44.971	47.21	1.654	64.36	41.402	35.55
	93	76	152	184	100	94	117	134
17.1	42.011	66.62	44.819	45.37	1.554	63.42	41.285	34.21
	62	67	109	195	75	128	91	166
27.1	41.949	65.95	44.710	43.42	1.479	62.14	41.194	32.55
	25	54	55	199	38	155	54	197
Oct. 7.0	41.924	65.41	44.655	41.43	1.441	60.59	41.140	30.58
	16	36	7	193	1	179	12	225
17.0	41.940	65.05	44.662	39.50	1.442	58.80	41.128	28.33
	66	12	73	179	49	204	36	249
27.0	42.006	64.93	44.735	37.71	1.491	56.76	41.164	25.84
	116	13	142	159	96	228	85	269
Nov. 6.0	42.122	65.06	44.877	36.12	1.587	54.48	41.249	23.15
	167	43	210	126	144	243	138	283
15.9	42.289	65.49	45.087	34.86	1.731	52.05	41.387	20.32
	212	70	272	89	194	257	188	293
25.9	42.501	66.19	45.359	33.97	1.925	49.48	41.575	17.39
	255	102	329	48	233	262	235	292
Dec. 5.9	42.756	67.21	45.688	33.49	2.158	46.86	41.810	14.47
	290	129	374	3	272	261	275	283
15.8	43.046	68.50	46.062	33.46	2.430	44.25	42.085	11.64
	315	151	409	41	302	251	307	269
25.8	43.361	70.01	46.471	33.87	2.732	41.74	42.392	8.95
	331	171	427	85	320	233	331	242
35.8	43.692	71.72	46.898	34.72	3.052	39.41	42.723	6.53
Mean Place	41.016	64.11	43.591	36.33	1.108	59.32	41.057	28.26
Sec δ, Tan δ	1.050	−0.320	1.464	−1.069	1.056	+0.340	1.130	+0.526
$D_{\psi a}$, $D_{\omega a}$	+0.065	−0.019	+0.074	−0.063	+0.057	+0.020	+0.054	+0.031
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.36	−0.44	−0.35	−0.46	−0.35	−0.47	−0.35	−0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		τ Virginis. Mag. 4.3		θ Apodis. Var. 5.5–6.6		β Centauri. Mag. 0.9		π Hydræ. Mag. 3.5	
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
		h m	° ′	h m	° ′	h m	° ′	h m	° ′
		13 57	+ 1 54	13 57	−76 25	13 58	−59 59	14 1	−26 18
		s	″	s	″	s	″	s	″
Jan.	0.8	43.012	62.78	46.44	10.25	22.42	47.20	58.550	31.18
		316	205	108	20	56	67	348	150
	10.8	43.328	60.73	47.52	10.45	22.98	47.87	58.898	32.68
		318	191	110	80	56	116	350	170
	20.7	43.646	58.82	48.62	11.25	23.54	49.03	59.248	34.38
		311	173	107	134	55	157	340	182
	30.7	43.957	57.09	49.69	12.59	24.09	50.60	59.588	36.20
Feb.	9.7	44.250	55.59	50.71	14.42	24.61	52.57	59.911	38.09
		293	150	102	183	52	197	323	189
		269	121	95	229	48	231	296	191
	19.7	44.519	54.38	51.66	16.71	25.09	54.88	60.207	40.00
		242	92	86	266	43	256	268	187
Mar.	1.6	44.761	53.46	52.52	19.37	25.52	57.44	60.475	41.87
		211	60	75	297	38	278	235	179
	11.6	44.972	52.86	53.27	22.34	25.90	60.22	60.710	43.66
		179	32	63	319	33	291	200	167
	21.6	45.151	52.54	53.90	25.53	26.23	63.13	60.910	45.33
		144	1	50	335	26	298	166	155
	31.6	45.295	52.53	54.40	28.88	26.49	66.11	61.076	46.88
		111	23	38	342	20	297	132	141
Apr.	10.5	45.406	52.76	54.78	32.30	26.69	69.08	61.208	48.29
		80	45	24	344	14	292	99	123
	20.5	45.486	53.21	55.02	35.74	26.83	72.00	61.307	49.52
		51	61	11	337	8	281	66	108
	30.5	45.537	53.82	55.13	39.11	26.91	74.81	61.373	50.60
May	10.4	45.561	54.55	55.10	42.36	26.93	77.46	61.409	51.51
		21	73	3	325	2	265	36	91
	20.4	45.560	55.38	54.94	45.42	26.90	79.89	61.417	52.23
		1	83	16	306	3	213	8	72
		27	87	29	279	10	217	21	56
	30.4	45.533	56.25	54.65	48.21	26.80	82.06	61.396	52.79
		48	87	41	243	14	188	48	38
June	9.4	45.485	57.12	54.24	50.64	26.66	83.94	61.348	53.17
		69	87	52	206	20	149	74	19
	19.3	45.416	57.99	53.72	52.70	26.46	85.43	61.274	53.36
		89	81	62	162	24	112	96	2
	29.3	45.327	58.80	53.10	54.32	26.22	86.55	61.178	53.38
July	9.3	45.223	59.56	52.41	55.47	25.94	87.26	61.060	53.20
		104	76	69	115	28	71	118	18
		119	67	76	62	31	28	135	35
	19.3	45.104	60.23	51.65	56.09	25.63	87.54	60.925	52.85
		127	58	79	10	32	18	148	53
	29.2	44.977	60.81	50.86	56.19	25.31	87.36	60.777	52.32
Aug.	8.2	44.843	61.27	50.06	55.75	24.97	86.70	60.622	51.62
		134	46	80	44	34	66	155	70
	18.2	44.710	61.61	49.28	54.77	24.64	85.64	60.464	50.79
		133	34	78	98	33	106	158	83
	28.1	44.581	61.80	48.54	53.31	24.33	84.21	60.313	49.84
		129	19	74	146	31	143	151	95
		116	2	66	192	29	182	138	102
Sept.	7.1	44.465	61.82	47.88	51.39	24.04	82.39	60.175	48.82
		97	15	56	232	23	209	114	107
	17.1	44.368	61.67	47.32	49.07	23.81	80.30	60.061	47.75
		71	38	42	263	17	231	84	105
	27.1	44.297	61.29	46.90	46.44	23.64	77.99	59.977	46.70
Oct.	7.0	44.260	60.70	46.64	43.60	23.53	75.54	59.931	45.71
		3	59	10	284	2	215	46	99
	17.0	44.263	59.89	46.54	40.64	23.51	73.08	59.932	44.87
		48	81	9	296	7	246	1	84
			107		294		239	52	66
	27.0	44.311	58.82	46.63	37.70	23.58	70.69	59.984	44.21
		94	132	28	281	16	220	105	43
Nov.	6.0	44.405	57.50	46.91	34.89	23.74	68.49	60.089	43.78
		142	153	46	258	25	194	159	14
	15.9	44.547	55.97	47.37	32.31	23.99	66.55	60.248	43.64
		189	176	63	222	34	161	211	17
	25.9	44.736	54.21	48.00	30.09	24.33	64.94	60.459	43.81
Dec.	5.9	44.967	52.30	48.78	28.31	24.74	63.78	60.716	44.30
		231	191	78	178	41	116	257	49
		265	204	90	127	47	65	295	82
	15.8	45.232	50.26	49.68	27.04	25.21	63.13	61.011	45.12
		294	211	100	71	52	17	324	112
	25.8	45.526	48.15	50.68	26.33	25.73	62.96	61.335	46.24
	35.8	45.837	46.05	51.74	26.21	26.28	63.34	61.678	47.62
		311	210	106	12	55	38	343	138
Mean Place		43.578	59.59	46.229	33.80	22.493	68.35	58.907	43.73
Sec δ, Tan δ		1.001	+0.033	4.261	−4.142	2.000	−1.732	1.116	−0.495
$D_{\psi\alpha}$, $D_{\omega\alpha}$		+0.061	+0.002	+0.115	−0.240	+0.084	−0.100	+0.068	−0.028
$D_{\psi\delta}$, $D_{\omega\delta}$		−0.35	−0.49	−0.35	−0.49	−0.35	−0.49	−0.34	−0.51

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Centauri. Mag. 2.3		α Draconis. Mag. 3.6		d Boötis. Mag. 4.8		κ Virginis. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 14 2	° ′ −35 59	h m 14 2	° ′ +64 44	h m 14 6	° ′ +25 27	h m 14 8	° ′ − 9 54
	s	″	s	″	s	″	s	″
Jan. 0.8	8.352	15.20	15.91	24.10	52.375	16.65	46.616	50.15
	377	127	57	194	329	223	319	180
10.8	8.729	16.47	16.48	22.16	52.704	14.42	46.935	51.95
	379	156	60	132	337	188	322	183
20.8	9.108	18.03	17.08	20.84	53.041	12.54	47.257	53.78
	368	179	60	69	330	151	319	178
30.7	9.476	19.82	17.68	20.15	53.371	11.03	47.576	55.56
	318	196	58	1	319	101	301	167
Feb. 9.7	9.824	21.78	18.26	20.14	53.690	10.02	47.877	57.23
	322	208	54	61	294	51	277	152
19.7	10.146	23.86	18.80	20.78	53.984	9.51	48.154	58.75
	289	214	49	128	268	5	255	132
Mar. 1.6	10.435	26.00	19.29	22.06	54.252	9.46	48.409	60.07
	256	215	43	182	231	41	223	110
11.6	10.691	28.15	19.72	23.88	54.483	9.90	48.632	61.17
	217	210	34	230	197	84	191	89
21.6	10.908	30.25	20.06	26.18	54.680	10.74	48.823	62.06
	180	205	26	267	159	121	158	64
31.6	11.088	32.30	20.32	28.85	54.839	11.95	48.981	62.70
	143	192	17	294	121	152	127	43
Apr. 10.5	11.231	34.22	20.49	31.79	54.960	13.47	49.108	63.13
	106	178	8	308	85	174	97	25
20.5	11.337	36.00	20.57	34.87	55.045	15.21	49.205	63.38
	70	165	0	309	49	190	70	10
30.5	11.407	37.65	20.57	37.96	55.094	17.11	49.275	63.48
	35	147	9	302	16	194	36	8
May 10.5	11.442	39.12	20.48	40.98	55.110	19.05	49.311	63.40
	2	127	16	281	14	194	11	21
20.4	11.444	40.39	20.32	43.79	55.096	20.99	49.325	63.19
	27	106	22	255	44	185	15	30
30.4	11.417	41.45	20.10	46.34	55.052	22.84	49.310	62.89
	61	85	29	223	67	172	36	40
June 9.4	11.356	42.30	19.81	48.57	54.985	24.56	49.274	62.49
	89	60	33	179	92	153	62	45
19.3	11.267	42.90	19.48	50.36	54.893	26.09	49.212	62.04
	116	35	38	131	114	129	84	50
29.3	11.151	43.25	19.10	51.67	54.779	27.38	49.128	61.54
	110	8	40	85	130	105	97	55
July 9.3	11.011	43.33	18.70	52.52	54.649	28.43	49.031	60.99
	158	18	42	30	146	76	117	58
19.3	10.853	43.15	18.28	52.82	54.503	29.19	48.914	60.41
	173	44	44	19	153	45	134	60
29.2	10.680	42.71	17.84	52.63	54.350	29.64	48.780	59.81
	181	70	43	74	162	10	137	58
Aug. 8.2	10.499	42.01	17.41	51.89	54.188	29.74	48.643	59.23
	183	91	41	125	160	21	140	57
18.2	10.316	41.10	17.00	50.64	54.028	29.53	48.503	58.66
	175	113	40	171	158	55	137	53
28.2	10.141	39.97	16.60	48.93	53.870	28.98	48.366	58.13
	160	130	36	218	142	84	124	46
Sept. 7.1	9.981	38.67	16.24	46.75	53.728	28.14	48.242	57.67
	132	140	31	258	121	122	108	38
17.1	9.849	37.27	15.93	44.17	53.607	26.92	48.134	57.29
	98	146	25	297	96	150	77	24
27.1	9.751	35.81	15.68	41.20	53.511	25.42	48.057	57.05
	55	145	19	328	61	184	48	7
Oct. 7.0	9.696	34.36	15.49	37.92	53.450	23.58	48.009	56.98
	3	137	11	352	21	211	4	9
17.0	9.693	32.99	15.38	34.40	53.429	21.47	48.005	57.07
	53	121	3	369	26	235	40	32
27.0	9.746	31.78	15.35	30.71	53.455	19.12	48.045	57.39
	112	99	7	380	77	258	88	59
Nov. 6.0	9.858	30.79	15.42	26.91	53.532	16.54	48.133	57.98
	171	70	16	380	127	276	138	80
15.9	10.029	30.09	15.58	23.11	53.659	13.78	48.271	58.78
	227	37	26	370	178	284	185	108
25.9	10.256	29.72	15.84	19.41	53.837	10.94	48.456	59.86
	278	0	35	349	224	286	230	131
Dec. 5.9	10.534	29.72	16.19	15.92	54.061	8.08	48.686	61.17
	319	36	43	323	265	283	267	152
15.9	10.853	30.08	16.62	12.69	54.326	5.25	48.953	62.69
	351	74	50	280	300	268	295	168
25.8	11.204	30.82	17.12	9.89	54.626	2.57	49.248	64.37
	370	111	55	232	320	244	314	182
35.8	11.574	31.93	17.67	7.57	54.946	0.13	49.562	66.19
Mean Place	8.646	30.63	18.301	36.51	53.285	20.49	47.140	57.61
Sec δ, Tan δ	1.236	−0.726	2.344	+2.120	1.108	+0.476	1.015	−0.175
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.071	−0.042	+0.033	+0.122	+0.055	+0.027	+0.064	−0.010
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.34	−0.51	−0.34	−0.51	−0.34	−0.53	−0.34	−0.53

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 Ursæ Minoris. Mag. 5.0		ι Virginis. Mag. 4.2		α Boötis. (*Arcturus.*) Mag. 0.2		λ Boötis. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 8	+77 54	14 11	− 5 37	14 12	+19 34	14 13	+46 26
	s	″	s	″	s	″	s	″
Jan. 0.8	62.30	20.33	57.873	55.13	8.069	55.64	26.064	20.00
	104	179	313	191	315	228	391	224
10.8	63.34	18.54	58.186	57.04	8.384	53.36	26.455	17.76
	111	116	322	188	324	199	405	178
20.8	64.45	17.38	58.508	58.92	8.708	51.37	26.860	15.98
	113	49	314	177	320	163	403	116
30.7	65.58	16.89	58.822	60.69	9.028	49.74	27.263	14.82
	111	19	299	162	306	123	392	59
Feb. 9.7	66.69	17.08	59.121	62.31	9.334	48.51	27.655	14.23
	105	86	277	143	286	77	367	5
19.7	67.74	17.94	59.398	63.74	9.620	47.74	28.022	14.28
	95	147	253	118	261	32	334	64
Mar. 1.6	68.69	19.41	59.651	64.92	9.881	47.42	28.356	14.92
	83	203	222	94	225	8	293	121
11.6	69.52	21.44	59.873	65.86	10.106	47.50	28.649	16.13
	67	248	192	67	194	52	245	170
21.6	70.19	23.92	60.065	66.53	10.300	48.02	28.894	17.83
	50	283	159	44	159	86	197	206
31.6	70.69	26.75	60.224	66.97	10.459	48.88	29.091	19.89
	32	308	128	20	122	116	113	242
Apr. 10.5	71.01	29.83	60.352	67.17	10.581	50.04	29.234	22.31
	13	319	97	0	90	139	94	261
20.5	71.14	33.02	60.449	67.17	10.671	51.43	29.328	24.92
	5	319	69	17	55	155	43	271
30.5	71.09	36.21	60.518	67.00	10.726	52.98	29.371	27.63
	23	306	40	32	21	164	5	273
May 10.5	70.86	39.27	60.558	66.68	10.750	54.62	29.366	30.36
	40	286	15	42	5	167	49	264
20.4	70.46	42.13	60.573	66.26	10.745	56.29	29.317	33.00
	54	254	11	51	33	161	87	247
30.4	69.92	44.67	60.562	65.75	10.712	57.90	29.230	35.47
	67	217	36	57	56	152	126	220
June 9.4	69.25	46.84	60.526	65.18	10.656	59.42	29.104	37.67
	77	172	59	60	82	137	155	192
19.3	68.48	48.56	60.467	64.58	10.574	60.79	28.949	39.59
	86	122	81	63	103	118	185	153
29.3	67.62	49.78	60.386	63.95	10.471	61.97	28.764	41.12
	92	71	98	62	118	97	207	114
July 9.3	66.70	50.49	60.288	63.33	10.353	62.94	28.557	42.26
	97	17	115	61	136	75	224	68
19.3	65.73	50.66	60.173	62.72	10.217	63.69	28.333	42.94
	97	37	129	57	148	48	235	23
29.2	64.76	50.29	60.044	62.15	10.069	64.17	28.098	43.17
	97	92	136	54	153	18	242	20
Aug. 8.2	63.79	49.37	59.908	61.61	9.916	64.35	27.856	42.97
	94	141	139	47	155	11	238	68
18.2	62.85	47.96	59.769	61.14	9.761	64.24	27.618	42.29
	89	192	136	40	150	37	229	111
28.2	61.96	46.04	59.633	60.74	9.611	63.87	27.389	41.18
	82	237	124	31	140	68	213	155
Sept. 7.1	61.14	43.67	59.509	60.43	9.471	63.19	27.176	39.63
	71	277	108	17	122	96	186	194
17.1	60.43	40.90	59.401	60.26	9.349	62.23	26.990	37.69
	61	311	82	2	96	129	154	236
27.1	59.82	37.79	59.319	60.24	9.253	60.94	26.836	35.33
	47	343	50	16	62	157	110	268
Oct. 7.0	59.35	34.36	59.269	60.40	9.191	59.37	26.726	32.65
	32	364	9	37	23	184	64	297
17.0	59.03	30.72	59.260	60.77	9.168	57.53	26.662	29.68
	15	379	35	59	23	211	3	322
27.0	58.88	26.93	59.295	61.36	9.191	55.42	26.659	26.46
	2	385	84	83	69	232	57	341
Nov. 6.0	58.90	23.08	59.379	62.19	9.260	53.10	26.716	23.05
	20	383	131	111	121	253	122	348
15.9	59.10	19.25	59.510	63.30	9.381	50.57	26.838	19.57
	39	369	180	133	169	265	183	351
25.9	59.49	15.56	59.690	64.63	9.550	47.92	27.021	16.06
	57	346	223	153	217	273	245	341
Dec. 5.9	60.06	12.10	59.913	66.16	9.767	45.19	27.266	12.65
	73	312	261	173	252	271	296	324
15.9	60.79	8.98	60.174	67.89	10.019	42.48	27.562	9.41
	88	269	291	185	290	263	344	293
25.8	61.67	6.29	60.465	69.74	10.309	39.85	27.906	6.48
	100	218	308	192	309	243	376	256
35.8	62.67	4.11	60.773	71.66	10.618	37.42	28.282	3.92
Mean Place	67.406	33.35	58.450	61.30	8.915	57.51	27.503	28.69
Sec δ, Tan δ	4.774	+4.668	1.005	−0.099	1.061	+0.356	1.451	+1.052
$L_{\psi a}$, $D_{\omega a}$	−0.005	+0.263	+0.063	−0.006	+0.056	+0.020	+0.046	+0.059
$L_{\psi \delta}$, $L_{\omega \delta}$	−0.34	−0.53	−0.33	−0.54	−0.33	−0.55	−0.33	−0.55

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Virginis. Mag. 4.6		2 Libræ. Mag. 6.3		θ Boötis. Mag. 4.1		f Boötis. Mag. 5.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 14	−13 0	14 19	−11 21	14 22	+52 11	14 22	+19 34
	s	″	s	″	s	″	s	″
Jan. 0.8	55.824	54.00	16.250	38.84	32.865	72.78	51.542	19.18
10.8	56.147 323	55.74 174	16.569 319	40.60 176	33.285 420	70.46 232	51.857 315	16.90 228
20.8	56.471 324	57.49 175	16.894 325	42.38 178	33.721 436	68.67 179	52.181 324	14.92 198
30.7	56.792 321	59.27 178	17.213 319	44.13 175	34.164 443	67.50 117	52.503 322	13.29 163
Feb. 9.7	57.098 306	60.97 170	17.518 305	45.79 166	34.595 431	66.92 58	52.815 312	12.08 121
	286	155	284	152	409	10	291	78
19.7	57.384	62.52	17.802	47.31	35.004	67.02	53.106	11.30
Mar. 1.7	57.642 258	63.94 142	18.062 260	48.66 135	35.378 374	67.72 70	53.373 267	10.98 32
11.6	57.872 230	65.15 121	18.293 231	49.80 114	35.709 331	69.02 130	53.610 237	11.11 13
21.6	58.069 197	66.17 102	18.494 201	50.74 94	35.989 280	70.83 181	53.814 204	11.64 53
31.6	58.235 166	66.98 81	18.663 169	51.44 70	36.214 225	73.04 221	53.985 171	12.55 91
	136	61	137	51	166	256	135	121
Apr. 10.5	58.371 105	67.59 43	18.800 108	51.95 33	36.380 110	75.60	54.120 101	13.76
20.5	58.476 73	68.02 26	18.908 78	52.28 15	36.490 50	78.36 276	54.221 68	15.20 144
30.5	58.549 46	68.28 12	18.986 49	52.43 1	36.540 3	81.24 288	54.289 37	16.83 163
May 10.5	58.595 20	68.40 4	19.035 23	52.44 13	36.537 56	84.12 288	54.326 7	18.56 173
20.4	58.615 7	68.36 14	19.058 4	52.31 23	36.481 102	86.91 279	54.333 22	20.30 174
						259		171
30.4	58.608	68.22	19.054	52.08	36.379	89.50	54.311	22.01
June 9.4	58.574 34	67.97 25	19.025 29	51.77 31	36.233 146	91.82 232	54.265 46	23.63 162
19.4	58.515 59	67.65 32	18.971 54	51.38 39	36.048 185	93.84 202	54.193 72	25.11 148
29.3	58.437 78	67.27 38	18.894 77	50.94 44	35.833 215	95.46 162	54.098 95	26.41 130
July 9.3	58.336 101	66.79 48	18.797 97	50.44 50	35.589 244	96.64 118	53.983 115	27.48 107
	118	52	116	53	264	74	132	85
19.3	58.218	66.27	18.681	49.91	35.325	97.38	53.851	28.33
29.2	58.086 132	65.70 57	18.551 130	49.35 56	35.047 278	97.61 23	53.706 145	28.90 57
Aug. 8.2	57.946 140	65.11 59	18.412 139	48.78 57	34.762 285	97.39 22	53.553 153	29.20 30
18.2	57.803 143	64.51 60	18.267 145	48.22 56	34.477 285	96.65 74	53.396 157	29.22 2
28.2	57.660 143	63.92 59	18.125 142	47.68 54	34.201 276	95.47 118	53.240 156	28.94 28
	129	57	131	50	256	165	145	58
Sept. 7.1	57.531 112	63.35 48	17.994 114	47.18 41	33.945 228	93.82 207	53.095 128	28.36
17.1	57.419 86	62.87 40	17.880 89	46.77 30	33.717 192	91.75 248	52.967 103	27.48 88
27.1	57.333 51	62.47 24	17.791 56	46.47 17	33.525 145	89.27 286	52.864 71	26.30 118
Oct. 7.1	57.282 13	62.23 7	17.735 16	46.30 3	33.380 92	86.41 310	52.793 33	24.82 148
17.0	57.269 35	62.16 12	17.719 29	46.33 22	33.288 32	83.31 338	52.760 11	23.05 177
								202
27.0	57.304	62.28	17.748	46.55	33.256	79.93	52.771	21.03
Nov. 6.0	57.387 83	62.65 37	17.827 79	47.02 47	33.291 35	76.37 356	52.831 60	18.77 226
15.9	57.521 134	63.26 61	17.955 128	47.73 71	33.399 108	72.70 367	52.944 113	16.32 245
25.9	57.703 182	64.15 89	18.132 177	48.69 96	33.576 177	69.05 365	53.104 160	13.72 260
Dec. 5.9	57.932 229	65.27 112	18.355 223	49.90 121	33.824 248	65.49 356	53.311 207	11.06 266
	265	136	261	142	305	334	248	266
15.9	58.197	66.63	18.616	51.32	34.129	62.15	53.559	8.40
25.8	58.490 293	68.18 155	18.907 291	52.92 160	34.487 358	59.13 302	53.841 282	5.79 261
35.8	58.805 315	69.88 170	19.218 311	54.66 174	34.889 402	56.48 265	54.149 308	3.35 244
Mean Place	56.361	62.65	16.824	47.08	34.589	81.99	52.444	20.51
Sec δ, Tan δ	1.026	−0.231	1.020	−0.201	1.632	+1.289	1.061	+0.356
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.065	−0.013	+0.064	−0.011	+0.041	+0.070	+0.056	+0.019
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.33	−0.56	−0.33	−0.57	−0.32	−0.58	−0.32	−0.58

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	φ Virginis. Mag. 5.0		δ Ursæ Minoris. Mag. 4.4		ρ Boötis. Mag. 3.8		γ Boötis. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 24	− 1 52	14 27	+76 1	14 28	+30 42	14 28	+38 38
	s	″	s	″	s	″	s	″
Jan. 0.8	13.323	55.11	35.33	66.49	29.614	27.34	57.408	33.94
	309	194	88	204	330	236	351	210
10.8	13.632	57.05	36.21	64.45	29.944	24.98	57.759	31.54
	316	187	95	145	340	199	364	196
20.8	13.948	58.92	37.16	63.00	30.284	22.99	58.123	29.58
	312	174	99	78	342	155	367	144
30.7	14.260	60.66	38.15	62.22	30.626	21.44	58.490	28.14
Feb. 9.7	300	154	98	10	333	104	357	90
	14.560	62.20	39.13	62.12	30.959	20.40	58.847	27.24
	282	131	94	58	314	50	338	30
19.7	14.842	63.51	40.07	62.70	31.273	19.90	59.185	26.94
	257	104	87	120	288	2	312	27
Mar. 1.7	15.099	64.55	40.94	63.90	31.561	19.92	59.497	27.21
	229	75	77	180	259	53	277	81
11.6	15.328	65.30	41.71	65.70	31.820	20.45	59.774	28.02
	199	48	65	230	222	102	238	132
21.6	15.527	65.78	42.36	68.00	32.042	21.47	60.012	29.34
	169	19	50	270	184	139	196	174
31.6	15.696	65.97	42.86	70.70	32.226	22.86	60.208	31.08
	138	3	35	299	147	175	153	206
Apr. 10.6	15.834	65.94	43.21	73.69	32.373	24.61	60.361	33.14
	107	26	19	315	106	200	110	233
20.5	15.941	65.68	43.40	76.84	32.479	26.61	60.471	35.47
	79	43	4	321	72	214	67	248
30.5	16.020	65.25	43.44	80.05	32.551	28.75	60.538	37.95
May 10.5	51	56	12	314	33	222	27	254
	16.071	64.69	43.32	83.19	32.584	30.97	60.565	40.49
20.4	22	66	28	298	0	223	14	250
	16.093	64.03	43.04	86.17	32.584	33.20	60.551	42.99
	2	74	40	272	34	216	49	238
30.4	16.091	63.29	42.64	88.89	32.550	35.36	60.502	45.37
	28	76	52	235	63	199	82	221
June 9.4	16.063	62.53	42.12	91.24	32.487	37.35	60.420	47.58
	52	77	62	196	88	177	113	192
19.4	16.011	61.76	41.50	93.20	32.399	39.12	60.307	49.50
	75	75	71	150	118	153	140	164
29.3	15.936	61.01	40.79	94.70	32.281	40.65	60.167	51.14
July 9.3	95	70	77	99	138	124	162	126
	15.841	60.31	40.02	95.69	32.143	41.89	60.005	52.40
	113	67	82	46	155	92	184	91
19.3	15.728	59.64	39.20	96.15	31.988	42.81	59.821	53.31
	128	59	85	7	169	53	197	49
29.3	15.600	59.05	38.35	96.08	31.819	43.34	59.624	53.80
Aug. 8.2	137	52	85	61	179	20	206	7
	15.463	58.53	37.50	95.47	31.640	43.54	59.418	53.87
18.2	143	42	84	115	183	17	210	31
	15.320	58.11	36.66	94.32	31.457	43.37	59.208	53.53
28.2	141	31	81	163	179	57	205	75
	15.179	57.80	35.85	92.69	31.278	42.80	59.003	52.78
	133	16	75	211	170	90	193	118
Sept. 7.1	15,046	57.64	35.10	90.58	31.108	41.90	58.810	51.60
	116	2	68	254	152	130	172	157
17.1	14.930	57.62	34.42	88.04	30.956	40.60	58.638	50.03
	93	15	59	294	124	164	146	195
27.1	14.837	57.77	33.83	85.10	30.832	38.96	58.492	48.08
Oct. 7.1	61	35	47	326	94	199	108	232
	14.776	58.12	33.36	81.84	30.738	36.97	58.384	45.76
17.0	23	56	36	353	50	230	65	261
	14.753	58.68	33.00	78.31	30.688	34.67	58.319	43.15
	22	80	20	372	6	253	15	289
27.0	14.775	59.48	32.80	74.59	30.682	32.14	58.304	40.26
	69	103	6	382	50	279	41	309
Nov. 6.0	14.844	60.51	32.74	70.77	30.732	29.35	58.345	37.17
	118	128	11	385	100	297	100	325
16.0	14.962	61.79	32.85	66.92	30.832	26.38	58.445	33.92
	166	149	27	377	155	302	156	332
25.9	15.128	63.28	33.12	63.15	30.987	23.36	58.601	30.60
Dec. 5.9	211	169	44	360	208	309	213	330
	15.339	64.97	33.56	59.55	31.195	20.27	58.814	27.30
	250	184	58	329	249	300	260	319
15.9	15.589	66.81	34.14	56.26	31.444	17.27	59.074	24.11
	280	194	72	291	292	288	305	298
25.8	15.869	68.75	34.86	53.35	31.736	14.39	59.379	21.13
35.8	303	198	84	241	318	260	338	268
	16.172	70.73	35.70	50.94	32.054	11.79	59.717	18.45
Mean Place	13.995	60.45	40.037	78.11	30.727	31.48	58.702	40.00
Sec δ, Tan δ	1.001	−0.033	4.144	+4.022	1.163	+0.594	1.280	+0.800
$D_{\psi a}$, $D_{\omega a}$	+0.062	−0.002	−0.003	+0.214	+0.052	+0.032	+0.048	+0.042
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.32	−0.59	−0.32	−0.60	−0.32	−0.60	−0.32	−0.61

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Centauri. Mag. 2.6		σ Boötis. Mag. 4.5		α^2 Centauri. Mag. 0.3		33 Boötis. Mag. 5.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 14 30 s	° ′ −41 48 ″	h m 14 31 s	° ′ +30 4 ″	h m 14 34 s	° ′ −60 30 ″	h m 14 35 s	° ′ +44 43 ″
Jan. 0.8	36.114	56.09	18.597	40.49	21.47	40.87	56.866	62.82
10.8	36.511 397	56.91 82	18.925 328	38.11 238	22.02 55	41.10 23	57.233 367	60.36 246
20.8	36.916 405	58.06 115	19.266 341	36.09 202	22.58 56	41.83 73	57.620 387	58.38 198
30.7	37.317 401	59.48 142	19.606 340	34.52 157	23.14 56	43.03 120	58.012 392	56.95 143
Feb. 9.7	37.705 388	61.16 168	19.938 332	33.45 107	23.68 54	44.59 156	58.397 385	56.11 84
	365	188	315	53	51	194	369	23
19.7	38.070	63.04	20.253	32.92	24.19	46.53	58.766	55.88
Mar. 1.7	38.405 335	65.04 200	20.542 289	32.90 2	24.66 47	48.75 222	59.106 340	56.26 38
11.6	38.708 303	67.12 208	20.801 259	33.39 49	25.08 42	51.21 246	59.409 303	57.23 97
21.6	38.978 270	69.22 210	21.025 224	34.36 97	25.44 36	53.83 262	59.672 263	58.70 147
31.6	39.206 228	71.34 212	21.211 186	35.73 137	25.75 31	56.57 274	59.889 217	60.62 192
	191	207	150	172	25	281	170	228
Apr. 10.6	39.397	73.41	21.361	37.45	26.00	59.38	60.059	62.90
20.5	39.550 153	75.41 200	21.471 110	39.41 196	26.19 19	62.18 280	60.181 122	65.43 253
30.5	39.663 113	77.30 189	21.546 75	41.54 213	26.32 13	64.90 272	60.254 73	68.12 269
May 10.5	39.739 76	79.06 176	21.583 37	43.74 220	26.38 6	67.54 264	60.282 28	70.86 274
20.4	39.775 36	80.67 161	21.587 4	45.96 222	26.38 0	69.99 245	60.265 17	73.55 269
	1	142	29	215	6	225	58	255
30.4	39.774	82.09	21.558	48.11	26.32	72.24	60.207	76.10
June 9.4	39.736 38	83.28 119	21.500 58	50.09 198	26.21 11	74.25 201	60.111 96	78.46 236
19.4	39.660 76	84.27 99	21.415 85	51.89 180	26.04 17	75.94 169	59.980 131	80.52 206
29.3	39.552 108	84.97 70	21.303 112	53.42 153	25.81 23	77.30 136	59.818 162	82.25 173
July 9.3	39.411 141	85.41 44	21.169 134	54.67 125	25.54 27	78.27 97	59.631 187	83.60 135
	166	15	152	93	31	56	211	94
19.3	39.245	85.56	21.017	55.60	25.23	78.83	59.420	84.54
29.3	39.056 189	85.42 14	20.850 167	56.17 57	24.89 34	78.95 12	59.193 227	85.04 50
Aug. 8.2	38.853 203	84.98 44	20.673 177	56.39 22	24.53 36	78.65 30	58.956 237	85.10 6
18.2	38.643 210	84.23 75	20.490 183	56.26 13	24.17 36	77.92 73	58.715 241	84.69 41
28.2	38.436 207	83.23 100	20.312 178	55.74 52	23.82 35	76.78 114	58.478 237	83.83 86
	195	123	169	87	33	152	225	130
Sept. 7.1	38.241 172	82.00	20.143	54.87	23.49	75.26	58.253	82.53
17.1	38.069 138	80.57 143	19.990 153	53.61 126	23.20 29	73.37 189	58.050 203	80.81 172
27.1	37.931 93	79.03 154	19.864 126	52.01 160	22.97 23	71.24 213	57.876 174	78.69 212
Oct. 7.1	37.838 41	77.41 162	19.771 93	50.09 192	22.80 17	68.94 230	57.740 136	76.20 219
17.0	37.797 20	75.78 163	19.717 54	47.84 225	22.71 9	66.54 210	57.651 89	73.40 280
		155	6	251	1	210	35	309
27.0	37.817	74.23	19.711	45.33	22.72	64.14	57.616	70.31
Nov. 6.0	37.899 82	72.84 139	19.756 45	42.59 274	22.82 10	61.83 231	57.640 24	67.01 330
16.0	38.047 148	71.70 114	19.856 100	39.66 293	23.01 19	59.74 209	57.728 88	63.57 344
25.9	38.260 213	70.83 87	20.007 151	36.64 302	23.29 28	57.93 181	57.878 150	60.07 350
Dec. 5.9	38.528 268	70.32 51	20.211 204	33.58 306	23.66 37	56.51 142	58.089 211	56.60 347
	319	17	248	300	44	101	267	333
15.9	38.847	70.15	20.459	30.58	24.10	55.50	58.356	53.27
25.8	39.205 358	70.38 23	20.747 288	27.73 285	24.59 49	54.97 53	58.671 315	50.19 308
35.8	39.591 386	71.00 62	21.063 316	25.11 262	25.12 53	54.95 2	59.024 353	47.43 276
Mean Place	36.617	73.39	19.714	44.32	21.402	66.45	58.373	69.76
Sec δ, Tan δ	1.342	−0.895	1.156	+0.579	2.032	−1.769	1.408	+0.991
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.076	−0.047	+0.052	+0.031	+0.090	−0.092	+0.045	+0.051
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.32	−0.61	−0.31	−0.61	−0.31	−0.62	−0.31	−0.63

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Apodis. Mag. 3.8		μ Virginis. Mag. 4.0		ε Boötis. Mag. 2.7		109 Virginis. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 38	−78 42	14 38	− 5 19	14 41	+27 23	14 42	+ 2 12
	s	″	s	″	s	″	s	″
Jan. 0.8	11.70	46.81	59.279	20.40	36.340	50.40	20.472	64.24
	126	42	307	185	317	242	302	202
10.8	12.96	46.39	59.586	22.25	36.657	47.98	20.774	62.22
	130	12	316	180	330	208	312	190
20.8	14.26	46.51	59.902	24.05	36.987	45.90	21.086	60.32
	132	69	314	170	333	167	312	173
30.8	15.58	47.20	60.216	25.75	37.320	44.23	21.398	58.59
Feb. 9.7	129	121	306	157	327	116	302	149
	16.87	48.41	60.522	27.32	37.647	43.07	21.700	57.10
	124	170	289	137	312	67	287	121
19.7	18.11	50.11	60.811	28.69	37.959	42.40	21.987	55.89
Mar. 1.7	115	211	267	113	287	17	267	91
	19.26	52.22	61.078	29.82	38.246	42.23	22.254	54.98
11.6	106	251	240	87	262	34	239	59
	20.32	54.73	61.318	30.69	38.508	42.57	22.493	54.39
21.6	93	280	212	61	226	81	213	−28
	21.25	57.53	61.530	31.30	38.734	43.38	22.706	54.11
31.6	80	305	185	37	193	121	185	3
	22.05	60.58	61.715	31.67	38.927	44.59	22.891	54.14
	65	323	153	13	159	157	152	28
Apr. 10.6	22.70	63.81	61.868	31.80	39.086	46.16	23.043	54.42
	50	331	124	6	120	183	124	52
20.5	23.20	67.12	61.992	31.74	39.206	47.99	23.167	54.94
	33	337	95	24	86	202	94	70
30.5	23.53	70.49	62.087	31.50	39.292	50.01	23.261	55.64
May 10.5	16	331	67	38	50	211	66	84
	23.69	73.80	62.154	31.12	39.342	52.12	23.327	56.48
20.4	0	322	39	48	18	216	37	91
	23.69	77.02	62.193	30.64	39.360	54.28	23.364	57.39
	17	300	13	57	18	209	11	98
30.4	23.52	80.02	62.206	30.07	39.342	56.37	23.375	58.37
June 9.4	33	279	16	61	46	196	16	98
	23.19	82.81	62.190	29.46	39.296	58.33	23.359	59.35
19.4	48	246	40	65	72	179	43	97
	22.71	85.27	62.150	28.81	39.224	60.12	23.316	60.32
29.3	63	209	67	64	102	157	67	92
	22.08	87.36	62.083	28.17	39.122	61.69	23.249	61.24
July 9.3	75	167	88	64	125	130	90	84
	21.33	89.03	61.995	27.53	38.997	62.99	23.159	62.08
	85	115	109	60	145	99	110	74
19.3	20.48	90.18	61.886	26.93	38.852	63.98	23.049	62.82
29.3	92	67	127	57	158	66	127	62
	19.56	90.85	61.759	26.36	38.694	64.64	22.922	63.44
Aug. 8.2	98	11	139	51	174	35	140	51
	18.58	90.96	61.620	25.85	38.520	64.99	22.782	63.95
18.2	99	40	146	44	177	5	147	37
	17.59	90.56	61.474	25.41	38.343	64.94	22.635	64.32
28.2	96	98	147	38	179	38	148	21
	16.63	89.58	61.327	25.03	38.164	64.56	22.487	64.53
	90	144	139	27	171	71	143	5
Sept. 7.1	15.73	88.14	61.188	24.76	37.993	63.85	22.344	64.58
	81	194	126	14	155	110	129	14
17.1	14.92	86.20	61.062	24.62	37.838	62.75	22.215	64.44
	66	234	104	0	130	144	107	33
27.1	14.26	83.86	60.958	24.62	37.708	61.31	22.108	64.11
Oct. 7.1	51	264	72	17	99	178	77	55
	13.75	81.22	60.886	24.79	37.609	59.53	22.031	63.56
17.0	31	287	37	36	63	209	42	76
	13.44	78.35	60.849	25.15	37.546	57.44	21.989	62.80
	9	298	8	58	16	235	2	102
27.0	13.35	75.37	60.857	25.73	37.530	55.09	21.991	61.78
Nov. 6.0	13	295	57	81	35	261	50	126
	13.48	72.42	60.914	26.54	37.565	52.48	22.041	60.52
16.0	36	282	106	106	89	279	98	148
	13.84	69.60	61.020	27.60	37.654	49.69	22.139	59.04
25.9	57	260	156	127	140	293	147	170
	14.41	67.00	61.176	28.87	37.794	46.76	22.286	57.34
Dec. 5.9	78	224	201	147	191	298	193	187
	15.19	64.76	61.377	30.34	37.985	43.78	22.479	55.47
	95	182	241	166	235	294	235	198
15.9	16.14	62.94	61.618	32.00	38.220	40.84	22.714	53.49
25.8	109	129	274	179	275	283	266	205
	17.23	61.65	61.892	33.79	38.495	38.01	22.980	51.44
35.8	121	76	299	185	306	264	293	207
	18.44	60.89	62.191	35.64	38.801	35.37	23.273	49.37
Mean Place	12.870	70.47	60.005	27.25	37.456	53.00	21.276	59.58
Sec δ, Tan δ	5.112	−5.013	1.004	−0.093	1.126	+0.518	1.001	+0.039
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.146	−0.258	+0.063	−0.005	+0.052	+0.026	+0.060	+0.002
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.31	−0.64	−0.31	−0.64	−0.30	−0.65	−0.30	−0.65

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	8 Libræ. Mag. 5.3		α Libræ. Mag. 2.9		Groombridge 2164. Mag. 5.7		β Ursæ Minoris. Mag. 2.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 46	−15 40	14 46	−15 43	14 49	+59 35	14 50	+74 27
	s	″	s	″	s	″	s	″
Jan. 0.8	24.742	30.30	36.191	11.39	26.720	74.53	50.34	62.68
	315	152	314	153	456	252	76	235
10.8	25.057	31.82	36.505	12.92	27.176	72.01	51.10	60.33
	325	159	325	157	489	198	84	176
20.8	25.382	33.41	36.830	14.49	27.665	70.03	51.94	58.57
	325	161	324	162	507	136	88	112
30.8	25.707	35.02	37.154	16.11	28.172	68.67	52.82	57.45
	316	158	316	158	509	70	89	45
Feb. 9.7	26.023	36.60	37.470	17.69	28.681	67.97	53.71	57.00
	300	150	299	150	493	4	87	23
19.7	26.323	38.10	37.769	19.19	29.174	67.93	54.58	57.23
	278	136	280	134	461	62	82	90
Mar. 1.7	26.601	39.46	38.049	20.53	29.635	68.55	55.40	58.13
	254	120	254	121	419	124	74	149
11.6	26.855	40.66	38.303	21.74	30.054	69.79	56.14	59.62
	227	104	228	105	365	182	65	206
21.6	27.082	41.70	38.531	22.79	30.419	71.61	56.79	61.68
	197	86	196	86	301	226	53	250
31.6	27.279	42.56	38.727	23.65	30.720	73.87	57.32	64.18
	166	67	168	70	235	265	39	286
Apr. 10.6	27.445	43.23	38.895	24.35	30.955	76.52	57.71	67.04
	138	50	137	51	165	290	26	308
20.5	27.583	43.73	39.032	24.86	31.120	79.42	57.97	70.12
	107	36	109	34	91	306	11	320
30.5	27.690	44.09	39.141	25.20	31.214	82.48	58.08	73.32
	80	22	78	23	22	311	2	321
May 10.5	27.770	44.31	39.219	25.43	31.236	85.59	58.06	76.53
	50	10	52	9	13	303	16	309
20.5	27.820	44.41	39.271	25.52	31.193	88.62	57.90	79.62
	21	3	20	1	106	288	29	288
30.4	27.841	44.38	39.291	25.51	31.087	91.50	57.61	82.50
June 9.4	27.832	44.28	39.284	25.44	30.922	94.12	57.21	85.10
	9	10	7	7	165	262	40	260
19.4	27.798	44.10	39.248	25.24	30.704	96.40	56.70	87.33
	34	18	36	20	218	228	51	223
29.3	27.735	43.83	39.185	24.96	30.439	98.31	56.11	89.12
	63	27	63	28	265	191	59	179
July 9.3	27.648	43.50	39.099	24.63	30.136	99.77	55.44	90.44
	87	33	86	33	303	146	67	132
	111	39	112	40	335	99	72	82
19.3	27.537	43.11	38.987	24.23	29.801	100.76	54.72	91.26
	131	46	132	46	358	50	76	28
29.3	27.406	42.65	38.855	23.77	29.443	101.26	53.96	91.54
	144	50	143	48	373	3	77	24
Aug. 8.2	27.262	42.15	38.712	23.29	29.070	101.23	53.19	91.30
	153	53	154	53	377	53	78	78
18.2	27.109	41.62	38.558	22.76	28.693	100.70	52.41	90.52
	155	55	154	56	373	101	77	129
28.2	26.954	41.07	38.404	22.20	28.320	99.69	51.64	89.23
	150	56	149	55	355	154	72	179
Sept. 7.2	26.804	40.51	38.255	21.65	27.965	98.15	50.92	87.44
	135	51	136	53	328	198	67	225
17.1	26.669	40.00	38.119	21.12	27.637	96.17	50.25	85.19
	112	46	112	45	289	243	60	265
27.1	26.557	39.54	38.007	20.67	27.348	93.74	49.65	82.54
	81	36	82	37	239	280	51	306
Oct. 7.1	26.476	39.18	37.925	20.30	27.109	90.94	49.14	79.48
	42	23	40	23	179	315	39	335
17.0	26.434	38.95	37.885	20.07	26.930	87.79	48.75	76.13
	2	4	0	5	107	342	27	360
27.0	26.436	38.91	37.885	20.02	26.823	84.37	48.48	72.53
Nov. 6.0	26.489	39.06	37.939	20.15	26.793	80.74	48.34	68.76
	53	15	54	13	30	363	14	377
16.0	26.594	39.44	38.043	20.53	26.846	76.98	48.36	64.91
	105	38	104	38	53	376	2	385
25.9	26.750	40.06	38.199	21.17	26.983	73.21	48.52	61.09
	156	62	156	64	137	377	16	382
Dec. 5.9	26.953	40.93	38.401	22.03	27.205	69.50	48.84	57.39
	203	87	202	86	222	371	32	370
	246	110	216	111	299	352	45	346
15.9	27.199	42.03	38.647	23.14	27.504	65.98	49.29	53.93
	281	131	281	129	370	323	60	313
25.9	27.480	43.34	38.928	24.43	27.874	62.75	49.89	50.80
	304	146	303	146	429	284	70	270
35.8	27.784	44.80	39.231	25.89	28.303	59.91	50.59	48.10
Mean Place	25.445	40.47	36.895	21.59	29.048	83.04	54.862	72.48
Sec δ, Tan δ	1.039	−0.281	1.039	−0.282	1.977	+1.705	3.735	+3.599
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.066	−0.014	+0.066	−0.014	+0.031	+0.084	−0.004	+0.176
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.30	−0.66	−0.30	−0.66	−0.29	−0.67	−0.29	−0.68

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Piazzi 221. Mag. 5.8		ξ^2 Libræ. Mag. 5.6		β Lupi. Mag. 2.8		δ Libræ. Var. 4.8–6.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 14 52 s	° ′ +14 45 ″	h m 14 52 s	° ′ −11 5 ″	h m 14 53 s	° ′ −42 49 ″	h m 14 56 s	° ′ − 8 12 ″
Jan. 0.8	34.092	25.32	34.425	50.41	27.968	12.38	50.503	43.33
	300	227	307	163	391	55	304	170
10.8	34.392	23.05	34.732	52.04	28.362	12.93	50.807	45.03
	311	205	318	165	407	87	312	169
20.8	34.703	21.00	35.050	53.69	28.769	13.80	51.119	46.72
	316	176	318	163	407	118	316	163
30.8	35.019	19.24	35.368	55.32	29.176	14.98	51.435	48.35
	309	139	313	153	399	142	308	152
Feb. 9.7	35.328	17.85	35.681	56.85	29.575	16.40	51.743	49.87
	295	100	296	141	383	163	296	136
19.7	35.623	16.85	35.977	58.26	29.958	18.03	52.039	51.23
	275	57	276	123	358	180	276	115
Mar. 1.7	35.898	16.28	36.253	59.49	30.316	19.83	52.315	52.38
	251	14	254	103	328	191	254	94
11.7	36.149	16.14	36.507	60.52	30.644	21.74	52.569	53.32
	223	24	225	84	291	196	226	70
21.6	36.372	16.38	36.732	61.36	30.938	23.70	52.795	54.02
	193	64	200	61	262	200	200	46
31.6	36.565	17.02	36.932	61.97	31.200	25.70	52.995	54.48
	163	94	168	41	222	197	173	26
Apr. 10.6	36.728	17.96	37.100	62.38	31.422	27.67	53.168	54.74
	131	121	141	23	185	195	143	4
20.5	36.859	19.17	37.241	62.61	31.607	29.62	53.311	54.78
	100	140	111	7	148	188	113	11
30.5	36.959	20.57	37.352	62.68	31.755	31.50	53.424	54.67
	69	153	83	8	105	177	85	21
May 10.5	37.028	22.10	37.435	62.60	31.860	33.27	53.509	54.41
	39	161	55	19	67	165	56	35
20.5	37.067	23.71	37.490	62.41	31.927	34.92	53.565	54.06
	9	161	26	28	28	151	29	43
30.4	37.076	25.32	37.516	62.13	31.955	36.43	53.594	53.63
	17	156	4	33	14	132	0	50
June 9.4	37.059	26.88	37.512	61.80	31.941	37.75	53.594	53.13
	47	147	29	41	53	111	28	54
19.4	37.012	28.35	37.483	61.39	31.888	38.86	53.566	52.59
	72	133	59	44	92	89	55	56
29.4	36.940	29.68	37.424	60.95	31.796	39.75	53.511	52.03
	97	115	83	46	127	62	81	56
July 9.3	36.843	30.83	37.341	60.49	31.669	40.37	53.430	51.47
	118	95	105	49	159	36	104	55
19.3	36.725	31.78	37.236	60.00	31.510	40.73	53.326	50.92
	136	73	126	51	186	5	124	54
29.3	36.589	32.51	37.110	59.49	31.324	40.78	53.202	50.38
	149	48	142	50	207	22	140	51
Aug. 8.2	36.440	32.99	36.968	58.99	31.117	40.56	53.062	49.87
	160	24	150	49	216	53	150	47
18.2	36.280	33.23	36.818	58.50	30.901	40.03	52.912	49.40
	160	3	153	47	221	80	153	41
28.2	36.120	33.20	36.665	58.03	30.680	39.23	52.759	48.99
	157	29	150	43	211	108	149	34
Sept. 7.2	35.963	32.91	36.515	57.60	30.466	38.15	52.610	48.65
	143	58	136	35	192	128	138	24
17.1	35.820	32.33	36.379	57.25	30.274	36.87	52.472	48.41
	122	86	114	25	162	146	116	13
27.1	35.698	31.47	36.265	57.00	30.112	35.41	52.356	48.28
	95	115	85	12	122	156	89	3
Oct. 7.1	35.603	30.32	36.180	56.88	29.990	33.85	52.267	48.31
	59	141	48	2	69	161	52	18
17.1	35.544	28.91	36.132	56.90	29.921	32.24	52.215	48.49
	15	171	4	21	10	157	9	38
27.0	35.529	27.20	36.128	57.11	29.911	30.67	52.206	48.87
	31	194	46	43	55	147	40	59
Nov. 6.0	35.560	25.26	36.174	57.54	29.966	29.20	52.246	49.46
	82	216	95	66	120	127	89	82
16.0	35.642	23.10	36.269	58.20	30.086	27.93	52.335	50.28
	131	235	148	88	186	103	139	105
25.9	35.773	20.75	36.417	59.08	30.272	26.90	52.474	51.33
	179	246	193	111	248	72	187	126
Dec. 5.9	35.952	18.29	36.610	60.19	30.520	26.18	52.661	52.59
	224	253	236	132	301	39	230	144
15.9	36.176	15.76	36.846	61.51	30.821	25.79	52.891	54.03
	258	250	271	147	347	2	264	159
25.9	36.434	13.26	37.117	62.98	31.168	25.77	53.155	55.62
	288	240	297	159	378	36	292	169
35.8	36.722	10.86	37.414	64.57	31.546	26.13	53.447	57.31
Mean Place	35.073	23.96	35.187	59.34	28.669	29.92	51.305	51.49
Sec δ, Tan δ	1.034	+0.263	1.019	−0.196	1.363	−0.927	1.010	−0.144
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.056	+0.013	+0.065	−0.010	+0.078	−0.045	+0.064	−0.007
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.29	−0.68	−0.29	−0.68	−0.29	−0.69	−0.29	−0.70

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Boötis. Mag. 3.6		γ Scorpii. Mag. 3.4		ψ Boötis. Mag. 4.7		c Boötis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 59	+40 41	14 59	−24 58	15 1	+27 14	15 3	+25 9
	s	″	s	″	s	″	s	″
Jan. 0.8	1.244	32.09	32.801	35.75	7.556	47.96	53.957	64.50
10.8	1.582 338	29.47 262	33.129 328	36.88 113	7.861 305	45.45 251	54.259 302	62.01 249
20.8	1.941 359	27.29 218	33.467 338	38.17 129	8.184 323	43.27 218	54.577 318	59.82 219
30.8	2.308 367	25.57 172	33.809 342	39.57 140	8.513 329	41.50 177	54.904 327	58.04 178
Feb. 9.7	2.676 368	24.46 111	34.143 334	41.08 151	8.840 327	40.19 131	55.227 323	56.69 135
	355	53	321	151	316	80	313	86
19.7	3.031	23.93	34.464	42.59	9.156	39.39	55.540	55.83
Mar. 1.7	3.365 334	24.00 7	34.763 299	44.07 148	9.452 296	39.10 29	55.834 294	55.48 35
11.7	3.671 306	24.67 67	35.040 277	45.49 142	9.723 271	39.34 24	56.105 271	55.62 14
21.6	3.941 270	25.86 119	35.289 249	46.83 134	9.964 241	40.05 71	56.345 240	56.25 63
31.6	4.174 233	27.53 167	35.511 222	48.06 123	10.174 210	41.21 116	56.556 211	57.29 104
	189	205	192	112	175	151	177	141
Apr. 10.6	4.363 148	29.58 233	35.703 161	49.18 98	10.349 141	42.72 182	56.733 144	58.70 171
20.5	4.511 104	31.91 255	35.864 129	50.16 88	10.490 104	44.54 201	56.877 109	60.41 192
30.5	4.615 59	34.46 265	35.993 98	51.04 71	10.594 72	46.55 215	56.986 75	62.33 206
May 10.5	4.674 18	37.11 270	36.091 67	51.78 62	10.666 36	48.70 219	57.061 41	64.39 211
20.5	4.692 —	39.81 259	36.158 35	52.40 51	10.702 2	50.89 217	57.102 9	66.50 209
30.4	4.670	42.40	36.193	52.91	10.704	53.06	57.111	68.59
June 9.4	4.610 60	44.83 243	36.195 2	53.28 37	10.676 28	55.13 207	57.089 22	70.58 199
19.4	4.512 98	47.02 219	36.168 27	53.57 29	10.615 61	57.03 190	57.035 54	72.43 185
29.4	4.384 128	48.91 189	36.108 60	53.71 14	10.528 87	58.71 168	56.952 83	74.08 165
July 9.3	4.224 160	50.48 157	36.023 85	53.70 1	10.411 117	60.14 143	56.845 107	75.50 142
	185	116	116	10	139	113	133	112
19.3	4.039	51.64 76	35.907	53.60	10.272	61.27	56.712	76.62
29.3	3.832 207	52.40 37	35.770 137	53.34 26	10.115 157	62.08 81	56.560 152	77.46 84
Aug. 8.2	3.614 218	52.77 11	35.615 155	52.95 39	9.940 175	62.56 48	56.391 169	77.95 49
18.2	3.385 229	52.66 52	35.448 167	52.44 51	9.757 183	62.67 11	56.212 179	78.13 18
28.2	3.155 230	52.14 98	35.277 171	51.81 63	9.570 187	62.44 23	56.030 182	77.94 19
	223		169	72	181	60	178	53
Sept. 7.2	2.932	51.16	35.108	51.09	9.389	61.84	55.852	77.41
17.1	2.724 208	49.74 142	34.957 151	50.32 77	9.220 169	60.87 97	55.687 165	76.53 88
27.1	2.541 183	47.93 181	34.827 130	49.53 79	9.071 149	59.55 132	55.541 146	75.29 124
Oct. 7.1	2.392 149	45.74 219	34.729 98	48.75 78	8.953 118	57.89 166	55.425 116	73.72 157
17.1	2.286 106	43.21 253	34.672 57	48.03 72	8.871 82	55.90 199	55.344 81	71.84 188
	61	286	8	59	38	229	37	219
27.0	2.225	40.35	34.664	47.44	8.833	53.61	55.307	69.65
Nov. 6.0	2.224 1	37.23 312	34.705 41	47.00 44	8.845 12	51.07 254	55.318 11	67.20 245
16.0	2.280 56	33.95 328	34.802 97	46.78 22	8.909 64	48.31 276	55.381 63	64.54 266
25.9	2.399 119	30.57 338	34.954 152	46.79 1	9.028 119	45.39 292	55.498 117	61.73 281
Dec. 5.9	2.576 177	27.16 341	35.159 205	47.07 28	9.198 170	42.42 297	55.666 168	58.82 291
	233	334	248	53	218	298	215	291
15.9	2.809	23.82	35.407	47.60	9.416	39.44	55.881	55.91
25.9	3.090 281	20.66 316	35.695 288	48.41 81	9.673 257	36.55 289	56.135 254	53.06 285
35.8	3.407 317	17.76 290	36.010 315	49.42 101	9.966 293	33.85 270	56.424 289	50.38 268
Mean Place	2.742	36.77	33.547	48.75	8.757	49.48	55.135	65.37
Sec δ, Tan δ	1.319	+0.860	1.103	−0.466	1.125	+0.515	1.105	+0.470
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.045	+0.041	+0.070	−0.022	+0.051	+0.024	+0.052	+0.022
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.28	−0.70	−0.28	−0.71	−0.28	−0.71	−0.28	−0.72

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Lupi. Mag. 3.5		ι Libræ. Mag. 4.7		3 Serpentis. Mag. 5.4		γ Triang. Aust. Mag. 3.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 15 6 s	° ′ −51 48 ″	h m 15 7 s	° ′ −19 29 ″	h m 15 11 s	° ′ + 5 13 ″	h m 15 11 s	° ′ −68 23 ″
Jan. 0.9	43.709	6.29	48.874	53.53	20.625	32.29	40.38	26.22
	444	5	313	126	287	206	68	58
10.8	44.153	6.34	49.187	54.79	20.912	30.23	41.06	25.64
	464	48	326	139	303	193	72	10
20.8	44.617	6.82	49.513	56.18	21.215	28.30	41.78	25.54
	472	83	329	144	309	173	74	39
30.8	45.089	7.65	49.842	57.62	21.524	26.57	42.52	25.93
	464	118	324	145	303	149	74	86
Feb. 9.7	45.553	8.83	50.166	59.07	21.827	25.08	43.26	26.79
	449	146	311	112	295	117	72	129
19.7	46.002	10.29	50.477	60.49	22.122	23.91	43.98	28.08
	426	174	294	134	278	84	69	170
Mar. 1.7	46.428	12.03	50.771	61.83	22.400	23.07	44.67	29.78
	394	193	272	121	256	50	64	202
11.7	46.822	13.96	51.043	63.04	22.656	22.57	45.31	31.80
	360	206	246	109	233	14	58	231
21.6	47.182	16.02	51.289	64.13	22.889	22.43	45.89	34.11
	320	219	219	95	205	18	53	254
31.6	47.502	18.21	51.508	65.08	23.094	22.61	46.42	36.65
	276	225	192	80	179	47	15	272
Apr. 10.6	47.778	20.46	51.700	65.88	23.273	23.08	46.87	39.37
	234	228	162	65	149	72	37	284
20.6	48.012	22.74	51.862	66.53	23.422	23.80	47.24	42.21
	188	226	133	52	121	91	30	291
30.5	48.200	25.00	51.995	67.05	23.543	24.71	47.54	45.12
	139	221	103	40	93	106	21	291
May 10.5	48.339	27.21	52.098	67.45	23.636	25.77	47.75	48.03
	93	210	73	28	63	116	12	284
20.5	48.432	29.31	52.171	67.73	23.699	26.93	47.87	50.87
	40	198	44	19	33	120	4	272
30.4	48.472	31.29	52.215	67.92	23.732	28.13	47.91	53.59
	10	180	12	9	6	120	6	257
June 9.4	48.462	33.09	52.227	68.01	23.738	29.33	47.85	56.16
	58	157	20	1	21	115	14	230
19.4	48.404	34.66	52.207	68.02	23.714	30.48	47.71	58.46
	106	135	18	7	51	108	22	203
29.4	48.298	36.01	52.159	67.95	23.663	31.56	47.49	60.49
	151	104	78	16	79	99	30	165
July 9.3	48.147	37.05	52.081	67.79	23.584	32.55	47.19	62.14
	193	72	101	26	101	86	37	130
19.3	47.954	37.77	51.977	67.53	23.483	33.41	46.82	63.44
	227	39	129	32	125	71	43	81
29.3	47.727	38.16	51.848	67.21	23.358	34.12	46.39	64.25
	254	1	116	40	110	56	47	38
Aug. 8.3	47.473	38.17	51.702	66.81	23.218	34.68	45.92	64.63
	270	33	160	46	153	39	49	12
18.2	47.203	37.84	51.542	66.35	23.065	35.07	45.43	64.51
	275	72	166	53	158	20	50	60
28.2	46.928	37.12	51.376	65.82	22.907	35.27	44.93	63.91
	269	105	161	57	157	2	49	107
Sept. 7.2	46.659	36.07	51.215	65.25	22.750	35.29	44.44	62.84
	217	136	152	58	148	21	45	151
17.1	46.412	34.71	51.063	64.67	22.602	35.08	43.99	61.33
	213	160	131	56	130	41	39	189
27.1	46.199	33.11	50.932	64.11	22.472	34.67	43.60	59.44
	166	180	101	51	103	65	32	221
Oct. 7.1	46.033	31.31	50.831	63.60	22.369	34.02	43.28	57.23
	106	193	63	42	68	88	22	246
17.1	45.927	29.38	50.768	63.18	22.301	33.14	43.06	54.77
	39	197	18	27	28	113	11	260
27.0	45.888	27.41	50.750	62.91	22.273	32.01	42.95	52.17
	35	193	32	12	19	136	2	262
Nov. 6.0	45.923	25.48	50.782	62.79	22.292	30.65	42.97	49.55
	114	179	86	9	67	160	13	256
16.0	46.037	23.69	50.868	62.88	22.359	29.05	43.10	46.99
	192	158	138	33	118	180	27	237
26.0	46.229	22.11	51.006	63.21	22.477	27.25	43.37	44.62
	264	128	190	56	166	196	37	213
Dec. 5.9	46.493	20.83	51.196	63.77	22.643	25.29	43.74	42.49
	329	96	233	81	210	210	49	174
15.9	46.822	19.87	51.429	64.58	22.853	23.19	44.23	40.75
	383	56	272	101	246	214	58	134
25.9	47.205	19.31	51.701	65.59	23.099	21.05	44.81	39.41
	426	17	300	120	275	213	65	88
35.8	47.631	19.14	52.001	66.79	23.374	18.92	45.46	38.53
Mean Place	44.585	25.62	49.683	65.06	21.589	27.58	41.719	48.13
Sec δ, Tan δ	1.617	−1.271	1.061	−0.354	1.004	+0.091	2.716	−2.525
Dψα, Dωα	+0.086	−0.058	+0.068	−0.016	+0.059	+0.004	+0.111	−0.113
Dψδ, Dωδ	−0.27	−0.73	−0.27	−0.73	−0.27	−0.74	−0.27	−0.74

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Boötis. Mag. 3.5		β Libræ. Mag. 2.7		γ Ursæ Minoris. Mag. 3.1		μ Boötis *pr.* Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	15 12	+33 35	15 12	− 9 5	15 20	+72 6	15 21	+37 38
	s	″	s	″	s	″	s	″
Jan. 0.9	22.548	62.08	50.766	50.35	46.20	21.29	33.386	44.60
	309	265	296	163	61	269	310	275
10.8	22.857	59.43	51.062	51.98	46.81	18.60	33.696	41.85
	332	226	310	162	70	216	337	233
20.8	23.189	57.17	51.372	53.60	47.51	16.44	34.033	39.52
	341	184	314	155	75	155	351	190
30.8	23.530	55.33	51.686	55.15	48.26	14.89	34.384	37.62
Feb. 9.7	342	132	311	147	77	88	351	134
	23.872	54.01	51.997	56.62	49.03	14.01	34.735	36.28
	332	76	300	132	78	22	347	77
19.7	24.204	53.25	52.297	57.94	49.81	13.79	35.082	35.51
	316	21	285	113	75	47	330	19
Mar. 1.7	24.520	53.04	52.582	59.07	50.56	14.26	35.412	35.32
	291	36	262	92	70	112	308	42
11.7	24.811	53.40	52.844	59.99	51.26	15.38	35.720	35.74
	264	88	238	68	62	171	280	96
21.6	25.075	54.28	53.082	60.67	51.88	17.09	36.000	36.70
	228	133	215	47	54	222	244	145
31.6	25.303	55.61	53.297	61.14	52.42	19.31	36.244	38.15
	193	175	185	26	43	263	207	185
Apr. 10.6	25.496	57.36	53.482	61.40	52.85	21.94	36.451	40.00
	159	206	158	6	32	295	168	218
20.6	25.655	59.42	53.640	61.46	53.17	24.89	36.619	42.18
	117	229	129	10	19	316	131	245
30.5	25.772	61.71	53.769	61.36	53.36	28.05	36.750	44.63
May 10.5	81	212	102	24	8	323	88	259
	25.853	64.13	53.871	61.12	53.44	31.28	36.838	47.22
20.5	41	248	72	33	5	320	47	264
	25.894	66.61	53.943	60.79	53.39	34.48	36.885	49.86
	4	243	44	13	16	306	8	260
30.4	25.898	69.04	53.987	60.36	53.23	37.54	36.893	52.46
	29	231	13	47	26	284	29	248
June 9.4	25.869	71.35	54.000	59.89	52.97	40.38	36.864	54.94
	65	214	16	51	37	254	70	228
19.4	25.804	73.49	53.984	59.38	52.60	42.92	36.794	57.22
	95	187	45	50	46	219	100	236
29.4	25.709	75.36	53.939	58.88	52.14	45.11	36.694	59.28
July 9.3	127	163	71	54	53	174	138	174
	25.582	76.99	53.865	58.34	51.61	46.85	36.556	61.02
	152	126	96	53	59	123	161	138
19.3	25.430	78.25	53.769	57.81	51.02	48.08	36.392	62.40
	176	91	122	50	64	74	187	99
29.3	25.254	79.16	53.647	57.31	50.38	48.82	36.205	63.39
	192	53	139	18	68	22	207	56
Aug. 8.3	25.062	79.69	53.508	56.83	49.70	49.04	35.998	63.95
	204	12	153	46	69	29	221	20
18.2	24.858	79.81	53.355	56.37	49.01	48.75	35.777	64.15
	208	29	156	40	69	83	227	23
28.2	24.650	79.52	53.199	55.97	48.32	47.92	35.550	63.92
	204	66	158	35	68	135	222	71
Sept. 7.2	24.446	78.86	53.041	55.62	47.64	46.57	35.328	63.21
	195	110	146	25	64	182	215	111
17.1	24.251	77.76	52.895	55.37	47.00	44.75	35.113	62.10
	171	146	127	15	59	231	192	153
27.1	24.080	76.30	52.768	55.22	46.41	42.44	34.921	60.57
Oct. 7.1	112	188	102	0	51	270	164	192
	23.938	74.42	52.666	55.22	45.90	39.74	34.757	58.65
17.1	103	222	63	15	43	309	124	229
	23.835	72.20	52.603	55.37	45.47	36.65	34.633	56.36
	63	247	26	28	32	338	82	263
27.0	23.772	69.73	52.577	55.65	45.15	33.27	34.551	53.73
	7	281	25	54	21	363	25	292
Nov. 6.0	23.765	66.92	52.602	56.19	44.94	29.64	34.526	50.81
	47	301	73	74	8	378	29	312
16.0	23.812	63.91	52.675	56.93	44.86	25.86	34.555	47.69
	103	314	127	95	5	383	90	327
26.0	23.915	60.77	52.802	57.88	44.91	22.03	34.645	44.42
Dec. 5.9	159	322	175	116	19	380	148	335
	24.074	57.55	52.977	59.04	45.10	18.23	34.793	41.07
	209	319	215	134	32	363	201	332
15.9	24.283	54.36	53.192	60.38	45.42	14.60	34.994	37.75
	256	307	254	150	45	338	251	319
25.9	24.539	51.29	53.446	61.88	45.87	11.22	35.245	34.56
	291	289	282	158	56	301	290	297
35.8	24.830	48.40	53.728	63.46	46.43	8.21	35.535	31.59
Mean Place	23.922	64.47	51.646	59.08	50.387	28.60	34.894	47.28
Sec δ, Tan δ	1.201	+0.664	1.013	−0.160	3.255	+3.098	1.263	+0.771
$D_{\psi a}$, $D_{\omega a}$	+0.048	+0.030	+0.064	−0.007	−0.002	+0.132	+0.045	+0.033
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.27	−0.74	−0.27	−0.75	−0.25	−0.77	−0.25	−0.77

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^1 Serpentis. Mag. 5.5		ι Draconis. Mag. 3.5		32 Libræ. Mag. 5.9		β Coronæ Borealis. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 15 22 s	° ′ +15 41 ″	h m 15 23 s	° ′ +59 13 ″	h m 15 23 s	° ′ −16 26 ″	h m 15 24 s	° ′ +29 21 ″
Jan. 0.9	11.887	54.49	10.508	61.03	53.723	45.89	37.930	72.32
10.8	12.170 283	52.15 234	10.920 412	58.19 284	54.022 299	47.19 130	38.223 293	69.68 264
20.8	12.471 301	50.03 212	11.375 455	55.87 232	54.336 314	48.57 138	38.538 315	67.39 229
30.8	12.781 310	48.19 184	11.861 486	54.10 177	54.658 322	49.97 140	38.866 328	65.48 191
Feb. 9.8	13.091 310	46.71 148	12.358 497	52.99 111	54.978 320	51.35 138	39.193 327	64.03 145
	300	107	495	45	311	131	324	91
19.7	13.391	45.64	12.853	52.54	55.289	52.66	39.517	63.12
Mar. 1.7	13.678 287	45.00 61	13.329 476	52.76 22	55.584 295	53.86 120	39.828 311	62.75 37
11.7	13.944 266	44.80 20	13.774 445	53.64 88	55.860 276	54.92 106	40.114 286	62.91 16
21.6	14.187 243	45.02 22	14.174 400	55.10 146	56.114 254	55.84 92	40.375 261	63.58 67
31.6	14.403 216	45.64 62	14.521 347	57.11 201	56.347 233	56.58 74	40.607 232	64.74 116
	189	96	287	245	198	58	199	155
Apr. 10.6	14.592	46.60	14.808	59.56	56.545	57.16	40.806	66.29
20.6	14.749 157	47.86 126	15.030 222	62.33 277	56.719 174	57.58 42	40.972 166	68.15 186
30.5	14.876 127	49.34 148	15.183 153	65.35 302	56.866 117	57.88 30	41.102 130	70.26 211
May 10.5	14.975 99	50.98 164	15.268 85	68.47 312	56.983 117	58.05 17	41.198 96	72.52 226
20.5	15.041 66	52.70 172	15.284 16	71.61 314	57.071 88	58.12 7	41.255 57	74.87 235
	35	175	50	305	58	1	23	235
30.5	15.076	54.45	15.234	74.66	57.129	58.11	41.278	77.22
June 9.4	15.082 −6	56.16 171	15.121 113	77.51 285	57.156 27	58.03 8	41.267 11	79.45 223
19.4	15.056 26	57.77 161	14.948 173	80.10 259	57.151 5	57.88 15	41.221 46	81.55 210
29.4	15.002 54	59.26 149	14.723 225	82.34 221	57.115 36	57.68 20	41.143 78	83.45 190
July 9.3	14.918 84	60.57 131	14.449 274	84.18 184	57.047 68	57.43 25	41.034 109	85.10 165
	110	110	313	140	95	29	137	132
19.3	14.808	61.67	14.136	85.58	56.952	57.14	40.897	86.42
29.3	14.677 131	62.55 88	13.788 348	86.51 93	56.831 121	56.80 34	40.737 160	87.42 100
Aug. 8.3	14.526 151	63.18 63	13.417 371	86.94 43	56.689 142	56.42 38	40.559 178	88.07 65
18.2	14.361 165	63.54 36	13.031 386	86.85 9	56.533 156	56.00 42	40.367 192	88.35 28
28.2	14.191 170	63.63 9	12.641 390	86.22 63	56.368 165	55.55 45	40.168 199	88.24 11
	171	21	385	107	164	45	200	47
Sept. 7.2	14.020	63.42	12.256	85.15	56.204	55.10	39.968	87.77
17.2	13.858 162	62.94 48	11.892 364	83.56 159	56.048 156	54.65 45	39.780 188	86.90 87
27.1	13.712 146	62.15 79	11.558 334	81.50 206	55.910 138	54.25 40	39.609 171	85.64 126
Oct. 7.1	13.593 119	61.07 108	11.267 291	79.02 248	55.798 112	53.91 34	39.465 144	84.04 160
17.1	13.506 87	59.71 136	11.031 236	76.13 289	55.722 76	53.67 24	39.356 109	82.09 195
	45	166	171	321	33	10	68	228
27.0	13.461	58.05	10.860	72.92	55.689	53.57	39.288	79.81
Nov. 6.0	13.458 −3	56.14 191	10.763 97	69.44 348	55.704 15	53.63 6	39.271 17	77.25 256
16.0	13.510 52	53.99 215	10.748 15	65.76 368	55.770 66	53.88 25	39.306 35	74.44 281
26.0	13.611 101	51.65 234	10.817 69	62.00 376	55.889 119	54.36 48	39.398 92	71.46 298
Dec. 5.9	13.762 151	49.17 248	10.973 156	58.23 377	56.061 172	55.05 69	39.542 144	68.41 305
	197	255	234	366	216	89	194	308
15.9	13.959	46.62	11.207	54.57	56.277	55.94	39.736	65.33
25.9	14.194 235	44.07 255	11.521 314	51.13 344	56.532 255	57.03 109	39.976 240	62.34 299
35.9	14.464 270	41.60 247	11.900 379	48.01 312	56.818 286	58.28 125	40.249 273	59.52 282
Mean Place	13.004	52.14	12.997	66.99	54.630	56.75	39.266	73.09
Sec δ, Tan δ	1.039	+0.281	1.955	+1.680	1.043	−0.295	1.148	+0.563
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.055	+0.012	+0.027	+0.071	+0.067	−0.012	+0.050	+0.024
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.25	−0.77	−0.25	−0.77	−0.25	−0.78	−0.25	−0.78

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν^1 Boötis. Mag. 5.2		γ Lupi (*mean*). Mag. 3.0		γ Libræ. Mag. 4.0		α Coronæ Borealis. Mag. 2.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 15 28 s	° ′ +41 5 ″	h m 15 29 s	° ′ −40 54 ″	h m 15 31 s	° ′ −14 31 ″	h m 15 31 s	° ′ +26 58 ″
Jan. 0.9	8.185	38.33	59.171	16.88	12.022	50.62	24.311	22.64
10.8	8.499 314	35.52 281	59.535 364	17.12 24	12.316 294	51.96 134	24.598 287	20.00 264
20.8	8.843 344	33.10 242	59.920 385	17.67 55	12.626 310	53.35 139	24.906 308	17.70 230
30.8	9.202 359	31.18 192	60.315 395	18.49 82	12.944 318	54.75 140	25.224 318	15.78 192
Feb. 9.8	9.567 365	29.79 139	60.708 393	19.53 104	13.260 316	56.11 136	25.548 324	14.27 151
	361	79	385	124	310	128	320	98
19.7	9.928	29.00 17	61.093	20.77	13.570	57.39	25.868	13.29 46
Mar. 1.7	10.273 345	28.83 44	61.463 370	22.17 140	13.865 295	58.52 113	26.173 305	12.83 3
11.7	10.597 324	29.27 100	61.810 347	23.68 151	14.141 276	59.50 98	26.459 286	12.86 58
21.7	10.891 294	30.27 151	62.130 320	25.27 159	14.398 257	60.32 82	26.723 264	13.44 103
31.6	11.151 260	31.78 195	62.422 292	26.90 163	14.630 232	60.95 63	26.957 234	14.47 142
	220		260	165	207	45	202	
Apr. 10.6	11.371	33.73	62.682	28.55	14.837	61.40	27.159	15.89
20.6	11.553 182	36.02 229	62.907 225	30.20 165	15.016 179	61.71 31	27.331 172	17.63 174
30.5	11.693 140	38.58 256	63.098 191	31.81 161	15.168 152	61.88 17	27.469 138	19.63 200
May 10.5	11.788 95	41.27 269	63.251 153	33.38 157	15.292 124	61.92 4	27.572 103	21.81 218
20.5	11.840 52	44.03 276	63.364 113	34.87 149	15.385 93	61.86 6	27.639 67	24.07 226
	10	273	74	140	65	15	33	226
30.5	11.850	46.76	63.438	36.27	15.450	61.71	27.672	26.33
June 9.4	11.819 31	49.38 262	63.471 33	37.54 127	15.482 32	61.51 20	27.672 0	28.51 218
19.4	11.746 73	51.78 240	63.461 10	38.67 113	15.482 0	61.26 25	27.636 36	30.60 209
29.4	11.637 109	53.93 215	63.409 52	39.63 96	15.451 31	60.97 29	27.570 66	32.46 186
July 9.4	11.493 144	55.75 182	63.318 91	40.38 75	15.389 62	60.66 31	27.471 99	34.09 163
	175	117	129	54	90	36	127	134
19.3	11.318	57.22 105	63.189	40.92 30	15.299	60.30	27.344	35.43 104
29.3	11.117 201	58.27 64	63.027 162	41.22 4	15.182 117	59.93 37	27.195 149	36.47 68
Aug. 8.3	10.895 222	58.91 19	62.837 190	41.26 21	15.044 138	59.55 38	27.023 172	37.15 37
18.2	10.658 237	59.10 24	62.627 210	41.05 49	14.889 155	59.14 41	26.835 188	37.52 4
28.2	10.415 243	58.86 70	62.408 219	40.56 75	14.726 163	58.74 40	26.641 194	37.48 36
	243		221		166	41	194	
Sept. 7.2	10.172	58.16	62.187	39.81	14.560	58.33	26.447	37.12
17.2	9.941 231	57.00 116	61.979 208	38.86 95	14.401 159	57.96 37	26.263 184	36.36 76
27.1	9.729 212	55.43 157	61.793 186	37.70 116	14.259 142	57.62 34	26.091 172	35.23 113
Oct. 7.1	9.549 180	53.45 198	61.639 154	36.40 130	14.144 115	57.38 24	25.947 144	33.75 148
17.1	9.405 144	51.08 237	61.533 106	35.02 138	14.063 81	57.24 14	25.837 110	31.90 185
	96	270	52	140	40	0	70	213
27.1	9.309	48.38	61.481	33.62	14.023	57.24	25.767	29.77
Nov. 6.0	9.267 42	45.38 300	61.488 7	32.27 135	14.030 7	57.41 17	25.746 21	27.32 245
16.0	9.284 17	42.16 322	61.561 73	31.04 123	14.090 60	57.77 36	25.776 30	24.65 267
26.0	9.362 78	38.77 339	61.700 139	30.01 103	14.200 110	58.34 57	25.862 86	21.81 284
Dec. 5.9	9.502 140	35.32 345	61.901 201	29.19 82	14.363 163	59.12 78	25.999 137	18.84 297
	196	341	258	54	208	98	186	300
15.9	9.698	31.91	62.159	28.65	14.571	60.10	26.185	15.84
25.9	9.947 249	28.62 329	62.466 307	28.41 24	14.818 247	61.25 115	26.419 234	12.89 295
35.9	10.240 293	25.59 303	62.813 347	28.50 9	15.096 278	62.55 130	26.685 266	10.10 279
Mean Place	9.814	41.24	60.161	33.62	12.974	61.05	25.629	22.53
Sec δ, Tan δ	1.327	+0.872	1.323	−0.866	1.033	−0.259	1.122	+0.509
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.043	+0.036	+0.079	−0.035	+0.067	−0.010	+0.050	+0.020
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.24	−0.79	−0.24	−0.79	−0.24	−0.80	−0.24	−0.80

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Cor. Bor. *seq.* Mag. 5.1		α Serpentis. Mag. 2.8		β Serpentis. Mag. 3.7		κ Serpentis. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 15 36	° ′ +36 52	h m 15 40	° ′ + 6 39	h m 15 42	° ′ +15 39	h m 15 45	° ′ +18 22
	s	″	s	″	s	″	s	″
Jan. 0.9	27.166	64.49	27.319	66.12	36.831	45.60	15.124	44.66
	299	280	273	209	270	236	269	244
10.9	27.465	61.69	27.592	64.03	37.101	43.24	15.393	42.22
	324	215	289	193	291	217	293	224
20.8	27.789	59.24	27.881	62.10	37.392	41.07	15.686	39.98
	342	199	301	175	305	189	304	192
30.8	28.131	57.25	28.182	60.35	37.697	39.18	15.990	38.06
Feb. 9.8	348	148	303	150	307	154	309	156
	28.479	55.77	28.485	58.85	38.004	37.64	16.299	36.50
	315	90	299	120	302	113	305	113
19.7	28.824	54.87	28.784	57.65	38.306	36.51	16.604	35.37
	332	32	289	84	292	72	295	68
Mar. 1.7	29.156	54.55	29.073	56.81	38.598	35.79	16.899	34.69
	313	26	270	46	275	26	278	20
11.7	29.469	54.81	29.343	56.35	38.873	35.53	17.177	34.49
	286	82	250	11	255	17	259	23
21.7	29.755	55.63	29.593	56.24	39.128	35.70	17.436	34.72
	256	131	226	24	230	59	234	69
31.6	30.011	56.94	29.819	56.48	39.358	36.29	17.670	35.41
	220	180	205	56	205	93	208	104
Apr. 10.6	30.231	58.74	30.024	57.04	39.563	37.22	17.878	36.45
	185	213	175	80	178	125	180	136
20.6	30.416	60.87	30.199	57.84	39.741	38.47	18.058	37.81
	116	240	149	104	147	148	150	162
30.6	30.562	63.27	30.348	58.88	39.888	39.95	18.208	39.43
May 10.5	105	257	116	121	117	166	118	179
	30.667	65.84	30.464	60.09	40.005	41.61	18.326	41.22
20.5	65	261	90	130	88	177	88	191
	30.732	68.48	30.554	61.39	40.093	43.38	18.414	43.13
	25	263	59	135	53	180	53	194
30.5	30.757	71.11	30.613	62.74	40.146	45.18	18.467	45.07
	14	254	29	135	21	178	23	190
June 9.4	30.743	73.65	30.642	64.09	40.170	46.96	18.490	46.97
	51	237	1	132	9	170	12	182
19.4	30.692	76.02	30.641	65.41	40.161	48.66	18.478	48.79
	88	214	34	122	40	158	41	168
29.4	30.604	78.16	30.607	66.63	40.121	50.24	18.437	50.47
July 9.4	123	183	61	112	73	142	76	151
	30.481	79.99	30.543	67.75	40.048	51.66	18.361	51.98
	153	152	90	99	99	120	103	128
19.3	30.328	81.51	30.453	68.74	39.949	52.86	18.258	53.26
	181	113	118	82	127	98	130	103
29.3	30.147	82.64	30.335	69.56	39.822	53.84	18.128	54.29
	204	74	139	64	117	72	150	75
Aug. 8.3	29.943	83.38	30.196	70.20	39.675	54.56	17.978	55.04
	217	32	153	45	164	47	169	46
18.3	29.726	83.70	30.043	70.65	39.511	55.03	17.809	55.50
	228	10	165	27	174	18	179	18
28.2	29.498	83.60	29.878	70.92	39.337	55.21	17.630	55.68
	227	55	167	6	178	10	182	12
Sept. 7.2	29.271	83.05	29.711	70.98	39.159	55.11	17.448	55.56
	220	97	162	16	172	39	177	46
17.2	29.051	82.08	29.549	70.82	38.987	54.72	17.271	55.10
	202	138	148	42	158	71	164	77
27.1	28.849	80.70	29.401	70.40	38.829	54.01	17.107	54.33
Oct. 7.1	174	180	122	67	135	98	141	109
	28.675	78.90	29.279	69.73	38.694	53.03	16.966	53.24
17.1	139	216	94	87	104	130	109	139
	28.536	76.74	29.185	68.86	38.590	51.73	16.857	51.85
	95	250	58	115	64	157	70	171
27.1	28.441	74.24	29.127	67.71	38.526	50.16	16.787	50.14
	45	282	9	139	22	186	27	198
Nov. 6.0	28.396	71.42	29.118	66.32	38.504	48.30	16.760	48.16
	12	305	37	160	29	209	21	223
16.0	28.408	68.37	29.155	64.72	38.533	46.21	16.784	45.93
	71	321	89	183	81	230	75	243
26.0	28.479	65.16	29.244	62.89	38.614	43.91	16.859	43.50
Dec. 6.0	128	332	138	199	130	246	126	258
	28.607	61.84	29.382	60.90	38.744	41.45	16.985	40.92
	184	331	181	211	176	253	174	264
15.9	28.791	58.53	29.563	58.79	38.920	38.92	17.159	38.28
	235	323	225	214	221	255	216	267
25.9	29.026	55.30	29.788	56.65	39.141	36.37	17.375	35.61
	276	302	254	216	252	248	253	258
35.9	29.302	52.28	30.042	54.49	39.393	33.89	17.628	33.03
Mean Place	28.710	66.12	28.422	60.90	38.026	42.43	16.362	42.00
Sec δ, Tan δ	1.250	+0.750	1.007	+0.117	1.039	+0.280	1.054	+0.332
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.045	+0.029	+0.059	+0.004	+0.055	+0.011	+0.054	+0.012
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.23	−0.81	−0.23	−0.82	−0.22	−0.83	−0.22	−0.83

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	12 H. Draconis. Mag. 5.1		μ Serpentis. Mag. 3.6		ζ Ursæ Minoris. Mag. 4.3		ϵ Serpentis. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 15 45 s	° ′ +62 49 ″	h m 15 45 s	° ′ − 3 11 ″	h m 15 46 s	° ′ +78 1 ″	h m 15 46 s	° ′ + 4 42 ″
Jan. 0.9	26.41	69.04	34.921	36.40	40.07	49.96	57.447	37.13
	41	299	273	173	77	285	267	201
10.9	26.82	66.05	35.194	38.13	40.84	47.11	57.714	35.12
	47	253	292	168	91	236	288	190
20.8	27.29	63.52	35.486	39.81	41.75	44.75	58.002	33.22
	51	197	302	158	101	177	298	173
30.8	27.80	61.55	35.788	41.39	42.76	42.98	58.300	31.49
Feb. 9.8	28.35	60.21	36.092	42.81	43.85	41.82	58.603	30.02
	55	134	304	142	109	116	303	147
	54	68	299	119	111	48	298	118
19.7	28.89	59.53	36.391	44.00	44.96	41.34	58.901	28.84
	53	1	289	97	110	20	290	87
Mar. 1.7	29.42	59.54	36.680	44.97	46.06	41.54	59.190	27.97
	50	67	273	68	105	84	272	50
11.7	29.92	60.21	36.953	45.65	47.11	42.38	59.462	27.47
	47	130	254	41	97	149	253	17
21.7	30.39	61.51	37.207	46.06	48.08	43.87	59.715	27.30
	41	187	232	15	81	201	231	—
31.6	30.80	63.38	37.439	46.21	48.92	45.88	59.946	27.45
	36	234	209	12	71	246	209	15
								48
Apr. 10.6	31.16	65.72	37.648	46.09	49.63	48.34	60.155	27.93
	28	273	183	32	54	285	180	73
20.6	31.44	68.45	37.831	45.77	50.17	51.19	60.335	28.66
	20	301	156	52	37	308	155	93
30.6	31.64	71.46	37.987	45.25	50.54	54.27	60.490	29.59
May 10.5	31.77	74.62	38.117	44.59	50.72	57.47	60.616	30.68
	13	316	130	66	18	320	126	109
20.5	31.81	77.83	38.216	43.83	50.73	60.70	60.711	31.90
	4	321	99	76	1	323	95	122
	—							
	2	317	71	83	18	315	68	127
30.5	31.79	81.00	38.287	43.00	50.55	63.85	60.779	33.17
	10	300	39	85	35	297	35	127
June 9.4	31.69	84.00	38.326	42.15	50.20	66.82	60.814	34.44
	17	278	9	84	51	267	5	124
19.4	31.52	86.78	38.335	41.31	49.69	69.49	60.819	35.68
	21	215	—	83	65	236	—	117
29.4	31.28	89.23	38.313	40.48	49.04	71.85	28	36.85
July 9.4	29	208	22	75	78	197	60.791	117
	30.99	91.31	38.258	39.73	48.26	73.82	59	37.92
	35	165	55	71	89	152	60.732	107
			85				81	96
19.3	30.64	92.96	38.173	39.02	47.37	75.34	60.648	38.88
	40	116	109	62	97	103	111	79
29.3	30.24	94.12	38.064	38.40	46.40	76.37	60.534	39.67
	42	69	133	54	103	51	136	64
Aug. 8.3	29.82	94.81	37.931	37.86	45.37	76.88	60.398	40.31
	45	17	150	45	108	1	152	48
18.3	29.37	94.98	37.781	37.41	44.29	76.89	60.246	40.79
	46	—	161	33	109	—	164	32
28.2	28.91	94.63	37.620	37.08	43.20	76.34	60.082	41.11
	15	35	166	21	107	55	167	9
		87				103		—
Sept. 7.2	28.46	93.76	37.454	36.87	42.13	75.31	59.915	41.20
	44	137	162	7	104	155	163	12
17.2	28.02	92.39	37.292	36.80	41.09	73.76	59.752	41.08
	40	186	147	—	98	200	150	32
27.1	27.62	90.53	37.145	36.87	40.11	71.76	59.602	40.76
Oct. 7.1	37	231	124	24	80	217	129	56
	27.25	88.22	37.021	37.11	39.22	69.29	59.473	40.20
17.1	32	273	93	42	76	284	97	78
	26.93	85.49	36.928	37.53	38.46	66.45	59.376	39.42
	25	310	56	61	63	320	62	102
27.1	26.68	82.39	36.872	38.14	37.83	63.25	59.314	38.40
	17	340	9	82	47	316	13	128
Nov. 6.0	26.51	78.99	36.863	38.96	37.36	59.79	59.301	37.12
	8	363	—	103	29	365	—	148
16.0	26.43	75.36	38	39.99	37.07	56.14	33	35.64
	—	376	36.901	124	10	377	59.334	168
26.0	1	71.60	89	41.23	36.97	52.37	83	33.96
Dec. 6.0	26.44	381	36.990	138	—	375	59.417	186
	12	67.79	138	110	10	48.62	133	32.10
	26.56	375	37.128	42.63	37.07	367	59.550	201
	20		184	157	30		175	
15.9	26.76	64.04	37.312	44.20	37.37	44.95	59.725	30.09
	29	356	226	169	50	345	221	203
25.9	27.05	60.48	37.538	45.89	37.87	41.50	59.946	28.06
	37	327	255	174	68	314	249	208
35.9	27.42	57.21	37.793	47.63	38.55	33.36	60.195	25.98
Mean Place	29.318	73.63	35.979	44.17	46.529	55.35	58.557	31.26
Sec δ, Tan δ	2.191	+1.949	1.002	−0.056	4.823	+4.718	1.003	+0.082
$D_{\psi a}$, $D_{\omega a}$	+0.018	+0.072	+0.062	−0.002	−0.043	+0.173	+0.059	+0.003
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.22	−0.83	−0.22	−0.83	−0.22	−0.84	−0.22	−0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Triang. Aust. Mag. 3.0		λ Libræ. Mag. 5.1		γ Serpentis. Mag. 3.9		π Scorpii. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	15 48	−63 11	15 48	−19 56	15 52	+15 54	15 54	−25 53
Jan. 0.9	18.91	20.74	50.586	5.67	52.494	46.65	10.321	24.09
	54	86	291	101	264	242	300	71
10.9	19.45	19.88	50.877	6.68	52.758	44.23	10.621	24.80
	58	42	309	112	286	222	320	86
20.8	20.03	19.46	51.186	7.80	53.044	42.01	10.941	25.66
	61	1	322	118	300	195	333	98
30.8	20.64	19.45	51.508	8.98	53.344	40.06	11.274	26.64
Feb. 9.8	21.26	19.88	51.831	10.17	53.651	38.46	11.611	27.70
	62	43	323	118	307	160	337	106
	61	81	319	115	302	120	333	110
19.7	21.87	20.69	52.150	11.32	53.953	37.26	11.944	28.80
Mar. 1.7	22.47	21.88	52.459	12.43	54.247	36.49	12.266	29.90
	60	119	309	111	294	77	322	110
11.7	23.04	23.40	52.752	13.43	54.527	36.17	12.572	30.96
	57	152	293	100	280	—	306	106
21.7	23.58	25.19	53.025	14.33	54.786	36.29	12.860	31.97
	54	179	273	90	259	12	288	101
31.6	24.07	27.22	53.277	15.09	55.024	36.82	13.125	32.91
	49	203	252	76	238	53	265	94
	44	224	228	63	213	90	243	86
Apr. 10.6	24.51	29.46	53.505	15.72	55.237	37.72	13.368	33.77
	39	240	202	52	187	122	215	78
20.6	24.90	31.86	53.707	16.24	55.424	38.94	13.583	34.55
	33	248	173	40	157	146	188	69
30.6	25.23	34.34	53.880	16.64	55.581	40.40	13.771	35.24
May 10.5	25.49	36.91	54.027	16.95	55.708	42.06	13.929	35.87
	26	257	147	31	127	166	158	63
20.5	25.68	39.46	54.141	17.16	55.805	43.82	14.055	36.43
	19	255	114	21	97	176	126	56
	12	251	86	15	65	181	91	50
30.5	25.80	41.97	54.227	17.31	55.870	45.63	14.149	36.93
	5	210	50	8	31	180	58	42
June 9.4	25.85	44.37	54.277	17.39	55.901	47.43	14.207	37.35
	—	227	17	2	0	172	22	36
	3							
19.4	25.82	46.64	54.294	17.41	55.901	49.15	14.229	37.71
	10	203	19	2	34	158	14	28
29.4	25.72	48.67	54.275	17.39	55.867	50.73	14.215	37.99
July 9.4	25.55	50.45	54.224	17.32	55.802	52.16	14.165	38.18
	17	178	51	7	65	143	50	19
	24	145	84	13	94	122	86	11
19.3	25.31	51.90	54.140	17.19	55.708	53.38	14.079	38.29
	30	109	113	19	123	101	117	
29.3	25.01	52.99	54.027	17.00	55.585	54.39	13.962	38.29
	35	70	139	24	145	71	144	0
Aug. 8.3	24.66	53.69	53.888	16.74	55.440	55.13	13.818	38.19
	39	26	157	30	165	48	166	10
18.3	24.27	53.95	53.731	16.44	55.275	55.61	13.652	37.95
	40	—	172	36	175	20	180	24
28.2	23.87	53.78	53.559	16.08	55.100	55.81	13.472	37.61
	41	17	174	41	180	—	186	34
		63				10		44
Sept. 7.2	23.46	53.15	53.385	15.67	54.920	55.71	13.286	37.17
	39	104	171	44	177	38	181	52
17.2	23.07	52.11	53.214	15.23	54.743	55.33	13.105	36.65
	36	143	157	44	163	70	167	60
27.1	22.71	50.68	53.057	14.79	54.580	54.63	12.938	36.05
Oct. 7.1	22.40	48.89	52.926	14.37	54.437	53.65	12.796	35.41
	31	179	131	42	143	98	142	64
17.1	22.17	46.84	52.827	13.99	54.325	52.35	12.688	34.78
	23	205	99	38	112	130	108	63
	15	226	56	29	74	159	64	59
27.1	22.02	44.58	52.771	13.70	54.251	50.76	12.624	34.19
	6	234	8	16	30	184	14	
Nov. 6.0	21.96	42.24	52.763	13.54	54.221	48.92	12.610	33.69
	-		—	—	—		—	50
	5	235	42	1	19	211	40	
16.0	22.01	39.89	52.805	13.53	54.240	46.81	12.650	33.32
	15	227	97	19	69	231	97	37
26.0	22.16	37.62	52.902	13.72	54.309	44.50	12.747	33.12
Dec. 6.0	22.42	35.54	53.052	14.11	54.429	42.02	12.897	33.12
	26	208	150	39	120	248	150	20
	35	180	199	59	168	258	202	0
								21
15.9	22.77	33.74	53.251	14.70	54.597	39.44	13.099	33.33
	43	148	240	79	211	258	246	
25.9	23.20	32.26	53.491	15.49	54.808	36.86	13.345	33.75
	51	110	275	94	248	253	282	42
35.9	23.71	31.16	53.766	16.43	55.056	34.33	13.627	34.38
								63
Mean Place	20.575	40.84	51.619	17.49	53.726	43.12	11.390	37.23
Sec δ, Tan δ	2.217	−1.979	1.064	−0.363	1.040	+0.285	1.112	−0.485
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.105	−0.072	+0.069	−0.013	+0.055	+0.010	+0.072	−0.017
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.22	−0.84	−0.22	−0.84	−0.21	−0.85	−0.21	−0.85

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Coronæ Borealis. Mag. 4.2		δ Scorpii. Mag. 2.5		θ Draconis. Mag. 4.1		β Scorpii. Mag. 2.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 15 54 s	° ′ +27 5 ″	h m 15 55 s	° ′ −22 24 ″	h m 16 0 s	° ′ +58 46 ″	h m 16 0 s	° ′ −19 35 ″
Jan. 0.9	22.506	61.06	45.518	1.17	24.112	10.82	56.250	33.23
	268	270	291	86	355	312	284	97
10.9	22.774	58.36	45.809	2.03	24.467	7.70	56.534	34.20
	296	241	313	98	410	269	304	106
20.8	23.070	55.95	46.122	3.01	24.877	5.01	56.838	35.26
	309	201	325	106	449	213	316	110
30.8	23.379	53.91	46.447	4.07	25.326	2.88	57.154	36.36
	321	161	329	111	474	155	322	113
Feb. 9.8	23.700	52.27	46.776	5.18	25.800	1.33	57.476	37.49
	320	112	324	109	484	90	320	108
19.8	24.020	51.15	47.100	6.27	26.284	0.43	57.796	38.57
	309	58	315	108	479	22	310	102
Mar. 1.7	24.329	50.57	47.415	7.35	26.763	0.21	58.106	39.59
	294	7	301	100	459	46	296	93
11.7	24.623	50.50	47.716	8.35	27.222	0.67	58.402	40.52
	274	44	281	91	429	109	280	81
21.7	24.897	50.94	47.997	9.26	27.651	1.76	58.682	41.33
	251	94	260	82	386	167	259	69
31.6	25.148	51.88	48.257	10.08	28.037	3.43	58.941	42.02
	220	136	238	71	335	218	239	55
Apr. 10.6	25.368	53.24	48.495	10.79	28.372	5.61	59.180	42.57
	195	172	211	60	276	258	211	44
20.6	25.563	54.96	48.706	11.39	28.648	8.19	59.391	43.01
	159	199	185	50	215	292	185	34
30.6	25.722	56.95	48.891	11.89	28.863	11.11	59.576	43.35
	126	220	154	42	148	310	156	26
May 10.5	25.848	59.15	49.045	12.31	29.011	14.21	59.732	43.61
	91	229	124	35	81	321	128	16
20.5	25.939	61.44	49.169	12.66	29.092	17.42	59.860	43.77
	54	233	95	29	12	318	95	10
30.5	25.993	63.77	49.264	12.95	29.104	20.60	59.955	43.87
	22	231	57	22	53	307	62	5
June 9.5	26.015	66.08	49.321	13.17	29.051	23.67	60.017	43.92
	18	218	22	18	118	287	27	0
19.4	25.997	68.26	49.343	13.35	28.933	26.54	60.044	43.92
	50	201	13	9	178	261	9	4
29.4	25.947	70.27	49.330	13.44	28.755	29.15	60.035	43.88
	85	178	47	3	234	226	43	8
July 9.4	25.862	72.05	49.283	13.47	28.521	31.41	59.992	43.80
	118	151	84	3	282	184	76	12
19.3	25.744	73.56	49.199	13.44	28.239	33.25	59.916	43.68
	144	120	111	11	326	141	107	18
29.3	25.600	74.76	49.088	13.33	27.913	34.66	59.809	43.50
	167	89	140	17	359	93	136	22
Aug. 8.3	25.433	75.65	48.948	13.16	27.554	35.59	59.673	43.28
	188	51	161	24	385	42	155	26
18.3	25.245	76.16	48.787	12.92	27.169	36.01	59.518	43.02
	198	15	171	35	400	8	171	33
28.2	25.047	76.31	48.613	12.57	26.769	35.93	59.347	42.69
	203	21	179	39	403	60	177	37
Sept. 7.2	24.844	76.10	48.434	12.18	26.366	35.33	59.170	42.32
	201	59	175	47	395	110	173	35
17.2	24.643	75.51	48.259	11.71	25.971	34.23	58.997	41.97
	185	96	162	48	373	160	162	41
27.2	24.458	74.55	48.097	11.23	25.598	32.63	58.835	41.56
	162	135	141	51	340	207	139	38
Oct. 7.1	24.296	73.20	47.956	10.72	25.258	30.56	58.696	41.18
	131	170	103	46	293	250	107	35
17.1	24.165	71.50	47.853	10.26	24.965	28.06	58.589	40.83
	92	202	65	40	234	290	68	24
27.1	24.073	69.48	47.788	9.86	24.731	25.16	58.521	40.59
	48	235	13	30	164	323	19	16
Nov. 6.0	24.025	67.13	47.775	9.56	24.567	21.93	58.502	40.43
	6	260	35	18	88	350	29	2
16.0	24.031	64.53	47.810	9.38	24.479	18.43	58.531	40.45
	56	281	92	2	5	367	87	19
26.0	24.087	61.72	47.902	9.40	24.474	14.76	58.618	40.64
	114	296	145	21	79	376	135	36
Dec. 6.0	24.201	58.76	48.047	9.61	24.553	11.00	58.753	41.00
	160	300	194	41	164	373	187	57
15.9	24.361	55.76	48.241	10.02	24.717	7.27	58.940	41.57
	210	297	238	62	245	359	229	74
25.9	24.571	52.79	48.479	10.64	24.962	3.68	59.169	42.31
	250	285	275	80	316	336	266	88
35.9	24.821	49.94	48.754	11.44	25.278	0.32	59.435	43.19
Mean Place	23.903	59.78	46.590	13.52	26.712	13.86	57.345	44.95
Sec δ, Tan δ	1.123	+0.512	1.082	−0.412	1.929	+1.649	1.061	−0.356
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.050	+0.018	+0.071	−0.014	+0.023	+0.055	+0.069	−0.012
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.21	−0.85	−0.21	−0.86	−0.20	−0.87	−0.20	−0.87

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Herculis. Mag. 5.3		Groombridge 2320. Mag. 5.4		φ Herculis. Mag. 4.3		δ¹ Apodis. Mag. 4.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	16 4	+17 14	16 6	+68 0	16 6	+45 7	16 8	−78 29
	s	″	s	″	s	″	s	″
Jan. 0.9	34.582	66.91	2.76	42.64	18.722	69.05	42.77	56.36
	251	244	43	313	288	306	106	168
10.9	34.836	64.47	3.19	39.51	19.010	65.99	43.83	54.68
	281	224	52	268	325	269	117	119
20.8	35.117	62.23	3.71	36.83	19.335	63.30	45.00	53.49
	296	195	58	214	355	224	126	71
30.8	35.413	60.28	4.29	34.69	19.690	61.06	46.26	52.78
	303	161	61	152	370	169	130	21
Feb. 9.8	35.716	58.67	4.90	33.17	20.060	59.37	47.56	52.57
	303	119	65	86	376	110	133	27
19.8	36.019	57.48	5.55	32.31	20.436	58.27	48.89	52.84
	296	77	64	19	372	46	132	77
Mar. 1.7	36.315	56.71	6.19	32.12	20.808	57.81	50.21	53.61
	284	30	61	50	356	17	127	120
11.7	36.599	56.41	6.80	32.62	21.164	57.98	51.48	54.81
	266	15	58	115	335	78	121	160
21.7	36.865	56.56	7.38	33.77	21.499	58.76	52.69	56.41
	246	59	52	173	305	134	113	198
31.6	37.111	57.15	7.90	35.50	21.804	60.10	53.82	58.39
	222	97	16	225	270	185	103	231
Apr. 10.6	37.333	58.12	8.36	37.75	22.074	61.95	54.85	60.70
	196	130	37	265	232	227	90	256
20.6	37.529	59.42	8.73	40.40	22.306	64.22	55.75	63.26
	166	156	27	297	189	259	77	279
30.6	37.695	60.98	9.00	43.37	22.495	66.81	56.52	66.05
	139	177	19	318	143	280	61	295
May 10.5	37.834	62.75	9.19	46.55	22.638	69.61	57.13	69.00
	106	189	9	325	96	293	45	303
20.5	37.940	64.64	9.28	49.80	22.734	72.54	57.58	72.03
	74	194	1	326	49	296	28	305
30.5	38.014	66.58	9.27	53.06	22.783	75.50	57.86	75.08
	40	193	10	313	2	289	11	301
June 9.5	38.054	68.51	9.17	56.19	22.785	78.39	57.97	78.09
	7	185	20	291	45	273	8	288
19.4	38.061	70.36	8.97	59.10	22.740	81.12	57.89	80.97
	26	173	28	266	91	249	25	269
29.4	38.035	72.09	8.69	61.76	22.649	83.61	57.64	83.66
	61	157	35	228	133	221	42	213
July 9.4	37.974	73.66	8.34	64.01	22.516	85.82	57.22	86.09
	91	135	43	187	173	186	58	209
19.3	37.883	75.01	7.91	65.91	22.343	87.68	56.64	88.18
	122	112	18	140	208	116	72	169
29.3	37.761	76.13	7.43	67.31	22.135	89.14	55.92	89.87
	114	86	53	93	236	104	83	126
Aug. 8.3	37.617	76.99	6.90	68.24	21.899	90.18	55.09	91.13
	165	57	56	40	261	59	93	77
18.3	37.452	77.56	6.34	68.64	21.638	90.77	54.16	91.90
	180	30	58	10	274	12	98	23
28.2	37.272	77.86	5.76	68.54	21.364	90.89	53.18	92.13
	185	1	59	64	280	35	99	36
Sept. 7.2	37.087	77.85	5.17	67.90	21.084	90.54	52.19	91.77
	183	32	57	118	276	83	97	80
17.2	36.904	77.53	4.60	66.72	20.808	89.71	51.22	90.97
	173	64	55	164	261	129	91	135
27.2	36.731	76.89	4.05	65.08	20.547	88.42	50.31	89.62
	152	96	50	214	238	174	80	183
Oct. 7.1	36.579	75.93	3.55	62.94	20.309	86.68	49.51	87.79
	123	126	44	256	201	217	66	226
17.1	36.456	74.67	3.11	60.38	20.108	84.51	48.85	85.53
	87	156	36	297	157	257	49	254
27.1	36.369	73.11	2.75	57.41	19.951	81.94	48.36	82.99
	45	185	28	330	104	289	29	279
Nov. 6.0	36.324	71.26	2.47	54.11	19.847	79.05	48.07	80.20
	6	210	17	357	41	319	7	290
16.0	36.330	69.16	2.30	50.54	19.803	75.86	48.00	77.30
	55	233	6	372	19	338	16	292
26.0	36.385	66.83	2.24	46.82	19.822	72.48	48.16	74.38
	107	248	5	381	84	353	38	279
Dec. 6.0	36.492	64.35	2.29	43.01	19.906	68.95	48.54	71.59
	156	258	17	377	150	355	60	259
15.9	36.648	61.77	2.46	39.24	20.056	65.40	49.14	69.00
	198	261	27	362	207	345	79	230
25.9	36.846	59.16	2.73	35.62	20.263	61.95	49.93	66.70
	237	254	38	338	261	328	96	190
35.9	37.083	56.62	3.11	32.24	20.524	58.67	50.89	64.80
Mean Place	35.869	63.21	6.401	45.96	20.604	70.07	46.943	77.06
Sec δ, Tan δ	1.047	+0.310	2.671	+2.477	1.418	+1.005	5.017	−4.917
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.054	+0.010	+0.003	+0.079	+0.038	+0.032	+0.176	−0.153
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.19	−0.88	−0.19	−0.88	−0.19	−0.88	−0.19	−0 88

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 3.0		σ Cor. Bor. *seq.* Mag. 5.8		19 Ursæ Minoris. Mag. 5.5		γ^2 Normæ. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	16 10	− 3 29	16 11	+34 3	16 12	+76 4	16 14	−49 57
	s	″	s	″	s	″	s	″
Jan. 0.9	17.353	41.33	46.084	12.17	54.26	15.98	2.556	48.18
	257	163	258	289	59	308	377	58
10.9	17.610	42.96	46.342	9.28	54.85	12.90	2.933	47.60
	277	160	293	260	72	266	411	27
20.8	17.887	44.56	46.635	6.68	55.57	10.24	3.347	47.33
	295	153	315	223	84	213	431	5
30.8	18.182	46.09	46.950	4.45	56.41	8.11	3.781	47.38
	298	136	329	173	91	152	448	34
Feb. 9.8	18.480	47.45	47.279	2.72	57.32	6.59	4.229	47.72
	300	115	332	120	95	87	448	63
19.8	18.780	48.60	47.611	1.52	58.27	5.72	4.677	48.35
	292	89	328	61	96	18	441	87
Mar. 1.7	19.072	49.49	47.939	0.91	59.23	5.54	5.118	49.22
	281	65	316	4	94	48	428	110
11.7	19.353	50.14	48.255	0.87	60.17	6.02	5.546	50.32
	267	39	297	50	88	114	406	129
21.7	19.620	50.53	48.552	1.37	61.05	7.16	5.952	51.61
	217	11	273	103	80	171	382	144
31.7	19.867	50.64	48.825	2.40	61.85	8.87	6.334	53.05
	226	15	215	151	69	223	319	158
Apr. 10.6	20.093	50.49	49.070	3.91	62.54	11.10	6.683	54.63
	206	36	215	192	56	265	317	169
20.6	20.299	50.13	49.285	5.83	63.10	13.75	7.000	56.32
	176	55	182	221	41	296	277	176
30.6	20.475	49.58	49.467	8.04	63.51	16.71	7.277	58.08
	155	70	111	216	27	317	238	180
May 10.5	20.630	48.88	49.611	10.50	63.78	19.88	7.515	59.88
	122	80	105	260	11	324	192	183
20.5	20.752	48.08	49.716	13.10	63.89	23.12	7.707	61.71
	95	86	68	264	4	325	143	181
30.5	20.847	47.22	49.784	15.74	63.85	26.37	7.850	63.52
	60	89	27	260	20	312	91	175
June 9.5	20.907	46.33	49.811	18.34	63.65	29.49	7.941	65.27
	30	88	10	250	31	291	39	166
19.4	20.937	45.45	49.801	20.84	63.31	32.40	7.980	66.93
	5	84	54	230	18	263	16	155
29.4	20.932	44.61	49.747	23.14	62.83	35.03	7.964	68.48
	38	80	87	207	59	228	71	135
July 9.4	20.894	43.81	49.660	25.21	62.24	37.31	7.893	69.83
	71	73	127	175	71	187	122	115
19.4	20.823	43.08	49.533	26.96	61.53	39.18	7.771	70.98
	100	63	159	113	79	111	169	90
29.3	20.723	42.45	49.374	28.39	60.74	40.59	7.602	71.88
	127	56	181	108	86	93	209	61
Aug. 8.3	20.596	41.89	49.190	29.47	59.88	41.52	7.393	72.49
	117	43	207	65	92	42	213	32
18.3	20.449	41.46	48.983	30.12	58.96	41.94	7.150	72.81
	162	35	221	24	94	10	267	4
28.2	20.287	41.11	48.759	30.36	58.02	41.84	6.883	72.77
	170	20	229	14	95	63	278	35
Sept. 7.2	20.117	40.91	48.530	30.22	57.07	41.21	6.605	72.42
	169	8	225	61	93	115	275	69
17.2	19.948	40.83	48.305	29.61	56.14	40.06	6.330	71.73
	159	7	217	100	90	163	257	98
27.2	19.789	40.90	48.088	28.61	55.24	38.43	6.073	70.75
	139	21	196	143	82	210	226	125
Oct. 7.1	19.650	41.11	47.892	27.18	54.42	36.33	5.847	69.50
	113	39	165	183	71	253	183	147
17.1	19.537	41.50	47.727	25.35	53.68	33.80	5.664	68.03
	73	59	124	217	63	293	125	164
27.1	19.464	42.09	47.603	23.18	53.05	30.87	5.539	66.39
	31	76	81	253	50	325	60	171
Nov. 6.1	19.433	42.85	47.522	20.65	52.55	27.62	5.479	64.68
	12	96	26	280	35	352	14	172
16.0	19.445	43.81	47.496	17.85	52.20	24.10	5.493	62.96
	67	117	31	303	17	368	89	165
26.0	19.512	44.98	47.527	14.82	52.03	20.42	5.582	61.31
	112	132	85	316	1	377	162	151
Dec. 6.0	19.624	46.30	47.612	11.66	52.02	16.65	5.744	59.80
	161	148	111	323	16	373	231	131
15.9	19.788	47.78	47.753	8.43	52.18	12.92	5.978	58.49
	202	161	193	321	34	359	298	104
25.9	19.990	49.39	47.946	5.22	52.52	9.33	6.276	57.45
	212	164	240	307	51	333	350	77
35.9	20.232	51.03	48.186	2.15	53.03	6.00	6.626	56.68
Mean Place	18.507	49.54	47.664	11.21	59.965	19.04	4.037	65.39
Sec δ, Tan δ	1.002	−0.061	1.207	+0.676	4.155	+4.033	1.555	−1.190
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.063	−0.002	+0.045	+0.021	−0.034	+0.121	+0.089	−0.035
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.18	−0.89	−0.18	−0.89	−0.18	−0.89	−0.18	−0.90

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Ophiuchi. Mag. 3.3		σ Scorpii. Mag. 3.1		τ Herculis. Mag. 3.9		γ Herculis. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 16 14 s	° ′ − 4 30 ″	h m 16 16 s	° ′ −25 24 ″	h m 16 17 s	° ′ +46 29 ″	h m 16 18 s	° ′ +19 19 ″
Jan. 0.9	13.539	12.74	29.091	20.85	23.614	45.09	30.000	62.36
	255	159	282	58	279	313	244	251
10.9	13.794	14.33	29.373	21.43	23.893	41.96	30.244	59.85
	278	155	308	73	320	278	273	232
20.8	14.072	15.88	29.681	22.16	24.213	39.18	30.517	57.53
	293	149	323	82	352	235	290	203
30.8	14.365	17.37	30.004	22.98	24.565	36.83	30.807	55.50
	300	133	331	90	373	178	301	167
Feb. 9.8	14.665	18.70	30.335	23.88	24.938	35.05	31.108	53.83
	300	112	331	93	381	118	304	124
19.8	14.965	19.82	30.666	24.81	25.319	33.87	31.412	52.59
	293	92	325	92	381	58	300	81
Mar. 1.7	15.258	20.74	30.991	25.73	25.700	33.29	31.712	51.78
	283	64	313	89	367	10	288	31
11.7	15.541	21.38	31.304	26.62	26.067	33.39	32.000	51.47
	266	40	297	84	347	71	275	16
21.7	15.807	21.78	31.601	27.46	26.414	34.10	32.275	51.63
	252	11	280	78	320	129	255	62
31.7	16.059	21.89	31.881	28.24	26.734	35.39	32.530	52.25
	229	11	258	69	285	180	232	101
Apr. 10.6	16.288	21.78	32.139	28.93	27.019	37.19	32.762	53.26
	209	32	235	63	248	221	208	137
20.6	16.497	21.46	32.374	29.56	27.267	39.43	32.970	54.63
	182	52	207	56	207	258	181	166
30.6	16.679	20.94	32.581	30.12	27.474	42.01	33.151	56.29
	155	66	181	51	158	283	150	188
May 10.5	16.834	20.28	32.762	30.63	27.632	44.84	33.301	58.17
	129	76	119	45	111	298	118	201
20.5	16.963	19.52	32.911	31.08	27.743	47.82	33.419	60.18
	97	82	116	41	61	301	87	206
30.5	17.060	18.70	33.027	31.49	27.804	50.83	33.506	62.24
	67	85	81	37	14	296	50	208
June 9.5	17.127	17.85	33.108	31.86	27.818	53.79	33.556	64.32
	34	84	15	32	39	281	17	199
19.4	17.161	17.01	33.153	32.18	27.779	56.60	33.573	66.31
	0	82	6	27	86	261	20	187
29.4	17.161	16.19	33.159	32.45	27.693	59.21	33.553	68.18
	34	76	33	21	127	233	53	169
July 9.4	17.127	15.43	33.126	32.66	27.566	61.54	33.500	69.87
	68	70	70	14	174	198	87	150
19.4	17.059	14.73	33.056	32.80	27.392	63.52	33.413	71.37
	97	61	104	7	211	158	118	123
29.3	16.962	14.12	32.952	32.87	27.181	65.10	33.295	72.60
	125	53	135	2	242	116	145	97
Aug. 8.3	16.837	13.59	32.817	32.85	26.939	66.26	33.150	73.57
	146	44	160	12	265	72	166	66
18.3	16.691	13.15	32.657	32.73	26.674	66.98	32.984	74.23
	161	35	178	23	285	23	183	38
28.2	16.530	12.80	32.479	32.50	26.389	67.21	32.801	74.61
	171	22	188	31	291	21	192	4
Sept. 7.2	16.359	12.58	32.291	32.19	26.098	67.00	32.609	74.65
	171	10	188	41	290	74	192	28
17.2	16.188	12.48	32.103	31.78	25.808	66.26	32.417	74.37
	161	3	178	48	279	122	181	63
27.2	16.027	12.51	31.925	31.30	25.529	65.04	32.236	73.74
	142	18	155	53	253	165	165	95
Oct. 7.1	15.885	12.69	31.770	30.77	25.276	63.39	32.071	72.79
	113	33	125	54	221	211	136	128
17.1	15.772	13.02	31.645	30.23	25.055	61.28	31.935	71.51
	78	51	84	52	177	250	102	158
27.1	15.694	13.53	31.561	29.71	24.878	58.78	31.833	69.93
	36	70	36	45	121	286	61	188
Nov. 6.1	15.658	14.23	31.525	29.26	24.757	55.92	31.772	68.05
	12	89	16	36	66	317	10	215
16.0	15.670	15.12	31.541	28.90	24.691	52.75	31.762	65.90
	62	108	72	20	2	340	39	237
26.0	15.732	16.20	31.613	28.70	24.693	49.35	31.801	63.53
	113	127	127	5	68	353	91	255
Dec. 6.0	15.845	17.47	31.740	28.65	24.761	45.82	31.892	60.98
	159	140	179	14	132	357	140	264
15.9	16.004	18.87	31.919	28.79	24.893	42.25	32.032	58.34
	202	153	225	33	196	351	186	269
25.9	16.206	20.40	32.144	29.12	25.089	38.74	32.218	55.65
	238	158	263	50	249	333	224	263
35.9	16.444	21.98	32.407	29.62	25.338	35.41	32.442	53.02
Mean Place	14.704	21.23	30.275	33.63	25.576	45.54	31.350	58.50
Sec δ, Tan δ	1.003	−0.079	1.107	−0.475	1.453	+1.054	1.060	+0.351
$D_{\psi a}$, $D_{\omega a}$	+0.063	−0.002	+0.072	−0.014	+0.036	+0.030	+0.053	+0.010
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.18	−0.90	−0.17	−0.90	−0.17	−0.90	−0.17	−0.90

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Ursæ Minoris. Mag. 5.0		γ Apodis. Mag. 3.9		ω Herculis. Mag. 4.5		η Draconis. Mag. 2.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	16 19	+75 55	16 21	−78 43	16 21	+14 12	16 22	+61 41
	s	″	s	″	s	″	s	″
Jan. 0.9	38.36	57.68	30.69	18.21	50.118	39.34	53.84	15.85
		56		103		240		34
10.9	38.92	54.56	31.72	16.37	50.358	37.01	54.18	12.59
		70		116		268		40
20.9	39.62	51.85	32.88	15.00	50.626	34.84	54.58	9.73
		81		126		285		46
30.8	40.43	49.65	34.14	14.09	50.911	32.90	55.04	7.38
		89		132		295		49
Feb. 9.8	41.32	48.04	35.46	13.68	51.206	31.28	55.53	5.60
		94		135		299		52
19.8	42.26	47.10	36.81	13.75	51.505	30.04	56.05	4.44
		95		135		294		52
Mar. 1.7	43.21	46.82	38.16	14.30	51.799	29.21	56.57	3.96
		93		132		285		50
11.7	44.14	47.22	39.48	15.30	52.084	28.81	57.07	4.18
		88		126		271		48
21.7	45.02	48.27	40.74	16.73	52.355	28.84	57.55	5.07
		81		119		253		45
31.7	45.83	49.91	41.93	18.55	52.608	29.29	58.00	6.55
		69		109		231		30
Apr. 10.6	46.52	52.08	43.02	20.67	52.839	30.12	58.39	8.57
		57		97		208		33
20.6	47.09	54.69	43.99	23.11	53.047	31.28	58.72	11.03
		44		83		184		27
30.6	47.53	57.61	44.82	25.76	53.231	32.70	58.99	13.87
		29		68		153		19
May 10.6	47.82	60.76	45.50	28.61	53.384	34.34	59.18	16.94
		11		53		124		13
20.5	47.96	64.01	46.03	31.58	53.508	36.10	59.31	20.16
		2		35		94		5
30.5	47.94	67.27	46.38	34.59	53.602	37.93	59.36	23.43
		18		16		58		3
June 9.5	47.76	70.44	46.54	37.59	53.660	39.77	59.33	26.61
		31		2		25		10
19.4	47.45	73.40	46.52	40.51	53.685	41.56	59.23	29.63
		45		20		10		17
29.4	47.00	76.09	46.32	43.26	53.675	43.24	59.06	32.45
		57		38		43		24
July 9.4	46.43	78.45	45.94	45.78	53.632	44.77	58.82	34.91
		69		54		77		30
19.4	45.74	80.40	45.40	47.98	53.555	46.13	58.52	37.01
		77		70		109		34
29.3	44.97	81.91	44.70	49.83	53.446	47.26	58.18	38.67
		85		82		135		39
Aug. 8.3	44.12	82.94	43.88	51.21	53.311	48.17	57.79	39.85
		90		92		159		43
18.3	43.22	83.47	42.96	52.14	53.152	48.81	57.36	40.56
		94		100		175		44
28.3	42.28	83.47	41.96	52.56	52.977	49.20	56.92	40.78
		94		102		183		46
Sept. 7.2	41.34	82.96	40.94	52.43	52.794	49.30	56.46	40.44
		93		100		185		45
17.2	40.41	81.93	39.94	51.76	52.609	49.13	56.01	39.59
		90		96		177		44
27.2	39.51	80.41	38.98	50.55	52.432	48.65	55.57	38.23
		84		85		159		40
Oct. 7.1	38.67	78.41	38.13	48.87	52.273	47.87	55.17	36.38
		75		73		132		36
17.1	37.92	75.96	37.40	46.74	52.141	46.80	54.81	34.09
		64		54		98		30
27.1	37.28	73.13	36.86	44.26	52.043	45.45	54.51	31.36
		52		36		56		23
Nov. 6.1	36.76	69.94	36.50	41.53	51.987	43.81	54.28	28.25
		37		13		9		16
16.0	36.39	66.48	36.37	38.67	51.978	41.92	54.12	24.85
		21		10		41		6
26.0	36.18	62.84	36.47	35.76	52.019	39.80	54.06	21.22
		4		32		90		3
Dec. 6.0	36.14	59.09	36.79	32.89	52.109	37.52	54.09	17.47
		14		55		140		12
15.9	36.28	55.35	37.34	30.21	52.249	35.11	54.21	13.70
		31		75		184		21
25.9	36.59	51.75	38.09	27.82	52.433	32.65	54.42	10.02
		47		94		223		30
35.9	37.06	48.39	39.03	25.78	52.656	30.22	54.72	6.54
		374		268		241		377
		360		239		246		368
		336		204		243		348
		375		287		228		375
		319		273		164		311
		346		286		189		340
		364		291		212		363
Mean Place	44.032	60.14	35.333	38.22	51.418	34.42	56.743	17.36
Sec δ, Tan δ	4.115	+3.992	5.116	−5.017	1.032	+0.253	2.109	+1.856
$D_{\psi\alpha}$, $D_{\omega\alpha}$	−0.035	+0.113	+0.182	−0.139	+0.055	+0.007	+0.016	+0.051
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.17	−0.91	−0.17	−0.91	−0.17	−0.91	−0.16	−0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Scorpii. (*Antares.*) Mag. 1.2		β Herculis. Mag. 2.8		λ Ophiuchi. Mag. 3.8		A Draconis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	16 24	−26 15	16 26	+21 39	16 27	+ 2 9	16 28	+68 55
	s	″	s	″	s	″	s	″
Jan. 0.9	39.738	31.79	53.097	26.56	0.470	12.27	3.70	63.62
	281	49	238	259	239	184	40	327
10.9	40.019	32.28	53.335	23.97	0.709	10.43	4.10	60.35
	304	62	266	240	267	178	49	287
20.9	40.323	32.90	53.601	21.57	0.976	8.65	4.59	57.48
	319	75	289	209	283	163	56	235
30.8	40.642	33.65	53.890	19.48	1.259	7.02	5.15	55.13
Feb. 9.8	332	82	300	174	292	143	62	180
	40.974	34.47	54.190	17.74	1.551	5.59	5.77	53.33
	333	85	305	129	294	117	65	113
19.8	41.307	35.32	54.495	16.45	1.845	4.42	6.42	52.20
	330	85	303	81	291	88	67	47
Mar. 1.7	41.637	36.17	54.798	15.64	2.136	3.54	7.09	51.73
	319	85	293	32	283	55	65	22
11.7	41.956	37.02	55.091	15.32	2.419	2.99	7.74	51.95
	303	77	279	18	270	22	62	90
21.7	42.259	37.79	55.370	15.50	2.689	2.77	8.36	52.85
	287	75	262	66	252	10	57	150
31.7	42.546	38.54	55.632	16.16	2.941	2.87	8.93	54.35
	265	68	239	105	235	38	51	203
Apr. 10.6	42.811	39.22	55.871	17.21	3.176	3.25	9.44	56.38
	215	62	215	144	212	66	43	250
20.6	43.056	39.84	56.086	18.65	3.388	3.91	9.87	58.88
	215	56	190	174	190	87	34	287
30.6	43.271	40.40	56.276	20.39	3.578	4.78	10.21	61.75
May 10.6	192	52	157	197	163	103	24	312
	43.463	40.92	56.433	22.36	3.741	5.81	10.45	64.87
20.5	158	49	127	210	136	116	11	324
	43.621	41.41	56.560	24.46	3.877	6.97	10.59	68.11
	124	41	92	220	105	122	4	329
30.5	43.745	41.85	56.652	26.66	3.982	8.19	10.63	71.40
	91	40	58	218	73	124	6	322
June 9.5	43.836	42.25	56.710	28.84	4.055	9.43	10.57	74.62
	53	35	20	213	41	124	16	306
19.4	43.889	42.60	56.730	30.97	4.096	10.67	10.41	77.68
	12	33	18	199	5	115	25	283
29.4	43.901	42.93	56.712	32.96	4.101	11.82	10.16	80.51
July 9.4	27	25	49	182	29	107	34	250
	43.874	43.18	56.663	34.78	4.072	12.89	9.82	83.01
	65	19	86	160	62	97	41	213
19.4	43.809	43.37	56.577	36.38	4.010	13.86	9.41	85.14
	102	14	121	136	91	83	49	168
29.3	43.707	43.51	56.456	37.74	3.916	14.69	8.92	86.82
Aug. 8.3	131	2	143	104	122	68	54	121
	43.576	43.53	56.313	38.78	3.794	15.37	8.38	88.03
18.3	158	7	171	73	116	53	58	73
	43.418	43.46	56.142	39.51	3.648	15.90	7.80	88.76
28.3	178	17	188	45	161	37	61	20
	43.240	43.29	55.954	39.96	3.484	16.27	7.19	88.96
	190	28	196	7	173	19	63	31
Sept. 7.2	43.050	43.01	55.758	40.03	3.311	16.46	6.56	88.65
	193	39	198	28	176	1	62	84
17.2	42.857	42.62	55.560	39.75	3.135	16.47	5.94	87.81
	180	45	191	62	167	18	60	137
27.2	42.677	42.17	55.369	39.13	2.968	16.29	5.34	86.44
Oct. 7.1	162	53	173	96	152	38	56	184
	42.515	41.64	55.196	38.17	2.816	15.91	4.78	84.60
17.1	131	51	148	133	125	59	50	233
	42.384	41.13	55.048	36.84	2.691	15.32	4.28	82.27
	91	51	112	162	92	81	43	273
27.1	42.293	40.59	54.936	35.22	2.599	14.51	3.85	79.54
	45	52	71	195	51	102	35	312
Nov. 6.1	42.248	40.07	54.865	33.27	2.548	13.49	3.50	76.42
	7	39	22	225	4	124	24	341
16.0	42.255	39.68	54.843	31.02	2.544	12.25	3.26	73.01
	64	28	29	246	45	144	13	363
26.0	42.319	39.40	54.872	28.56	2.589	10.81	3.13	69.38
Dec. 6.0	118	12	79	260	96	163	1	377
	42.437	39.28	54.951	25.96	2.685	9.18	3.12	65.61
	172	4	131	275	141	176	10	378
16.0	42.609	39.32	55.082	23.21	2.826	7.42	3.22	61.83
	218	24	176	278	186	185	23	369
25.9	42.827	39.56	55.258	20.43	3.012	5.57	3.45	58.14
35.9	260	41	219	273	223	189	33	347
	43.087	39.97	55.477	17.70	3.235	3.68	3.78	54.67
Mean Place	40.972	44.61	54.497	22.77	1.700	4.93	7.559	65.13
Sec δ, Tan δ	1.115	−0.493	1.076	+0.397	1.001	+0.038	2.782	+2.597
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.073	−0.013	+0.051	+0.010	+0.060	+0.001	−0.002	+0.068
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.16	−0.91	−0.16	−0.92	−0.16	−0.92	−0.16	−0.92

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Scorpii. Mag. 2.9		σ Herculis. Mag. 4.2		ζ Ophiuchi. Mag. 2.7		24 Scorpii. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 16 31 s	° ′ −28 3 ″	h m 16 31 s	° ′ +42 35 ″	h m 16 32 s	° ′ −10 24 ″	h m 16 37 s	° ′ −17 35 ″
Jan. 0.9	3.851	14.44	35.367	42.66	53.778	34.47	5.776	28.42
10.9	4.128 277	14.79 35	35.621 254	39.51 315	54.024 246	35.70 123	6.029 253	29.27 85
20.9	4.433 305	15.29 50	35.916 295	36.69 282	54.297 273	36.97 127	6.308 279	30.20 93
30.8	4.757 324	15.91 62	36.241 325	34.28 241	54.587 290	38.18 121	6.606 298	31.16 96
Feb. 9.8	5.091 334	16.63 72	36.589 348	32.39 189	54.886 299	39.33 115	6.915 309	32.10 94
	336	77	357	135	303	101	311	90
19.8	5.427	17.40	36.946	31.04	55.189	40.34	7.226	33.00
Mar. 1.7	5.760 333	18.20 80	37.305 359	30.31 73	55.489 300	41.17 83	7.535 309	33.81 81
11.7	6.084 324	19.00 80	37.656 351	30.22 — 9	55.780 291	41.83 66	7.836 301	34.49 68
21.7	6.394 310	19.77 77	37.991 335	30.73 51	56.059 279	42.28 45	8.126 290	35.05 56
31.7	6.689 295	20.51 74	38.303 312	31.83 110	56.325 266	42.54 26	8.402 276	35.47 42
	275	69	284	163	246	6	257	30
Apr. 10.6	6.964	21.20	38.587	33.46	56.571	42.60 —	8.659	35.77
20.6	7.215 251	21.85 65	38.838 251	35.52 206	56.799 228	42.49 11	8.897 238	35.93 16
30.6	7.442 227	22.47 62	39.052 214	37.96 244	57.001 202	42.23 26	9.110 213	36.00 — 7
May 10.6	7.641 199	23.05 58	39.224 172	40.65 269	57.179 178	41.84 39	9.300 190	35.98 2
20.5	7.808 167	23.60 55	39.353 129	43.53 288	57.328 149	41.37 47	9.460 160	35.91 7
	135	52	83	294	120	52	130	12
30.5	7.943 98	24.12	39.436 37	46.47	57.448	40.85	9.590	35.79
June 9.5	8.041 59	24.62 50	39.473 — 11	49.39 292	57.535 87	40.30 55	9.687 97	35.65 14
19.4	8.100 20	25.08 46	39.462 55	52.20 281	57.588 53	39.74 56	9.748 61	35.50 15
29.4	8.120 — 22	25.50 42	39.407 101	54.84 264	57.605 — 17	39.19 55	9.771 — 23	35.34 16
July 9.4	8.098	25.86 36	39.306 142	57.21 237	57.585 20	38.67 52	9.757 14	35.18 16
	61	30		206	53	18	50	16
19.4	8.037	26.16	39.164	59.27	57.532	38.19	9.707	35.02
29.3	7.940 97	26.36 20	38.984 180	60.97 170	57.445 87	37.76 43	9.621 86	34.85 17
Aug. 8.3	7.808 132	26.47 11	38.770 214	62.27 130	57.326 119	37.37 39	9.502 119	34.67 18
18.3	7.647 161	26.48 1	38.529 241	63.14 87	57.182 144	37.04 33	9.357 145	34.48 19
28.3	7.466 181	26.36 — 12	38.269 260	63.57 — 43	57.023 159	36.73 31	9.191 166	34.28 20
	193	25	272	4	173	23	179	23
Sept. 7.2	7.273	26.11	37.997	63.53	56.850	36.50	9.012	34.05
17.2	7.076 197	25.75 36	37.725 272	63.02 51	56.673 177	36.32 18	8.830 182	33.81 24
27.2	6.888 188	25.30 45	37.462 263	62.04 98	56.505 168	36.22 10	8.654 176	33.58 23
Oct. 7.1	6.720 168	24.76 54	37.219 243	60.60 144	56.351 154	36.21 — 1	8.496 158	33.36 22
17.1	6.581 139	24.17 59	37.005 214	58.73 187	56.227 124	36.31 10	8.364 132	33.18 18
	99	61	174	229	93	20	98	11
27.1	6.482	23.56	36.831	56.44	56.134	36.51	8.266	33.07
Nov. 6.1	6.431 — 51	22.98 58	36.706 125	53.79 265	56.085 49	36.87 36	8.212 54	33.05 — 2
16.0	6.433 2	22.47 51	36.636 70	50.81 298	56.080 — 5	37.40 53	8.208 — 4	33.15 10
26.0	6.490 57	22.07 40	36.627 — 9	47.59 322	56.129 49	38.09 69	8.256 48	33.39 24
Dec. 6.0	6.604 114	21.83 24	36.678 51	44.20 339	56.226 97	38.94 85	8.355 99	33.78 39
	168	8 —	114	318	147	100	149	54
16.0	6.772	21.75 9	36.792	40.72	56.373	39.94	8.504	34.32
25.9	6.988 216	21.84 28	36.964 172	37.28 344	56.561 188	41.07 113	8.699 195	35.02 70
35.9	7.245 257	22.12	37.191 227	33.97 331	56.792 231	42.30 123	8.932 233	35.84 82
Mean Place	5.124	27.44	37.218	41.67	55.002	44.23	7.022	39.47
Sec δ, Tan δ	1.133	−0.533	1.358	+0.919	1.017	−0.184	1.049	−0.317
$D_{\psi a}$, $D_{\omega a}$	+0.074	−0.013	+0.039	+0.023	+0.066	−0.005	+0.069	−0.007
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.15	−0.93	−0.15	−0.93	−0.15	−0.93	−0.14	−0.94

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Herculis. Mag. 3.0		η Herculis. Mag. 3.6		α Triang. Aust. Mag. 1.9		Groombridge 2377. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 16 38 s	° ′ +31 44 ″	h m 16 40 s	° ′ +39 3 ″	h m 16 40 s	° ′ −68 52 ″	h m 16 43 s	° ′ +56 54 ″
Jan. 0.9	21.398	32.01	13.559	66.08	26.84	60.65	47.625	69.08
	233	290	240	310	57	168	279	336
10.9	21.631	29.11	13.799	62.98	27.41	58.97	47.904	65.72
	265	266	276	281	64	130	339	301
20.9	21.896	26.45	14.075	60.17	28.05	57.67	48.243	62.71
	294	230	308	241	69	92	388	255
30.8	22.190	24.15	14.383	57.76	28.74	56.75	48.631	60.16
	311	188	331	197	74	51	424	203
Feb. 9.8	22.501	22.27	14.714	55.79	29.48	56.24	49.055	58.13
	319	137	341	141	76	4	447	141
19.8	22.820	20.90	15.055	54.38	30.24	56.20	49.502	56.72
	320	83	345	82	76	35	457	75
Mar. 1.8	23.140	20.07	15.400	53.56	31.00	56.55	49.959	55.97
	315	25	338	21	75	70	453	8
11.7	23.455	19.82	15.738	53.35	31.75	57.25	50.412	55.89
	301	30	325	37	73	112	437	56
21.7	23.756	20.12	16.063	53.72	32.48	58.37	50.849	56.45
	283	85	304	98	68	142	408	122
31.7	24.039	20.97	16.367	54.70	33.16	59.79	51.257	57.67
	251	133	279	148	65	171	371	179
Apr. 10.6	24.300	22.30	16.646	56.18	33.81	61.53	51.628	59.46
	235	176	251	193	59	199	326	226
20.6	24.535	24.06	16.897	58.11	34.40	63.52	51.954	61.72
	204	210	219	230	52	221	274	265
30.6	24.739	26.16	17.116	60.41	34.92	65.73	52.228	64.37
	169	237	177	257	41	240	216	297
May 10.6	24.908	28.53	17.293	62.98	35.36	68.13	52.444	67.34
	135	254	137	277	37	251	154	315
20.5	25.043	31.07	17.430	65.75	35.73	70.64	52.598	70.49
	97	262	97	285	27	261	90	323
30.5	25.140	33.69	17.527	68.60	36.00	73.25	52.688	73.72
	58	263	50	285	18	261	25	322
June 9.5	25.198	36.32	17.577	71.45	36.18	75.86	52.713	76.94
	18	255	7	276	8	255	41	311
19.5	25.216	38.87	17.584	74.21	36.26	78.41	52.672	80.05
	23	240	36	261	2	244	105	291
29.4	25.193	41.27	17.548	76.82	36.24	80.85	52.567	82.96
	64	218	81	238	12	229	164	265
July 9.4	25.129	43.45	17.467	79.20	36.12	83.14	52.403	85.61
	101	194	120	208	22	203	222	229
19.4	25.028	45.39	17.347	81.28	35.90	85.17	52.181	87.90
	137	163	160	172	31	171	271	192
29.3	24.891	47.02	17.187	83.00	35.59	86.88	51.910	89.82
	170	128	195	138	39	137	314	148
Aug. 8.3	24.721	48.30	16.992	84.38	35.20	88.25	51.596	91.30
	194	91	221	95	46	99	351	100
18.3	24.527	49.21	16.771	85.33	34.74	89.24	51.245	92.30
	211	52	240	51	50	51	376	52
28.3	24.316	49.73	16.531	85.84	34.24	89.75	50.869	92.82
	226	13	253	10	52	1	392	1
Sept. 7.2	24.090	49.86	16.278	85.94	33.72	89.76	50.477	92.81
	228	30	258	39	54	41	394	51
17.2	23.862	49.56	16.020	85.55	33.18	89.35	50.083	92.30
	221	72	249	84	51	93	387	102
27.2	23.641	48.84	15.771	84.71	32.67	88.42	49.696	91.28
	207	114	232	126	47	136	362	151
Oct. 7.2	23.434	47.70	15.539	83.45	32.20	87.06	49.334	89.77
	179	153	207	172	40	177	329	200
17.1	23.255	46.17	15.332	81.73	31.80	85.29	49.005	87.77
	146	191	169	213	32	210	280	244
27.1	23.109	44.26	15.163	79.60	31.48	83.19	48.725	85.33
	102	227	121	249	20	233	220	285
Nov. 6.1	23.007	41.99	15.042	77.11	31.28	80.86	48.505	82.48
	53	257	71	283	9	250	153	320
16.0	22.954	39.42	14.971	74.28	31.19	78.36	48.352	79.28
	1	282	12	310	4	255	77	346
26.0	22.955	36.60	14.959	71.18	31.23	75.81	48.275	75.82
	57	300	46	323	17	252	2	364
Dec. 6.0	23.012	33.60	15.005	67.95	31.40	73.29	48.277	72.18
	113	313	105	337	29	239	84	372
16.0	23.125	30.47	15.110	64.58	31.69	70.90	48.361	68.46
	162	313	161	337	41	216	162	369
25.9	23.287	27.34	15.271	61.21	32.10	68.74	48.523	64.77
	209	305	212	327	51	187	237	353
35.9	23.496	24.29	15.483	57.94	32.61	66.87	48.760	61.24
Mean Place	22.987	29.24	15.320	64.15	29.723	78.81	50.173	68.61
Sec δ, Tan δ	1.176	+0.619	1.288	+0.812	2.776	−2.590	1.832	+1.535
Dψα, Dωα	+0.046	+0.014	+0.041	+0.018	+0.126	−0.059	+0.023	+0.033
Dψδ, Dωδ	−0.14	−0.94	−0.14	−0.94	−0.14	−0.94	−0.13	−0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Scorpii. Mag. 2.4		49 Herculis. Mag. 6.4		ϵ^1 Aræ. Mag. 4.2		κ Ophiuchi. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 16 45 s	° ′ −34 9 ″	h m 16 48 s	° ′ +15 6 ″	h m 16 53 s	° ′ −53 2 ″	h m 16 53 s	° ′ + 9 29 ″
Jan. 0.9	8.904	4.35	33.090	13.69	24.483	22.81	59.999	43.73
	280	6	219	237	354	110	215	213
10.9	9.184	4.29	33.309	11.32	24.837	21.71	60.214	41.60
	311	12	250	220	401	82	245	201
20.9	9.495	4.41	33.559	9.12	25.238	20.89	60.459	39.59
	334	26	271	199	435	54	267	184
30.8	9.829	4.67	33.830	7.13	25.673	20.35	60.726	37.75
	348	44	286	169	457	23	282	157
Feb. 9.8	10.177	5.11	34.116	5.44	26.130	20.12	61.008	36.18
	353	54	294	131	470	5	290	124
19.8	10.530	5.65	34.410	4.13	26.600	20.17	61.298	34.94
	353	62	294	90	473	33	288	90
Mar. 1.8	10.883	6.27	34.704	3.23	27.073	20.50	61.586	34.04
	345	71	289	47	467	58	286	49
11.7	11.228	6.98	34.993	2.76	27.540	21.08	61.872	33.55
	336	74	279	0	456	82	279	11
21.7	11.564	7.72	35.272	2.76	27.996	21.90	62.151	33.44
	320	78	266	41	436	103	265	30
31.7	11.884	8.50	35.538	3.17	28.432	22.93	62.416	33.74
	299	80	249	83	412	122	250	65
Apr. 10.7	12.183	9.30	35.787	4.00	28.844	24.15	62.666	34.39
	278	81	228	116	384	139	229	95
20.6	12.461	10.11	36.015	5.16	29.228	25.54	62.895	35.34
	254	81	206	146	347	154	211	123
30.6	12.715	10.92	36.221	6.62	29.575	27.08	63.106	36.57
	224	83	177	169	307	166	181	113
May 10.6	12.939	11.75	36.398	8.31	29.882	28.74	63.287	38.00
	191	83	150	185	262	175	156	160
20.5	13.130	12.58	36.548	10.16	30.144	30.49	63.443	39.60
	155	84	116	193	211	182	123	166
30.5	13.285	13.42	36.664	12.09	30.355	32.31	63.566	41.26
	118	82	84	196	157	183	92	169
June 9.5	13.403	14.24	36.748	14.05	30.512	34.14	63.658	42.95
	75	80	47	192	97	182	58	168
19.5	13.478	15.04	36.795	15.97	30.609	35.96	63.716	44.63
	32	77	12	182	37	176	21	159
29.4	13.510	15.81	36.807	17.79	30.646	37.72	63.737	46.22
	13	69	25	169	25	164	15	149
July 9.4	13.497	16.50	36.782	19.48	30.621	39.36	63.722	47.71
	57	61	61	152	85	149	52	133
19.4	13.440	17.11	36.721	21.00	30.536	40.85	63.670	49.04
	98	52	95	129	145	128	87	114
29.4	13.342	17.63	36.626	22.29	30.391	42.13	63.583	50.18
	136	38	127	106	197	101	117	98
Aug. 8.3	13.206	18.01	36.499	23.35	30.194	43.17	63.466	51.16
	168	21	152	79	241	73	144	73
18.3	13.038	18.22	36.347	24.14	29.953	43.90	63.322	51.89
	194	5	173	53	275	42	166	49
28.3	12.844	18.27	36.174	24.67	29.678	44.32	63.156	52.38
	209	14	188	23	297	7	180	25
Sept. 7.2	12.635	18.13	35.986	24.90	29.381	44.39	62.976	52.63
	213	29	191	7	306	29	186	1
17.2	12.422	17.84	35.795	24.83	29.075	44.10	62.790	52.64
	209	48	186	37	299	64	182	23
27.2	12.213	17.36	35.609	24.46	28.776	43.46	62.608	52.41
	188	63	174	68	276	97	169	54
Oct. 7.2	12.025	16.73	35.435	23.78	28.500	42.49	62.439	51.87
	163	73	151	97	238	126	150	77
17.1	11.862	16.00	35.284	22.81	28.262	41.23	62.289	51.10
	119	83	119	128	184	150	116	105
27.1	11.743	15.17	35.165	21.53	28.078	39.73	62.173	50.05
	71	84	80	156	122	168	78	130
Nov. 6.1	11.672	14.33	35.085	19.97	27.956	38.05	62.095	48.75
	16	84	36	185	47	179	37	154
16.1	11.656	13.49	35.049	18.12	27.909	36.26	62.058	47.21
	41	75	13	205	29	182	14	178
26.0	11.697	12.74	35.062	16.07	27.938	34.44	62.072	45.43
	102	67	63	227	110	178	60	195
Dec. 6.0	11.799	12.07	35.125	13.80	28.048	32.66	62.132	43.48
	160	51	114	239	188	164	112	206
16.0	11.959	11.56	35.239	11.41	28.236	31.02	62.244	41.42
	211	34	158	246	257	148	154	218
25.9	12.170	11.22	35.397	8.95	28.493	29.54	62.398	39.24
	257	14	198	245	324	124	196	219
35.9	12.427	11.08	35.595	6.50	28.817	28.30	62.594	37.05
Mean Place	10.311	17.97	34.466	8.06	26.384	38.62	61.345	37.11
Sec δ, Tan δ	1.208	−0.678	1.036	+0.270	1.663	−1.329	1.014	+0.167
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.078	−0.015	+0.054	+0.006	+0.095	−0.025	+0.057	+0.003
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.13	−0.95	−0.12	−0.95	−0.11	−0.96	−0.11	−0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Ophiuchi. Mag. 5.0		ϵ Herculis. Mag. 3.9		*d* Herculis. Mag. 5.3		η Ophiuchi. Mag. 2.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 16 56 s	° ′ − 4 6 ″	h m 16 57 s	° ′ +31 2 ″	h m 16 58 s	° ′ +33 40 ″	h m 17 5 s	° ′ −15 37 ″
Jan. 0.9	58.676	21.03	18.972	23.78	44.036	47.26	56.231	40.51
10.9	58.897 221	22.50 147	19.187 215	20.85 293	44.249 213	44.25 301	56.459 228	41.32 81
20.9	59.146 249	23.94 144	19.436 249	18.13 272	44.498 249	41.47 278	56.716 257	42.19 87
30.8	59.417 271	25.30 136	19.716 280	15.75 238	44.782 284	39.04 243	56.994 278	43.07 88
Feb. 9.8	59.702 285	26.52 122	20.015 299	13.77 198	45.087 305	37.00 204	57.286 292	43.88 81
	291	103	313	150	317	151	303	76
19.8	59.993	27.55	20.328	12.27	45.404	35.49	57.589	44.64
Mar. 1.8	60.286 293	28.35 80	20.645 317	11.30 97	45.728 324	34.52 97	57.893 304	45.30 66
11.7	60.575 289	28.90 55	20.959 314	10.91 39	46.050 322	34.12 40	58.195 302	45.80 50
21.7	60.855 280	29.20 30	21.264 305	11.07 − 16	46.363 313	34.28 16	58.489 294	46.18 38
31.7	61.124 269	29.21 1	21.555 291	11.78 71	46.661 298	35.03 75	58.774 285	46.41 23
	255	− 22	272	121	277	125	271	9
Apr. 10.7	61.379	28.99	21.827	12.99	46.938	36.28	59.045	46.50 − 6
20.6	61.616 237	28.53 46	22.076 249	14.63 164	47.192 254	38.00 172	59.299 254	46.44 16
30.6	61.832 216	27.89 64	22.297 221	16.64 201	47.419 227	40.09 209	59.535 236	46.28 25
May 10.6	62.025 193	27.09 80	22.487 190	18.95 231	47.612 193	42.47 238	59.746 211	46.03 27
20.5	62.191 166	26.20 89	22.642 155	21.46 251	47.768 156	45.06 259	59.932 186	45.76 34
	137	95	118	262	119	271	154	
30.5	62.328 104	25.25 98	22.760 79	24.08 264	47.887 78	47.77 274	60.086 122	45.42 33
June 9.5	62.432 73	24.27 96	22.839 39	26.72 259	47.965 37	50.51 269	60.208 85	45.09 33
19.5	62.505 35	23.31 92	22.878 − 3	29.31 247	48.002 − 6	53.20 255	60.293 50	44.76 31
29.4	62.540 − 2	22.39 86	22.875 45	31.78 228	47.996 51	55.75 235	60.343 − 9	44.45 31
July 9.4	62.538	21.53	22.830	34.06	47.945	58.10	60.352	44.14
	39	76	83	201	88	211	28	25
19.4	62.499	20.77	22.747	36.10	47.857	60.21	60.324	43.89
29.4	62.423 76	20.10 67	22.624 123	37.84 174	47.727 130	62.03 182	60.255 69	43.67 22
Aug. 8.3	62.317 106	19.53 57	22.468 156	39.25 141	47.563 164	63.50 147	60.153 102	43.47 20
18.3	62.182 135	19.07 46	22.283 185	40.33 108	47.368 195	64.58 108	60.018 135	43.30 17
28.3	62.025 157	18.72 35	22.075 208	41.00 67	47.153 215	65.28 70	59.862 156	43.13 17
	171	22	223	28	231	− 31	176	16
Sept. 7.2	61.854	18.50	21.852	41.28	46.922	65.59	59.686	42.97
17.2	61.675 179	18.40 − 10	21.622 230	41.15 13	46.684 238	65.44 15	59.505 181	42.84 13
27.2	61.499 176	18.44 4	21.397 225	40.58 57	46.448 236	64.87 57	59.322 183	42.71 13
Oct. 7.2	61.335 164	18.60 16	21.183 214	39.62 96	46.227 221	63.87 100	59.153 169	42.61 10
17.1	61.194 141	18.92 32	20.994 189	38.25 137	46.027 200	62.45 142	59.006 147	42.55 − 6
	110	48	157	176	166	183	117	2
27.1	61.084 69	19.40 66	20.837 117	36.49 213	45.861 123	60.62 220	58.889 77	42.57 10
Nov. 6.1	61.015 27	20.06 83	20.720 70	34.36 245	45.738 80	58.42 253	58.812 31	42.67 21
16.1	60.988 − 19	20.89 102	20.650 17	31.91 271	45.658 24	55.89 279	58.781 − 16	42.88 29
26.0	61.007 69	21.91 117	20.633 − 36	29.20 293	45.634 − 33	53.10 304	58.797 70	43.17 45
Dec. 6.0	61.076	23.08	20.669	26.27	45.667	50.06	58.867	43.62
	118	132	91	306	85	315	117	57
16.0	61.194	24.40	20.760	23.21	45.752	46.91	58.984	44.19
25.9	61.357 163	25.82 142	20.902 142	20.10 311	45.892 140	43.71 320	59.150 166	44.89 70
35.9	61.559 202	27.30 148	21.091 189	17.05 305	46.079 187	40.57 314	59.357 207	45.70 81
Mean Place	59.978	29.75	20.574	19.92	45.690	43.62	57.577	50.88
Sec δ, Tan δ	1.003	−0.072	1.167	+0.602	1.202	+0.666	1.038	−0.280
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.063	−0.001	+0.046	+0.011	+0.044	+0.012	+0.068	−0.004
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.11	−0.96	−0.11	−0.96	−0.11	−0.96	−0.09	−0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Scorpii. Mag. 3.4		ζ Draconis. Mag. 3.2		α Herculis. Var. 3.1–3.9		δ Herculis. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	17 6	−43 8	17 8	+65 48	17 11	+14 28	17 11	+24 55
	s	″	s	″	s	″	s	″
Jan. 0.9	36.396	7.86	30.26	35.61	6.728	43.49	50.554	49.75
	289	69	28	318	200	233	198	275
10.9	36.685	7.17	30.54	32.13	6.928	41.16	50.752	47.00
	328	50	37	319	228	219	233	258
20.9	37.013	6.67	30.91	28.94	7.156	38.97	50.985	44.42
	359	27	44	276	257	200	261	229
30.9	37.372	6.40	31.35	26.18	7.413	36.97	51.246	42.13
	379	8	50	225	276	168	282	195
Feb. 9.8	37.751	6.32	31.85	23.93	7.689	35.29	51.528	40.18
	390	11	55	166	287	135	295	152
19.8	38.141	6.43	32.40	22.27	7.976	33.94	51.823	38.66
	395	31	58	100	290	95	302	104
Mar. 1.8	38.536	6.74	32.98	21.27	8.266	32.99	52.125	37.62
	393	15	58	33	289	53	302	51
11.7	38.929	7.19	33.56	20.94	8.555	32.46	52.427	37.11
	381	59	57	36	285	8	296	1
21.7	39.313	7.78	34.13	21.30	8.840	32.38	52.723	37.12
	372	73	55	101	273	36	285	52
31.7	39.685	8.51	34.68	22.31	9.113	32.74	53.008	37.64
	354	83	50	161	260	77	270	99
Apr. 10.7	40.039	9.34	35.18	23.92	9.373	33.51	53.278	38.63
	333	94	45	214	211	112	250	142
20.6	40.372	10.28	35.63	26.06	9.614	34.63	53.528	40.05
	305	103	38	258	223	142	228	179
30.6	40.677	11.31	36.01	28.64	9.837	36.05	53.756	41.84
	276	112	31	292	196	166	200	205
May 10.6	40.953	12.43	36.32	31.56	10.033	37.71	53.956	43.89
	240	120	22	317	169	185	169	228
20.6	41.193	13.63	36.54	34.73	10.202	39.56	54.125	46.17
	200	124	14	331	140	195	135	239
30.5	41.393	14.87	36.68	38.04	10.342	41.51	54.260	48.56
	156	127	4	333	102	198	98	244
June 9.5	41.549	16.14	36.72	41.37	10.444	43.49	54.358	51.00
	108	128	4	327	69	195	60	241
19.5	41.657	17.42	36.68	44.64	10.513	45.44	54.418	53.41
	58	125	13	311	33	189	20	232
29.4	41.715	18.67	36.55	47.75	10.546	47.33	54.438	55.73
	6	119	21	286	8	176	19	216
July 9.4	41.721	19.86	36.34	50.61	10.538	49.09	54.419	57.89
	46	111	30	257	43	158	61	196
19.4	41.675	20.97	36.04	53.18	10.495	50.67	54.358	59.85
	97	97	36	219	81	138	97	169
29.4	41.578	21.94	35.68	55.37	10.414	52.05	54.261	61.54
	142	81	43	176	116	117	134	140
Aug. 8.3	41.436	22.75	35.25	57.13	10.298	53.22	54.127	62.94
	183	59	48	130	144	91	162	108
18.3	41.253	23.34	34.77	58.43	10.154	54.13	53.965	64.02
	215	37	51	82	166	62	189	76
28.3	41.038	23.71	34.26	59.25	9.988	54.75	53.776	64.78
	236	11	55	31	185	35	204	39
Sept. 7.3	40.802	23.82	33.71	59.56	9.803	55.10	53.572	65.17
	247	15	55	22	193	4	212	0
17.2	40.555	23.67	33.16	59.34	9.610	55.14	53.360	65.17
	245	41	56	75	191	22	213	36
27.2	40.310	23.26	32.60	58.59	9.419	54.92	53.147	64.81
	229	66	53	126	181	56	203	73
Oct. 7.2	40.081	22.60	32.07	57.33	9.238	54.36	52.944	64.08
	200	88	49	178	164	85	182	113
17.1	39.881	21.72	31.58	55.55	9.074	53.51	52.762	62.95
	158	105	44	225	133	116	153	148
27.1	39.723	20.67	31.14	53.30	8.941	52.35	52.609	61.47
	106	120	37	267	97	142	115	183
Nov. 6.1	39.617	19.47	30.77	50.63	8.844	50.93	52.494	59.64
	46	126	29	307	57	173	71	214
16.1	39.571	18.21	30.48	47.56	8.787	49.20	52.423	57.50
	17	127	19	337	6	197	22	241
26.0	39.588	16.94	30.29	44.19	8.781	47.23	52.401	55.09
	83	123	10	360	42	214	28	262
Dec. 6.0	39.671	15.71	30.19	40.59	8.823	45.09	52.429	52.47
	149	112	1	372	89	227	80	279
16.0	39.820	14.59	30.20	36.87	8.912	42.82	52.509	49.68
	208	98	12	374	136	239	130	285
26.0	40.028	13.61	30.32	33.13	9.048	40.43	52.639	46.83
	261	80	21	364	177	239	174	285
35.9	40.289	12.81	30.53	29.49	9.225	38.04	52.813	43.98
Mean Place	38.078	21.84	33.663	33.61	8.138	37.12	52.076	44.52
Sec δ, Tan δ	1.370	−0.937	2.441	+2.226	1.033	+0.258	1.103	+0.465
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.085	−0.014	+0.004	+0.033	+0.054	+0.004	+0.049	+0.006
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.09	−0.97	−0.09	−0.97	−0.08	−0.98	−0.08	−0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Herculis. Mag. 3.4		θ Ophiuchi. Mag. 3.4		w Herculis. Mag. 5.4		β Aræ. Mag. 2.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 17 12	° ′ +36 53	h m 17 17	° ′ −24 55	h m 17 17	° ′ +32 33	h m 17 18	° ′ −55 27
	s	″	s	″	s	″	s	″
Jan. 0.9	20.107	46.32	15.267	15.39	44.976	61.65	51.500	16.97
	203	312	232	21	193	303	337	145
10.9	20.310	43.20	15.499	15.60	45.169	58.62	51.837	15.52
	241	287	263	34	233	283	392	120
20.9	20.551	40.33	15.762	15.94	45.402	55.79	52.229	14.32
	278	257	287	40	265	253	432	92
30.9	20.829	37.76	16.049	16.34	45.667	53.26	52.661	13.40
	305	217	307	46	291	214	466	62
Feb. 9.8	21.134	35.59	16.356	16.80	45.958	51.12	53.127	12.78
	319	163	317	48	307	167	484	35
19.8	21.453	33.96	16.673	17.28	46.265	49.45	53.611	12.43
	330	107	321	44	315	113	495	5
Mar. 1.8	21.783	32.89	16.994	17.72	46.580	48.32	54.106	12.38
	332	48	320	42	318	56	497	22
11.8	22.115	32.41	17.314	18.14	46.898	47.76	54.603	12.60
	325	9	316	36	315	1	490	48
21.7	22.440	32.50	17.630	18.50	47.213	47.77	55.093	13.08
	313	69	306	33	302	58	476	75
31.7	22.753	33.19	17.936	18.83	47.515	48.35	55.569	13.83
	294	123	293	26	287	110	457	94
Apr. 10.7	23.047	34.42	18.229	19.09	47.802	49.45	56.026	14.77
	270	172	278	23	266	156	430	119
20.6	23.317	36.14	18.507	19.32	48.068	51.01	56.456	15.96
	243	213	260	17	239	196	398	138
30.6	23.560	38.27	18.767	19.49	48.307	52.97	56.854	17.34
	210	245	235	18	212	228	358	153
May 10.6	23.770	40.72	19.002	19.67	48.519	55.25	57.212	18.87
	171	265	209	16	176	251	313	168
20.6	23.941	43.37	19.211	19.83	48.695	57.76	57.525	20.55
	134	282	176	17	139	265	260	179
30.5	24.075	46.19	19.387	20.00	48.834	60.41	57.785	22.34
	90	289	141	18	100	271	203	187
June 9.5	24.165	49.08	19.528	20.18	48.934	63.12	57.988	24.21
	46	283	104	20	57	268	142	190
19.5	24.211	51.91	19.632	20.38	48.991	65.80	58.130	26.11
	1	272	66	19	15	259	76	189
29.5	24.212	54.63	19.698	20.57	49.006	68.39	58.206	28.00
	46	252	20	22	29	241	9	182
July 9.4	24.166	57.15	19.718	20.79	48.977	70.80	58.215	29.82
	86	227	19	21	71	218	60	169
19.4	24.080	59.42	19.699	21.00	48.906	72.98	58.155	31.51
	131	199	65	23	111	191	126	156
29.4	23.949	61.41	19.634	21.23	48.795	74.89	58.029	33.07
	167	165	100	16	149	159	185	129
Aug. 8.3	23.782	63.06	19.534	21.39	48.646	76.48	57.844	34.36
	200	125	138	13	182	120	237	104
18.3	23.582	64.31	19.396	21.52	48.464	77.68	57.607	35.40
	226	81	163	4	208	85	280	69
28.3	23.356	65.15	19.233	21.56	48.256	78.53	57.327	36.09
	215	44	184	1	225	44	312	37
Sept. 7.3	23.111	65.59	19.049	21.55	48.031	78.97	57.015	36.46
	253	5	194	10	236	1	328	0
17.2	22.858	65.54	18.855	21.45	47.795	78.98	56.687	36.46
	252	46	195	18	236	41	326	39
27.2	22.606	65.08	18.660	21.27	47.559	78.57	56.361	36.07
	240	91	183	24	225	84	310	74
Oct. 7.2	22.366	64.17	18.477	21.03	47.334	77.73	56.051	35.33
	219	137	164	31	207	127	278	110
17.2	22.147	62.80	18.313	20.72	47.127	76.46	55.773	34.23
	187	179	129	31	175	166	228	137
27.1	21.960	61.01	18.184	20.41	46.952	74.80	55.545	32.86
	147	218	88	33	140	204	165	163
Nov. 6.1	21.813	58.83	18.096	20.08	46.812	72.76	55.380	31.23
	103	254	44	31	93	241	92	180
16.1	21.710	56.29	18.052	19.77	46.719	70.35	55.288	29.43
	45	286	7	22	44	269	15	190
26.0	21.665	53.43	18.059	19.55	46.675	67.66	55.273	27.53
	9	305	64	15	12	293	70	191
Dec. 6.0	21.674	50.38	18.123	19.40	46.687	64.73	55.343	25.62
	67	322	114	4	66	310	151	187
16.0	21.741	47.16	18.237	19.36	46.753	61.63	55.494	23.75
	122	329	167	10	118	315	230	173
26.0	21.863	43.87	18.404	19.46	46.871	58.48	55.724	22.02
	174	324	205	19	169	313	299	157
35.9	22.037	40.63	18.609	19.65	47.040	55.35	56.023	20.45
Mean Place	21.847	42.27	16.713	26.73	46.625	56.91	53.716	31.53
Sec δ, Tan δ	1.250	+0.751	1.103	−0.465	1.187	+0.639	1.764	−1.453
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.042	+0.010	+0.073	−0.006	+0.045	+0.008	+0.099	−0.017
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.08	−0.98	−0.07	−0.98	−0.07	−0.98	−0.07	−0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*b* Ophiuchi. Mag. 4.3		*σ* Ophiuchi. Mag. 4.4		*δ* Aræ. Mag. 3.8		*α* Aræ. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 17 21 s	° ′ −24 6 ″	h m 17 22 s	° ′ + 4 12 ″	h m 17 24 s	° ′ −60 36 ″	h m 17 25 s	° ′ −49 48 ″
Jan. 0.9	38.463	10.52	40.234	30.18	5.89	64.01	51.166	47.06
10.9	38.687 224	10.75 23	40.428 194	28.35 183	6.26 37	62.27 174	51.462 296	45.84 122
20.9	38.946 259	11.12 37	40.652 224	26.59 176	6.69 43	60.79 148	51.806 344	44.84 100
30.9	39.229 283	11.53 41	40.901 249	24.98 161	7.18 49	59.63 116	52.185 379	44.09 75
Feb. 9.8	39.531 302	11.99 46	41.169 268	23.55 143	7.70 52	58.76 87	52.595 410	43.57 52
	313	46	279	115	55	53	427	30
19.8	39.844	12.45	41.448	22.40	8.25	58.23	53.022	43.27
Mar. 1.8	40.160 316	12.86 41	41.733 285	21.54 86	8.81 56	58.00 — 23	53.460 438	43.22 — 5
11.8	40.479 319	13.26 40	42.020 287	21.03 51	9.38 57	58.12 12	53.900 440	43.40 18
21.7	40.795 316	13.58 32	42.302 282	20.86 — 17	9.94 56	58.55 43	54.336 436	43.76 36
31.7	41.101 306	13.88 30	42.576 274	21.03 17	10.49 55	59.28 73	54.763 427	44.35 59
	294	21	262	50	53	97	409	76
Apr. 10.7	41.395	14.09	42.838	21.53	11.02	60.25	55.172	45.11
20.6	41.675 280	14.25 16	43.086 248	22.32 79	11.52 50	61.52 127	55.560 388	46.04 93
30.6	41.934 259	14.37 12	43.316 230	23.36 104	11.97 45	63.00 148	55.922 362	47.15 111
May 10.6	42.172 238	14.48 11	43.524 208	24.60 124	12.39 42	64.71 171	56.251 329	48.39 124
20.6	42.380 208	14.58 10	43.708 184	25.99 139	12.75 36	66.56 185	56.539 288	49.76 137
	181	11	155	116	30	200	246	147
30.5	42.561	14.69	43.863	27.45	13.05	68.56	56.785	51.23
June 9.5	42.707 146	14.81 12	43.985 122	28.95 150	13.28 23	70.65 209	56.981 196	52.79 156
19.5	42.815 108	14.95 14	44.074 89	30.44 149	13.44 16	72.80 215	57.124 143	54.39 160
29.5	42.885 70	15.09 14	44.125 51	31.87 143	13.53 9	74.95 215	57.208 84	55.98 159
July 9.4	42.910 — 25	15.26 17	44.137 12	33.20 133	13.53 0	77.02 207	57.232 — 24	57.55 157
	17	19	25	120	7	193	36	147
19.4	42.893	15.45	44.112	34.40	13.46	78.95	57.196	59.02
29.4	42.832 61	15.61 16	44.049 63	35.46 106	13.32 14	80.72 177	57.101 95	60.36 134
Aug. 8.3	42.734 98	15.77 16	43.953 96	36.36 90	13.10 22	82.21 149	56.952 149	61.51 115
18.3	42.601 133	15.89 12	43.824 129	37.05 69	12.82 28	83.44 123	56.754 198	62.44 93
28.3	42.440 161	15.94 5	43.671 153	37.57 52	12.50 32	84.31 87	56.516 238	63.09 65
	181	1	173	32	37	48	267	37
Sept. 7.3	42.259	15.95	43.498	37.89	12.13	84.79	56.249	63.46
17.2	42.066 193	15.88 7	43.316 182	38.00 — 11	11.74 39	84.85 — 6	55.967 282	63.51 — 5
27.2	41.872 194	15.72 16	43.132 184	37.89 11	11.36 38	84.52 33	55.683 284	63.23 28
Oct. 7.2	41.689 183	15.51 21	42.957 175	37.59 30	10.99 37	83.77 75	55.410 273	62.62 61
17.2	41.523 166	15.25 26	42.799 158	37.05 54	10.66 33	82.62 115	55.167 243	61.73 89
	131	25	130	76	27	148	202	116
27.1	41.392	15.00	42.669	36.29	10.39	81.14	54.965	60.57
Nov. 6.1	41.300 92	14.70 30	42.573 96	35.32 97	10.18 21	79.36 178	54.818 147	59.21 136
16.1	41.252 48	14.46 24	42.519 54	34.13 119	10.06 12	77.40 196	54.733 85	57.69 152
26.0	41.255 — 3	14.28 18	42.510 — 9	32.73 140	10.02 — 4	75.26 214	54.718 — 15	56.08 161
Dec. 6.0	41.313 58	14.19 9	42.550 40	31.16 157	10.08 6	73.09 217	54.777 59	54.47 161
	111	0	86	172	15	215	131	157
16.0	41.424	14.19	42.636	29.44	10.23	70.94	54.908	52.90
26.0	41.583 159	14.30 11	42.767 131	27.62 182	10.48 25	68.92 202	55.108 200	51.43 147
35.9	41.785 202	14.54 24	42.941 174	25.76 186	10.80 32	67.09 183	55.370 262	50.14 129
Mean Place	39.915	21.62	41.608	22.37	8.480	78.65	53.175	60.67
Sec δ, Tan δ	1.096	−0.447	1.003	+0.074	2.038	−1.776	1.550	−1.184
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.073	−0.005	+0.059	+0.001	+0.108	−0.018	+0.092	−0.012
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.07	−0.99	−0.06	−0.99	−0.06	−0.99	−0.06	−0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Herculis. Mag. 4.5		λ Scorpii. Mag. 1.7		β Draconis. Mag. 3.0		α Ophiuchi. Mag. 2.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	17 27	+26 9	17 28	−37 2	17 28	+52 21	17 31	+12 36
	s	″	s	″	s	″	s	″
Jan. 1.0	36.015	69.62	20.999	44.16	39.242	32.19	20.135	60.73
	182	279	247	52	196	346	183	222
10.9	36.197	66.83	21.246	43.64	39.438	28.73	20.318	58.51
	220	261	286	38	256	325	214	214
20.9	36.417	64.19	21.532	43.26	39.694	25.48	20.532	56.37
	249	236	314	23	308	287	244	193
30.9	36.666	61.83	21.846	43.03	40.002	22.61	20.776	54.44
	274	202	338	9	349	240	262	168
Feb. 9.8	36.940	59.81	22.184	42.94	40.351	20.21	21.038	52.76
	290	161	353	3	377	187	277	135
19.8	37.230	58.20	22.537	42.97	40.728	18.34	21.315	51.41
	300	112	358	15	400	127	285	98
Mar. 1.8	37.530	57.08	22.895	43.12	41.128	17.07	21.600	50.43
	302	57	363	24	410	61	287	56
11.8	37.832	56.51	23.258	43.36	41.538	16.46	21.887	49.87
	300	6	357	31	407	4	286	15
21.7	38.132	56.45	23.615	43.67	41.945	16.50	22.173	49.72
	293	16	349	39	395	71	279	28
31.7	38.425	56.91	23.964	44.06	42.340	17.21	22.452	50.00
	279	95	338	47	374	130	267	69
Apr. 10.7	38.704	57.86	24.302	44.53	42.714	18.51	22.719	50.69
	262	139	321	53	343	184	252	102
20.7	38.966	59.25	24.623	45.06	43.057	20.35	22.971	51.71
	239	179	301	59	309	231	234	133
30.6	39.205	61.04	24.924	45.65	43.366	22.66	23.205	53.04
	214	208	274	66	261	270	216	159
May 10.6	39.419	63.12	25.198	46.31	43.627	25.36	23.421	54.63
	183	232	246	73	212	297	186	178
20.6	39.602	65.44	25.444	47.04	43.839	28.33	23.607	56.41
	151	246	211	79	159	316	158	188
30.5	39.753	67.90	25.655	47.83	43.998	31.49	23.765	58.29
	114	253	170	83	99	325	124	194
June 9.5	39.867	70.43	25.825	48.66	44.097	34.74	23.889	60.23
	75	251	128	89	40	322	89	193
19.5	39.942	72.94	25.953	49.55	44.137	37.96	23.978	62.16
	34	213	82	89	19	313	52	186
29.5	39.976	75.37	26.035	50.44	44.118	41.09	24.030	64.02
	8	228	33	89	78	293	13	175
July 9.4	39.968	77.65	26.068	51.33	44.040	44.02	24.043	65.77
	48	209	17	84	137	268	24	158
19.4	39.920	79.74	26.051	52.17	43.903	46.70	24.019	67.35
	89	183	65	79	191	235	66	143
29.4	39.831	81.57	25.986	52.96	43.712	49.05	23.953	68.78
	128	155	110	68	238	199	101	119
Aug. 8.4	39.703	83.12	25.876	53.64	43.474	51.04	23.852	69.97
	159	122	150	54	280	156	133	96
18.3	39.544	84.34	25.726	54.18	43.194	52.60	23.719	70.93
	186	88	184	40	315	112	158	68
28.3	39.358	85.22	25.542	54.58	42.879	53.72	23.561	71.61
	205	53	209	21	341	60	178	42
Sept. 7.3	39.153	85.75	25.333	54.79	42.538	54.32	23.383	72.03
	216	14	222	0	354	12	190	17
17.2	38.937	85.89	25.111	54.79	42.184	54.44	23.193	72.20
	219	25	226	19	357	37	192	16
27.2	38.718	85.64	24.885	54.60	41.827	54.07	23.001	72.04
	211	64	215	38	341	91	186	42
Oct. 7.2	38.507	85.00	24.670	54.22	41.483	53.16	22.815	71.62
	193	101	193	57	324	141	168	74
17.2	38.314	83.99	24.477	53.65	41.159	51.75	22.647	70.88
	166	140	160	73	289	186	145	100
27.1	38.148	82.59	24.317	52.92	40.870	49.89	22.502	69.88
	129	176	115	82	242	236	109	129
Nov. 6.1	38.019	80.83	24.202	52.10	40.628	47.53	22.393	68.59
	89	208	62	90	187	275	67	155
16.1	37.930	78.75	24.140	51.20	40.441	44.78	22.326	67.04
	40	238	6	92	129	312	28	180
26.1	37.890	76.37	24.134	50.28	40.312	41.66	22.298	65.24
	11	262	53	90	54	335	25	199
Dec. 6.0	37.901	73.75	24.187	49.38	40.258	38.31	22.323	63.25
	63	279	114	82	16	354	71	212
16.0	37.964	70.96	24.301	48.56	40.274	34.77	22.394	61.13
	111	287	170	71	86	360	117	226
26.0	38.075	68.09	24.471	47.85	40.360	31.17	22.511	58.87
	157	288	220	57	159	358	161	228
35.9	38.232	65.21	24.691	47.28	40.519	27.59	22.672	56.59
Mean Place	37.567	63.87	22.661	56.42	41.520	28.10	21.561	53.66
Sec δ, Tan δ	1.114	+0.491	1.253	−0.755	1.638	+1.297	1.025	+0.224
Dψa, Dωa	+0.048	+0.005	+0.081	−0.007	+0.027	+0.012	+0.055	+0.002
Dψδ, Dωδ	−0.06	−0.99	−0.05	−0.99	−0.05	−0.99	−0.05	−0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Serpentis. Mag. 3.6		ι Herculis. Mag. 3.8		ω Draconis. Mag. 4.9		η Pavonis. Mag. 3.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	17 33	−15 20	17 37	+46 2	17 37	+68 47	17 38	−64 40
	s	″	s	″	s	″	s	″
Jan. 1.0	9.120	54.61	15.487	52.84	20.23	41.41	7.12	67.23
	201	72	177	336	22	356	38	204
10.9	9.321	55.33	15.664	49.48	20.45	37.85	7.50	65.19
	236	75	230	317	34	332	47	178
20.9	9.557	56.08	15.894	46.31	20.79	34.53	7.97	63.41
	259	75	275	287	42	297	52	149
30.9	9.816	56.83	16.169	43.44	21.21	31.56	8.49	61.92
	280	71	308	240	51	251	58	118
Feb. 9.8	10.096	57.54	16.477	41.04	21.72	29.05	9.07	60.74
	290	61	341	190	58	196	61	83
19.8	10.386	58.15	16.818	39.14	22.30	27.09	9.68	59.91
	298	52	358	132	62	134	63	47
Mar. 1.8	10.684	58.67	17.176	37.82	22.92	25.75	10.31	59.44
	300	39	365	72	64	69	64	14
11.8	10.984	59.06	17.541	37.10	23.56	25.06	10.95	59.30
	298	20	368	5	65	1	65	20
21.7	11.282	59.26	17.909	37.05	24.21	25.07	11.60	59.50
	291	8	357	57	63	67	63	55
31.7	11.573	59.34	18.266	37.62	24.84	25.74	12.23	60.05
	282	7	341	118	60	130	61	85
Apr. 10.7	11.855	59.27	18.607	38.80	25.44	27.04	12.84	60.90
	269	20	319	168	54	186	58	116
20.7	12.124	59.07	18.926	40.48	25.98	28.90	13.42	62.06
	253	29	287	217	47	237	54	143
30.6	12.377	58.78	19.213	42.65	26.45	31.27	13.96	63.49
	232	38	254	255	40	275	49	169
May 10.6	12.609	58.40	19.467	45.20	26.85	34.02	14.45	65.18
	210	42	211	284	31	308	43	191
20.6	12.819	57.98	19.678	48.04	27.16	37.10	14.88	67.09
	179	45	163	305	21	326	36	206
30.5	12.998	57.53	19.841	51.09	27.37	40.36	15.24	69.15
	148	44	115	313	11	335	29	222
June 9.5	13.146	57.09	19.956	54.22	27.48	43.71	15.53	71.37
	111	11	63	313	1	336	20	229
19.5	13.257	56.68	20.019	57.35	27.49	47.07	15.73	73.66
	75	37	9	305	9	328	12	231
29.5	13.332	56.31	20.028	60.40	27.40	50.35	15.85	75.97
	33	32	43	291	20	309	3	226
July 9.4	13.365	55.99	19.985	63.31	27.20	53.44	15.88	78.23
	7	29	96	265	29	283	7	217
19.4	13.358	55.70	19.889	65.96	26.91	56.27	15.81	80.40
	48	20	146	234	38	250	15	200
29.4	13.310	55.50	19.743	68.30	26.53	58.77	15.66	82.40
	85	19	187	200	45	213	24	175
Aug. 8.4	13.225	55.31	19.556	70.30	26.08	60.90	15.42	84.15
	121	13	233	163	53	170	30	145
18.3	13.104	55.18	19.323	71.93	25.55	62.60	15.12	85.60
	148	10	263	116	57	123	37	111
28.3	12.956	55.08	19.060	73.09	24.98	63.83	14.75	86.71
	171	9	288	71	62	74	42	69
Sept. 7.3	12.785	54.99	18.772	73.80	24.36	64.57	14.33	87.40
	183	6	303	26	64	22	44	26
17.2	12.602	54.93	18.469	74.06	23.72	64.79	13.89	87.66
	186	4	307	26	65	31	45	18
27.2	12.416	54.89	18.162	73.80	23.07	64.48	13.44	87.48
	179	1	299	73	63	83	44	64
Oct. 7.2	12.237	54.88	17.863	73.07	22.44	63.65	13.00	86.84
	161	1	281	126	60	137	40	107
17.2	12.076	54.89	17.582	71.81	21.84	62.28	12.60	85.77
	134	6	250	170	55	188	34	146
27.1	11.942	54.95	17.332	70.11	21.29	60.40	12.26	84.31
	98	13	210	217	49	236	27	180
Nov. 6.1	11.844	55.08	17.122	67.94	20.80	58.04	11.99	82.51
	54	22	160	256	40	276	18	206
16.1	11.790	55.30	16.962	65.38	20.40	55.28	11.81	80.45
	7	29	108	291	31	312	8	226
26.1	11.783	55.59	16.854	62.47	20.09	52.16	11.73	78.19
	42	42	44	319	19	342	3	236
Dec. 6.0	11.825	56.01	16.810	59.28	19.90	48.74	11.76	75.83
	90	53	20	339	9	362	13	235
16.0	11.915	56.54	16.830	55.89	19.81	45.12	11.89	73.48
	138	62	81	348	4	370	24	229
26.0	12.053	57.16	16.911	52.41	19.85	41.42	12.13	71.19
	180	71	143	345	15	366	33	212
35.9	12.233	57.87	17.054	48.96	20.00	37.76	12.46	69.07
Mean Place	10.541	64.49	17.489	47.89	24.018	37.10	10.213	81.13
Sec δ, Tan δ	1.037	−0.274	1.441	+1.037	2.765	+2.578	2.339	−2.114
$D_{\psi a}$, $D_{\omega a}$	+0.068	−0.002	+0.034	+0.007	−0.007	+0.017	+0.117	−0.013
$D_{\psi \delta}$, $D_{\omega \delta}$	−0.05	−0.99	−0.04	−1.00	−0.04	−1.00	−0.04	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ophiuchi. Mag. 2.9		ι¹ Scorpii. Mag. 3.1		ψ Draconis. Mag. 4.9		μ Herculis. Mag. 3.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	17 39	+ 4 35	17 42	−40 5	17 43	+72 11	17 43	+27 45
	s	″	s	″	s	″	s	″
Jan. 1.0	38.690	61.94	10.137	43.37	13.77	18.12	25.076	59.47
10.9	38.868 178	60.14 180	10.376 239	42.58 79	14.00 23	14.55 357	25.243 167	56.60 287
20.9	39.078 210	58.40 174	10.657 281	41.94 64	14.36 36	11.20 335	25.447 204	53.88 272
30.9	39.317 239	56.79 161	10.972 315	41.45 49	14.83 47	8.19 301	25.684 237	51.41 247
Feb. 9.9	39.573 256	55.38 141	11.312 340	41.11 34	15.41 58	5.62 257	25.948 264	49.25 216
	272	115	359	19	65	203	284	171
19.8	39.845	54.23	11.671	40.92	16.06	3.59	26.232	47.54
Mar. 1.8	40.126 281	53.37 86	12.040 369	40.85 — 7	16.77 71	2.17 142	26.529 297	46.33 121
11.8	40.409 283	52.86 51	12.413 373	40.90 5	17.52 75	1.43 74	26.831 302	45.62 71
21.7	40.692 283	52.71 — 15	12.786 373	41.07 17	18.28 76	1.35 — 8	27.135 304	45.46 — 16
31.7	40.969 277	52.90 19	13.154 368	41.35 28	19.01 73	1.92 57	27.433 298	45.84 38
	269	52	356	38	70	121	287	85
Apr. 10.7	41.238	53.42	13.510	41.73	19.71	3.13	27.720	46.69
20.7	41.496 258	54.24 82	13.853 343	42.21 48	20.35 64	4.92 179	27.992 272	48.04 135
30.6	41.737 241	55.32 108	14.176 323	42.79 58	20.92 57	7.21 229	28.244 252	49.79 175
May 10.6	41.957 220	56.60 128	14.474 298	43.48 69	21.38 46	9.91 270	28.472 228	51.88 209
20.6	42.154 197	58.04 144	14.742 268	44.26 78	21.75 37	12.93 302	28.669 197	54.21 233
	168	154	234	87	24	322	163	250
30.6	42.322	59.58	14.976	45.13	21.99	16.15	28.832	56.71
June 9.5	42.461 139	61.14 156	15.169 193	46.08 95	22.12 13	19.48 333	28.962 130	59.29 258
19.5	42.563 102	62.70 156	15.318 149	47.09 101	22.13 1	22.82 334	29.050 88	61.88 259
29.5	42.629 66	64.20 150	15.417 99	48.13 104	22.01 — 12	26.11 329	29.097 47	64.41 253
July 9.4	42.656 — 27	65.62 142	15.466 — 49	49.19 106	21.78 23	29.20 309	29.100 — 3	66.79 238
	12	128	5	103	35	282	40	220
19.4	42.644	66.90	15.461	50.22	21.43	32.02	29.060	68.99
29.4	42.594 50	68.02 112	15.406 55	51.19 97	20.98 45	34.57 255	28.981 79	70.97 198
Aug. 8.4	42.507 87	68.98 96	15.301 105	52.06 87	20.43 55	36.74 217	28.860 121	72.63 166
18.3	42.386 121	69.75 77	15.152 149	52.79 73	19.81 62	38.49 175	28.703 157	73.97 134
28.3	42.238 148	70.32 57	14.967 185	53.35 56	19.12 69	39.76 127	28.521 182	75.01 104
	169	38	216	37	74	80	207	64
Sept. 7.3	42.069	70.70	14.751	53.72	18.38	40.56	28.314	75.65
17.3	41.886 183	70.85 — 15	14.519 232	53.85 — 13	17.62 76	40.85 — 29	28.093 221	75.90 — 25
27.2	41.700 186	70.79 6	14.282 237	53.76 9	16.85 77	40.62 23	27.868 225	75.77 13
Oct. 7.2	41.520 180	70.52 27	14.051 231	53.43 33	16.08 77	39.83 79	27.647 221	75.21 56
17.2	41.354 166	70.03 49	13.841 210	52.89 54	15.35 73	38.54 129	27.440 207	74.26 95
	138	73	177	74	67	181	179	133
27.1	41.216	69.30	13.664	52.15	14.68	36.73	27.261	72.93
Nov. 6.1	41.107 109	68.37 93	13.530 134	51.26 89	14.08 60	34.45 228	27.115 146	71.20 173
16.1	41.040 67	67.20 117	13.448 82	50.26 100	13.57 51	31.73 272	27.011 104	69.14 206
26.1	41.016 — 24	65.84 136	13.425 — 23	49.20 106	13.17 40	28.65 308	26.949 62	66.76 238
Dec. 6.0	41.039 23	64.30 154	13.463 38	48.13 107	12.90 27	25.28 337	26.941 — 8	64.17 259
	69	168	100	103	14	359	42	283
16.0	41.108	62.62	13.563	47.10	12.76	21.69	26.983	61.34
26.0	41.224 116	60.84 178	13.721 158	46.14 96	12.76 0	18.00 369	27.074 91	58.42 292
36.0	41.381 157	59.01 183	13.932 211	45.30 84	12.90 14	14.33 367	27.215 141	55.47 295
Mean Place	40.091	54.02	11.922	55.21	18.219	13.35	26.656	53.19
Sec δ, Tan δ	1.003	+0.080	1.307	−0.842	3.269	+3.113	1.130	+0.526
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.059	0.000	+0.083	−0.004	−0.021	+0.015	+0.047	+0.003
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.04	−1.00	−0.03	−1.00	−0.03	−1.00	−0.03	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ophiuchi. Mag. 3.7		ξ Draconis. Mag. 3.9		89 Herculis. Mag. 5.5		35 Draconis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 17 44 s	° ′ + 2 44 ″	h m 17 52 s	° ′ +56 52 ″	h m 17 52 s	° ′ +26 3 ″	h m 17 52 s	° ′ +76 58 ″
Jan. 1.0	0.457	14.62	9.411	69.20	17.279	47.41	47.72	32.10
	176	170	165	356	157	277	22	353
10.9	0.633	12.92	9.576	65.64	17.436	44.64	47.94	28.57
	209	163	233	336	196	265	41	335
20.9	0.842	11.29	9.809	62.28	17.632	41.99	48.35	25.22
	234	153	297	304	229	242	58	302
30.9	1.076	9.76	10.106	59.24	17.861	39.57	48.93	22.20
	256	135	350	262	256	210	72	262
Feb. 9.9	1.332	8.41	10.456	56.62	18.117	37.47	49.65	19.58
	270	111	393	211	276	171	84	209
19.8	1.602	7.30	10.849	54.51	18.393	35.76	50.49	17.49
	278	81	424	151	291	123	93	150
Mar. 1.8	1.880	6.49	11.273	53.00	18.684	34.53	51.42	15.99
	283	51	441	87	298	72	98	86
11.8	2.163	5.98	11.714	52.13	18.982	33.81	52.40	15.13
	283	17	448	21	300	19	101	19
21.7	2.446	5.81	12.162	51.92	19.282	33.62	53.41	14.94
	278	17	443	47	297	33	99	48
31.7	2.724	5.98	12.605	52.39	19.579	33.95	54.40	15.42
	270	48	425	110	289	83	94	110
Apr. 10.7	2.994	6.46	13.030	53.49	19.868	34.78	55.34	16.52
	258	77	398	167	274	130	87	168
20.7	3.252	7.23	13.428	55.16	20.142	36.08	56.21	18.20
	244	101	358	219	257	171	76	219
30.6	3.496	8.24	13.786	57.35	20.399	37.79	56.97	20.39
	225	121	314	260	233	202	64	261
May 10.6	3.721	9.45	14.100	59.95	20.632	39.81	57.61	23.00
	200	135	260	296	206	229	49	296
20.6	3.921	10.80	14.360	62.91	20.838	42.10	58.10	25.96
	174	143	200	316	173	216	34	317
30.6	4.095	12.23	14.560	66.07	21.011	44.56	58.44	29.13
	143	149	137	331	139	255	18	330
June 9.5	4.238	13.72	14.697	69.38	21.150	47.11	58.62	32.43
	109	146	70	334	101	257	0	334
19.5	4.347	15.18	14.767	72.72	21.251	49.68	58.62	35.77
	71	141	2	327	57	252	16	328
29.5	4.418	16.59	14.769	75.99	21.308	52.20	58.46	39.05
	32	132	67	313	15	239	32	313
July 9.4	4.450	17.91	14.702	79.12	21.323	54.59	58.14	42.18
	7	119	133	291	27	221	48	290
19.4	4.443	19.10	14.569	82.03	21.296	56.80	57.66	45.08
	45	105	196	261	70	199	61	261
29.4	4.398	20.15	14.373	84.64	21.226	58.79	57.05	47.69
	84	89	255	226	110	171	75	226
Aug. 8.4	4.314	21.04	14.118	86.90	21.116	60.50	56.30	49.95
	117	71	304	186	145	141	85	186
18.3	4.197	21.75	13.814	88.76	20.971	61.91	55.45	51.81
	145	54	347	142	176	106	94	142
28.3	4.052	22.29	13.467	90.18	20.795	62.97	54.51	53.23
	167	35	380	94	199	71	102	93
Sept. 7.3	3.885	22.64	13.087	91.12	20.596	63.68	53.49	54.16
	181	15	400	43	214	34	105	43
17.3	3.704	22.79	12.687	91.55	20.382	64.02	52.44	54.59
	185	4	409	8	220	5	107	8
27.2	3.519	22.75	12.278	91.47	20.162	63.97	51.37	54.51
	181	25	403	60	217	44	107	60
Oct. 7.2	3.338	22.50	11.875	90.87	19.945	63.53	50.30	53.91
	165	44	386	112	204	83	102	113
17.2	3.173	22.06	11.489	89.75	19.741	62.70	49.28	52.78
	141	66	352	163	178	122	96	163
27.1	3.032	21.40	11.137	88.12	19.563	61.48	48.32	51.15
	109	85	311	212	148	158	87	211
Nov. 6.1	2.923	20.55	10.826	86.00	19.415	59.90	47.45	49.04
	69	106	253	256	109	192	75	254
16.1	2.854	19.49	10.573	83.44	19.306	57.98	46.70	46.50
	26	127	188	296	63	224	61	296
26.1	2.828	18.22	10.385	80.48	19.243	55.74	46.09	43.54
	21	143	117	326	14	250	45	324
Dec. 6.0	2.849	16.79	10.268	77.22	19.229	53.24	45.64	40.30
	67	157	38	350	35	269	26	348
16.0	2.916	15.22	10.230	73.72	19.264	50.55	45.38	36.82
	113	169	41	362	85	280	10	362
26.0	3.029	13.53	10.271	70.10	19.349	47.75	45.28	33.20
	154	173	117	363	132	283	12	361
36.0	3.183	11.80	10.388	66.47	19.481	44.92	45.40	29.59
Mean Place	1.857	6.49	11.913	63.58	18.835	40.69	53.661	26.51
Sec δ, Tan δ	1.001	+0.048	1.831	+1.533	1.113	+0.489	4.437	+4.323
Dψa, Dωa	+0.060	0.000	+0.021	+0.003	+0.048	+0.001	−0.053	+0.009
Dψδ, Dωδ	−0.03	−1.00	−0.01	−1.00	−0.01	−1.00	−0.01	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Herculis. Mag. 4.0		ξ Herculis. Mag. 3.8		ν Ophiuchi. Mag. 3.5		γ Draconis. Mag. 2.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 17 53 s	° ′ +37 15 ″	h m 17 54 s	° ′ +29 15 ″	h m 17 54 s	° ′ − 9 45 ″	h m 17 54 s	° ′ +51 29 ″
Jan. 1.0	34.977	41.80	44.773	25.67	45.770	46.45	46.871	56.39
	153	316	154	289	177	96	157	349
10.9	35.130	38.64	44.927	22.78	45.947	47.41	47.028	52.90
	200	300	195	277	209	97	214	331
20.9	35.330	35.64	45.122	20.01	46.156	48.38	47.242	49.59
	241	273	229	252	237	92	272	299
30.9	35.571	32.91	45.351	17.49	46.393	49.30	47.514	46.60
Feb. 9.9	269	235	258	218	258	82	314	263
	35.840	30.56	45.609	15.31	46.651	50.12	47.828	43.97
	298	195	279	178	274	69	354	209
19.8	36.138	28.61	45.888	13.53	46.925	50.81	48.182	41.88
	314	138	294	130	283	53	378	151
Mar. 1.8	36.452	27.23	46.182	12.23	47.208	51.34	48.560	40.37
	325	80	304	76	290	35	395	89
11.8	36.777	26.43	46.486	11.47	47.498	51.69	48.955	39.48
	328	22	306	22	290	12	401	25
21.8	37.105	26.21	46.792	11.25	47.788	51.81	49.356	39.23
	326	— 37	303	— 33	289	— 9	395	— 41
31.7	37.431	26.58	47.095	11.58	48.077	51.72	49.751	39.64
	314	97	294	86	281	28	384	105
Apr. 10.7	37.745	27.55	47.389	12.44	48.358	51.44	50.135	40.69
	298	146	282	134	272	45	359	161
20.7	38.043	29.01	47.671	13.78	48.630	50.99	50.494	42.30
	276	193	261	176	259	60	329	212
30.6	38.319	30.94	47.932	15.54	48.889	50.39	50.823	44.42
May 10.6	251	232	239	212	241	73	289	252
	38.570	33.26	48.171	17.66	49.130	49.66	51.112	46.94
20.6	214	259	209	238	218	79	243	288
	38.784	35.85	48.380	20.04	49.348	48.87	51.355	49.82
	178	281	177	257	194	82	194	310
30.6	38.962	38.66	48.557	22.61	49.542	48.05	51.549	52.92
	138	293	141	267	162	83	140	322
June 9.5	39.100	41.59	48.698	25.28	49.704	47.22	51.689	56.14
	91	295	100	269	128	80	79	327
19.5	39.191	44.54	48.798	27.97	49.832	46.42	51.768	59.41
	45	289	57	264	90	73	19	322
29.5	39.236	47.43	48.855	30.61	49.922	45.69	51.787	62.63
	— 3	277	13	251	49	68	— 38	308
July 9.4	39.233	50.20	48.868	33.12	49.971	45.01	51.749	65.71
	50	256	— 31	233	— 11	59	101	286
19.4	39.183	52.76	48.837	35.45	49.982	44.42	51.648	68.57
	97	229	74	209	31	48	156	258
29.4	39.086	55.05	48.763	37.54	49.951	43.94	51.492	71.15
	137	203	115	182	72	40	205	224
Aug. 8.4	38.949	57.08	48.648	39.36	49.879	43.54	51.287	73.39
	180	164	152	149	108	32	255	184
18.3	38.769	58.72	48.496	40.85	49.771	43.22	51.032	75.23
	210	125	183	114	138	22	296	144
28.3	38.559	59.97	48.313	41.99	49.633	43.00	50.736	76.67
	237	83	207	76	161	13	323	94
Sept. 7.3	38.322	60.80	48.106	42.75	49.472	42.87	50.413	77.61
	252	42	223	37	178	6	343	46
17.3	38.070	61.22	47.883	43.12	49.294	42.81	50.070	78.07
	259	— 7	229	— 2	183	— 2	350	— 5
27.2	37.811	61.15	47.654	43.10	49.111	42.83	49.720	78.02
	257	47	227	44	181	9	347	53
Oct. 7.2	37.554	60.68	47.427	42.66	48.930	42.92	49.373	77.49
	241	97	212	85	167	18	331	107
17.2	37.313	59.71	47.215	41.81	48.763	43.10	49.042	76.42
	217	141	190	126	143	27	302	158
27.1	37.096	58.30	47.025	40.55	48.620	43.37	48.740	74.84
	182	183	157	164	112	36	262	203
Nov. 6.1	36.914	56.47	46.868	38.91	48.508	43.73	48.478	72.81
	142	226	118	201	71	48	216	248
16.1	36.772	54.21	46.750	36.90	48.437	44.21	48.262	70.33
	92	258	72	232	28	61	155	288
26.1	36.680	51.63	46.678	34.58	48.409	44.82	48.107	67.45
	40	289	22	261	18	70	90	317
Dec. 6.0	36.640	48.74	46.656	31.97	48.427	45.52	48.017	64.28
	— 17	309	— 29	280	66	81	21	343
16.0	36.657	45.65	46.685	29.17	48.493	46.33	47.996	60.85
	72	320	79	293	114	90	44	353
26.0	36.729	42.45	46.764	26.24	48.607	47.23	48.040	57.32
	125	322	127	295	153	98	117	357
36.0	36.854	39.23	46.891	23.29	48.760	48.21	48.157	53.75
Mean Place	36.720	35.53	46.367	18.99	47.206	55.47	49.073	50.46
Sec δ, Tan δ	1.256	+0.761	1.146	+0.560	1.015	−0.172	1.606	+1.257
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.041	+0.001	+0.046	+0.001	+0.066	0.000	+0.028	+0.002
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.01	−1.00	−0.01	−1.00	−0.01	−1.00	−0.01	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	67 Ophiuchi. Mag. 3.9		θ Aræ. Mag. 3.9		γ Sagittarii. Mag. 3.1		70 Ophiuchi. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	17 56	+ 2 56	18 0	−50 5	18 0	−30 25	18 1	+ 2 30
	s	″	s	″	s	″	s	″
Jan. 1.0	45.915	10.96	35.976	43.50	49.938	25.23	32.330	66.07
10.9	46.080 165	9.29 167	36.225 249	42.04 146	50.137 199	24.89 31	32.491 161	64.40 167
20.9	46.277 197	7.66 163	36.527 302	40.73 131	50.371 234	24.67 22	32.684 193	62.78 162
30.9	46.502 225	6.15 151	36.874 347	39.61 112	50.638 267	24.54 13	32.906 222	61.26 152
Feb. 9.9	46.749 247	4.83 132	37.255 381	38.68 93	50.932 294	24.41 13	33.151 245	59.93 133
	265	109	407	72	311	7	261	111
19.8	47.014	3.74	37.662	37.96	51.243	24.34	33.412	58.82
Mar. 1.8	47.288 274	2.93 81	38.087 425	37.46 50	51.566 323	24.33 1	33.685 273	57.99 83
11.8	47.569 281	2.43 50	38.523 436	37.16 30	51.897 331	24.33 0	33.965 280	57.49 50
21.8	47.851 282	2.27 16	38.962 439	37.08 8	52.231 334	24.35 2	34.248 283	57.30 19
31.7	48.132 281	2.44 17	39.399 437	37.21 13	52.561 330	24.36 1	34.530 282	57.44 14
	274	51	429	34	321	4	277	47
Apr. 10.7	48.406	2.95	39.828	37.55	52.885	24.40	34.807	57.91
20.7	48.671 265	3.72 77	40.243 415	38.09 54	53.203 318	24.45 5	35.073 266	58.66 75
30.6	48.922 251	4.77 105	40.637 394	38.82 73	53.504 301	24.52 7	35.327 254	59.66 100
May 10.6	49.156 234	6.02 125	41.003 366	39.74 92	53.783 279	24.66 14	35.563 236	60.86 120
20.6	49.365 209	7.41 139	41.334 331	40.84 110	54.041 258	24.86 20	35.778 215	62.21 135
	185	117	291	125	229	23	189	114
30.6	49.550	8.88	41.625	42.09	54.270	25.09	35.967	63.65
June 9.5	49.705 155	10.40 152	41.870 245	43.48 139	54.463 193	25.40 31	36.126 159	65.14 149
19.5	49.824 119	11.91 151	42.061 191	44.96 148	54.618 155	25.81 41	36.252 126	66.62 148
29.5	49.907 83	13.37 146	42.195 134	46.51 155	54.727 109	26.25 44	36.340 88	68.04 142
July 9.5	49.949 42	14.74 137	42.269 74	48.11 160	54.794 67	26.76 51	36.388 48	69.36 132
	4	124	10	157	20	53	9	120
19.4	49.953	15.98	42.279	49.68	54.814	27.29	36.397	70.56
29.4	49.917 36	17.07 109	42.225 54	51.18 150	54.784 30	27.84 55	36.365 32	71.63 107
Aug. 8.4	49.842 75	18.02 95	42.112 113	52.55 137	54.709 75	28.37 53	36.292 73	72.53 90
18.3	49.731 111	18.77 75	41.945 167	53.74 119	54.593 116	28.84 47	36.186 106	73.25 72
28.3	49.591 140	19.34 57	41.730 215	54.71 97	54.442 151	29.24 40	36.049 137	73.78 53
	163	38	253	69	182	32	160	36
Sept. 7.3	49.428	19.72	41.477	55.40	54.260	29.56	35.889	74.14
17.3	49.249 179	19.90 18	41.200 277	55.81 41	54.059 201	29.76 20	35.711 178	74.30 16
27.2	49.064 185	19.89 1	40.911 289	55.88 7	53.850 209	29.81 5	35.527 184	74.26 4
Oct. 7.2	48.880 184	19.67 22	40.625 286	55.63 25	53.645 205	29.73 8	35.346 181	74.03 23
17.2	48.711 169	19.25 42	40.360 265	55.04 59	53.454 191	29.53 20	35.175 171	73.59 44
	148	63	233	88	165	34	150	64
27.2	48.563	18.62	40.127	54.16	53.289	29.19	35.025	72.95
Nov. 6.1	48.447 116	17.79 83	39.941 186	53.01 115	53.160 129	28.77 42	34.907 118	72.12 83
16.1	48.368 79	16.74 105	39.813 128	51.67 134	53.075 85	28.31 46	34.825 82	71.08 104
26.1	48.331 37	15.50 124	39.751 62	50.15 152	53.038 37	27.80 51	34.785 40	69.85 123
Dec. 6.0	48.340 9	14.09 141	39.760 9	48.55 160	53.053 15	27.31 49	34.789 4	68.45 140
	56	153	79	163	71	47	53	154
16.0	48.396	12.56	39.839	46.92	53.124	26.84	34.842	66.91
26.0	48.495 99	10.91 165	39.989 150	45.32 160	53.250 126	26.43 41	34.938 96	65.27 164
36.0	48.637 142	9.20 171	40.202 213	43.80 152	53.421 171	26.10 33	35.075 137	63.58 169
Mean Place	47.331	2.81	38.186	54.88	51.594	35.40	33.750	57.88
Sec δ, Tan δ	1.001	+0.051	1.559	−1.196	1.160	−0.587	1.001	+0.044
Dψα, Dωα	+0.060	0.000	+0.093	0.000	+0.077	0.000	+0.060	0.000
Dψδ, Dωδ	−0.01	−1.00	0.00	−1.00	0.00	−1.00	0.00	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Ophiuchi. Mag. 3.7		o Herculis. Mag. 3.8		μ Sagittarii. Mag. 4.0		η Sagittarii. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	18 3	+ 9 33	18 4	+28 44	18 9	−21 4	18 12	−36 46
	s	″	s	″	s	″	s	″
Jan. 1.0	40.474	14.64	30.709	70.36	7.919	39.85	23.241	59.71
	153	201	141	286	175	22	197	76
11.0	40.627	12.63	30.850	67.50	8.094	40.07	23.438	58.95
	188	193	185	275	209	23	238	65
20.9	40.815	10.70	31.035	64.75	8.303	40.30	23.676	58.30
	216	179	219	253	242	28	275	57
30.9	41.031	8.91	31.254	62.22	8.545	40.58	23.951	57.73
Feb. 9.9	242	158	250	224	265	24	303	48
	41.273	7.33	31.504	59.98	8.810	40.82	24.254	57.25
	258	129	273	179	283	21	325	38
19.8	41.531	6.04	31.777	58.19	9.093	41.03	24.579	56.87
	272	96	290	133	297	17	340	30
Mar. 1.8	41.803	5.08	32.067	56.86	9.390	41.20	24.919	56.57
	280	57	300	81	304	6	350	21
11.8	42.083	4.51	32.367	56.05	9.694	41.26	25.269	56.36
	282	19	305	27	308	0	355	14
21.8	42.365	4.32	32.672	55.78	10.002	41.26	25.624	56.22
	282	22	304	28	307	12	356	7
31.7	42.647	4.54	32.976	56.06	10.309	41.14	25.980	56.15
	276	60	296	77	303	18	350	1
Apr. 10.7	42.923	5.14	33.272	56.83	10.612	40.96	26.330	56.16
	267	93	285	129	295	23	343	9
20.7	43.190	6.07	33.557	58.12	10.907	40.73	26.673	56.25
	254	125	267	172	282	30	328	20
30.7	43.444	7.32	33.824	59.84	11.189	40.43	27.001	56.45
May 10.6	235	148	217	207	267	30	309	29
	43.679	8.80	34.071	61.91	11.456	40.13	27.310	56.74
20.6	43.893	10.48	34.288	64.26	11.700	39.80	27.596	57.13
	214	168	217	235	244	33	286	39
	187	181	184	255	219	31	254	51
30.6	44.080	12.29	34.472	66.81	11.919	39.49	27.850	57.64
	156	187	152	265	187	23	218	61
June 9.5	44.236	14.16	34.624	69.46	12.106	39.26	28.068	58.25
	120	186	108	268	153	19	177	72
19.5	44.356	16.02	34.732	72.14	12.259	39.07	28.245	58.97
	85	183	68	267	109	11	131	79
29.5	44.441	17.85	34.800	74.81	12.368	38.96	28.376	59.76
July 9.5	43	172	24	251	70	10	82	85
	44.484	19.57	34.824	77.35	12.438	38.86	28.458	60.61
	4	159	22	236	21	2	30	89
	—				—		—	
19.4	44.488	21.16	34.802	79.71	12.462	38.88	28.488	61.50
	37	142	67	216	17	7	21	88
29.4	44.451	22.58	34.735	81.87	12.445	38.95	28.467	62.38
Aug. 8.4	76	121	104	185	62	11	71	85
	44.375	23.79	34.631	83.72	12.383	39.06	28.396	63.23
18.4	112	100	144	157	100	17	119	78
	44.263	24.79	34.487	85.29	12.283	39.23	28.277	64.01
28.3	141	77	178	123	138	13	158	65
	44.122	25.56	34.309	86.52	12.145	39.36	28.119	64.66
	168	52	203	84	163	12	191	52
Sept. 7.3	43.954	26.08	34.106	87.36	11.982	39.48	27.928	65.18
	184	28	220	44	183	10	215	35
17.3	43.770	26.36	33.886	87.80	11.799	39.58	27.713	65.53
	190	1	226	7	193	6	226	15
27.2	43.580	26.37	33.660	87.87	11.606	39.64	27.487	65.68
Oct. 7.2	189	25	226	37	189	5	226	5
	43.391	26.12	33.434	87.50	11.417	39.69	27.261	65.63
17.2	177	51	217	76	179	1	211	25
	43.214	25.61	33.217	86.74	11.238	39.68	27.050	65.38
	157	78	193	116	157	4	187	43
27.2	43.057	24.83	33.024	85.58	11.081	39.64	26.863	64.95
	127	103	161	157	122	3	150	59
Nov. 6.1	42.930	23.80	32.863	84.01	10.959	39.61	26.713	64.36
	90	128	123	193	86	4	104	73
16.1	42.840	22.52	32.740	82.08	10.873	39.57	26.609	63.63
	50	151	83	226	39	0	53	81
26.1	42.790	21.01	32.657	79.82	10.834	39.57	26.556	62.82
Dec. 6.1	2	171	31	252	8	3	5	86
	42.788	19.30	32.626	77.30	10.842	39.60	26.561	61.96
	42	188	18	275	59	10	60	87
16.0	42.830	17.42	32.644	74.55	10.901	39.70	26.621	61.09
	88	199	70	289	108	15	117	83
26.0	42.918	15.43	32.714	71.66	11.009	39.85	26.738	60.26
	129	204	118	292	152	22	168	77
36.0	43.047	13.39	32.832	68.74	11.161	40.07	26.906	59.49
Mean Place	41.908	6.80	32.296	63.28	9.465	49.14	25.054	69.65
Sec δ, Tan δ	1.014	+0.168	1.141	+0.549	1.072	−0.385	1.249	−0.748
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.057	0.000	+0.047	−0.001	+0.071	+0.001	+0.081	+0.003
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.01	−1.00	+0.01	−1.00	+0.02	−1.00	+0.02	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2533. Mag. 5.4		36 Draconis. Mag. 5.0		δ Sagittarii. Mag. 2.8		η Serpentis. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 18 13 s	° ′ +42 7 ″	h m 18 13 s	° ′ +64 22 ″	h m 18 16 s	° ′ −29 51 ″	h m 18 17 s	° ′ − 2 54 ″
Jan. 1.0	13.208	63.63	24.17	22.69	2.186	34.77	18.028	63.26
	129	329	13	361	180	35	146	130
11.0	13.337	60.34	24.30	19.08	2.366	34.42	18.174	64.56
	179	316	22	346	220	29	181	128
20.9	13.516	57.18	24.52	15.62	2.586	34.13	18.355	65.84
	226	292	31	321	253	23	211	118
30.9	13.742	54.26	24.83	12.41	2.839	33.90	18.566	67.02
	264	256	38	283	279	20	236	107
Feb. 9.9	14.006	51.70	25.21	9.58	3.118	33.70	18.802	68.09
	296	212	45	233	300	16	254	86
19.8	14.302	49.58	25.66	7.25	3.418	33.54	19.056	68.95
	319	159	49	177	313	14	267	65
Mar. 1.8	14.621	47.99	26.15	5.48	3.731	33.40	19.323	69.60
	335	101	53	113	324	13	276	39
11.8	14.956	46.98	26.68	4.35	4.055	33.27	19.599	69.99
	345	39	55	46	329	13	283	11
21.8	15.301	46.59	27.23	3.89	4.384	33.14	19.882	70.10
	341	22	55	20	330	13	283	15
31.7	15.645	46.81	27.78	4.09	4.714	33.01	20.165	69.95
	338	82	53	86	327	12	280	44
Apr. 10.7	15.983	47.63	28.31	4.95	5.041	32.89	20.445	69.51
	325	138	50	148	320	9	275	67
20.7	16.308	49.01	28.81	6.43	5.361	32.80	20.720	68.84
	303	189	47	202	306	7	263	86
30.7	16.611	50.90	29.28	8.45	5.667	32.73	20.983	67.98
	276	230	40	218	291	2	249	107
May 10.6	16.887	53.20	29.68	10.93	5.958	32.71	21.232	66.91
	213	265	34	285	268	5	229	116
20.6	17.130	55.85	30.02	13.78	6.226	32.76	21.461	65.75
	203	288	26	315	242	13	202	123
30.6	17.333	58.73	30.28	16.93	6.468	32.89	21.663	64.52
	160	305	19	332	207	21	173	124
June 9.5	17.493	61.78	30.47	20.25	6.675	33.10	21.836	63.28
	112	311	10	340	170	29	143	123
19.5	17.605	64.89	30.57	23.65	6.845	33.39	21.979	62.05
	62	307	2	339	128	38	103	118
29.5	17.667	67.96	30.59	27.04	6.973	33.77	22.082	60.87
	10	299	7	328	82	44	65	111
July 9.5	17.677	70.95	30.52	30.32	7.055	34.21	22.147	59.76
	42	281	16	310	35	50	23	97
19.4	17.635	73.76	30.36	33.42	7.090	34.71	22.170	58.79
	93	255	24	285	14	53	17	86
29.4	17.542	76.31	30.12	36.27	7.076	35.24	22.153	57.93
	141	225	31	251	61	54	58	71
Aug. 8.4	17.401	78.56	29.81	38.78	7.015	35.78	22.095	57.22
	185	192	38	213	104	51	97	55
18.4	17.216	80.48	29.43	40.91	6.911	36.29	21.998	56.67
	222	152	44	171	142	45	128	43
28.3	16.994	82.00	28.99	42.62	6.769	36.74	21.870	56.24
	252	109	48	125	174	37	152	28
Sept. 7.3	16.742	83.09	28.51	43.87	6.595	37.11	21.718	55.96
	272	64	51	75	195	26	173	12
17.3	16.470	83.73	28.00	44.62	6.400	37.37	21.545	55.84
	283	19	53	23	207	15	183	3
27.2	16.187	83.92	27.47	44.85	6.193	37.52	21.362	55.87
	283	30	53	29	206	2	183	18
Oct. 7.2	15.904	83.62	26.94	44.56	5.987	37.54	21.179	56.05
	273	79	52	83	196	12	174	30
17.2	15.631	82.83	26.42	43.73	5.791	37.42	21.005	56.35
	250	126	48	137	172	24	155	47
27.2	15.381	81.57	25.94	42.36	5.619	37.18	20.850	56.82
	219	172	44	188	139	33	126	61
Nov. 6.1	15.162	79.85	25.50	40.48	5.480	36.85	20.724	57.43
	177	215	38	235	97	41	90	78
16.1	14.985	77.70	25.12	38.13	5.383	36.44	20.634	58.21
	129	254	31	278	50	45	50	90
26.1	14.856	75.16	24.81	35.35	5.333	35.99	20.584	59.11
	76	286	21	315	4	47	7	107
Dec. 6.1	14.780	72.30	24.60	32.20	5.337	35.52	20.577	60.18
	19	313	13	343	55	45	39	118
16.0	14.761	69.17	24.47	28.77	5.392	35.07	20.616	61.36
	39	328	3	359	107	42	82	129
26.0	14.800	65.89	24.44	25.18	5.499	34.65	20.698	62.65
	96	334	7	367	154	36	127	131
36.0	14.896	62.55	24.51	21.51	5.653	34.29	20.825	63.96
Mean Place	15.041	56.42	27.224	15.51	3.866	44.21	19.465	71.60
Sec δ, Tan δ	1.348	+0.905	2.312	+2.085	1.153	−0.574	1.001	−0.051
Dψα, Dωα	+0.037	−0.003	+0.006	−0.008	+0.076	+0.003	+0.063	0.000
Dψδ, Dωδ	+0.02	−1.00	+0.02	−1.00	+0.03	−1.00	+0.03	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sagittarii. Mag. 2.0		109 Herculis. Mag. 3.9		α Telescopii. Mag. 3.8		χ Draconis. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 18 19 s	° ′ −34 25 ″	h m 18 20 s	° ′ +21 43 ″	h m 18 21 s	° ′ −46 0 ″	h m 18 22 s	° ′ +72 41 ″
Jan. 1.0	1.863	10.95	23.476	68.39	13.736	35.33	22.54	66.92
	185	64	131	257	209	135	11	360
11.0	2.048	10.31	23.607	65.82	13.945	33.98	22.65	63.32
	226	57	169	246	257	124	25	349
20.9	2.274	9.74	23.776	63.36	14.202	32.74	22.90	59.83
	261	50	203	230	299	112	38	327
30.9	2.535	9.24	23.979	61.06	14.501	31.62	23.28	56.56
	290	42	231	204	337	96	49	289
Feb. 9.9	2.825	8.82	24.210	59.02	14.838	30.66	23.77	53.67
	311	38	253	171	363	82	60	243
19.9	3.136	8.44	24.463	57.31	15.201	29.84	24.37	51.24
	327	30	272	126	383	65	67	189
Mar. 1.8	3.463	8.14	24.735	56.05	15.584	29.19	25.04	49.35
	340	24	285	81	398	48	74	127
11.8	3.803	7.90	25.020	55.24	15.982	28.71	25.78	48.08
	346	19	291	32	405	32	76	60
21.8	4.149	7.71	25.311	54.92	16.387	28.39	26.54	47.48
	346	15	292	−18	407	16	78	−6
31.7	4.495	7.56	25.603	55.10	16.794	28.23	27.32	47.54
	343	9	289	66	404	−3	75	72
Apr. 10.7	4.838	7.47	25.892	55.76	17.198	28.26	28.07	48.26
	335	2	282	111	394	21	72	133
20.7	5.173	7.45	26.174	56.87	17.592	28.47	28.79	49.59
	324	−7	268	150	380	36	65	189
30.7	5.497	7.52	26.442	58.37	17.972	28.83	29.44	51.48
	306	14	252	184	359	57	58	239
May 10.6	5.803	7.66	26.694	60.21	18.331	29.40	30.02	53.87
	283	24	227	210	331	73	47	276
20.6	6.086	7.90	26.921	62.31	18.662	30.13	30.49	56.63
	254	33	199	229	296	89	37	307
30.6	6.340	8.23	27.120	64.60	18.958	31.02	30.86	59.70
	220	45	166	240	255	106	25	326
June 9.6	6.560	8.68	27.286	67.00	19.213	32.08	31.11	62.96
	181	55	130	245	208	118	12	338
19.5	6.741	9.23	27.416	69.45	19.421	33.26	31.23	66.34
	135	64	91	242	156	129	0	338
29.5	6.876	9.87	27.507	71.87	19.577	34.55	31.23	69.72
	88	71	47	232	98	135	13	331
July 9.5	6.964	10.58	27.554	74.19	19.675	35.90	31.10	73.03
	38	76	5	217	39	138	25	315
19.4	7.002	11.34	27.559	76.36	19.714	37.28	30.85	76.18
	12	77	39	198	21	136	37	288
29.4	6.990	12.11	27.520	78.34	19.693	38.64	30.48	79.06
	63	75	77	173	78	129	47	262
Aug. 8.4	6.927	12.86	27.443	80.07	19.615	39.93	30.01	81.68
	108	72	120	147	134	118	57	223
18.4	6.819	13.58	27.323	81.54	19.481	41.11	29.44	83.91
	148	61	152	116	178	100	66	184
28.3	6.671	14.19	27.171	82.70	19.303	42.11	28.78	85.75
	183	50	178	84	220	79	71	138
Sept. 7.3	6.488	14.69	26.993	83.54	19.083	42.90	28.07	87.13
	205	36	198	50	247	53	77	88
17.3	6.283	15.05	26.795	84.04	18.836	43.43	27.30	88.01
	217	18	209	14	263	27	79	37
27.3	6.066	15.23	26.586	84.18	18.573	43.70	26.51	88.38
	219	3	209	−21	264	−3	80	−13
Oct. 7.2	5.847	15.26	26.377	83.97	18.309	43.67	25.71	88.25
	207	−17	200	59	251	31	78	69
17.2	5.640	15.09	26.177	83.38	18.058	43.36	24.93	87.56
	183	33	182	92	225	61	75	126
27.2	5.457	14.76	25.995	82.46	17.833	42.75	24.18	86.30
	150	47	155	130	186	84	69	173
Nov. 6.1	5.307	14.29	25.840	81.16	17.647	41.91	23.49	84.57
	106	59	118	162	136	107	61	223
16.1	5.201	13.70	25.722	79.54	17.511	40.84	22.88	82.34
	56	68	80	193	77	124	50	267
26.1	5.145	13.02	25.642	77.61	17.434	39.60	22.38	79.67
	3	72	33	218	15	134	40	307
Dec. 6.1	5.142	12.30	25.609	75.43	17.419	38.26	21.98	76.60
	−53	73	−12	240	−49	141	26	335
16.0	5.195	11.57	25.621	73.03	17.468	36.85	21.72	73.25
	108	70	60	254	115	141	13	355
26.0	5.303	10.87	25.681	70.49	17.583	35.44	21.59	69.70
	157	66	106	261	176	136	1	365
36.0	5.460	10.21	25.787	67.88	17.759	34.08	21.60	66.05
Mean Place	3.643	20.40	24.977	60.63	15.864	45.06	26.878	58.97
Sec δ, Tan δ	1.212	−0.685	1.077	+0.399	1.440	−1.036	3.363	+3.211
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.079	+0.004	+0.051	−0.002	+0.089	+0.006	−0.024	−0.021
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.03	−1.00	+0.04	−1.00	+0.04	−1.00	+0.04	−1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Sagittarii. Mag. 2.9		c Serpentis. Mag. 5.4		1 Aquilæ. Mag. 4.1		ζ Pavonis. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	18 23	−25 27	18 25	− 2 1	18 30	− 8 17	18 33	−71 29
	s	″	s	″	s	″	s	″
Jan. 1.0	11.502	47.82	39.083	62.37	59.536	48.50	57.79	38.12
11.0	11.669 167	47.71 11	39.223 140	63.68 131	59.676 140	49.44 94	58.12 33	35.43 269
20.9	11.874 205	47.64 7	39.400 177	64.97 129	59.851 175	50.38 94	58.56 44	32.87 256
30.9	12.109 235	47.60 4	39.605 205	66.16 119	60.056 205	51.24 86	59.12 56	30.56 231
Feb. 9.9	12.373 264	47.57 3	39.834 229	67.22 106	60.286 230	52.00 76	59.77 65	28.49 207
	282	4	248	88	250	62	70	177
19.9	12.655	47.53	40.082	68.10	60.536	52.62	60.47	26.72
Mar. 1.8	12.953 298	47.47 6	40.347 265	68.73 63	60.804 268	53.06 44	61.24 77	25.30 142
11.8	13.263 310	47.37 10	40.622 275	69.11 38	61.082 278	53.26 20	62.06 82	24.23 107
21.8	13.577 314	47.22 15	40.902 280	69.20 — 9	61.368 286	53.27 1	62.89 83	23.55 68
31.7	13.894 317	47.03 19	41.186 284	69.01 19	61.657 289	53.06 21	63.74 85	23.25 30
	316	23	282	49	288	42	84	9
Apr. 10.7	14.210	46.80	41.468	68.52	61.945	52.64	64.58	23.34
20.7	14.519 309	46.55 25	41.745 277	67.80 72	62.229 284	51.99 65	65.41 83	23.82 48
30.7	14.817 298	46.30 25	42.011 266	66.86 94	62.501 272	51.20 79	66.20 79	24.70 88
May 10.6	15.102 285	46.07 23	42.266 255	65.75 111	62.763 262	50.32 88	66.94 74	25.89 119
20.6	15.365 263	45.88 19	42.499 233	64.50 125	63.008 245	49.34 98	67.61 67	27.44 155
	239	14	211	132	218	102	60	185
30.6	15.604	45.74	42.710	63.18	63.226	48.32	68.21	29.29
June 9.6	15.810 206	45.68 — 6	42.892 182	61.85 133	63.420 194	47.28 104	68.72 51	31.37 208
19.5	15.981 171	45.69 1	43.042 150	60.52 133	63.577 157	46.30 98	69.12 40	33.70 233
29.5	16.111 130	45.79 10	43.154 112	59.24 128	63.700 123	45.38 92	69.40 28	36.15 245
July 9.5	16.197 86	45.97 18	43.227 73	58.07 117	63.781 81	44.54 84	69.58 18	38.70 255
	41	26	31	107	42	72	4	256
19.4	16.238	46.23	43.258	57.00	63.823	43.82	69.62	41.26
29.4	16.232 6	46.53 30	43.247 11	56.07 93	63.819 4	43.20 62	69.53 9	43.73 247
Aug. 8.4	16.180 52	46.87 34	43.197 50	55.28 79	63.774 45	42.70 50	69.32 21	46.07 234
18.4	16.086 94	47.23 36	43.108 89	54.65 63	63.691 83	42.31 39	69.01 31	48.20 213
28.3	15.953 133	47.56 33	42.985 123	54.18 47	63.570 121	42.05 26	68.58 43	49.98 178
	163	30	151	33	146	14	50	144
Sept. 7.3	15.790	47.86	42.834	53.85	63.424	41.91	68.08	51.42
17.3	15.604 186	48.09 23	42.664 170	53.69 16	63.254 170	41.86 — 5	67.50 58	52.43 101
27.3	15.407 197	48.26 17	42.482 182	53.69 0	63.073 181	41.92 6	66.89 61	52.98 55
Oct. 7.2	15.208 199	48.34 — 8	42.299 183	53.83 14	62.889 184	42.07 15	66.27 62	52.98 0
17.2	15.018 190	48.33 1	42.124 175	54.13 30	62.715 174	42.31 24	65.67 60	52.51 47
	167	8	157	46	159	32	56	99
27.2	14.851	48.25	41.967	54.59	62.556	42.63	65.11	51.52
Nov. 6.1	14.714 137	48.10 15	41.838 129	55.21 62	62.425 131	43.07 44	64.62 49	50.06 146
16.1	14.616 98	47.91 19	41.742 96	55.99 78	62.324 101	43.60 53	64.22 40	48.21 185
26.1	14.563 53	47.70 21	41.686 56	56.91 92	62.267 57	44.23 63	63.94 28	46.01 220
Dec. 6.1	14.559 — 4	47.49 21	41.674 — 12	57.98 107	62.253 — 14	44.96 73	63.79 15	43.55 246
	46	19	32	119	32	84	2	264
16.0	14.605	47.30	41.706	59.17	62.285	45.80	63.77 —	40.91
26.0	14.702 97	47.15 15	41.782 76	60.44 127	62.359 74	46.69 89	63.89 12	38.20 271
36.0	14.842 140	47.04 11	41.901 119	61.78 134	62.479 120	47.62 93	64.14 25	35.49 271
Mean Place	13.127	56.76	40.524	70.62	61.007	56.80	62.540	47.57
Sec δ, Tan δ	1.108	−0.476	1.001	−0.036	1.011	−0.146	3.150	−2.988
$D_{\psi a}$, $D_{\omega a}$	+0.074	+0.003	+0.062	0.000	+0.065	+0.001	+0.140	+0.029
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.04	−0.99	+0.04	−0.99	+0.05	−0.99	+0.06	−0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Lyræ. (*Vega*.) Mag. 0.1		2 Aquilæ. Mag. 4.7		φ Sagittarii. Mag. 3.3		110 Herculis. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 18 34 s	° ′ +38 42 ″	h m 18 38 s	° ′ − 9 7 ″	h m 18 40 s	° ′ −27 4 ″	h m 18 42 s	° ′ ″ +20 28 ″
Jan. 1.0	18.169	48.46	2.058	30.77	49.075	8.49	19.332	25.79
	101	316	134	85	150	29	109	247
11.0	18.273	45.30	2.192	31.62	49.225	8.20	19.441	23.32
	154	308	171	83	189	26	147	241
20.9	18.427	42.22	2.363	32.45	49.414	7.94	19.588	20.91
	199	288	198	78	223	24	181	225
30.9	18.626	39.34	2.561	33.23	49.637	7.70	19.769	18.66
	234	257	227	68	252	23	212	203
Feb. 9.9	18.860	36.77	2.788	33.91	49.889	7.47	19.981	16.63
	269	220	246	55	275	23	238	170
19.9	19.129	34.57	3.034	34.46	50.164	7.24	20.219	14.93
	296	166	264	38	293	25	257	132
Mar. 1.8	19.425	32.91	3.298	34.84	50.457	6.99	20.476	13.61
	314	113	276	17	306	29	273	87
11.8	19.739	31.78	3.574	35.01	50.763	6.70	20.749	12.74
	328	53	285	4	316	30	284	40
21.8	20.067	31.25	3.859	34.97	51.079	6.40	21.033	12.34
	332	4	289	24	321	34	289	10
31.8	20.399	31.29	4.148	34.73	51.400	6.06	21.322	12.44
	330	66	289	46	322	36	291	57
Apr. 10.7	20.729	31.95	4.437	34.27	51.722	5.70	21.613	13.01
	323	121	285	65	318	36	287	100
20.7	21.052	33.16	4.722	33.62	52.040	5.34	21.900	14.01
	306	171	277	80	312	34	277	141
30.7	21.358	34.87	4.999	32.82	52.352	5.00	22.177	15.42
	283	215	265	91	297	31	262	176
May 10.6	21.641	37.02	5.264	31.91	52.649	4.69	22.439	17.18
	260	247	219	99	279	25	212	203
20.6	21.901	39.49	5.513	30.92	52.928	4.44	22.681	19.21
	220	278	227	102	256	17	218	224
30.6	22.121	42.27	5.740	29.90	53.184	4.27	22.899	21.45
	182	296	199	101	225	8	187	237
June 9.6	22.303	45.23	5.939	28.89	53.409	4.19	23.086	23.82
	139	307	166	98	192	4	151	243
19.5	22.442	48.30	6.105	27.91	53.601	4.23	23.237	26.25
	94	305	130	91	150	12	110	240
29.5	22.533	51.35	6.235	27.00	53.751	4.35	23.347	28.65
	39	297	89	83	105	22	71	234
July 9.5	22.572	54.32	6.324	26.17	53.856	4.57	23.418	30.99
	8	284	16	70	59	32	26	221
19.5	22.564	57.16	6.370	25.47	53.915	4.89	23.444	33.20
	61	263	4	59	10	39	17	203
29.4	22.503	59.79	6.374	24.88	53.925	5.28	23.427	35.23
	107	236	38	47	37	43	62	180
Aug. 8.4	22.396	62.15	6.336	24.41	53.888	5.71	23.365	37.03
	151	204	79	34	82	46	101	156
18.4	22.245	64.19	6.257	24.07	53.806	6.17	23.264	38.59
	195	166	111	24	123	45	136	125
28.3	22.050	65.85	6.143	23.83	53.683	6.62	23.128	39.84
	222	127	145	12	155	41	166	95
Sept. 7.3	21.828	67.12	5.998	23.71	53.528	7.03	22.962	40.79
	248	87	166	3	182	36	189	61
17.3	21.580	67.99	5.832	23.68	53.346	7.39	22.773	41.40
	262	39	180	6	197	26	203	29
27.3	21.318	68.38	5.652	23.74	53.149	7.65	22.570	41.69
	265	6	183	15	202	17	207	
Oct. 7.2	21.053	68.32	5.469	23.89	52.947	7.82	22.363	
	260	53	177	23	194	5	78	
17.2	20.793	67.79	5.292	24.12	52.753	7.87	22. [illegible]	87.56
	241	101	161	30	177	4	75	126
27.2	20.552	66.78	5.131	24.42	52.576	7.83	21.[illegible]18	86.30
	216	141	135	40	149	14	69	173
Nov. 6.2	20.336	65.34	4.996	24.82	52.427	7.69	21.811	84.57
	175	192	102	48	113	21	130	223
16.1	20.161	63.42	4.894	25.30	52.314	7.48	21.681	82.34
	138	228	61	58	68	26	94	267
26.1	20.023	61.14	4.833	25.88	52.246	7.22	21.587	36.10
	85	260	21	68	21	29	52	307
Dec. 6.1	19.938	58.54	4.812	26.56	52.225	6.93	21.535	34.08
	33	291	25	76	27	29	5	225
16.0	19.905	55.63	4.837	27.32	52.252	6.64	21.530	31.83
	18	310	70	81	78	29	39	241
26.0	19.923	52.53	4.907	28.13	52.330	6.35	21.569	29.42
	74	319	112	86	125	27	82	249
36.0	19.997	49.34	5.019	28.99	52.455	6.08	21.651	26.93
Mean Place	19.884	40.19	3.536	38.89	50.755	16.61	20.803	17.49
Sec δ, Tan δ	1.282	+0.802	1.013	−0.161	1.123	−0.511	1.067	+0.373
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.040	−0.008	+0.065	+0.002	+0.075	+0.006	+0.051	−0.005
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.06	−0.99	+0.07	−0.99	+0.07	−0.98	+0.07	−0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	6 Aquilæ. Mag. 4.5		λ Pavonis. Mag. 4.4		β Lyræ. Var. 3.4–4.1		50 Draconis. Mag. 5.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	18 43	− 4 49	18 45	−62 16	18 47	+33 16	18 48	+75 20
Jan. 1.0	3.873	45.28	1.87	31.56	12.613	29.35	47.25	46.94
11.0	3.999 126	46.37 109	2.10 23	29.24 232	12.706 93	26.36 299	47.25 0	43.39 355
21.0	4.161 162	47.44 107	2.40 30	27.02 222	12.843 137	23.47 289	47.42 17	39.86 353
30.9	4.353 192	48.44 100	2.78 38	24.94 208	13.024 181	20.72 275	47.75 33	36.49 337
Feb. 9.9	4.570 217	49.33 89	3.22 44	23.08 186	13.237 213	18.26 246	48.23 48	33.45 301
	240	71	49	165	247	210	61	266
19.9	4.810	50.04	3.71	21.43	13.484	16.16	48.84	30.79
Mar. 1.8	5.066 256	50.54 50	4.24 53	20.06 137	13.758 274	14.48 168	49.56 72	28.63 216
11.8	5.336 270	50.81 27	4.80 56	18.97 109	14.052 294	13.35 113	50.37 81	27.07 156
21.8	5.615 279	50.82 — 1	5.37 57	18.19 78	14.357 305	12.77 58	51.23 86	26.13 94
31.8	5.899 284	50.58 24	5.96 59	17.71 48	14.672 315	12.76 — 1	52.12 89	25.84 — 29
	286	50	59	15	315	55	89	39
Apr. 10.7	6.185	50.08	6.55	17.56	14.987	13.31	53.01	26.23
20.7	6.468 283	49.35 73	7.13 58	17.72 16	15.296 309	14.39 108	53.87 86	27.23 100
30.7	6.744 276	48.45 90	7.69 56	18.22 50	15.595 299	15.96 157	54.67 80	28.81 158
May 10.7	7.008 264	47.38 107	8.23 54	19.03 81	15.875 280	17.94 198	55.38 71	30.94 213
20.6	7.257 249	46.19 119	8.72 49	20.14 111	16.136 261	20.28 234	56.00 62	33.49 255
	225	124	45	137	226	261	49	291
30.6	7.482	44.95	9.17	21.51	16.362	22.89	56.49	36.40
June 9.6	7.681 199	43.70 125	9.56 39	23.15 164	16.554 192	25.69 280	56.85 36	39.57 317
19.5	7.848 167	42.48 122	9.88 32	25.01 186	16.708 154	28.56 287	57.07 22	42.91 334
29.5	7.978 130	41.31 117	10.12 24	27.03 202	16.816 108	31.47 291	57.14 7	46.33 342
July 9.5	8.069 91	40.24 107	10.28 16	29.15 212	16.877 61	34.32 285	57.06 — 8	49.73 340
	47	95	8	216	14	272	23	320
19.5	8.116	39.29	10.36	31.31	16.891	37.04	56.83	53.03
29.4	8.122 — 6	38.45 84	10.34 2	33.47 216	16.857 34	39.57 253	56.46 37	56.15 312
Aug. 8.4	8.087 35	37.77 68	10.24 10	35.55 208	16.778 79	41.86 229	55.96 50	58.99 284
18.4	8.010 77	37.23 54	10.06 18	37.44 189	16.652 126	43.86 200	55.34 62	61.56 257
28.4	7.898 112	36.84 39	9.80 26	39.10 166	16.489 163	45.50 164	54.62 72	63.75 219
	142	26	32	138	198	128	81	174
Sept. 7.3	7.756	36.58	9.48	40.48	16.291	46.78	53.81	65.49
17.3	7.592 164	36.46 — 12	9.11 37	41.51 103	16.071 220	47.70 92	52.93 88	66.82 133
27.3	7.413 179	36.48 2	8.71 40	42.12 61	15.835 236	48.17 47	52.00 93	67.61 79
Oct. 7.2	7.230 183	36.62 14	8.30 41	42.31 — 19	15.593 212	48.20 — 3	51.05 95	67.92 — 31
17.2	7.054 176	36.88 26	7.90 40	42.05 26	15.355 238	47.80 40	50.10 95	67.67 25
	163	38	38	69	221	85	91	80
27.2	6.891	37.26	7.52	41.36	15.131	46.95	49.19	66.87
Nov. 6.2	6.754 137	37.78 52	7.19 33	40.24 112	14.933 198	45.68 127	48.32 87	65.54 133
16.1	6.649 105	38.42 64	6.93 26	38.75 149	14.765 168	43.97 171	47.53 79	63.70 184
26.1	6.582 67	39.19 77	6.74 19	36.96 179	14.636 129	41.93 204	46.84 69	61.36 234
Dec. 6.1	6.555 — 27	40.09 90	6.64 10	34.92 204	14.553 83	39.55 238	46.28 56	58.62 274
	19	96	0	221	34	267	43	312
16.1	6.574	41.05	6.64	32.71	14.519	36.88	45.85	55.50
26.0	6.634 60	42.12 107	6.72 8	30.40 231	14.532 13	34.01 287	45.58 27	52.12 338
36.0	6.738 104	43.23 111	6.90 18	28.08 232	14.597 65	31.02 299	45.47 11	48.58 354
Mean Place	5.328	53.31	5.174	39.81	14.207	20.63	52.048	36.92
Sec δ, Tan δ	1.004	−0.085	2.150	−1.903	1.196	+0.656	3.953	+3.824
Dψα, Dωα	+0.063	+0.001	+0.111	+0.025	+0.044	−0.009	−0.038	−0.054
Dψδ, Dωδ	+0.07	−0.98	+0.08	−0.98	+0.08	−0.98	+0.08	−0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o Draconis. Mag. 4.8		σ Sagittarii. Mag. 2.1		θ Serpentis *pr.* Mag. 4.5		R Lyræ. Var. 4.0–4.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	18 50	+59 17	18 50	−26 23	18 52	+ 4 6	18 52	+43 50
	s	″	s	″	s	″	s	″
Jan. 1.0	1.613	47.56	27.752	30.27	22.050	16.18	57.759	47.48
	57	356	139	25	110	159	77	328
11.0	1.670	44.00	27.891	30.02	22.160	14.59	57.836	44.20
	138	349	177	26	147	155	129	323
21.0	1.808	40.51	28.068	29.76	22.307	13.04	57.965	40.97
	211	334	212	24	178	147	179	306
30.9	2.019	37.17	28.280	29.52	22.485	11.57	58.144	37.91
	280	301	243	28	204	128	225	277
Feb. 9.9	2.299	34.16	28.523	29.24	22.689	10.29	58.369	35.14
	341	262	265	26	229	107	264	239
19.9	2.640	31.54	28.788	28.98	22.918	9.22	58.633	32.75
	393	211	287	31	246	80	297	191
Mar. 1.8	3.033	29.43	29.075	28.67	23.164	8.42	58.930	30.84
	428	151	301	33	262	49	322	136
11.8	3.461	27.92	29.376	28.34	23.426	7.93	59.252	29.48
	456	87	310	37	272	14	340	75
21.8	3.917	27.05	29.686	27.97	23.698	7.79	59.592	28.73
	471	22	317	42	281	—	352	14
31.8	4.388	26.83	30.003	27.55	23.979	7.99	59.944	28.59
	471	45	321	42	282	20	353	—
						54		48
Apr. 10.7	4.859	27.28	30.324	27.13	24.261	8.53	60.297	29.07
	460	107	319	47	282	84	348	107
20.7	5.319	28.35	30.643	26.66	24.543	9.37	60.645	30.14
	435	166	314	42	271	113	334	160
30.7	5.754	30.01	30.957	26.24	24.817	10.50	60.979	31.74
	400	216	302	40	264	134	313	208
May 10.7	6.154	32.17	31.259	25.84	25.081	11.84	61.292	33.82
	353	261	283	32	219	152	285	247
20.6	6.507	34.78	31.542	25.52	25.330	13.36	61.577	36.29
	298	297	262	29	227	165	250	281
30.6	6.805	37.75	31.804	25.23	25.557	15.01	61.827	39.10
	238	321	231	16	200	170	208	302
June 9.6	7.043	40.96	32.035	25.07	25.757	16.71	62.035	42.12
	168	336	200	7	168	173	160	317
19.5	7.211	44.32	32.235	25.00	25.925	18.44	62.195	45.29
	95	343	156	—	133	167	110	319
29.5	7.306	47.75	32.391	7	26.058	20.11	62.305	48.48
	19	340	114	25.07	92	159	54	319
July 9.5	7.325	51.15	32.505	17	26.150	21.70	62.359	51.67
	—	330	67	25.24	50	147	1	304
	54			27			—	
19.5	7.271	54.45	32.572	25.51	26.200	23.17	62.360	54.71
	128	310	21	34	8	131	54	286
29.4	7.143	57.55	32.593	25.85	26.208	24.48	62.306	57.57
	201	283	—	42	—	114	106	261
Aug. 8.4	6.942	60.38	30	26.27	34	25.62	62.200	60.18
	263	252	32.563	44	26.174	94	156	230
18.4	6.679	62.90	73	26.71	74	26.56	62.044	62.48
	320	213	32.490	45	26.100	76	200	194
28.4	6.359	65.03	115	27.16	110	27.32	61.844	64.42
	368	170	147	42	142	54	238	155
Sept. 7.3	5.991	66.73	32.228	27.58	25.848	27.86	61.606	65.97
	405	125	178	37	163	34	264	110
17.3	5.586	67.98	32.050	27.95	25.685	28.20	61.342	67.07
	429	74	194	32	180	11	285	65
27.3	5.157	68.72	31.856	28.27	25.505	28.31	61.057	67.72
	440	22	201	24	184	—	292	18
Oct. 7.2	4.717	68.94	31.655	28.51	25.321	9	60.765	67.90
	438	31	194	12	181	28.22	289	—
17.2	4.279	68.63	31.461	28.63	25.140	30	60.476	67.57
	419	84	178	0	167	27.92	276	81
						51		
27.2	3.860	67.79	31.283	28.63	24.973	27.41	60.200	66.76
	389	139	153	4	146	73	250	131
Nov. 6.2	3.471	66.40	31.130	28.59	24.827	26.68	59.950	65.45
	346	188	120	16	115	91	217	178
16.1	3.125	64.52	31.010	28.43	24.712	25.77	59.733	63.67
	289	239	73	21	78	113	175	221
26.1	2.836	62.13	30.937	28.22	24.634	24.64	59.558	61.46
	226	278	32	23	40	128	125	257
Dec. 6.1	2.610	59.35	30.905	27.99	24.594	23.36	59.433	58.89
	151	313	—	26	—	144	71	292
			18		3			
16.1	2.459	56.22	30.923	27.73	24.597	21.92	59.362	55.97
	74	340	67	26	46	153	16	315
26.0	2.385	52.82	30.990	27.47	24.643	20.39	59.346	52.82
	—	355	114	27	87	160	—	326
36.0	7	49.27	31.104	27.20	24.730	18.79	41	49.56
	2.392						59.387	
Mean Place	4.058	37.93	29.433	37.92	23.475	8.11	59.544	38.18
Sec δ, Tan δ	1.958	+1.684	1.116	−0.496	1.003	+0.072	1.387	+0.960
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.018	−0.024	+0.074	+0.007	+0.059	−0.001	+0.036	−0.015
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.09	−0.98	+0.09	−0.98	+0.09	−0.97	+0.09	−0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Lyræ. Mag. 3.3		ϵ Aquilæ. Mag. 4.2		ζ Sagittarii. Mag. 2.7		ζ Aquilæ. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 18 56	° ′ +32 34	h m 18 56	° ′ +14 57	h m 18 57	° ′ −29 59	h m 19 1	° ′ +13 44
	s	″	s	″	s	″	s	″
Jan. 1.0	2.193	67.80	6.207	53.73	41.039	23.28	50.820	60.91
	85	294	99	215	134	52	94	208
11.0	2.278	64.86	6.306	51.58	41.173	22.76	50.914	58.83
	126	286	135	211	176	51	129	204
21.0	2.404	62.00	6.441	49.47	41.349	22.25	51.043	56.79
	172	274	170	200	212	50	166	193
30.9	2.576	59.26	6.611	47.47	41.561	21.75	51.209	54.86
Feb. 9.9	203	245	200	180	242	49	195	172
	2.779	56.81	6.811	45.67	41.803	21.26	51.404	53.14
	240	212	224	151	269	49	219	148
19.9	3.019	54.69	7.035	44.16	42.072	20.77	51.623	51.66
	266	170	245	116	289	49	242	112
Mar. 1.8	3.285	52.99	7.280	43.00	42.361	20.28	51.865	50.54
	286	117	262	78	306	49	259	75
11.8	3.571	51.82	7.542	42.22	42.667	19.79	52.124	49.79
	301	62	274	34	318	50	274	34
21.8	3.872	51.20	7.816	41.88	42.985	19.29	52.398	49.45
	310	7	282	10	326	50	280	—
31.8	4.182	51.13	8.098	41.98	43.311	18.79	52.678	9
	314	—	286	52	330	49	285	49.54
		49						51
Apr. 10.7	4.496	51.62	8.384	42.50	43.641	18.30	52.963	50.05
	311	102	284	93	331	46	285	90
20.7	4.807	52.64	8.668	43.43	43.972	17.84	53.248	50.95
	301	150	278	130	325	42	280	127
30.7	5.108	54.14	8.946	44.73	44.297	17.42	53.528	52.22
May 10.7	284	194	267	162	314	33	269	157
	5.392	56.08	9.213	46.35	44.611	17.09	53.797	53.79
20.6	266	229	249	185	297	25	252	184
	5.658	58.37	9.462	48.20	44.908	16.84	54.049	55.63
	234	256	227	206	276	15	232	199
30.6	5.892	60.93	9.689	50.26	45.184	16.69	54.281	57.62
June 9.6	201	277	198	217	245	2	202	214
	6.093	63.70	9.887	52.43	45.429	16.67	54.483	59.76
19.5	163	285	166	221	211	—	170	217
	6.256	66.55	10.053	54.64	45.640	11	54.653	61.93
29.5	116	291	128	221	171	16.78	135	217
	6.372	69.46	10.181	56.85	45.811	21	54.788	64.10
July 9.5	71	285	89	212	125	17.02	95	209
	6.443	72.31	10.270	58.97	45.936	35	54.883	66.19
	27	273	45	202	77	17.37	51	197
19.5	—	75.04	10.315	60.99	46.013	46	54.934	68.16
	6.470		1		28	17.83	6	
29.4	25	255	10.316	185	46.041	55	54.940	184
	6.445	77.59	—	62.84	—	18.38	—	70.00
Aug. 8.4	69	233	42	164	23	61	35	161
	6.376	79.92	10.274	64.48	46.018	18.99	54.905	71.61
18.4	117	204	83	142	70	63	77	139
	6.259	81.96	10.191	65.90	45.948	19.62	54.828	73.00
28.4	155	169	119	115	114	63	112	113
	6.104	83.65	10.072	67.05	45.834	20.25	54.716	74.13
	189	137	150	88	151	58	145	89
Sept. 7.3	5.915	85.02	9.922	67.93	45.683	20.83	54.571	75.02
	214	96	175	59	179	50	170	58
17.3	5.701	85.98	9.747	68.52	45.504	21.33	54.401	75.60
	229	53	190	30	199	40	188	31
27.3	5.472	86.51	9.557	68.82	45.305	21.73	54.213	75.91
Oct. 7.2	239	13	196	0	207	26	193	0
	5.233	86.64	9.361	68.82	45.098	21.99	54.020	75.91
17.2	239	—	193	32	204	14	191	29
	4.994	32	9.168	68.50	44.894	22.13	53.829	75.62
	223	86.32	181	63	188	0	179	57
27.2	4.771	75	8.987	67.87	44.706	22.13	53.650	75.05
	200	85.57	158	92	162	13	159	88
Nov. 6.2	4.571	118	8.829	66.95	44.544	22.00	53.491	74.17
	169	84.39	129	122	127	27	130	118
16.1	4.402	161	8.700	65.73	44.417	21.73	53.361	72.99
	131	82.78	95	148	86	35	95	142
26.1	4.271	197	8.605	64.25	44.331	21.38	53.266	71.57
Dec. 6.1	90	231	54	174	38	42	60	164
	4.181	80.81	8.551	62.51	44.293	20.96	53.206	69.93
	43	78.50	11	194	11	47	13	187
	—	231	—		—		—	
16.1	4.138	260	8.540	60.57	44.304	20.49	53.193	68.06
	6	75.90	32	209	61	49	27	202
26.0	4.144	281	8.572	58.48	44.365	20.00	53.220	66.04
	56	73.09	74	217	108	48	69	210
36.0	4.200	292	8.646	56.31	44.473	19.52	53.289	63.94
Mean Place	3.759	58.78	7.634	45.34	42.789	30.50	52.239	52.54
Sec δ, Tan δ	1.187	+0.639	1.035	+0.267	1.155	−0.577	1.030	+0.245
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.045	−0.010	+0.054	−0.004	+0.076	+0.010	+0.055	−0.004
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.10	−0.97	+0.10	−0.97	+0.10	−0.97	+0.11	−0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Aquilæ. Mag. 3.6		α Coronæ Australis. Mag. 4.1		ι Lyræ. Mag. 5.1		π Sagittarii. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 2	− 4 59	19 4	−38 1	19 4	+35 58	19 5	−21 8
	s	″	s	″	s	″	s	″
Jan. 1.0	8.298	48.90	12.094	27.21	31.680	52.40	9.515	43.16
	108	103	137	103	70	301	117	2
11.0	8.406	49.93	12.231	26.18	31.750	49.39	9.632	43.18
	143	100	183	102	117	299	158	1
21.0	8.549	50.93	12.414	25.16	31.867	46.40	9.790	43.19
	176	95	223	100	161	285	189	4
30.9	8.725	51.88	12.637	24.16	32.028	43.55	9.979	43.15
	201	80	258	95	201	259	219	6
Feb. 9.9	8.926	52.68	12.895	23.21	32.229	40.96	10.198	43.09
	226	65	288	89	234	225	242	12
19.9	9.152	53.33	13.183	22.32	32.463	38.71	10.440	42.97
	245	44	311	86	265	180	265	21
Mar. 1.9	9.397	53.77	13.494	21.46	32.728	36.91	10.705	42.76
	262	22	332	77	288	130	282	29
11.8	9.659	53.99	13.826	20.69	33.016	35.61	10.987	42.47
	273	− 4	346	69	308	75	293	38
21.8	9.932	53.95	14.172	20.00	33.324	34.86	11.280	42.09
	281	29	356	62	317	17	303	48
31.8	10.213	53.66	14.528	19.38	33.641	34.69	11.583	41.61
	286	55	361	54	323	− 41	308	57
Apr. 10.7	10.499	53.11	14.889	18.84	33.964	35.10	11.891	41.04
	287	76	362	40	322	98	309	62
20.7	10.786	52.35	15.251	18.44	34.286	36.08	12.200	40.42
	282	98	356	30	313	148	305	67
30.7	11.068	51.37	15.607	18.14	34.599	37.56	12.505	39.75
	273	111	317	14	297	193	296	67
May 10.7	11.341	50.26	15.954	18.00	34.896	39.49	12.801	39.08
	259	124	328	− 1	276	230	282	66
20.6	11.600	49.02	16.282	18.01	35.172	41.79	13.083	38.42
	239	129	304	17	246	262	262	58
30.6	11.839	47.73	16.586	18.18	35.418	44.41	13.345	37.84
	214	129	272	35	211	283	234	51
June 9.6	12.053	46.44	16.858	18.53	35.629	47.24	13.579	37.33
	183	128	235	52	172	296	205	41
19.6	12.236	45.16	17.093	19.05	35.801	50.20	13.784	36.92
	148	120	191	67	127	301	165	34
29.5	12.384	43.96	17.284	19.72	35.928	53.21	13.949	36.58
	107	111	142	81	78	297	124	18
July 9.5	12.491	42.85	17.426	20.53	36.006	56.18	14.073	36.40
	66	99	90	91	29	288	79	7
19.5	12.557	41.86	17.516	21.44	36.035	59.06	14.152	36.33
	23	87	35	99	21	271	33	5
29.4	12.580	40.99	17.551	22.43	36.014	61.77	14.185	36.38
	20	70	20	103	71	247	15	15
Aug. 8.4	12.560	40.29	17.531	23.46	35.943	64.24	14.170	36.53
	63	55	73	104	117	218	57	22
18.4	12.497	39.74	17.458	24.50	35.826	66.42	14.113	36.75
	99	40	120	97	159	187	100	28
28.4	12.398	39.34	17.338	25.47	35.667	68.29	14.013	37.03
	133	27	163	87	194	149	137	30
Sept. 7.3	12.265	39.07	17.175	26.34	35.473	69.78	13.876	37.33
	156	12	196	73	223	109	162	33
17.3	12.109	38.95	16.979	27.07	35.250	70.87	13.714	37.66
	174	2	216	56	241	68	182	29
27.3	11.935	38.97	16.763	27.63	35.009	71.55	13.532	37.95
	182	14	228	35	250	23	191	26
Oct. 7.3	11.753	39.11	16.535	27.98	34.759	71.78	13.341	38.21
	177	26	224	14	250	22	187	22
17.2	11.576	39.37	16.311	28.12	34.509	71.56	13.154	38.43
	167	38	212	− 10	238	67	176	17
27.2	11.409	39.75	16.099	28.02	34.271	70.89	12.978	38.60
	145	50	184	29	217	113	153	13
Nov. 6.2	11.264	40.25	15.915	27.73	34.054	69.76	12.825	38.73
	116	63	148	50	188	156	122	8
16.1	11.148	40.88	15.767	27.23	33.866	68.20	12.703	38.81
	79	74	103	68	149	197	83	6
26.1	11.069	41.62	15.664	26.55	33.717	66.23	12.620	38.87
	43	84	54	81	105	233	42	5
Dec. 6.1	11.026	42.46	15.610	25.74	33.612	63.90	12.578	38.92
	− 2	93	− 1	91	60	265	− 3	3
16.1	11.028	43.39	15.611	24.83	33.552	61.25	12.581	38.95
	45	101	56	98	10	287	51	4
26.0	11.073	44.40	15.667	23.85	33.542	58.38	12.632	38.99
	84	105	108	100	− 38	302	93	5
36.0	11.157	45.45	15.775	22.85	33.580	55.36	12.725	39.04
Mean Place	9.751	56.56	14.053	33.88	33.268	42.91	11.124	50.17
Sec δ, Tan δ	1.004	−0.087	1.269	−0.782	1.236	+0.726	1.072	−0.387
$D_{\psi}a$, $D_{\omega}a$	+0.063	+0.002	+0.081	+0.014	+0.043	−0.013	+0.071	+0.007
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.11	−0.96	+0.11	−0.96	+0.11	−0.96	+0.11	−0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Sagittarii. Mag. 4.9		δ Draconis. Mag. 3.2		d Sagittarii. Mag. 5.0		θ Lyræ. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	19 10	−25 23	19 12	+67 31	19 13	−19 5	19 13	+37 59
Jan. 1.0	47.531	20.07	29.51	45.21	6.245	21.57	40.077	55.10
	116	25	2	352	108	13	59	306
11.0	47.647	19.82	29.49	41.69	6.353	21.70	40.136	52.04
	155	28	9	355	144	10	104	303
21.0	47.802	19.54	29.58	38.14	6.497	21.80	40.240	49.01
	190	30	19	344	180	7	151	291
30.9	47.992	19.24	29.77	34.70	6.677	21.87	40.391	46.10
Feb. 9.9	48.213	18.92	30.07	31.51	6.886	21.88	40.581	43.41
	221	32	30	319	209	1	190	269
	247	38	38	283	233	− 6	231	233
19.9	48.460	18.54	30.45	28.68	7.119	21.82	40.812	41.08
	269	40	46	235	255	17	263	192
Mar. 1.9	48.729	18.14	30.91	26.33	7.374	21.65	41.075	39.16
	287	46	53	183	272	28	289	140
11.8	49.016	17.68	31.44	24.50	7.646	21.37	41.364	37.76
	301	52	57	119	285	39	308	84
21.8	49.317	17.16	32.01	23.31	7.931	20.98	41.672	36.92
	309	57	60	55	296	51	323	26
31.8	49.626	16.59	32.61	22.76	8.227	20.47	41.995	36.66
	318	60	61	− 12	303	62	330	− 32
Apr. 10.7	49.944	15.99	33.22	22.88	8.530	19.85	42.325	36.98
	319	63	60	76	306	70	329	91
20.7	50.263	15.36	33.82	23.64	8.836	19.15	42.654	37.89
	316	62	58	137	301	76	323	142
30.7	50.579	14.74	34.40	25.01	9.137	18.39	42.977	39.31
May 10.7	309	58	53	195	296	76	308	190
	50.888	14.16	34.93	26.96	9.433	17.63	43.285	41.21
20.6	294	52	48	241	282	78	285	230
	51.182	13.64	35.41	29.37	9.715	16.85	43.570	43.51
	272	43	41	281	263	73	262	260
30.6	51.454	13.21	35.82	32.18	9.978	16.12	43.832	46.11
	248	33	32	311	239	66	222	286
June 9.6	51.702	12.88	36.14	35.29	10.217	15.46	44.054	48.97
	214	22	24	334	208	58	181	300
19.6	51.916	12.66	36.38	38.63	10.425	14.88	44.235	51.97
	179	9	14	315	170	45	135	307
29.5	52.095	12.57	36.52	42.08	10.595	14.43	44.370	55.04
July 9.5	134	1	4	319	130	33	86	307
	52.229	12.61	36.56	45.57	10.725	14.10	44.456	58.11
	88	18	− 6	314	85	20	− 35	298
19.5	52.317	12.79	36.50	49.01	10.810	13.90	44.491	61.09
	39	28	15	330	40	8	16	281
29.4	52.356	13.07	36.35	52.31	10.850	13.82	44.475	63.90
Aug. 8.4	9	36	25	306	7	3	65	259
	52.347	13.43	36.10	55.37	10.843	13.85	44.410	66.49
18.4	56	44	34	280	52	13	115	230
	52.291	13.87	35.76	58.17	10.791	13.98	44.295	68.79
28.4	98	47	41	245	92	20	158	201
	52.193	14.34	35.35	60.62	10.699	14.18	44.137	70.80
	136	47	48	207	129	26	196	163
Sept. 7.3	52.057	14.81	34.87	62.69	10.570	14.44	43.941	72.43
	165	45	54	161	158	28	225	120
17.3	51.892	15.26	34.33	64.30	10.412	14.72	43.716	73.63
	186	39	57	111	177	29	215	81
27.3	51.706	15.65	33.76	65.41	10.235	15.01	43.471	74.44
Oct. 7.3	196	33	60	62	187	28	257	35
	51.510	15.98	33.16	66.03	10.048	15.29	43.214	74.79
17.2	194	24	61	8	185	25	259	10
	51.316	16.22	32.55	66.11	9.863	15.54	42.955	74.69
	182	14	59	− 48	176	22	247	60
27.2	51.134	16.36	31.96	65.63	9.687	15.76	42.708	74.09
	160	4	57	104	155	20	229	106
Nov. 6.2	50.974	16.40	31.39	64.59	9.532	15.96	42.479	73.03
	129	− 4	52	156	124	17	199	148
16.1	50.845	16.36	30.87	63.03	9.408	16.13	42.280	71.55
	91	11	45	209	87	16	166	194
26.1	50.754	16.25	30.42	60.94	9.321	16.29	42.114	69.61
Dec. 6.1	47	16	38	255	48	15	119	233
	50.707	16.09	30.04	58.39	9.273	16.44	41.995	67.28
	3	20	29	296	3	15	74	260
16.1	50.704	15.89	29.75	55.43	9.270	16.59	41.921	64.68
	46	23	20	325	41	15	26	288
26.0	50.750	15.66	29.55	52.18	9.311	16.74	41.895	61.80
	91	23	8	349	84	16	27	305
36.0	50.841	15.43	29.47	48.69	9.395	16.90	41.922	58.75
Mean Place	49.207	26.68	32.541	33.81	7.822	28.33	41.673	45.18
Sec δ, Tan δ	1.107	−0.475	2.616	+2.418	1.058	−0.346	1.269	+0.781
$D_{\psi a}$, $D_{\omega a}$	+0.073	+0.010	0.000	−0.050	+0.070	+0.007	+0.041	−0.016
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.12	−0.95	+0.12	−0.95	+0.12	−0.95	+0.13	−0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ω Aquilæ. Mag. 5.1		κ Cygni. Mag. 4.0		τ Draconis. Mag. 4.6		δ Aquilæ. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 14	+11 27	19 15	+53 13	19 16	+73 12	19 21	+ 2 57
	s	″	s	″	s	″	s	″
Jan. 1.0	10.732	28.09	17.460	43.91	58.80	58.70	35.566	44.28
	83	193	27	311	8	348	83	144
11.0	10.815	26.16	17.487	40.50	58.72	55.22	35.649	42.84
	120	190	94	341	7	354	121	141
21.0	10.935	24.26	17.581	37.09	58.79	51.68	35.770	41.43
	154	180	158	330	20	344	150	133
30.9	11.089	22.46	17.739	33.79	58.99	48.24	35.920	40.10
Feb. 9.9	183	162	217	305	35	323	183	118
	11.272	20.84	17.956	30.74	59.34	45.01	36.103	38.92
	211	137	271	269	47	288	203	97
19.9	11.483	19.47	18.227	28.05	59.81	42.13	36.306	37.95
	233	106	317	224	58	242	230	72
Mar. 1.9	11.716	18.41	18.544	25.81	60.39	39.71	36.536	37.23
	252	70	356	169	66	186	249	43
11.8	11.968	17.71	18.900	24.12	61.05	37.85	36.785	36.80
	265	30	385	108	73	133	261	10
21.8	12.233	17.41	19.285	23.04	61.78	36.52	37.046	36.70
	277	9	403	45	78	67	276	24
31.8	12.510	17.50	19.688	22.59	62.56	35.85	37.322	36.94
	284	52	412	20	78	5	281	55
Apr. 10.8	12.794	18.02	20.100	22.79	63.34	35.90	37.603	37.49
	286	87	410	83	78	65	286	87
20.7	13.080	18.89	20.510	23.62	64.12	36.55	37.889	38.36
	282	123	397	141	74	127	283	112
30.7	13.362	20.12	20.907	25.03	64.86	37.82	38.172	39.48
May 10.7	273	153	377	195	69	183	278	135
	13.635	21.65	21.284	26.98	65.55	39.65	38.450	40.83
20.6	260	175	343	211	61	233	265	152
	13.895	23.40	21.627	29.39	66.16	41.98	38.715	42.35
	239	194	303	279	52	273	247	165
30.6	14.134	25.34	21.930	32.18	66.68	44.71	38.962	44.00
	214	204	254	307	40	307	221	171
June 9.6	14.348	27.38	22.184	35.25	67.08	47.78	39.183	45.71
	183	210	199	329	29	329	196	171
19.6	14.531	29.48	22.383	38.54	67.37	51.07	39.379	47.42
	148	207	138	337	17	342	157	172
29.5	14.679	31.55	22.521	41.91	67.54	54.49	39.536	49.14
July 9.5	106	203	74	339	3	348	121	159
	14.785	33.58	22.595	45.30	67.57	57.97	39.657	50.73
	65	190	9	333	10	344	78	150
19.5	14.850	35.48	22.604	48.63	67.47	61.41	39.735	52.23
	22	176	57	319	22	330	36	133
29.5	14.872	37.24	22.547	51.82	67.25	64.71	39.771	53.56
Aug. 8.4	22	155	120	294	35	312	10	118
	14.850	38.79	22.427	54.76	66.90	67.83	39.761	54.74
18.4	64	136	180	268	46	286	52	97
	14.786	40.15	22.247	57.44	66.44	70.69	39.709	55.71
28.4	102	109	234	232	56	253	86	79
	14.684	41.24	22.013	59.76	65.88	73.22	39.623	56.50
	136	87	281	195	66	215	123	56
Sept. 7.3	14.548	42.11	21.732	61.71	65.22	75.37	39.500	57.06
	161	58	317	150	72	168	149	37
17.3	14.387	42.69	21.415	63.21	64.50	77.05	39.351	57.43
	179	33	345	102	77	124	170	19
27.3	14.208	43.02	21.070	64.23	63.73	78.29	39.181	57.62
Oct. 7.3	189	4	359	53	81	75	180	2
	14.019	43.06	20.711	64.76	62.92	79.04	39.001	57.60
17.2	188	22	363	2	82	19	181	24
	13.831	42.84	20.348	64.78	62.10	79.23	38.820	57.36
	179	51	352	52	81	38	170	43
27.2	13.652	42.33	19.996	64.26	61.29	78.85	38.650	56.93
	160	79	332	105	78	91	152	64
Nov. 6.2	13.492	41.54	19.664	63.21	60.51	77.94	38.498	56.29
	132	104	298	157	72	144	127	81
16.2	13.360	40.50	19.366	61.64	59.79	76.50	38.371	55.48
	102	130	255	206	65	201	97	99
26.1	13.258	39.20	19.111	59.58	59.14	74.49	38.274	54.49
Dec. 6.1	61	149	203	249	55	246	60	115
	13.197	37.71	18.908	57.09	58.59	72.03	38.214	53.34
	24	171	145	288	44	286	19	125
16.1	13.173	36.00	18.763	54.21	58.15	69.17	38.195	52.09
	19	184	81	316	31	320	21	140
26.0	13.192	34.16	18.682	51.05	57.84	65.97	38.216	50.69
	59	194	14	338	17	342	60	145
36.0	13.251	32.22	18.668	47.67	57.67	62.55	38.276	49.24
Mean Place	12.131	19.77	19.456	33.02	62.706	46.72	36.968	36.56
Sec δ, Tan δ	1.020	+0.203	1.670	+1.338	3.463	+3.315	1.001	+0.052
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.056	−0.004	+0.028	−0.029	−0.022	−0.073	+0.060	−0.001
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.13	−0.95	+0.13	−0.95	+0.13	−0.94	+0.14	−0.94

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cygni. Mag. 3.2		ι Cygni. Mag. 3.9		μ Aquilæ. Mag. 4.6		ħ Sagittarii. Mag. 4.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 27	+27 47	19 27	+51 33	19 30	+ 7 12	19 31	−25 3
	s	″	s	″	s	″	s	″
Jan. 1.0	35.503	58.80	44.048	66.04	18.323	60.31	59.703	11.99
	57	265	13	334	70	165	92	31
11.0	35.560	56.15	44.061	62.70	18.393	58.66	59.795	11.68
	94	265	75	337	108	164	133	33
21.0	35.654	53.50	44.136	59.33	18.501	57.02	59.928	11.35
	136	254	135	328	141	156	168	38
31.0	35.790	50.96	44.271	56.05	18.642	55.46	60.096	10.97
	173	233	196	306	172	138	199	41
Feb. 9.9	35.963	48.63	44.467	52.99	18.814	54.08	60.295	10.56
	202	205	218	273	198	117	228	49
19.9	36.165	46.58	44.715	50.26	19.012	52.91	60.523	10.07
	235	170	295	230	221	90	252	53
Mar. 1.9	36.400	44.88	45.010	47.96	19.233	52.01	60.775	9.54
	258	120	333	178	242	56	273	60
11.8	36.658	43.68	45.343	46.18	19.475	51.45	61.048	8.94
	278	72	365	117	258	22	291	67
21.8	36.936	42.96	45.708	45.01	19.733	51.23	61.339	8.27
	293	20	384	56	273	14	303	73
31.8	37.229	42.76	46.092	44.45	20.006	51.37	61.642	7.54
	301	31	398	8	282	52	313	76
Apr. 10.8	37.530	43.07	46.490	44.53	20.288	51.89	61.955	6.78
	305	82	400	71	284	85	320	79
20.7	37.835	43.89	46.890	45.24	20.572	52.74	62.275	5.99
	302	130	391	130	285	117	319	79
30.7	38.137	45.19	47.281	46.54	20.857	53.91	62.594	5.20
	293	173	375	183	280	143	316	74
May 10.7	38.430	46.92	47.656	48.37	21.137	55.34	62.910	4.46
	277	208	345	232	268	164	302	69
20.7	38.707	49.00	48.001	50.69	21.405	56.98	63.212	3.77
	259	238	310	271	250	179	287	59
30.6	38.966	51.38	48.311	53.40	21.655	58.77	63.499	3.18
	224	256	265	301	227	189	263	47
June 9.6	39.190	53.94	48.576	56.41	21.882	60.66	63.762	2.71
	191	272	212	322	200	194	231	34
19.6	39.381	56.66	48.788	59.63	22.082	62.60	63.993	2.37
	155	276	157	335	163	191	196	19
29.5	39.536	59.42	48.945	62.98	22.245	64.51	64.189	2.18
	108	275	94	339	126	185	154	7
July 9.5	39.644	62.17	49.039	66.37	22.371	66.36	64.343	2.11
	65	267	32	333	83	173	109	11
19.5	39.709	64.84	49.071	69.70	22.454	68.09	64.452	2.22
	15	251	32	322	40	158	60	24
29.5	39.724	67.35	49.039	72.92	22.494	69.67	64.512	2.46
	31	234	96	301	4	141	12	35
Aug. 8.4	39.693	69.69	48.943	75.93	22.490	71.08	64.524	2.81
	73	207	152	275	47	119	36	44
18.4	39.620	71.76	48.791	78.68	22.443	72.27	64.488	3.25
	119	178	209	242	84	98	81	50
28.4	39.501	73.54	48.582	81.10	22.359	73.25	64.407	3.75
	155	144	254	205	122	76	121	53
Sept. 7.4	39.346	74.98	48.323	83.15	22.237	74.01	64.286	4.28
	185	113	294	162	147	51	152	52
17.3	39.161	76.11	48.034	84.77	22.090	74.52	64.134	4.80
	204	74	321	115	169	29	177	49
27.3	38.957	76.85	47.713	85.92	21.921	74.81	63.957	5.29
	214	36	339	68	180	4	191	43
Oct. 7.3	38.743	77.21	47.374	86.60	21.741	74.85	63.766	5.72
	219	7	344	17	182	20	192	36
17.2	38.524	77.14	47.030	86.77	21.559	74.65	63.574	6.08
	214	47	338	36	174	42	186	24
27.2	38.310	76.67	46.692	86.41	21.385	74.23	63.388	6.32
	195	85	322	89	160	67	167	14
Nov. 6.2	38.115	75.82	46.370	85.52	21.225	73.56	63.221	6.46
	170	127	290	142	135	87	139	6
16.2	37.945	74.55	46.080	84.10	21.090	72.69	63.082	6.52
	139	162	252	190	104	111	105	4
26.1	37.806	72.93	45.828	82.20	20.986	71.58	62.977	6.48
	103	195	204	237	68	129	65	11
Dec. 6.1	37.703	70.98	45.624	79.83	20.918	70.29	62.912	6.37
	61	225	149	274	32	146	21	17
16.1	37.642	68.73	45.475	77.09	20.886	68.83	62.891	6.20
	16	249	90	307	8	158	24	20
26.1	37.626	66.24	45.385	74.02	20.894	67.25	62.915	6.00
	26	263	28	327	50	165	67	26
36.0	37.652	63.61	45.357	70.75	20.944	65.60	62.982	5.74
Mean Place	36.940	49.15	45.915	54.59	19.700	52.34	61.374	17.44
Sec δ, Tan δ	1.130	+0.527	1.609	+1.260	1.008	+0.127	1.104	−0.467
$D_{\psi a}$, $D_{\omega a}$	+0.048	−0.013	+0.030	−0.031	+0.058	−0.003	+0.073	+0.012
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.15	−0.93	+0.15	−0.93	+0.15	−0.92	+0.16	−0.92

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Aquilæ. Mag. 5.0		θ Cygni. Mag. 4.6		54 Sagittarii. Mag. 5.4		β Sagittæ. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 32	− 7 11	19 34	+50 2	19 36	−16 27	19 37	+17 17
	s	″	s	″	s	″	s	″
Jan. 1.0	43.567	52.10	20.832	43.29	17.261	69.74	34.045	56.96
11.0	43.646 79	52.90 80	20.839 7	40.03 326	17.343 82	69.97 23	34.101 56	54.81 215
21.0	43.762 116	53.69 79	20.907 68	36.70 333	17.462 119	70.17 20	34.195 94	52.66 215
31.0	43.909 147	54.41 72	21.032 125	33.45 325	17.616 154	70.30 13	34.321 126	50.60 206
Feb. 9.9	44.087 178	54.99 58	21.214 182	30.41 304	17.799 183	70.35 — 5	34.484 163	48.73 187
	204	45	235	273	210	4	188	165
19.9	44.291	55.44 26	21.449	27.68 230	18.009	70.31	34.672	47.08
Mar. 1.9	44.516 225	55.70 — 5	21.729 280	25.38 180	18.244 235	70.12 19	34.891 219	45.78 130
11.8	44.761 245	55.75 19	22.047 318	23.58 121	18.497 253	69.82 30	35.132 241	44.86 92
21.8	45.024 263	55.56 42	22.397 350	22.37 60	18.769 272	69.36 46	35.392 260	44.36 50
31.8	45.298 274	55.14 65	22.770 373	21.77 — 3	19.054 285	68.75 61	35.665 273	44.30 — 6
	285		386		296	74	287	40
Apr. 10.8	45.583	54.49	23.156	21.80	19.350	68.01	35.952	44.70
20.7	45.873 290	53.64 85	23.546 390	22.46 66	19.651 301	67.18 83	36.243 291	45.52 82
30.7	46.163 290	52.62 102	23.930 384	23.70 124	19.954 303	66.25 93	36.534 291	46.75 123
May 10.7	46.450 287	51.45 117	24.299 369	25.49 179	20.254 300	65.27 98	36.821 287	48.29 154
20.7	46.726 276	50.20 125	24.643 344	27.75 226	20.542 288	64.27 100	37.092 271	50.19 190
	260	131	310	266	273	95	254	209
30.6	46.986	48.89	24.953	30.41	20.815	63.32	37.346	52.28
June 9.6	47.224 238	47.59 130	25.221 268	33.38 297	21.066 251	62.41 91	37.580 234	54.53 225
19.6	47.433 209	46.32 127	25.440 219	36.57 319	21.289 223	61.59 82	37.780 200	56.88 235
29.5	47.609 176	45.14 118	25.604 164	39.89 332	21.478 189	60.91 68	37.943 163	59.25 237
July 9.5	47.747 138	44.06 108	25.710 106	43.27 338	21.628 150	60.34 57	38.070 127	61.61 236
	96	95	43	333	106	41	82	224
19.5	47.843	43.11	25.753	46.60	21.734	59.93	38.152	63.85
29.5	47.894 51	42.31 80	25.735 18	49.82 322	21.793 59	59.65 28	38.190 38	65.95 210
Aug. 8.4	47.901 — 7	41.67 64	25.657 78	52.84 302	21.808 — 15	59.53 12	38.181 9	67.87 192
18.4	47.864 37	41.18 49	25.519 138	55.62 278	21.775 33	59.52 — 1	38.129 52	69.58 171
28.4	47.787 77	40.84 34	25.328 191	58.07 245	21.702 73	59.62 10	38.041 88	71.01 143
	113	18	238	209	112	20	128	116
Sept. 7.4	47.674	40.66 — 6	25.090	60.16 167	21.590	59.82	37.913	72.17 89
17.3	47.532 142	40.60 6	24.814 276	61.83 123	21.447 143	60.08 26	37.756 157	73.06 55
27.3	47.368 164	40.66 17	24.509 305	63.06 75	21.282 165	60.38 30	37.578 178	73.61 24
Oct. 7.3	47.193 175	40.83 28	24.185 324	63.81 23	21.104 178	60.70 32	37.388 190	73.85 — 6
17.2	47.015 178	41.11 37	23.856 329	64.04 27	20.922 182	61.03 33	37.195 193	73.79 41
	169		325		175	32	187	
27.2	46.846	41.48	23.531	63.77	20.747	61.35	37.008	73.38
Nov. 6.2	46.692 154	41.93 45	23.223 308	62.95 82	20.588 159	61.66 31	36.831 177	72.65 73
16.2	46.563 129	42.47 54	22.941 282	61.63 132	20.455 133	61.97 31	36.679 152	71.61 104
26.1	46.464 99	43.09 62	22.696 245	59.80 183	20.353 102	62.28 31	36.559 120	70.30 131
Dec. 6.1	46.403 61	43.80 71	22.496 200	57.54 226	20.291 62	62.56 28	36.472 87	68.70 160
	22	76	146	267	25	29	51	185
16.1	46.381	44.56	22.350	54.87	20.266	62.85	36.421	66.85
26.1	46.398 17	45.37 81	22.258 92	51.87 300	20.283 17	63.13 28	36.412 — 9	64.83 202
36.0	46.455 57	46.21 84	22.227 31	48.66 321	20.343 60	63.40 27	36.442 30	62.70 213
Mean Place	45.009	58.85	22.616	31.66	18.797	75.61	35.407	48.10
Sec δ, Tan δ	1.008	−0.126	1.557	+1.194	1.043	−0.296	1.047	+0.311
Dψa, Dωa	+0.064	+0.003	+0.032	−0.032	+0.068	+0.008	+0.054	−0.009
Dψδ, Dωδ	+0.16	−0.92	+0.16	−0.92	+0.16	−0.91	+0.16	−0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Cygni. Mag. 5.0		f Sagittarii. Mag. 5.1		δ Cygni. Mag. 3.0		γ Aquilæ. Mag 2.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	19 41	+37 9	19 41	−19 56	19 42	+44 56	19 42	+10 25
Jan. 1.0	28.537	74.59	50.721	45.11	32.540	43.08	34.581	36.65
	25	293	78	0	10	314	57	179
11.0	28.562	71.66	50.799	45.11	32.550	39.94	34.638	34.86
	73	296	117	4	60	320	92	178
21.0	28.635	68.70	50.916	45.07	32.610	36.74	34.730	33.08
	118	289	151	9	116	312	125	169
31.0	28.753	65.81	51.067	44.98	32.726	33.62	34.855	31.39
Feb. 9.9	160	269	181	17	164	293	160	154
	28.913	63.12	51.248	44.81	32.890	30.69	35.015	29.85
	200	242	210	25	213	264	184	130
19.9	29.113	60.70	51.458	44.56	33.103	28.05	35.199	28.55
	235	202	234	36	254	223	214	103
Mar. 1.9	29.348	58.68	51.692	44.20	33.357	25.82	35.413	27.52
	266	155	255	47	287	179	235	68
11.9	29.614	57.13	51.947	43.73	33.644	24.03	35.648	26.84
	290	103	274	59	319	120	253	35
21.8	29.904	56.10	52.221	43.14	33.963	22.83	35.901	26.49
	311	45	289	70	340	59	268	—
31.8	30.215	55.65	52.510	42.44	34.303	22.24	36.169	7
	323	— 12	301	80	356	0	280	26.56 48
Apr. 10.8	30.538	55.77	52.811	41.64	34.659	22.24	36.449	27.04
	329	68	307	87	362	62	286	85
20.7	30.867	56.45	53.118	40.77	35.021	22.86	36.735	27.89
	330	122	309	92	360	118	288	117
30.7	31.197	57.67	53.427	39.85	35.381	24.04	37.023	29.06
May 10.7	321	171	306	92	347	173	286	148
	31.518	59.38	53.733	38.93	35.728	25.77	37.309	30.54
20.7	301	214	297	93	327	216	272	172
	31.819	61.52	54.030	38.00	36.055	27.93	37.581	32.26
	280	219	280	86	302	257	257	191
30.6	32.099	64.01	54.310	37.14	36.357	30.50	37.838	34.17
	247	275	261	78	263	287	234	200
June 9.6	32.346	66.76	54.571	36.36	36.620	33.37	38.072	36.17
	212	294	230	66	221	310	208	211
19.6	32.558	69.70	54.801	35.70	36.841	36.47	38.280	38.28
	168	306	198	52	171	321	170	208
29.6	32.726	72.76	54.999	35.18	37.012	39.68	38.450	40.36
July 9.5	120	308	158	37	117	328	135	205
	32.846	75.84	55.157	34.81	37.129	42.96	38.585	42.41
	70	301	113	23	64	324	91	192
19.5	32.916	78.85	55.270	34.58	37.193	46.20	38.676	44.33
	19	291	67	8	4	316	47	181
29.5	32.935	81.76	55.337	34.50	37.197	49.36	38.723	46.14
	34	271	21	6	48	294	6	159
Aug. 8.4	32.901	84.47	55.358	34.56	37.149	52.30	38.729	47.73
	83	247	28	19	107	271	39	140
18.4	32.818	86.94	55.330	34.75	37.042	55.01	38.690	49.13
	129	217	71	27	155	239	77	117
28.4	32.689	89.11	55.259	35.02	36.887	57.40	38.613	50.30
	170	185	109	34	201	207	117	92
Sept. 7.4	32.519	90.96	55.150	35.36	36.686	59.47	38.496	51.22
	203	146	143	39	239	164	144	69
17.3	32.316	92.42	55.007	35.75	36.447	61.11	38.352	51.91
	228	105	165	40	263	121	169	38
27.3	32.088	93.47	54.842	36.15	36.184	62.32	38.183	52.29
	213	63	181	41	284	78	179	16
Oct. 7.3	31.845	94.10	54.661	36.56	35.900	63.10	38.004	52.45
	250	17	185	38	290	27	184	—
17.3	31.595	94.27	54.476	36.94	35.610	63.37	37.820	12
	246	— 29	179	33	287	— 22	179	52.33 38
27.2	31.349	93.98	54.297	37.27	35.323	63.15	37.641	51.95
Nov. 6.2	232	75	163	27	273	73	166	65
	31.117	93.23	54.134	37.54	35.050	62.42	37.475	51.30
16.2	208	121	139	24	248	123	142	90
	30.909	92.02	53.995	37.78	34.802	61.19	37.333	50.40
26.1	177	165	107	17	217	171	114	115
	30.732	90.37	53.888	37.95	34.585	59.48	37.219	49.25
Dec. 6.1	140	205	68	15	177	214	79	136
	30.592	88.32	53.820	38.10	34.408	57.34	37.140	47.89
	98	239	31	11	128	254	48	151
16.1	30.494	85.93	53.789	38.21	34.280	54.80	37.092	46.38
	52	268	13	8	80	285	4	169
26.1	30.442	83.25	53.802	38.29	34.200	51.95	37.088	44.69
	4	288	56	5	25	308	32	179
36.0	30.438	80.37	53.858	38.34	34.175	48.87	37.120	42.90
Mean Place	30.018	63.74	52.301	50.45	34.153	31.50	35.929	28.46
Sec δ, Tan δ	1.255	+0.758	1.064	−0.363	1.413	+0.998	1.017	+0.184
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.043	−0.022	+0.070	+0.010	+0.037	−0.029	+0.057	−0.005
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.17	−0.90	+0.17	−0.90	+0.17	−0.90	+0.17	−0.90

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Sagittæ. Mag. 3.8		α Aquilæ. (*Altair.*) Mag. 0.9		ϵ Draconis. Mag. 4.0		η Aquilæ. Var. 3.7–4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 43	+18 20	19 47	+ 8 39	19 48	+70 4	19 48	+ 0 48
	s	″	s	″	s	″	s	″
Jan. 1.0	55.918	45.39	0.241	57.80	23.63	32.18	31.694	32.20
	47	218	57	167	13	338	58	126
11.0	55.965	43.21	0.298	56.13	23.50	28.80	31.752	30.94
	85	218	93	165	2	350	93	121
21.0	56.050	41.03	0.391	54.48	23.48	25.30	31.845	29.73
	123	211	127	158	11	347	128	112
31.0	56.173	38.92	0.518	52.90	23.59	21.83	31.973	28.61
	155	193	158	141	22	335	157	101
Feb. 9.9	56.328	36.99	0.676	51.49	23.81	18.48	32.130	27.60
	184	169	185	118	34	307	184	83
19.9	56.512	35.30	0.861	50.31	24.15	15.41	32.314	26.77
	213	136	213	92	43	268	210	59
Mar. 1.9	56.725	33.94	1.074	49.39	24.58	12.73	32.524	26.18
	237	98	236	59	52	221	230	31
11.9	56.962	32.96	1.310	48.80	25.10	10.52	32.754	25.87
	257	55	252	24	58	163	250	3
21.8	57.219	32.41	1.562	48.56	25.68	8.89	33.004	25.84
	274	9	268	12	64	102	265	29
31.8	57.493	32.32	1.830	48.68	26.32	7.87	33.269	26.13
	285	36	279	52	67	36	277	60
Apr. 10.8	57.778	32.68	2.109	49.20	26.99	7.51	33.546	26.73
	291	80	287	88	68	29	285	87
20.7	58.069	33.48	2.396	50.08	27.67	7.80	33.831	27.60
	294	121	289	118	66	92	288	113
30.7	58.363	34.69	2.685	51.26	28.33	8.72	34.119	28.73
	287	157	284	148	63	152	285	134
May 10.7	58.650	36.26	2.969	52.74	28.96	10.24	34.404	30.07
	278	186	275	171	59	203	278	151
20.7	58.928	38.12	3.244	54.45	29.55	12.27	34.682	31.58
	260	213	259	188	51	251	262	163
30.6	59.188	40.25	3.503	56.33	30.06	14.78	34.944	33.21
	236	229	236	199	44	289	243	167
June 9.6	59.424	42.54	3.739	58.32	30.50	17.67	35.187	34.88
	207	240	212	204	34	318	215	169
19.6	59.631	44.94	3.951	60.36	30.84	20.85	35.402	36.57
	169	242	174	203	24	340	184	164
29.6	59.800	47.36	4.125	62.39	31.08	24.25	35.586	38.21
	132	241	138	196	13	350	145	156
July 9.5	59.932	49.77	4.263	64.35	31.21	27.75	35.731	39.77
	87	231	95	189	2	353	105	144
19.5	60.019	52.08	4.358	66.24	31.23	31.28	35.836	41.21
	44	217	50	170	9	348	60	129
29.5	60.063	54.25	4.408	67.94	31.14	34.76	35.896	42.50
	4	199	8	153	19	333	16	111
Aug. 8.4	60.059	56.24	4.416	69.47	30.95	38.09	35.912	43.61
	46	177	35	130	31	312	27	93
18.4	60.013	58.01	4.381	70.77	30.64	41.21	35.885	44.54
	86	152	74	111	39	283	68	73
28.4	59.927	59.53	4.307	71.88	30.25	44.04	35.817	45.27
	125	123	111	86	48	252	104	55
Sept. 7.4	59.802	60.76	4.196	72.74	29.77	46.56	35.713	45.82
	154	94	142	61	55	210	135	35
17.3	59.648	61.70	4.054	73.35	29.22	48.66	35.578	46.17
	176	62	162	35	61	167	157	15
27.3	59.472	62.32	3.892	73.70	28.61	50.33	35.421	46.32
	190	31	174	15	65	115	171	2
Oct. 7.3	59.282	62.63	3.718	73.85	27.96	51.48	35.250	46.30
	196	4	181	15	67	66	176	21
17.3	59.086	62.59	3.537	73.70	27.29	52.14	35.074	46.09
	190	35	176	38	67	10	172	37
27.2	58.896	62.24	3.361	73.32	26.62	52.24	34.902	45.72
	177	70	163	64	66	47	158	54
Nov. 6.2	58.719	61.54	3.198	72.68	25.96	51.77	34.744	45.18
	156	102	142	84	62	104	137	71
16.2	58.563	60.52	3.056	71.84	25.34	50.73	34.607	44.47
	126	131	112	108	57	157	109	85
26.1	58.437	59.21	2.944	70.76	24.77	49.16	34.498	43.62
	93	160	78	129	51	209	75	99
Dec. 6.1	58.344	57.61	2.866	69.47	24.26	47.07	34.423	42.63
	58	184	44	144	41	257	39	111
16.1	58.286	55.77	2.822	68.03	23.85	44.50	34.384	41.52
	15	203	3	157	32	298	2	121
26.1	58.271	53.74	2.819	66.46	23.53	41.52	34.382	40.31
	23	215	34	167	21	324	35	124
36.0	58.294	51.59	2.853	64.79	23.32	38.28	34.417	39.07
Mean Place	57.264	36.36	1.586	49.94	26.611	18.38	33.059	25.08
Sec δ, Tan δ	1.054	+0.332	1.012	+0.152	2.935	+2.759	1.000	+0.014
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.053	−0.010	+0.058	−0.005	−0.004	−0.084	+0.061	0.000
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.17	−0.90	+0.18	−0.89	+0.18	−0.89	+0.18	−0.89

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Sagittarii. Mag. 4.2		β Aquilæ. Mag. 3.9		ϵ Pavonis. Mag. 4.1		γ Sagittæ. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	19 49	−42 3	19 51	+ 6 12	19 51	−73 6	19 55	+19 16
Jan. 1.1	54.947	75.86	30.514	56.04	36.96	54.41	18.619	64.73
11.0	55.027 80	74.49 137	30.566 52	54.50 154	37.05 9	51.46 295	18.652 33	62.54 219
21.0	55.157 130	73.07 142	30.653 87	52.95 155	37.27 22	48.47 299	18.726 74	60.35 219
31.0	55.332 175	71.60 147	30.774 121	51.51 144	37.62 35	45.52 295	18.836 110	58.22 213
Feb. 9.9	55.549 217	70.13 147	30.925 151	50.19 132	38.08 46	42.65 287	18.979 143	56.23 199
	253	145	183	110	58	269	178	172
19.9	55.802	68.68	31.108	49.09	38.66	39.96	19.157	54.51
Mar. 1.9	56.088 286	67.27 141	31.311 203	48.23 86	39.32 66	37.50 246	19.358 201	53.10 141
11.9	56.401 313	65.93 134	31.540 229	47.67 56	40.06 74	35.32 218	19.588 230	52.07 103
21.8	56.738 337	64.67 126	31.789 249	47.47 — 20	40.87 81	33.48 184	19.840 252	51.48 59
31.8	57.095 357	63.51 116	32.051 262	47.61 14	41.72 85	31.98 150	20.112 272	51.31 — 17
	370	103	278	51	88	110	281	29
Apr. 10.8	57.465	62.48	32.329	48.12	42.60	30.88	20.393	51.60
20.7	57.846 381	61.59 89	32.615 286	48.95 83	43.50 90	30.17 71	20.686 293	52.35 75
30.7	58.230 384	60.88 71	32.902 287	50.10 115	44.41 91	29.87 — 30	20.984 298	53.54 119
May 10.7	58.611 381	60.36 52	33.187 285	51.50 140	45.29 88	30.04 17	21.275 291	55.08 154
20.7	58.983 372	60.05 31	33.465 278	53.12 162	46.14 85	30.61 57	21.558 283	56.95 187
	352	— 6	263	180	80	97	265	212
30.6	59.335	59.99	33.728	54.92	46.94	31.58	21.823	59.07
June 9.6	59.661 326	60.14 15	33.968 240	56.78 186	47.66 72	32.96 138	22.071 248	61.37 230
19.6	59.952 291	60.54 40	34.185 217	58.69 191	48.29 63	34.68 172	22.284 213	63.79 242
29.6	60.202 250	61.18 64	34.366 181	60.59 190	48.82 53	36.72 204	22.465 181	66.26 247
July 9.5	60.404 202	62.02 84	34.509 143	62.42 183	49.23 41	39.05 233	22.607 142	68.72 246
	147	104	104	175	28	249	97	237
19.5	60.551 89	63.06	34.613	64.17	49.51	41.54	22.704	71.09
29.5	60.640 31	64.24 118	34.672 59	65.73 156	49.65 14	44.17 263	22.756 52	73.36 227
Aug. 8.4	60.671 — 28	65.52 128	34.689 — 17	67.13 140	49.65 0	46.81 264	22.765 — 9	75.44 208
18.4	60.643 84	66.86 134	34.659 30	68.32 119	49.51 14	49.40 259	22.728 37	77.28 184
28.4	60.559	68.18 132	34.592 67	69.33 101	49.24 27	51.85 245	22.652 76	78.90 162
	136	127	105	78	40	221	120	133
Sept. 7.4	60.423	69.45	34.487	70.11	48.84	54.06	22.532	80.23
17.3	60.247 176	70.59 114	34.350 137	70.63 52	48.34 50	55.93 187	22.385 147	81.24 101
27.3	60.039 208	71.58 99	34.192 158	70.94 31	47.75 59	57.42 149	22.213 172	81.98 74
Oct. 7.3	59.808 231	72.33 75	34.020 172	71.01 — 7	47.10 65	58.44 102	22.025 188	82.37 39
17.3	59.568 240	72.85 52	33.842 178	70.87 14	46.43 67	58.97 — 53	21.830 195	82.41 — 4
	234	— 25	174	38	68	3	191	27
27.2	59.334	73.10	33.668	70.49	45.75	58.94	21.639	82.14
Nov. 6.2	59.116 218	73.07 3	33.503 165	69.89 60	45.11 64	58.39 55	21.460 179	81.50 64
16.2	58.928 188	72.76 31	33.362 141	69.07 82	44.53 58	57.30 109	21.299 161	80.54 96
26.1	58.777 151	72.17 59	33.249 113	68.07 100	44.03 50	55.74 156	21.166 133	79.28 126
Dec. 6.1	58.672 105	71.37 80	33.168 81	66.87 120	43.64 39	53.74 200	21.065 101	77.74 154
	56	101	49	135	27	237	68	182
16.1	58.616 2	70.36	33.119 8	65.52	43.37 13	51.37	20.997 27	75.92
26.1	58.614 — 51	69.18 118	33.111 — 30	64.07 145	43.24 — 1	48.71 266	20.970 — 12	73.90 202
36.0	58.665	67.88 130	33.141	62.54 153	43.25	45.86 285	20.982	71.76 214
Mean Place	57.063	79.01	31.855	48.38	42.581	56.22	19.935	55.54
Sec δ, Tan δ	1.347	−0.903	1.006	+0.109	3.443	−3.294	1.060	+0.350
$D_{\psi a}$, $D_{\omega a}$	+0.082	+0.028	+0.059	−0.003	+0.138	+0.103	+0.053	−0.011
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.18	−0.89	+0.19	−0.88	+0.19	−0.88	+0.19	−0.88

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*c* Sagittarii. Mag. 4.6		*τ* Aquilæ. Mag. 5.6		*θ* Aquilæ. Mag. 3.4		*o* Cygni *seq.* Mag. 4.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 19 57 s	° ′ −27 55 ″	h m 20 0 s	° ′ + 7 3 ″	h m 20 7 s	° ′ − 1 2 ″	h m 20 11 s	° ′ +46 30 ″
Jan. 1.1	53.854	26.73	21.403	43.42	18.602	56.64	10.982	38.66
	66	52	41	154	43	107	−32	304
11.0	53.920	26.21	21.444	41.88	18.645	57.71	10.950	35.62
	105	59	78	156	76	105	20	314
21.0	54.025	25.62	21.522	40.32	18.721	58.76	10.970	32.48
	143	65	110	146	111	101	75	316
31.0	54.168	24.97	21.632	38.86	18.832	59.77	11.045	29.32
Feb. 10.0	177	72	144	132	140	85	126	301
	54.345	24.25	21.776	37.54	18.972	60.62	11.171	26.31
	208	76	173	113	170	67	178	277
19.9	54.553	23.49	21.949	36.41	19.142	61.29	11.349	23.54
	235	83	197	88	193	48	226	242
Mar. 1.9	54.788	22.66	22.146	35.53	19.335	61.77	11.575	21.12
	261	88	224	55	220	−20	266	198
11.9	55.049	21.78	22.370	34.98	19.555	61.97	11.841	19.14
	280	94	245	−24	243	−7	304	149
21.8	55.329	20.84	22.615	34.74	19.798	61.90	12.145	17.65
	300	97	259	13	256	36	333	87
31.8	55.629	19.87	22.874	34.87	20.054	61.54	12.478	16.78
	313	99	274	51	273	65	354	28
Apr. 10.8	55.942	18.88	23.148	35.38	20.327	60.89	12.832	16.50
	324	99	284	84	285	90	370	31
20.8	56.266	17.89	23.432	36.22	20.612	59.99	13.202	16.81
	328	96	289	115	291	114	372	93
30.7	56.594	16.93	23.721	37.37	20.903	58.85	13.574	17.74
May 10.7	328	88	289	142	290	135	367	145
	56.922	16.05	24.010	38.79	21.193	57.50	13.941	19.19
20.7	322	80	281	166	286	149	351	195
	57.244	15.25	24.291	40.45	21.479	56.01	14.292	21.14
	307	66	266	181	272	163	332	240
30.7	57.551	14.59	24.557	42.26	21.751	54.38	14.624	23.54
	287	52	247	192	256	164	294	274
June 9.6	57.838	14.07	24.804	44.18	22.007	52.74	14.918	26.28
	258	35	222	199	230	163	256	301
19.6	58.096	13.72	25.026	46.17	22.237	51.11	15.174	29.29
	224	17	188	196	198	160	208	319
29.6	58.320	13.55	25.214	48.13	22.435	49.51	15.382	32.48
July 9.5	183	2	151	190	165	153	156	330
	58.503	13.57	25.365	50.03	22.600	47.98	15.538	35.78
	137	20	111	180	121	138	101	332
19.5	58.640	13.77	25.476	51.83	22.721	46.60	15.639	39.10
	89	35	66	168	81	123	−41	327
29.5	58.729	14.12	25.542	53.51	22.802	45.37	15.680	42.37
	37	50	26	148	34	107	15	312
Aug. 8.5	58.766	14.62	25.568	54.99	22.836	44.30	15.665	45.49
	−12	62	−21	128	−8	88	76	294
18.4	58.754	15.24	25.547	56.27	22.828	43.42	15.589	48.43
	60	69	61	106	53	−68	129	265
28.4	58.694	15.93	25.486	57.33	22.775	42.74	15.460	51.08
	103	73	101	87	86	49	178	234
Sept. 7.4	58.591	16.66	25.385	58.20	22.689	42.25	15.282	53.42
	140	73	131	59	123	30	219	198
17.4	58.451	17.39	25.254	58.79	22.566	41.95	15.063	55.40
	168	68	154	37	148	−15	253	155
27.3	58.283	18.07	25.100	59.16	22.418	41.80	14.810	56.95
Oct. 7.3	187	59	171	−12	162	−6	276	110
	58.096	18.66	24.929	59.28	22.256	41.86	14.534	58.05
17.3	195	50	177	−9	173	20	289	66
	57.901	19.16	24.752	59.19	22.083	42.06	14.245	58.71
	191	38	175	33	169	35	293	−13
27.2	57.710	19.54	24.577	58.86	21.914	42.41	13.952	58.84
	179	22	165	56	161	51	285	37
Nov. 6.2	57.531	19.76	24.412	58.30	21.753	42.92	13.667	58.47
	155	−10	144	79	142	66	267	89
16.2	57.376	19.86	24.268	57.51	21.611	43.58	13.400	57.58
	123	−4	117	98	116	77	239	138
26.2	57.253	19.82	24.151	56.53	21.495	44.35	13.161	56.20
Dec. 6.1	86	17	89	119	86	89	209	188
	57.167	19.65	24.062	55.34	21.409	45.24	12.952	54.32
	46	29	56	133	54	97	162	229
16.1	57.121	19.36	24.006	54.01	21.355	46.21	12.790	52.03
	−3	37	−16	148	−15	108	119	265
26.1	57.118	18.99	23.990	52.53	21.340	47.29	12.671	49.38
	−41	45	−18	150	−22	110	64	293
36.1	57.159	18.54	24.008	51.03	21.362	48.39	12.607	46.45
Mean Place	55.559	30.46	22.720	35.78	19.946	63.08	12.473	25.86
Sec δ, Tan δ	1.132	−0.530	1.008	+0.124	1.000	−0.018	1.453	+1.054
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.073	+0.017	+0.058	−0.004	+0.062	+0.001	+0.038	−0.038
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.20	−0.87	+0.20	−0.87	+0.21	−0.85	+0.22	−0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cephei. Mag. 4.4		24 Vulpeculæ. Mag. 5.4		α^2 Capricorni. Mag. 3.8		β Capricorni. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 20 11 s	° ′ +77 28 ″	h m 20 13 s	° ′ +24 25 ″	h m 20 13 s	° ′ −12 46 ″	h m 20 16 s	° ′ −15 1 ″
Jan. 1.1	26.57	64.20	28.145	69.04	45.584	59.65	39.779	27.76
	37	319	10	234	44	38	41	24
11.0	26.20	61.01	28.155	66.70	45.628	60.03	39.820	28.00
	18	338	51	238	77	34	76	18
21.0	26.02	57.63	28.206	64.32	45.705	60.37	39.896	28.18
	0	345	87	234	114	23	111	10
31.0	26.02	54.18	28.293	61.98	45.819	60.60	40.007	28.28
	21	338	125	221	141	15	112	0
Feb. 10.0	26.23	50.80	28.418	59.77	45.960	60.75	40.149	28.28
	38	317	158	197	174	0	171	13
19.9	26.61	47.63	28.576	57.80	46.134	60.75	40.320	28.15
	57	290	190	167	197	14	198	29
Mar. 1.9	27.18	44.73	28.766	56.13	46.331	60.61	40.518	27.86
	70	215	220	127	225	36	223	43
11.9	27.88	42.28	28.986	54.86	46.556	60.25	40.741	27.43
	84	196	216	84	244	52	215	60
21.8	28.72	40.32	29.232	54.02	46.800	59.73	40.986	26.83
	93	133	268	36	265	69	264	78
31.8	29.65	38.99	29.500	53.66	47.065	59.04	41.250	26.05
	100	75	286	13	281	86	282	92
Apr. 10.8	30.65	38.24	29.786	53.79	47.346	58.18	41.532	25.13
	102	10	298	61	294	102	294	106
20.8	31.67	38.14	30.084	54.40	47.640	57.16	41.826	24.07
	102	52	303	107	299	114	302	116
30.7	32.69	38.66	30.387	55.47	47.939	56.02	42.128	22.91
	98	112	304	150	300	124	304	121
May 10.7	33.67	39.78	30.691	56.97	48.239	54.78	42.432	21.70
	92	171	295	186	298	127	302	124
20.7	34.59	41.49	30.986	58.83	48.537	53.51	42.734	20.46
	81	221	281	216	286	127	291	122
30.7	35.40	43.70	31.267	60.99	48.823	52.24	43.025	19.24
	71	262	260	241	268	125	274	116
June 9.6	36.11	46.32	31.527	63.40	49.091	50.99	43.299	18.08
	56	237	231	256	247	114	250	107
19.6	36.67	49.29	31.758	65.96	49.338	49.85	43.549	17.01
	41	321	198	267	212	104	219	94
29.6	37.08	52.53	31.956	68.63	49.550	48.81	43.768	16.07
	24	341	156	267	178	92	184	79
July 9.5	37.32	55.94	32.112	71.30	49.728	47.89	43.952	15.28
	8	352	114	264	140	73	112	61
19.5	37.40	59.46	32.226	73.94	49.868	47.16	44.094	14.67
	—		67	252	92	55	98	45
29.5	37.30	62.98	32.293	76.46	49.960	46.61	44.192	14.22
	10	352	20	237	47	42	51	27
Aug. 8.5	37.04	66.43	32.313	78.83	50.007	46.19	44.243	13.95
	26	315	—	214	1	24	5	11
18.4	36.62	69.74	32.287	80.97	50.008	45.95	44.248	13.84
	42	331	26	192	—	8	—	—
28.4	36.05	72.80	32.217	82.89	49.967	45.87	44.208	13.88
	57	306	70	162	41	—	40	4
	71	280	111		83	7	81	17
Sept. 7.4	35.34	75.60	32.106	84.51	49.884	45.94	44.127	14.05
	83	215	113	132	116	18	116	28
17.4	34.51	78.05	31.963	85.83	49.768	46.12	44.011	14.33
	93	204	171	98	145	27	143	35
27.3	33.58	80.09	31.792	86.81	49.623	46.39	43.868	14.68
	100	160	110	62	161	32	164	40
Oct. 7.3	32.58	81.69	31.602	87.43	49.462	46.71	43.704	15.08
	106	106	201	27	173	39	173	43
17.3	31.52	82.75	31.401	87.70	49.289	47.10	43.531	15.51
	108	55	199	13	170	43	173	44
27.2	30.44	83.30	31.202	87.57	49.119	47.53	43.358	15.95
	108	1	192	49	163	45	162	44
Nov. 6.2	29.36	83.29	31.010	87.08	48.956	47.98	43.196	16.39
	105	57	175	86	143	45	116	42
16.2	28.31	82.72	30.835	86.22	48.813	48.43	43.050	16.81
	99	116	152	124	118	47	120	41
26.2	27.32	81.56	30.683	84.98	48.695	48.90	42.930	17.22
	90	168	122	155	87	47	90	39
Dec. 6.1	26.42	79.88	30.561	83.43	48.608	49.37	42.840	17.61
	78	220	90	186	56	46	55	36
16.1	25.64	77.68	30.471	81.57	48.552	49.83	42.785	17.97
	65	267	52	208	15	47	18	33
26.1	24.99	75.01	30.419	79.49	48.537	50.30	42.767	18.30
	48	303	12	228	20	41	20	31
36.1	24.51	71.98	30.407	77.21	48.557	50.71	42.787	18.61
Mean Place	30.688	48.67	29.413	59.04	47.026	64.28	41.237	31.97
Sec δ, Tan δ	4.614	+4.505	1.098	+0.454	1.025	−0.227	1.035	−0.268
$D_{\psi a}$, $D_{\omega a}$	−0.039	−0.163	+0.051	−0.017	+0.066	+0.008	+0.067	+0.010
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.22	−0.84	+0.22	−0.84	+0.22	−0.83	+0.22	−0.83

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cygni. Mag. 2.3		α Pavonis. Mag. 2.1		π Capricorni. Mag. 5.2		ρ Capricorni. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	20 19	+40 0	20 19	−56 58	20 22	−18 27	20 24	−18 3
Jan. 1.1	26.517	46.42	30.958	60.12	53.430	50.74	26.748	65.90
	24	285	32	216	35	2	34	5
11.0	26.493	43.57	30.990	57.96	53.465	50.76	26.782	65.95
	23	293	100	235	70	5	71	2
21.0	26.516	40.64	31.090	55.61	53.535	50.71	26.853	65.93
	68	295	165	237	108	14	105	11
31.0	26.584	37.69	31.255	53.24	53.643	50.57	26.958	65.82
Feb. 10.0	117	281	226	239	139	24	136	23
	26.701	34.88	31.481	50.85	53.782	50.33	27.094	65.59
	159	259	283	233	170	35	167	33
19.9	26.860	32.29	31.764	48.52	53.952	49.98	27.261	65.26
Mar. 1.9	203	227	332	226	195	49	194	47
	27.063	30.02	32.096	46.26	54.147	49.49	27.455	64.79
11.9	240	183	375	211	225	62	221	61
	27.303	28.19	32.471	44.15	54.372	48.87	27.676	64.18
21.9	271	137	414	196	244	77	243	76
	27.574	26.82	32.885	42.19	54.616	48.10	27.919	63.42
31.8	302	80	449	173	269	89	265	89
	27.876	26.02	33.334	40.46	54.885	47.21	28.184	62.53
	322	22	475	148	285	103	282	102
Apr. 10.8	28.198	25.80	33.809	38.98	55.170	46.18	28.466	61.51
	338	33	492	120	296	111	297	112
20.8	28.536	26.13	34.301	37.78	55.466	45.07	28.763	60.39
	344	91	505	90	308	118	307	119
30.7	28.880	27.04	34.806	36.88	55.774	43.89	29.070	59.20
May 10.7	342	142	505	55	311	122	310	123
	29.222	28.46	35.311	36.33	56.085	42.67	29.380	57.97
20.7	330	191	495	23	310	119	306	121
	29.552	30.37	35.806	36.10	56.395	41.48	29.686	56.76
	313	230	477	12	297	112	299	116
30.7	29.865	32.67	36.283	36 22	56.692	40.36	29.985	55.60
June 9.6	287	263	449	50	280	107	283	109
	30.152	35.30	36.732	36.72	56.972	39.29	30.268	54.51
19.6	251	290	405	82	259	94	259	97
	30.403	38.20	37.137	37.54	57.231	38.35	30.527	53.54
29.6	211	306	356	116	230	80	230	82
	30.614	41.26	37.493	38.70	57.461	37.55	30.757	52.72
July 9.6	165	316	296	144	192	60	193	64
	30.779	44.42	37.789	40.14	57.653	36.95	30.950	52.08
	113	316	226	168	150	45	153	48
19.5	30.892	47.58	38.015	41.82	57.803	36.50	31.103	51.60
	58	309	151	190	107	26	107	28
29.5	30.950	50.67	38.166	43.72	57.910	36.24	31.210	51.32
	6	300	76	203	58	9	60	11
Aug. 8.5	30.956	53.67	38.242	45.75	57.968	36.15	31.270	51.21
	45	277	5	208	12	9	13	6
18.4	30.911	56.44	38.237	47.83	57.980	36.24	31.283	51.27
	96	252	84	204	33	20	33	22
28.4	30.815	58.96	38.153	49.87	57.947	36.44	31.250	51.49
	143	221	155	196	78	33	75	32
Sept. 7.4	30.672	61.17	37.998	51.83	57.869	36.77	31.175	51.81
	182	187	215	181	113	43	113	41
17.4	30.490	63.04	37.783	53.64	57.756	37.20	31.062	52.22
	212	148	267	154	140	48	141	47
27.3	30.278	64.52	37.516	55.18	57.616	37.68	30.921	52.69
Oct. 7.3	236	108	309	123	163	51	162	50
	30.042	65.60	37.207	56.41	57.453	38.19	30.759	53.19
17.3	251	59	330	87	175	52	173	51
	29.791	66.19	36.877	57.28	57.278	38.72	30.586	53.70
	252	16	336	46	175	48	175	48
27.3	29.539	66.35	36.541	57.74	57.103	39.20	30.411	54.18
Nov. 6.2	246	33	323	4	167	43	166	45
	29.293	66.02	36.218	57.78	56.936	39.63	30.245	54.63
16.2	233	83	296	39	150	38	151	40
	29.060	65.19	35.922	57.39	56.786	40.01	30.094	55.03
26.2	208	130	255	82	125	33	125	34
	28.852	63.89	35.667	56.57	56.661	40.34	29.969	55.37
Dec. 6.1	176	174	205	121	95	28	96	29
	28.676	62.15	35.462	55.36	56.566	40.62	29.873	55.66
	141	214	144	153	62	22	61	22
16.1	28.535	60.01	35.318	53.83	56.504	40.84	29.812	55.88
	99	244	78	185	23	14	25	18
26.1	28.486	57.57	35.240	51.98	56.481	40.98	29.787	56.06
	52	274	5	203	12	9	13	13
36.1	28.384	54.83	35.235	49.95	56.493	41.07	29.800	56.19
Mean Place	27.864	34.18	33.906	59.72	54.928	54.14	28.234	69.31
Sec δ, Tan δ	1.306	+0.840	1.835	−1.539	1.054	−0.334	1.052	−0.326
$D_{\psi a}$, $D_{\omega a}$	+0.043	−0.032	+0.095	+0.059	+0.068	+0.013	+0.068	+0.013
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.23	−0.82	+0.23	−0.82	+0.23	−0.81	+0.23	−0.81

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Cygni. Mag. 4.1		θ Cephei. Mag. 4.3		ε Delphini. Mag. 4.0		Groombridge 3241. Mag. 6.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	20 26	+30 6	20 28	+62 43	20 29	+11 2	20 30	+72 16
Jan. 1.1	13.771	50.02	15.68	80.85	30.855	34.06	18.38	31.40
	10	249	14	314	12	167	29	311
11.0	13.761	47.53	15.54	77.71	30.867	32.39	18.09	28.29
	30	258	6	332	41	166	16	332
21.0	13.791	44.95	15.48	74.39	30.911	30.73	17.93	24.97
	69	254	2	341	82	162	2	344
31.0	13.860	42.41	15.50	70.98	30.993	29.11	17.91	21.53
Feb. 10.0	109	245	10	336	111	150	11	311
	13.969	39.96	15.60	67.62	31.104	27.61	18.02	18.12
	147	224	19	316	144	131	24	328
19.9	14.116	37.72	15.79	64.46	31.248	26.30	18.26	14.84
Mar. 1.9	181	191	27	287	172	106	36	297
	14.297	35.81	16.06	61.59	31.420	25.24	18.62	11.87
11.9	217	154	34	245	202	73	48	259
	14.514	34.27	16.40	59.14	31.622	24.51	19.10	9.28
21.9	215	109	41	195	226	39	58	209
	14.759	33.18	16.81	57.19	31.848	24.12	19.68	7.19
31.8	271	59	45	137	248	0	65	153
	15.030	32.59	17.26	55.82	32.096	24.12	20.33	5.66
	291	5	49	74	265	38	70	91
Apr. 10.8	15.321	32.54	17.75	55.08	32.361	24.50	21.03	4.75
		—		11			74	29
20.8	306	46	51	—	281	75	[illegible]	4.46
	15.627	33.00	18.26	54.97	32.642	25.25	[illegible]	—
30.7	314	96	53	51	291	111	75	37
	15.941	33.96	18.79	55.48	32.933	26.36	[illegible]	4.83
May 10.7	316	142	51	114	292	143	74	98
	16.257	35.38	19.30	56.62	33.225	27.79	[illegible]	5.81
20.7	309	183	50	171	290	169	70	156
	16.566	37.21	19.80	58.33	33.515	29.48	[illegible]	7.37
	295	221	46	221	283	191	64	209
30.7	16.861	39.42	20.26	60.54	33.798	31.39	24.60	9.46
June 9.6	274	247	41	263	264	203	57	253
	17.135	41.89	20.67	63.17	34.062	33.42	25 17	11.99
19.6	247	268	35	301	238	214	48	291
	17.382	44.57	21.02	66.18	34.300	35.56	25.65	14.90
29.6	211	283	28	326	213	217	37	321
	17.593	47.40	21.30	69.44	34.513	37.73	26.02	18.11
July 9.6	169	287	21	315	171	213	26	341
	17.762	50.27	21.51	72.89	34.687	39.86	26.28	21.52
	124	286	13	354	131	208	15	354
19.5	17.886	53.13	21.64	76.43	34.821	41.94	26.43	25.06
	78	278	4	355	91	194	2	358
29.5	17.964	55.91	21.68	79.98	34.915	43.88	26.45	28.64
	27	265	1	347	46	175	10	354
Aug. 8.5	17.991	58.56	21.64	83.45	34.961	45.63	26.35	32.18
	—							
18.4	21	245	12	333	5	160	23	342
	17.970	61.01	21.52	86.78	31.966	47.23	26.12	35.60
28.4	67	219	21	311	41	136	33	322
	17.903	63.20	21.31	89.89	34.925	48.59	25.79	38.82
	109	192	27	284	78	110	44	295
Sept. 7.4	17.794	65.12	21 04	92.73	34.847	49.69	25.35	41.77
	145	160	33	248	114	87	52	263
17.4	17.649	66.72	20.71	95.21	34.733	50.56	24.83	44.40
	176	124	39	208	142	58	61	223
27.3	17.473	67.96	20.32	97.29	34.591	51.14	24.22	46.63
Oct. 7.3	198	87	43	162	159	34	66	180
	17.275	68.83	19.89	98.91	34.432	51.48	23.56	48.43
17.3	209	46	45	112	171	—	72	131
	17.066	69.29	19.44	100.03	34.261	51.54	22.84	49.74
	213	6	47	60	175	19	73	77
27.3	16.853	69.35	18.97	100.63	34.086	51.35	22.11	50.51
Nov. 6.2	208	35	47	—	168	44	74	21
	16.645	69.00	18.50	100.67	33.918	50.91	21.37	50.72
16.2	192	77	45	52	157	72	73	36
	16.453	68.23	18.05	100.15	33.761	50.19	20.64	50.36
26.2	171	117	42	109	132	96	69	94
	16.282	67.06	17.63	99.06	33.629	49.23	19.95	49.42
Dec. 6.1	144	156	39	163	108	117	64	152
	16.138	65.50	17.24	97.43	33.521	48.06	19.31	47.90
	116	189	33	216	76	137	55	204
16.1	16.026	63.61	16.91	95.27	33.445	46.69	18.76	45.86
	74	219	27	259	48	152	47	251
26.1	15.952	61.42	16.64	92.68	33.397	45.17	18.29	43.35
	36	240	19	296	7	161	36	294
36.1	15.916	59.02	16.45	89.72	33.390	43.56	17.93	40.41
Mean Place	15.008	39.07	17.582	65.62	32.075	26.21	21.070	15.25
Sec δ, Tan δ	1.156	+0.580	2.183	+1.941	1.019	+0.195	3.284	+3.128
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.049	−0.023	+0.020	−0.078	+0.057	−0.008	−0.005	−0.127
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.24	−0.80	+0.24	−0.80	+0.24	−0.79	+0.24	−0.79

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Indi. Mag. 3.2		β Delphini. Mag. 3.7		υ Capricorni. Mag. 5.3		α Delphini. Mag. 3.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 20 32 s	° ′ −47 33 ″	h m 20 33 s	° ′ +14 19 ″	h m 20 35 s	° ′ −18 24 ″	h m 20 36 s	° ′ +15 38 ″
Jan. 1.1	7.011	41.68	55.142	43.40	38.640	35.26	2.524	31.94
	22	168	4	180	23	2	2	184
11.1	7.033	40.00	55.146	41.60	38.663	35.28	2.526	30.10
	73	182	40	184	59	6	35	189
21.0	7.106	38.18	55.186	39.76	38.722	35.22	2.561	28.21
	125	193	72	179	93	17	69	187
31.0	7.231	36.25	55.258	37.97	38.815	35.05	2.630	26.34
Feb. 10.0	172	198	108	169	125	26	104	173
	7.403	34.27	55.366	36.28	38.940	34.79	2.734	24.61
	218	199	138	147	157	40	138	154
19.9	7.621	32.28	55.504	34.81	39.097	34.39	2.872	23.07
	257	197	169	121	183	54	165	128
Mar. 1.9	7.878	30.31	55.673	33.60	39.280	33.85	3.037	21.79
	294	192	197	90	212	69	197	96
11.9	8.172	28.39	55.870	32.70	39.492	33.16	3.234	20.83
	330	184	221	53	238	82	223	58
21.9	8.502	26.55	56.094	32.17	39.730	32.34	3.457	20.25
	357	170	216	11	258	97	247	16
31.8	8.859	24.85	56.340	32.06	39.988	31.37	3.704	20.09
	383	156	268	28	279	109	266	24
Apr. 10.8	9.242	23.29	56.608	32.34	40.267	30.28	3.970	20.33
	402	138	282	69	295	119	283	67
20.8	9.644	21.91	56.890	33.03	40.562	29.09	4.253	21.00
	415	113	292	108	306	124	293	105
30.8	10.059	20.78	57.182	34.11	40.868	27.85	4.546	22.05
May 10.7	418	91	296	141	311	129	296	142
	10.477	19.87	57.478	35.52	41.179	26.56	4.842	23.47
20.7	417	60	293	173	311	127	296	172
	10.894	19.27	57.771	37.25	41.490	25.29	5.138	25.19
	405	33	283	194	303	122	285	198
30.7	11.299	18.94	58.054	39.19	41.793	24.07	5.423	27.17
	384	0	267	214	289	114	267	217
June 9.6	11.683	18.94	58.321	41.33	42.082	22.93	5.690	29.34
	353	29	244	226	267	101	244	228
19.6	12.036	19.23	58.565	43.59	42.349	21.92	5.934	31.62
	314	61	215	229	237	86	218	234
29.6	12.350	19.84	58.780	45.88	42.586	21.06	6.152	33.96
July 9.6	266	89	178	230	203	68	179	235
	12.616	20.73	58.958	48.18	42.789	20.38	6.331	36.31
	210	116	139	222	162	48	141	229
19.5	12.826	21.89	59.097	50.40	42.951	19.90	6.472	38.60
	151	138	95	210	120	30	95	218
29.5	12.977	23.27	59.192	52.50	43.071	19.60	6.567	40.78
	85	154	48	197	71	10	48	202
Aug. 8.5	13.062	24.81	59.240	54.47	43.142	19.50	6.615	42.80
	22	161	6	174	24	8	9	180
18.5	13.084	26.45	59.246	56.21	43.166	19.58	6.624	44.60
	43	172	39	153	22	22	39	159
28.4	13.041	28.17	59.207	57.74	43.144	19.80	6.585	46.19
	104	168	78	127	67	35	77	139
Sept. 7.4	12.937	29.85	59.129	59.01	43.077	20.15	6.508	47.58
	155	160	113	101	103	45	114	106
17.4	12.782	31.45	59.016	60.02	42.974	20.60	6.394	48.64
	200	143	112	74	133	51	142	80
27.3	12.582	32.88	58.874	60.76	42.841	21.11	6.252	49.44
Oct. 7.3	233	121	161	45	157	55	160	50
	12.349	34.09	58.713	61.21	42.684	21.66	6.092	49.94
17.3	253	94	174	17	170	55	175	21
	12.096	35.03	58.539	61.38	42.514	22.21	5.917	50.15
	260	61	178	14	173	53	180	11
27.3	11.836	35.64	58.361	61.24	42.341	22.74	5.737	50.04
	252	29	172	41	167	48	174	37
Nov. 6.2	11.584	35.93	58.189	60.83	42.174	23.22	5.563	49.67
	232	7	159	71	153	44	161	72
16.2	11.352	35.86	58.030	60.12	42.021	23.66	5.402	48.95
	203	44	139	96	130	37	141	98
26.2	11.149	35.42	57.891	59.16	41.891	24.03	5.261	47.97
Dec. 6.2	162	75	113	124	102	30	117	125
	10.987	34.67	57.778	57.92	41.789	24.33	5.144	46.72
	114	107	84	144	69	22	88	147
16.1	10.873	33.60	57.694	56.48	41.720	24.55	5.056	45.25
	65	130	52	164	35	17	58	166
26.1	10.808	32.30	57.642	54.84	41.685	24.72	4.998	43.59
	8	156	16	176	1	8	18	180
36.1	10.800	30.74	57.626	53.08	41.686	24.80	4.980	41.79
Mean Place	9.326	40.90	56.336	35.02	40.110	38.01	3.709	23.37
Sec δ, Tan δ	1.482	−1.094	1.032	+0.255	1.054	−0.333	1.038	+0.280
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.084	+0.045	+0.056	−0.011	+0.068	+0.014	+0.055	−0.012
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.25	−0.79	+0.25	−0.78	+0.25	−0.78	+0.25	−0.78

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Pavonis. Mag. 3.6		α Cygni. (*Deneb.*) Mag. 1.3		δ Delphini. Mag. 4.5		ψ Capricorni. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 20 37 s	° ′ −66 28 ″	h m 20 38 s	° ′ +45 0 ″	h m 20 39 s	° ′ +14 47 ″	h m 20 41 s	° ′ −25 32 ″
Jan. 1.1	58.26	56.21	47.088	29.59	50.681	58.90	30.805	52.90
	3	258	61	285	2	180	18	39
11.1	58.23	53.63	47.027	26.74	50.679	57.10	30.823	52.51
	− 7	279	− 12	298	− 33	183	56	51
21.0	58.30	50.84	47.015	23.76	50.712	55.27	30.879	52.00
	15	286	38	305	67	180	91	62
31.0	58.45	47.98	47.053	20.71	50.779	53.47	30.970	51.38
	24	290	89	299	99	168	126	74
Feb. 10.0	58.69	45.08	47.142	17.72	50.878	51.79	31.096	50.64
	32	284	140	280	132	151	158	83
19.9	59.01	42.24	47.282	14.92	51.010	50.28	31.254	49.81
	39	274	189	249	164	124	188	94
Mar. 1.9	59.40	39.50	47.471	12.43	51.174	49.04	31.442	48.87
	47	259	232	209	192	93	217	104
11.9	59.87	36.91	47.703	10.34	51.366	48.11	31.659	47.83
	52	233	272	162	219	55	243	114
21.9	60.39	34.58	47.975	8.72	51.585	47.56	31.902	46.69
	57	208	306	109	243	15	268	122
31.8	60.96	32.50	48.281	7.63	51.828	47.41	32.170	45.47
	61	178	335	50	264	− 26	288	127
Apr. 10.8	61.57	30.72	48.616	7.13	52.092	47.67	32.458	44.20
	64	143	356	8	281	67	307	130
20.8	62.21	29.29	48.972	7.21	52.373	48.34	32.765	42.90
	66	105	365	67	291	105	318	129
30.8	62.87	28.24	49.337	7.88	52.664	49.39	33.083	41.61
	66	68	368	123	296	140	325	126
May 10.7	63.53	27.56	49.705	9.11	52.960	50.79	33.408	40.35
	66	24	360	173	294	171	326	116
20.7	64.19	27.32	50.065	10.84	53.254	52.50	33.734	39.19
	64	− 15	340	220	287	195	320	107
30.7	64.83	27.47	50.405	13.04	53.541	54.45	34.054	38.12
	60	62	319	256	271	214	304	91
June 9.6	65.43	28.09	50.724	15.60	53.812	56.59	34.358	37.21
	55	101	279	289	217	226	284	72
19.6	65.98	29.10	51.003	18.49	54.059	58.85	34.642	36.49
	49	136	211	309	218	232	254	54
29.6	66.47	30.46	51.244	21.58	54.277	61.17	34.896	35.95
	41	173	189	324	184	231	218	32
July 9.6	66.88	32.19	51.433	24.82	54.461	63.48	35.114	35.63
	32	200	138	329	143	225	177	10
19.5	67.20	34.19	51.571	28.11	54.604	65.73	35.291	35.53
	22	227	81	328	100	213	130	10
29.5	67.42	36.46	51.652	31.39	54.704	67.86	35.421	35.63
	12	240	22	318	55	199	82	32
Aug. 8.5	67.54	38.86	51.674	34.57	54.759	69.85	35.503	35.95
	2	248	− 31	301	− 10	180	− 31	48
18.5	67.56	41.34	51.643	37.58	54.769	71.65	35.534	36.43
	− 9	216	88	281	34	156	18	62
28.4	67.47	43.80	51.555	40.39	54.735	73.21	35.516	37.05
	19	235	139	251	75	132	63	73
Sept. 7.4	67.28	46.15	51.416	42.90	54.660	74.53	35.453	37.78
	28	217	182	219	110	105	104	78
17.4	67.00	48.32	51.234	45.09	54.550	75.58	35.349	38.56
	35	189	219	177	137	77	137	80
27.3	66.65	50.21	51.015	46.86	54.413	76.35	35.212	39.36
	42	155	247	137	160	50	163	77
Oct. 7.3	66.23	51.76	50.768	48.23	54.253	76.85	35.049	40.13
	45	110	265	93	173	20	177	70
17.3	65.78	52.86	50.503	49.16	54.080	77.05	34.872	40.83
	47	64	273	43	177	− 10	182	62
27.3	65.31	53.50	50.230	49.59	53.903	76.95	34.690	41.45
	47	11	272	6	172	38	177	50
Nov. 6.2	64.84	53.61	49.958	49.53	53.731	76.57	34.513	41.95
	44	− 37	261	59	160	67	163	37
16.2	64.40	53.24	49.697	48.94	53.571	75.90	34.350	42.32
	40	90	241	108	142	94	141	21
26.2	64.00	52.34	49.456	47.86	53.429	74.96	34.209	42.53
	33	135	214	155	116	121	112	9
Dec. 6.2	63.67	50.99	49.242	46.31	53.313	73.75	34.097	42.62
	27	178	179	200	88	142	77	− 5
16.1	63.40	49.21	49.063	44.31	53.225	72.33	34.020	42.57
	17	213	135	240	56	163	43	19
26.1	63.23	47.08	48.928	41.91	53.169	70.70	33.977	42.38
	8	245	93	267	22	176	4	31
36.1	63.15	44.63	48.835	39.24	53.147	68.94	33.973	42.07
Mean Place	62.305	53.51	48.388	16.16	51.849	50.49	32.386	54.22
Sec δ, Tan δ	2.506	−2.297	1.414	+1.000	1.034	+0.264	1.108	−0.478
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.108	+0.097	+0.041	−0.043	+0.056	−0.011	+0.071	+0.021
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.25	−0.77	+0.25	−0.77	+0.26	−0.77	+0.26	−0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Delphini *seq.* Mag. 4.5		ϵ Cygni. Mag. 2.6		ϵ Aquarii. Mag. 3.8		η Cephei. Mag. 3.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	20 43	+15 50	20 43	+33 40	20 43	− 9 46	20 43	+61 32
Jan. 1.1	3.990	54.07	4.561	63.67	29.215	38.87	41.89	37.45
	6	184	36	252	13	52	16	299
11.1	3.984	52.23	4.525	61.15	29.228	39.39	41.73	34.46
	27	188	8	263	46	45	9	321
21.0	4.011	50.35	4.533	58.52	29.274	39.84	41.64	31.25
	62	186	48	265	80	38	0	334
31.0	4.073	48.49	4.581	55.87	29.354	40.22	41.64	27.91
	97	175	90	257	110	23	7	333
Feb. 10.0	4.170	46.74	4.671	53.30	29.464	40.45	41.71	24.58
	129	157	131	237	141	9	16	316
19.9	4.299	45.17	4.802	50.93	29.605	40.54	41.87	21.42
	160	130	168	209	170	9	23	289
Mar. 1.9	4.459	43.87	4.970	48.84	29.775	40.45	42.10	18.53
	190	97	206	171	195	28	30	251
11.9	4.649	42.90	5.176	47.13	29.970	40.17	42.40	16.02
	218	60	240	129	221	49	37	206
21.9	4.867	42.30	5.416	45.84	30.191	39.68	42.77	13.96
	243	20	268	77	214	72	43	148
31.8	5.110	42.10	5.684	45.07	30.435	38.96	43.20	12.48
	263	21	292	21	266	91	46	87
Apr. 10.8	5.373	42.31	5.976	44.83	30.701	38.05	43.66	11.61
	281	61	312	28	281	111	49	26
20.8	5.654	42.95	6.288	45.11	30.982	36.94	44.15	11.35
	293	103	323	80	294	125	50	39
30.8	5.947	43.98	6.611	45.91	31.276	35.69	44.65	11.74
	297	138	329	132	299	137	51	100
May 10.7	6.244	45.36	6.940	47.23	31.575	34.32	45.16	12.74
	297	171	323	174	301	145	49	158
20.7	6.541	47.07	7.263	48.97	31.876	32.87	45.65	14.32
	288	196	312	215	294	119	46	209
30.7	6.829	49.03	7.575	51.12	32.170	31.38	46.11	16.41
	272	216	290	246	280	146	42	253
June 9.6	7.101	51.19	7.865	53.58	32.450	29.92	46.53	18.94
	251	229	266	271	262	141	37	294
19.6	7.352	53.48	8.131	56.29	32.712	28.51	46.90	21.88
	221	235	227	289	233	131	30	321
29.6	7.573	55.83	8.358	59.18	32.945	27.20	47.20	25.09
	186	236	189	298	200	116	23	343
July 9.6	7.759	58.19	8.547	62.16	33.145	26.04	47.43	28.52
	116	229	113	300	161	100	16	354
19.5	7.905	60.48	8.690	65.16	33.306	25.04	47.59	32.06
	103	220	95	291	119	83	8	359
29.5	8.008	62.68	8.785	68.10	33.425	24.21	47.67	35.65
	56	201	13	285	74	63	1	354
Aug. 8.5	8.064	64.72	8.828	70.95	33.499	23.58	47.66	39.19
	12	185	10	267	29	44	8	340
18.5	8.076	66.57	8.818	73.62	33.528	23.14	47.58	42.59
	31	161	53	242	18	26	16	323
28.4	8.045	68.18	8.765	76.04	33.510	22.88	47.42	45.82
	72	139	98	217	58	9	23	296
Sept. 7.4	7.973	69.57	8.667	78.21	33.452	22.79	47.19	48.78
	108	111	138	184	94	6	30	265
17.4	7.865	70.68	8.529	80.05	33.358	22.85	46.89	51.43
	137	83	171	148	124	21	34	225
27.3	7.728	71.51	8.358	81.53	33.234	23.06	46.55	53.68
	159	53	197	112	148	30	39	181
Oct. 7.3	7.569	72.04	8.161	82.65	33.086	23.36	46.16	55.49
	173	24	211	69	159	39	42	134
17.3	7.396	72.28	7.950	83.34	32.927	23.75	45.74	56.83
	177	7	218	30	165	45	44	81
27.3	7.219	72.21	7.732	83.64	32.762	24.20	45.30	57.64
	174	36	217	17	161	50	44	29
Nov. 6.2	7.045	71.85	7.515	83.47	32.601	24.70	44.86	57.93
	163	66	206	60	149	55	43	30
16.2	6.882	71.19	7.309	82.87	32.452	25.25	44.43	57.63
	143	94	187	103	127	56	41	87
26.2	6.739	70.25	7.122	81.84	32.325	25.81	44.02	56.76
	120	120	161	145	103	59	37	142
Dec. 6.2	6.619	69.05	6.961	80.39	32.222	26.40	43.65	55.34
	91	144	131	179	72	58	33	194
16.1	6.528	67.61	6.830	78.60	32.150	26.98	43.32	53.40
	60	166	99	216	42	59	28	243
26.1	6.468	65.95	6.731	76.44	32.108	27.57	43.04	50.97
	29	180	58	240	6	55	20	279
36.1	6.439	64.15	6.673	74.04	32.102	28.12	42.84	48.18
Mean Place	5.146	45.50	5.735	51.94	30.547	42.70	43.569	21.72
Sec δ, Tan δ	1.039	+0.284	1.202	+0.667	1.015	−0.172	2.099	+1.845
Dψα, Dωα	+0.055	−0.012	+0.048	−0.029	+0.065	+0.008	+0.024	−0.081
Dψδ, Dωδ	+0.26	−0.76	+0.26	−0.76	+0.26	−0.76	+0.26	−0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aquarii. Mag. 4.8		β Indi. Mag. 3.7		220 H¹. Draconis. Mag. 5.6		32 Vulpeculæ. Mag. 5.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	20 48	− 9 16	20 48	−58 44	20 51	+80 15	20 51	+27 45
	s	″	s	″	s	″	s	″
Jan. 1.1	28.819	20.09	45.179	47.60	3.76	69.54	15.561	61.41
	5	54	24	222	69	283	32	228
11.1	28.824	20.63	45.155	45.38	3.07	66.71	15.529	59.13
	43	47	43	239	47	315	7	238
21.0	28.867	21.10	45.198	42.99	2.60	63.56	15.536	56.75
	72	39	113	255	24	334	44	239
31.0	28.939	21.49	45.311	40.44	2.36	60.22	15.580	54.36
	106	26	176	259	2	338	83	231
Feb. 10.0	29.045	21.75	45.487	37.85	2.38	56.84	15.663	52.05
	135	10	238	260	26	332	119	214
20.0	29.180	21.85	45.725	35.25	2.64	53.52	15.782	49.91
	165	8	294	256	50	311	154	186
Mar. 1.9	29.345	21.77	46.019	32.69	3.14	50.41	15.936	48.05
	190	26	347	215	72	280	191	152
11.9	29.535	21.51	46.366	30.24	3.86	47.61	16.127	46.53
	219	50	393	230	91	237	222	111
21.9	29.754	21.01	46.759	27.94	4.77	45.24	16.349	45.42
	241	72	434	211	106	184	251	63
31.8	29.995	20.29	47.193	25.83	5.83	43.40	16.600	44.79
	262	91	468	187	119	127	275	14
Apr. 10.8	30.257	19.38	47.661	23.96	7.02	42.13	16.875	44.65
	280	111	497	158	125	66	295	34
20.8	30.537	18.27	48.158	22.38	8.27	41.47	17.170	44.99
	293	127	515	128	130	5	309	84
30.8	30.830	17.00	48.673	21.10	9.57	41.42	17.479	45.83
	299	138	526	94	129	60	313	129
May 10.7	31.129	15.62	49.199	20.16	10.86	42.02	17.792	47.12
	302	147	523	56	123	117	313	172
20.7	31.431	14.15	49.722	19.60	12.09	43.19	18.105	48.84
	295	150	513	18	114	174	303	205
30.7	31.726	12.65	50.235	19.42	13.23	44.93	18.408	50.89
	282	152	489	20	102	221	287	235
June 9.7	32.008	11.13	50.724	19.62	14.25	47.14	18.695	53.24
	262	144	454	59	86	264	264	256
19.6	32.270	9.69	51.178	20.21	15.11	49.78	18.959	55.80
	237	133	407	96	69	300	230	272
29.6	32.507	8.36	51.585	21.17	15.80	52.78	19.189	58.52
	202	121	318	131	50	328	194	279
July 9.6	32.709	7.15	51.933	22.48	16.30	56.06	19.383	61.31
	166	106	281	160	30	344	152	279
19.5	32.875	6.09	52.214	24.08	16.60	59.50	19.535	64.10
	123	87	205	187	8	355	104	273
29.5	32.998	5.22	52.419	25.95	16.68	63.05	19.639	66.83
	77	66	125	205	13	356	57	261
Aug. 8.5	33.075	4.56	52.544	28.00	16.55	66.61	19.696	69.44
	31	48	42	219	34	319	10	244
18.5	33.109	4.08	52.586	30.19	16.21	70.10	19.706	71.88
	14	31	39	222	51	337	37	220
28.4	33.095	3.77	52.547	32.41	15.67	73.47	19.669	74.08
	53	11	120	217	73	319	79	196
Sept. 7.4	33.042	3.66	52.427	34.58	14.94	76.66	19.590	76.04
	90	6	189	206	89	289	119	166
17.4	32.952	3.72	52.238	36.64	14.05	79.55	19.471	77.70
	120	18	250	183	105	257	151	133
27.4	32.832	3.90	51.988	38.47	13.00	82.12	19.320	79.03
	115	30	299	156	117	216	175	98
Oct. 7.3	32.687	4.20	51.689	40.03	11.83	84.28	19.145	80.01
	157	36	331	119	127	170	192	60
17.3	32.530	4.56	51.358	41.22	10.56	85.98	18.953	80.61
	163	46	347	80	131	121	198	22
27.3	32.367	5.02	51.011	42.02	9.22	87.19	18.755	80.83
	162	51	346	35	137	66	196	17
Nov. 6.2	32.205	5.53	50.665	42.37	7.85	87.85	18.559	80.66
	149	54	330	11	137	10	188	57
16.2	32.056	6.07	50.335	42.26	6.48	87.95	18.371	80.09
	129	58	296	57	134	51	170	96
26.2	31.927	6.65	50.039	41.69	5.14	87.44	18.201	79.13
	104	61	250	100	126	109	149	132
Dec. 6.2	31.823	7.26	49.789	40.69	3.88	86.35	18.052	77.81
	76	60	195	139	115	164	119	165
16.1	31.747	7.86	49.594	39.30	2.73	84.71	17.933	76.16
	46	60	133	175	101	218	88	196
26.1	31.701	8.46	49.461	37.55	1.72	82.53	17.845	74.20
	10	60	64	206	83	260	54	217
36.1	31.691	9.06	49.397	35.49	0.89	79.93	17.791	72.03
Mean Place	30.130	23.80	48.224	44.33	7.854	51.93	16.676	50.64
Sec δ, Tan δ	1.013	−0.163	1.928	−1.648	5.916	+5.830	1.130	+0.526
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.064	+0.007	+0.094	+0.074	−0.052	−0.264	+0.051	−0.024
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.27	−0.74	+0.27	−0.74	+0.27	−0.73	+0.27	−0.73

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Cygni. Mag. 4.0		α Octantis. Mag. 5.2		γ Microscopii. Mag. 4.7		θ Capricorni. Mag. 4.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	20 54	+40 52	20 55	−77 18	20 56	−32 33	21 1	−17 32
	s	″	s	″	s	″	s	″
Jan. 1.1	16.947 66	25.02 263	19.30 19	75.40	32.664	35.70	35.864 1	21.85 5
11.1	16.881 22	22.39 281	19.11 4	72.44 296	32.664 0	34.90 80	35.863 30	21.90 —
21.0	16.859 — 25	19.58 287	19.07 — 15	69.28 316	32.704 40	33.95 95	35.893 66	21.85 15
31.0	16.884 71	16.71 284	19.22 30	65.99 329	32.781 77	32.86 109	35.959 97	21.70 29
Feb. 10.0	16.955 116	13.87 269	19.52 45	62.66 333 326	32.897 116 150	31.65 121 131	36.056 129	21.41 44
20.0	17.071	11.18	19.97	59.40	33.047	30.34	36.185	20.97
Mar. 1.9	17.235 164	8.80 238	20.58 61	56.25 315	33.231 184	28.96 138	36.344 159	20.39 58
11.9	17.441 206	6.77 203	21.31 73	53.30 295	33.447 216	27.48 118	36.532 188	19.64 75
21.9	17.685 244	5.18 159	22.15 84	50.60 270	33.694 247	25.96 152	36.746 214	18.74 90
31.9	17.966 281 308	4.08 110 52	23.10 95 102	48.21 239 203	33.969 275 299	24.41 155 154	36.987 241 263	17.69 105 119
Apr. 10.8	18.274	3.56 —	24.12	46.18	34.268	22.87	37.250	16.50
20.8	18.605 331	3.58 2	25.22 110	44.55 163	34.587 319	21.38 149	37.534 284	15.19 131
30.8	18.950 345	4.18 60	26.34 112	43.35 120	34.921 334	19.95 143	37.834 300	13.81 138
May 10.7	19.304 354	5.35 117	27.48 114	42.62 73	35.266 345	18.63 132	38.142 308	12.39 142
20.7	19.651 347 334	6.98 163 205	28.62 114 111	42.37 — 25 22	35.614 348 313	17.45 118 99	38.455 313 310	10.95 144 138
30.7	19.985	9.03	29.73	42.59	35.957	16.46	38.765	9.57
June 9.7	20.303 318	11.48 215	30.77 104	43.29 70	36.287 330	15.67 79	39.064 299	8.27 130
19.6	20.586 283	14.24 276	31.74 97	44.46 117	36.599 312	15.13 54	39.344 280	7.08 119
29.6	20.835 249	17.23 299	32.61 87	46.05 159	36.880 281	14.84 29	39.600 256	6.07 101
July 9.6	21.041 206 154	20.36 313 318	33.34 73 58	48.04 199 230	37.125 245 201	14.81 — 3 22	39.822 222 185	5.23 84 63
19.5	21.195	23.54	33.92 42	50.34	37.326	15.03	40.007	4.60
29.5	21.300 105	26.73 319	34.34 24	52.92 258	37.480 154	15.49 46	40.151 144	4.18 42
Aug. 8.5	21.348 — 48	29.82 309	34.58 — 5	55.66 274	37.582 102	16.17 68	40.247 96	3.96 22
18.5	21.345 3	32.78 296	34.63 — 14	58.52 286	37.631 — 49	17.04 87	40.294 47	3.95 — 1
28.4	21.288 57 106	35.51 273 247	34.49 32	61.35 283 273	37.626 5 53	18.04 100 109	40.297 — 3 41	4.13 18 31
Sept. 7.4	21,182	37.98	34.17	64.08	37.573	19.13	40.256	4.44
17.4	21.034 148	40.16 218	33.70 47	66.59 251	37.475 98	20.25 112	40.174 82	4.90 46
27.4	20.848 186	41.96 180	33.07 63	68.80 221	37.338 137	21.37 112	40.059 115	5.44 54
Oct. 7.3	20.634 214	43.36 140	32.32 75	70.60 180	37.174 164	22.40 103	39.918 141	6.03 59
17.3	20.400 234 244	44.35 99 50	31.48 84 89	71.94 134 80	36.990 184 194	23.33 93 77	39.761 157 167	6.65 62 62
27.3	20.156	44.85 6	30.59	72.74 23	36.796	24.10 59	39.594	7.27
Nov. 6.2	19.911 245	44.91 — 44	29.68 91	72.97 — 34	36.605 191	24.69 37	39.430 164	7.84 57
16.2	19.674 237	44.47 92	28.80 88	72.63 94	36.425 180	25.06 13	39.275 155	8.37 53
26.2	19.453 221	43.55 136	27.98 82	71.69 149	36.264 161	25.19 — 8	39.139 136	8.84 47
Dec. 6.2	19.256 197 168	42.19 183	27.26 72 60	70.20 198	36.134 130 99	25.11 30	39.025 114 86	9.23 39 31
16.1	19.088	40.36	26.66	68.22	36.035	24.81	38.939	9.54
26.1	18.958 130	38.16 220	26.20 46	65.81 241	35.974 61	24.32 49	38.884 55	9.76 22
36.1	18.864 94	35.67 249	25.91 29	63.05 276	35.952 22	23.63 69	38.865 19	9.89 13
Mean Place.	18.104	11.93	26.607	70.59	34.372	34.89	37.250	23.36
Sec δ, Tan δ	1.322	+0.865	4.555	−4.443	1.186	−0.638	1.049	−0.316
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.045	−0.040	+0.146	+0.205	+0.073	+0.030	+0.067	+0.015
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.27	−0.72	+0.28	−0.72	+0.28	−0.72	+0.28	−0.70

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Cygni. Mag. 3.9		61 Cygni *pr.* Mag. 5.6		ν Aquarii. Mag. 4.5		Bradley 2777. Mag. 5.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	21 2	+43 37	21 3	+38 22	21 5	−11 40	21 6	+77 48
	s	″	s	″	s	″	s	″
Jan. 1.1	6.636	26.23	25.479	24.46	22.773	60.60	61.39	70.04
	83	265	53	215	5	38	59	272
11.1	6.553	23.58	25.426	22.01	22.768	60.98	60.80	67.32
	37	281	12	261	—	31	42	308
21.0	6.516	20.74	25.414	19.40	22.792	61.29	60.38	64.24
	—	293	—	266	24	19	24	328
31.0	10	17.81	30	16.74	22.852	61.48	60.14	60.96
	6.526	290	25.444	261	60	7	4	338
Feb. 10.0	59	14.91	74	14.10	89	—	—	57.58
	6.585	278	25.518	216	22.941	61.55	60.10	336
	107		119		120	9	15	
20.0	6.692	12.13	25.637	11.64	23.061	61.46	60.25	54.22
	156	251	165	222	150	24	34	317
Mar. 1.9	6.848	9.62	25.802	9.42	23.211	61.22	60.59	51.05
	202	216	205	185	176	46	53	290
11.9	7.050	7.46	26.007	7.57	23.387	60.76	61.12	48.15
	244	174	242	144	209	65	68	247
21.9	7.294	5.72	26.249	6.13	23.596	60.11	61.80	45.68
	282	121	278	95	231	85	82	200
31.9	7.576	4.51	26.527	5.18	23.827	59.26	62.62	43.68
	315	67	307	40	255	104	93	143
Apr. 10.8	7.891	3.84	26.834	4.78	24.082	58.22	63.55	42.25
	338	10	329	—	276	121	100	83
20.8	8.229	3.74	27.163	4.94	24.358	57.01	64.55	41.42
	356	—	345	16	291	136	105	21
30.8	8.585	48	27.508	70	24.649	55.65	65.60	—
		4.22		5.64				41.21
May 10.7	8.949	104	27.859	123	24.950	54.21	66.65	41
	364	5.26	351	6.87	301	144	105	41.62
20.7	9.311	156	28.209	171	25.255	52.70	67.67	104
	362	6.82	350	8.58	305	151	102	42.66
	349	202	340	213	304	153	97	158
30.7	9.660	8.84	28.549	10.71	25.559	51.17	68.64	44.24
	330	210	322	250	292	119	88	210
June 9.7	9.990	11.24	28.871	13.21	25.851	49.68	69.52	46.34
	299	274	296	281	274	143	76	255
19.6	10.289	13.98	29.167	16.02	26.125	48.25	70.28	48.89
	262	299	259	301	251	129	64	292
29.6	10.551	16.97	29.426	19.03	26.376	46.96	70.92	51.81
	217	315	218	315	219	115	48	321
July 9.6	10.768	20.12	29.644	22.18	26.595	45.81	71.40	55.02
	167	325	171	321	182	97	33	344
19.6	10.935	23.37	29.815	25.39	26.777	44.84	71.73	58.46
	114	325	121	321	141	78	16	357
29.5	11.049	26.62	29.936	28.60	26.918	44.06	71.89	62.03
	57	320	69	312	96	56	—	360
Aug. 8.5	11.106	29.82	30.005	31.72	27.014	43.50	1	65.63
	0	306	16	296	50	36	71.88	361
18.5	11.106	32.88	30.021	34.68	27.064	43.14	19	69.24
	53	287	—	276	4	18	71.69	345
28.4	11.053	35.75	35	37.44	27.068	42.96	34	72.69
	104	261	29.986	252	—	—	71.35	330
			82		38	1	50	
Sept. 7.4	10.949	38.36	29.904	39.96	27.030	42.97	70.85	75.99
	151	232	126	220	78	16	64	305
17.4	10.798	40.68	29.778	42.16	26.952	43.13	70.21	79.04
	188	195	161	185	110	30	77	272
27.4	10.610	42.63	29.617	44.01	26.842	43.43	69.44	81.76
	220	156	190	147	133	39	87	235
Oct. 7.3	10.390	44.19	29.427	45.48	26.709	43.82	68.57	84.11
	210	112	208	104	152	47	97	190
17.3	10.150	45.31	29.219	46.52	26.557	44.29	67.60	86.01
	254	67	219	60	160	53	102	141
27.3	9.896	45.98	29.000	47.12	26.397	44.82	66.58	87.42
	257	18	221	13	160	55	106	87
Nov. 6.3	9.639	46.16	28.779	47.25	26.237	45.37	65.52	88.29
	252	—	217	—	149	57	108	31
16.2	9.387	34	28.562	31	26.088	45.94	64.44	88.60
	237	45.85	200	46.94	134	56	105	—
26.2	9.150	81	28.362	76	25.954	46.50	63.39	29
	213	45.04	176	46.18	111	55	101	88.31
Dec. 6.2	8.937	129	28.186	123	25.843	47.05	62.38	90
	186	43.75	150	44.95	87	53	93	87.41
		175		165				146
16.1	8.751	42.00	28.036	43.30	25.756	47.58	61.45	85.95
	151	216	116	200	56	48	83	201
26.1	8.601	39.84	27.920	41.30	25.700	48.06	60.62	83.94
	110	250	78	233	24	44	69	249
36.1	8.491	37.34	27.842	38.97	25.676	48.50	59.93	81.45
Mean Place	7.763	12.51	26.578	11.89	24.064	63.09	64.298	51.94
Sec δ, Tan δ	1.381	+0.953	1.276	+0.792	1.021	−0.207	4.739	+4.632
$D_{\psi a}$, $D_{\omega a}$	+0.043	−0.045	+0.047	−0.038	+0.065	+0.010	−0.023	−0.225
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.28	−0.70	+0.29	−0.70	+0.29	−0.69	+0.29	−0.68

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Piscis Australis. Mag. 5.6		ζ Cygni. Mag. 3.4		τ Cygni. Mag. 3.8		α Equulei. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	21 8	−27 55	21 9	+29 54	21 11	+37 42	21 11	+ 4 55
	s	″	s	″	s	″	s	″
Jan. 1.1	42.022	64.18	38.461	48.39	41.972	70.74	57.399	49.21
	9	53	52	224	72	243	19	122
11.1	42.013	63.65	38.409	46.15	41.900	68.31	57.380	47.99
	26	67	17	239	33	262	9	124
21.1	42.039	62.98	38.392	43.76	41.867	65.69	57.389	46.75
	61	82	23	242	9	270	44	117
31.0	42.100	62.16	38.415	41.34	41.876	62.99	57.433	45.58
	98	95	59	238	52	267	72	108
Feb. 10.0	42.198	61.21	38.474	38.96	41.928	60.32	57.505	44.50
	129	108	100	223	95	254	105	91
20.0	42.327	60.13	38.574	36.73	42.023	57.78	57.610	43.59
	165	120	136	197	139	231	133	69
Mar. 1.9	42.492	58.93	38.710	34.76	42.162	55.47	57.743	42.90
	194	131	176	165	181	197	165	44
11.9	42.686	57.62	38.886	33.11	42.343	53.50	57.908	42.46
	225	138	209	127	220	156	193	13
21.9	42.911	56.24	39.095	31.84	42.563	51.94	58.101	42.33
	253	148	213	79	257	108	220	18
31.9	43.164	54.76	39.338	31.05	42.820	50.86	58.321	42.51
	279	151	267	31	288	56	244	52
Apr. 10.8	43.443	53.25	39.605	30.74	43.108	50.30	58.565	43.03
	303	153	293	17	313	1	266	83
20.8	43.746	51.72	39.898	30.91	43.421	50.29	58.831	43.86
	315	150	310	69	330	53	282	114
30.8	44.061	50.22	40.208	31.60	43.751	50.82	59.113	45.00
	330	145	318	117	340	105	293	139
May 10.8	44.391	48.77	40.526	32.77	44.091	51.87	59.406	46.39
	335	133	323	157	343	153	297	163
20.7	44.726	47.44	40.849	34.34	44.434	53.40	59.703	48.02
	333	119	314	197	334	198	294	180
30.7	45.059	46.25	41.163	36.31	44.768	55.38	59.997	49.82
	322	103	299	229	319	233	285	192
June 9.7	45.381	45.22	41.462	38.60	45.087	57.71	60.282	51.74
	306	83	279	253	292	265	266	197
19.6	45.687	44.39	41.741	41.13	45.379	60.36	60.548	53.71
	277	58	248	273	261	287	214	197
29.6	45.964	43.81	41.989	43.86	45.640	63.23	60.792	55.68
	215	34	210	281	220	303	212	194
July 9.6	46.209	43.47	42.199	46.67	45.860	66.26	61.004	57.62
	206	9	170	286	175	310	176	184
19.6	46.415	43.38	42.369	49.53	46.035	69.36	61.180	59.46
	159	16	124	284	126	311	137	170
29.5	46.574	43.54	42.493	52.37	46.161	72.47	61.317	61.16
	111	37	78	274	75	303	92	152
Aug. 8.5	46.685	43.91	42.571	55.11	46.236	75.50	61.409	62.68
	62	60	27	259	22	291	46	135
18.5	46.747	44.51	42.598	57.70	46.258	78.41	61.455	64.03
	10	75	18	236	29	272	4	112
28.4	46.757	45.26	42.580	60.06	46.229	81.13	61.459	65.15
	38	89	67	216	77	246	37	92
Sept. 7.4	46.719	46.15	42.513	62.22	46.152	83.59	61.422	66.07
	81	96	105	183	120	217	74	68
17.4	46.638	47.11	42.408	64.05	46.032	85.76	61.348	66.75
	120	98	139	151	158	184	106	45
27.4	46.518	48.09	42.269	65.56	45.874	87.60	61.242	67.20
	118	99	161	120	186	117	131	24
Oct. 7.3	46.370	49.08	42.105	66.76	45.688	89.07	61.111	67.44
	168	89	186	79	209	106	149	1
17.3	46.202	49.97	41.919	67.55	45.479	90.13	60.962	67.45
	179	80	196	43	220	64	156	19
27.3	46.023	50.77	41.723	67.98	45.259	90.77	60.806	67.26
	180	66	198	2	225	18	158	37
Nov. 6.3	45.843	51.43	41.525	67.96	45.034	90.95	60.648	66.89
	169	48	193	40	220	27	151	57
16.2	45.674	51.91	41.332	67.56	44.814	90.68	60.497	66.32
	153	32	178	80	207	73	137	75
26.2	45.521	52.23	41.154	66.76	44.607	89.95	60.360	65.57
	129	12	161	119	188	119	117	88
Dec. 6.2	45.392	52.35	40.993	65.57	44.419	88.76	60.243	64.69
	100	6	134	157	162	160	94	103
16.1	45.292	52.29	40.859	64.00	44.257	87.16	60.149	63.66
	67	24	106	185	132	198	66	115
26.1	45.225	52.05	40.753	62.15	44.125	85.18	60.083	62.51
	31	41	76	213	97	229	39	122
36.1	45.194	51.64	40.677	60.02	44.028	82.89	60.044	61.29
Mean Place	43.582	63.33	39.489	37.17	43.001	57.95	58.500	43.41
Sec δ, Tan δ	1.132	−0.530	1.154	+0.575	1.264	+0.773	1.004	+0.086
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.071	+0.026	+0.051	−0.028	+0.047	−0.038	+0.060	−0.004
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.29	−0.68	+0.29	−0.68	+0.30	−0.67	+0.30	−0.67

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Cygni. Mag. 4.3		θ¹ Microscopii. Mag. 4.9		α Cephei. Mag. 2.6		ι Capricorni. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 21 14 s	° ′ +39 4 ″	h m 21 15 s	° ′ −41 7 ″	h m 21 16 s	° ′ +62 15 ″	h m 21 17 s	° ′ −17 9 ″
Jan. 1.1	22.409	30.38	48.430	72.92	43.28	49.09	56.385	47.21
	80	246	28	124	22	273	16	7
11.1	22.329	27.92	48.402	71.68	43.06	46.36	56.369	47.28
	40	264	14	144	15	304	14	3
21.1	22.289	25.28	48.416	70.24	42.91	43.32	56.383	47.25
	2	274	58	162	7	323	48	18
31.0	22.291	22.54	48.474	68.62	42.84	40.09	56.431	47.07
	49	275	99	175	0	331	79	30
Feb. 10.0	22.340	19.79	48.573	66.87	42.84	36.78	56.510	46.77
	92	261	137	186	10	323	112	45
20.0	22.432	17.18	48.710	65.01	42.94	33.55	56.622	46.32
	135	237	179	193	17	301	140	62
Mar. 1.9	22.567	14.81	48.889	63.08	43.11	30.51	56.762	45.70
	179	206	216	197	25	275	171	77
11.9	22.746	12.75	49.105	61.11	43.36	27.76	56.933	44.93
	222	164	251	198	32	232	200	95
21.9	22.968	11.11	49.356	59.13	43.68	25.44	57.133	43.98
	258	116	284	196	39	182	229	112
31.9	23.226	9.95	49.640	57.17	44.07	23.62	57.362	42.86
	291	63	315	188	44	129	254	126
Apr. 10.8	23.517	9.32	49.955	55.29	44.51	22.33	57.616	41.60
	315	−8	339	179	49	66	276	137
20.8	23.832	9.24	50.294	53.50	45.00	21.67	57.892	40.23
	335	47	361	162	51	−5	295	146
30.8	24.167	9.71	50.655	51.88	45.51	21.62	58.187	38.77
	345	99	375	145	51	58	307	152
May 10.8	24.512	10.70	51.030	50.43	46.02	22.20	58.494	37.25
	347	150	382	122	52	117	312	152
20.7	24.859	12.20	51.412	49.21	46.54	23.37	58.806	35.73
	339	193	381	97	50	175	312	148
30.7	25.198	14.13	51.793	48.24	47.04	25.12	59.118	34.25
	323	233	370	67	46	220	304	141
June 9.7	25.521	16.46	52.163	47.57	47.50	27.32	59.422	32.84
	299	263	351	36	43	261	288	128
19.6	25.820	19.09	52.514	47.21	47.93	29.96	59.710	31.56
	265	288	321	−6	36	300	265	112
29.6	26.085	21.97	52.838	47.15	48.29	32.96	59.975	30.44
	224	304	285	−27	30	327	234	93
July 9.6	26.309	25.01	53.123	47.42	48.59	36.23	60.209	29.51
	179	313	241	58	22	346	199	73
19.6	26.488	28.14	53.364	48.00	48.81	39.69	60.408	28.78
	129	314	189	86	15	355	156	49
29.5	26.617	31.28	53.553	48.86	48.96	43.24	60.564	28.29
	77	308	131	111	6	359	112	28
Aug. 8.5	26.694	34.36	53.687	49.97	49.02	46.83	60.676	28.01
	24	294	75	131	−1	352	65	6
18.5	26.718	37.30	53.762	51.28	49.01	50.35	60.741	27.95
	−28	277	17	146	10	340	18	13
28.5	26.690	40.07	53.779	52.71	48.91	53.75	60.759	28.08
	77	252	−40	155	17	319	−26	31
Sept. 7.4	26.613	42.59	53.739	54.29	48.74	56.94	60.733	28.39
	121	223	92	157	24	291	68	45
17.4	26.492	44.82	53.647	55.86	48.50	59.85	60.665	28.84
	158	190	137	152	31	262	101	56
27.4	26.334	46.72	53.510	57.38	48.19	62.17	60.564	29.40
	190	152	174	141	35	219	130	62
Oct. 7.3	26.144	48.24	53.336	58.79	47.84	64.66	60.434	30.02
	211	111	200	122	39	171	159	67
17.3	25.933	49.35	53.136	60.01	47.45	66.40	60.284	30.69
	226	68	215	100	42	126	159	66
27.3	25.707	50.03	52.921	61.01	47.03	67.66	60.125	31.35
	229	21	218	73	43	71	162	63
Nov. 6.3	25.478	50.27	52.703	61.74	46.60	68.37	59.963	31.98
	227	−21	210	43	44	19	155	58
16.2	25.251	50.03	52.493	62.17	46.16	68.56	59.808	32.56
	215	72	193	10	43	−43	140	51
26.2	25.036	49.31	52.300	62.27	45.73	68.13	59.668	33.07
	195	117	165	−22	40	100	119	44
Dec. 6.2	24.841	48.14	52.135	62.05	45.33	67.13	59.549	33.51
	170	161	132	51	36	153	94	36
16.2	24.671	46.53	52.003	61.54	44.97	65.60	59.455	33.87
	140	197	95	82	33	204	65	26
26.1	24.531	44.56	51.908	60.72	44.64	63.56	59.390	34.13
	103	231	52	106	26	252	36	16
36.1	24.428	42.25	51.856	59.66	44.38	61.04	59.354	34.29
Mean Place	23.431	17.31	50.346	69.36	44.630	32.23	57.712	47.91
Sec δ, Tan δ	1.288	+0.812	1.328	−0.873	2.148	+1.902	1.047	−0.309
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.047	−0.041	+0.076	+0.044	+0.028	−0.096	+0.066	+0.016
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.30	−0.66	+0.30	−0.66	+0.30	−0.65	+0.30	−0.65

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	1 Pegasi. Mag. 4.2		γ Pavonis. Mag. 4.3		ζ Capricorni. Mag. 3.9		ζ Cygni. Mag. 5.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	21 18	+19 28	21 20	−65 42	21 22	−22 44	21 26	+46 11
	s	″	s	″	s	″	s	″
Jan. 1.1	30.511 40	36.62 185	2.09 12	64.25	15.061	45.15	35.443 119	76.58
11.1	30.471 9	34.77 191	1.97 4	61.82 243	15.040 21	44.93 22	35.324 74	74.08 250
21.1	30.462 — 23	32.86 192	1.93 — 4	59.12 270	15.052 12	44.55 38	35.250 27	71.33 275
31.0	30.485 61	30.94 185	1.97 13	56.24 288	15.095 43	44.02 53	35.223 — 23	68.44 289
Feb. 10.0	30.546 90	29.09 170	2.10 21	53.22 302 305	15.172 77 112	43.38 64 80	35.246 71	65.51 293 285
20.0	30.636	27.39	2.31	50.17	15.284	42.58	35.320	62.66
Mar. 1.9	30.762 126	25.90 149	2.60 29	47.15 302	15.424 140	41.63 95	35.446 126	60.01 265
11.9	30.921 159	24.70 120	2.95 35	44.21 294	15.598 174	40.52 111	35.624 178	57.66 235
21.9	31.114 193	23.88 82	3.37 42	41.41 280	15.802 204	39.28 124	35.849 225	55.71 195
31.9	31.337 223 248	23.47 41 0	3.86 49 53	38.82 259 233	16.036 234 259	37.89 139 111	36.119 270 309	54.24 147 93
Apr. 10.8	31.585	23.47	4.39	36.49	16.295	36.45	36.428	53.31
20.8	31.856 271	23.89 42	4.96 57	34.47 202	16.577 282	34.93 152	36.768 340	52.94 — 37
30.8	32.147 291	24.74 85	5.57 61	32.79 168	16.879 302	33.39 154	37.130 362	53.14 20
May 10.8	32.448 301	25.99 125	6.21 64	31.51 128	17.194 315	31.84 155	37.505 375	53.90 76
20.7	32.753 305 305	27.60 161 189	6.85 64 63	30.63 88 41	17.516 322 323	30.35 119 143	37.885 380 373	55.21 131 180
30.7	33.058	29.49	7.48	30.19 —	17.839	28.92	38.258	57.01
June 9.7	33.348 290	31.65 216	8.10 62	30.21 2	18.154 315	27.66 126	38.613 355	59.24 223
19.6	33.621 273	33.99 234	8.68 58	30.66 45	18.453 299	26.58 108	38.943 330	61.85 261
29.6	33.871 250	36.44 245	9.22 54	31.56 90	18.729 276	25.66 92	39.236 293	64.74 289
July 9.6	34.086 215 176	38.94 250 218	9.69 47 39	32.87 131 167	18.975 216 208	25.01 65 45	39.486 250 202	67.86 312 325
19.6	34.262	41.42	10.08	34.54	19.183	24.56	39.688	71.11
29.5	34.399 137	43.84 242	10.38 30	36.51 197	19.349 166	24.37 — 19	39.834 146	74.42 331
Aug. 8.5	34.489 90	46.12 228	10.60 22	38.77 226	19.469 120	24.40 3	39.923 89	77.72 330
18.5	34.536 47	48.25 213	10.70 10	41.19 212	19.542 73	24.66 26	39.955 — 32	80.93 321
28.5	34.536 0 39	50.18 193 168	10.71 — 1 10	43.71 252 250	19.565 — 23 22	25.14 48 58	39.930 25 78	83.98 305 284
Sept. 7.4	34.497	51.86	10.61	46.21	19.543	25.72	39.852	86.82
17.4	34.416 81	53.27 141	10.43 18	48.62 241	19.475 68	26.46 74	39.723 129	89.38 256
27.4	34.300 116	54.43 116	10.15 28	50.83 221	19.374 101	27.27 81	39.551 172	91.61 223
Oct. 7.3	34.161 139	55.25 82	9.81 34	52.77 194	19.241 133	28.11 84	39.344 207	93.49 188
17.3	34.003 158 169	55.77 52 21	9.41 40 43	54.33 156 114	19.091 150 166	28.93 82 82	39.110 234 253	94.93 144 99
27.3	33.834	55.98	8.98	55.47	18.925	29.75	38.857	95.92
Nov. 6.3	33.662 172	55.87 11	8.53 45	56.11 64	18.758 167	30.44 69	38.595 262	96.43 51
16.2	33.495 167	55.43 44	8.09 44	56.24 — 13	18.594 164	31.03 59	38.333 262	96.44 — 1
26.2	33.341 154	54.68 75	7.67 42	55.85 39	18.447 147	31.47 44	38.081 252	95.93 51
Dec. 6.2	33.204 137 116	53.63 105 133	7.29 38 31	54.95 90 139	18.320 127 101	31.81 34 17	37.844 237 211	94.92 101 149
16.2	33.088	52.30	6.98	53.56	18.219	31.98	37.633	93.43
26.1	32.997 91	50.74 156	6.73 25	51.73 183	18.145 74	32.01 — 3	37.450 183	91.50 193
36.1	32.936 61	48.99 175	6.56 17	49.51 222	18.106 39	31.90 11	37.305 145	89.20 230
Mean Place	31.509	27.67	5.838	57.47	16.470	44.44	36.419	62.04
Sec δ, Tan δ	1.061	+0.354	2.431	−2.216	1.084	−0.419	1.445	+1.043
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.055	−0.018	+0.099	+0.113	+0.068	+0.022	+0.044	−0.055
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.30	−0.65	+0.30	−0.64	+0.31	−0.64	+0.31	−0.62

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Aquarii. Mag. 3.1		β Cephei. Mag. 3.3		ξ Aquarii. Mag. 4.8		74 Cygni. Mag. 5.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 21 27	° ′ ″ − 5 54	h m s 21 27	° ′ ″ +70 13	h m s 21 33	° ′ ″ − 8 11	h m s 21 33	° ′ ″ +40 3
Jan. 1.1	29.256	35.84	38.87	38.99	38.116	58.95	50.812	74.56
	24	68	37	261	31	54	100	231
11.1	29.232	36.52	38.50	36.38	38.085	59.49	50.712	72.22
	0	60	27	295	3	46	64	257
21.1	29.232	37.12	38.23	33.43	38.082	59.95	50.648	69.65
	36	50	17	320	29	37	22	269
31.0	29.268	37.62	38.06	30.23	38.111	60.32	50.626	66.96
	62	38	5	334	59	23	22	273
Feb. 10.0	29.330	38.00	38.01	26.89	38.170	60.55	50.648	64.23
	96	22	6	335	89	6	68	262
20.0	29.426	38.22	38.07	23.54	38.259	60.61	50.716	61.61
Mar. 2.0	29.548	38.24	38.25	20.32	38.380	60.48	50.829	59.16
	122	2	18	322	121	13	113	245
11.9	29.705	38.06	38.55	17.39	38.530	60.18	50.989	57.02
	157	18	30	293	150	30	160	214
21.9	29.886	37.65	38.95	14.84	38.708	59.62	51.193	55.28
	181	41	40	255	178	56	201	174
31.9	30.099	36.97	39.44	12.76	38.917	58.84	51.434	53.96
	213	68	49	208	209	78	241	132
	237	90	57	154	235	101	282	80
Apr. 10.8	30.336	36.07	40.01	11.22	39.152	57.83	51.716	53.16
	261	114	63	95	259	121	309	26
20.8	30.597	34.93	40.64	10.27	39.411	56.62	52.025	52.90
	281	133	67	35	280	138	332	28
30.8	30.878	33.60	41.31	9.92	39.691	55.24	52.357	53.18
	295	148	68	28	294	154	348	81
May 10.8	31.173	32.12	41.99	10.20	39.985	53.70	52.705	53.99
	299	161	68	91	303	162	354	132
20.7	31.472	30.51	42.67	11.11	40.288	52.08	53.059	55.31
	302	171	66	149	303	168	349	180
30.7	31.774	28.80	43.33	12.60	40.591	50.40	53.408	57.11
June 9.7	32.067	27.09	43.95	14.60	40.889	48.72	53.745	59.31
	293	171	62	200	298	168	337	220
19.7	32.346	25.43	44.50	17.07	41.173	47.10	54.061	61.83
	279	166	55	247	284	162	316	252
29.6	32.604	23.80	44.99	19.94	41.436	45.55	54.342	64.60
	258	163	49	287	263	155	281	277
July 9.6	32.834	22.32	45.38	23.12	41.673	44.14	54.591	67.60
	230	148	39	318	237	141	249	300
	194	134	30	342	201	123	200	312
19.6	33.028	20.98	45.68	26.54	41.874	42.91	54.791	70.72
	154	117	19	358	161	107	152	319
29.5	33.182	19.81	45.87	30.12	42.035	41.84	54.943	73.91
	114	94	9	363	122	83	101	311
Aug. 8.5	33.296	18.87	45.96	33.75	42.157	41.01	55.044	77.02
	67	77	2	365	74	64	47	304
18.5	33.363	18.10	45.94	37.40	42.231	40.37	55.091	80.06
	27	54	13	353	33	40	4	286
28.5	33.390	17.56	45.81	40.93	42.264	39.97	55.087	82.92
	20	34	23	338	15	20	51	268
Sept. 7.4	33.370	17.22	45.58	44.31	42.249	39.77	55.033	85.60
	58	11	32	315	51	2	100	237
17.4	33.312	17.11	45.26	47.46	42.198	39.75	54.933	87.97
	93	4	41	283	87	13	141	207
27.4	33.219	17.15	44.85	50.29	42.111	39.88	54.792	90.04
	117	18	48	249	114	29	176	171
Oct. 7.4	33.102	17.33	44.37	52.78	41.997	40.17	54.616	91.75
	138	30	54	205	134	40	198	131
17.3	32.964	17.63	43.83	54.83	41.863	40.57	54.418	93.06
	151	15	59	155	147	51	217	91
27.3	32.813	18.08	43.24	56.38	41.716	41.08	54.201	93.97
Nov. 6.3	32.661	18.60	42.63	57.41	41.564	41.64	53.974	94.41
	152	52	61	103	152	56	227	44
16.2	32.514	19.20	42.00	57.89	41.417	42.26	53.749	94.37
	147	60	63	48	147	62	225	4
26.2	32.378	19.84	41.38	57.77	41.280	42.90	53.527	93.87
	136	64	62	12	137	64	222	50
Dec. 6.2	32.260	20.52	40.78	57.04	41.161	43.55	53.324	92.91
	118	68	60	73	119	65	203	96
	97	71	56	128	98	67	182	140
16.2	32.163	21.23	40.22	55.76	41.063	44.22	53.142	91.51
	70	71	50	187	73	62	158	182
26.1	32.093	21.94	39.72	53.89	40.990	44.84	52.984	89.69
	46	71	43	235	49	60	122	219
36.1	32.047	22.65	39.29	51.54	40.941	45.44	52.862	87.50
Mean Place	30.400	38.61	40.438	20.91	39.261	60.90	51.713	61.16
Sec δ, Tan δ	1.005	−0.104	2.956	+2.782	1.010	−0.144	1.307	+0.841
$D_{\psi}a$, $D_{\omega}a$	+0.063	+0.005	+0.016	−0.146	+0.063	+0.008	+0.048	−0.045
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.31	−0.62	+0.31	−0.62	+0.32	−0.60	+0.32	−0.60

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Capricorni. Mag. 3.8		ε Pegasi. Mag. 2.5		11 Cephei. Mag. 4.8		δ Capricorni. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	21 35	−17 0	21 40	+ 9 31	21 40	+70 57	21 42	−16 28
	s	″	s	″	s	″	s	″
Jan. 1.1	48.379	38.99	23.280	22.72	46.55	42.30	46.355	39.22
	31	10	47	133	41	246	37	13
11.1	48.348	39.09	23.233	21.39	46.14	39.84	46.318	39.35
	2	3	18	141	32	284	8	0
21.1	48.346	39.06	23.215	19.98	45.82	37.00	46.310	39.35
	30	19	11	135	21	314	22	15
31.0	48.376	38.87	23.226	18.63	45.61	33.86	46.332	39.20
Feb. 10.0	61	32	43	126	10	328	53	29
	48.437	38.55	23.269	17.37	45.51	30.58	46.385	38.91
	90	47	73	113	3	333	83	46
20.0	48.527	38.08	23.342	16.24	45.54	27.25	46.468	38.45
Mar. 2.0	123	66	107	92	15	323	116	64
	48.650	37.42	23.449	15.32	45.69	24.02	46.584	37.81
11.9	154	83	137	66	27	299	146	81
	48.804	36.59	23.586	14.66	45.96	21.03	46.730	37.00
21.9	184	100	170	38	37	266	178	99
	48.988	35.59	23.756	14.28	46.33	18.37	46.908	36.01
31.9	214	118	200	2	49	222	207	117
	49.202	34.41	23.956	14.26	46.82	16.15	47.115	34.84
	211	133	230	32	57	169	237	133
Apr. 10.9	49.443	33.08	24.186	14.58	47.39	14.46	47.352	33.51
	267	145	254	68	63	112	262	146
20.8	49.710	31.63	24.440	15.26	48.02	13.34	47.614	32.05
	286	154	275	103	68	50	284	155
30.8	49.996	30.09	24.715	16.29	48.70	12.84	47.898	30.50
May 10.8	303	160	290	128	70	11	300	163
	50.299	28.49	25.005	17.57	49.40	12.95	48.198	28.87
20.7	312	162	297	160	71	73	310	163
	50.611	26.87	25.302	19.17	50.11	13.68	48.508	27.24
	315	158	301	183	70	131	315	162
30.7	50.926	25.29	25.603	21.00	50.81	14.99	48.823	25.62
June 9.7	308	149	293	198	65	185	310	153
	51.234	23.80	25.896	22.98	51.46	16.84	49.133	24.09
19.7	296	138	282	209	60	233	299	142
	51.530	22.42	26.178	25.07	52.06	19.17	49.432	22.67
29.6	276	120	260	215	52	276	279	125
	51.806	21.22	26.438	27.22	52.58	21.93	49.711	21.42
July 9.6	247	102	230	215	44	309	251	107
	52.053	20.20	26.668	29.37	53.02	25.02	49.962	20.35
	213	79	201	209	34	334	217	85
19.6	52.266	19.41	26.869	31.46	53.36	28.36	50.179	19.50
	173	57	158	197	24	354	179	61
29.6	52.439	18.84	27.027	33.43	53.60	31.90	50.358	18.89
	128	33	116	183	12	361	135	37
Aug. 8.5	52.567	18.51	27.143	35.26	53.72	35.54	50.493	18.52
	82	11	72	166	1	365	90	15
18.5	52.649	18.40	27.215	36.92	53.73	39.19	50.583	18.37
	36	11	30	145	9	360	43	9
28.5	52.685	18.51	27.245	38.37	53.64	42.79	50.626	18.46
	9	31	15	120	20	346	3	26
Sept. 7.4	52.676	18.82	27.230	39.57	53.44	46.25	50.623	18.72
	50	45	52	100	29	326	44	45
17.4	52.626	19.27	27.178	40.57	53.15	49.51	50.579	19.17
	88	58	82	75	39	206	82	56
27.4	52.538	19.85	27.096	41.32	52.76	52.47	50.497	19.73
	117	66	116	47	48	263	110	67
Oct. 7.4	52.421	20.51	26.980	41.79	52.28	55.10	50.387	20.40
	139	72	135	27	53	222	134	72
17.3	52.282	21.23	26.845	42.06	51.75	57.32	50.253	21.12
	151	71	146	1	58	176	148	73
27.3	52.131	21.94	26.699	42.05	51.17	59.08	50.105	21.85
	157	69	153	24	62	124	153	73
Nov. 6.3	51.974	22.63	26.546	41.81	50.55	60.32	49.952	22.58
	153	65	151	44	64	69	151	68
16.3	51.821	23.28	26.395	41.37	49.91	61.01	49.801	23.26
	142	57	142	65	65	9	143	60
26.2	51.679	23.85	26.253	40.72	49.26	61.10	49.658	23.86
Dec. 6.2	124	50	127	86	62	51	126	53
	51.555	24.35	26.126	39.86	48.64	60.59	49.532	24.39
	103	40	111	104	60	110	106	43
16.2	51.452	24.75	26.015	38.82	48.04	59.49	49.426	24.82
	77	29	89	118	54	167	80	34
26.1	51.375	25.04	25.926	37.64	47.50	57.82	49.346	25.16
	49	17	61	132	47	219	54	22
36.1	51.326	25.21	25.865	36.32	47.03	55.63	49.292	25.38
Mean Place	49.636	38.80	24.230	16.58	47.934	23.81	47.579	38.74
Sec δ, Tan δ	1.046	−0.306	1.014	+0.168	3.065	+2.898	1.043	−0.296
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.066	+0.016	+0.059	−0.009	+0.017	−0.159	+0.066	+0.016
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.32	−0.59	+0.33	−0.57	+0.33	−0.57	+0.33	−0.56

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^2 Cygni. Mag. 4.3		μ Capricorni. Mag. 5.2		γ Gruis. Mag. 3.2		16 Pegasi. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 21 43 s	° ′ +48 57 ″	h m 21 49 s	° ′ −13 54 ″	h m 21 49 s	° ′ −37 43 ″	h m 21 49 s	° ′ +25 33 ″
Jan. 1.1	55.967	25.33	4.818	54.49	14.581	45.66	32.637	54.57
	1·9				59		79	
11.1	55.818	22.94	4.773	54.73	14.522	44.73	32.558	52.70
	108	239	15	24		93		187
21.1	55.710	20.24	4.759	54.86	14.497	43.54	32.514	50.67
	59	270	14	13	25	119	44	203
31.0	55.651	17.35	4.773	54.86	14.509	42.13	32.500	48.59
	5	289	14	0	12	141	14	208
Feb. 10.0	55.646	14.39	4.818	54.72	14.562	40.52	32.521	46.52
	46	296	45	14	53	161	21	207
		290	78	33	90	176	57	198
20.0	55.692	11.49	4.896	54.39	14.652	38.76	32.578	44.54
	107		107		128	190	94	178
Mar. 2.0	55.799	8.72	5.003	53.89	14.780	36.86	32.672	42.76
	159	277	140	50	167	198	132	152
11.9	55.958	6.23	5.143	53.19	14.947	34.88	32.804	41.24
	213	249	169	70	202	205	165	120
21.9	56.171	4.09	5.312	52.30	15.149	32.83	32.969	40.04
	264	214	202	89	239	209	204	79
31.9	56.435	2.42	5.514	51.21	15.388	30.74	33.173	39.25
	307	167	229	109	273	207	239	34
		116		127				
Apr. 10.9	56.742	1.26	5.743	49.94	15.661	28.67	33.412	38.91
	345	63	256	111	302	203	265	10
20.8	57.087	0.63	5.999	48.53	15.963	26.64	33.677	39.01
	369	3	279	154	329	192	287	56
30.8	57.456	0.60	6.278	46.99	16.292	24.72	33.964	39.57
	390	53	294	163	350	177	305	100
May 10.8	57.846	1.13	6.572	45.36	16.642	22.95	34.269	40.57
	397	111	308	167	363	158	316	110
20.7	58.243	2.24	6.880	43.69	17.005	21.37	34.585	41.97
	393	161	311	169	368	136	318	178
30.7	58.636	3.85	7.191	42.00	17.373	20.01	34.903	43.75
	380	208	308	163	365	108	309	207
June 9.7	59.016	5.93	7.499	40.37	17.738	18.93	35.212	45.82
	356	248	296	150	352	81	294	234
19.7	59.372	8.11	7.795	38.87	18.090	18.12	35.506	48.16
	320	278	279	140	331	46	275	252
29.6	59.692	11.19	8.074	37.47	18.421	17.66	35.781	50.68
	277	307	252	120	300	15	242	262
July 9.6	59.969	14.26	8.326	36.27	18.721	17.51	36.023	53.30
	227	323	218	102	263	20	206	268
19.6	60.196	17.49	8.544	35.25	18.984	17.71	36.229	55.98
	175	334	182	79	218	52	167	266
29.6	60.371	20.83	8.726	34.46	19.202	18.23	36.396	58.64
	116	337	139	54	166	80	120	261
Aug. 8.5	60.487	24.20	8.865	33.92	19.368	19.03	36.516	61.25
	55	331	95	33	112	106	76	247
18.5	60.542	27.51	8.960	33.59	19.480	20.09	36.592	63.72
	5	321	47	8	56	128	28	231
28.5	60.537	30.75	9.007	33.51	19.536	21.37	36.620	66.03
	62	299	5	13	2	113	13	207
Sept. 7.4	60.475	33.74	9.012	33.64	19.538	22.80	36.607	68.10
	114	275	38	26	50	152	58	181
17.4	60.361	36.49	8.974	33.90	19.488	24.32	36.549	69.91
	158	247	75	16	95	155	95	157
27.4	60.203	38.96	8.899	34.36	19.393	25.87	36.454	71.48
	201	210	105	55	137	151	122	122
Oct. 7.4	60.002	41.06	8.794	34.91	19.256	27.38	36.332	72.70
	233	170	130	64	165	138	149	93
17.3	59.769	42.76	8.664	35.55	19.091	28.76	36.183	73.63
	257	121	140	68	186	122	164	55
27.3	59.512	44.00	8.524	36.23	18.905	29.98	36.019	74.18
	271	77	150	69	195	102	172	22
Nov. 6.3	59.241	44.77	8.374	36.92	18.710	31.00	35.847	74.40
	274	25	148	67	195	72	173	17
16.3	58.967	45.02	8.226	37.59	18.515	31.72	35.674	74.23
	269	26	140	65	187	43	167	53
26.2	58.698	44.76	8.086	38.24	18.328	32.15	35.507	73.70
	260	80	125	59	168	13	157	85
Dec. 6.2	58.438	43.96	7.961	38.83	18.160	32.28	35.350	72.85
	237	127	107	50	145	17	139	121
16.2	58.201	42.69	7.854	39.33	18.015	32.11	35.211	71.64
	212	178	83	42	115	49	117	150
26.1	57.989	40.91	7.771	39.75	17.900	31.62	35.094	70.14
	175	219	57	34	80	75	95	173
36.1	57.814	38.72	7.714	40.09	17.820	30.87	34.999	68.41
Mean Place	56.829	10.09	5.976	54.28	16.252	40.13	33.454	44.52
Sec δ, Tan δ	1.523	+1.149	1.030	−0.248	1.264	−0.774	1.108	+0.478
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.044	−0.063	+0.065	+0.014	+0.072	+0.043	+0.054	−0.027
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.33	−0.56	+0.33	−0.54	+0.33	−0.54	+0.34	−0.54

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	79 Draconis. Mag. 6.6		20 Pegasi. Mag. 5.7		ϵ Indi. Mag. 4.7		α Aquarii. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 21 51 s	° ′ +73 20 ″	h m 21 57 s	° ′ +12 44 ″	h m 21 57 s	° ′ −57 5 ″	h m 22 1 s	° ′ − 0 41 ″
Jan. 1.1	52.22	34.99	19.406	68.21	26.159	80.90	48.845	37.32
	51	232	61	140	121	174	53	85
11.1	51.71	32.67	19.345	66.81	26.038	79.16	48.792	38.17
	40	275	35	147	66	208	30	82
21.1	51.31	29.92	19.310	65.34	25.972	77.08	48.762	38.99
	29	306	7	147	8	231	4	74
31.1	51.02	26.86	19.303	63.87	25.964	74.74	48.758	39.73
	16	326	23	141	51	255	27	63
Feb. 10.0	50.86	23.60	19.326	62.46	26.015	72.19	48.785	40.36
	1	333	54	129	109	269	56	49
20.0	50.85	20.27	19.380	61.17	26.124	69.50	48.841	40.85
	12	326	87	109	166	278	87	29
Mar. 2.0	50.97	17.01	19.467	60.08	26.290	66.72	48.928	41.14
	26	307	121	86	223	281	120	5
11.9	51.23	13.94	19.588	59.22	26.513	63.91	49.048	41.19
	40	277	155	51	276	276	152	18
21.9	51.63	11.17	19.743	58.68	26.789	61.15	49.200	41.01
	51	235	186	20	330	268	180	48
31.9	52.14	8.82	19.929	58.48	27.119	58.47	49.380	40.53
	62	181	219	15	377	252	215	74
Apr. 10.9	52.76	6.98	20.148	58.63	27.496	55.95	49.595	39.79
	69	128	217	53	419	232	242	101
20.8	53.45	5.70	20.395	59.16	27.915	53.63	49.837	38.78
	75	72	269	88	456	206	263	126
30.8	54.20	4.98	20.664	60.04	28.371	51.57	50.100	37.52
	79	8	288	123	486	175	283	147
May 10.8	54.99	4.90	20.952	61.27	28.857	49.82	50.383	36.05
	80	51	299	154	503	141	297	165
20.8	55.79	5.44	21.251	62.81	29.360	48.41	50.680	34.40
	79	114	304	178	513	103	300	179
30.7	56.58	6.58	21.555	64.59	29.873	47.38	50.980	32.61
	71	168	301	199	510	62	300	186
June 9.7	57.32	8.26	21.856	66.58	30.383	46.76	51.280	30.75
	68	218	289	214	491	18	290	191
19.7	58.00	10.44	22.145	68.72	30.877	46.58	51.570	28.84
	61	262	271	223	468	25	272	186
29.6	58.61	13.06	22.416	70.95	31.345	46.83	51.842	26.98
	52	300	213	225	426	69	251	178
July 9.6	59.13	16.06	22.659	73.20	31.771	47.52	52.093	25.20
	41	327	211	222	375	110	216	166
19.6	59.54	19.33	22.870	75.42	32.146	48.62	52.309	23.54
	29	350	173	213	315	148	181	152
29.6	59.83	22.83	23.043	77.55	32.461	50.10	52.490	22.02
	17	362	131	202	244	180	113	133
Aug. 8.5	60.00	26.45	23.174	79.57	32.705	51.90	52.633	20.69
	5	367	88	185	169	207	98	110
18.5	60.05	30.12	23.262	81.42	32.874	53.97	52.731	19.59
	8	366	46	161	92	227	54	93
28.5	59.97	33.78	23.308	83.06	32.966	56.24	52.785	18.66
	20	353	1	144	12	238	12	66
Sept. 7.5	59.77	37.31	23.309	84.50	32.978	58.62	52.797	18.00
	31	336	38	118	62	212	26	44
17.4	59.46	40.67	23.271	85.68	32.916	61.04	52.771	17.56
	11	312	75	94	131	234	65	26
27.4	59.05	43.79	23.196	86.62	32.785	63.38	52.706	17.30
	51	281	102	68	192	218	90	4
Oct. 7.4	58.54	46.60	23.094	87.30	32.593	65.56	52.616	17.26
	59	239	126	43	212	195	117	14
17.3	57.95	48.99	22.968	87.73	32.351	67.51	52.499	17.40
	65	194	140	16	275	161	133	29
27.3	57.30	50.93	22.828	87.89	32.076	69.12	52.366	17.69
	70	144	149	9	296	122	140	45
Nov. 6.3	56.60	52.37	22.679	87.80	31.780	70.34	52.226	18.14
	73	88	150	35	303	78	140	55
16.3	55.87	53.25	22.529	87.45	31.477	71.12	52.086	18.69
	76	31	145	58	296	31	138	65
26.2	55.11	53.56	22.384	86.87	31.181	71.43	51.948	19.34
	71	31	134	82	274	16	125	74
Dec. 6.2	54.40	53.25	22.250	86.05	30.907	71.27	51.823	20.08
	69	92	117	102	240	65	111	80
16.2	53.71	52.33	22.133	85.03	30.667	70.62	51.712	20.88
	65	150	100	120	200	109	92	84
26.2	53.06	50.83	22.033	83.83	30.467	69.53	51.620	21.72
	57	201	76	135	150	150	67	87
36.1	52.49	48.82	21.957	82.48	30.317	68.03	51.553	22.59
Mean Place	53.545	16.04	20.249	61.63	28.739	71.60	49.786	40.03
Sec δ, Tan δ	3.488	+3.342	1.025	+0.226	1.841	−1.546	1.000	−0.012
$D_{\psi a}$, $D_{\omega a}$	+0.014	−0.189	+0.058	−0.013	+0.082	+0.089	+0.061	+0.001
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.34	−0.53	+0.34	−0.51	+0.34	−0.51	+0.35	−0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Aquarii. Mag. 4.4		20 Cephei. Mag. 5.4		α Gruis. Mag. 2.2		ι Pegasi. Mag. 4.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	22 2	−14 14	22 2	+62 24	22 3	−47 19	22 3	+24 58
Jan. 1.1	15.708 53	39.02 25	39.26 29	52.08 227	21.258 99	73.87 134	24.791 86	16.06 176
11.1	15.655 26	39.27 11	38.97 23	49.81 267	21.159 59	72.53 164	24.705 56	14.30 192
21.1	15.629 — 2	39.38 — 3	38.74 16	47.14 296	21.100 — 14	70.89 190	24.649 — 26	12.38 200
31.1	15.631 31	39.35 18	38.58 8	44.18 314	21.086 — 31	68.99 212	24.623 — 8	10.38 201
Feb. 10.0	15.662 61	39.17 35	38.50 1 —	41.04 321	21.117 76	66.87 232	24.631 41	8.37 193
20.0	15.723	38.82	38.49	37.83	21.193	64.55	24.672	6.44
Mar. 2.0	15.817 94	38.27 55	38.57 8	34.71 312	21.316 123	62.12 243	24.751 79	4.68 176
11.9	15.940 123	37.53 74	38.73 16	31.79 292	21.485 169	59.62 250	24.867 116	3.18 150
21.9	16.097 157	36.58 95	38.98 25	29.17 262	21.695 210	57.09 253	25.021 154	2.00 118
31.9	16.285 188	35.44 114	39.30 32	26.96 221	21.950 255	54.58 251	25.212 191	1.20 80
	219	132	38	171	295	243	226	39
Apr. 10.9	16.504	34.12	39.68	25.25	22.245	52.15	25.438	0.81 — 6
20.8	16.751 247	32.66 146	40.13 45	24.07 118	22.577 332	49.82 233	25.694 256	0.87 50
30.8	17.024 273	31.06 160	40.61 48	23.51 — 56	22.939 362	47.70 212	25.976 282	1.37 93
May 10.8	17.316 292	29.38 168	41.13 52	23.54 — 3	23.329 390	45.76 194	26.278 302	2.30 134
20.8	17.621 305	27.64 174	41.65 52	24.18 64	23.737 408	44.13 163	26.592 314	3.64 171
	311	172	53	120	416	133	319	
30.7	17.932	25.92	42.18	25.38	24.153	42.80	26.911	5.35
June 9.7	18.243 311	24.25 167	42.68 50	27.12 174	24.567 414	41.80 100	27.226 315	7.38 203
19.7	18.544 301	22.67 158	43.16 48	29.36 224	24.971 404	41.18 62	27.527 301	9.65 227
29.6	18.829 285	21.24 143	43.60 44	31.98 262	25.352 381	40.94 — 24	27.809 282	12.10 245
July 9.6	19.090 261	19.98 126	43.97 37	34.99 301	25.704 352	41.13 19	28.063 254	14.69 259
	228	103	32	325	309	55	219	265
19.6	19.318	18.95	44.29	38.24	26.013	41.68	28.282	17.34
29.6	19.510 192	18.13 82	44.52 23	41.69 345	26.273 260	42.59 91	28.462 180	19.98 264
Aug. 8.5	19.661 151	17.57 56	44.69 17	45.25 356	26.478 205	43.85 126	28.598 136	22.54 256
18.5	19.767 106	17.24 33	44.77 8	48.85 360	26.621 143	45.36 151	28.689 91	25.00 246
28.5	19.828 61	17.16 — 8	44.77 0	52.40 355	26.701 80	47.13 177	28.735 46	27.30 230
	16 —	13	7	344	15 —	192	0	208
Sept. 7.5	19.844	17.29	44.70	55.84	26.716	49.05	28.735	29.38
17.4	19.819 25	17.61 32	44.55 15	59.09 325	26.671 45	51.05 200	28.693 42	31.23 185
27.4	19.754 65	18.08 47	44.34 21	62.07 298	26.572 99	53.04 199	28.614 79	32.79 156
Oct. 7.4	19.659 95	18.68 60	44.06 28	64.72 265	26.424 148	54.92 188	28.504 110	34.06 127
17.3	19.540 119	19.36 68	43.74 32	66.99 227	26.235 189	56.64 172	28.369 135	35.03 97
	137	73	36	182	217	152	152	62
27.3	19.403	20.09	43.38	68.81	26.018	58.16	28.217	35.65
Nov. 6.3	19.258 145	20.83 74	42.98 40	70.14 133	25.786 232	59.33 117	28.053 164	35.93 — 28
16.3	19.111 147	21.55 72	42.57 41	70.93 79	25.547 239	60.19 86	27.886 167	35.85 — 8
26.2	18.971 140	22.22 67	42.15 42	71.17 — 24	25.319 228	60.64 45	27.724 162	35.44 41
Dec. 6.2	18.842 129	22.83 61	41.74 41	70.82 — 35	25.103 216	60.67 — 3	27.569 155	34.67 77
	110	52	39	93	193	34	141	110
16.2	18.732	23.35	41.35	69.89	24.910	60.33	27.428	33.57
26.2	18.640 92	23.78 43	40.98 37	68.40 149	24.751 159	59.61 72	27.306 122	32.19 138
36.1	18.573 67	24.12 34	40.66 32	66.41 199	24.631 120	58.48 113	27.206 100	30.55 164
Mean Place	16.814	38.06	40.059	34.32	23.225	65.49	25.528	6.33
Sec δ, Tan δ	1.032	−0.254	2.160	+1.914	1.476	−1.085	1.103	+0.466
$D_{\psi}a$, $D_{\omega}a$	+0.064	+0.015	+0.036	−0.111	+0.075	+0.063	+0.055	−0.027
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.35	−0.49	+0.35	−0.49	+0.35	−0.49	+0.35	−0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pegasi. Mag. 3.7		π Pegasi. Mag. 4.4		ζ Cephei. Mag. 3.6		24 Cephei. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 22 6 s	° ′ + 5 49 ″	h m 22 6 s	° ′ +32 47 ″	h m 22 8 s	° ′ +57 49 ″	h m 22 8 s	° ′ +71 57 ″
Jan. 1.1	18.109	11.19	33.284	71.24	10.144	34.01	18.89	61.00
	60	111	105	193	240	222	50	215
11.1	18.049	10.08	33.179	69.31	9.904	31.79	18.39	58.85
	37	113	76	216	192	259	40	260
21.1	18.012	8.95	33.103	67.15	9.712	29.20	17.99	56.25
	10	109	43	230	131	289	31	295
31.1	18.002	7.86	33.060	64.85	9.578	26.31	17.68	53.30
	—	102	7	233	71	305	18	318
Feb. 10.0	18.020	6.84	33.053	62.52	9.504	23.26	17.50	50.12
	18	88	—	228	3	310	6	329
	51		31				—	
20.0	18.071	5.96	33.084	60.24	9.501	20.16	17.44	46.83
	80	67	74	216	69	302	7	326
Mar. 2.0	18.151	5.29	33.158	58.08	9.570	17.14	17.51	43.57
	114	44	115	188	141	285	20	312
12.0	18.265	4.85	33.273	56.20	9.711	14.29	17.71	40.45
	145	16	157	156	211	251	32	284
21.9	18.410	4.69	33.430	54.64	9.922	11.78	18.03	37.61
	179	13	198	117	276	213	44	246
31.9	18.589	4.82	33.628	53.47	10.198	9.65	18.47	35.15
	209	46	236	73	337	163	54	200
Apr. 10.9	18.798	5.28	33.864	52.74	10.535	8.02	19.01	33.15
	239	77	269	25	388	109	62	144
20.8	19.037	6.05	34.133	52.49	10.923	6.93	19.63	31.71
	264	108	297	23	427	53	69	87
30.8	19.301	7.13	34.430	52.72	11.350	6.40	20.32	30.84
	282	135	316	74	455	9	73	25
May 10.8	19.583	8.48	34.746	53.46	11.805	6.49	21.05	30.59
	297	160	331	116	469	66	74	36
20.8	19.880	10.08	35.077	54.62	12.274	7.15	21.79	30.95
	302	179	335	163	471	124	75	96
30.7	20.182	11.87	35.412	56.25	12.745	8.39	22.54	31.91
	301	195	329	199	458	174	71	151
June 9.7	20.483	13.82	35.741	58.24	13.203	10.13	23.25	33.42
	291	200	317	231	435	224	67	201
19.7	20.774	15.82	36.058	60.55	13.638	12.37	23.92	35.46
	274	206	295	253	397	260	61	248
29.7	21.048	17.88	36.353	63.08	14.035	14.97	24.53	37.94
	250	203	267	275	348	297	52	289
July 9.6	21.298	19.91	36.620	65.83	14.383	17.94	25.05	40.83
	220	196	226	284	291	321	43	318
19.6	21.518	21.87	36.846	68.67	14.677	21.15	25.48	44.01
	184	183	186	289	232	339	33	343
29.6	21.702	23.70	37.032	71.56	14.909	24.54	25.81	47.44
	113	168	141	288	163	351	21	360
Aug. 8.5	21.845	25.38	37.173	74.44	15.072	28.05	26.02	51.04
	101	150	92	283	94	352	11	367
18.5	21.946	26.88	37.265	77.27	15.166	31.57	26.13	54.71
	56	127	44	265	23	348	1	368
28.5	22.002	28.15	37.309	79.92	15.189	35.05	26.12	58.39
	14	106	—	247	—	331	12	360
	—		4		45			
Sept. 7.5	22.016	29.21	37.305	82.39	15.144	38.39	26.00	61.99
	25	84	48	223	110	316	24	343
17.4	21.991	30.05	37.257	84.62	15.034	41.55	25.76	65.42
	60	59	87	195	169	290	32	322
27.4	21.931	30.64	37.170	86.57	14.865	44.45	25.44	68.64
	90	36	123	161	221	258	42	291
Oct. 7.4	21.841	31.00	37.047	88.18	14.644	47.03	25.02	71.55
	115	16	148	132	266	220	50	256
17.4	21.726	31.16	36.899	89.50	14.378	49.23	24.52	74.11
	131	7	168	92	302	174	57	212
27.3	21.595	31.09	36.731	90.42	14.076	50.97	23.95	76.23
	139	26	181	54	326	127	61	163
Nov. 6.3	21.456	30.83	36.550	90.96	13.750	52.24	23.34	77.86
	142	44	187	12	343	76	65	110
16.3	21.314	30.39	36.363	91.08	13.407	53.00	22.69	78.96
	138	61	184	28	349	22	67	50
26.2	21.176	29.78	36.179	90.80	13.058	53.22	22.02	79.46
	128	77	179	72	343	36	66	—
Dec. 6.2	21.048	29.01	36.000	90.08	12.715	52.86	21.36	79.38
	113	88	164	106	329	92	65	68
16.2	20.935	28.13	35.836	89.02	12.386	51.94	20.71	78.70
	96	101	144	146	303	145	60	129
26.2	20.839	27.12	35.692	87.56	12.083	50.49	20.11	77.41
	74	108	121	180	269	195	55	186
36.1	20.765	26.04	35.571	85.76	11.814	48.54	19.56	75.55
Mean Place	18.965	6.79	33.975	59.55	10.837	16.93	19.825	41.90
Sec δ, Tan δ	1.005	+0.102	1.190	+0.645	1.878	+1.590	3.230	+3.071
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.060	−0.006	+0.053	−0.038	+0.041	−0.094	+0.023	−0.181
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.35	−0.48	+0.35	−0.48	+0.35	−0.47	+0.35	−0.47

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aquarii. Mag. 4.3		α Tucanæ. Mag. 2.9		γ Aquarii. Mag. 4.0		31 Pegasi. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	22 12	− 8 9	22 13	−60 38	22 17	− 1 46	22 17	+11 48
Jan. 1.1	45.320	61.76	11.50	48.97	39.900	30.89	42.932	65.78
	61	51	18	186	65	78	74	129
11.1	45.259	62.27	11.32	47.11	39.835	31.67	42.858	64.49
	36	44	13	223	41	75	51	135
21.1	45.223	62.71	11.19	44.88	39.794	32.42	42.807	63.14
	10	32	7	252	18	64	24	136
31.1	45.213	63.03	11.12	42.36	39.776	33.06	42.783	61.78
	20	16	1	277	13	55	3	131
Feb. 10.0	45.233	63.19	11.13	39.59	39.789	33.61	42.786	60.47
	46	1	6	291	11	41	34	118
20.0	45.279	63.18	11.19	36.65	39.830	34.02	42.820	59.29
	83	19	13	305	72	20	67	102
Mar. 2.0	45.362	62.99	11.32	33.60	39.902	34.22	42.887	58.27
	111	38	20	308	103	4	99	79
12.0	45.473	62.61	11.52	30.52	40.005	34.18	42.986	57.48
	144	64	25	305	139	27	135	51
21.9	45.617	61.97	11.77	27.47	40.144	33.91	43.121	56.97
	175	85	32	296	168	54	170	18
31.9	45.792	61.12	12.09	24.51	40.312	33.37	43.291	56.79
	207	110	37	281	203	78	203	16
Apr. 10.9	45.999	60.02	12.46	21.70	40.515	32.59	43.494	56.95
	236	129	42	259	231	107	233	51
20.8	46.235	58.73	12.88	19.11	40.746	31.52	43.727	57.46
	262	147	47	231	255	130	260	87
30.8	46.497	57.26	13.35	16.80	41.001	30.22	43.987	58.33
	284	162	50	202	280	151	281	121
May 10.8	46.781	55.64	13.85	14.78	41.281	28.71	44.268	59.54
	297	174	53	162	294	168	296	148
20.8	47.078	53.90	14.38	13.16	41.575	27.03	44.564	61.02
	305	178	54	123	301	180	305	176
30.7	47.383	52.12	14.92	11.93	41.876	25.23	44.869	62.78
	305	179	51	80	303	187	303	195
June 9.7	47.688	50.33	15.46	11.13	42.179	23.36	45.172	64.73
	299	177	53	33	295	189	297	210
19.7	47.987	48.56	15.99	10.80	42.474	21.47	45.469	66.83
	282	166	50	13	280	188	281	218
29.7	48.269	46.90	16.49	10.93	42.754	19.59	45.750	69.01
	261	153	47	61	258	177	256	222
July 9.6	48.530	45.37	16.96	11.54	43.012	17.82	46.006	71.23
	231	134	41	102	231	164	226	219
19.6	48.761	44.03	17.37	12.56	43.243	16.18	46.232	73.42
	195	117	35	145	195	149	192	210
29.6	48.956	42.86	17.72	14.01	43.438	14.69	46.424	75.52
	154	93	28	181	158	131	151	199
Aug. 8.5	49.110	41.93	18.00	15.82	43.596	13.38	46.575	77.51
	115	73	19	209	113	107	108	183
18.5	49.225	41.20	18.19	17.91	43.709	12.31	46.683	79.34
	67	45	11	234	71	86	65	163
28.5	49.292	40.75	18.30	20.25	43.780	11.45	46.748	80.97
	27	21	3	247	27	64	23	141
Sept. 7.5	49.319	40.51	18.33	22.72	43.807	10.81	46.771	82.38
	17	4	6	251	13	39	18	118
17.4	49.302	40.47	18.27	25.23	43.794	10.42	46.753	83.56
	52	17	14	246	46	19	53	94
27.4	49.250	40.64	18.13	27.69	43.748	10.23	46.700	84.50
	84	31	21	230	82	2	85	68
Oct. 7.4	49.166	40.95	17.92	29.99	43.666	10.21	46.615	85.18
	108	47	26	207	101	18	110	44
17.4	49.058	41.42	17.66	32.06	43.565	10.39	46.505	85.62
	128	55	32	173	123	33	127	19
27.3	48.930	41.97	17.34	33.79	43.442	10.72	46.378	85.81
	136	63	34	132	134	47	138	5
Nov. 6.3	48.794	42.60	17.00	35.11	43.308	11.19	46.240	85.76
	140	66	35	89	136	57	143	30
16.3	48.654	43.26	16.65	36.00	43.172	11.76	46.097	85.46
	138	69	35	37	135	65	141	51
26.2	48.516	43.95	16.30	36.37	43.037	12.41	45.956	84.95
	126	69	34	14	126	73	134	73
Dec. 6.2	48.390	44.64	15.96	36.23	42.911	13.14	45.822	84.22
	113	67	30	64	114	77	122	92
16.2	48.277	45.31	15.66	35.59	42.797	13.91	45.700	83.30
	95	62	27	115	99	80	106	109
26.2	48.182	45.93	15.39	34.44	42.698	14.71	45.594	82.21
	72	56	21	159	76	80	88	124
36.1	48.110	46.49	15.18	32.85	42.622	15.51	45.506	80.97
Mean Place	46.296	61.93	14.279	37.85	40.779	32.68	43.679	60.01
Sec δ, Tan δ	1.010	−0.143	2.040	−1.778	1.000	−0.031	1.022	+0.209
$D_{\psi a}$, $D_{\omega a}$	+0.063	+0.009	+0.082	+0.106	+0.062	+0.002	+0.059	−0.013
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.36	−0.45	+0.36	−0.45	+0.36	−0.43	+0.36	−0.43

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Lacertæ. Mag. 4.6		π Aquarii. Mag. 4.6		σ Aquarii. Mag. 4.9		α Lacertæ. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	22 20	+51 50	22 21	+ 0 59	22 26	−11 3	22 28	+49 53
Jan. 1.2	31.224	50.33	19.840	12.39	33.502	81.95	6.528	25.78
	203	207	67	88	72	40	197	196
11.1	31.021	48.26	19.773	11.51	33.430	82.35	6.331	23.82
	164	246	45	87	47	30	159	237
21.1	30.857	45.80	19.728	10.64	33.383	82.65	6.172	21.45
	119	270	22	80	20	13	118	262
31.1	30.738	43.10	19.706	9.84	33.363	82.78	6.054	18.83
	65	289	—	69	—	2	69	280
Feb. 10.0	30.673	40.21	19.712	9.15	33.366	82.76	5.985	16.03
	11	293	6	51	3	19	15	284
	—		36		37		—	
20.0	30.662	37.28	19.748	8.61	33.403	82.57	5.970	13.19
	48	286	67	39	61	37	38	278
Mar. 2.0	30.710	34.42	19.815	8.22	33.467	82.20	6.008	10.41
	112	269	99	13	99	61	100	261
12.0	30.822	31.73	19.914	8.09	33.566	81.59	6.108	7.80
	171	238	133	11	132	81	156	234
21.9	30.993	29.35	20.047	8.20	33.698	80.78	6.264	5.46
	231	202	164	41	163	105	214	199
31.9	31.224	27.33	20.211	8.61	33.861	79.73	6.478	3.47
	285	151	199	66	199	124	267	151
Apr. 10.9	31.509	25.79	20.410	9.27	34.060	78.49	6.745	1.96
	331	103	229	95	227	143	311	105
20.9	31.840	24.76	20.639	10.22	34.287	77.06	7.059	0.91
	369	48	251	122	256	158	353	46
30.8	32.209	24.28	20.893	11.44	34.543	75.48	7.412	0.45
	398	10	277	145	280	172	381	—
May 10.8	32.607	24.38	21.170	12.89	34.823	73.76	7.793	0.52
	416	66	291	164	297	179	401	7
20.8	33.023	25.04	21.464	14.53	35.120	71.97	8.194	1.17
	421	121	300	180	304	184	408	65
								115
30.7	33.444	26.25	21.764	16.33	35.424	70.13	8.602	2.32
	415	170	303	190	310	180	407	168
June 9.7	33.859	27.95	22.067	18.23	35.734	68.33	9.009	4.00
	398	216	294	195	305	175	389	241
19.7	34.257	30.11	22.361	20.18	36.039	66.58	9.398	6.11
	370	252	281	193	291	161	367	215
29.7	34.627	32.63	22.642	22.11	36.330	64.97	9.765	8.56
	331	287	259	190	270	118	329	282
July 9.6	34.958	35.50	22.901	24.01	36.600	63.49	10.094	11.38
	284	310	232	175	241	126	288	305
19.6	35.242	38.60	23.133	25.76	36.841	62.23	10.382	14.43
	231	327	196	161	209	106	236	322
29.6	35.473	41.87	23.329	27.37	37.050	61.17	10.618	17.65
	174	338	160	115	168	81	181	333
Aug. 8.6	35.647	45.25	23.489	28.82	37.218	60.36	10.799	20.98
	113	339	115	126	129	59	126	334
18.5	35.760	48.64	23.604	30.08	37.347	59.77	10.925	24.32
	51	333	75	101	83	31	67	328
28.5	35.811	51.97	23.679	31.09	37.430	59.46	10.992	27.60
	—	323	29	79	38	7	5	319
	10				—	—	—	
Sept. 7.5	35.801	55.20	23.708	31.88	37.468	59.39	10.997	30.79
		302		59	2	12	47	302
17.4	35.736	58.22	23.699	32.47	37.466	59.51	10.950	33.81
	65	279	9	31	41	32	100	275
27.4	35.616	61.01	23.653	32.81	37.425	59.83	10.850	36.56
	120	247	46	11	73	49	111	214
Oct. 7.4	35.451	63.48	23.575	32.95	37.352	60.32	10.706	39.00
	165	211	78	4	101	60	184	212
17.4	35.246	65.59	23.475	32.91	37.251	60.92	10.522	41.12
	205	168	100	23	117	69	215	168
	237		121					
27.3	35.009	67.27	23.354	32.68	37.134	61.61	10.307	42.80
	261	124	132	38	133	73	210	128
Nov. 6.3	34.748	68.51	23.222	32.30	37.001	62.34	10.067	44.08
	275	74	135	52	138	75	257	77
16.3	34.473	69.25	23.087	31.78	36.863	63.09	9.810	44.85
	282	24	134	63	137	72	262	30
26.3	34.191	69.49	22.953	31.15	36.726	63.81	9.548	45.15
	280	—	126	73	128	69	264	—
Dec. 6.2	33.911	31	22.827	30.42	36.598	64.50	9.284	27
	271	69.18	116	82	117	62	253	44.88
		84						76
16.2	33.640	68.34	22.711	29.60	36.481	65.12	9.031	44.12
	250	135	103	87	101	54	239	130
26.2	33.390	66.99	22.608	28.73	36.380	65.66	8.792	42.82
	224	183	80	88	81	48	213	170
36.1	33.166	65.16	22.528	27.85	36.299	66.14	8.579	41.12
Mean Place	31.774	34.33	20.673	9.96	34.450	80.64	7.013	10.22
Sec δ, Tan δ	1.619	+1.273	1.000	+0.017	1.019	−0.196	1.552	+1.187
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.047	−0.077	+0.061	−0.001	+0.063	+0.012	+0.049	−0.073
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.36	−0.42	+0.36	−0.42	+0.37	−0.40	+0.37	−0.39

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Aquarii. Mag. 5.3		226 B. Cephei. Mag. 5.7		η Aquarii. Mag. 4.1		10 Lacertæ. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	22 30	−21 5	22 30	+75 49	22 31	− 0 30	22 35	+38 38
Jan. 1.2	27.923	76.15	55.04	66.00	23.205	51.67	47.772	69.46
	75		70	185	75	81	143	179
11.1	27.848	76.14	54.34	64.15	23.130	52.48	47.629	67.67
	53	1	60	230	52	79	120	211
21.1	27.795	75.92	53.74	61.85	23.078	53.27	47.509	65.56
	25	22	48	274	31	69	84	231
31.1	27.770	75.51	53.26	59.11	23.047	53.96	47.425	63.25
	2	41	34	306	0	60	50	244
Feb. 10.1	27.772	74.90	52.92	56.05	23.047	54.56	47.375	60.81
	34	61	18	323	24	44	6	244
		81						
20.0	27.806	74.09	52.74	52.82	23.071	55.00	47.369	58.37
	65	100	1	328	60	28	35	236
Mar. 2.0	27.871	73.09	52.73	49.54	23.131	55.28	47.404	56.01
	98	121	15	320	88	3	82	218
12.0	27.969	71.88	52.88	46.34	23.219	55.31	47.486	53.83
	134	138	31	299	124	21	132	189
21.9	28.103	70.50	53.19	43.35	23.343	55.10	47.618	51.94
	168	154	47	268	156	47	177	157
31.9	28.271	68.96	53.66	40.67	23.499	54.63	47.795	50.37
	202	169	60	229	190	73	222	111
Apr. 10.9	28.473	67.27	54.26	38.38	23.689	53.90	48.017	49.26
	234	181	72	178	222	102	263	67
20.9	28.707	65.46	54.98	36.60	23.911	52.88	48.280	48.59
	264	187	82	120	250	128	298	17
30.8	28.971	63.59	55.80	35.40	24.161	51.60	48.578	48.42
	288	191	88	62	273	148	325	33
May 10.8	29.259	61.68	56.68	34.78	24.434	50.12	48.903	48.75
	308	189	92	3	292	168	343	87
20.8	29.567	59.79	57.60	34.75	24.726	48.44	49.246	49.62
	319	183	92	59	300	180	355	129
30.8	29.886	57.96	58.52	35.34	25.026	46.64	49.601	50.91
	323	172	90	116	303	189	355	175
June 9.7	30.209	56.24	59.42	36.50	25.329	44.75	49.956	52.66
	319	155	86	171	299	193	344	209
19.7	30.528	54.69	60.28	38.21	25.628	42.82	50.300	54.75
	306	135	80	219	285	190	325	243
29.7	30.834	53.34	61.08	40.40	25.913	40.92	50.625	57.18
	287	111	70	261	266	185	302	269
July 9.6	31.121	52.23	61.78	43.04	26.179	39.07	50.927	59.87
	257	85	59	301	238	173	262	287
19.6	31.378	51.38	62.37	46.05	26.417	37.34	51.189	62.74
	223	56	47	328	205	156	224	298
29.6	31.601	50.82	62.84	49.33	26.622	35.78	51.413	65.72
	183	27	31	319	168	139	177	303
Aug. 8.6	31.784	50.55	63.18	52.82	26.790	34.39	51.590	68.75
	138	1	21	364	126	118	129	300
18.5	31.922	50.56	63.39	56.46	26.916	33.21	51.719	71.75
	92	28	7	372	85	96	79	293
28.5	32.014	50.84	63.46	60.18	27.001	32.25	51.798	74.68
	47	51	8	369	40	71	27	279
Sept. 7.5	32.061	51.35	63.38	63.87	27.041	31.54	51.825	77.47
	2	73	20	363	3	50	17	258
17.4	32.063	52.08	63.18	67.50	27.044	31.04	51.808	80.05
	39	87	35	342	37	26	63	233
27.4	32.024	52.95	62.83	70.92	27.007	30.78	51.745	82.38
	75	98	45	319	67	7	100	206
Oct. 7.4	31.949	53.93	62.38	74.11	26.940	30.71	51.645	84.44
	104	104	57	283	94	13	135	171
17.4	31.845	54.97	61.81	76.94	26.846	30.84	51.510	86.15
	126	104	66	217	114	27	160	136
27.3	31.719	56.01	61.15	79.41	26.732	31.11	51.350	87.51
	140	100	74	202	127	43	179	94
Nov. 6.3	31.579	57.01	60.41	81.43	26.605	31.54	51.171	88.45
	146	92	80	149	131	55	191	53
16.3	31.433	57.93	59.61	82.92	26.474	32.09	50.980	88.98
	146	79	84	95	133	64	198	10
26.3	31.287	58.72	58.77	83.87	26.341	32.73	50.782	89.08
	139	64	85	31	127	73	197	35
Dec. 6.2	31.148	59.36	57.92	84.18	26.214	33.46	50.585	88.73
	126	48	85	30	116	78	191	81
16.2	31.022	59.84	57.07	83.88	26.098	34.24	50.394	87.92
	109	29	82	91	103	82	176	122
26.2	30.913	60.13	56.25	82.97	25.995	35.06	50.218	86.70
	89	12	76	148	84	82	159	160
36.1	30.824	60.25	55.49	81.49	25.911	35.88	50.059	85.10
Mean Place	29.006	71.84	55.610	46.30	24.002	53.25	48.241	56.60
Sec δ, Tan δ	1.072	−0.386	4.086	+3.962	1.000	−0.009	1.280	+0.800
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.065	+0.024	+0.021	−0.244	+0.061	+0.001	+0.054	−0.050
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.37	−0.38	+0.37	−0.38	+0.37	−0.38	+0.37	−0.36

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Piscis Australis. Mag. 4.2		ζ Pegasi. Mag. 3.6		β Gruis. Mag. 2.2		η Pegasi. Mag. 3.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 22 36 s	° ′ −27 26 ″	h m 22 37 s	° ′ +10 25 ″	h m 22 38 s	° ′ −47 16 ″	h m 22 39 s	° ′ +29 48 ″
Jan. 1.2	22.804	51.60	36.616	48.87	2.849	87.50	22.929	75.16
	88	28	84	116	138	113	119	164
11.1	22.716	51.32	36.532	47.71	2.711	86.37	22.810	73.52
	62	52	63	124	102	146	96	187
21.1	22.654	50.80	36.469	46.47	2.609	84.91	22.714	71.65
	34	76	42	123	64	181	69	202
31.1	22.620	50.04	36.427	45.24	2.545	83.10	22.645	69.63
	5	98	14	122	22	207	37	208
Feb. 10.1	22.615	49.06	36.413	44.02	2.523	81.03	22.608	67.55
	27	121	14	106	22	232	1	208
20.0	22.642	47.85	36.427	42.96	2.545	78.71	22.607	65.47
	60	139	49	92	65	249	36	197
Mar. 2.0	22.702	46.46	36.476	42.04	2.610	76.22	22.643	63.50
	95	159	80	69	114	262	78	176
12.0	22.797	44.87	36.556	41.35	2.724	73.60	22.721	61.74
	132	174	118	42	160	269	118	150
21.9	22.929	43.13	36.674	40.93	2.884	70.91	22.839	60.24
	168	188	154	13	205	273	163	114
31.9	23.097	41.25	36.828	40.80	3.089	68.18	23.002	59.10
	201	198	184	20	251	269	202	76
Apr. 10.9	23.301	39.27	37.012	41.00	3.340	65.49	23.204	58.34
	238	205	221	55	293	261	238	31
20.9	23.539	37.22	37.233	41.55	3.633	62.88	23.442	58.03
	270	207	246	86	332	217	274	12
30.8	23.809	35.15	37.479	42.41	3.965	60.41	23.716	58.15
	296	204	274	120	364	225	299	60
May 10.8	24.105	33.11	37.753	43.61	4.329	58.16	24.015	58.75
	316	198	292	148	390	204	317	104
20.8	24.421	31.13	38.045	45.09	4.719	56.12	24.332	59.79
	330	185	302	171	407	170	329	144
30.8	24.751	29.28	38.347	46.80	5.126	54.42	24.661	61.23
	336	167	305	190	415	137	331	180
June 9.7	25.087	27.61	38.652	48.70	5.541	53.05	24.992	63.03
	333	146	301	206	412	100	323	211
19.7	25.420	26.15	38.953	50.76	5.953	52.05	25.315	65.14
	321	119	289	214	398	58	310	237
29.7	25.741	24.96	39.242	52.90	6.351	51.47	25.625	67.51
	301	92	268	216	371	18	284	255
July 9.6	26.042	24.04	39.510	55.06	6.725	51.29	25.909	70.06
	272	59	238	212	340	26	254	268
19.6	26.314	23.45	39.748	57.18	7.065	51.55	26.163	72.74
	238	28	209	206	296	68	217	274
29.6	26.552	23.17	39.957	59.24	7.361	52.23	26.380	75.48
	196	4	169	196	245	104	173	274
Aug. 8.6	26.748	23.21	40.126	61.20	7.606	53.27	26.553	78.22
	150	35	130	176	187	139	131	267
18.5	26.898	23.56	40.256	62.96	7.793	54.66	26.684	80.89
	102	64	85	158	126	168	83	258
28.5	27.000	24.20	40.341	64.54	7.919	56.34	26.767	83.47
	54	86	44	136	64	191	40	238
Sept. 7.5	27.054	25.06	40.385	65.90	7.983	58.25	26.807	85.85
	6	107	4	115	1	206	7	217
17.5	27.060	26.13	40.389	67.05	7.984	60.31	26.800	88.02
	37	121	33	89	57	211	46	194
27.4	27.023	27.34	40.356	67.94	7.927	62.42	26.754	89.96
	75	129	64	65	108	209	82	166
Oct. 7.4	26.948	28.63	40.292	68.59	7.819	64.51	26.672	91.62
	108	131	93	43	152	197	110	134
17.4	26.840	29.94	40.199	69.02	7.667	66.48	26.562	92.96
	131	127	111	17	190	179	136	100
27.3	26.709	31.21	40.088	69.19	7.477	68.27	26.426	93.96
	147	116	127	6	211	152	151	66
Nov. 6.3	26.562	32.37	39.961	69.13	7.266	69.79	26.275	94.62
	156	102	134	24	228	118	162	31
16.3	26.406	33.39	39.827	68.89	7.038	70.97	26.113	94.93
	156	84	137	49	229	80	168	8
26.3	26.250	34.23	39.690	68.40	6.809	71.77	25.945	94.85
	151	62	132	67	223	39	165	46
Dec. 6.2	26.099	34.85	39.558	67.73	6.586	72.16	25.780	94.39
	138	39	124	86	208	3	160	82
16.2	25.961	35.24	39.434	66.87	6.378	72.13	25.620	93.57
	121	13	110	99	185	45	147	118
26.2	25.840	35.37	39.324	65.88	6.193	71.68	25.473	92.39
	101	10	96	110	156	87	129	147
36.2	25.739	35.27	39.228	64.78	6.037	70.81	25.344	90.92
Mean Place	23.977	45.24	37.275	44.14	4.603	76.49	23.424	64.71
Sec δ, Tan δ	1.127	−0.519	1.017	+0.184	1.474	−1.083	1.153	+0.573
$D_{\psi a}$, $D_{\omega a}$	+0.066	+0.032	+0.059	−0.011	+0.071	+0.068	+0.056	−0.036
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.37	−0.36	+0.37	−0.35	+0.37	−0.35	+0.37	-0.34

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Pegasi. Mag. 4.1		ϵ Gruis. Mag. 3.7		τ Aquarii. Mag. 4.2		μ Pegasi. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 22 42	° ′ ″ +23 9	h m s 22 43	° ′ ″ −51 42	h m s 22 45	° ′ ″ −13 59	h m s 22 46	° ′ ″ +24 11
Jan. 1.2	48.685	44.64	52.726	91.71	30.137	60.77	16.622	49.33
	108	148	166	125	84	29	110	147
11.1	48.577	43.16	52.560	90.46	30.053	61.06	16.512	47.86
	82	165	126	164	61	16	89	167
21.1	48.495	41.51	52.434	88.82	29.992	61.22	16.423	46.19
	61	175	84	200	39	2	64	177
31.1	48.434	39.76	52.350	86.82	29.953	61.20	16.359	44.42
	32	179	40	228	12	20	35	182
Feb. 10.1	48.402	37.97	52.310	84.54	29.941	61.00	16.324	42.60
	1	176	9	252	16	38	4	179
20.0	48.403	36.21	52.319	82.02	29.957	60.62	16.320	40.81
	38	162	60	271	45	59	32	166
Mar. 2.0	48.441	34.59	52.379	79.31	30.002	60.03	16.352	39.15
	73	141	109	283	79	80	70	148
12.0	48.514	33.18	52.488	76.48	30.081	59.23	16.422	37.67
	115	113	162	290	113	101	110	121
21.9	48.629	32.05	52.650	73.58	30.194	58.22	16.532	36.46
	151	84	210	291	147	123	150	88
31.9	48.780	31.21	52.860	70.67	30.341	56.99	16.682	35.58
	191	43	262	285	182	141	188	51
Apr. 10.9	48.971	30.78	53.122	67.82	30.523	55.58	16.870	35.07
	228	5	308	271	216	159	226	11
20.9	49.199	30.73	53.430	65.08	30.739	53.99	17.096	34.96
	257	39	351	257	246	172	258	32
30.8	49.456	31.12	53.781	62.51	30.985	52.27	17.354	35.28
	285	78	387	234	272	183	285	74
May 10.8	49.741	31.90	54.168	60.17	31.257	50.44	17.639	36.02
	305	117	416	207	292	189	305	113
20.8	50.046	33.07	54.584	58.10	31.549	48.55	17.944	37.15
	314	152	431	173	307	190	317	149
30.8	50.360	34.59	55.018	56.37	31.856	46.65	18.261	38.64
	319	185	445	135	313	186	322	181
June 9.7	50.679	36.44	55.463	55.02	32.169	44.79	18.583	40.45
	315	207	442	94	311	176	316	208
19.7	50.994	38.51	55.905	54.08	32.480	43.03	18.899	42.53
	299	230	431	51	300	162	302	229
29.7	51.293	40.81	56.336	53.57	32.780	41.41	19.201	44.82
	276	244	404	6	283	144	282	243
July 9.6	51.569	43.25	56.740	53.51	33.063	39.97	19.483	47.25
	253	251	370	38	257	122	253	253
19.6	51.822	45.76	57.110	53.89	33.320	38.75	19.736	49.78
	213	252	325	82	225	98	218	255
29.6	52.035	48.28	57.435	54.71	33.545	37.77	19.954	52.33
	176	248	270	122	189	70	179	251
Aug. 8.6	52.211	50.76	57.705	55.93	33.734	37.07	20.133	54.84
	131	212	207	158	146	45	136	243
18.5	52.342	53.18	57.912	57.51	33.880	36.62	20.269	57.27
	90	224	142	186	103	17	93	230
28.5	52.432	55.42	58.054	59.37	33.983	36.45	20.362	59.57
	43	207	74	210	58	7	48	212
Sept. 7.5	52.475	57.49	58.128	61.47	34.041	36.52	20.410	61.69
	4	185	6	225	16	32	6	191
17.5	52.479	59.34	58.134	63.72	34.057	36.84	20.416	63.60
	35	159	56	229	23	50	33	186
27.4	52.444	60.93	58.078	66.01	34.034	37.34	20.383	65.26
	69	131	117	227	58	66	67	140
Oct. 7.4	52.375	62.27	57.961	68.28	33.976	38.00	20.316	66.66
	98	105	165	213	86	76	96	110
17.4	52.277	63.32	57.796	70.41	33.890	38.76	20.220	67.76
	122	74	206	191	109	83	120	80
27.3	52.155	64.06	57.590	72.32	33.781	39.59	20.100	68.56
	135	14	236	163	125	86	135	50
Nov. 6.3	52.020	64.50	57.354	73.95	33.656	40.45	19.965	69.06
	148	11	253	125	133	85	116	17
16.3	51.872	64.61	57.101	75.20	33.523	41.30	19.819	69.23
	151	20	259	82	135	80	151	16
26.3	51.721	64.41	56.842	76.02	33.388	42.10	19.668	69.07
	150	52	253	39	131	73	150	48
Dec. 6.2	51.571	63.89	56.589	76.41	33.257	42.83	19.518	68.59
	143	83	238	8	122	64	145	80
16.2	51.428	63.06	56.351	76.33	33.135	43.47	19.373	67.79
	131	112	215	54	110	52	135	109
26.2	51.297	61.94	56.136	75.79	33.025	43.99	19.238	66.70
	118	135	184	98	93	40	120	136
36.2	51.179	60.59	55.952	74.81	32.932	44.39	19.118	65.34
Mean Place	49.207	36.21	54.648	79.45	31.029	57.67	17.111	40.66
Sec δ, Tan δ	1.088	+0.428	1.614	−1.267	1.031	−0.249	1.096	+0.449
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.057	−0.027	+0.072	+0.080	+0.063	+0.016	+0.057	−0.028
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.38	−0.33	+0.38	−0.33	+0.38	−0.32	+0.38	−0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Cephei. Mag. 3.7		λ Aquarii. Mag. 3.8		ρ Indi. Mag. 6.1		δ Aquarii. Mag. 3.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 22 46 s	° ′ +65 47 ″	h m 22 48 s	° ′ − 7 59 ″	h m 22 49 s	° ′ −70 28 ″	h m 22 50 s	° ′ −16 13 ″
Jan. 1.2	55.86	60.87	35.099	24.50	15.48	83.22	33.019	54.54
	40	176	83	52	40	191	87	23
11.1	55.46	59.11	35.016	25.02	15.08	81.31	32.932	54.77
	34	222	64	42	32	237	67	4
21.1	55.12	56.89	34.952	25.44	14.76	78.94	32.865	54.81
	28	262	42	30	23	274	43	12
31.1	54.84	54.27	34.910	25.74	14.53	76.20	32.822	54.69
	20	294	18	16	14	305	19	33
Feb. 10.1	54.64	51.33	34.892	25.90	14.39	73.15	32.803	54.36
	11	310	12	4	5	328	10	53
20.0	54.53	48.23	34.904	25.86	14.34	69.87	32.813	53.83
	2	313	41	22	6	342	42	72
Mar. 2.0	54.51	45.10	34.945	25.64	14.40	66.45	32.855	53.11
	7	308	75	45	14	351	74	96
12.0	54.58	42.02	35.020	25.19	14.54	62.94	32.929	52.15
	18	289	109	66	25	348	110	114
22.0	54.76	39.13	35.129	24.53	14.79	59.46	33.039	51.01
	26	257	143	90	34	342	144	135
31.9	55.02	36.56	35.272	23.63	15.13	56.04	33.183	49.66
	36	218	177	113	42	325	178	153
Apr. 10.9	55.38	34.38	35.449	22.50	15.55	52.79	33.361	48.13
	43	167	210	134	51	301	211	169
20.9	55.81	32.71	35.659	21.16	16.06	49.78	33.575	46.44
	49	115	241	152	58	274	245	183
30.8	56.30	31.56	35.900	19.64	16.64	47.04	33.820	44.61
	54	58	267	170	61	237	272	189
May 10.8	56.84	30.98	36.167	17.94	17.28	44.67	34.092	42.72
	58	1	288	181	70	199	294	195
20.8	57.42	30.99	36.455	16.13	17.98	42.68	34.386	40.77
	59	59	301	190	72	153	308	193
30.8	58.01	31.58	36.756	14.23	18.70	41.15	34.694	38.84
	59	117	307	189	74	104	314	186
June 9.7	58.60	32.75	37.063	12.34	19.44	40.11	35.008	36.98
	56	172	305	187	75	53	315	175
19.7	59.16	34.47	37.368	10.47	20.19	39.58	35.323	35.23
	54	217	295	176	72	1	305	159
29.7	59.70	36.64	37.663	8.71	20.91	39.57	35.628	33.64
	49	261	278	164	68	51	288	139
July 9.7	60.19	39.25	37.941	7.07	21.59	40.08	35.916	32.25
	42	295	254	149	63	102	263	114
19.6	60.61	42.20	38.195	5.58	22.22	41.10	36.179	31.11
	35	320	222	125	55	149	231	89
29.6	60.96	45.40	38.417	4.33	22.77	42.59	36.410	30.22
	28	315	184	105	45	191	193	61
Aug. 8.6	61.24	48.85	38.601	3.28	23.22	44.50	36.603	29.61
	19	357	148	78	35	229	153	34
18.5	61.43	52.42	38.749	2.50	23.57	46.79	36.756	29.27
	11	363	102	54	24	258	107	5
28.5	61.54	56.05	38.851	1.96	23.81	49.37	36.863	29.22
	2	360	62	32	11	275	66	21
Sept. 7.5	61.56	59.65	38.913	1.64	23.92	52.12	36.929	29.43
	6	350	18	4	1	286	23	43
17.5	61.50	63.15	38.931	1.60	23.91	54.98	36.952	29.86
	14	333	20	16	13	285	20	63
27.4	61.36	66.48	38.911	1.76	23.78	57.83	36.932	30.49
	22	307	53	31	24	273	53	77
Oct. 7.4	61.14	69.55	38.858	2.07	23.54	60.56	36.879	31.26
	28	277	83	49	34	248	85	89
17.4	60.86	72.32	38.775	2.56	23.20	63.04	36.794	32.15
	34	239	100	60	42	216	106	93
27.4	60.52	74.71	38.675	3.16	22.78	65.20	36.688	33.08
	38	195	119	68	49	173	124	95
Nov. 6.3	60.14	76.66	38.556	3.84	22.29	66.93	36.564	34.03
	43	144	129	73	53	124	131	99
16.3	59.71	78.10	38.427	4.57	21.76	68.17	36.430	34.93
	45	90	131	75	56	68	135	85
26.3	59.26	79.00	38.296	5.32	21.20	68.85	36.295	35.78
	46	31	126	72	55	11	134	74
Dec. 6.2	58.80	79.31	38.170	6.04	20.65	68.96	36.161	36.52
	16	26	120	70	53	47	126	63
16.2	58.34	79.05	38.050	6.74	20.12	68.49	36.035	37.15
	45	86	109	66	48	106	113	48
26.2	57.89	78.19	37.941	7.40	19.64	67.43	35.922	37.63
	42	143	94	60	44	159	97	34
36.2	57.47	76.76	37.847	8.00	19.20	65.84	35.825	37.97
Mean Place	56.084	42.42	35.896	23.03	19.200	68.14	33.921	50.49
Sec δ, Tan δ	2.439	+2.225	1.010	−0.140	2.993	−2.821	1.042	−0.291
Dψa, Dωa	+0.043	−0.141	+0.062	+0.009	+0.084	+0.179	+0.063	+0.019
Dψδ, Dωδ	+0.38	−0.31	+0.38	−0.31	+0.38	−0.30	+0.38	−0.30

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Piscis Australis. (*Fomalhaut.*) Mag. 1.3		o Andromedæ. Mag. 3.6		β Pegasi. Var. 2.2–2.7		α Pegasi. (*Markab.*) Mag. 2.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 22 53 s	° ′ −30 1 ″	h m 22 58 s	° ′ +41 54 ″	h m 23 0 s	° ′ +27 39 ″	h m 23 0 s	° ′ +14 47 ″
Jan. 1.2	22.833	58.92	22.172	55.95	1.963	62.58	54.937	31.79
	104	31	171	163	124	145	105	121
11.1	22.729	58.61	22.001	54.32	1.839	61.13	54.832	30.58
	82	58	147	198	104	167	84	130
21.1	22.647	58.03	21.854	52.34	1.735	59.46	54.748	29.28
	53	86	119	225	83	183	63	135
31.1	22.594	57.17	21.735	50.09	1.652	57.63	54.685	27.93
	25	109	84	210	53	190	41	133
Feb. 10.1	22.569	56.08	21.651	47.69	1.599	55.73	54.644	26.60
	5	135	40	249	20	191	9	126
20.0	22.574	54.73	21.611	45.20	1.579	53.82	54.635	25.34
	43	158	5	245	14	182	19	113
Mar. 2.0	22.617	53.15	21.616	42.75	1.593	52.00	54.654	24.21
	77	176	54	231	56	165	57	96
12.0	22.694	51.39	21.670	40.44	1.649	50.35	54.711	23.25
	116	193	106	210	97	140	95	69
22.0	22.810	49.46	21.776	38.34	1.746	48.95	54.806	22.56
	152	205	157	176	137	110	132	38
31.9	22.962	47.41	21.933	36.58	1.883	47.85	54.938	22.18
	193	216	206	140	181	71	167	7
Apr. 10.9	23.155	45.25	22.139	35.18	2.064	47.14	55.105	22.11
	228	222	253	92	221	32	205	29
20.9	23.383	43.03	22.392	34.26	2.285	46.82	55.310	22.40
	264	224	294	48	254	12	210	66
30.8	23.647	40.79	22.686	33.78	2.539	46.94	55.550	23.06
	291	218	325	6	286	54	264	97
May 10.8	23.938	38.61	23.011	33.84	2.825	47.48	55.814	24.03
	316	210	351	57	307	97	289	130
20.8	24.254	36.51	23.362	34.41	3.132	48.45	56.103	25.33
	335	197	366	105	322	134	302	160
30.8	24.589	34.54	23.728	35.46	3.454	49.79	56.405	26.93
	339	175	370	150	329	170	310	184
June 9.7	24.928	32.79	24.098	36.96	3.783	51.49	56.715	28.77
	342	153	367	190	325	201	310	199
19.7	25.270	31.26	24.465	38.86	4.108	53.50	57.025	30.76
	331	121	318	227	316	226	298	215
29.7	25.601	30.05	24.813	41.13	4.424	55.76	57.323	32.91
	316	95	328	257	294	215	281	223
July 9.7	25.917	29.10	25.141	43.70	4.718	58.21	57.604	35.14
	292	57	291	278	268	255	256	225
19.6	26.209	28.53	25.432	46.48	4.986	60.76	57.860	37.39
	256	26	254	296	232	262	226	221
29.6	26.465	28.27	25.686	49.44	5.218	63.38	58.086	39.60
	215	12	208	305	196	264	190	215
Aug. 8.6	26.680	28.39	25.894	52.49	5.414	66.02	58.276	41.75
	171	42	160	307	151	258	151	200
18.5	26.851	28.81	26.054	55.56	5.565	68.60	58.427	43.75
	123	75	110	307	108	247	107	183
28.5	26.974	29.56	26.164	58.63	5.673	71.07	58.534	45.58
	74	99	56	291	63	230	68	162
Sept. 7.5	27.048	30.55	26.220	61.54	5.736	73.37	58.602	47.20
	25	123	9	276	21	212	25	142
17.5	27.073	31.78	26.229	64.30	5.757	75.49	58.627	48.62
	17	137	35	258	20	188	10	117
27.4	27.056	33.15	26.194	66.88	5.737	77.37	58.617	49.79
	59	146	80	231	55	162	46	95
Oct. 7.4	26.997	34.61	26.114	69.19	5.682	78.99	58.571	50.74
	97	149	116	199	87	134	73	69
17.4	26.900	36.10	25.998	71.18	5.595	80.33	58.498	51.43
	123	144	117	164	113	102	98	39
27.4	26.777	37.54	25.851	72.82	5.482	81.35	58.400	51.82
	144	133	172	124	132	70	115	20
Nov. 6.3	26.633	38.87	25.679	74.06	5.350	82.05	58.285	52.02
	150	117	191	84	146	38	126	7
16.3	26.483	40.04	25.488	74.90	5.204	82.43	58.159	51.95
	160	97	200	37	152	0	133	31
26.3	26.323	41.01	25.288	75.27	5.052	82.43	58.026	51.64
	158	70	206	7	156	32	134	54
Dec. 6.2	26.165	41.71	25.082	75.20	4.896	82.11	57.892	51.10
	148	46	205	51	153	69	129	77
16.2	26.017	42.17	24.877	74.69	4.743	81.42	57.763	50.33
	133	15	196	100	146	100	124	94
26.2	25.884	42.32	24.681	73.69	4.597	80.42	57.639	49.39
	114	10	182	139	133	129	109	111
36.2	25.770	42.22	24.499	72.30	4.464	79.13	57.530	48.28
Mean Place	23.969	50.80	22.449	42.57	2.343	53.20	55.423	26.45
Sec δ, Tan δ	1.155	−0.578	1.344	+0.898	1.129	+0.525	1.034	+0.264
$D_{\psi a}$, $D_{\omega a}$	+0.066	+0.037	+0.055	−0.058	+0.058	−0.034	+0.059	−0.017
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.38	−0.29	+0.38	−0.27	+0.38	−0.26	+0.38	−0.26

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	55 Pegasi. Mag. 4.7		c^2 Aquarii. Mag. 3.8		π Cephei. Mag. 4.6		ι Gruis. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	23 3	+ 8 59	23 5	−21 35	23 5	+74 58	23 5	−45 39
Jan. 1.2	6.939	38.86	19.678	33.00	26.88	35.31	58.859	63.60
	98	105	101	6	71	110	159	84
11.2	6.841	37.81	19.577	33.06	26.17	33.91	58.700	62.76
	80	109	81	16	63	195	128	122
21.1	6.761	36.72	19.496	32.90	25.54	31.96	58.572	61.54
	59	110	58	40	54	212	98	161
31.1	6.702	35.62	19.438	32.50	25.00	29.54	58.474	59.93
	38	104	35	63	43	280	59	190
Feb. 10.1	6.664	34.58	19.403	31.87	24.57	26.74	58.415	58.03
	9	96	5	84	28	306	20	220
	—		—				—	
20.0	6.655	33.62	19.398	31.03	24.29	23.68	58.395	55.83
	21	80	25	107	14	320	23	241
Mar. 2.0	6.676	32.82	19.423	29.96	24.15	20.48	58.418	53.42
	55	59	60	129	—	321	67	260
12.0	6.731	32.23	19.483	28.67	24.17	17.27	58.485	50.82
	91	36	97	148	18	310	114	271
22.0	6.822	31.87	19.580	27.19	24.35	14.17	58.599	48.11
	127	5	131	168	33	288	162	280
31.9	6.949	31.82	19.711	25.51	24.68	11.31	58.761	45.31
	164	21	169	182	48	252	207	280
	—	—						
Apr. 10.9	7.113	32.06	19.880	23.69	25.16	8.79	58.968	42.51
	200	56	205	196	60	208	253	276
20.9	7.313	32.62	20.085	21.73	25.76	6.71	59.221	39.75
	232	88	210	203	70	158	294	266
30.9	7.545	33.50	20.325	19.70	26.46	5.13	59.515	37.09
	261	118	269	209	80	103	333	251
May 10.8	7.806	34.68	20.594	17.61	27.26	4.10	59.848	34.58
	283	115	295	208	81	44	362	228
20.8	8.089	36.13	20.889	15.53	28.10	3.66	60.210	32.30
	298	169	311	204	89	17	386	202
	—		—				—	
30.8	8.387	37.82	21.200	13.49	28.99	3.83	60.596	30.28
	305	188	322	190	88	74	400	168
June 9.7	8.692	39.70	21.522	11.59	29.87	4.57	60.996	28.60
	306	200	323	175	86	131	403	133
19.7	8.998	41.70	21.845	9.84	30.73	5.88	61.399	27.27
	297	209	319	153	82	183	395	91
29.7	9.295	43.79	22.164	8.31	31.55	7.71	61.794	26.36
	281	211	301	130	75	230	379	50
July 9.7	9.576	45.90	22.165	7.01	32.30	10.01	62.173	25.86
	256	208	278	100	67	270	351	6
	—		—				—	
19.6	9.832	47.98	22.743	6.01	32.97	12.71	62.524	25.80
	226	201	250	70	56	306	314	36
29.6	10.058	49.99	22.993	5.31	33.53	15.77	62.838	26.16
	192	188	212	39	46	334	268	80
Aug. 8.6	10.250	51.87	23.205	4.92	33.99	19.11	63.106	26.96
	152	171	170	9	33	354	217	117
18.6	10.402	53.58	23.375	4.83	34.32	22.65	63.323	28.13
	111	152	127	22	21	368	158	152
28.5	10.513	55.10	23.502	5.05	34.53	26.33	63.181	29.65
	70	131	82	50	7	371	99	178
	—		—				—	
Sept. 7.5	10.583	56.41	23.584	5.55	34.60	30.04	63.580	31.43
	30	107	39	75	5	368	42	200
17.5	10.613	57.48	23.623	6.30	34.55	33.72	63.622	33.43
	9	86	6	92	18	359	18	211
27.4	10.601	58.34	23.617	7.22	34.37	37.31	63.604	35.54
	41	60	13	108	29	339	72	216
Oct. 7.4	10.563	58.94	23.574	8.30	34.08	40.70	63.532	37.70
	71	38	76	116	41	311	116	210
17.4	10.492	59.32	23.498	9.46	33.67	43.84	63.416	39.80
	90	17	101	119	51	279	154	197
	—		—				—	
27.4	10.402	59.49	23.397	10.65	33.16	46.63	63.262	41.77
	110	6	122	117	60	210	186	174
Nov. 6.3	10.292	59.43	23.275	11.82	32.56	49.03	63.076	43.51
	121	25	131	108	67	193	205	144
16.3	10.171	59.18	23.144	12.90	31.89	50.96	62.871	44.95
	127	44	141	97	73	138	212	110
26.3	10.044	58.74	23.003	13.87	31.16	52.34	62.659	46.05
	128	60	138	80	77	81	215	68
Dec. 6.3	9.916	58.14	22.865	14.67	30.39	53.15	62.444	46.73
	123	77	134	63	78	21	209	28
	—		—			—		—
16.2	9.793	57.37	22.731	15.30	29.61	53.36	62.235	47.01
	116	89	123	43	78	43	191	14
26.2	9.677	56.48	22.608	15.73	28.83	52.93	62.044	46.87
	105	100	110	19	75	103	171	59
36.2	9.572	55.48	22.498	15.92	28.08	51.90	61.873	46.28
Mean Place	7.469	35.46	20.584	26.55	26.638	15.74	60.354	50.95
Sec δ, Tan δ	1.012	+0.158	1.075	−0.395	3.858	+3.726	1.431	−1.023
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.060	−0.010	+0.064	+0.026	+0.038	−0.241	+0.068	+0.066
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.39	−0.25	+0.39	−0.24	+0.39	−0.24	+0.39	−0.23

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	59 Pegasi. Mag. 5.2		5 H¹. Cassiopeiæ. Mag. 5.6		φ Aquarii. Mag. 4.4		ψ Aquarii. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 23 7 s	° ′ + 8 18 ″	h m 23 9 s	° ′ +56 44 ″	h m 23 10 s	° ′ − 6 27 ″	h m 23 11 s	° ′ − 9 30 ″
Jan. 1.2	50.379	9.35	34.148	51.80	19.431	53.78	50.843	29.45
	100	102	274	153	96	59	97	49
11.2	50.279	8.33	33.874	50.27	19.335	54.37	50.746	29.94
	83	105	244	198	80	49	79	37
21.1	50.196	7.28	33.630	48.29	19.255	54.86	50.667	30.31
	63	105	204	237	58	37	58	22
31.1	50.133	6.23	33.426	45.92	19.197	55.23	50.609	30.53
	42	99	154	264	39	24	38	5
Feb. 10.1	50.091	5.24	33.272	43.28	19.158	55.47	50.571	30.58
	13	92	96	284	9	4	11	13
20.0	50.078	4.32	33.176	40.44	19.149	55.51	50.560	30.45
	17	76	32	289	18	13	17	34
Mar. 2.0	50.095	3.56	33.144	37.55	19.167	55.38	50.577	30.11
	50	51	39	284	52	38	51	55
12.0	50.145	3.02	33.183	34.71	19.219	55.00	50.628	29.56
	87	31	111	268	84	58	85	78
22.0	50.232	2.71	33.234	32.03	19.303	54.42	50.713	28.78
	122	2	184	238	121	84	120	101
31.9	50.354	2.69	33.478	29.65	19.424	53.58	50.833	27.77
	160	27	252	204	156	107	157	125
Apr. 10.9	50.514	2.96	33.730	27.61	19.580	52.51	50.990	26.52
	195	59	316	158	194	130	193	142
20.9	50.709	3.55	34.046	26.03	19.774	51.21	51.183	25.10
	229	91	370	107	227	151	227	163
30.9	50.938	4.46	34.416	24.96	20.001	49.70	51.410	23.47
	258	119	415	55	253	164	255	178
May 10.8	51.196	5.65	34.831	24.41	20.254	48.06	51.665	21.69
	281	146	450	2	280	180	281	189
20.8	51.477	7.11	35.281	24.43	20.534	46.26	51.946	19.80
	297	169	469	58	295	191	297	194
30.8	51.774	8.80	35.750	25.01	20.829	44.35	52.243	17.86
	305	187	477	112	305	193	307	195
June 9.7	52.079	10.67	36.227	26.13	21.134	42.42	52.550	15.91
	306	198	470	161	307	194	311	191
19.7	52.385	12.65	36.697	27.74	21.441	40.48	52.861	14.00
	298	209	451	205	300	185	303	182
29.7	52.683	14.74	37.148	29.79	21.741	38.63	53.164	12.18
	282	208	421	217	286	173	290	166
July 9.7	52.965	16.82	37.569	32.26	22.027	36.90	53.454	10.52
	259	207	381	281	264	157	268	149
19.6	53.224	18.89	37.950	35.07	22.291	35.33	53.722	9.03
	229	200	330	306	237	140	240	125
29.6	53.453	20.89	38.280	38.13	22.528	33.93	53.962	7.78
	197	184	273	328	200	116	206	102
Aug. 8.6	53.650	22.73	38.553	41.41	22.728	32.77	54.168	6.76
	156	168	213	338	163	90	166	75
18.6	53.806	24.41	38.766	44.79	22.891	31.87	54.334	6.01
	116	150	148	345	125	67	128	49
28.5	53.922	25.91	38.914	48.24	23.016	31.20	54.462	5.52
	74	127	82	342	81	37	85	22
Sept. 7.5	53.996	27.18	38.996	51.66	23.097	30.83	54.547	5.30
	36	104	19	333	42	17	42	2
17.5	54.032	28.22	39.015	54.99	23.139	30.66	54.589	5.32
	1	82	42	317	0	4	4	24
27.4	54.028	29.04	38.973	58.16	23.139	30.70	54.593	5.56
	35	57	98	294	31	28	31	44
Oct. 7.4	53.993	29.61	38.875	61.10	23.108	30.98	54.562	6.00
	66	35	151	266	65	44	62	59
17.4	53.927	29.96	38.724	63.76	23.043	31.42	54.500	6.59
	88	14	195	231	84	57	85	70
27.4	53.839	30.10	38.529	66.07	22.959	31.99	54.415	7.29
	106	9	235	189	106	65	104	77
Nov. 6.3	53.733	30.01	38.294	67.96	22.853	32.64	54.311	8.06
	118	26	263	145	117	74	118	82
16.3	53.615	29.75	38.031	69.41	22.736	33.38	54.193	8.88
	126	44	289	94	121	75	123	81
26.3	53.489	29.31	37.742	70.35	22.615	34.13	54.070	9.69
	126	61	301	41	125	76	125	80
Dec. 6.3	53.363	28.70	37.441	70.76	22.490	34.89	53.945	10.49
	124	76	309	13	122	76	122	73
16.2	53.239	27.94	37.132	70.63	22.368	35.65	53.823	11.22
	116	88	302	68	112	72	114	65
26.2	53.123	27.06	36.830	69.95	22.256	36.37	53.709	11.87
	106	96	288	123	104	61	104	56
36.2	53.017	26.10	36.542	68.72	22.152	37.01	53.605	12.43
Mean Place	50.888	6.35	34.180	35.13	20.091	51.79	51.534	26.41
Sec δ, Tan δ	1.011	+0.146	1.824	+1.525	1.006	−0.113	1.014	−0.167
Dψα, Dωα	+0.060	−0.009	+0.052	−0.099	+0.062	+0.007	+0.062	+0.011
Dψδ, Dωδ	+0.39	−0.23	+0.39	−0.22	+0.39	−0.22	+0.39	−0.21

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tucanæ. Mag. 4.1		γ Piscium. Mag. 3.8		γ Sculptoris. Mag. 4.5		o Cephei. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	23 12	−58 39	23 13	+ 2 51	23 14	−32 56	23 15	+67 41
	s	″	s	″	s	″	s	″
Jan. 1.2	54.561	46.16	9.852	41.81	39.073	76.54	27.62	42.69
	250	126	97	86	124	31	46	139
11.2	54.311	44.90	9.755	40.95	38.949	76.23	27.16	41.30
	211	172	81	84	105	63	41	187
21.1	54.100	43.18	9.674	40.11	38.844	75.60	26.75	39.43
	165	214	62	80	78	94	36	237
31.1	53.935	41.04	9.612	39.31	38.766	74.66	26.39	37.06
Feb. 10.1	113	247	41	70	52	122	28	269
	53.822	38.57	9.571	38.61	38.714	73.44	26.11	34.37
	58	279	14	59	19	148	20	297
20.1	53.764	35.78	9.557	38.02	38.695	71.96	25.91	31.40
	0	300	14	42	13	173	9	310
Mar. 2.0	53.764	32.78	9.571	37.60	38.708	70.23	25.82	28.30
	61	315	46	21	51	195	0	309
12.0	53.825	29.63	9.617	37.39	38.759	68.28	25.82	25.21
	122	324	82	2	90	212	12	298
22.0	53.947	26.39	9.699	37.41	38.849	66.16	25.94	22.23
	188	326	119	29	130	227	22	276
31.9	54.135	23.13	9.818	37.70	38.979	63.89	26.16	19.47
	216	322	156	57	171	236	32	240
Apr. 10.9	54.381	19.91	9.974	38.27	39.150	61.53	26.48	17.07
	308	308	190	85	212	212	41	198
20.9	54.689	16.83	10.164	39.12	39.362	59.11	26.89	15.09
	361	291	225	112	218	213	49	148
30.9	55.050	13.92	10.389	40.24	39.610	56.68	27.38	13.61
May 10.8	410	265	273	137	284	237	55	97
	55.460	11.27	10.642	41.61	39.894	54.31	27.93	12.61
20.8	452	235	279	160	311	226	60	35
	55.912	8.92	10.921	43.21	40.205	52.05	28.53	12.29
	481	199	294	177	332	211	62	20
30.8	56.393	6.93	11.215	44.98	40.537	49.94	29.15	12.49
	501	156	306	190	315	191	61	79
June 9.8	56.894	5.37	11.521	46.88	40.882	48.03	29.79	13.28
	510	111	305	198	350	162	63	133
19.7	57.404	4.26	11.826	48.86	41.232	46.41	30.42	14.61
	502	65	300	200	315	133	60	182
29.7	57.906	3.61	12.126	50.86	41.577	45.08	31.02	16.43
July 9.7	484	10	286	198	330	100	56	231
	58.390	3.51	12.412	52.84	41.907	44.08	31.58	18.74
	450	31	263	190	309	60	50	233
19.6	58.840	3.82	12.675	54.74	42.216	43.48	32.08	21.42
	401	84	236	177	276	26	44	303
29.6	59.244	4.66	12.911	56.51	42.492	43.22	32.52	24.45
Aug. 8.6	319	130	201	160	241	14	36	330
	59.593	5.96	13.112	58.11	42.733	43.36	32.88	27.75
18.6	281	171	163	112	195	48	28	318
	59.874	7.67	13.275	59.53	42.928	43.84	33.16	31.23
28.5	208	203	124	118	147	84	19	360
	60.082	9.70	13.399	60.71	43.075	44.68	33.35	34.83
	130	234	82	97	100	112	10	361
Sept. 7.5	60.212	12.04	13.481	61.68	43.175	45.80	33.45	38.47
	53	253	41	72	17	137	1	359
17.5	60.265	14.57	13.525	62.40	43.222	47.17	33.46	42.06
	26	260	4	49	1	155	8	317
27.5	60.239	17.17	13.529	62.89	43.223	48.72	33.38	45.53
	100	260	29	27	41	165	16	330
Oct. 7.4	60.139	19.77	13.500	63.16	43.182	50.37	33.22	48.83
	166	247	58	6	79	169	23	303
17.4	59.973	22.24	13.442	63.22	43.103	52.06	32.99	51.86
	221	228	82	12	113	164	31	270
27.4	59.752	24.52	13.360	63.10	42.990	53.70	32.68	54.56
	267	196	100	30	136	151	36	231
Nov. 6.3	59.485	26.48	13.260	62.80	42.854	55.24	32.32	56.87
	297	156	112	43	152	136	42	185
16.3	59.188	28.04	13.148	62.37	42.702	56.60	31.90	58.72
	316	112	120	56	160	112	46	131
26.3	58.872	29.16	13.028	61.81	42.542	57.72	31.44	60.03
Dec. 6.3	322	60	121	68	163	86	48	76
	58.550	29.76	12.907	61.13	42.379	58.58	30.96	60.79
	315	9	119	74	158	55	50	16
16.2	58.235	29.85	12.788	60.39	42.221	59.13	30.46	60.95
	295	44	113	81	149	22	50	41
26.2	57.940	29.41	12.675	59.58	42.072	59.35	29.96	60.54
	269	95	103	85	135	9	48	102
36.2	57.671	28.46	12.572	58.73	41.937	59.26	29.48	59.52
Mean Place	56.650	30.68	10.387	40.82	40.147	66.37	27.393	24.17
Sec δ, Tan δ	1.922	−1.642	1.001	+0.050	1.192	−0.648	2.635	+2.437
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.070	+0.107	+0.061	−0.003	+0.065	+0.042	+0.049	−0.159
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.39	−0.20	+0.39	−0.20	+0.39	−0.20	+0.39	−0.19

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Pegasi. Mag. 4.6		b^1 Aquarii. Mag. 4.2		4 Cassiopeiæ. Mag. 5.2		υ Pegasi. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	23 16	+23 19	23 18	−20 30	23 21	+61 51	23 21	+22 58
	s	″	s	″	s	″	s	″
Jan. 1.2	49.070	14.49	54.864	83.12	24.69	53.16	31.730	54.99
11.2	48.945 125	13.19 130	54.753 111	83.28 16	24.34 35	51.81 135	31.607 123	53.76 123
21.1	48.838 107	11.74 145	54.666 93	83.20 8	24.02 32	49.94 187	31.499 108	52.34 142
31.1	48.752 86	10.16 158	54.596 70	82.90 30	23.74 28	47.66 228	31.408 91	50.79 155
Feb. 10.1	48.689 63	8.50 166	54.550 46	82.35 55	23.52 22	45.04 262	31.342 66	49.17 162
	34	167	20	77	15	286	37	162
20.1	48.655	6.83	54.530	81.58	23.37	42.18	31.305	47.55
Mar. 2.0	48.655 0	5.25 158	54.539 9	80.57 101	23.29 8	39.20 298	31.299 6	46.02 153
12.0	48.692 37	3.86 139	54.583 44	79.33 124	23.29 0	36.23 297	31.332 33	44.63 139
22.0	48.768 76	2.70 116	54.665 82	77.90 113	23.38 9	33.39 284	31.404 72	43.47 116
31.9	48.888 120	1.79 91	54.781 116	76.26 164	23.56 18	30.78 261	31.518 114	42.59 88
	159	55	153	181	25	229	156	54
Apr. 10.9	49.047	1.24	54.934	74.45	23.81	28.49	31.674	42.05
20.9	49.248 201	1.07 17	55.126 192	72.52 193	24.14 33	26.65 184	31.870 196	41.87 18
30.9	49.487 239	1.28 21	55.354 228	70.46 206	21.54 10	25.29 136	32.102 232	42.09 22
May 10.8	49.753 266	1.90 62	55.612 258	68.36 210	25.00 46	24.46 83	32.367 265	42.69 60
20.8	50.046 293	2.89 99	55.898 286	66.24 212	25.49 49	24.18 28	32.657 290	43.66 97
	310	131	305	208	52	30	310	134
30.8	50.356	4.23	56.203	64.16	26.01	24.48	32.967	45.00
June 9.8	50.675 319	5.90 167	56.520 317	62.17 199	26.54 53	25.32 84	33.287 320	46.65 165
19.7	50.998 323	7.82 192	56.841 321	60.36 181	27.07 53	26.71 139	33.608 321	48.56 191
29.7	51.311 313	9.97 215	57.160 319	58.73 163	27.58 51	28.56 185	33.923 315	50.70 214
July 9.7	51.606 295	12.30 233	57.463 303	57.34 139	28.06 48	30.88 232	34.221 298	52.99 229
	275	211	284	111	43	267	276	239
19.6	51.881	14.71	57.747	56.23	28.49	33.55	34.497	55.38
29.6	52.122 241	17.16 245	58.003 256	55.42 81	28.87 38	36.54 299	34.743 246	57.81 243
Aug. 8.6	52.330 208	19.60 244	58.223 220	54.93 49	29.19 32	39.78 324	34.953 210	60.23 242
18.6	52.496 166	21.96 236	58.104 181	54.75 18	29.44 25	43.18 340	35.125 172	62.58 235
28.5	52.621 125	21.22 226	58.544 140	54.87 12	29.62 18	46.68 350	35.255 130	64.81 223
	85	211	94	42	10	351	87	208
Sept. 7.5	52.706	26.33	58.638	55.29	29.72	50.19	35.342	66.89
17.5	52.747 41	28.24 191	58.690 52	55.97 68	29.75 3	53.67 348	35.388 46	68.77 188
27.5	52.747 0	29.90 166	58.699 9	56.84 87	29.72 3	57.01 334	35.396 8	70.43 166
Oct. 7.4	52.715 32	31.35 145	58.671 28	57.88 104	29.61 11	60.17 316	35.368 28	71.86 143
17.4	52.649 66	32.51 116	58.608 63	59.03 115	29.44 17	63.06 289	35.307 61	73.02 116
	90	88	90	120	22	256	86	89
27.4	52.559	33.39	58.518	60.23	29.22	65.62	35.221	73.91
Nov. 6.3	52.445 114	33.99 60	58.406 112	61.42 119	28.95 27	67.80 218	35.115 106	74.49 58
16.3	52.317 128	34.27 28	58.282 124	62.55 113	28.64 31	69.52 172	34.991 124	74.79 30
26.3	52.180 137	34.28 1	58.147 135	63.57 102	28.29 35	70.75 123	34.858 133	74.80 1
Dec. 6.3	52.039 141	33.95 33	58.012 135	64.46 89	27.93 36	71.43 68	34.719 139	74.51 29
	113	61	134	70	38	12	141	59
16.2	51.896	33.34	57.878	65.16	27.55	71.55	34.578	73.92
26.2	51.756 140	32.47 87	57.752 126	65.66 50	27.17 38	71.10 45	34.440 138	73.07 85
36.2	51.628 128	31.31 116	57.637 115	65.96 30	26.80 37	70.08 102	34.309 131	71.96 111
Mean Place	49.383	6.92	55.676	76.27	24.507	35.69	32.014	47.68
Sec δ, Tan δ	1.089	+0.431	1.068	−0.374	2.121	+1.870	1.086	+0.424
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.059	−0.028	+0.063	+0.025	+0.053	−0.123	+0.059	−0.028
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.39	−0.19	+0.39	−0.18	+0.39	−0.17	+0.39	−0.17

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Piscium. Mag. 4.9		θ Piscium. Mag. 4.4		70 Pegasi. Mag. 4.7		β Sculptoris. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	23 22	+ 0 49	23 24	+ 5 57	23 25	+12 20	23 28	−38 14
	s	″	s	″	s	″	s	″
Jan. 1.2	58.605	62.11	3.228	22.87	15.164	11.90	49.693	52.57
	102	80	106	92	109	105	119	40
11.2	58.503	61.31	3.122	21.95	15.055	10.85	49.544	52.17
	88	76	91	94	98	112	127	77
21.1	58.415	60.55	3.031	21.01	14.957	9.73	49.417	51.40
	70	70	73	91	79	116	103	113
31.1	58.345	59.85	2.958	20.10	14.878	8.57	49.314	50.27
	51	59	55	87	58	114	73	145
Feb. 10.1	58.294	59.26	2.903	19.23	14.820	7.43	49.241	48.82
	24	47	27	74	34	109	44	175
20.1	58.270	58.79	2.876	18.49	14.786	6.34	49.197	47.07
	4	30	0	59	3	96	7	201
Mar. 2.0	58.274	58.49	2.876	17.90	14.783	5.38	49.190	45.06
	37	7	35	39	33	78	33	222
12.0	58.311	58.42	2.911	17.51	14.816	4.60	49.223	42.84
	71	14	68	16	67	54	73	241
22.0	58.382	58.56	2.979	17.35	14.883	4.06	49.296	40.43
	109	42	109	10	108	27	118	255
31.9	58.491	58.98	3.088	17.45	14.991	3.79	49.414	37.88
	145	67	147	41	144	3	162	263
Apr. 10.9	58.636	59.65	3.235	17.86	15.135	3.82	49.576	35.25
	180	94	179	68	184	35	205	266
20.9	58.816	60.59	3.414	18.54	15.319	4.17	49.781	32.59
	218	121	218	97	220	69	247	265
30.9	59.034	61.80	3.632	19.51	15.539	4.86	50.028	29.94
	216	143	246	125	251	101	283	255
May 10.8	59.280	63.23	3.878	20.76	15.790	5.87	50.311	27.39
	274	163	271	149	276	130	317	243
20.8	59.554	64.86	4.149	22.25	16.066	7.17	50.628	24.96
	291	180	292	168	296	157	341	223
30.8	59.845	66.66	4.441	23.93	16.362	8.74	50.969	22.73
	302	192	302	187	306	178	359	198
June 9.8	60.147	68.58	4.743	25.80	16.668	10.52	51.328	20.75
	306	197	306	197	310	195	366	167
19.7	60.153	70.55	5.049	27.77	16.978	12.47	51.694	19.08
	300	199	301	203	305	209	365	132
29.7	60.753	72.54	5.350	29.80	17.283	14.56	52.059	17.76
	289	194	289	205	290	214	352	95
July 9.7	61.042	74.48	5.639	31.85	17.573	16.70	52.411	16.81
	268	184	268	199	269	216	333	54
19.6	61.310	76.32	5.907	33.84	17.842	18.86	52.744	16.27
	241	170	238	191	244	210	301	12
29.6	61.551	78.02	6.145	35.75	18.086	20.96	53.045	16.15
	208	152	210	173	210	203	264	30
Aug. 8.6	61.759	79.54	6.355	37.48	18.296	22.99	53.309	16.45
	172	131	169	156	172	188	220	69
18.6	61.931	80.85	6.524	39.04	18.468	24.87	53.529	17.14
	132	109	133	138	132	171	172	105
28.5	62.063	81.94	6.657	40.42	18.600	26.58	53.701	18.19
	92	85	90	115	93	151	119	137
Sept. 7.5	62.155	82.79	6.747	41.57	18.693	28.09	53.820	19.56
	51	60	50	92	51	130	67	163
17.5	62.206	83.39	6.797	42.49	18.744	29.39	53.887	21.19
	15	37	16	67	14	105	16	181
27.5	62.221	83.76	6.813	43.16	18.758	30.44	53.903	23.00
	22	16	22	47	20	84	31	193
Oct. 7.4	62.199	83.92	6.791	43.63	18.738	31.28	53.872	24.93
	49	5	16	24	50	57	75	195
17.4	62.150	83.87	6.745	43.87	18.688	31.85	53.797	26.88
	75	23	75	2	76	36	110	190
27.4	62.075	83.64	6.670	43.89	18.612	32.21	53.687	28.78
	91	37	93	14	95	14	138	176
Nov. 6.3	61.981	83.27	6.577	43.75	18.517	32.35	53.549	30.54
	108	51	111	33	111	9	161	155
16.3	61.873	82.76	6.466	43.42	18.406	32.26	53.388	32.09
	118	62	118	49	120	29	172	127
26.3	61.755	82.14	6.348	42.93	18.286	31.97	53.216	33.36
	121	69	122	63	125	49	178	96
Dec. 6.3	61.634	81.45	6.226	42.30	18.161	31.48	53.038	34.32
	119	75	122	73	126	69	177	60
16.2	61.515	80.70	6.104	41.57	18.035	30.79	52.861	34.92
	116	78	118	81	122	84	170	22
26.2	61.399	79.92	5.986	40.76	17.913	29.95	52.691	35.14
	107	81	109	86	116	95	156	17
36.2	61.292	79.11	5.877	39.90	17.797	29.00	52.535	34.97
Mean Place	59.110	62.20	3.671	21.28	15.533	8.19	50.796	40.22
Sec δ, Tan δ	1.000	+0.015	1.005	+0.104	1.024	+0.219	1.273	−0.788
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.061	−0.001	+0.061	−0.007	+0.060	−0.014	+0.064	+0.052
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.39	−0.16	+0.39	−0.16	+0.39	−0.15	+0.39	−0.14

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Pegasi (*mean*). Mag. 5.2		λ Andromedæ. Mag. 4.0		ι Andromedæ. Mag. 4.3		ι Piscium. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 23 30 s	° ′ +30 53 ″	h m 23 33 s	° ′ +46 2 ″	h m 23 34 s	° ′ +42 50 ″	h m 23 35 s	° ′ + 5 12 ″
Jan. 1.2	7.611	70.58	47.464	40.87	21.300	42.95	58.949	32.60
11.2	7.465 146	69.30 128	47.257 207	39.57 130	21.109 191	41.65 130	58.841 108	31.71 89
21.1	7.334 131	67.76 154	47.065 192	37.87 170	20.933 176	39.99 166	58.742 99	30.83 88
31.1	7.222 112	66.02 174	46.899 166	35.83 204	20.779 154	38.02 197	58.662 80	29.97 86
Feb. 10.1	7.134 88	64.15 187	46.765 134	33.55 228	20.656 123	35.83 219	58.602 60	29.17 80
	56	192	95	244	87	235	40	72
20.1	7.078	62.23	46.670	31.11	20.569	33.48	58.562	28.45
Mar. 2.0	7.058 — 20	60.32 191	46.623 — 47	28.60 251	20.527 — 42	31.10 238	58.554 — 8	27.92 53
12.0	7.077 19	58.53 179	46.627 4	26.14 246	20.534 7	28.77 233	58.575 21	27.57 35
22.0	7.140 63	56.95 158	46.687 60	23.82 232	20.593 59	26.60 217	58.636 61	27.47 — 10
Apr. 1.0	7.248 108	55.63 132	46.805 118	21.75 207	20.706 113	24.68 192	58.732 96	27.58 11
	154	99	175	173	169	158	135	43
10.9	7.402	54.64	46.980	20.02	20.875	23.10	58.867	28.01
20.9	7.601 199	54.03 61	47.209 229	18.68 134	21.095 220	21.91 119	59.038 171	28.71 70
30.9	7.839 238	53.84 — 19	47.487 278	17.79 89	21.360 265	21.16 75	59.246 208	29.68 97
May 10.8	8.113 274	54.08 24	47.809 322	17.39 — 40	21.667 307	20.88 — 28	59.488 242	30.95 127
20.8	8.416 303	54.75 67	48.164 355	17.49 10	22.007 340	21.11 23	59.753 265	32.44 149
	323	107	378	60	364	69	290	167
30.8	8.739	55.82	48.542	18.09	22.371	21.80	60.043	34.11
June 9.8	9.075 336	57.27 145	48.934 392	19.16 107	22.745 374	22.98 118	60.344 301	35.96 185
19.7	9.412 337	59.06 179	49.328 394	20.69 153	23.124 379	24.56 158	60.651 307	37.90 194
29.7	9.743 331	61.14 208	49.714 386	22.62 193	23.495 371	26.52 196	60.955 304	39.91 201
July 9.7	10.059 316	63.45 231	50.081 367	24.90 228	23.849 354	28.82 230	61.247 292	41.92 201
	292	248	338	258	326	257	275	195
19.7	10.351	65.93	50.419	27.48	24.175	31.39	61.522	43.87
29.6	10.612 261	68.53 260	50.721 302	30.27 279	24.466 291	34.17 278	61.769 247	45.73 186
Aug. 8.6	10.838 226	71.17 264	50.981 260	33.23 296	24.719 253	37.08 291	61.986 217	47.45 172
18.6	11.024 186	73.80 263	51.194 213	36.30 307	24.925 206	40.08 300	62.170 184	48.98 153
28.5	11.166 142	76.36 256	51.356 162	39.38 308	25.084 159	43.07 299	62.314 144	50.30 132
	99	246	111	305	109	296	104	111
Sept. 7.5	11.265 51	78.82	51.467 59	42.43	25.193 59	46.03	62.418 65	51.41 87
17.5	11.319 12	81.12 230	51.526 10	45.39 296	25.252 12	48.87 284	62.483 28	52.28 62
27.5	11.331 — 24	83.22 210	51.536 — 36	48.19 280	25.264 — 31	51.55 268	62.511 — 8	52.90 39
Oct. 7.4	11.307 59	85.09 187	51.500 79	50.78 259	25.233 70	54.02 247	62.503 36	53.29 20
17.4	11.248 87	86.68 159	51.421 117	53.12 234	25.163 107	56.20 218	62.467 65	53.49 — 2
		130		202		191		
27.4	11.161	87.98	51.304	55.14	25.056	58.11	62.402	53.47
Nov. 6.4	11.048 113	88.98 100	51.156 148	56.80 166	24.918 138	59.66 155	62.319 83	53.27 20
16.3	10.918 130	89.63 65	50.981 175	58.07 127	24.757 161	60.81 115	62.219 100	52.95 32
26.3	10.774 144	89.94 — 31	50.787 194	58.90 83	24.577 180	61.55 74	62.106 113	52.44 51
Dec. 6.3	10.621 153	89.89 5	50.576 211	59.28 — 38	24.383 194	61.85 — 30	61.989 117	51.81 63
	158	41	218	10	202	13	120	72
16.2	10.463 157	89.48 76	50.358 221	59.18 57	24.181 203	61.72 61	61.869 118	51.09 81
26.2	10.306 152	88.72 108	50.137 216	58.61 103	23.978 199	61.11 103	61.751 111	50.28 86
36.2	10.154	87.64	49.921	57.58	23.779	60.08	61.640	49.42
Mean Place	7.759	61.04	47.406	27.17	21.284	30.07	59.332	31.76
Sec δ, Tan δ	1.165	+0.599	1.441	+1.037	1.364	+0.928	1.004	+0.091
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.059	−0.040	+0.058	−0.069	+0.058	−0.061	+0.061	−0.006
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.39	−0.13	+0.40	−0.11	+0.40	−0.11	+0.40	−0.10

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cephei. Mag. 3.4		κ Andromedæ. Mag. 4.3		ω^2 Aquarii. Mag. 4.6		i^1 Aquarii. Mag. 5.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	23 36	+77 11	23 36	+43 54	23 38	−14 57	23 40	−18 41
	s	″	s	″	s	″	s	″
Jan. 1.2	11.66	88.75	36.675	39.73	43.205	80.49	11.922	83.52
	89	84	197	128	111	39	116	29
11.2	10.77	87.81	36.478	38.45	43.094	80.88	11.806	83.81
	82	151	182	166	100	19	104	6
21.2	9.95	86.30	36.296	36.79	42.994	81.07	11.702	83.87
	73	208	160	197	81	1	88	17
31.1	9.22	84.22	36.136	34.82	42.913	81.06	11.614	83.70
Feb. 10.1	61	250	128	221	62	22	64	43
	8.61	81.72	36.008	32.61	42.851	80.84	11.550	83.27
	46	285	92	237	41	11	43	65
20.1	8.15	78.87	35.916	30.24	42.810	80.40	11.507	82.62
	29	308	47	211	10	68	11	90
Mar. 2.0	7.86	75.79	35.869	27.83	42.800	79.72	11.496	81.72
	12	319	3	236	22	89	18	113
12.0	7.74	72.60	35.872	25.47	42.822	78.83	11.514	80.59
	7	315	56	222	57	113	58	134
22.0	7.81	69.45	35.928	23.25	42.879	77.70	11.572	79.25
Apr. 1.0	25	300	110	196	91	134	93	155
	8.06	66.45	36.038	21.29	42.973	76.36	11.665	77.70
	44	275	168	161	132	155	134	177
10.9	8.50	63.70	36.206	19.65	43.105	74.81	11.799	75.93
	58	238	220	125	171	174	171	193
20.9	9.08	61.32	36.426	18.40	43.276	73.07	11.970	74.00
	74	191	269	82	203	189	208	203
30.9	9.82	59.41	36.695	17.58	43.482	71.18	12.178	71.97
May 10.8	86	114	309	31	211	199	210	212
	10.68	57.97	37.004	17.24	43.723	69.19	12.418	69.85
20.8	94	89	345	15	269	207	273	217
	11.62	57.08	37.349	17.39	43.992	67.12	12.691	67.68
	100	27	366	66	293	208	296	213
30.8	12.62	56.81	37.715	18.05	44.285	65.04	12.987	65.55
	102	30	381	113	307	205	308	208
June 9.8	13.64	57.11	38.096	19.18	44.592	62.99	13.295	63.47
	102	85	383	154	313	197	318	193
19.7	14.66	57.96	38.479	20.72	44.905	61.02	13.613	61.54
	99	142	377	194	313	182	318	179
29.7	15.65	59.38	38.856	22.66	45.218	59.20	13.931	59.75
July 9.7	94	190	359	229	303	162	308	155
	16.59	61.28	39.215	24.95	45.521	57.58	14.239	58.20
	86	239	331	255	285	140	290	127
19.7	17.45	63.67	39.546	27.50	45.806	56.18	14.529	56.93
	75	277	299	278	261	113	267	99
29.6	18.20	66.44	39.845	30.28	46.067	55.05	14.796	55.94
Aug. 8.6	64	310	258	291	230	84	233	66
	18.84	69.54	40.103	33.19	46.297	54.21	15.029	55.28
18.6	51	340	212	301	194	53	198	35
	19.35	72.94	40.315	36.20	46.491	53.68	15.227	54.93
28.5	37	357	163	302	154	21	159	1
	19.72	76.51	40.478	39.22	46.645	53.44	15.386	54.92
	23	370	112	299	113	6	115	27
Sept. 7.5	19.95	80.21	40.590	42.21	46.758	53.50	15.501	55.19
	8	374	64	289	70	33	75	53
17.5	20.03	83.95	40.654	45.10	46.828	53.83	15.576	55.72
	7	372	15	272	31	57	31	78
27.5	19.96	87.67	40.669	47.82	46.859	54.40	15.607	56.50
Oct. 7.4	21	359	29	253	7	77	6	97
	19.75	91.26	40.640	50.35	46.852	55.17	15.601	57.47
17.4	35	337	72	226	40	92	41	111
	19.40	94.63	40.568	52.61	46.812	56.09	15.560	58.58
	47	312	105	196	69	100	69	117
27.4	18.93	97.75	40.463	54.57	46.743	57.09	15.491	59.75
	60	278	138	160	89	106	93	121
Nov. 6.4	18.33	100.53	40.325	56.17	46.654	58.15	15.398	60.96
	71	235	163	120	107	106	110	118
16.3	17.62	102.88	40.162	57.37	46.547	59.21	15.288	62.14
	78	183	183	80	119	100	123	110
26.3	16.84	104.71	39.979	58.17	46.428	60.21	15.165	63.24
Dec. 6.3	86	130	198	36	124	93	130	97
	15.98	106.01	39.781	58.53	46.304	61.14	15.035	64.21
	91	70	206	11	127	81	130	78
16.2	15.07	106.71	39.575	58.42	46.177	61.95	14.905	64.99
	92	6	209	55	122	65	127	60
26.2	14.15	106.77	39.366	57.87	46.055	62.60	14.778	65.59
	91	54	201	100	117	48	121	44
36.2	13.24	106.23	39.162	56.87	45.938	63.08	14.657	66.03
Mean Place	10.514	69.38	36.626	26.63	43.818	74.39	12.580	76.14
Sec δ, Tan δ	4.516	+4.404	1.388	+0.963	1.035	−0.267	1.056	−0.338
$D_{\psi a}$, $D_{\omega a}$	+0.049	−0.292	+0.059	−0.064	+0.062	+0.018	+0.062	+0.022
$D_{\psi \delta}$, $D_{\omega \delta}$	+0.40	−0.10	+0.40	−0.10	+0.40	−0.09	+0.40	−0.09

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Andromedæ. Mag. 5.1		41 H. Cephei. Mag. 5.0		δ Sculptoris. Mag. 4.6		φ Pegasi. Mag. 5.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	23 42	+45 59	23 44	+67 22	23 44	−28 33	23 48	+18 41
	s	″	s	″	s	″	s	″
Jan. 1.2	12.882	46.94	13.75	61.76	54.214	34.31	33.907	38.28
11.2	12.670 212	45.72 122	13.28 47	60.76 100	54.078 136	34.33 — 2	33.782 125	37.24 104
21.2	12.474 196	44.12 160	12.84 44	59.21 155	53.960 118	34.04 29	33.665 117	36.05 119
31.1	12.301 173	42.16 196	12.45 39	57.17 201	53.860 100	33.42 62	33.561 104	34.76 129
Feb. 10.1	12.158 143	39.96 220	12.12 33	54.72 245	53.781 79	32.53 89	33.478 83	33.41 135
	105	210	26	277	52	120	59	132
20.1	12.053	37.56	11.86	51.95	53.729	31.33	33.419	32.09
Mar. 2.0	11.993 60	35.10 246	11.70 16	48.99 296	53.708 — 21	29.90 143	33.389 — 30	30.84 125
12.0	11.986 — 7	32.66 244	11.64 — 6	45.95 304	53.722 14	28.19 171	33.394 5	29.73 111
22.0	12.033 47	30.36 230	11.68 4	42.96 299	53.774 52	26.27 192	33.438 44	28.81 92
Apr. 1.0	12.141 108	28.28 208	11.83 15	40.12 284	53.866 92	24.17 210	33.522 84	28.14 67
	164	175	25	255	133	224	127	37
10.9	12.305	26.53	12.08	37.57	53.999	21.93	33.649	27.77
20.9	12.525 220	25.15 138	12.43 35	35.38 219	54.172 173	19.56 237	33.817 168	27.75 — 2
30.9	12.796 271	21.22 393	12.86 43	33.63 175	54.387 215	17.16 240	34.024 207	28.05 30
May 10.9	13.109 313	23.75 — 47	13.38 52	32.41 122	54.635 248	14.72 244	34.266 242	28.71 66
20.8	13.459 350	23.78 3	13.94 56	31.70 71	54.918 283	12.33 239	34.538 272	29.72 101
	374	55	61	12	306	227	295	131
30.8	13.833	24.33	14.55	31.58 —	55.224	10.06	34.833	31.03
June 9.8	14.221 391	25.35 102	15.18 63	32.02 44	55.550 326	7.95 211	35.142 309	32.63 160
19.7	14.619 395	26.80 145	15.82 64	33.00 98	55.886 336	6.06 189	35.459 317	34.45 182
29.7	15.007 388	28.66 186	16.44 62	34.50 150	56.223 337	4.41 165	35.774 315	36.47 202
July 9.7	15.379 372	30.90 224	17.03 59	36.49 199	56.551 328	3.09 132	36.078 304	38.61 214
	345	251	54	241	310	101	286	223
19.7	15.724	33.41	17.57	38.90	56.861	2.08	36.364	40.84
29.6	16.035 311	36.17 276	18.06 49	41.70 280	57.144 283	1.47 61	36.626 262	43.09 225
Aug. 8.6	16.305 270	39.11 294	18.48 42	44.77 307	57.398 254	1.22 — 25	36.855 229	45.29 220
18.6	16.527 222	42.14 303	18.83 35	48.10 333	57.615 217	1.37 15	37.051 196	47.43 214
28.6	16.702 175	45.22 308	19.09 26	51.59 349	57.786 171	1.84 47	37.207 156	49.44 201
	123	305	18	357	127	82	115	184
Sept. 7.5	16.825 72	48.27	19.27 9	55.16	57.913 81	2.66	37.322	51.28
17.5	16.897 23	51.22 295	19.36 0	58.75 359	57.997 38	3.78 112	37.398 76	52.95 167
27.5	16.920 — 24	54.05 283	19.36 7	62.28 353	58.035 — 8	5.10 132	37.436 38	54.40 145
Oct. 7.4	16.896 67	56.68 263	19.29 16	65.67 339	58.027 43	6.61 151	37.439 — 3	55.60 120
17.4	16.829	59.04 236	19.13 23	68.85 318	57.984	8.22 161	37.410 29	56.58 98
	105	208		290	78	162	58	73
27.4	16.724	61.12	18.90	71.75	57.906	9.84	37.352	57.31
Nov. 6.4	16.586 138	62.85 173	18.60 30	74.31 256	57.805 101	11.43 159	37.271 81	57.78 47
16.3	16.420 166	64.20 135	18.25 35	76.44 213	57.679 126	12.89 146	37.172 99	58.02 — 24
26.3	16.231 189	65.11 91	17.84 41	78.11 167	57.541 138	14.17 128	37.057 115	57.99 3
Dec. 6.3	16.026 205	65.58 47	17.40 44	79.23 112	57.397 144	15.26 109	36.933 124	57.73 26
	215	1	47	54	149	79	129	50
16.3	15.811	65.59	16.93	79.77 —	57.248	16.05	36.804	57.23
26.2	15.591 220	65.12 47	16.45 48	79.73 4	57.103 145	16.61 56	36.672 132	56.50 73
36.2	15.373 218	64.19 93	15.97 48	79.11 62	56.966 137	16.80 19	36.543 129	55.58 92
Mean Place	12.758	33.45	13.087	43.81	55.002	23.67	34.072	33.28
Sec δ, Tan δ	1.439	+1.035	2.600	+2.400	1.138	−0.544	1.056	+0.338
Dψα, Dωα	+0.059	−0.069	+0.057	−0.160	+0.062	+0.036	+0.061	−0.023
Dψδ, Dωδ	+0.40	−0.08	+0.40	−0.07	+0.40	−0.07	+0.40	−0.05

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ρ Cassiopeiæ. Mag. 4.8		Groombridge 4163. Mag. 6.6		ω Piscium. Mag. 4.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 23 50	° ′ ″ +57 4	h m s 23 51	° ′ ″ +73 58	h m s 23 55	° ′ ″ + 6 26
Jan. 1.2	32.030	31.52	4.95	73.05	21.117	14.02
	301	104	70	78	114	87
11.2	31.729	30.48	4.25	72.27	21.003	13.15
	286	153	65	139	108	87
21.2	31.443	28.95	3.60	70.88	20.895	12.28
	257	197	60	192	95	86
31.1	31.186	26.98	3.00	68.96	20.800	11.42
	217	230	51	238	77	81
Feb. 10.1	30.969	24.68	2.49	66.58	20.723	10.61
	167	259	40	275	57	74
20.1	30.802	22.09	2.09	63.83	20.666	9.87
	108	273	27	297	29	57
Mar. 2.0	30.694	19.36	1.82	60.86	20.637	9.30
	40	278	13	312	1	40
12.0	30.654	16.58	1.69	57.74	20.638	8.90
	32	272	1	310	40	17
22.0	30.686	13.86	1.70	54.64	20.678	8.73
	109	252	17	298	75	5
Apr. 1.0	30.795	11.34	1.87	51.66	20.753	8.78
	183	224	31	278	117	35
10.9	30.978	9.10	2.18	48.88	20.870	9.13
	252	188	45	240	154	65
20.9	31.230	7.22	2.63	46.48	21.024	9.78
	318	144	56	201	194	87
30.9	31.548	5.78	3.19	44.47	21.218	10.65
	374	95	68	150	230	119
May 10.9	31.922	4.83	3.87	42.97	21.448	11.84
	420	43	74	94	256	142
20.8	32.342	4.40	4.61	42.03	21.704	13.26
	453	11	81	41	282	162
30.8	32.795	4.51	5.42	41.62	21.986	14.88
	471	63	84	16	297	181
June 9.8	33.266	5.14	6.26	41.78	22.283	16.69
	478	114	85	74	307	194
19.7	33.744	6.28	7.11	42.52	22.590	18.63
	472	162	83	131	305	199
29.7	34.216	7.90	7.94	43.83	22.895	20.62
	451	206	79	177	298	202
July 9.7	34.667	9.96	8.73	45.60	23.193	22.64
	422	243	74	225	284	199
19.7	35.089	12.39	9.47	47.85	23.477	24.63
	380	274	66	266	260	190
29.6	35.469	15.13	10.13	50.51	23.737	26.53
	332	301	58	300	230	174
Aug. 8.6	35.801	18.14	10.71	53.51	23.967	28.27
	275	318	47	330	199	163
18.6	36.076	21.32	11.18	56.81	24.166	29.90
	217	330	37	350	160	140
28.6	36.293	24.62	11.55	60.31	24.326	31.30
	155	336	25	363	124	118
Sept. 7.5	36.448	27.98	11.80	63.94	24.450	32.48
	92	333	13	369	84	95
17.5	36.540	31.31	11.93	67.63	24.534	33.43
	31	324	2	367	45	74
27.5	36.571	34.55	11.95	71.30	24.579	34.17
	27	308	10	356	12	47
Oct. 7.4	36.544	37.63	11.85	74.86	24.591	34.64
	83	288	21	338	19	27
17.4	36.461	40.51	11.64	78.24	24.572	34.91
	135	258	32	316	46	6
27.4	36.326	43.09	11.32	81.40	24.526	34.97
	180	223	42	280	69	11
Nov. 6.4	36.146	45.32	10.90	84.20	24.457	34.86
	221	184	51	241	90	29
16.3	35.925	47.16	10.39	86.61	24.367	34.57
	255	139	58	195	101	45
26.3	35.670	48.55	9.81	88.56	24.266	34.12
	280	89	65	139	113	53
Dec. 6.3	35.390	49.44	9.16	89.95	24.153	33.59
	301	37	69	80	118	68
16.3	35.089	49.81	8.47	90.75	24.035	32.91
	309	17	71	22	119	76
26.2	34.780	49.64	7.76	90.97	23.916	32.15
	310	71	71	40	116	83
36.2	34.470	48.93	7.05	90.57	23.800	31.32
Mean Place	31.615	15.66	3.771	54.37	21.376	13.52
Sec δ, Tan δ	1.840	+1.544	3.625	+3.484	1.006	+0.113
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.059	−0.103	+0.058	−0.232	+0.061	−0.008
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.40	−0.04	+0.40	−0.04	+0.40	−0.02

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Tucanæ. Mag. 4.7		30 Piscium. Mag. 4.7		2 Ceti. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 23 55	° ′ −65 59	h m 23 57	° ′ − 6 26	h m 23 59	° ′ −17 45
	s	″	s	″	s	″
Jan. 1.2	53.40	98.05	60.288	35.28	47.266	61.04
11.2	52.99 41	97.02 103	60.173 115	35.90 62	47.143 123	61.42 38
21.2	52.62 37	95.47 155	60.068 105	36.42 52	47.031 112	61.56 −14
31.1	52.32 30	93.42 205	59.973 95	36.79 37	46.931 100	61.48 8
Feb. 10.1	52.04 28	90.94 248	59.897 76	37.01 22	46.849 82	61.15 33
	20	286	55	3	59	57
20.1	51.84	88.08	59.842	37.04	46.790	60.58
Mar. 2.1	51.72 12	84.95 313	59.811 31	36.88 16	46.758 32	59.76 82
12.0	51.67 −5	81.58 337	59.812 −1	36.50 38	46.755 −3	58.70 106
22.0	51.70 3	78.08 350	59.847 35	35.88 62	46.789 34	57.41 129
Apr. 1.0	51.81 11	74.51 357	59.920 73	35.03 85	46.861 72	55.89 152
	19	355	114	109	110	172
10.9	52.00	70.96	60.034	33.94	46.971	54.17
20.9	52.28 28	67.50 346	60.184 150	32.62 132	47.122 151	52.27 190
30.9	52.63 35	64.21 329	60.371 187	31.09 153	47.312 190	50.23 204
May 10.9	53.05 42	61.14 307	60.595 224	29.37 172	47.539 227	48.08 215
20.8	53.54 49	58.37 277	60.848 253	27.51 186	47.797 258	45.88 220
	54	237	279	196	284	220
30.8	54.08	56.00 197	61.127	25.55	48.081	43.68
June 9.8	54.66 58	54.03 151	61.424 297	23.54 201	48.384 303	41.55 213
19.8	55.26 60	52.52 99	61.730 306	21.51 203	48.698 314	39.51 204
29.7	55.88 62	51.53 −43	62.037 307	19.57 194	49.015 317	37.63 188
July 9.7	56.49 61	51.10 10	62.338 301	17.73 184	49.326 311	35.97 166
	58		286	171	296	140
19.7	57.07	51.20	62.624	16.02	49.622	34.57
29.6	57.62 55	51.84 −64	62.888 264	14.52 150	49.897 275	33.47 110
Aug. 8.6	58.11 49	53.01 117	63.122 234	13.26 126	50.143 246	32.67 80
18.6	58.53 42	54.66 165	63.326 204	12.25 101	50.356 213	32.21 46
28.6	58.87 34	56.72 206	63.491 165	11.51 74	50.530 174	32.08 −13
	25	245	128	44	133	18
Sept. 7.5	59.12	59.17	63.619	11.07	50.663	32.26
17.5	59.27 15	61.85 −268	63.707 88	10.87 −20	50.756 93	32.73 47
27.5	59.32 −5	64.72 287	63.756 49	10.93 6	50.808 52	33.47 74
Oct. 7.5	59.28 4	67.64 292	63.770 −14	11.21 28	50.821 −13	34.40 93
17.4	59.14 14	70.50 286	63.750 20	11.70 49	50.800 21	35.50 110
	23	270	45	61	52	120
27.4	58.91	73.20	63.705	12.31	50.748	36.70
Nov. 6.4	58.62 29	75.61 −241	63.634 71	13.05 −74	50.672 76	37.94 124
16.3	58.26 36	77.65 204	63.545 89	13.87 82	50.575 97	39.16 122
26.3	57.86 40	79.21 156	63.443 102	14.71 84	50.464 111	40.31 115
Dec. 6.3	57.44 42	80.27 106	63.330 113	15.56 85	50.342 122	41.35 104
	44	49	117	81	126	90
16.3	57.00	80.76	63.213	16.37	50.216	42.25
26.2	56.57 43	80.67 −9	63.094 119	17.13 −76	50.088 128	42.95 −70
36.2	56.15 42	79.99 68	62.978 116	17.81 68	49.963 125	43.46 51
Mean Place	55.556	78.82	60.676	31.16	47.788	53.03
Sec δ, Tan δ	2.459	−2.246	1.006	−0.113	1.050	−0.320
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.062	+0.150	+0.061	+0.008	+0.061	+0.021
$D_{\psi\delta}$, $D_{\omega\delta}$	+0.40	−0.02	+0.40	−0.01	+0.40	0.00

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Jan. 1	18 44 45.23	11.044	−23 2 52.7	+11.81	+ 3 26.67	+1.184	16 17.90	1 11.06	18 41 17.98
2	18 49 10.13	11.031	22 57 55.6	12.95	3 54.94	1.171	16 17.91	1 11.02	18 45 14.54
3	18 53 34.69	11.016	22 52 31.0	14.09	4 22.87	1.156	16 17.91	1 10.97	18 49 11.10
4	18 57 58.88	11.000	22 46 39.1	15.23	4 50.44	1.140	16 17.90	1 10.92	18 53 7.66
5	19 2 22.69	10.983	22 40 20.0	16.36	5 17.61	1.123	16 17.88	1 10.87	18 57 4.21
6	19 6 46.08	10.965	−22 33 33.9	+17.48	+ 5 44.37	+1.106	16 17.86	1 10.81	19 1 0.77
7	19 11 9.03	10.947	22 26 21.0	18.59	6 10.68	1.087	16 17.83	1 10.74	19 4 57.33
8	19 15 31.51	10.927	22 18 41.5	19.69	6 36.54	1.067	16 17.80	1 10.67	19 8 53.88
9	19 19 53.51	10.906	22 10 35.8	20.78	7 1.92	1.046	16 17.77	1 10.60	19 12 50.44
10	19 24 15.00	10.884	22 2 3.9	21.87	7 26.78	1.024	16 17.72	1 10.53	19 16 47.00
11	19 28 35.94	10.861	−21 53 6.1	+22.94	+ 7 51.10	+1.002	16 17.67	1 10.45	19 20 43.55
12	19 32 56.32	10.837	21 43 42.7	24.00	8 14.86	0.978	16 17.62	1 10.37	19 24 40.11
13	19 37 16.12	10.811	21 33 54.0	25.05	8 38.03	0.953	16 17.57	1 10.28	19 28 36.67
14	19 41 35.30	10.785	21 23 40.3	26.09	9 0.60	0.927	16 17.51	1 10.20	19 32 33.22
15	19 45 53.84	10.759	21 13 1.9	27.11	9 22.53	0.900	16 17.44	1 10.11	19 36 29.78
16	19 50 11.72	10.731	−21 1 59.0	+28.12	+ 9 43.80	+0.872	16 17.37	1 10.01	19 40 26.34
17	19 54 28.92	10.702	20 50 31.9	29.12	10 4.38	0.843	16 17.30	1 9.92	19 44 22.89
18	19 58 45.42	10.672	20 38 41.1	30.11	10 24.26	0.814	16 17.22	1 9.82	19 48 19.45
19	20 3 1.18	10.641	20 26 26.9	31.08	10 43.41	0.783	16 17.14	1 9.72	19 52 16.00
20	20 7 16.20	10.610	20 13 49.5	32.03	11 1.83	0.751	16 17.06	1 9.62	19 56 12.56
21	20 11 30.45	10.578	−20 0 49.4	+32.97	+ 11 19.49	+0.719	16 16.98	1 9.52	20 0 9.12
22	20 15 43.94	10.545	19 47 26.9	33.90	11 36.37	0.687	16 16.89	1 9.42	20 4 5.67
23	20 19 56.64	10.512	19 33 42.3	34.81	11 52.46	0.651	16 16.79	1 9.31	20 8 2.23
24	20 24 8.53	10.479	19 19 36.0	35.71	12 7.76	0.621	16 16.69	1 9.20	20 11 58.78
25	20 28 19.62	10.445	19 5 8.5	36.59	12 22.25	0.587	16 16.59	1 9.09	20 15 55.34
26	20 32 29.89	10.411	−18 50 20.0	+37.45	+12 35.93	+0.553	16 16.48	1 8.98	20 19 51.90
27	20 36 39.34	10.377	18 35 11.0	38.30	12 48.78	0.519	16 16.36	1 8.87	20 23 48.45
28	20 40 47.96	10.342	18 19 41.8	39.13	13 0.81	0.484	16 16.24	1 8.76	20 27 45.01
29	20 44 55.75	10.308	18 3 52.8	39.94	13 12.02	0.450	16 16.12	1 8.64	20 31 41.56
30	20 49 2.71	10.273	17 47 44.5	40.74	13 22.39	0.415	16 15.99	1 8.53	20 35 38.12
31	20 53 8.83	10.238	−17 31 17.1	+41.52	+13 31.93	+0.381	16 15.86	1 8.41	20 39 34.67
Feb. 1	20 57 14.13	10.204	17 14 31.1	42.29	13 40.66	0.347	16 15.72	1 8.30	20 43 31.23
2	21 1 18.61	10.170	16 57 26.8	43.04	13 48.57	0.313	16 15.57	1 8.18	20 47 27.78
3	21 5 22.27	10.136	16 40 4.8	43.78	13 55.65	0.279	16 15.42	1 8.07	20 51 24.34
4	21 9 25.12	10.102	16 22 25.3	44.50	14 1.92	0.215	16 15.25	1 7.95	20 55 20.89
5	21 13 27.16	10.069	−16 4 28.7	+45.21	+14 7.39	+0.212	16 15.09	1 7.84	20 59 17.44
6	21 17 28.41	10.036	15 46 15.5	45.89	14 12.08	0.179	16 14.92	1 7.72	21 3 14.00
7	21 21 28.87	10.003	15 27 46.1	46.56	14 15.98	0.146	16 14.74	1 7.61	21 7 10.55
8	21 25 28.55	9.970	15 9 0.8	47.21	14 19.09	0.113	16 14.57	1 7.50	21 11 7.11
9	21 29 27.45	9.938	14 50 0.0	47.84	14 21.42	0.081	16 14.39	1 7.38	21 15 3.66
10	21 33 25.57	9.906	−14 30 44.3	+48.45	+14 22.99	+0.049	16 14.20	1 7.27	21 19 0.22
11	21 37 22.93	9.874	14 11 14.1	49.05	14 23.80	+0.018	16 14.02	1 7.16	21 22 56.77
12	21 41 19.53	9.842	13 51 29.7	49.63	14 23.85	−0.014	16 13.83	1 7.05	21 26 53.32
13	21 45 15.37	9.811	13 31 31.6	50.20	14 23.14	0.045	16 13.64	1 6.94	21 30 49.88
14	21 49 10.47	9.780	13 11 20.2	50.74	14 21.69	0.076	16 13.44	1 6.84	21 34 46.43
15	21 53 4.83	9.750	−12 50 55.9	+51.27	+14 19.50	−0.106	16 13.24	1 6.73	21 38 42.98
16	21 56 58.45	9.719	−12 30 19.2	+51.78	+14 16.57	−0.136	16 13.04	1 6.63	21 42 39.54

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Feb. 16	21 56 58.45	9.719	−12 30 19.2	+51.78	+14 16.57	−0.136	16 13.04	1 6.63	21 42 39.54
17	22 0 51.34	9.689	12 9 30.5	52.27	14 12.92	0.166	16 12.84	1 6.52	21 46 36.09
18	22 4 43.52	9.659	11 48 30.2	52.74	14 8.56	0.196	16 12.64	1 6.42	21 50 32.64
19	22 8 35.00	9.630	11 27 18.8	53.20	14 3.50	0.225	16 12.43	1 6.32	21 54 29.20
20	22 12 25.78	9.602	11 5 56.7	53.64	13 57.74	0.254	16 12.22	1 6.23	21 58 25.75
21	22 16 15.88	9.574	−10 44 24.3	+54.06	+13 51.30	−0.282	16 12.01	1 6.13	22 2 22.30
22	22 20 5.31	9.546	10 22 42.0	54.46	13 44.20	0.310	16 11.79	1 6.04	22 6 18.86
23	22 23 54.08	9.519	10 0 50.2	54.84	13 36.44	0.337	16 11.58	1 5.95	22 10 15.41
24	22 27 42.21	9.493	9 38 49.4	55.21	13 28.04	0.363	16 11.36	1 5.86	22 14 11.96
25	22 31 29.72	9.467	9 16 39.9	55.56	13 19.02	0.388	16 11.13	1 5.77	22 18 8.51
26	22 35 16.63	9.442	− 8 54 22.2	+55.90	+13 9.40	−0.413	16 10.91	1 5.69	22 22 5.07
27	22 39 2.95	9.418	8 31 56.6	56.22	12 59.19	0.437	16 10.68	1 5.60	22 26 1.62
28	22 42 48.69	9.394	8 9 23.5	56.52	12 48.41	0.461	16 10.45	1 5.52	22 29 58.17
Mar. 1	22 46 33.88	9.372	7 46 43.4	56.81	12 37.09	0.483	16 10.21	1 5.45	22 33 54.72
2	22 50 18.56	9.351	7 23 56.6	57.09	12 25.21	0.504	16 9.97	1 5.38	22 37 51.28
3	22 54 2.73	9.331	− 7 1 3.4	+57.34	+12 12.90	0.521	16 9.73	1 5.31	22 41 47.83
4	22 57 46.42	9.311	6 38 4.4	57.58	12 0.07	0.544	16 9.48	1 5.24	22 45 44.38
5	23 1 29.65	9.292	6 14 59.7	57.80	11 46.78	0.563	16 9.23	1 5.17	22 49 40.93
6	23 5 12.45	9.275	5 51 49.8	58.01	11 33.07	0.580	16 8.97	1 5.11	22 53 37.48
7	23 8 54.85	9.259	5 28 35.1	58.21	11 18.95	0.596	16 8.71	1 5.05	22 57 34.04
8	23 12 36.85	9.243	− 5 5 16.0	+58.39	+11 4.44	−0.612	16 8.45	1 4.99	23 1 30.59
9	23 16 18.49	9.228	4 41 52.8	58.55	10 49.57	0.627	16 8.19	1 4.93	23 5 27.14
10	23 19 59.78	9.214	4 18 25.7	58.69	10 34.36	0.641	16 7.92	1 4.88	23 9 23.69
11	23 23 40.74	9.200	3 54 55.4	58.82	10 18.81	0.654	16 7.66	1 4.83	23 13 20.24
12	23 27 21.40	9.187	3 31 22.3	58.93	10 2.95	0.667	16 7.39	1 4.78	23 17 16.80
13	23 31 1.76	9.176	− 3 7 46.6	+59.03	+ 9 46.80	−0.678	16 7.12	1 4.74	23 21 13.35
14	23 34 41.85	9.165	2 44 8.6	59.11	9 30.38	0.689	16 6.86	1 4.69	23 25 9.90
15	23 38 21.68	9.155	2 20 28.9	59.18	9 13.71	0.700	16 6.59	1 4.65	23 29 6.45
16	23 42 1.27	9.145	1 56 47.8	59.23	8 56.79	0.710	16 6.32	1 4.62	23 33 3.00
17	23 45 40.64	9.136	1 33 5.7	59.26	8 39.65	0.718	16 6.05	1 4.59	23 36 59.56
18	23 49 19.80	9.128	− 1 9 23.0	+59.28	+ 8 22.31	−0.726	16 5.78	1 4.56	23 40 56.11
19	23 52 58.77	9.121	0 45 40.0	59.29	8 4.78	0.733	16 5.51	1 4.54	23 44 52.66
20	23 56 37.58	9.114	− 0 21 57.2	59.27	7 47.09	0.740	16 5.24	1 4.52	23 48 49.21
21	0 0 16.23	9.108	+ 0 1 45.1	59.24	7 29.24	0.746	16 4.97	1 4.50	23 52 45.76
22	0 3 54.75	9.103	0 25 26.6	59.20	7 11.26	0.752	16 4.70	1 4.48	23 56 42.31
23	0 7 33.15	9.098	+ 0 49 6.8	+59.14	+ 6 53.16	−0.756	16 4.43	1 4.47	0 0 38.86
24	0 11 11.45	9.091	1 12 45.3	59.06	6 34.96	0.760	16 4.16	1 4.46	0 4 35.42
25	0 14 49.67	9.092	1 36 21.9	58.97	6 16.68	0.763	16 3.90	1 4.44	0 8 31.97
26	0 18 27.83	9.090	1 59 56.1	58.86	5 58.34	0.765	16 3.63	1 4.44	0 12 28.52
27	0 22 5.96	9.088	2 23 27.6	58.74	5 39.96	0.766	16 3.36	1 4.44	0 16 25.07
28	0 25 44.07	9.088	+ 2 46 56.0	+58.61	+ 5 21.57	−0.766	16 3.08	1 4.44	0 20 21.62
29	0 29 22.18	9.088	3 10 21.0	58.46	5 3.18	0.766	16 2.81	1 4.45	0 24 18.17
30	0 33 0.32	9.090	3 33 42.3	58.30	4 44.82	0.764	16 2.54	1 4.45	0 28 14.73
31	0 36 38.51	9.093	3 56 59.5	58.12	4 26.51	0.761	16 2.26	1 4.46	0 32 11.28
Apr. 1	0 40 16.77	9.096	4 20 12.3	57.93	4 8.27	0.758	16 1.99	1 4.47	0 36 7.83
2	0 43 55.13	9.101	+ 4 43 20.3	+57.73	+ 3 50.12	−0.754	16 1.71	1 4.49	0 40 4.38
3	0 47 33.61	9.106	+ 5 6 23.4	+57.51	+ 3 32.10	−0.748	16 1.43	1 4.51	0 44 0.93

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Apr. 1	0 40 16.77	9.096	+ 4 20 12.3	+57.93	+4 8.27	−0.758	16 1.99	1 4.47	0 36 7.83
2	0 43 55.13	9.101	4 43 20.3	57.73	3 50.12	0.754	16 1.71	1 4.49	0 40 4.38
3	0 47 33.61	9.106	5 6 23.4	57.51	3 32.10	0.748	16 1.43	1 4.51	0 44 0.93
4	0 51 12.25	9.113	5 29 21.1	57.28	3 14.23	0.741	16 1.15	1 4.53	0 47 57.49
5	0 54 51.05	9.121	5 52 13.0	57.04	2 56.53	0.733	16 0.87	1 4.56	0 51 54.04
6	0 58 30.04	9.129	+ 6 14 59.0	+56.78	+2 39.02	−0.725	16 0.59	1 4.59	0 55 50.59
7	1 2 9.24	9.138	6 37 38.6	56.51	2 21.71	0.716	16 0.31	1 4.62	0 59 47.14
8	1 5 48.67	9.148	7 0 11.4	56.22	2 4.63	0.707	16 0.02	1 4.65	1 3 43.70
9	1 9 28.35	9.159	7 22 37.2	55.92	1 47.81	0.696	15 59.74	1 4.68	1 7 40.25
10	1 13 8.30	9.170	7 44 55.7	55.61	1 31.25	0.684	15 59.47	1 4.72	1 11 36.80
11	1 16 48.52	9.182	+ 8 7 6.4	+55.28	+1 14.96	−0.672	15 59.19	1 4.76	1 15 33.35
12	1 20 29.03	9.195	8 29 8.9	54.93	0 58.96	0.660	15 58.91	1 4.80	1 19 29.90
13	1 24 9.85	9.208	8 51 3.1	54.57	0 43.27	0.647	15 58.64	1 4.84	1 23 26.46
14	1 27 50.99	9.221	9 12 48.6	54.20	0 27.91	0.634	15 58.37	1 4.89	1 27 23.01
15	1 31 32.46	9.235	9 34 24.8	53.81	+0 12.87	0.620	15 58.10	1 4.94	1 31 19.56
16	1 35 14.29	9.250	+ 9 55 51.5	+53.41	−0 1.83	−0.605	15 57.83	1 4.99	1 35 16.11
17	1 38 56.47	9.265	10 17 8.5	52.99	0 16.16	0.590	15 57.56	1 5.04	1 39 12.67
18	1 42 39.02	9.281	10 38 15.3	52.56	0 30.12	0.574	15 57.30	1 5.10	1 43 9.22
19	1 46 21.95	9.297	10 59 11.5	52.11	0 43.70	0.558	15 57.04	1 5.16	1 47 5.77
20	1 50 5.28	9.314	11 19 56.9	51.65	0 56.89	0.541	15 56.78	1 5.22	1 51 2.33
21	1 53 49.01	9.331	+11 40 31.0	+51.18	−1 9.68	−0.524	15 56.53	1 5.28	1 54 58.88
22	1 57 33.15	9.348	12 0 53.6	50.69	1 22.05	0.506	15 56.28	1 5.34	1 58 55.43
23	2 1 17.72	9.366	12 21 4.3	50.19	1 34.00	0.489	15 56.03	1 5.41	2 2 51.98
24	2 5 2.73	9.385	12 41 2.8	49.67	1 45.52	0.471	15 55.78	1 5.48	2 6 48.54
25	2 8 48.18	9.404	13 0 48.7	49.14	1 56.59	0.452	15 55.53	1 5.55	2 10 45.09
26	2 12 34.10	9.423	+13 20 21.7	+48.60	−2 7.20	−0.433	15 55.29	1 5.62	2 14 41.64
27	2 16 20.49	9.443	13 39 41.4	48.04	2 17.34	0.413	15 55.04	1 5.69	2 18 38.20
28	2 20 7.36	9.463	13 58 47.7	47.47	2 26.99	0.392	15 54.80	1 5.77	2 22 34.75
29	2 23 54.73	9.484	14 17 40.1	46.89	2 36.15	0.371	15 54.56	1 5.84	2 26 31.30
30	2 27 42.61	9.506	14 36 18.4	46.30	2 44.79	0.349	15 54.31	1 5.92	2 30 27.86
May 1	2 31 31.01	9.528	+14 54 42.3	+45.69	−2 52.92	−0.327	15 54.07	1 5.99	2 34 24.41
2	2 35 19.96	9.551	15 12 51.4	45.07	3 0.51	0.305	15 53.83	1 6.07	2 38 20.97
3	2 39 9.46	9.574	15 30 45.4	44.43	3 7.55	0.282	15 53.59	1 6.15	2 42 17.52
4	2 42 59.52	9.598	15 48 24.2	43.79	3 14.03	0.258	15 53.36	1 6.23	2 46 14.08
5	2 46 50.15	9.622	16 5 47.3	43.13	3 19.94	0.234	15 53.12	1 6.31	2 50 10.63
6	2 50 41.36	9.646	+16 22 54.5	+42.46	−3 25.27	−0.210	15 52.89	1 6.39	2 54 7.18
7	2 54 33.15	9.670	16 39 45.4	41.78	3 30.02	0.186	15 52.66	1 6.47	2 58 3.74
8	2 58 25.52	9.694	16 56 19.8	41.08	3 34.18	0.161	15 52.43	1 6.55	3 2 0.29
9	3 2 18.49	9.719	17 12 37.4	40.37	3 37.76	0.137	15 52.20	1 6.64	3 5 56.85
10	3 6 12.05	9.744	17 28 37.9	39.65	3 40.75	0.112	15 51.97	1 6.72	3 9 53.40
11	3 10 6.19	9.768	+17 44 20.9	+38.92	−3 43.15	−0.088	15 51.76	1 6.80	3 13 49.96
12	3 14 0.93	9.793	17 59 46.1	38.18	3 44.96	0.064	15 51.55	1 6.88	3 17 46.51
13	3 17 56.26	9.817	18 14 53.2	37.42	3 46.19	0.039	15 51.34	1 6.96	3 21 43.07
14	3 21 52.16	9.841	18 29 42.0	36.64	3 46.84	−0.015	15 51.13	1 7.04	3 25 39.62
15	3 25 48.63	9.865	18 44 12.2	35.86	3 46.92	+0.009	15 50.92	1 7.13	3 29 36.18
16	3 29 45.68	9.889	+18 58 23.4	+35.07	−3 46.43	+0.032	15 50.72	1 7.21	3 33 32.73
17	3 33 43.30	9.913	+19 12 15.5	+34.26	−3 45.37	+0.056	15 50.53	1 7.29	3 37 29.28

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
May	17	3 33 43.30	9.913	+19 12 15.5	+34.26	−3 45.37	+0.056	15 50.53	1 7.29	3 37 29.28
	18	3 37 41.48	9.936	19 25 48.0	33.44	3 43.75	0.079	15 50.34	1 7.37	3 41 25.84
	19	3 41 40.21	9.958	19 39 0.7	32.61	3 41.58	0.102	15 50.15	1 7.45	3 45 22.40
	20	3 45 39.48	9.981	19 51 53.4	31.77	3 38.87	0.124	15 49.97	1 7.52	3 49 18.95
	21	3 49 39.28	10.003	20 4 25.7	30.92	3 35.64	0.146	15 49.79	1 7.60	3 53 15.51
	22	3 53 39.60	10.024	+20 16 37.5	+30.05	−3 31.89	+0.167	15 49.62	1 7.68	3 57 12.06
	23	3 57 40.44	10.045	20 28 28.4	29.18	3 27.62	0.188	15 49.45	1 7.75	4 1 8.62
	24	4 1 41.78	10.066	20 39 58.3	28.30	3 22.84	0.209	15 49.29	1 7.82	4 5 5.17
	25	4 5 43.61	10.086	20 51 6.8	27.41	3 17.58	0.229	15 49.13	1 7.89	4 9 1.73
	26	4 9 45.92	10.106	21 1 53.8	26.51	3 11.84	0.249	15 48.97	1 7.96	4 12 58.29
	27	4 13 48.71	10.126	+21 12 19.0	+25.59	−3 5.62	+0.269	15 48.81	1 8.03	4 16 54.84
	28	4 17 51.97	10.145	21 22 22.2	24.67	2 58.93	0.288	15 48.65	1 8.10	4 20 51.40
	29	4 21 55.69	10.161	21 32 3.3	23.74	2 51.79	0.307	15 48.50	1 8.16	4 24 47.95
	30	4 25 59.86	10.183	21 41 21.9	22.81	2 44.19	0.326	15 48.35	1 8.23	4 28 44.51
	31	4 30 4.48	10.201	21 50 18.0	21.86	2 36.15	0.344	15 48.20	1 8.29	4 32 41.07
June	1	4 34 9.53	10.219	+21 58 51.3	+20.91	−2 27.68	+0.362	15 48.05	1 8.35	4 36 37.62
	2	4 38 15.01	10.236	22 7 1.7	19.95	2 18.79	0.379	15 47.91	1 8.40	4 40 34.18
	3	4 42 20.89	10.253	22 14 49.0	18.98	2 9.49	0.396	15 47.77	1 8.46	4 44 30.74
	4	4 46 27.16	10.269	22 22 13.0	18.01	1 59.80	0.412	15 47.63	1 8.51	4 48 27.29
	5	4 50 33.82	10.285	22 29 13.7	17.04	1 49.73	0.427	15 47.50	1 8.56	4 52 23.85
	6	4 54 40.84	10.299	+22 35 50.8	+16.05	−1 39.30	+0.442	15 47.37	1 8.60	4 56 20.40
	7	4 58 48.19	10.313	22 42 4.2	15.06	1 28.53	0.456	15 47.24	1 8.65	5 0 16.96
	8	5 2 55.87	10.326	22 47 53.7	14.06	1 17.44	0.469	15 47.12	1 8.69	5 4 13.52
	9	5 7 3.85	10.338	22 53 19.3	13.06	1 6.05	0.480	15 47.01	1 8.73	5 8 10.07
	10	5 11 12.10	10.349	22 58 20.8	12.05	0 54.38	0.491	15 46.90	1 8.76	5 12 6.63
	11	5 15 20.61	10.359	+23 2 58.0	+11.04	−0 42.47	+0.501	15 46.79	1 8.79	5 16 3.19
	12	5 19 29.35	10.368	23 7 10.9	10.03	0 30.32	0.510	15 46.69	1 8.82	5 19 59.74
	13	5 23 38.29	10.376	23 10 59.4	9.01	0 17.97	0.518	15 46.60	1 8.84	5 23 56.30
	14	5 27 47.40	10.383	23 14 23.4	7.99	−0 5.44	0.525	15 46.50	1 8.86	5 27 52.86
	15	5 31 56.67	10.389	23 17 22.9	6.97	+0 7.25	0.531	15 46.42	1 8.88	5 31 49.42
	16	5 36 6.07	10.394	+23 19 57.8	+ 5.94	+0 20.05	+0.536	15 46.34	1 8.90	5 35 45.97
	17	5 40 15.57	10.397	23 22 7.9	4.91	0 32.95	0.539	15 46.27	1 8.92	5 39 42.53
	18	5 44 25.14	10.399	23 23 53.3	3.88	0 45.92	0.541	15 46.20	1 8.93	5 43 39.08
	19	5 48 34.75	10.401	23 25 13.9	2.84	0 58.94	0.543	15 46.14	1 8.93	5 47 35.64
	20	5 52 44.38	10.401	23 26 9.7	1.81	1 11.98	0.543	15 46.08	1 8.94	5 51 32.20
	21	5 56 53.99	10.400	+23 26 40.7	+ 0.78	+1 25.01	+0.542	15 46.03	1 8.94	5 55 28.76
	22	6 1 3.57	10.398	23 26 47.0	− 0.26	1 38.00	0.540	15 45.98	1 8.94	5 59 25.31
	23	6 5 13.11	10.395	23 26 28.4	1.29	1 50.93	0.537	15 45.93	1 8.93	6 3 21.87
	24	6 9 22.56	10.392	23 25 45.0	2.32	2 3.79	0.534	15 45.89	1 8.91	6 7 18.43
	25	6 13 31.91	10.387	23 24 36.8	3.36	2 16.55	0.529	15 45.85	1 8.90	6 11 14.98
	26	6 17 41.13	10.382	+23 23 3.9	− 4.39	+2 29.18	+0.524	15 45.82	1 8.90	6 15 11.54
	27	6 21 50.22	10.376	23 21 6.3	5.41	2 41.68	0.518	15 45.79	1 8.88	6 19 8.10
	28	6 25 59.15	10.369	23 18 44.1	6.44	2 54.02	0.511	15 45.76	1 8.85	6 23 4.65
	29	6 30 7.91	10.361	23 15 57.3	7.46	3 6.19	0.503	15 45.74	1 8.82	6 27 1.21
	30	6 34 16.48	10.352	23 12 46.0	8.48	3 18.17	0.495	15 45.72	1 8.79	6 30 57.77
July	1	6 38 24.83	10.343	+23 9 10.3	− 9.50	+3 29.93	+0.486	15 45.70	1 8.76	6 34 54.32
	2	6 42 32.96	10.334	+23 5 10.3	−10.51	+3 41.47	+0.476	15 45.68	1 8.73	6 38 50.88

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
July	1	6 38 24.83	10.343	+23 9 10.3	− 9.50	+3 29.93	+0.486	15 45.70	1 8.76	6 34 54.32
	2	6 42 32.96	10.334	23 5 10.3	10.51	3 41.47	0.476	15 45.68	1 8.73	6 38 50.88
	3	6 46 40.84	10.323	23 0 46.0	11.51	3 52.77	0.465	15 45.67	1 8.69	6 42 47.44
	4	6 50 48.45	10.311	22 55 57.6	12.51	4 3.80	0.453	15 45.66	1 8.65	6 46 43.99
	5	6 54 55.78	10.298	22 50 45.3	13.51	4 14.54	0.441	15 45.66	1 8.60	6 50 40.55
	6	6 59 2.79	10.285	+22 45 9.1	−14.50	+4 24.97	+0.428	15 45.66	1 8.56	6 54 37.11
	7	7 3 9.48	10.272	22 39 9.2	15.49	4 35.07	0.414	15 45.66	1 8.51	6 58 33.66
	8	7 7 15.82	10.257	22 32 45.7	16.47	4 44.83	0.399	15 45.67	1 8.46	7 2 30.22
	9	7 11 21.80	10.241	22 25 58.8	17.44	4 54.22	0.383	15 45.68	1 8.40	7 6 26.78
	10	7 15 27.39	10.224	22 18 48.6	18.40	5 3.22	0.366	15 45.71	1 8.34	7 10 23.33
	11	7 19 32.57	10.207	+22 11 15.3	−19.36	+5 11.83	+0.350	15 45.74	1 8.28	7 14 19.89
	12	7 23 37.33	10.189	22 3 19.2	20.31	5 20.02	0.332	15 45.77	1 8.22	7 18 16.44
	13	7 27 41.65	10.170	21 55 0.3	21.25	5 27.75	0.313	15 45.80	1 8.16	7 22 13.00
	14	7 31 45.49	10.151	21 46 18.9	22.19	5 35.01	0.293	15 45.84	1 8.09	7 26 9.56
	15	7 35 48.85	10.130	21 37 15.2	23.12	5 41.80	0.273	15 45.89	1 8.02	7 30 6.11
	16	7 39 51.71	10.108	+21 27 49.3	−24.03	+5 48.09	+0.251	15 45.95	1 7.95	7 34 2.67
	17	7 43 54.05	10.086	21 18 1.5	24.94	5 53.86	0.229	15 46.00	1 7.88	7 37 59.23
	18	7 47 55.86	10.064	21 7 52.2	25.84	5 59.10	0.207	15 46.07	1 7.81	7 41 55.78
	19	7 51 57.12	10.041	20 57 21.4	26.73	6 3.79	0.184	15 46.14	1 7.73	7 45 52.34
	20	7 55 57.81	10.017	20 46 29.4	27.61	6 7.92	0.160	15 46.22	1 7.65	7 49 48.89
	21	7 59 57.93	9.993	+20 35 16.4	−28.47	+6 11.47	+0.136	15 46.30	1 7.57	7 53 45.45
	22	8 3 57.47	9.969	20 23 42.7	29.33	6 14.44	0.112	15 46.38	1 7.49	7 57 42.00
	23	8 7 56.42	9.944	20 11 48.5	30.18	6 16.83	0.087	15 46.47	1 7.41	8 1 38.56
	24	8 11 54.77	9.919	19 59 34.1	31.02	6 18.63	0.063	15 46.56	1 7.33	8 5 35.12
	25	8 15 52.53	9.894	19 46 59.7	31.85	6 19.83	0.038	15 46.65	1 7.25	8 9 31.67
	26	8 19 49.69	9.869	+19 34 5.5	−32.66	+6 20.43	+0.013	15 46.75	1 7.17	8 13 28.23
	27	8 23 46.25	9.845	19 20 51.9	33.47	6 20.43	−0.012	15 46.85	1 7.08	8 17 24.78
	28	8 27 42.21	9.820	19 7 19.1	34.26	6 19.83	0.037	15 46.95	1 7.00	8 21 21.34
	29	8 31 37.57	9.795	18 53 27.4	35.04	6 18.64	0.062	15 47.05	1 6.91	8 25 17.89
	30	8 35 32.34	9.770	18 39 17.0	35.81	6 16.86	0.086	15 47.16	1 6.82	8 29 14.45
	31	8 39 26.51	9.745	+18 24 48.1	−36.58	+6 14.48	−0.111	15 47.28	1 6.74	8 33 11.00
Aug.	1	8 43 20.08	9.720	18 10 1.1	37.33	6 11.51	0.136	15 47.39	1 6.65	8 37 7.56
	2	8 47 13.07	9.696	17 54 56.2	38.07	6 7.95	0.160	15 47.51	1 6.56	8 41 4.11
	3	8 51 5.47	9.671	17 39 33.8	38.79	6 3.80	0.185	15 47.63	1 6.48	8 45 0.67
	4	8 54 57.28	9.647	17 23 54.1	39.51	5 59.07	0.209	15 47.76	1 6.39	8 48 57.22
	5	8 58 48.50	9.622	+17 7 57.4	−40.21	+5 53.75	−0.234	15 47.89	1 6.30	8 52 53.78
	6	9 2 39.13	9.598	16 51 44.0	40.90	5 47.85	0.258	15 48.02	1 6.21	8 56 50.33
	7	9 6 29.18	9.574	16 35 14.2	41.58	5 41.37	0.282	15 48.16	1 6.13	9 0 46.88
	8	9 10 18.66	9.550	16 18 28.3	42.24	5 34.32	0.306	15 48.30	1 6.04	9 4 43.44
	9	9 14 7.57	9.526	16 1 26.7	42.89	5 26.69	0.330	15 48.44	1 5.96	9 8 39.99
	10	9 17 55.91	9.502	+15 44 9.5	−43.53	+5 18.49	−0.353	15 48.59	1 5.87	9 12 36.55
	11	9 21 43.68	9.478	15 26 37.2	44.15	5 9.73	0.377	15 48.75	1 5.79	9 16 33.10
	12	9 25 30.88	9.455	15 8 50.0	44.76	5 0.40	0.400	15 48.92	1 5.71	9 20 29.66
	13	9 29 17.51	9.431	14 50 48.3	45.36	4 50.51	0.424	15 49.09	1 5.63	9 24 26.21
	14	9 33 3.58	9.408	14 32 32.6	45.94	4 40.05	0.447	15 49.26	1 5.55	9 28 22.76
	15	9 36 49.09	9.385	+14 14 2.9	−46.52	+4 29.04	−0.470	15 49.43	1 5.47	9 32 19.32
	16	9 40 34.06	9.362	+13 55 19.6	−47.08	+4 17.48	−0.493	15 49.61	1 5.39	9 36 15.87

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Aug. 16	9 40 34.06	9.362	+13 55 19.6	-47.08	+ 4 17.48	−0.493	15 49.61	1 5.39	9 36 15.87
17	9 44 18.48	9.339	13 36 23.1	47.62	4 5.38	0.515	15 49.80	1 5.32	9 40 12.42
18	9 48 2.36	9.317	13 17 13.8	48.15	3 52.74	0.537	15 49.99	1 5.24	9 44 8.98
19	9 51 45.71	9.296	12 57 51.9	48.67	3 39.58	0.559	15 50.18	1 5.17	9 48 5.53
20	9 55 28.55	9.275	12 38 17.7	49.17	3 25.91	0.580	15 50.37	1 5.10	9 52 2.08
21	9 59 10.89	9.254	+12 18 31.6	−49.66	+ 3 11.74	−0.600	15 50.57	1 5.03	9 55 58.64
22	10 2 52.74	9.234	11 58 33.9	50.14	2 57.07	0.620	15 50.77	1 4.96	9 59 55.19
23	10 6 34.12	9.215	11 38 24.8	50.61	2 41.93	0.640	15 50.98	1 4.90	10 3 51.74
24	10 10 15.05	9.196	11 18 4.7	51.06	2 26.34	0.659	15 51.18	1 4.83	10 7 48.30
25	10 13 55.54	9.178	10 57 33.9	51.50	2 10.32	0.677	15 51.39	1 4.77	10 11 44.85
26	10 17 35.61	9.161	+10 36 52.7	−51.93	+ 1 53.88	−0.693	15 51.60	1 4.71	10 15 41.40
27	10 21 15.27	9.145	10 16 1.5	52.34	1 37.04	0.709	15 51.81	1 4.65	10 19 37.96
28	10 24 54.55	9.129	9 55 0.4	52.74	1 19.82	0.725	15 52.03	1 4.59	10 23 34.51
29	10 28 33.48	9.115	9 33 49.8	53.13	1 2.24	0.740	15 52.24	1 4.54	10 27 31.06
30	10 32 12.06	9.101	9 12 30.1	53.51	0 44.32	0.754	15 52.46	1 4.49	10 31 27.62
31	10 35 50.30	9.087	+ 8 51 1.4	−53.87	+ 0 26.07	−0.767	15 52.68	1 4.44	10 35 24.17
Sept. 1	10 39 28.24	9.074	8 29 24.2	54.22	+ 0 7.50	0.780	15 52.90	1 4.39	10 39 20.72
2	10 43 5.89	9.063	8 7 38.8	54.56	− 0 11.35	0.791	15 53.12	1 4.35	10 43 17.27
3	10 46 43.26	9.052	7 45 45.5	54.88	0 30.48	0.802	15 53.35	1 4.30	10 47 13.82
4	10 50 20.38	9.042	7 23 44.5	55.19	0 49.86	0.812	15 53.58	1 4.26	10 51 10.38
5	10 53 57.26	9.032	+ 7 1 36.3	−55.49	− 1 9.48	−0.822	15 53.81	1 4.23	10 55 6.93
6	10 57 33.92	9.023	6 39 21.1	55.77	1 29.31	0.831	15 54.04	1 4.19	10 59 3.48
7	11 1 10.38	9.015	6 16 59.3	56.04	1 49.35	0.839	15 54.28	1 4.16	11 3 0.03
8	11 4 46.65	9.008	5 54 31.2	56.29	2 9.58	0.846	15 54.52	1 4.13	11 6 56.59
9	11 8 22.74	9.001	5 31 57.1	56.53	2 29.98	0.853	15 54.76	1 4.11	11 10 53.14
10	11 11 58.68	8.995	+ 5 9 17.5	−56.76	− 2 50.54	−0.859	15 55.00	1 4.09	11 14 49.69
11	11 15 34.47	8.989	4 46 32.6	56.97	3 11.24	0.865	15 55.26	1 4.07	11 18 46.24
12	11 19 10.13	8.983	4 23 42.8	57.17	3 32.08	0.871	15 55.51	1 4.05	11 22 42.79
13	11 22 45.67	8.979	4 0 48.3	57.35	3 53.03	0.875	15 55.77	1 4.04	11 26 39.35
14	11 26 21.11	8.975	3 37 49.7	57.52	4 14.08	0.879	15 56.03	1 4.02	11 30 35.90
15	11 29 56.48	8.972	+ 3 14 47.2	−57.68	− 4 35.21	−0.882	15 56.30	1 4.02	11 34 32.45
16	11 33 31.77	8.970	2 51 41.2	57.82	4 56.41	0.884	15 56.56	1 4.01	11 38 29.00
17	11 37 7.01	8.968	2 28 32.1	57.94	5 17.66	0.886	15 56.83	1 4.01	11 42 25.55
18	11 40 42.24	8.967	2 5 20.1	58.05	5 38.94	0.887	15 57.10	1 4.01	11 46 22.11
19	11 44 17.45	8.967	1 42 5.5	58.15	6 0.22	0.886	15 57.37	1 4.01	11 50 18.66
20	11 47 52.68	8.968	+ 1 18 48.8	−58.23	− 6 21.49	−0.886	15 57.64	1 4.01	11 54 15.21
21	11 51 27.95	8.971	0 55 30.2	58.30	6 42.72	0.884	15 57.91	1 4.02	11 58 11.76
22	11 55 3.27	8.974	0 32 10.0	58.36	7 3.88	0.880	15 58.18	1 4.04	12 2 8.31
23	11 58 38.68	8.978	+ 0 8 48.6	58.40	7 24.96	0.876	15 58.45	1 4.05	12 6 4.86
24	12 2 14.21	8.983	− 0 14 33.6	58.43	7 45.93	0.871	15 58.72	1 4.07	12 10 1.42
25	12 5 49.87	8.989	− 0 37 56.4	−58.45	− 8 6.76	−0.865	15 58.99	1 4.09	12 13 57.97
26	12 9 25.69	8.996	1 1 19.4	58.46	8 27.44	0.858	15 59.27	1 4.12	12 17 54.52
27	12 13 1.68	9.004	1 24 42.4	58.45	8 47.94	0.850	15 59.54	1 4.15	12 21 51.07
28	12 16 37.88	9.013	1 48 5.0	58.42	9 8.23	0.841	15 59.81	1 4.18	12 25 47.62
29	12 20 14.31	9.023	2 11 26.8	58.38	9 28.30	0.831	16 0.08	1 4.21	12 29 44.18
30	12 23 51.00	9.034	− 2 34 47.4	−58.33	− 9 48.12	−0.820	16 0.35	1 4.25	12 33 40.73
Oct. 1	12 27 27.95	9.046	− 2 58 6.7	−58.26	−10 7.66	−0.808	16 0.62	1 4.29	12 37 37.28

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Oct.	1	12 27 27.95	9.046	− 2 58 6.7	−58.26	−10 7.66	−0.808	16 0.62	1 4.29	12 37 37.28
	2	12 31 5.19	9.059	3 21 24.2	58.18	10 26.92	0.796	16 0.89	1 4.33	12 41 33.83
	3	12 34 42.76	9.072	3 44 39.6	58.08	10 45.86	0.782	16 1.16	1 4.37	12 45 30.38
	4	12 38 20.66	9.086	4 7 52.4	57.97	11 4.45	0.768	16 1.43	1 4.42	12 49 26.93
	5	12 41 58.92	9.102	4 31 2.5	57.85	11 22.69	0.753	16 1.70	1 4.47	12 53 23.48
	6	12 45 37.55	9.118	− 4 54 9.4	−57.71	−11 40.56	−0.736	16 1.97	1 4.53	12 57 20.04
	7	12 49 16.57	9.135	5 17 12.7	57.56	11 58.04	0.719	16 2.25	1 4.58	13 1 16.59
	8	12 52 56.01	9.152	5 40 12.1	57.39	12 15.11	0.702	16 2.52	1 4.64	13 5 13.14
	9	12 56 35.87	9.170	6 3 7.2	57.20	12 31.76	0.684	16 2.80	1 4.71	13 9 9.69
	10	13 0 16.18	9.189	6 25 57.6	56.99	12 47.96	0.666	16 3.08	1 4.77	13 13 6.25
	11	13 3 56.95	9.208	− 6 48 42.8	−56.77	−13 3.70	−0.647	16 3.36	1 4.84	13 17 2.80
	12	13 7 38.18	9.228	7 11 22.5	56.53	13 18.98	0.627	16 3.64	1 4.91	13 20 59.35
	13	13 11 19.89	9.249	7 33 56.4	56.28	13 33.78	0.607	16 3.92	1 4.99	13 24 55.90
	14	13 15 2.10	9.270	7 56 24.0	56.01	13 48.08	0.585	16 4.20	1 5.07	13 28 52.46
	15	13 18 44.83	9.292	8 18 44.8	55.72	14 1.87	0.563	16 4.48	1 5.15	13 32 49.01
	16	13 22 28.09	9.314	− 8 40 58.6	−55.42	−14 15.12	−0.541	16 4.76	1 5.23	13 36 45.56
	17	13 26 11.90	9.337	9 3 5.0	55.10	14 27.83	0.518	16 5.04	1 5.32	13 40 42.11
	18	13 29 56.28	9.361	9 25 3.5	54.76	14 39.97	0.494	16 5.32	1 5.40	13 44 38.66
	19	13 33 41.24	9.387	9 46 53.7	54.41	14 51.53	0.469	16 5.60	1 5.49	13 48 35.22
	20	13 37 26.80	9.412	10 8 35.4	54.04	15 2.49	0.443	16 5.88	1 5.58	13 52 31.77
	21	13 41 12.99	9.438	−10 30 8.1	−53.66	−15 12.83	−0.417	16 6.15	1 5.68	13 56 28.32
	22	13 44 59.84	9.465	10 51 31.4	53.27	15 22.52	0.390	16 6.42	1 5.77	14 0 24.88
	23	13 48 47.34	9.493	11 12 45.0	52.86	15 31.55	0.362	16 6.69	1 5.87	14 4 21.43
	24	13 52 35.52	9.522	11 33 48.5	52.43	15 39.90	0.334	16 6.96	1 5.97	14 8 17.98
	25	13 56 24.39	9.552	11 54 41.5	51.98	15 47.55	0.304	16 7.23	1 6.07	14 12 14.54
	26	14 0 13.98	9.582	−12 15 23.5	−51.52	−15 54.50	−0.274	16 7.49	1 6.18	14 16 11.09
	27	14 4 4.31	9.613	12 35 54.3	51.04	16 0.71	0.243	16 7.75	1 6.28	14 20 7.64
	28	14 7 55.38	9.641	12 56 13.4	50.54	16 6.17	0.212	16 8.00	1 6.39	14 24 4.20
	29	14 11 47.22	9.676	13 16 20.5	50.03	16 10.87	0.180	16 8.25	1 6.50	14 28 0.75
	30	14 15 39.84	9.709	13 36 15.1	49.50	16 14.79	0.147	16 8.50	1 6.61	14 31 57.30
	31	14 19 33.25	9.742	−13 55 56.9	−48.96	−16 17.92	−0.114	16 8.75	1 6.72	14 35 53.86
Nov.	1	14 23 27.47	9.776	14 15 25.5	48.40	16 20.26	0.081	16 9.00	1 6.83	14 39 50.41
	2	14 27 22.49	9.810	14 34 40.4	47.83	16 21.79	0.047	16 9.25	1 6.95	14 43 46.96
	3	14 31 18.34	9.844	14 53 41.3	47.24	16 22.49	−0.012	16 9.49	1 7.06	14 47 43.52
	4	14 35 15.03	9.879	15 12 27.8	46.63	16 22.36	+0.022	16 9.73	1 7.18	14 51 40.07
	5	14 39 12.55	9.914	−15 30 59.3	−46.00	−16 21.39	+0.057	16 9.97	1 7.30	14 55 36.63
	6	14 43 10.92	9.949	15 49 15.6	45.35	16 19.58	0.092	16 10.21	1 7.41	14 59 33.18
	7	14 47 10.13	9.984	16 7 16.2	44.69	16 16.93	0.128	16 10.44	1 7.53	15 3 29.74
	8	14 51 10.19	10.019	16 25 0.7	44.01	16 13.44	0.163	16 10.68	1 7.65	15 7 26.29
	9	14 55 11.09	10.054	16 42 28.6	43.31	16 9.11	0.198	16 10.92	1 7.77	15 11 22.84
	10	14 59 12.83	10.089	−16 59 39.5	−42.59	−16 3.94	+0.232	16 11.15	1 7.89	15 15 19.40
	11	15 3 15.41	10.124	17 16 33.1	41.86	15 57.93	0.267	16 11.38	1 8.01	15 19 15.95
	12	15 7 18.83	10.159	17 33 8.8	41.11	15 51.08	0.302	16 11.61	1 8.13	15 23 12.51
	13	15 11 23.08	10.194	17 49 26.3	40.34	15 43.40	0.337	16 11.84	1 8.25	15 27 9.06
	14	15 15 28.17	10.229	18 5 25.2	39.56	15 34.89	0.371	16 12.07	1 8.37	15 31 5.62
	15	15 19 34.08	10.263	−18 21 5.0	−38.75	−15 25.55	+0.406	16 12.29	1 8.49	15 35 2.17
	16	15 23 40.83	10.298	−18 36 25.3	−37.93	−15 15.39	+0.440	16 12.51	1 8.61	15 38 58.73

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Nov. 16	15 23 40.83	10.298	−18 36 25.3	−37.93	−15 15.39	+0.440	16 12.51	1 8.61	15 38 58.73
17	15 27 48.40	10.332	18 51 25.9	37.10	15 4.41	0.475	16 12.72	1 8.72	15 42 55.28
18	15 31 56.80	10.367	19 6 6.3	36.25	14 52.60	0.509	16 12.93	1 8.84	15 46 51.84
19	15 36 6.01	10.401	19 20 26.1	35.38	14 39.98	0.543	16 13.14	1 8.95	15 50 48.40
20	15 40 16.03	10.435	19 34 25.0	34.50	14 26.54	0.577	16 13.35	1 9.07	15 54 44.95
21	15 44 26.87	10.468	−19 48 2.6	−33.61	−14 12.29	+0.610	16 13.55	1 9.18	15 58 41.51
22	15 48 38.53	10.502	20 1 18.5	32.70	13 57.24	0.643	16 13.74	1 9.29	16 2 38.06
23	15 52 50.98	10.535	20 14 12.5	31.78	13 41.40	0.677	16 13.93	1 9.40	16 6 34.62
24	15 57 4.21	10.568	20 26 44.0	30.84	13 24.77	0.710	16 14.12	1 9.50	16 10 31.17
25	16 1 18.23	10.600	20 38 52.8	29.88	13 7.36	0.742	16 14.30	1 9.61	16 14 27.73
26	16 5 33.01	10.632	−20 50 38.7	−28.92	−12 49.17	+0.774	16 14.48	1 9.72	16 18 24.29
27	16 9 48.55	10.664	21 2 1.2	27.94	12 30.23	0.805	16 14.65	1 9.82	16 22 20.84
28	16 14 4.85	10.694	21 13 0.0	26.95	12 10.55	0.835	16 14.81	1 9.92	16 26 17.40
29	16 18 21.87	10.724	21 23 34.8	25.94	11 50.14	0.865	16 14.97	1 10.01	16 30 13.96
30	16 22 39.61	10.754	21 33 45.4	24.93	11 29.01	0.895	16 15.12	1 10.11	16 34 10.51
Dec. 1	16 26 58.06	10.783	−21 43 31.3	−23.90	−11 7.18	+0.924	16 15.28	1 10.20	16 38 7.07
2	16 31 17.18	10.811	21 52 52.4	22.86	10 44.68	0.952	16 15.43	1 10.29	16 42 3.62
3	16 35 36.96	10.838	22 1 48.3	21.80	10 21.52	0.979	16 15.58	1 10.37	16 46 0.18
4	16 39 57.38	10.863	22 10 18.8	20.73	9 57.73	1.004	16 15.72	1 10.45	16 49 56.74
5	16 44 18.40	10.888	22 18 23.6	19.66	9 33.33	1.029	16 15.86	1 10.53	16 53 53.30
6	16 48 40.00	10.911	−22 26 2.4	−18.57	− 9 8.35	+1.052	16 15.99	1 10.60	16 57 49.85
7	16 53 2.15	10.933	22 33 14.9	17.47	8 42.82	1.074	16 16.12	1 10.67	17 1 46.41
8	16 57 24.82	10.954	22 40 1.0	16.36	8 16.78	1.095	16 16.25	1 10.74	17 5 42.97
9	17 1 47.97	10.974	22 46 20.5	15.25	7 50.26	1.114	16 16.37	1 10.80	17 9 39.52
10	17 6 11.57	10.992	22 52 13.0	14.12	7 23.29	1.132	16 16.49	1 10.86	17 13 36.08
11	17 10 35.59	11.008	−22 57 38.5	−12.99	− 6 55.90	+1.149	16 16.61	1 10.92	17 17 32.64
12	17 14 59.99	11.024	23 2 36.7	11.85	6 28.14	1.164	16 16.72	1 10.97	17 21 29.19
13	17 19 24.74	11.038	23 7 7.4	10.70	6 0.03	1.178	16 16.83	1 11.02	17 25 25.75
14	17 23 49.81	11.051	23 11 10.5	9.55	5 31.59	1.191	16 16.94	1 11.07	17 29 22.31
15	17 28 15.17	11.062	23 14 45.8	8.39	5 2.87	1.202	16 17.04	1 11.11	17 33 18.87
16	17 32 40.77	11.072	−23 17 53.3	− 7.23	− 4 33.90	+1.212	16 17.14	1 11.14	17 37 15.42
17	17 37 6.60	11.080	23 20 32.8	6.06	4 4.71	1.220	16 17.23	1 11.17	17 41 11.98
18	17 41 32.62	11.087	23 22 44.3	4.89	3 35.32	1.227	16 17.32	1 11.19	17 45 8.54
19	17 45 58.81	11.094	23 24 27.6	3.72	3 5.78	1.234	16 17.39	1 11.21	17 49 5.10
20	17 50 25.12	11.099	23 25 42.7	2.54	2 36.11	1.239	16 17.46	1 11.23	17 53 1.65
21	17 54 51.52	11.102	−23 26 29.6	− 1.37	− 2 6.34	+1.242	16 17.53	1 11.24	17 56 58.21
22	17 59 17.99	11.103	23 26 48.2	− 0.19	1 36.51	1.243	16 17.60	1 11.25	18 0 54.77
23	18 3 44.50	11.104	23 26 38.4	+ 0.99	1 6.65	1.244	16 17.65	1 11.26	18 4 51.33
24	18 8 11.01	11.104	23 26 0.4	2.17	0 36.78	1.244	16 17.70	1 11.26	18 8 47.88
25	18 12 37.49	11.102	23 24 54.0	3.35	− 0 6.94	1.242	16 17.75	1 11.25	18 12 44.44
26	18 17 3.92	11.099	−23 23 19.4	+ 4.53	+ 0 22.85	+1.239	16 17.79	1 11.24	18 16 41.00
27	18 21 30.26	11.095	23 21 16.6	5.70	0 52.55	1.235	16 17.82	1 11.22	18 20 37.56
28	18 25 56.47	11.090	23 18 45.6	6.88	1 22.13	1.230	16 17.84	1 11.20	18 24 34.11
29	18 30 22.54	11.083	23 15 46.5	8.05	1 51.56	1.223	16 17.86	1 11.17	18 28 30.67
30	18 34 48.43	11.074	23 12 19.3	9 21	2 20.81	1.214	16 17.87	1 11.14	18 32 27.23
31	18 39 14.10	11.064	−23 8 24.3	+10.37	+ 2 49.85	+1.205	16 17.88	1 11.11	18 36 23.78

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.	
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″		
Jan. 0	L	22 47.14	2.207	5 28 14.36	142.62	+18 12 47.9	+108.6	67.82	15 29.6	56 46.1		
1	U	11 13.85	2.244	5 56 59.63	144.85	18 26 37.8	+ 28.9	68.35	15 35.0	57 6.2	I.	S.
1	L	23 40.95	2.272	6 26 8.59	146.55	18 24 8.8	− 54.3	68.76	15 40.4	57 25.8		
2	U	12 8.34	2.290	6 55 34.41	147.65	18 4 48.0	139.3	69.02	15 45.5	57 44.5	*I.* II.	S.
3	L	0 35.88	2.298	7 25 9.71	148.12	+17 28 25.6	−224.1	69.14	15 50.2	58 2.0		
3	U	13 3.46	2.296	7 54 47.17	148.02	16 35 16.9	306.7	69.13	15 54.5	58 17.9	II.	S.
4	L	1 30.96	2.286	8 24 20.18	147.40	15 26 3.2	384.7	69.00	15 58.4	58 32.0		
4	U	13 58.30	2.267	8 53 43.26	146.39	14 1 48.7	456.5	68.77	16 1.7	58 44.3	II.	S.
5	L	2 25.41	2.218	9 22 52.50	145.12	+12 23 58.8	−520.4	68.49	16 4.5	58 54.6		
5	U	14 52.25	2.225	9 51 45.64	143.74	10 34 14.6	575.4	68.18	16 6.8	59 2.8	II.	S.
6	L	3 18.81	2.203	10 20 22.18	142.37	8 34 30.0	620.4	67.88	16 8.5	59 9.1		
6	U	15 45.12	2.182	10 48 43.14	141.16	6 26 46.4	655.1	67.61	16 9.7	59 13.5	II.	S.
7	L	4 11.21	2.166	11 16 50.91	140.19	+ 4 13 10.5	−679.2	67.40	16 10.4	59 16.1		
7	U	16 37.13	2.156	11 44 48.94	139.54	+ 1 55 50.0	692.5	67.26	16 10.7	59 17.1	II.	S.
8	L	5 2.96	2.151	12 12 41.39	139.26	− 0 23 6.8	695.2	67.21	16 10.6	59 16.6		
8	U	17 28.78	2.153	12 40 32.81	139.37	2 41 32.4	687.3	67.25	16 10.1	59 14.8	II.	S.
9	L	5 54.65	2.161	13 8 27.91	139.87	− 4 57 21.5	−669.1	67.38	16 9.2	59 11.7		
9	U	18 20.66	2.175	13 36 31.10	140.72	7 8 31.1	640.8	67.59	16 8.1	59 7.5	II.	S.
10	L	6 46.87	2.194	14 4 46.30	141.85	9 13 0.8	602.5	67.86	16 6.7	59 2.3		
10	U	19 13.33	2.216	14 33 16.45	143.19	11 8 53.8	554.8	68.17	16 4.9	58 56.0	II.	S.
11	L	7 40.07	2.240	15 2 3.41	144.63	−12 54 18.7	−497.9	68.50	16 2.9	58 48.7		
11	U	20 7.09	2.264	15 31 7.55	146.03	14 27 31.1	432.8	68.82	16 0.7	58 40.3	II.	S.
12	L	8 34.38	2.284	16 0 27.59	147.26	15 46 57.1	360.4	69.09	15 58.1	58 30.8		
12	U	21 1.89	2.299	16 30 0.61	148.18	16 51 16.5	281.9	69.27	15 55.2	58 20.3	II.	S.
13	L	9 29.53	2.307	16 59 41.97	148.64	−17 39 25.8	−199.0	69.35	15 52.0	58 8.6		
13	U	21 57.21	2.305	17 29 25.67	148.55	18 10 42.9	113.5	69.30	15 48.5	57 55.8	II.	S.
14	L	10 24.82	2.294	17 59 4.80	147.86	18 24 48.6	− 27.5	69.11	15 44.7	57 41.9		
14	U	22 52.22	2.272	18 28 31.93	146.56	18 21 48.1	+ 57.2	68.77	15 40.7	57 27.0	II.	S.
15	L	11 19.31	2.241	18 57 39.89	144.68	−18 2 10.1	+138.4	68.29	15 36.4	57 11.2		
15	U	23,45.97	2.201	19 26 22.18	142.30	17 26 45.4	214.6	67.69	15 31.9	56 54.7		
16	L	12 12.12	2.155	19 54 33.55	139.54	16 36 42.6	284.6	67.00	15 27.2	56 37.6		
17	U	0 37.69	2.105	20 22 10.21	136.53	15 33 23.8	347.2	66.26	15 22.5	56 20.3		
17	L	13 2.64	2.054	20 49 9.96	133.42	−14 18 19.8	+402.1	65.48	15 17.8	56 3.0		
18	U	1 26.97	2.002	21 15 32.25	130.32	12 53 5.9	448.9	64.70	15 13.1	55 45.9	I.	S.
18	L	13 50.70	1.953	21 41 17.94	127.33	11 19 17.6	487.8	63.96	15 8.6	55 29.4		
19	U	2 13.85	1.907	22 6 29.14	124.58	9 38 28.0	519.1	63.27	15 4.4	55 13.8	I.	S.
19	L	14 36.48	1.866	22 31 9.02	122.12	− 7 52 5.5	+543.4	62.66	15 0.5	54 59.4		
20	U	2 58.66	1.831	22 55 21.49	120.02	6 1 33.0	561.0	62.14	14 57.0	54 46.4	I.	S.
20	L	15 20.46	1.803	23 19 11.15	118.33	4 8 7.0	572.4	61.71	14 53.9	54 35.2		
21	U	3 41.96	1.782	23 42 42.97	117.05	2 12 58.1	578.1	61.40	14 51.4	54 26.0	I.	S.
21	L	16 3.25	1.768	0 6 2.24	116.23	− 0 17 12.0	+578.6	61.22	14 49.5	54 19.0		
22	U	4 24.42	1.762	0 29 14.46	115.88	+ 1 38 10.4	574.3	61.15	14 48.2	54 14.3	I.	S.
22	L	16 45.57	1.764	0 52 25.21	115.99	3 32 10.8	565.1	61.20	14 47.6	54 12.2		
23	U	5 6.79	1.774	1 15 40.13	116.57	5 23 52.6	551.1	61.37	14 47.8	54 12.8	I.	S.
23	L	17 28.17	1.791	1 39 4.76	117.61	+ 7 12 19.4	+532.5	61.67	14 48.7	54 16.2		

Jan. 2, U Defective Illumination of *I.* 0ᵈ.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan 24	U	5 49.81	1.816	2 2 44.59	119.10	+ 8 56 34.1	+509.0	62.08	14 50.4	54 22.3	I. S.
24	L	18 11.78	1.848	2 26 44.86	121.01	10 35 36.8	480.4	62.59	14 52.8	54 31.2	
25	U	6 34.17	1.886	2 51 10.44	123.31	12 8 24.0	446.4	63.19	14 56.0	54 42.9	I. S.
25	L	18 57.06	1.930	3 16 5.79	125.96	13 33 48.3	406.6	63.87	14 59.9	54 57.3	
26	U	7 20.51	1.978	3 41 34.62	128.88	+14 50 37.6	+360.5	64.61	15 4.5	55 14.2	I. S.
26	L	19 44.56	2.030	4 7 39.79	132.00	15 57 35.5	308.0	65.39	15 9.7	55 33.4	
27	U	8 9.24	2.084	4 34 23.08	135.22	16 53 22.4	248.7	66.18	15 15.5	55 54.6	I. S.
27	L	20 34.56	2.137	5 1 44.92	138.41	17 36 37.7	182.8	66.95	15 21.8	56 17.5	
28	U	9 0.51	2.187	5 29 44.20	141.44	+18 6 2.5	+110.5	67.67	15 28.4	56 41.8	I. S.
28	L	21 27.03	2.233	5 58 18.29	144.19	18 20 24.4	+ 32.4	68.31	15 35.2	57 6.9	
29	U	9 54.06	2.272	6 27 22.98	146.52	18 18 40.9	− 50.3	68.85	15 42.1	57 32.3	I. S.
29	L	22 21.51	2.302	6 56 52.66	148.34	18 0 6.3	135.9	69.27	15 49.0	57 57.5	
30	U	10 49.27	2.322	7 26 40.78	149.59	+17 24 15.1	−222.6	69.54	15 55.7	58 21.9	I. *N*.S.
30	L	23 17.21	2.333	7 56 40.29	150.21	16 31 7.5	308.2	69.67	16 1.9	58 44.8	
31	U	11 45.23	2.335	8 26 44.19	150.32	15 21 10.5	390.5	69.68	16 7.6	59 5.7	I. *N*.S.
Feb. 1	L	0 13.21	2.328	8 56 46.13	149.92	13 55 19.3	467.0	69.58	16 12.6	59 24.1	
1	U	12 41.08	2.315	9 26 40.84	149.14	+12 14 55.9	−535.5	69.40	16 16.8	59 39.6	II. S.
2	L	1 8.76	2.298	9 56 24.52	148.11	10 21 46.0	594.4	69.16	16 20.1	59 51.8	
2	U	13 36.22	2.279	10 25 54.91	146.95	8 17 53.9	642.3	68.90	16 22.5	60 0.5	II. S.
3	L	2 3.44	2.260	10 55 11.35	145.79	6 5 38.3	678.2	68.64	16 24.0	60 5.7	
3	U	14 30.45	2.242	11 24 14.54	144.76	+ 3 47 26.7	−701.6	68.41	16 24.4	60 7.3	II. S.
4	L	2 57.27	2.228	11 53 6.34	143.92	+ 1 25 50.1	712.4	68.24	16 23.9	60 5.5	
4	U	15 23.95	2.218	12 21 49.50	143.32	− 0 56 40.3	710.6	68.12	16 22.6	60 0.6	II. S.
5	L	3 50.53	2.213	12 50 27.22	143.01	3 17 37.9	697.0	68.07	16 20.5	59 53.0	
5	U	16 17.08	2.213	13 19 2.94	142.99	− 5 34 41.5	−671.8	68.09	16 17.8	59 43.0	II. S.
6	L	4 43.66	2.217	13 47 39.97	143.22	7 45 38.6	636.0	68.17	16 14.5	59 31.1	
6	U	17 10.30	2.224	14 16 21.10	143.66	9 48 26.3	590.4	68.30	16 10.8	59 17.6	II. S.
7	L	5 37.04	2.234	14 45 8.48	144.25	11 41 12.0	535.9	68.45	16 6.8	59 3.0	
7	U	18 3.91	2.244	15 14 3.27	144.88	−13 22 15.1	−473.4	68.61	16 2.6	58 47.5	II. S.
8	L	6 30.90	2.254	15 43 5.53	145.47	14 50 7.9	404.3	68.76	15 58.3	58 31.5	
8	U	18 58.00	2.261	16 12 14.05	145.91	16 3 37.0	329.7	68.85	15 53.8	58 15.2	II. S.
9	L	7 25.16	2.264	16 41 26.39	146.10	17 1 44.2	250.9	68.87	15 49.3	57 58.8	
9	U	19 52.32	2.262	17 10 39.03	145.95	−17 43 48.5	−169.5	68.81	15 44.9	57 42.5	II. S.
10	L	8 19.42	2.253	17 39 47.47	145.39	18 9 27.4	87.0	68.65	15 40.5	57 26.3	
10	U	20 46.36	2.236	18 8 46.68	144.40	18 18 36.8	− 4.8	68.37	15 36.1	57 10.3	II. S.
11	L	9 13.06	2.213	18 37 31.41	142.98	18 11 31.9	+ 75.2	67.99	15 31.8	56 54.6	
11	U	21 39.44	2.182	19 5 56.61	141.16	−17 48 45.1	+151.9	67.50	15 27.6	56 39.1	II. N.
12	L	10 5.42	2.146	19 33 57.80	138.99	17 11 5.2	223.9	66.93	15 23.5	56 23.9	
12	U	22 30.94	2.106	20 1 31.36	136.56	16 19 34.5	290.2	66.29	15 19.4	56 9.0	II. N.
13	L	10 55.95	2.063	20 28 34.75	133.98	15 15 25.8	350.1	65.62	15 15.5	55 54.5	
13	U	23 20.44	2.019	20 55 6.59	131.32	−13 59 59.8	+403.1	64.92	15 11.6	55 40.3	
14	L	11 44.41	1.975	21 21 6.60	128.69	12 34 41.6	448.8	64.23	15 7.9	55 26.6	
15	U	0 7.86	1.933	21 46 35.60	126.16	11 0 57.9	487.2	63.57	15 4.3	55 13.5	
15	L	12 30.82	1.894	22 11 35.35	123.82	9 20 15.8	518.5	62.96	15 0.9	55 1.1	
16	U	0 53.33	1.860	22 36 8.41	121.73	− 7 34 0.0	+543.0	62.41	14 57.7	54 49.4	

Jan. 30, U Defective Illumination of *N*. 0″.31. Jan. 31, U Defective Illumination of *N*. 0″.76.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 16	U	0 53.33	1.860	22 36 8.41	121.73	− 7 34 0.0	+543.0	62.41	14 57.7	54 49.4	
16	L	13 15.46	1.830	23 0 18.01	119.92	5 43 32.1	560.6	61.94	14 54.8	54 38.7	
17	U	1 37.26	1.805	23 24 7.84	118.44	3 50 9.9	572.0	61.57	14 52.2	54 29.2	I. S.
17	L	13 58.80	1.786	23 47 42.03	117.33	− 1 55 7.2	577.4	61.30	14 50.0	54 21.0	
18	U	2 20.15	1.774	0 11 4.93	116.57	+ 0 0 26.6	+577.3	61.13	14 48.2	54 14.3	I. S.
18	L	14 41.39	1.768	0 34 21.14	116.21	1 55 25.7	571.7	61.06	14 46.8	54 9.3	
19	U	3 2.60	1.768	0 57 35.36	116.24	3 48 47.1	561.0	61.11	14 46.0	54 6.1	I. S.
19	L	15 23.86	1.775	1 20 52.31	116.66	5 39 30.8	545.4	61.26	14 45.7	54 5.0	
20	U	3 45.23	1.789	1 44 16.77	117.48	+ 7 26 37.6	+524.9	61.51	14 46.0	54 6.2	I. S.
20	L	16 6.81	1.809	2 7 53.38	118.69	9 9 9.0	499.6	61.86	14 46.9	54 9.7	
21	U	4 28.67	1.835	2 31 46.67	120.26	10 46 6.3	469.2	62.31	14 48.6	54 15.8	I. S.
21	L	16 50.88	1.867	2 56 0.92	122.17	12 16 29.3	433.8	62.85	14 51.0	54 24.5	
22	U	5 13.50	1.904	3 20 40.08	124.40	+13 39 16.0	+393.1	63.46	14 54.1	54 35.8	I. S.
22	L	17 36.59	1.945	3 45 47.61	126.89	14 53 21.9	347.0	64.12	14 57.9	54 49.8	
23	U	6 0.20	1.990	4 11 26.35	129.60	15 57 40.3	295.1	64.82	15 2.4	55 6.5	I. S.
23	L	18 24.36	2.037	4 37 38.39	132.43	16 51 2.3	237.5	65.55	15 7.7	55 25.8	
24	U	6 49.09	2.085	5 4 24.83	135.31	+17 32 18.2	+174.2	66.28	15 13.6	55 47.6	I. S.
24	L	19 14.40	2.132	5 31 45.73	138.15	18 0 19.5	105.1	66.98	15 20.1	56 11.6	
25	U	7 40.26	2.177	5 59 39.99	140.86	18 14 0.7	+ 30.9	67.63	15 27.2	56 37.6	I. *N.* S.
25	L	20 6.64	2.218	6 28 5.31	143.31	18 12 23.4	− 47.8	68.21	15 34.7	57 5.1	
26	U	8 33.48	2.254	6 56 58.27	145.45	+17 54 40.1	−129.9	68.70	15 42.5	57 33.7	I. N. *S.*
26	L	21 0.71	2.283	7 26 14.57	147.19	17 20 18.0	213.9	69.09	15 50.5	58 2.9	
27	U	9 28.24	2.305	7 55 49.28	148.52	16 29 3.5	298.2	69.38	15 58.4	58 32.0	I. N.
27	L	21 55.99	2.320	8 25 37.22	149.41	15 21 5.9	380.8	69.56	16 6.1	59 0.3	
28	U	10 23.88	2.328	8 55 33.36	149.89	+13 56 59.9	−459.3	69.65	16 13.4	59 27.1	I. N.
28	L	22 51.83	2.330	9 25 33.23	150.03	12 17 46.8	531.6	69.66	16 20.1	59 51.6	
Mar. 1	U	11 19.78	2.328	9 55 33.16	149.92	10 24 54.9	595.4	69.61	16 26.0	60 13.1	I. N. *S.*
1	L	23 47.69	2.323	10 25 30.63	149.63	8 20 17.1	648.9	69.53	16 30.8	60 30.9	
2	U	12 15.53	2.317	10 55 24.12	149.27	+ 6 6 8.5	−690.3	69.44	16 34.5	60 44.5	*I.* II. *N.* S.
3	L	0 43.30	2.312	11 25 13.24	148.92	3 45 0.9	718.5	69.36	16 37.0	60 53.5	
3	U	13 11.01	2.307	11 54 58.47	148.64	+ 1 19 39.2	732.7	69.30	16 38.1	60 57.7	II. S.
4	L	1 38.67	2.304	12 24 40.98	148.47	− 1 7 6.1	732.4	69.28	16 37.9	60 57.0	
4	U	14 6.31	2.303	12 54 22.29	148.44	− 3 32 23.1	−718.0	69.30	16 36.4	60 51.7	II. S.
5	L	2 33.96	2.305	13 24 4.03	148.54	5 53 24.7	690.0	69.35	16 33.8	60 42.0	
5	U	15 1.64	2.308	13 53 47.52	148.72	8 7 33.1	649.4	69.43	16 30.1	60 28.4	II. S.
6	L	3 29.36	2.312	14 23 33.61	148.96	10 12 23.8	597.3	69.52	16 25.5	60 11.5	
6	U	15 57.13	2.315	14 53 22.39	149.16	−12 5 49.4	−535.4	69.60	16 20.2	59 52.0	II. S.
7	L	4 24.93	2.317	15 23 13.03	149.25	13 46 1.6	465.4	69.65	16 14.4	59 30.5	
7	U	16 52.72	2.315	15 53 3.68	149.15	15 11 33.1	388.9	69.65	16 8.1	59 7.6	II. S.
8	L	5 20.47	2.309	16 22 51.56	148.78	16 21 18.0	308.0	69.57	16 1.6	58 43.9	
8	U	17 48.12	2.297	16 52 33.07	148.08	−17 14 33.4	−224.3	69.41	15 55.1	58 19.9	II. S.
9	L	6 15.59	2.280	17 22 3.98	147.01	17 50 57.5	139.7	69.15	15 48.6	57 56.2	
9	U	18 42.80	2.256	17 51 19.81	145.57	18 10 29.6	− 55.9	68.79	15 42.3	57 33.0	II. S.
10	L	7 9.70	2.226	18 20 16.08	143.76	18 13 27.8	+ 25.7	68.33	15 36.2	57 10.6	
10	U	19 36.20	2.190	18 48 48.69	141.63	−18 0 26.8	+103.8	67.78	15 30.4	56 49.2	II. N.

Feb. 25, U Defective Illumination of *N.* 0″.64.
Feb. 26, U Defective Illumination of *S.* 0″.26.
Mar. 1, U Defective Illumination of *S.* 0″.49.
Mar. 2, U Defective Illumination of *I.* 0″.00.
Mar. 2, U Defective Illumination of *N.* 0″.29.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Mar. 10	U	19 36.20	2.190	18 48 48.69	141.63	−18 0 26.8	+103.8	67.78	15 30.4	56 49.2	II. N.
11	L	8 2.25	2.151	19 16 54.16	139.25	17 32 15.5	177.3	67.17	15 24.9	56 29.1	
11	U	20 27.80	2.108	19 44 29.92	136.69	16 49 53.9	245.4	66.50	15 19.8	56 10.2	II. N.
12	L	8 52.83	2.064	20 11 34.32	134.03	15 54 30.3	307.5	65.79	15 15.0	55 52.7	
12	U	21 17.33	2.020	20 38 6.71	131.37	−14 47 18.9	+363.2	65.08	15 10.6	55 36.5	II. N.
13	L	9 41.31	1.976	21 4 7.44	128.77	13 29 37.8	412.5	64.37	15 6.5	55 21.6	
13	U	22 4.78	1.935	21 29 37.72	126.30	12 2 46.3	455.0	63.70	15 2.8	55 7.9	II. N.
14	L	10 27.78	1.898	21 54 39.50	124.03	10 28 4.3	490.8	63.08	14 59.4	54 55.4	
14	U	22 50.34	1.864	22 19 15.37	121.99	− 8 46 50.8	+520.3	62.52	14 56.3	54 44.2	II. N.
15	L	11 12.53	1.835	22 43 28.44	120.24	7 0 23.3	543.3	62.03	14 53.6	54 34.2	
15	U	23 34.39	1.810	23 7 22.14	118.77	5 9 57.1	560.0	61.62	14 51.2	54 25.3	
16	L	11 55.99	1.791	23 31 0.22	117.63	3 16 45.9	570.8	61.31	14 49.1	54 17.6	
17	U	0 17.40	1.778	23 54 26.61	116.83	− 1 22 0.7	+575.8	61.09	14 47.3	54 11.1	
17	L	12 38.69	1.770	0 17 45.33	116.36	+ 0 33 9.6	575.0	60.97	14 45.9	54 5.9	
18	U	0 59.91	1.768	0 41 0.46	116.23	2 27 37.7	568.8	60.95	14 44.8	54 2.0	
18	L	13 21.14	1.771	1 4 16.04	116.43	4 20 18.4	557.1	61.03	14 44.2	53 59.5	
19	U	1 42.44	1.780	1 27 36.12	116.98	+ 6 10 7.8	+540.3	61.20	14 43.9	53 58.5	I. S.
19	L	14 3.89	1.795	1 51 4.62	117.83	7 56 2.9	518.1	61.45	14 44.0	53 59.1	
20	U	2 25.54	1.814	2 14 45.24	118.99	9 37 2.0	490.8	61.79	14 44.7	54 1.4	I. S.
20	L	14 47.44	1.838	2 38 41.51	120.43	11 12 2.8	458.4	62.21	14 45.8	54 5.6	
21	U	3 9.66	1.866	3 2 56.69	122.13	+12 40 3.9	+420.8	62.70	14 47.5	54 11.9	I. S.
21	L	15 32.24	1.898	3 27 33.60	124.06	14 0 3.7	378.2	63.24	14 49.8	54 20.3	
22	U	3 55.23	1.933	3 52 34.66	126.15	15 11 0.5	330.3	63.83	14 52.7	54 30.9	I. S.
22	L	16 18.64	1.970	4 18 1.76	128.38	16 11 52.9	277.5	64.44	14 56.3	54 43.9	
23	U	4 42.51	2.008	4 43 56.10	130.69	+17 1 40.1	+219.5	65.06	15 0.5	54 59.3	I. S.
23	L	17 6.84	2.047	5 10 18.25	133.00	17 39 22.9	156.8	65.68	15 5.3	55 17.0	
24	U	5 31.63	2.085	5 37 8.02	135.28	18 4 5.0	89.5	66.27	15 10.8	55 37.2	I. S.
24	L	17 56.87	2.121	6 4 24.44	137.44	18 14 54.0	+ 18.1	66.82	15 16.9	55 59.7	
25	U	6 22.52	2.154	6 32 5.88	139.44	+18 11 4.8	− 56.8	67.32	15 23.6	56 24.3	I. N.
25	L	18 48.54	2.183	7 0 10.06	141.22	17 52 0.1	134.4	67.76	15 30.8	56 50.9	
26	U	7 14.90	2.209	7 28 34.30	142.77	17 17 14.3	213.4	68.12	15 38.5	57 19.1	I. N.
26	L	19 41.55	2.231	7 57 15.63	144.07	16 26 35.7	292.9	68.42	15 46.5	57 48.5	
27	U	8 8.43	2.249	8 26 11.12	145.14	+15 20 9.0	−371.2	68.66	15 54.7	58 18.6	I. N.
27	L	20 35.50	2.263	8 55 18.04	145.99	13 58 17.3	446.7	68.84	16 3.0	58 48.9	
28	U	9 2.72	2.274	9 24 34.11	146.67	12 21 45.3	517.7	68.98	16 11.1	59 18.6	I. N.
28	L	21 30.07	2.284	9 53 57.72	147.24	10 31 39.1	582.1	69.08	16 18.8	59 46.9	
29	U	9 57.53	2.293	10 23 27.96	147.78	+ 8 29 28.4	−638.1	69.18	16 25.9	60 13.0	I. N.
29	L	22 25.09	2.302	10 53 4.59	148.32	6 17 4.8	683.9	69.29	16 32.2	60 36.1	
30	U	10 52.77	2.312	11 22 48.10	148.94	3 56 42.0	717.7	69.41	16 37.5	60 55.5	I. N.
30	L	23 20.58	2.323	11 52 39.48	149.64	+ 1 30 52.6	738.1	69.57	16 41.6	61 10.4	
31	U	11 48.54	2.337	12 22 39.93	150.45	− 0 57 35.4	−744.0	69.76	16 44.3	61 20.3	I. N.*S.*
Apr. 1	L	0 16.67	2.352	12 52 50.72	151.36	3 25 43.3	734.7	69.98	16 45.5	61 24.8	
1	U	12 44.99	2.368	13 23 12.76	152.32	5 50 28.0	710.2	70.21	16 45.2	61 23.8	II. *N.* S.
2	L	1 13.50	2.384	13 53 46.33	153.26	8 8 48.0	670.8	70.45	16 43.4	61 17.3	
2	U	13 42.19	2.398	14 24 30.73	154.11	−10 17 51.5	−617.5	70.68	16 40.3	61 5.7	II. S.

Mar. 31, U Defective Illumination of *S.* 0″.77. Apr. 1, U Defective Illumination of *N.* 0″.41.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	U	13 42.19	2.398	14 24 30.73	154.11	−10 17 51.5	−617.5	70.68	16 40.3	61 5.7	II. S.
3	L	2 11.03	2.408	14 55 24.12	154.75	12 15 1.9	552.2	70.85	16 35.8	60 49.4	
3	U	14 39.96	2.413	15 26 23.34	155.07	13 58 4.9	476.7	70.96	16 30.3	60 29.1	II. S.
4	L	3 8.92	2.412	15 57 23.93	154.96	15 25 12.5	393.5	70.97	16 23.9	60 5.6	
4	U	15 37.81	2.402	16 28 20.39	154.36	−16 35 7.4	−305.1	70.86	16 16.8	59 39.6	II. S.
5	L	4 6.53	2.383	16 59 6.40	153.22	17 27 2.7	211.0	70.62	16 9.3	59 11.9	
5	U	16 34.96	2.355	17 29 35.36	151.52	18 0 42.5	122.8	70.24	16 1.5	58 43.3	II. *N*. S.
6	L	5 3.01	2.318	17 59 40.87	149.31	18 16 18.5	− 33.7	69.72	15 53.6	58 14.4	
6	U	17 30.57	2.274	18 29 17.21	146.67	−18 14 27.0	+ 51.5	69.09	15 45.8	57 45.9	II. N.
7	L	5 57.56	2.225	18 58 19.73	143.69	17 56 3.1	131.5	68.37	15 38.3	57 18.3	
7	U	18 23.94	2.172	19 26 45.07	140.50	17 22 16.2	205.2	67.58	15 31.1	56 51.9	II. N.
8	L	6 49.67	2.117	19 54 31.33	137.21	16 34 24.7	272.1	66.75	15 24.4	56 27.1	
8	U	19 14.74	2.062	20 21 38.00	133.92	−15 33 52.8	+332.0	65.90	15 18.1	56 4.1	II. N.
9	L	7 39.17	2.009	20 48 5.85	130.75	14 22 5.4	381.7	65.07	15 12.4	55 43.0	
9	U	20 2.98	1.960	21 13 56.75	127.77	13 0 27.7	430.4	64.27	15 7.2	55 24.0	II. N.
10	L	8 26.23	1.915	21 39 13.45	125.06	11 30 22.0	469.4	63.54	15 2.6	55 7.0	
10	U	20 48.96	1.875	22 3 59.37	122.65	− 9 53 7.4	+501.9	62.87	14 58.5	54 52.0	II. N.
11	L	9 11.24	1.840	22 28 18.44	120.58	8 10 0.2	528.2	62.29	14 54.9	54 38.9	
11	U	21 33.15	1.812	22 52 14.90	118.89	6 22 13.1	548.6	61.80	14 51.9	54 27.8	II. N.
12	L	9 54.76	1.790	23 15 53.20	117.56	4 30 56.2	563.3	61.41	14 49.3	54 18.5	
12	U	22 16.14	1.774	23 39 17.84	116.61	− 2 37 17.2	+572.1	61.13	14 47.3	54 10.9	II. N.
13	L	10 37.37	1.765	0 2 33.34	116.01	− 0 42 22.2	576.0	60.95	14 45.7	54 5.0	
13	U	22 58.52	1.761	0 25 44.15	115.83	+ 1 12 43.7	574.1	60.88	14 44.5	54 0.6	II. N.
14	L	11 19.67	1.761	0 48 51.61	115.97	3 6 56.0	567.0	60.90	14 43.7	53 57.7	
14	U	23 30.87	1.772	1 12 8.88	116.45	+ 4 59 10.4	+551.5	61.02	14 43.3	53 56.3	
15	L	12 2.21	1.785	1 35 30.87	117.26	6 48 22.4	536.6	61.23	14 43.2	53 56.2	
16	U	0 23.74	1.803	1 59 4.22	118.35	8 33 27.1	513.3	61.53	14 43.6	53 57.6	
16	L	12 45.51	1.826	2 22 52.27	119.70	10 13 19.0	484.5	61.90	14 44.4	54 0.4	
17	U	1 7.57	1.852	2 46 57.91	121.28	+11 46 52.7	+450.2	62.33	14 45.5	54 4.6	I. S.
17	L	13 29.96	1.881	3 11 23.56	123.03	13 13 2.8	410.5	62.82	14 47.1	54 10.2	
18	U	1 52.72	1.912	3 36 11.13	121.91	14 30 44.2	365.4	63.34	14 49.0	54 17.4	I. S.
18	L	14 15.87	1.915	4 1 21.87	126.88	15 38 53.2	315.2	63.89	14 51.4	54 26.2	
19	U	2 39.41	1.978	4 26 56.43	128.87	+16 36 28.5	+259.9	64.44	14 54.3	54 36.6	I. S.
19	L	15 3.34	2.011	4 52 54.72	130.83	17 22 31.5	199.9	64.98	14 57.6	54 48.8	
20	U	3 27.66	2.042	5 19 15.98	132.70	17 56 8.4	135.6	65.49	15 1.4	55 2.8	I. N.
20	L	15 52.33	2.070	5 45 58.81	134.41	18 16 31.2	+ 67.6	65.96	15 5.7	55 18.7	
21	U	4 17.34	2.096	6 13 1.29	135.96	+18 22 58.9	− 3.5	66.39	15 10.6	55 36.5	I. N.
21	L	16 42.62	2.118	6 40 21.06	137.30	18 14 59.3	76.8	66.75	15 15.9	55 56.1	
22	U	5 8.16	2.137	7 7 55.60	138.42	17 52 10.2	151.5	67.05	15 21.8	56 17.6	I. N.
22	L	17 33.90	2.152	7 35 42.32	139.33	17 14 20.0	226.7	67.29	15 28.1	56 40.8	
23	U	5 59.80	2.164	8 3 38.90	140.07	+16 21 30.2	−301.4	67.48	15 34.9	57 5.7	I. N.
23	L	18 25.83	2.174	8 31 43.43	140.67	15 13 54.5	374.2	67.63	15 42.0	57 31.9	
24	U	6 51.97	2.183	8 59 54.62	141.19	13 52 1.2	444.0	67.75	15 49.4	57 59.1	I. N.
24	L	19 18.22	2.191	9 28 11.89	141.70	12 16 33.2	509.8	67.87	15 57.0	58 26.9	
25	U	7 44.57	2.201	9 56 35.47	142.25	+10 28 29.0	−569.9	67.98	16 4.6	58 54.8	I. N.

Apr. 5, U Defective Illumination of *N*. 0″.14.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 25	U	7 44.57	2.201	9 56 35.47	142.25	+10 28 29.0	−569.9	67.98	16 4.6	58 54.8	I. N.
25	L	20 11.04	2.212	10 25 6.42	142.93	8 29 3.9	623.0	68.13	16 12.1	59 22.2	
26	U	8 37.66	2.226	10 53 46.46	143.77	6 19 49.9	667.7	68.31	16 19.3	59 48.5	I. N.
26	L	21 4.48	2.244	11 22 38.00	144.85	4 2 37.5	702.5	68.54	16 25.9	60 12.8	
27	U	9 31.53	2.266	11 51 43.82	146.16	+ 1 39 34.3	−725.9	68.83	16 31.8	60 34.5	I. N.
27	L	21 58.87	2.291	12 21 6.83	147.72	− 0 46 54.0	736.6	69.18	16 36.8	60 52.8	
28	U	10 26.54	2.321	12 50 49.81	149.48	3 14 6.8	733.2	69.59	16 40.6	61 7.0	I. N.
28	L	22 54.57	2.352	13 20 54.99	151.40	5 39 11.0	715.0	70.03	16 43.2	61 16.5	
29	U	11 23.00	2.385	13 51 23.66	153.37	− 7 59 6.3	−681.6	70.49	16 44.4	61 20.8	I. N.
29	L	23 51.82	2.417	14 22 15.76	155.28	10 10 50.9	633.3	70.94	16 44.1	61 19.8	
30	U	12 21.00	2.445	14 53 29.54	156.96	12 11 29.7	570.9	71.35	16 42.4	61 13.3	II. N. S.
May 1	L	0 50.48	2.466	15 25 1.32	158.25	13 58 22.9	496.0	71.66	16 39.2	61 1.7	
1	U	13 20.16	2.479	15 56 45.39	158.98	−15 29 13.5	−410.9	71.85	16 34.7	60 45.3	II. N. S.
2	L	1 49.92	2.480	16 28 34.24	159.03	16 42 16.0	318.5	71.89	16 29.1	60 24.7	
2	U	14 19.61	2.467	17 0 19.03	158.30	17 36 20.7	221.8	71.74	16 22.5	60 0.5	II. N. S.
3	L	2 49.08	2.442	17 31 50.21	156.77	18 10 55.5	124.1	71.41	16 15.2	59 33.7	
3	U	15 18.17	2.404	18 2 58.35	154.47	−18 26 6.0	− 28.3	70.90	16 7.4	59 5.0	II. N.
4	L	3 46.73	2.355	18 33 34.91	151.52	18 22 30.4	+ 63 2	70.22	15 59.3	58 35.1	
4	U	16 14.65	2.297	19 3 32.87	148.07	18 1 13.8	118 3	69.41	15 51.0	58 4.9	II. N.
5	L	4 41.84	2.234	19 32 47.20	144.28	17 23 40.8	225.8	68.51	15 42.9	57 35.1	
5	U	17 8.26	2.169	20 1 14.94	140 33	−16 31 27.5	+295.0	67.55	15 35.0	57 6.2	II. N.
6	L	5 33.89	2.103	20 28 55.19	136 39	15 26 15.9	355.5	66.58	15 27.5	56 38.6	
6	U	17 58.74	2.040	20 55 48.87	132.58	14 9 47.8	407.7	65.62	15 20.5	56 12.7	II. N.
7	L	6 22.86	1.981	21 21 58.38	129.04	12 43 41.8	451.9	64.71	15 14.0	55 49.0	
7	U	18 46.31	1.928	21 47 27.29	125.84	−11 9 30.9	+488.6	63.86	15 8.1	55 27.4	II. N.
8	L	7 9.15	1.881	22 12 20.02	123.02	9 28 41.7	518.4	63.11	15 2.9	55 8.2	
8	U	19 31.48	1.841	22 36 41.54	120.63	7 42 33.9	541 9	62.46	14 58.3	54 51.4	II. N.
9	L	7 53.38	1.809	23 0 37.10	118.71	5 52 21.1	559.3	61.92	14 54.4	54 37.1	
9	U	20 14.93	1.785	23 24 12.37	117.24	− 3 59 12.6	+571.2	61.50	14 51.2	54 25.2	II. N.
10	L	8 36.24	1.768	23 47 32.64	116.22	2 4 13.1	577.8	61.19	14 48.6	54 15.7	
10	U	20 57.39	1.758	0 10 43.40	115.65	− 0 8 24.9	579.4	61.00	14 46.6	54 8.4	II. N.
11	L	9 18.47	1.756	0 33 49.95	115.51	+ 1 47 11.3	575.9	60.93	14 45.2	54 3.3	
11	U	21 39.56	1.761	0 56 57.35	115.79	+ 3 41 34.9	+567.3	60.97	14 44.3	54 0.2	II. N.
12	L	10 0.75	1.772	1 20 10.38	116.45	5 33 44.8	553.5	61.13	14 44.0	53 59.1	
12	U	22 22.11	1.789	1 43 33.50	117.47	7 22 38.9	534.5	61.38	14 44.2	53 59.7	II. N.
13	L	10 43.70	1.811	2 7 10.77	118.80	9 7 13.4	510.2	61.72	14 44.8	54 2.0	
13	U	23 5.58	1.838	2 31 5.76	120.41	+10 46 22.2	+480.3	62.13	14 45.9	54 5.9	
14	L	11 27.81	1.868	2 55 21.43	122.24	12 18 58.1	441.7	62.60	14 47.3	54 11.2	
14	U	23 50.43	1.901	3 20 0.12	124.23	13 43 52.4	403.3	63.12	14 49.1	54 17.8	
15	L	12 13.45	1.936	3 45 3.39	126.32	14 59 56.0	356.3	63.67	14 51.3	54 25.6	
16	U	0 36.89	1.971	4 10 31.90	128.43	+16 6 1.1	+303.7	64.22	14 53.7	54 34.7	
16	L	13 0.74	2.005	4 36 25.47	130.48	17 1 2.3	245.7	64.77	14 56.5	54 44.9	
17	U	1 24.99	2.037	5 2 42.96	132.40	17 43 58.8	182.9	65.28	14 59.6	54 56.3	I. N.
17	L	13 49.61	2.066	5 29 22.36	134.12	18 13 56.0	116.0	65.74	15 3.0	55 8.8	
18	U	2 14.55	2.090	5 56 20.91	135.59	+18 30 8.6	+ 45.6	66.14	15 6.7	55 22.1	I. N.

Apr. 30. U Defective Illumination of *S.* 0″.37. May 2, U Defective Illumination of *S.* 0″.00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 18	U	2 14.55	2.090	5 56 20.91	135.59	+18 30 8.6	+ 45.6	66.14	15 6.7	55 22.4	I. N.
18	L	14 39.75	2.109	6 23 35.26	136.75	18 32 0.5	− 27.3	66.47	15 10.7	55 37.1	
19	U	3 5.15	2.123	6 51 1.73	137.60	18 19 8.4	101.6	66.72	15 15.1	55 53.0	I. N.
19	L	15 30.69	2.132	7 18 36.63	138.16	17 51 21.9	176.1	66.89	15 19.7	56 10.0	
20	U	3 56.31	2.137	7 46 16.48	138.44	+17 8 43.8	−249.9	66.99	15 24.6	56 28.1	I. N.
20	L	16 21.97	2.138	8 13 58.40	138.52	16 11 30.3	321.8	67.04	15 29.9	56 47.3	
21	U	4 47.63	2.137	8 41 40.29	138.45	15 0 10.9	390.8	67.04	15 35.4	57 7.5	I. N.
21	L	17 13.26	2.135	9 9 20.99	138.33	13 35 27.5	455.6	67.03	15 41.1	57 28.6	
22	U	5 38.88	2.134	9 37 0.42	138.25	+11 58 13.8	−515.7	67.03	15 47.1	57 50.5	I. N.
22	L	18 4.49	2.135	10 4 39.56	138.30	10 9 35.2	569.7	67.04	15 53.2	58 12.8	
23	U	6 30.13	2.139	10 32 20.44	138.55	8 10 47.8	616.9	67.10	15 59.3	58 35.4	I. N.
23	L	18 55.85	2.148	11 0 5.95	139.09	6 3 19.8	656.3	67.22	16 5.4	58 57.8	
24	U	7 21.70	2.162	11 27 59.78	139.95	+ 3 48 50.2	−686.9	67.42	16 11.4	59 19.6	I. N.
24	L	19 47.76	2.183	11 56 6.10	141.17	+ 1 29 11.1	707.7	67.71	16 17.0	59 40.2	
25	U	8 14.11	2.209	12 24 29.41	142.77	− 0 53 33.1	717.6	68.08	16 22.2	59 59.2	I. N.
25	L	20 40.81	2.242	12 53 14.10	144.73	3 17 5.5	715.6	68.53	16 26.7	60 15.9	
26	U	9 7.93	2.280	13 22 24.22	147.01	− 5 38 56.2	−700.6	69.06	16 30.5	60 29.8	I. N.
26	L	21 35.53	2.321	13 52 2.93	149.49	7 56 26.0	672.0	69.64	16 33.4	60 40.3	
27	U	10 3.64	2.364	14 22 12.12	152.06	10 6 48.7	629.4	70.24	16 35.2	60 46.9	I. N.
27	L	22 32.25	2.405	14 52 51.96	154.56	12 7 16.4	573.0	70.81	16 35.8	60 49.2	
28	U	11 1.34	2.442	15 24 0.41	156.79	−13 55 7.5	−503.4	71.33	16 35.2	60 47.0	I. N.
28	L	23 30.83	2.472	15 55 33.07	158.55	15 27 53.4	422.4	71.73	16 33.3	60 40.2	
29	U	12 0.61	2.490	16 27 23.02	159.65	16 43 28.8	332.1	71.98	16 30.2	60 28.9	*I.* II. N.
30	L	0 30.53	2.494	16 59 21.20	159.90	17 40 19.3	235.4	72.05	16 26.0	60 13.4	
30	U	13 0.41	2.483	17 31 17.05	159.21	−18 17 27.3	−135.7	71.91	16 20.8	59 54.2	II. N.
31	L	1 30.06	2.456	18 2 59.26	157.63	18 34 35.7	− 36.1	71.55	16 14.7	59 31.8	
31	U	13 59.30	2.415	18 34 16.86	155.16	18 32 5.7	+ 60.2	70.99	16 7.9	59 6.9	II. N.
June 1	L	2 27.97	2.362	19 5 0.15	151.95	18 10 53.6	150.6	70.25	16 0.6	58 40.1	
1	U	14 55.95	2.299	19 35 1.51	148.20	−17 32 22.6	+233.1	69.37	15 53.0	58 12.2	II. N.
2	L	3 23.14	2.231	20 4 15.62	144.12	16 38 14.8	306.6	68.40	15 45.3	57 43.8	
2	U	15 49.49	2.161	20 32 39.71	139.89	15 30 22.7	370.5	67.38	15 37.6	57 15.7	II. N.
3	L	4 15.01	2.092	21 0 13.35	135.73	14 10 41.6	424.8	66.37	15 30.2	56 48.4	
3	U	16 39.72	2.026	21 26 58.14	131.77	−12 41 4.5	+469.9	65.39	15 23.1	56 22.4	II. N.
4	L	5 3.67	1.966	21 52 57.25	128.14	11 3 17.9	506.5	64.46	15 16.4	55 58.0	
4	U	17 26.93	1.912	22 18 15.04	124.90	9 18 59.7	535.2	63.63	15 10.3	55 35.6	II. N.
5	L	5 49.59	1.866	22 42 56.72	122.12	7 29 39.6	556.9	62.91	15 4.9	55 15.5	
5	U	18 11.75	1.828	23 7 7.99	119.84	− 5 36 38.1	+572.2	62.30	15 0.1	54 57.9	II. N.
6	L	6 33.50	1.798	23 30 54.85	118.06	3 41 8.3	581.8	61.82	14 56.0	54 42.9	
6	U	18 54.94	1.777	23 54 23.40	116.78	− 1 44 16.8	585.9	61.46	14 52.6	54 30.4	II. N.
7	L	7 16.18	1.764	0 17 39.73	116.02	+ 0 12 54.1	585.0	61.23	14 49.9	54 20.6	
7	U	19 37.32	1.760	0 40 49.80	115.74	+ 2 9 25.1	+579.3	61.14	14 48.0	54 13.5	II. N.
8	L	7 58.45	1.763	1 3 59.39	115.94	4 4 19.0	568.8	61.17	14 46.7	54 8.9	
8	U	20 19.67	1.774	1 27 14.01	116.57	5 56 37.7	553.5	61.32	14 46.1	54 6.8	II. N.
9	L	8 41.05	1.791	1 50 38.85	117.62	7 45 23.0	533.1	61.58	14 46.2	54 7.0	
9	U	21 2.68	1.815	2 14 18.60	119.06	+ 9 29 34.1	+507.7	61.93	14 46.9	54 9.4	II. N.

May 29, U Defective Illumination of *I.* 0ʰ.00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
June 9	U	21 2.68	1.815	2 14 18.60	119.06	+ 9 29 34.1	+507.7	61.93	14 46.9	54 9.4	II. N.
10	L	9 24.64	1.844	2 38 17.52	120.81	11 8 7.5	476.9	62.37	14 48.1	54 13.9	
10	U	21 46.97	1.878	3 2 39.25	122.83	12 39 57.0	440.4	62.87	14 49.8	54 20.2	II. N.
11	L	10 9.72	1.915	3 27 26.58	125.07	14 3 54.3	398.1	63.43	14 52.0	54 28.2	
11	U	22 32.93	1.954	3 52 41.48	127.43	+15 18 48.5	+350.0	64.02	14 54.6	54 37.8	II. N.
12	L	10 56.62	1.994	4 18 24.86	129.80	16 23 28.6	295.9	64.62	14 57.5	54 48.6	
12	U	23 20.78	2.032	4 44 36.51	132.12	17 16 45.3	236.1	65.20	15 0.8	55 0.6	
13	L	11 45.38	2.068	5 11 15.04	134.27	17 57 32.8	171.0	65.74	15 4.3	55 13.5	
14	U	0 10.39	2.099	5 38 17.92	136.16	+18 24 52.4	+101.5	66.22	15 8.1	55 27.2	
14	L	12 35.74	2.125	6 5 41.57	137.71	18 37 55.1	+ 28.4	66.62	15 12.0	55 41.5	
15	U	1 1.37	2.145	6 33 21.59	138.89	18 36 4.1	− 47.2	66.92	15 16.0	55 56.4	I. N.
15	L	13 27.19	2.157	7 1 13.09	139.63	18 18 57.4	123.9	67.13	15 20.2	56 11.6	
16	U	1 53.11	2.163	7 29 11.10	139.97	+17 46 29.3	−200.5	67.23	15 24.4	56 27.1	I. N.
16	L	14 19.06	2.162	7 57 10.88	139.94	16 58 51.2	275.4	67.25	15 28.7	56 42.8	
17	U	2 44.98	2.157	8 25 8.39	139.61	15 56 31.0	347.3	67.20	15 33.0	56 58.7	I. N.
17	L	15 10.81	2.118	8 53 0.55	139.06	14 40 12.2	415.0	67.09	15 37.3	57 14.7	
18	U	3 36.51	2.137	9 20 45.46	138.11	+13 10 51.9	−477.4	66.96	15 41.7	57 30.7	I. N.
18	L	16 2.09	2.126	9 48 22.55	137.78	11 29 39.8	533.5	66.83	15 46.1	57 46.7	
19	U	4 27.55	2.117	10 15 52.55	137.25	9 37 55.2	582.6	66.72	15 50.4	58 2.7	I. N.
19	L	16 52.92	2.112	10 43 17.38	136.93	7 37 6.8	624.1	66.65	15 54.7	58 18.4	
20	U	5 18.26	2.112	11 10 40.09	136.91	+ 5 28 50.7	−657.1	66.66	15 58.9	58 33.9	I. N.
20	L	17 43.63	2.117	11 38 4.56	137.24	3 14 49.9	681.4	66.76	16 3.0	58 49.0	
21	U	6 9.10	2.129	12 5 35.42	137.97	+ 0 56 54.7	696.2	66.95	16 7.0	59 3.4	I. N.
21	L	18 34.76	2.149	12 33 17.60	139.13	− 1 22 58.0	700.9	67.23	16 10.6	59 16.9	
22	U	7 0.70	2.175	13 1 16.22	140.71	− 3 42 43.6	−694.9	67.60	16 13.9	59 29.1	I. N.
22	L	19 26.99	2.207	13 29 36.15	142.67	6 0 10.7	677.6	68.08	16 16.9	59 39.9	
23	U	7 53.70	2.245	13 58 21.66	144.96	8 13 0.6	648.6	68.63	16 19.4	59 48.9	I. N.
23	L	20 20.89	2.287	14 27 35.99	147.45	10 18 50.2	607.5	69.21	16 21.2	59 55.6	
24	U	8 48.59	2.330	14 57 20.97	150.03	−12 15 13.8	−551.3	69.81	16 22.3	59 59.8	I. N.
24	L	21 16.80	2.371	15 27 36.48	152.52	13 59 47.7	489.4	70.38	16 22.7	60 1.1	
25	U	9 45.48	2.408	15 58 20.22	154.71	15 30 16.2	413.7	70.87	16 22.2	59 59.3	I. N.
25	L	22 14.55	2.436	16 29 27.41	156.39	16 44 38.4	328.7	71.25	16 20.8	59 54.2	
26	U	10 43.89	2.452	17 0 50.94	157.40	−17 41 16.2	−236.6	71.46	16 18.5	59 45.9	I. N.
26	L	23 13.35	2.455	17 32 21.71	157.58	18 19 0.0	140.1	71.49	16 15.4	59 34.3	
27	U	11 42.76	2.443	18 3 49.18	156.85	18 37 15.0	− 42.3	71.31	16 11.4	59 19.6	I. N.
28	L	0 11.93	2.416	18 35 2.44	155.22	18 36 2.9	+ 53.9	70.92	16 6.6	59 2.1	
28	U	12 40.69	2.375	19 5 51.04	152.75	−18 16 0.3	+145.6	70.34	16 1.2	58 42.3	II. N.
29	L	1 8.89	2.323	19 36 5.93	149.62	17 38 15.0	230.6	69.60	15 55.3	58 20.5	
29	U	13 36.41	2.263	20 5 40.09	146.00	16 44 18.8	307.2	68.74	15 49.0	57 57.3	II. N.
30	L	2 3.18	2.198	20 34 28.80	142.09	15 35 59.6	374.3	67.80	15 42.4	57 33.2	
30	U	14 29.15	2.131	21 2 29.80	138.08	−14 15 14.1	+431.6	66.83	15 35.7	57 8.8	II. N.
July 1	L	2 54.33	2.066	21 29 43.04	134.15	12 44 0.4	479.1	65.87	15 29.1	56 44.5	
1	U	15 18.75	2.004	21 56 10.32	130.44	11 4 13.3	517.3	64.95	15 22.7	56 21.0	II. N.
2	L	3 42.46	1.948	22 21 54.94	127.05	9 17 40.9	546.8	64.10	15 16.6	55 58.5	
2	U	16 5.53	1.898	22 47 1.33	124.07	− 7 26 2.2	+568.5	63.35	15 10.9	55 37.6	II. N.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	U	16 5.53	1.898	22 47 1.33	121.07	− 7 26 2.2	+568.5	63.35	15 10.9	55 37.6	II. N.
3	L	4 28.05	1.856	23 11 34.70	121.55	5 30 47.0	583.6	62.71	15 5.7	55 18.6	
3	U	16 50.12	1.823	23 35 40.72	119.53	3 33 16.2	591.2	62.19	15 1.1	55 1.6	II. N.
4	L	5 11.84	1.798	23 59 25.36	118.00	− 1 34 42.6	593.6	61.79	14 57.1	54 47.0	
4	U	17 33.30	1.781	0 22 54.73	116.98	+ 0 23 47.4	+590.6	61.52	14 53.8	54 35.0	II. N.
5	L	5 54.60	1.772	0 46 14.90	116.16	2 21 12.6	582.8	61.39	14 51.3	54 25.6	
5	U	18 15.85	1.772	1 9 31.88	116.11	4 16 35.1	570.1	61.38	14 49.4	54 18.9	II. N.
6	L	6 37.15	1.779	1 32 51.45	116.90	6 8 58.4	552.8	61.50	14 48.3	54 14.9	
6	U	18 58.58	1.794	1 56 19.22	117.81	+ 7 57 26.5	+530.9	61.73	14 48.0	54 13.6	II. N.
7	L	7 20.24	1.816	2 20 0.39	119.13	9 41 2.0	504.1	62.07	14 48.4	54 15.0	
7	U	19 42.20	1.841	2 43 59.74	120.83	11 18 45.7	472.2	62.50	14 49.4	54 18.9	II. N.
8	L	8 4.53	1.878	3 8 21.54	122.85	12 49 35.1	435.1	63.01	14 51.2	54 25.3	
8	U	20 27.29	1.916	3 33 9.33	125.15	+14 12 25.2	+392.1	63.58	14 53.6	54 34.0	II. N.
9	L	8 50.53	1.957	3 58 25.77	127.62	15 26 7.7	343.8	64.19	14 56.5	54 44.8	
9	U	21 14.27	2.000	4 24 12.55	130.18	16 29 32.7	289.1	64.83	14 59.9	54 57.4	II. N.
10	L	9 38.53	2.043	4 50 30.23	132.75	17 21 29.9	229.2	65.46	15 3.8	55 11.7	
10	U	22 3.29	2.083	5 17 18.01	135.19	+18 0 51.6	+163.5	66.05	15 8.1	55 27.3	II. N.
11	L	10 28.51	2.120	5 44 33.86	137.40	18 26 34.6	92.9	66.58	15 12.6	55 43.9	
11	U	22 54.15	2.152	6 12 14.43	139.30	18 37 41.3	+ 18.1	67.03	15 17.3	56 1.3	II. N.
12	L	11 20.12	2.176	6 40 15.33	140.79	18 33 38.6	− 59.4	67.39	15 22.2	56 19.1	
12	U	23 46.34	2.193	7 8 31.36	141.81	+18 13 50.1	−138.7	67.64	15 27.1	56 37.0	
13	L	12 12.72	2.202	7 36 56.90	142.36	17 38 9.6	217.9	67.77	15 31.9	56 54.8	
14	U	0 39.17	2.201	8 5 26.37	142.47	16 46 47.9	295.3	67.80	15 36.6	57 12.2	
14	L	13 5.60	2.200	8 33 54.75	142.20	15 40 15.6	369.3	67.74	15 41.2	57 28.9	
15	U	1 31.94	2.190	9 2 17.80	141.61	+14 19 22.5	−438.5	67.61	15 45.5	57 44.7	I. N.
15	L	13 58.15	2.177	9 30 32.54	140.83	12 45 16.4	501.3	67.44	15 49.5	57 59.5	
16	U	2 24.18	2.163	9 58 37.32	139.97	10 59 19.7	556.7	67.26	15 53.3	58 13.2	I. N.
16	L	14 50.05	2.149	10 26 31.92	139.15	9 3 7.6	603.7	67.08	15 56.7	58 25.7	
17	U	3 15.77	2.138	10 54 17.40	138.47	+ 6 58 25.0	−641.7	66.94	15 59.8	58 36.9	I. N.
17	L	15 41.37	2.130	11 21 56.09	138.03	4 47 3.6	670.2	66.86	16 2.5	58 46.9	
18	U	4 6.92	2.128	11 49 31.28	137.89	2 31 0.4	688.6	66.85	16 4.8	58 55.6	I. N.
18	L	16 32.47	2.132	12 17 7.01	138.13	+ 0 12 16.4	696.9	66.93	16 6.8	59 3.0	
19	U	4 58.11	2.142	12 44 47.83	138.75	− 2 7 5.0	−691.9	67.10	16 8.5	59 9.1	I. N.
19	L	17 23.91	2.159	13 12 38.43	139.76	4 24 57.9	682.2	67.36	16 9.8	59 14.0	
20	U	5 49.95	2.182	13 40 43.46	141.13	6 39 15.0	658.9	67.71	16 10.8	59 17.7	I. N.
20	L	18 16.30	2.210	14 9 7.07	142.84	8 47 48.3	624.9	68.14	16 11.5	59 20.0	
21	U	6 43.02	2.243	14 37 52.58	144.78	−10 48 29.6	−580.2	68.61	16 11.8	59 21.0	I. N.
21	L	19 10.13	2.277	15 7 2.17	146.83	12 39 12.7	525.2	69.09	16 11.6	59 20.5	
22	U	7 37.65	2.311	15 36 36.46	148.87	14 17 56.2	460.3	69.56	16 11.0	59 18.4	I. N.
22	L	20 5.57	2.341	16 6 34.29	150.73	15 42 46.6	386.6	69.99	16 10.0	59 14.7	
23	U	8 33.82	2.366	16 36 52.48	152.23	−16 52 3.8	−305.1	70.33	16 8.6	59 9.3	I. N.
23	L	21 2.33	2.383	17 7 25.85	153.23	17 44 25.3	217.6	70.54	16 6.6	59 2.0	
24	U	9 30.97	2.389	17 38 7.43	153.59	18 18 51.3	126.3	70.59	16 4.1	58 52.8	I. N.
24	L	21 59.62	2.383	18 8 48.95	153.21	18 34 49.4	− 33.4	70.47	16 1.1	58 41.8	
25	U	10 28.11	2.364	18 39 21.41	152.07	−18 32 16.1	+ 58.5	70.18	15 57.6	58 29.0	I. N.S.

July 25, U. Defective Illumination of *S.* 0″.42.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July25	U	10 28.11	2.364	18 39 21.41	152.07	−18 32 16.1	+ 58.5	70.18	15 57.6	58 29.0	I. N.S.
25	L	22 56.30	2.333	19 9 35.92	150.22	18 11 37.9	147.0	69.71	15 53.6	58 14.4	
26	U	11 24.06	2.292	19 39 24.36	147.76	17 33 48.5	230.1	69.10	15 49.2	57 58.2	I. N.S.
26	L	23 51.28	2.243	20 8 39.95	141.78	16 40 4.6	305.9	68.36	15 44.4	57 40.7	
27	U	12 17.86	2.188	20 37 17.77	141.48	−15 32 0.6	+373.3	67.55	15 39.4	57 22.1	I. II. N.
28	L	0 43.77	2.130	21 5 14.78	138.01	14 11 22.5	431.6	66.70	15 34.1	57 2.8	
28	U	13 8.98	2.072	21 32 29.92	131.52	12 40 1.6	480.4	65.83	15 28.7	56 43.0	II. N.
29	L	1 33.51	2.016	21 59 3.81	131.16	10 59 50.1	520.0	64.99	15 23.3	56 23.2	
29	U	13 57.39	1.964	22 24 58.56	128.02	− 9 12 36.6	+550.8	64.20	15 18.0	56 3.7	II. N.
30	L	2 20.67	1.917	22 50 17.45	125.20	7 20 3.9	573.3	63.49	15 12.9	55 45.0	
30	U	14 43.42	1.876	23 15 4.63	122.74	5 23 47.4	588.2	62.88	15 8.1	55 27.2	II. N.
31	L	3 5.72	1.842	23 39 24.85	120.71	3 25 14.3	596.2	62.37	15 3.6	55 10.8	
31	U	15 27.67	1.816	0 3 23.31	119.12	− 1 25 43.8	+597.8	61.98	14 59.6	54 56.1	II. N.
Aug. 1	L	3 49.34	1.797	0 27 5.43	117.98	+ 0 33 31.6	593.7	61.70	14 56.1	54 43.3	
1	U	16 10.83	1.786	0 50 36.74	117.31	2 31 25.5	584.3	61.55	14 53.2	54 32.7	II. N.
2	L	4 32.23	1.782	1 14 2.81	117.11	4 26 56.4	569.9	61.51	14 50.9	54 24.4	
2	U	16 53.64	1.787	1 37 29.13	117.35	+ 6 19 6.0	+550.8	61.60	14 49.1	54 18.7	II. N.
3	L	5 15.14	1.798	2 1 0.99	118.03	8 6 57.7	527.0	61.80	14 48.6	54 15.6	
3	U	17 36.82	1.816	2 24 43.54	119.13	9 49 35.5	498.5	62.10	14 48.5	54 15.2	II. N.
4	L	5 58.76	1.841	2 48 41.58	120.60	11 26 3.2	465.3	62.50	14 49.1	54 17.6	
4	U	18 21.02	1.871	3 12 59.46	122.13	+12 55 22.2	+427.0	62.98	14 50.5	54 22.7	II. N.
5	L	6 43.68	1.906	3 37 41.02	121.54	14 16 32.7	383.8	63.52	14 52.6	54 30.5	
5	U	19 6.79	1.945	4 2 49.43	126.89	15 28 31.6	335.1	64.12	14 55.4	54 40.9	II. N.
6	L	7 30.38	1.987	4 28 27.02	129.39	16 30 14.6	281.0	64.75	14 58.9	54 53.8	
6	U	19 54.48	2.030	4 54 35.11	131.96	+17 20 36.1	+221.6	65.39	15 3.1	55 9.0	II. N.
7	L	8 19.09	2.072	5 21 13.95	134.50	17 58 30.8	156.7	66.00	15 7.8	55 26.3	
7	U	20 44.19	2.112	5 48 22.56	136.91	18 22 56.5	86.8	66.58	15 13.0	55 45.4	II. N.
8	L	9 9.75	2.148	6 15 58.75	139.08	18 32 57.6	+ 12.6	67.09	15 18.6	56 5.9	
8	U	21 35.71	2.179	6 43 59.18	140.94	+18 27 46.8	− 65.0	67.52	15 24.5	56 27.5	II. N.
9	L	10 2.01	2.203	7 12 19.57	142.40	18 6 50.6	141.8	67.86	15 30.6	56 49.8	
9	U	22 28.56	2.220	7 40 55.02	143.44	17 29 51.4	225.1	68.09	15 36.7	57 12.2	II. N.
10	L	10 55.27	2.230	8 9 40.31	144.05	16 36 51.2	301.5	68.21	15 42.7	57 34.4	
10	U	23 22.06	2.234	8 38 30.35	144.24	+15 28 13.1	−381.2	68.24	15 48.5	57 55.8	
11	L	11 48.85	2.231	9 7 20.67	144.09	14 4 41.7	453.2	68.20	15 54.1	58 16.1	
12	U	0 15.59	2.224	9 36 7.60	143.69	12 27 23.1	518.7	68.10	15 59.2	58 34.8	
12	L	12 42.23	2.215	10 4 48.66	143.13	10 37 43.3	576.4	67.97	16 3.7	58 51.4	
13	U	1 8.75	2.205	10 33 22.59	142.52	+ 8 37 25.0	−621.9	67.83	16 7.6	59 5.8	I. N.
13	L	13 35.15	2.196	11 1 49.33	141.95	6 28 25.2	663.2	67.71	16 10.8	59 17.7	
14	U	2 1.46	2.189	11 30 10.08	141.53	4 12 51.9	690.5	67.63	16 13.4	59 27.0	I. N.
14	L	14 27.69	2.185	11 58 26.95	141.32	+ 1 52 59.8	706.2	67.60	16 15.2	59 33.6	
15	U	2 53.92	2.186	12 26 42.81	141.37	− 0 28 51.8	−710.3	67.64	16 16.2	59 37.5	I. N.
15	L	15 20.18	2.192	12 55 1.03	141.71	2 50 21.4	702.7	67.75	16 16.6	59 39.0	
16	U	3 46.53	2.202	13 23 25.14	142.36	5 9 9.6	683.4	67.94	16 16.4	59 38.1	I. N.
16	L	16 13.05	2.217	13 51 58.61	143.27	7 22 59.2	652.9	68.19	16 15.6	59 35.1	
17	U	4 39.77	2.236	14 20 44.41	144.40	− 9 29 36.9	−611.6	68.50	16 14.3	59 30.2	I. N.

July 25, U Defective Illumination of *S.* 0″.42.
July 26, U Defective Illumination of *S.* 0″.18.
July 27, U Defective Illumination of *I.* 0″.06.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 17	U	4 39.77	2.236	14 20 44.41	144.40	− 9 29 36.9	−611.6	68.50	16 14.3	59 30.2	I. N.
17	L	17 6.73	2.258	14 49 44.81	145.68	11 26 57.1	560.1	68.83	16 12.5	59 23.6	
18	U	5 33.95	2.280	15 19 1.03	147.02	13 13 1.8	499.2	69.16	16 10.3	59 15.6	I. N.
18	L	18 1.44	2.301	15 48 33.05	148.29	14 46 4.1	429.9	69.47	16 7.8	59 6.4	
19	U	6 29.16	2.319	16 18 19.31	149.37	−16 4 30.1	−353.4	69.73	16 5.0	58 56.1	I. N.
19	L	18 57.07	2.332	16 48 16.80	150.11	17 7 1.8	271.1	69.90	16 2.0	58 45.0	
20	U	7 25.10	2.338	17 18 21.02	150.49	17 52 40.4	184.8	69.96	15 58.7	58 33.0	I. N.
20	L	19 53.14	2.335	17 48 26.31	150.31	18 20 48.2	96.3	69.89	15 55.2	58 20.4	
21	U	8 21.09	2.322	18 18 26.16	149.57	−18 31 10.3	− 7.5	69.68	15 51.6	58 7.2	I. N.*S.*
21	L	20 48.83	2.300	18 48 13.72	148.26	18 23 55.9	+ 79.5	69.33	15 47.8	57 53.3	
22	U	9 16.26	2.270	19 17 42.32	146.43	17 59 37.1	162.9	68.85	15 43.9	57 39.0	I. *N.*S.
22	L	21 43.28	2.232	19 46 46.06	144.14	17 19 6.7	241.1	68.26	15 39.9	57 24.2	
23	U	10 9.80	2.188	20 15 20.07	141.49	−16 23 35.8	+312.8	67.58	15 35.7	57 8.9	I. S.
23	L	22 35.77	2.140	20 43 20.83	138.61	15 14 28.5	377.0	66.84	15 31.5	56 53.3	
24	U	11 1.16	2.090	21 10 46.27	135.62	13 53 19.3	433.1	66.07	15 27.2	56 37.5	I. S.
24	L	23 25.94	2.041	21 37 35.79	132.64	12 21 48.0	480.6	65.31	15 22.9	56 21.6	
25	U	11 50.14	1.993	22 3 50.09	129.77	−10 41 36.8	+519.7	64.57	15 18.5	56 5.6	I. *N.*S.
26	L	0 13.79	1.948	22 29 30.98	127.09	8 54 26.5	550.5	63.87	15 14.2	55 49.8	
26	U	12 36.92	1.908	22 54 41.20	124.67	7 1 55.2	573.3	63.24	15 10.0	55 34.5	II. N.*S.*
27	L	0 59.61	1.873	23 19 24.22	122.57	5 5 36.3	588.5	62.70	15 6.0	55 19.7	
27	U	13 21.91	1.844	23 43 44.02	120.80	− 3 6 57.4	+596.8	62.26	15 2.2	55 5.7	II. N.
28	L	1 43.89	1.821	0 7 44.92	119.41	− 1 7 20.6	598.3	61.91	14 58.7	54 52.8	
28	U	14 5.63	1.804	0 31 31.51	118.42	+ 0 51 58.0	593 8	61.67	14 55.5	54 41.2	II. N.
29	L	2 27.22	1.794	0 55 8.49	117.81	2 49 47.9	583.5	61.54	14 52.7	54 31.0	
29	U	14 48.73	1.791	1 18 40.58	117.60	+ 4 45 2.3	+568.0	61.51	14 50.4	54 22.6	II. N.
30	L	3 10.23	1.794	1 42 12.47	117.77	6 36 39.1	547.4	61.59	14 48.7	54 16.2	
30	U	15 31.80	1.803	2 5 48.75	118.33	8 23 38.4	521.8	61.77	14 47.5	54 11.9	II. N.
31	L	3 53.52	1.818	2 29 33.80	119.23	10 5 2.8	491.5	62.05	14 47.0	54 9.9	
31	U	16 15.46	1.839	2 53 31.79	120.48	+11 39 55.5	+456.5	62.41	14 47.1	54 10.4	II. N.
Sept. 1	L	4 37.67	1.864	3 17 46.56	122.03	13 7 20.2	416.8	62.84	14 47.9	54 13.4	
1	U	17 0.22	1.894	3 42 21.51	123.84	14 26 20.2	372.3	63.34	14 49.5	54 19.1	II. N.
2	L	5 23.15	1.928	4 7 19.54	125.87	15 35 57.9	323.1	63.88	14 51.8	54 27.5	
2	U	17 46.51	1.965	4 32 42.89	128.05	+16 35 15.7	+269.0	64.46	14 54.8	54 38.7	II. N.
3	L	6 10.31	2.003	4 58 33.10	130.33	17 23 15.3	210.1	65.05	14 58.6	54 52.6	
3	U	18 34.57	2.041	5 24 50.85	132.63	17 58 59.5	146.5	65.63	15 3.1	55 9.0	II. N.
4	L	6 59.28	2.078	5 51 35.98	134.87	18 21 33.1	78.4	66.18	15 8.2	55 27.9	
4	U	19 24.43	2.113	6 18 47.35	136.99	+18 30 5.5	+ 6.3	66.70	15 14.0	55 49.1	II. N.
5	L	7 49.98	2.145	6 46 22.97	138.91	18 23 52.8	− 69.0	67.16	15 20.3	56 12.3	
5	U	20 15.89	2.173	7 14 20.08	140.57	18 2 20.4	146.7	67.54	15 27.1	56 37.1	II. S.
6	L	8 42.10	2.195	7 42 35.38	141.93	17 25 6.6	225.6	67.84	15 34.2	57 3.2	
6	U	21 8.55	2.213	8 11 5.18	142.98	+16 32 5.0	−304.4	68.07	15 41.5	57 29.9	II. S.
7	L	9 35.19	2.225	8 39 45.84	143.74	15 23 27.5	381.4	68.22	15 48.8	57 56.8	
7	U	22 1.95	2.233	9 8 33.92	144.23	13 59 45.5	454.9	68.31	15 56.0	58 23.3	II. S.
8	L	10 28.78	2.238	9 37 26.52	144.51	12 21 52.1	523.0	68.36	16 3.0	58 48.7	
8	U	22 55.65	2.240	10 6 21.53	144.64	+10 31 1.9	−584.0	68.37	16 9.4	59 12.4	II. S.

Aug. 21, U Defective Illumination of *S.* 0″.08.
Aug. 22, U Defective Illumination of *N.* 0″.68.
Aug. 25, U Defective Illumination of *N.* 0″.02.
Aug. 26, U Defective Illumination of *S.* 0″.92.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Sept. 8	U	22 55.65	2.210	10 6 21.53	141.64	+10 31 1.9	−584.0	68.37	16 9.4	59 12.4	II. S.
9	L	11 22.54	2.241	10 35 17.68	141.71	8 28 50.4	636.3	68.37	16 15.2	59 33.7	
9	U	23 49.44	2.213	11 4 14.64	144.79	6 17 12.8	678.2	68.38	16 20.2	59 52.2	
10	L	12 16.37	2.215	11 33 12.96	144.94	3 58 20.6	708.5	68.42	16 24.3	60 7.2	
11	U	0 43.34	2.250	12 2 13.90	145.23	+ 1 34 39.4	−726.2	68.51	16 27.4	60 18.4	
11	L	13 10.39	2.258	12 31 19.25	145.69	− 0 51 15.3	730.6	68.64	16 29.4	60 25.6	
12	U	1 37.54	2.268	13 0 31.12	146.32	3 16 42.3	721.5	68.81	16 30.2	60 28.8	I. N.
12	L	14 4.83	2.281	13 29 51.62	147.12	5 38 59.1	699.0	69.03	16 30.0	60 28.0	
13	U	2 32.30	2.297	13 59 22.52	148.04	− 7 55 26.1	−663.4	69.28	16 28.7	60 23.3	I. N.
13	L	14 59.96	2.314	14 29 5.04	149.04	10 3 31.4	615.5	69.56	16 26.5	60 15.2	
14	U	3 27.82	2.330	14 58 59.47	150.02	12 0 54.1	556.5	69.83	16 23.5	60 4.1	I. N.
14	L	15 55.87	2.344	15 29 5.02	150.88	13 45 28.5	487.8	70.06	16 19.7	59 50.3	
15	U	4 24.06	2.355	15 59 19.63	151.51	−15 15 27.6	−411.0	70.24	16 15.4	59 34.5	I. N.
15	L	16 52.35	2.360	16 29 40.02	151.82	16 29 24.8	327.8	70.33	16 10.7	59 17.1	
16	U	5 20.67	2.358	17 0 1.69	151.72	17 26 17.5	240.4	70.31	16 5.6	58 58.6	I. N.
16	L	17 48.91	2.348	17 30 19.26	151.13	18 5 26.8	150.9	70.18	16 0.4	58 39.4	
17	U	6 16.99	2.330	18 0 26.75	150.03	−18 26 38.7	− 61.3	69.92	15 55.1	58 19.9	I. N.*S.*
17	L	18 44.80	2.301	18 30 18.15	148.44	18 30 2.7	+ 26.7	69.53	15 49.8	58 0.3	
18	U	7 12.24	2.270	18 59 47.69	146.40	18 16 10.0	111.4	69.01	15 44.5	57 41.0	I. S.
18	L	19 39.24	2.230	19 28 50.39	143.99	17 45 50.8	191.0	68.39	15 39.4	57 22.1	
19	U	8 5.73	2.185	19 57 22.32	141.30	−17 0 10.5	+264.6	67.70	15 34.4	57 3.8	I. S.
19	L	20 31.66	2.137	20 25 20.76	138.12	16 0 26.4	331.5	66.95	15 29.6	56 46.1	
20	U	8 57.01	2.088	20 52 44.27	135.49	14 48 3.9	390.9	66.17	15 24.9	56 29.0	I. S.
20	L	21 21.78	2.040	21 19 32.68	132.59	13 24 33.8	442.7	65.40	15 20.4	56 12.7	
21	U	9 45.98	1.991	21 45 46.93	129.81	−11 51 28.9	+486.8	64.66	15 16.2	55 57.1	I. S.
21	L	22 9.65	1.951	22 11 28.93	127.23	10 10 22.1	523.0	63.97	15 12.2	55 42.3	
22	U	10 32.82	1.912	22 36 41.35	124.89	8 22 45.1	551.8	63.34	15 8.4	55 28.3	I. S.
22	L	22 55.55	1.878	23 1 27.48	122.84	6 30 7.1	573.3	62.78	15 4.7	55 15.0	
23	U	11 17.91	1.849	23 25 50.96	121.12	− 4 33 54.2	+587.8	62.31	15 1.3	55 2.5	I. S.
23	L	23 39.96	1.826	23 49 55.80	119.74	2 35 28.6	595.5	61.94	14 58.2	54 50.9	
24	U	12 1.77	1.809	0 13 46.12	118.71	− 0 36 9.5	596.7	61.66	14 55.3	54 40.3	*I.* II. *N.*S.
25	L	0 23.41	1.798	0 37 26.14	118.02	+ 1 22 48.3	591.9	61.48	14 52.7	54 30.7	
25	U	12 44.94	1.792	1 1 0.01	117.68	+ 3 20 12.7	+581.2	61.40	14 50.4	54 22.2	II. N.*S.*
26	L	1 6.44	1.792	1 24 31.86	117.68	5 14 55.1	565.0	61.42	14 48.4	54 15.0	
26	U	13 27.97	1.798	1 48 5.67	118.01	7 5 49.6	543.3	61.53	14 46.8	54 9.2	II. N.
27	L	1 49.60	1.808	2 11 45.22	118.64	8 51 52.7	516.4	61.73	14 45.7	54 5.0	
27	U	14 11.38	1.823	2 35 34.03	119.55	+10 32 3.2	+484.5	62.00	14 45.0	54 2.5	II. N.
28	L	2 33.37	1.842	2 59 35.32	120.71	12 5 21.8	447.7	62.34	14 44.8	54 1.9	
28	U	14 55.62	1.865	3 23 51.97	122.09	13 30 50.1	406.1	62.75	14 45.2	54 3.3	II. N.
29	L	3 18.16	1.892	3 48 26.40	123.67	14 47 31.8	360.0	63.20	14 46.2	54 6.9	
29	U	15 41.03	1.920	4 13 20.61	125.38	+15 54 31.3	+309.2	63.68	14 47.8	54 12.8	II. N.
30	L	4 4.25	1.950	4 38 35.97	127.19	16 50 55.3	254.0	64.18	14 50.0	54 21.1	
30	U	16 27.84	1.981	5 4 13.32	129.04	17 35 52.4	194.7	64.69	14 53.0	54 32.0	II. N.
Oct. 1	L	4 51.79	2.012	5 30 12.91	130.89	18 8 33.4	131.5	65.19	14 56.7	54 45.4	
1	U	17 16.11	2.041	5 56 34.33	132.67	+18 28 13.1	+ 64.6	65.66	15 1.0	55 1.4	II. *N.*S.

Sept. 17, U Defective Illumination of *S.* 0″.02.
Sept. 24, U Defective Illumination of *I.* 0″.04.
Sept. 24, U Defective Illumination of *N.* 0″.26.
Sept. 25, U Defective Illumination of *S.* 0″.37.
Oct. 1, U Defective Illumination of *N.* 0″.03.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	U	17 16.11	2.041	5 56 34.33	132.67	+18 28 13.1	+ 64.6	65.66	15 1.0	55 1.4	II. *N*. S.
2	L	5 40.78	2.069	6 23 16.59	134.35	18 34 11.0	− 5.4	66.10	15 6.1	55 20.0	
2	U	18 5.77	2.095	6 50 18.28	135.90	18 25 53.0	78.0	66.49	15 11.8	55 41.1	II. S.
3	L	6 31.05	2.118	7 17 37.54	137.28	18 2 52.6	152.4	66.83	15 18.2	56 4.5	
3	U	18 56.59	2.138	7 45 12.35	138.49	+17 24 52.9	−227.7	67.13	15 25.2	56 30.0	II. S.
4	L	7 22.35	2.155	8 13 0.64	139.53	16 31 48.7	302.9	67.37	15 32.6	56 57.3	
4	U	19 48.31	2.170	8 41 0.47	140.42	15 23 47.7	376.9	67.56	15 40.4	57 25.9	II. S.
5	L	8 14.43	2.183	9 9 10.30	141.20	14 1 13.1	448.3	67.73	15 48.5	57 55.5	
5	U	20 40.69	2.195	9 37 29.02	141.91	+12 24 44.2	−515.7	67.88	15 56.6	58 25.5	II. S.
6	L	9 7.10	2.207	10 5 56.20	142.62	10 35 19.1	577.4	68.02	16 4.7	58 55.0	
6	U	21 33.66	2.219	10 34 32.05	143.37	8 34 14.7	631.9	68.17	16 12.4	59 23.4	II. S.
7	L	10 0.37	2.233	11 3 17.44	144.22	6 23 8.6	677.4	68.35	16 19.7	59 50.0	
7	U	22 27.26	2.250	11 32 13.79	145.20	+ 4 3 57.6	−712.4	68.57	16 26.2	60 13.9	II. S.
8	L	10 54.37	2.269	12 1 23.00	146.36	+ 1 38 58.0	735.3	68.83	16 31.8	60 34.4	
8	U	23 21.73	2.291	12 30 47.16	147.70	− 0 49 16.6	741.7	69.15	16 36.3	60 50.9	
9	L	11 49.37	2.316	13 0 28.36	149.20	3 17 58.8	739.8	69.51	16 39.5	61 2.8	
10	U	0 17.32	2.343	13 30 28.30	150.81	− 5 44 11.8	−719 8	69.90	16 41.3	61 9.6	
10	L	12 45.60	2.370	14 0 47.95	152.47	8 4 54.1	681.7	70.31	16 41.8	61 11.3	
11	U	1 14.21	2.397	14 31 27.27	151.06	10 17 7.5	635.1	70.72	16 40.9	61 7.9	I. N.
11	L	13 43.11	2.121	15 2 21.81	155.48	12 18 3.3	572.1	71.08	16 38.6	60 59.5	
12	U	2 12.27	2.139	15 33 37.57	156.58	−14 5 10.1	−497.3	71.37	16 35.1	60 46.6	I. N.
12	L	14 41.61	2.119	16 5 0.88	157.22	15 36 19.7	413.0	71.55	16 30.5	60 29.8	
13	U	3 11.02	2.150	16 36 28.56	157.29	16 49 53.5	321.8	71.60	16 25.0	60 9.7	I. N.
13	L	15 40.38	2.441	17 7 53.25	156.71	17 44 45.1	226.4	71.50	16 18.8	59 47.0	
14	U	4 9.56	2.420	17 39 6.93	155.45	−18 20 22.1	−129.8	71.23	16 12.2	59 22.5	I. N.
14	L	16 38.42	2.388	18 10 1.45	153 53	18 36 45.4	− 34.6	70.79	16 5.2	58 56.9	
15	U	5 6.83	2 316	18 40 29.34	151.02	18 31 25.3	+ 57.1	70.20	15 58.0	58 30.7	I. S.
15	L	17 34.70	2.297	19 10 24.24	148.05	18 14 16.5	143.3	69.49	15 50.9	58 4.6	
16	U	6 1.94	2 212	19 39 41.28	144.74	−17 37 32.9	+222.8	68.69	15 44.0	57 39.1	I. S.
16	L	18 28.50	2.181	20 8 17.37	141.25	16 45 41.3	294.6	67.82	15 37.3	57 14.4	
17	U	6 54.35	2.125	20 36 11.11	137.71	15 40 16.2	358.3	66.92	15 30.9	56 50.9	I. S.
17	L	19 19.50	2 068	21 3 22.72	131.25	14 22 55.3	413.9	66.02	15 24.8	56 28.7	
18	U	7 43.98	2.013	21 29 53.78	130.97	−12 55 16.0	+461.4	65.16	15 19.2	56 8.1	I. S.
18	L	20 7.83	1.963	21 55 47.00	127.95	11 18 53.0	501.1	64.35	15 14.0	55 49.1	
19	U	8 31.11	1.918	22 21 5.90	125.25	9 35 17.9	533.5	63.62	15 9.3	55 31.7	I. S.
19	L	20 53.89	1.879	22 45 54.59	122.92	7 45 57.3	558.8	62.97	15 5.0	55 15.9	
20	U	9 16.24	1.847	23 10 17.55	120.97	− 5 52 13.6	+577.1	62.42	15 1.1	55 1.7	I. S.
20	L	21 38.24	1.821	23 34 19.48	119.42	3 55 25.9	589.5	61.98	14 57.6	54 49.0	
21	U	9 59.97	1.802	23 58 5.14	118.26	− 1 56 49.5	595.6	61.64	14 54.6	54 37.8	I. S.
21	L	22 21.51	1.789	0 21 39.24	117.49	+ 0 2 23.4	595.7	61.40	14 51.9	54 28.0	
22	U	10 42.93	1.782	0 45 6.38	117.09	+ 2 1 2.8	+590.0	61.27	14 49.6	54 19.6	I. S.
22	L	23 4.31	1.782	1 8 30.97	117.06	3 57 59.7	578.6	61.25	14 47.7	54 12.5	
23	U	11 25.72	1.787	1 31 57.16	117.36	5 52 7.2	561.7	61.32	14 46.1	54 6.8	I. S.
23	L	23 47.22	1.797	1 55 28.77	117.96	7 42 18.9	539.3	61.48	14 44.9	54 2.3	
24	U	12 8.86	1.812	2 19 9.32	118.84	+ 9 27 30.0	+511.6	61.72	14 44.1	53 59.2	II. *N*. S.

Oct. 1, U Defective Illumination of *N*. 0″.03. Oct. 24, U Defective Illumination of *N*. 0″.86.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 24	U	12 8.86	1.812	2 19 9.32	118.84	+ 9 27 30.0	+511.6	61.72	14 44.1	53 59.2	II. *N*. S.
25	L	0 30.70	1.830	2 43 1.86	119.96	11 6 36.0	478.4	62.03	14 43.6	53 57.5	
25	U	12 52.79	1.852	3 7 9.00	121.26	12 38 33.7	440.2	62.39	14 43.5	53 57.1	II. *N*. S.
26	L	1 15.16	1.876	3 31 32.77	122.72	14 2 21.6	396.9	62.80	14 43.8	53 58.3	
26	U	13 37.82	1.902	3 56 14.70	121.28	+15 17 0.1	+348.7	63.24	14 44.6	54 1.1	II. N. *S*.
27	L	2 0.80	1.928	4 21 15.62	125.88	16 21 32.2	295.9	63.70	14 45.8	54 5.5	
27	U	14 24.10	1.955	4 46 35.80	127.18	17 15 4.5	238.7	64.15	14 47.5	54 11.7	II. N. *S*.
28	L	2 47.72	1.980	5 12 14.83	129.02	17 56 47.8	177.8	64.58	14 49.7	54 19.9	
28	U	15 11.63	2.001	5 38 11.77	130.45	+18 25 58.1	+113.4	64.99	14 52.5	54 30.1	II. *N*. S.
29	L	3 35.81	2.026	6 4 25.12	131.75	18 41 57.8	+ 46.2	65.36	14 55.8	54 42.3	
29	U	16 0.24	2.045	6 30 53.09	132.88	18 44 16.4	− 23.3	65.68	14 59.8	54 56.8	II. S.
30	L	4 24.88	2.061	6 57 33.63	133.85	18 32 31.1	94.3	65.95	15 4.3	55 13.5	
30	U	16 49.69	2.074	7 24 24.68	134.61	+18 6 27.9	−166.2	66.17	15 9.5	55 32.4	II. S.
31	L	5 14.65	2.085	7 51 24.35	135.29	17 26 2.5	238.0	66.35	15 15.2	55 53.6	
31	U	17 39.72	2.094	8 18 31.09	135.82	16 31 19.6	308.9	66.50	15 21.6	56 16.9	II. S.
Nov. 1	L	6 4.89	2.102	8 45 43.90	136.31	15 22 34.8	378.2	66.63	15 28.5	56 42.2	
1	U	18 30.16	2.110	9 13 2.41	136.79	+14 0 14.0	−441.8	66.74	15 35.8	57 9.1	II. S.
2	L	6 55.53	2.119	9 40 26.99	137.33	12 24 55.4	507.6	66.87	15 43.6	57 37.5	
2	U	19 21.02	2.130	10 7 58.86	138.00	10 37 29.1	565.8	67.02	15 51.6	58 6.9	II. S.
3	L	7 46.66	2.141	10 35 39.91	138.87	8 38 59.2	618.1	67.21	15 59.7	58 36.8	
3	U	20 12.50	2.163	11 3 32.81	139.99	+ 6 30 44.8	−663.0	67.46	16 7.8	59 6.5	II. S.
4	L	8 38.59	2.186	11 31 40.79	141.39	4 14 21.3	699.3	67.78	16 15.7	59 35.3	
4	U	21 4.99	2.215	12 0 7.50	143.11	+ 1 51 42.1	725.1	68.18	16 23.1	60 2.5	II. S.
5	L	9 31.77	2.249	12 28 56.77	145.15	− 0 35 1.6	739.7	68.65	16 29.8	60 27.3	
5	U	21 58.98	2.288	12 58 12.32	147.48	− 3 3 19.9	−740.8	69.19	16 35.6	60 48.8	II. S.
6	L	10 26.69	2.330	13 27 57.34	150.05	5 30 26.2	727.6	69.79	16 40.4	61 6.2	
6	U	22 54.92	2.375	13 58 14.12	152.76	7 53 21.4	698.9	70.43	16 43.9	61 18.9	
7	L	11 23.69	2.420	14 29 3.53	155.47	10 8 57.9	654.5	71.07	16 45.9	61 26.4	
7	U	23 52.99	2.462	15 0 24.54	158.00	−12 14 7.5	−594.6	71.67	16 46.4	61 28.3	
8	L	12 22.76	2.498	15 32 13.91	160.15	14 5 51.3	520.5	72.18	16 45.4	61 24.5	
9	U	0 52.90	2.521	16 4 25.85	161.72	15 41 29.0	434.0	72.57	16 42.9	61 15.2	I. S.
9	L	13 23.29	2.538	16 36 52.25	162.53	16 58 49.3	338.1	72.78	16 39.0	61 0.8	
10	U	1 53.75	2.536	17 9 22.94	162.42	−17 56 18.7	−236.1	72.78	16 33.8	60 41.9	I. S.
10	L	14 24.09	2.518	17 41 46.57	161.35	18 33 5.6	131.6	72.56	16 27.6	60 19.1	
11	U	2 54.12	2.484	18 13 51.50	159.32	18 49 2.4	− 28.3	72.11	16 20.5	59 53.2	I. S.
11	L	15 23.65	2.436	18 45 26.84	156.45	18 44 42.1	+ 70.7	71.47	16 12.9	59 25.2	
12	U	3 52.54	2.377	19 16 23.40	152.89	−18 21 11.9	+163.0	70.65	16 4.9	58 55.8	I. S.
12	L	16 20.68	2.310	19 46 34.28	148.86	17 40 4.6	246.7	69.70	15 56.7	58 25.9	
13	U	4 47.98	2.239	20 15 55.15	144.59	16 43 9.2	320.8	68.68	15 48.6	57 56.0	I. S.
13	L	17 14.42	2.167	20 44 24.18	140.26	15 32 22.7	385.2	67.62	15 40.6	57 26.8	
14	U	5 40.01	2.097	21 12 1.86	136.05	−14 9 43.0	+439.8	66.57	15 33.0	56 58.9	I. S.
14	L	18 4.78	2.032	21 38 50.44	132.10	12 37 4.3	485.1	65.57	15 25.9	56 32.5	
15	U	6 28.79	1.972	22 4 53.68	128.52	10 56 13.6	521.9	64.64	15 19.2	56 8.0	I. S.
15	L	18 52.14	1.919	22 30 16.35	125.34	9 8 50.1	550.8	63.80	15 13.1	55 45.5	
16	U	7 14.89	1.874	22 55 3.76	122.63	− 7 16 24.5	+572.3	63.07	15 7.5	55 25.2	I. S.

Oct. 24, U Defective Illumination of *N*. 0″.86.
Oct. 25, U Defective Illumination of *N*. 0″.00.
Oct. 26, U Defective Illumination of *S*. 0″.04.
Oct. 27, U Defective Illumination of *S*. 0″.00.
Oct. 28, U Defective Illumination of *N*. 0″.32.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	U	7 14.89	1.874	22 55 3.76	122.63	− 7 16 24.5	+572.3	63.07	15 7.5	55 25.2	I. S.
16	L	19 37.16	1.838	23 19 21.67	120.42	5 20 19.6	587.4	62.46	15 2.6	55 7.1	
17	U	7 59.03	1.809	23 43 15.96	118.70	3 21 51.4	596.3	61.97	14 58.3	54 51.3	I. S.
17	L	20 20.61	1.789	0 6 52.47	117.47	− 1 22 11.0	599.5	61.60	14 54.6	54 37.7	
18	U	8 41.99	1.776	0 30 16.94	116.69	+ 0 37 34.7	+597.2	61.36	14 51.5	54 26.3	I. S.
18	L	21 3.26	1.770	0 53 34.83	116.36	2 36 21.1	589.7	61.24	14 48.9	54 16.9	
19	U	9 24.50	1.772	1 16 51.36	116.46	4 33 5.3	576.8	61.23	14 46.9	54 9.5	I. S.
19	L	21 45.81	1.780	1 40 11.33	116.93	6 26 45.0	558.9	61.33	14 45.4	54 4.0	
20	U	10 7.24	1.793	2 3 39.12	117.75	+ 8 16 17.0	+535.6	61.53	14 44.4	54 0.2	I. S.
20	L	22 28.87	1.812	2 27 18.67	118.88	10 0 38.5	507.0	61.81	14 43.8	53 58.1	
21	U	10 50.75	1.835	2 51 13.30	120.26	11 38 45.3	473.2	62.15	14 43.6	53 57.5	I. S.
21	L	23 12.92	1.861	3 15 25.66	121.82	13 9 32.8	433.9	62.56	14 43.8	53 58.3	
22	U	11 35.42	1.889	3 39 57.72	123.53	+14 31 57.0	+389.2	63.00	14 44.5	54 0.6	I. *II.* S.
22	L	23 58.27	1.919	4 4 50.63	125.29	15 44 54.5	339.5	63.46	14 45.4	54 4.1	
23	U	12 21.47	1.948	4 30 4.68	127.04	16 47 24.8	284.8	63.92	14 46.7	54 9.0	II. S.
24	L	0 45.01	1.976	4 55 39.28	128.70	17 38 30.9	225.5	64.37	14 48.4	54 15.2	
24	U	13 8.87	2.001	5 21 33.05	130.22	+18 17 21.3	+162.3	64.79	14 50.5	54 22.7	II. S.
25	L	1 33.01	2.022	5 47 43.81	131.53	18 43 12.0	95.6	65.15	14 52.9	54 31.5	
25	U	13 57.39	2.040	6 14 8.80	132.59	18 55 27.6	+ 26.6	65.45	14 55.6	54 41.6	II. S.
26	L	2 21.95	2.053	6 40 44.86	133.38	18 53 42.4	− 44.2	65.68	14 58.8	54 53.3	
26	U	14 46.65	2.062	7 7 28.70	133.89	+18 37 42.3	−115.8	65.85	15 2.4	55 6.4	II. S.
27	L	3 11.41	2.066	7 34 17.15	134.15	18 7 23.8	187.2	65.95	15 6.4	55 21.0	
27	U	15 36.21	2.067	8 1 7.45	134.21	17 22 55.0	257.4	66.00	15 10.8	55 37.2	II. S.
28	L	4 1.01	2.065	8 27 57.48	134.12	16 24 34.8	325.5	66.00	15 15.6	55 55.0	
28	U	16 25.78	2.063	8 54 45.95	133.96	+15 12 52.5	−390.9	65.99	15 20.9	56 14.4	II. S.
29	L	4 50.51	2.061	9 21 32.53	133.81	13 48 26.6	452.7	65.97	15 26.6	56 35.4	
29	U	17 15.23	2.060	9 48 17.94	133.77	12 12 5.0	510.1	65.98	15 32.7	56 57.8	II. S.
30	L	5 39.96	2.062	10 15 3.87	133.92	10 24 44.1	562.4	66.03	15 39.2	57 21.6	
30	U	18 4.74	2.069	10 41 53.08	134.34	+ 8 27 29.1	−609.0	66.14	15 46.0	57 46.5	II. S.
Dec. 1	L	6 29.64	2.081	11 8 49.17	135.08	6 21 34.6	648.9	66.32	15 53.0	58 12.1	
1	U	18 54.72	2.100	11 35 56.50	136.21	4 8 25.8	681.2	66.60	16 0.1	58 38.1	II. S.
2	L	7 20.07	2.126	12 3 20.01	137.78	+ 1 49 39.5	704.8	66.98	16 7.1	59 4.1	
2	U	19 45.78	2.160	12 31 4.98	139.79	− 0 32 54.4	−718.9	67.46	16 14.0	59 29.4	II. S.
3	L	8 11.93	2.201	12 59 16.83	142.25	2 57 11.0	721.9	68.05	16 20.6	59 53.4	
3	U	20 38.62	2.248	13 28 0.66	145.12	5 20 50.5	712.6	68.72	16 26.6	60 15.4	II. S.
4	L	9 5.91	2.301	13 57 20.90	148.30	7 41 18.2	689.7	69.47	16 31.9	60 34.7	
4	U	21 33.86	2.357	14 27 20.75	151.69	− 9 55 45.6	−652.3	70.26	16 36.2	60 50.6	II. S.
5	L	10 2.49	2.414	14 58 1.66	155.11	12 1 16.2	600.2	71.05	16 39.4	61 2.4	
5	U	22 31.79	2.468	15 29 22.72	158.34	13 54 50.7	533.2	71.80	16 41.3	61 9.6	II. S.
6	L	11 1.69	2.514	16 1 20.16	161.14	15 33 36.8	452.3	72.44	16 41.9	61 11.7	
6	U	23 32.09	2.549	16 33 47.18	163.23	−16 55 0.1	−359.7	72.92	16 41.1	61 8.6	
7	L	12 2.81	2.569	17 6 33.96	164.39	17 56 55.1	258.2	73.19	16 38.8	61 0.3	
8	U	0 33.66	2.570	17 39 28.25	164.46	18 37 55.8	151.4	73.21	16 35.2	60 46.9	
8	L	13 4.41	2.552	18 12 16.38	163.37	18 57 22.3	− 43.2	72.97	16 30.3	60 29.0	
9	U	1 34.82	2.515	18 44 44.53	161.15	−18 55 22.8	+ 62.4	72.47	16 24.3	60 7.2	I. S.

Nov. 22, U Defective Illumination of *II.* 0.05.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Dec. 9	U	1 34.82	2.515	18 44 44.53	161.15	−18 55 22.8	+ 62.4	72.47	16 24.3	60 7.2	I. S.
9	L	14 4.70	2.462	19 16 40.01	157.95	18 32 49.9	161.8	71.75	16 17.5	59 42.1	
10	U	2 33.85	2.396	19 47 52.39	154.01	17 51 13.3	252.6	70.84	16 10.0	59 14.6	I. S.
10	L	15 2.16	2.322	20 18 14.16	149.56	16 52 29.1	332.9	69.81	16 2.1	58 45.5	
11	U	3 29.56	2.244	20 47 40.90	144.88	−15 38 48.5	+401.9	68.70	15 53.9	58 15.5	I. S.
11	L	15 56.03	2.166	21 16 11.26	140.20	14 12 28.2	459.6	67.57	15 45.7	57 45.4	
12	U	4 21.57	2.092	21 43 46.40	135.71	12 35 41.8	506.4	66.47	15 37.7	57 15.9	I. S.
12	L	16 46.25	2.023	22 10 29.50	131.54	10 50 35.5	543.1	65.43	15 29.9	56 47.5	
13	U	5 10.14	1.961	22 36 25.23	127.82	− 8 59 4.5	+570.6	64.48	15 22.6	56 20.7	I. S.
13	L	17 33.34	1.907	23 1 39.23	124.60	7 2 52.3	590.0	63.65	15 15.8	55 55.8	
14	U	5 55.95	1.862	23 26 17.76	121.91	5 3 31.1	602.3	62.94	15 9.7	55 33.1	I. S.
14	L	18 18.08	1.827	23 50 27.31	119.78	3 2 22.3	608.1	62.37	15 4.2	55 12.9	
15	U	6 39.83	1.800	0 14 14.50	118.18	− 1 0 39.6	+608.1	61.93	14 59.3	54 55.2	I. S.
15	L	19 1.32	1.783	0 37 45.79	117.12	+ 1 0 30.5	602.7	61.63	14 55.2	54 40.1	
16	U	7 22.66	1.771	1 1 7.50	116.58	3 0 5.9	592.3	61.46	14 51.8	54 27.6	I. S.
16	L	19 43.93	1.773	1 24 25.62	116.52	4 57 7.7	577.1	61.42	14 49.1	54 17.7	
17	U	8 5.23	1.779	1 47 45.76	116.91	+ 6 50 37.8	+557.1	61.50	14 47.1	54 10.4	I. S.
17	L	20 26.66	1.793	2 11 13.09	117.71	8 39 38.9	532.2	61.68	14 45.8	54 5.4	
18	U	8 48.28	1.812	2 34 52.35	118.88	10 23 12.2	502.5	61.96	14 45.0	54 2.7	I. S.
18	L	21 10.17	1.837	2 58 47.57	120.37	12 0 17.9	467.6	62.33	14 44.9	54 2.3	
19	U	9 32.38	1.866	3 23 2.15	122.10	+13 29 54.1	+427.5	62.76	14 45.3	54 3.8	I. S.
19	L	21 54.96	1.897	3 47 38.60	124.01	14 50 58.1	382.2	63.23	14 46.2	54 7.1	
20	U	10 17.92	1.930	4 12 38.57	126.00	16 2 26.1	331.5	63.73	14 47.6	54 12.1	I. S.
20	L	22 41.29	1.964	4 38 2.68	128.01	17 3 15.3	275.7	64.22	14 49.4	54 18.6	
21	U	11 5.05	1.996	5 3 50.43	129.93	+17 52 25.5	+215.2	64.70	14 51.5	54 26.5	I. S.
21	L	23 29.18	2.025	5 30 0.26	131.68	18 29 1.8	150.2	65.14	14 54.0	54 35.5	
22	U	11 53.63	2.050	5 56 29.65	133.17	18 52 15.8	81.6	65.51	14 56.7	54 45.6	I. *II.* S.
23	L	0 18.35	2.069	6 23 15.12	134.35	19 1 28.9	+ 10.1	65.81	14 59.7	54 56.7	
23	U	12 43.27	2.083	6 50 12.60	135.17	+18 56 14.2	− 62.9	66.03	15 3.0	55 8.6	II. S.
24	L	1 8.31	2.090	7 17 17.72	135.62	18 36 18.3	136.4	66.16	15 6.4	55 21.2	
24	U	13 33.41	2.092	7 44 26.11	135.72	18 1 41.9	209.4	66.21	15 10.1	55 34.6	II. S.
25	L	1 58.50	2.089	8 11 33.81	135.51	17 12 39.9	280.5	66.18	15 13.9	55 48.7	
25	U	14 23.52	2.081	8 38 37.51	135.07	+16 9 41.6	−348.7	66.10	15 17.9	56 3.4	II. S.
26	L	2 48.44	2.071	9 5 34.93	134.48	14 53 28.6	412.8	65.98	15 22.1	56 18.7	
26	U	15 13.23	2.061	9 32 24.89	133.84	13 24 54.0	472.1	65.85	15 26.4	56 34.7	II. S.
27	L	3 37.90	2.051	9 59 7.41	133.26	11 45 0.1	525.8	65.74	15 31.0	56 51.3	
27	U	16 2.47	2.041	10 25 43.73	132.82	+ 9 54 57.7	−573.1	65.66	15 35.7	57 8.6	II. S.
28	L	4 26.97	2.041	10 52 16.28	132.64	7 56 4.0	611.3	65.64	15 40.5	57 26.4	
28	U	16 51.47	2.043	11 18 48.48	132.79	5 49 43.3	647.8	65.70	15 45.5	57 44.6	II. S.
29	L	5 16.03	2.052	11 45 24.69	133.33	3 37 25.4	673.7	65.85	15 50.6	58 3.3	
29	U	17 40.75	2.068	12 12 9.95	134.30	+ 1 20 47.4	−691.2	66.11	15 55.7	58 22.2	II. S.
30	L	6 5.71	2.092	12 39 9.79	135.75	− 0 58 26.9	699.6	66.48	16 0.9	58 41.1	
30	U	18 31.01	2.125	13 6 30.06	137.70	3 18 24.8	698.3	66.97	16 5.9	58 59.6	II. S.
31	L	6 56.74	2.165	13 34 16.49	140.12	5 37 4.4	686.4	67.56	16 10.8	59 17.5	
31	U	19 22.99	2.212	14 2 34.49	142.96	− 7 52 14.0	−663.2	68.25	16 15.4	59 34.3	II. S.

Dec. 22, U Defective Illumination of *II.* 0.01.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	1 8	19 49 32.54	−23 9 24.6	7.1	2.7	0.20	Feb. 15	22 31	20 13 23.83	−18 39 44.2	10.2	3.9	0.28
2	1 11	19 56 9.21	22 48 34.3	7.2	2.7	0.20	16	22 30	20 16 18.92	18 42 22.5	10.0	3.8	0.27
3	1 13	20 2 39.41	22 26 19.8	7.3	2.8	0.20	17	22 29	20 19 30.85	18 43 41.7	9.8	3.7	0.26
4	1 16	20 9 2.08	22 2 44.8	7.4	2.8	0.20	18	22 29	20 22 58.08	18 43 41.0	9.7	3.7	0.26
5	1 18	20 15 15.97	21 37 54.2	7.6	2.9	0.21	19	22 28	20 26 39.42	18 42 20.1	9.5	3.6	0.25
6	1 20	20 21 19.72	−21 11 53.5	7.7	2.9	0.21	20	22 28	20 30 33.60	−18 39 38.9	9.4	3.5	0.25
7	1 22	20 27 11.79	20 44 50.0	7.8	3.0	0.21	21	22 29	20 34 39.56	18 35 37.2	9.2	3.5	0.25
8	1 24	20 32 50.43	20 16 51.8	8.0	3.0	0.21	22	22 29	20 38 56.25	18 30 15.0	9.1	3.4	0.24
9	1 25	20 38 13.69	19 48 9.5	8.2	3.1	0.22	23	22 29	20 43 22.81	18 23 32.3	8.9	3.4	0.24
10	1 26	20 43 19.37	19 18 54.6	8.4	3.2	0.23	24	22 30	20 47 58.38	18 15 29.0	8.8	3.3	0.23
11	1 27	20 48 5.10	−18 49 20.8	8.6	3.3	0.23	25	22 31	20 52 42.22	−18 6 5.2	8.7	3.3	0.23
12	1 28	20 52 28.25	18 19 43.9	8.8	3.4	0.24	26	22 32	20 57 33.66	17 55 21.2	8.5	3.2	0.22
13	1 28	20 56 25.98	17 50 21.6	9.1	3.5	0.25	27	22 33	21 2 32.08	17 43 16.9	8.4	3.2	0.22
14	1 27	20 59 55.30	17 21 33.8	9.3	3.6	0.25	28	22 34	21 7 36.90	17 29 52.7	8.3	3.1	0.22
15	1 26	21 2 53.08	16 53 42.1	9.6	3.7	0.26	Mar. 1	22 35	21 12 47.67	17 15 8.7	8.2	3.1	0.22
16	1 25	21 5 16.18	−16 27 9.7	9.9	3.8	0.26	2	22 36	21 18 3.91	−16 59 5.4	8.1	3.1	0.22
17	1 22	21 7 1.57	16 2 20.5	10.2	3.9	0.27	3	22 38	21 23 25.21	16 41 42.5	8.0	3.0	0.21
18	1 20	21 8 6.44	15 39 39.5	10.5	4.0	0.28	4	22 39	21 28 51.22	16 23 0.9	7.9	3.0	0.21
19	1 16	21 8 28.42	15 19 30.1	10.9	4.1	0.29	5	22 41	21 34 21.65	16 3 0.6	7.8	3.0	0.21
20	1 12	21 8 5.77	15 2 14.6	11.2	4.3	0.30	6	22 43	21 39 56.15	15 41 41.8	7.7	2.9	0.20
21	1 7	21 6 57.68	−14 48 12.3	11.5	4.4	0.30	7	22 44	21 45 34.52	−15 19 5.4	7.7	2.9	0.20
22	1 1	21 5 4.45	14 37 38.1	11.9	4.5	0.31	8	22 46	21 51 16.50	14 55 11.0	7.6	2.9	0.20
23	0 54	21 2 27.68	14 30 41.6	12.2	4.6	0.32	9	22 48	21 57 1.93	14 29 59.5	7.5	2.8	0.19
24	0 47	20 59 10.49	14 27 25.6	12.5	4.7	0.32	10	22 50	22 2 50.63	14 3 31.2	7.4	2.8	0.19
25	0 39	20 55 17.49	14 27 46.1	12.8	4.8	0.33	11	22 52	22 8 42.44	13 35 46.4	7.4	2.8	0.19
26	0 31	20 50 54.72	−14 31 31.8	13.0	4.9	0.34	12	22 54	22 14 37.26	−13 6 45.4	7.3	2.8	0.19
27	0 22	20 46 9.48	14 38 25.0	13.2	5.0	0.34	13	22 56	22 20 35.01	12 36 28.8	7.2	2.7	0.18
28	0 13	20 41 9.90	14 48 2.6	13.3	5.0	0.34	14	22 58	22 26 35.61	12 4 57.1	7.2	2.7	0.18
29	0 4	20 36 4.59	14 59 57.6	13.4	5.1	0.35	15	23 0	22 32 39.01	11 32 10.4	7.1	2.7	0.18
29	23 55	20 31 2.03	15 13 41.7	13.4	5.1	0.35	16	23 2	22 38 45.17	10 58 9.7	7.0	2.7	0.18
30	23 47	20 26 10.22	−15 28 45.9	13.4	5.1	0.35	17	23 4	22 44 54.11	−10 22 55.0	7.0	2.7	0.18
31	23 38	20 21 36.23	15 44 43.0	13.3	5.1	0.35	18	23 6	22 51 5.84	9 46 27.1	7.0	2.6	0.18
Feb. 1	23 30	20 17 25.95	16 1 8.1	13.2	5.0	0.35	19	23 9	22 57 20.37	9 8 46.6	6.9	2.6	0.18
2	23 22	20 13 43.94	16 17 39.8	13.1	5.0	0.35	20	23 11	23 3 37.75	8 29 53.9	6.9	2.6	0.18
3	23 15	20 10 33.43	16 33 59.5	12.9	4.9	0.34	21	23 13	23 9 58.07	7 49 49.7	6.8	2.6	0.18
4	23 9	20 7 56.45	−16 49 52.7	12.7	4.8	0.33	22	23 16	23 16 21.39	− 7 8 34.8	6.8	2.6	0.18
5	23 3	20 5 53.89	17 5 7.1	12.5	4.7	0.33	23	23 18	23 22 47.80	6 26 10.0	6.7	2.6	0.18
6	22 57	20 4 25.80	17 19 33.4	12.3	4.6	0.32	24	23 21	23 29 17.41	5 42 36.2	6.7	2.5	0.17
7	22 53	20 3 31.49	17 33 3.9	12.0	4.6	0.32	25	23 23	23 35 50.34	4 57 54.4	6.7	2.5	0.17
8	22 48	20 3 9.77	17 45 33.0	11.8	4.5	0.31	26	23 26	23 42 26.73	4 12 5.9	6.7	2.5	0.17
9	22 45	20 3 19.11	−17 56 56.3	11.6	4.4	0.31	27	23 29	23 49 6.72	− 3 25 11.8	6.6	2.5	0.17
10	22 41	20 3 57.72	18 7 10.2	11.3	4.3	0.30	28	23 32	23 55 50.42	2 37 13.8	6.6	2.5	0.17
11	22 38	20 5 3.73	18 16 12.1	11.1	4.2	0.29	29	23 34	0 2 38.03	1 48 14.2	6.6	2.5	0.17
12	22 36	20 6 35.22	18 23 59.8	10.9	4.1	0.29	30	23 37	0 9 29.65	0 58 14.6	6.6	2.5	0.17
13	22 34	20 8 30.28	18 30 31.9	10.7	4.0	0.28	31	23 40	0 16 25.46	− 0 7 17.5	6.6	2.5	0.17
14	22 32	20 10 47.05	−18 35 47.0	10.4	4.0	0.28	Apr. 1	23 43	0 23 25.54	+ 0 44 33.9	6.5	2.5	0.17
15	22 31	20 13 23.83	−18 39 44.2	10.2	3.9	0.28	2	23 47	0 30 30.05	+ 1 37 16.3	6.5	2.5	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	23 43	0 23 25.54	+ 0 44 33.9	6.5	2.5	0.17	May 17	0 59	4 36 32.98	+23 13 24.7	14.0	5.3	0.39
2	23 47	0 30 30.05	1 37 16.3	6.5	2.5	0.17	18	0 55	4 36 26.73	22 59 10.2	14.3	5.4	0.39
3	23 50	0 37 39.05	2 30 45.9	6.5	2.5	0.17	19	0 51	4 36 1.48	22 43 27.5	14.6	5.5	0.40
4	23 53	0 44 52.62	3 24 57.8	6.5	2.5	0.17	20	0 46	4 35 18.21	22 26 23.0	14.8	5.6	0.40
5	23 56	0 52 10.75	4 19 46.7	6.6	2.5	0.17	21	0 41	4 34 18.12	22 8 3.9	15.1	5.7	0.41
7	0 0	0 59 33.38	+ 5 15 6.6	6.6	2.5	0.17	22	0 36	4 33 2.64	+21 48 38.3	15.3	5.8	0.42
8	0 3	1 7 0.43	6 10 50.4	6.6	2.5	0.17	23	0 30	4 31 33.36	21 28 15.6	15.5	5.9	0.42
9	0 7	1 14 31.70	7 6 50.2	6.6	2.5	0.17	24	0 25	4 29 52.08	21 7 6.4	15.7	5.9	0.42
10	0 10	1 22 6.90	8 2 57.1	6.6	2.5	0.17	25	0 19	4 28 0.78	20 45 22.0	15.8	6.0	0.43
11	0 14	1 29 45.66	8 59 1.3	6.7	2.5	0.17	26	0 13	4 26 1.59	20 23 15.1	15.9	6.0	0.43
12	0 18	1 37 27.47	+ 9 54 52.1	6.7	2.6	0.18	27	0 7	4 23 56.72	+20 0 59.4	16.0	6.1	0.43
13	0 22	1 45 11.74	10 50 17.9	6.8	2.6	0.18	28	0 0	4 21 48.49	19 38 48.6	16.0	6.1	0.43
14	0 26	1 52 57.74	11 45 6.6	6.8	2.6	0.18	28	23 55	4 19 39.19	19 16 57.4	16.0	6.1	0.43
15	0 29	2 0 44.59	12 39 5.2	6.9	2.6	0.18	29	23 49	4 17 31.15	18 55 40.2	16.0	6.1	0.43
16	0 33	2 8 31.38	13 32 0.5	7.0	2.7	0.19	30	23 43	4 15 26.60	18 35 11.1	16.0	6.1	0.43
17	0 37	2 16 16.97	+14 23 40.2	7.1	2.7	0.19	31	23 37	4 13 27.66	+18 15 43.7	15.9	6.0	0.42
18	0 41	2 24 0.29	15 13 51.1	7.2	2.7	0.19	June 1	23 31	4 11 36.33	17 57 30.8	15.8	6.0	0.42
19	0 44	2 31 40.09	16 2 21.3	7.3	2.8	0.19	2	23 25	4 9 54.43	17 40 43.7	15.6	5.9	0.41
20	0 48	2 39 15.16	16 48 59.6	7.4	2.8	0.20	3	23 20	4 8 23.58	17 25 32.5	15.5	5.9	0.41
21	0 52	2 46 44.20	17 33 36.2	7.5	2.9	0.20	4	23 15	4 7 5.24	17 12 5.7	15.3	5.8	0.40
22	0 55	2 54 6.01	+18 16 2.1	7.7	2.9	0.20	5	23 10	4 6 0.62	+17 0 30.3	15.1	5.7	0.40
23	0 58	3 1 19.35	18 56 10.5	7.8	3.0	0.21	6	23 5	4 5 10.79	16 50 51.4	14.8	5.6	0.39
24	1 1	3 8 23.07	19 33 55.4	8.0	3.0	0.21	7	23 1	4 4 36.57	16 43 12.8	14.6	5.5	0.38
25	1 4	3 15 16.04	20 9 12.6	8.1	3.1	0.22	8	22 56	4 4 18.67	16 37 36.5	14.3	5.4	0.38
26	1 7	3 21 57.27	20 41 59.4	8.3	3.2	0.23	9	22 52	4 4 17.59	16 34 3.2	14.1	5.3	0.37
27	1 10	3 28 25.73	+21 12 14.0	8.5	3.2	0.23	10	22 49	4 4 33.70	+16 32 32.2	13.8	5.2	0.37
28	1 12	3 34 40.54	21 39 56.2	8.7	3.3	0.24	11	22 45	4 5 7.29	16 33 1.7	13.5	5.1	0.35
29	1 14	3 40 40.88	22 5 6.1	9.0	3.4	0.24	12	22 42	4 5 58.51	16 35 28.5	13.2	5.0	0.35
30	1 16	3 46 25.97	22 27 45.3	9.2	3.5	0.25	13	22 39	4 7 7.42	16 39 49.3	12.9	4.9	0.34
May 1	1 17	3 51 55.09	22 47 55.7	9.4	3.6	0.26	14	22 37	4 8 34.08	16 45 59.7	12.7	4.8	0.33
2	1 19	3 57 7.57	+23 5 39.6	9.7	3.7	0.27	15	22 35	4 10 18.41	+16 53 54.2	12.4	4.7	0.33
3	1 20	4 2 2.77	23 20 59.8	9.9	3.8	0.28	16	22 33	4 12 20.38	17 3 27.4	12.1	4.6	0.32
4	1 20	4 6 40.12	23 33 59.3	10.2	3.9	0.28	17	22 31	4 14 39.88	17 14 33.1	11.8	4.5	0.32
5	1 21	4 10 59.06	23 44 41.3	10.4	4.0	0.28	18	22 30	4 17 16.84	17 27 4.9	11.5	4.4	0.31
6	1 21	4 14 59.09	23 53 9.0	10.7	4.1	0.29	19	22 29	4 20 11.17	17 40 56.0	11.3	4.3	0.30
7	1 20	4 18 39.72	+23 59 25.4	11.0	4.2	0.30	20	22 28	4 23 22.77	+17 55 59.5	11.0	4.2	0.29
8	1 20	4 22 0.50	24 3 33.8	11.3	4.3	0.31	21	22 28	4 26 51.56	18 12 7.9	10.7	4.1	0.29
9	1 19	4 25 1.04	24 5 37.4	11.6	4.4	0.32	22	22 28	4 30 37.50	18 29 13.8	10.5	4.0	0.28
10	1 18	4 27 41.02	24 5 39.2	11.9	4.5	0.33	23	22 28	4 34 40.54	18 47 9.4	10.2	3.9	0.28
11	1 16	4 30 0.14	24 3 42.2	12.2	4.6	0.34	24	22 28	4 39 0.67	19 5 46.6	10.0	3.8	0.27
12	1 14	4 31 58.21	+23 59 49.6	12.5	4.7	0.34	25	22 29	4 43 37.88	+19 24 57.3	9.8	3.7	0.26
13	1 12	4 33 35.13	23 54 4.3	12.8	4.9	0.36	26	22 30	4 48 32.17	19 44 32.7	9.5	3.6	0.25
14	1 9	4 34 50.87	23 46 29.6	13.1	5.0	0.36	27	22 31	4 53 43.57	20 4 24.1	9.3	3.5	0.25
15	1 6	4 35 45.56	23 37 8.8	13.4	5.1	0.37	28	22 32	4 59 12.09	20 24 21.9	9.1	3.5	0.25
• 16	1 3	4 36 19.45	23 26 5.8	13.7	5.2	0.38	29	22 34	5 4 57.74	20 44 16.8	8.9	3.4	0.24
17	0 59	4 36 32.98	+23 13 24.7	14.0	5.3	0.39	30	22 36	5 11 0.50	+21 3 58.6	8.7	3.3	0.24
18	0 55	4 36 26.73	+22 59 10.2	14.3	5.4	0.39	July 1	22 39	5 17 20.35	+21 23 16.6	8.5	3.2	0.23

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 39	5 17 20.35	+21 23 16.6	8.5	3.2	0.23	Aug. 17	1 30	11 10 5.12	+5 25 29.6	7.6	2.9	0.20
2	22 41	5 23 57.17	21 42 0.0	8.3	3.2	0.23	18	1 31	11 15 17.00	4 43 31.6	7.7	2.9	0.20
3	22 44	5 30 50.80	21 59 57.5	8.2	3.1	0.22	19	1 32	11 20 22.18	4 1 52.7	7.7	2.9	0.20
4	22 48	5 38 0.99	22 16 57.3	8.0	3.0	0.22	20	1 33	11 25 20.70	3 20 35.6	7.8	3.0	0.20
5	22 51	5 45 27.41	22 32 47.3	7.9	3.0	0.22	21	1 34	11 30 12.58	2 39 43.1	7.9	3.0	0.20
6	22 55	5 53 9.56	+22 47 15.4	7.7	2.9	0.21	22	1 35	11 34 57.82	+1 59 17.9	8.0	3.0	0.20
7	22 59	6 1 6.81	23 0 9.3	7.6	2.9	0.21	23	1 35	11 39 36.42	1 19 23.1	8.1	3.1	0.20
8	23 3	6 9 18.36	23 11 17.0	7.5	2.8	0.20	24	1 36	11 44 8.32	0 40 1.4	8.2	3.1	0.20
9	23 7	6 17 43.24	23 20 26.6	7.3	2.8	0.20	25	1 37	11 48 33.41	+0 1 15.7	8.3	3.1	0.20
10	23 12	6 26 20.31	23 27 27.4	7.2	2.7	0.20	26	1 37	11 52 51.58	−0 36 50.7	8.4	3.2	0.21
11	23 17	6 35 8.20	+23 32 8.9	7.1	2.7	0.20	27	1 37	11 57 2.69	−1 14 14.6	8.5	3.2	0.22
12	23 22	6 44 5.46	23 34 22.9	7.0	2.7	0.20	28	1 37	12 1 6.51	1 50 52.7	8.7	3.3	0.22
13	23 27	6 53 10.42	23 34 1.8	6.9	2.6	0.19	29	1 37	12 5 2.84	2 26 41.4	8.8	3.3	0.23
14	23 32	7 2 21.35	23 31 0.0	6.9	2.6	0.19	30	1 37	12 8 51.38	3 1 36.9	8.9	3.4	0.23
15	23 38	7 11 36.44	23 25 14.1	6.8	2.6	0.19	31	1 37	12 12 31.78	3 35 35.2	9.0	3.4	0.23
16	23 43	7 20 53.83	+23 16 42.6	6.8	2.6	0.19	Sept. 1	1 36	12 16 3.68	−4 8 31.8	9.2	3.5	0.24
17	23 48	7 30 11.74	23 5 25.7	6.7	2.5	0.18	2	1 36	12 19 26.63	4 40 22.2	9.3	3.5	0.24
18	23 54	7 39 28.43	22 51 26.0	6.7	2.5	0.18	3	1 35	12 22 40.14	5 11 1.2	9.5	3.6	0.24
19	23 59	7 48 42.28	22 34 47.6	6.6	2.5	0.18	4	1 34	12 25 43.64	5 40 23.1	9.6	3.6	0.24
21	0 4	7 57 51.80	22 15 35.8	6.6	2.5	0.18	5	1 33	12 28 36.51	6 8 22.1	9.8	3.7	0.25
22	0 9	8 6 55.68	+21 53 57.7	6.6	2.5	0.18	6	1 32	12 31 18.05	−6 34 51.2	10.0	3.8	0.25
23	0 14	8 15 52.81	21 30 1.1	6.6	2.5	0.18	7	1 31	12 33 47.50	6 59 43.7	10.1	3.8	0.26
24	0 19	8 24 42.21	21 3 54.5	6.6	2.5	0.18	8	1 29	12 36 4.02	7 22 51.4	10.3	3.9	0.26
25	0 24	8 33 23.11	20 35 46.9	6.6	2.5	0.18	9	1 27	12 38 6.70	7 44 5.9	10.5	4.0	0.27
26	0 28	8 41 54.92	20 5 47.3	6.6	2.5	0.18	10	1 25	12 39 54.57	8 3 17.6	10.7	4.1	0.28
27	0 33	8 50 17.20	+19 34 5.1	6.6	2.5	0.18	11	1 22	12 41 26.58	−8 20 16.2	10.9	4.1	0.28
28	0 37	8 58 29.61	19 0 49.3	6.6	2.5	0.18	12	1 20	12 42 41.64	8 34 50.8	11.1	4.2	0.28
29	0 41	9 6 31.99	18 26 8.5	6.6	2.5	0.17	13	1 17	12 43 38.61	8 46 49.7	11.3	4.3	0.29
30	0 45	9 14 24.23	17 50 11.3	6.6	2.5	0.17	14	1 13	12 44 16.38	8 55 59.8	11.5	4.4	0.30
31	0 49	9 22 6.35	17 13 5.9	6.6	2.5	0.17	15	1 10	12 44 33.78	9 2 8.2	11.8	4.5	0.30
Aug. 1	0 52	9 29 38.41	+16 34 59.7	6.7	2.5	0.17	16	1 6	12 44 29.80	−9 5 1.1	12.0	4.5	0.30
2	0 56	9 37 0.53	15 55 59.9	6.7	2.5	0.17	17	1 1	12 44 3.46	9 4 24.7	12.2	4.6	0.31
3	0 59	9 44 12.87	15 16 13.4	6.7	2.6	0.18	18	0 57	12 43 13.98	9 0 5.5	12.4	4.7	0.31
4	1 2	9 51 15.65	14 35 46.3	6.8	2.6	0.18	19	0 52	12 42 0.90	8 51 51.3	12.6	4.8	0.32
5	1 5	9 58 9.07	13 54 44.6	6.8	2.6	0.18	20	0 46	12 40 24.03	8 39 31.5	12.8	4.9	0.33
6	1 8	10 4 53.37	+13 13 13.8	6.9	2.6	0.18	21	0 40	12 38 23.68	−8 22 58.3	13.0	4.9	0.33
7	1 10	10 11 28.82	12 31 19.0	6.9	2.6	0.18	22	0 34	12 36 0.70	8 2 8.2	13.2	5.0	0.34
8	1 13	10 17 55.62	11 49 4.7	7.0	2.6	0.18	23	0 27	12 33 16.58	7 37 3.1	13.3	5.1	0.34
9	1 15	10 24 14.04	11 6 36.0	7.0	2.7	0.18	24	0 20	12 30 13.56	7 7 51.5	13.4	5.1	0.34
10	1 18	10 30 24.32	10 23 56.5	7.1	2.7	0.18	25	0 13	12 26 54.66	6 34 49.6	13.5	5.1	0.34
11	1 20	10 36 26.66	+ 9 41 10.3	7.1	2.7	0.18	26	0 5	12 23 23.69	−5 58 23.1	13.5	5.1	0.34
12	1 22	10 42 21.30	8 58 21.3	7.2	2.7	0.18	26	23 58	12 19 45.19	5 19 6.2	13.5	5.1	0.34
13	1 23	10 48 8.41	8 15 32.8	7.3	2.8	0.19	27	23 50	12 16 4.36	4 37 42.1	13.5	5.1	0.34
14	1 25	10 53 48.20	7 32 48.2	7.3	2.8	0.19	28	23 43	12 12 26.84	3 55 1.4	13.4	5.1	0.34
15	1 27	10 59 20.81	6 50 10.8	7.4	2.8	0.19	29	23 35	12 8 58.48	3 12 0.6	13.2	5.0	0.34
16	1 28	11 4 46.42	+ 6 7 43.6	7.5	2.8	0.19	30	23 28	12 5 45.13	−2 29 38.7	13.0	4.9	0.33
17	1 30	11 10 5.12	+ 5 25 29.6	7.6	2.9	0.20	Oct. 1	23 21	12 2 52.35	−1 48 55.0	12.8	4.9	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	23 21	12 2 52.35	− 1 48 55.0	12.8	4.9	0.33	Nov. 14	23 44	15 18 37.42	−18 27 49.6	6.1	2.3	0.16
2	23 15	12 0 25.11	1 10 45.5	12.5	4.8	0.32	15	23 46	15 25 0.86	18 58 29.7	6.1	2.3	0.16
3	23 9	11 58 27.67	0 36 0.8	12.2	4.7	0.32	16	23 49	15 31 25.58	19 28 13.4	6.1	2.3	0.16
4	23 4	11 57 3.36	− 0 5 23.8	11.9	4.5	0.30	17	23 51	15 37 51.63	19 56 59.7	6.1	2.3	0.16
5	22 59	11 56 14.55	+ 0 20 31.8	11.6	4.4	0.30	18	23 54	15 44 19.06	20 24 46.7	6.1	2.3	0.16
6	22 55	11 56 2.62	+ 0 41 21.4	11.3	4.3	0.29	19	23 56	15 50 47.91	−20 51 33.2	6.1	2.3	0.16
7	22 51	11 56 27.96	0 56 49.9	10.9	4.1	0.28	20	23 59	15 57 18.24	21 17 18.0	6.1	2.3	0.16
8	22 49	11 57 30.11	1 6 51.2	10.6	4.0	0.27	22	0 1	16 3 50.07	21 41 59.4	6.1	2.3	0.17
9	22 46	11 59 7.92	1 11 26.9	10.3	3.9	0.26	23	0 4	16 10 23.43	22 5 36.1	6.1	2.3	0.17
10	22 45	12 1 19.58	1 10 45.0	10.0	3.8	0.25	24	0 6	16 16 58.30	22 28 6.7	6.1	2.3	0.17
11	22 43	12 4 2.86	+ 1 4 59.0	9.6	3.7	0.25	25	0 9	16 23 34.73	−22 49 29.8	6.1	2.3	0.17
12	22 43	12 7 15.17	0 54 26.7	9.3	3.6	0.25	26	0 12	16 30 12.69	23 9 44.0	6.1	2.3	0.17
13	22 42	12 10 53.83	0 39 28.5	9.1	3.5	0.24	27	0 14	16 36 52.15	23 28 47.9	6.2	2.3	0.17
14	22 42	12 14 56.04	+ 0 20 27.1	8.8	3.4	0.23	28	0 17	16 43 33.10	23 46 40.0	6.2	2.3	0.17
15	22 43	12 19 19.04	− 0 2 13.9	8.6	3.3	0.22	29	0 20	16 50 15.46	24 3 19.0	6.2	2.3	0.17
16	22 44	12 24 0.19	− 0 28 10.9	8.4	3.2	0.22	30	0 23	16 56 59.18	−24 18 43.6	6.2	2.4	0.18
17	22 45	12 28 57.03	0 57 0.6	8.2	3.1	0.21	Dec. 1	0 26	17 3 44.17	24 32 52.1	6.3	2.4	0.18
18	22 46	12 34 7.29	1 28 20.4	8.0	3.0	0.20	2	0 28	17 10 30.31	24 45 43.2	6.3	2.4	0.18
19	22 47	12 39 28.85	2 1 49.2	7.8	3.0	0.20	3	0 31	17 17 17.48	24 57 15.4	6.3	2.4	0.18
20	22 49	12 44 59.99	2 37 7.2	7.6	2.9	0.20	4	0 34	17 24 5.56	25 7 27.7	6.4	2.4	0.18
21	22 50	12 50 39.08	− 3 13 56.1	7.5	2.8	0.19	5	0 37	17 30 54.31	−25 16 18.3	6.4	2.4	0.18
22	22 52	12 56 24.74	3 51 59.4	7.3	2.8	0.19	6	0 40	17 37 43.58	25 23 46.1	6.5	2.5	0.19
23	22 54	13 2 15.81	4 31 2.2	7.2	2.8	0.19	7	0 43	17 44 33.11	25 29 49.7	6.5	2.5	0.19
24	22 56	13 8 11.30	5 10 50.9	7.1	2.7	0.18	8	0 46	17 51 22.63	25 34 28.1	6.6	2.5	0.19
25	22 58	13 14 10.36	5 51 13.8	7.0	2.7	0.18	9	0 48	17 58 11.83	25 37 40.0	6.6	2.5	0.19
26	23 0	13 20 12.35	− 6 31 59.9	6.9	2.6	0.18	10	0 51	18 5 0.37	−25 39 24.5	6.7	2.5	0.19
27	23 2	13 26 16.68	7 13 0.0	6.8	2.6	0.18	11	0 54	18 11 47.83	25 39 40.6	6.7	2.5	0.19
28	23 5	13 32 22.93	7 54 5.7	6.7	2.6	0.18	12	0 57	18 18 33.79	25 38 27.7	6.8	2.6	0.19
29	23 7	13 38 30.72	8 35 9.6	6.7	2.5	0.17	13	1 0	18 25 17.74	25 35 45.1	6.9	2.6	0.19
30	23 9	13 44 39.81	9 16 5.3	6.6	2.5	0.17	14	1 2	18 31 59.10	25 31 32.6	7.0	2.6	0.19
31	23 11	13 50 49.97	− 9 56 47.1	6.5	2.5	0.17	15	1 5	18 38 37.23	−25 25 49.9	7.1	2.7	0.20
Nov. 1	23 13	13 57 1.06	10 37 10.0	6.5	2.5	0.17	16	1 8	18 45 11.41	25 18 37.7	7.2	2.7	0.20
2	23 16	14 3 12.96	11 17 9.4	6.4	2.4	0.17	17	1 10	18 51 40.82	25 9 56.3	7.3	2.8	0.21
3	23 18	14 9 25.63	11 56 41.3	6.4	2.4	0.16	18	1 13	18 58 4.54	24 59 46.5	7.4	2.8	0.21
4	23 20	14 15 39.01	12 35 42.3	6.3	2.4	0.16	19	1 15	19 4 21.52	24 48 10.6	7.5	2.8	0.21
5	23 22	14 21 53.11	−13 14 9.0	6.3	2.4	0.16	20	1 17	19 10 30.57	−24 35 10.2	7.6	2.9	0.21
6	23 25	14 28 7.92	13 51 58.7	6.3	2.4	0.16	21	1 19	19 16 30.36	24 20 48.6	7.8	2.9	0.21
7	23 27	14 34 23.47	14 29 8.7	6.2	2.4	0.16	22	1 21	19 22 19.39	24 5 9.4	7.9	3.0	0.22
8	23 29	14 40 39.82	15 5 36.7	6.2	2.3	0.16	23	1 23	19 27 55.95	23 48 17.4	8.1	3.1	0.23
9	23 32	14 46 57.00	15 41 20.4	6.2	2.3	0.16	24	1 24	19 33 18.13	23 30 18.5	8.2	3.1	0.23
10	23 34	14 53 15.05	−16 16 18.0	6.1	2.3	0.16	25	1 25	19 38 23.84	−23 11 19.4	8.4	3.2	0.23
11	23 36	14 59 34.06	16 50 27.5	6.1	2.3	0.16	26	1 26	19 43 10.59	22 51 29.1	8.6	3.3	0.24
12	23 39	15 5 54.07	17 23 46.9	6.1	2.3	0.16	27	1 27	19 47 35.82	22 30 56.9	8.9	3.4	0.24
13	23 41	15 12 15.17	17 56 14.8	6.1	2.3	0.16	28	1 27	19 51 36.67	22 9 54.7	9.1	3.5	0.25
14	23 44	15 18 37.42	18 27 49.6	6.1	2.3	0.16	29	1 26	19 55 9.97	21 48 35.3	9.3	3.5	0.25
15	23 46	15 25 0.86	−18 58 29.7	6.1	2.3	0.16	30	1 26	19 58 12.43	−21 27 13.7	9.6	3.6	0.26
16	23 49	15 31 25.58	−19 28 13.4	6.1	2.3	0.16	31	1 24	20 0 40.57	−21 6 5.8	9.9	3.7	0.26

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	21 12	15 53 20.42	−15 57 46.3	20.9	19.9	1.39	Feb. 15	21 3	18 44 45.56	−20 18 18.6	11.5	11.0	0.78
1	21 11	15 55 40.78	16 2 22.1	20.5	19.6	1.36	16	21 3	18 49 21.62	20 17 28.4	11.4	10.9	0.77
2	21 9	15 58 6.75	16 7 26.3	20.2	19.3	1.34	17	21 4	18 53 58.66	20 16 8.6	11.3	10.8	0.76
3	21 8	16 0 38.17	16 12 56.7	19.9	19.0	1.32	18	21 5	18 58 36.61	20 14 18.9	11.2	10.7	0.76
4	21 7	16 3 14.87	16 18 51.2	19.6	18.7	1.30	19	21 5	19 3 15.41	20 11 58.9	11.0	10.5	0.75
5	21 5	16 5 56.67	−16 25 7.6	19.3	18.4	1.28	20	21 6	19 7 54.98	−20 9 8.3	10.9	10.4	0.75
6	21 4	16 8 43.41	16 31 43.9	19.0	18.1	1.26	21	21 7	19 12 35.26	20 5 46.9	10.8	10.3	0.74
7	21 3	16 11 34.93	16 38 38.0	18.7	17.8	1.24	22	21 7	19 17 16.19	20 1 54.4	10.7	10.3	0.73
8	21 2	16 14 31.09	16 45 47.8	18.4	17.6	1.22	23	21 8	19 21 57.71	19 57 30.6	10.6	10.2	0.72
9	21 1	16 17 31.74	16 53 11.4	18.1	17.3	1.21	24	21 9	19 26 39.77	19 52 35.4	10.5	10.1	0.72
10	21 0	16 20 36.72	−17 0 46.9	17.9	17.1	1.19	25	21 10	19 31 22.30	−19 47 8.6	10.4	10.0	0.71
11	21 0	16 23 45.88	17 8 32.4	17.6	16.8	1.17	26	21 11	19 36 5.25	19 41 10.2	10.4	9.9	0.70
12	20 59	16 26 59.10	17 16 26.0	17.3	16.6	1.15	27	21 11	19 40 48.56	19 34 40.0	10.3	9.8	0.69
13	20 58	16 30 16.23	17 24 26.0	17.1	16.3	1.14	28	21 12	19 45 32.18	19 27 37.9	10.2	9.7	0.69
14	20 58	16 33 37.15	17 32 30.6	16.9	16.1	1.12	Mar. 1	21 13	19 50 16.07	19 20 4.0	10.1	9.6	0.68
15	20 57	16 37 1.75	−17 40 38.2	16.6	15.9	1.11	2	21 14	19 55 0.18	−19 11 58.3	10.0	9.6	0.68
16	20 57	16 40 29.89	17 48 47.2	16.4	15.7	1.10	3	21 14	19 59 44.44	19 3 20.9	9.9	9.5	0.67
17	20 56	16 44 1.47	17 56 56.0	16.2	15.4	1.09	4	21 15	20 4 28.82	18 54 11.7	9.8	9.4	0.66
18	20 56	16 47 36.38	18 5 3.0	16.0	15.2	1.07	5	21 16	20 9 13.27	18 44 30.9	9.8	9.3	0.65
19	20 56	16 51 14.52	18 13 6.8	15.7	15.0	1.06	6	21 17	20 13 57.73	18 34 18.8	9.7	9.2	0.65
20	20 55	16 54 55.80	−18 21 5.9	15.5	14.8	1.04	7	21 18	20 18 42.16	−18 23 35.5	9.6	9.2	0.64
21	20 55	16 58 40.12	18 28 58.9	15.3	14.6	1.03	8	21 18	20 23 26.51	18 12 21.0	9.5	9.1	0.64
22	20 55	17 2 27.40	18 36 44.5	15.1	14.4	1.02	9	21 19	20 28 10.74	18 0 35.7	9.4	9.0	0.63
23	20 55	17 6 17.54	18 44 21.4	14.9	14.3	1.01	10	21 20	20 32 54.81	17 48 19.9	9.4	8.9	0.63
24	20 55	17 10 10.47	18 51 48.3	14.7	14.1	0.99	11	21 21	20 37 38.67	17 35 33.8	9.3	8.9	0.62
25	20 55	17 14 6.11	−18 59 4.0	14.5	13.9	0.98	12	21 22	20 42 22.27	−17 22 17.6	9.2	8.8	0.62
26	20 55	17 18 4.36	19 6 7.2	14.4	13.7	0.97	13	21 22	20 47 5.57	17 8 31.7	9.2	8.7	0.61
27	20 55	17 22 5.15	19 12 56.8	14.2	13.6	0.96	14	21 23	20 51 48.55	16 54 16.5	9.1	8.7	0.61
28	20 55	17 26 8.41	19 19 31.6	14.0	13.4	0.95	15	21 24	20 56 31.17	16 39 32.4	9.0	8.6	0.60
29	20 55	17 30 14.07	19 25 50.7	13.8	13.2	0.94	16	21 25	21 1 13.39	16 24 19.6	8.9	8.5	0.59
30	20 55	17 34 22.06	−19 31 52.9	13.7	13.1	0.93	17	21 25	21 5 55.20	−16 8 38.6	8.9	8.5	0.59
31	20 56	17 38 32.30	19 37 37.2	13.5	12.9	0.92	18	21 26	21 10 36.56	15 52 29.9	8.8	8.4	0.59
Feb. 1	20 56	17 42 44.73	19 43 2.7	13.4	12.8	0.91	19	21 27	21 15 17.45	15 35 53.8	8.7	8.4	0.58
2	20 56	17 46 59.27	19 48 8.5	13.2	12.6	0.90	20	21 28	21 19 57.85	15 18 50.8	8.7	8.3	0.57
3	20 56	17 51 15.83	19 52 53.6	13.1	12.5	0.89	21	21 28	21 24 37.75	15 1 21.3	8.6	8.2	0.57
4	20 57	17 55 34.35	−19 57 17.1	12.9	12.3	0.88	22	21 29	21 29 17.12	−14 43 25.9	8.6	8.2	0.56
5	20 57	17 59 54.77	20 1 18.2	12.8	12.2	0.87	23	21 30	21 33 55.96	14 25 5.0	8.5	8.1	0.56
6	20 58	18 4 17.00	20 4 56.0	12.6	12.1	0.86	24	21 30	21 38 34.25	14 6 19.2	8.4	8.1	0.56
7	20 58	18 8 40.95	20 8 9.9	12.5	11.9	0.85	25	21 31	21 43 11.98	13 47 8.8	8.4	8.0	0.55
8	20 59	18 13 6.55	20 10 59.1	12.4	11.8	0.84	26	21 32	21 47 49.15	13 27 34.4	8.3	8.0	0.55
9	20 59	18 17 33.74	−20 13 22.8	12.2	11.7	0.83	27	21 33	21 52 25.76	−13 7 36.6	8.3	7.9	0.54
10	21 0	18 22 2.42	20 15 20.6	12.1	11.6	0.82	28	21 33	21 57 1.81	12 47 16.0	8.2	7.9	0.54
11	21 0	18 26 32.51	20 16 51.7	12.0	11.4	0.81	29	21 34	22 1 37.30	12 26 32.9	8.2	7.8	0.53
12	21 1	18 31 3.94	20 17 55.5	11.8	11.3	0.80	30	21 35	22 6 12.23	12 5 28.0	8.1	7.8	0.53
13	21 1	18 35 36.65	20 18 31.6	11.7	11.2	0.79	31	21 35	22 10 46.60	11 44 1.8	8.1	7.7	0.53
14	21 2	18 40 10.55	−20 18 39.5	11.6	11.1	0.79	Apr. 1	21 36	22 15 20.43	−11 22 14.9	8.0	7.7	0.52
15	21 3	18 44 45.56	-20 18 18.6	11.5	11.0	0.78	2	21 36	22 19 53.73	−11 0 7.8	8.0	7.6	0.52

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	21 36	22 15 20.43	−11 22 14.9	8.0	7.7	0.52	May 17	21 59	1 40 33.88	+ 8 32 41.2	6.3	6.0	0.41
2	21 36	22 19 53.73	11 0 7.8	8.0	7.6	0.52	18	22 0	1 45 5.82	8 58 47.6	6.3	6.0	0.41
3	21 37	22 24 26.50	10 37 41.2	7.9	7.6	0.51	19	22 1	1 49 38.43	9 24 43.5	6.3	6.0	0.41
4	21 37	22 28 58.74	10 14 55.7	7.9	7.5	0.51	20	22 1	1 54 11.75	9 50 28.4	6.2	6.0	0.40
5	21 38	22 33 30.47	9 51 51.7	7.8	7.5	0.51	21	22 2	1 58 45.81	10 16 1.5	6.2	5.9	0.40
6	21 39	22 38 1.69	− 9 28 30.0	7.8	7.4	0.50	22	22 3	2 3 20.63	+10 41 22.1	6.2	5.9	0.40
7	21 39	22 42 32.43	9 4 51.1	7.7	7.4	0.50	23	22 3	2 7 56.24	11 6 29.5	6.2	5.9	0.40
8	21 40	22 47 2.68	8 40 55.7	7.7	7.3	0.49	24	22 4	2 12 32.68	11 31 23.1	6.1	5.9	0.40
9	21 40	22 51 32.47	8 16 44.3	7.6	7.3	0.49	25	22 5	2 17 9.98	11 56 2.1	6.1	5.9	0.40
10	21 41	22 56 1.81	7 52 17.7	7.6	7.2	0.49	26	22 5	2 21 48.16	12 20 25.9	6.1	5.8	0.40
11	21 41	23 0 30.70	− 7 27 36.5	7.5	7.2	0.48	27	22 6	2 26 27.24	+12 44 33.8	6.1	5.8	0.40
12	21 42	23 4 59.17	7 2 41.4	7.5	7.2	0.48	28	22 7	2 31 7.25	13 8 25.0	6.1	5.8	0.40
13	21 42	23 9 27.23	6 37 32.9	7.5	7.1	0.48	29	22 7	2 35 48.23	13 31 58.9	6.0	5.8	0.40
14	21 43	23 13 54.90	6 12 11.7	7.4	7.1	0.47	30	22 8	2 40 30.21	13 55 14.9	6.0	5.7	0.40
15	21 43	23 18 22.20	5 46 38.5	7.4	7.0	0.47	31	22 9	2 45 13.18	14 18 12.1	6.0	5.7	0.39
16	21 44	23 22 49.17	− 5 20 53.9	7.3	7.0	0.47	June 1	22 10	2 49 57.18	+14 40 50.0	6.0	5.7	0.39
17	21 44	23 27 15.81	4 54 58.6	7.3	7.0	0.47	2	22 10	2 54 42.24	15 3 7.7	6.0	5.7	0.39
18	21 45	23 31 42.15	4 28 53.1	7.3	6.9	0.46	3	22 11	2 59 28.35	15 25 4.6	5.9	5.7	0.39
19	21 45	23 36 8.20	4 2 38.1	7.2	6.9	0.46	4	22 12	3 4 15.53	15 46 40.1	5.9	5.7	0.39
20	21 46	23 40 34.01	3 36 14.4	7.2	6.9	0.46	5	22 13	3 9 3.81	16 7 53.3	5.9	5.6	0.39
21	21 46	23 44 59.60	− 3 9 42.5	7.1	6.8	0.46	6	22 14	3 13 53.19	+16 28 43.5	5.9	5.6	0.39
22	21 47	23 49 25.00	2 43 3.0	7.1	6.8	0.45	7	22 15	3 18 43.68	16 49 10.1	5.9	5.6	0.39
23	21 47	23 53 50.23	2 16 16.7	7.1	6.8	0.45	8	22 16	3 23 35.28	17 9 12.4	5.8	5.6	0.39
24	21 48	23 58 15.32	1 49 24.1	7.0	6.7	0.45	9	22 17	3 28 27.99	17 28 49.7	5.8	5.6	0.39
25	21 48	0 2 40.32	1 22 25.9	7.0	6.7	0.45	10	22 18	3 33 21.83	17 48 1.3	5.8	5.5	0.39
26	21 49	0 7 5.26	− 0 55 22.7	7.0	6.6	0.44	11	22 19	3 38 16.79	+18 6 46.5	5.8	5.5	0.39
27	21 49	0 11 30.16	0 28 15.3	6.9	6.6	0.44	12	22 20	3 43 12.87	18 25 4.5	5.8	5.5	0.39
28	21 50	0 15 55.06	− 0 1 4.2	6.9	6.6	0.44	13	22 21	3 48 10.06	18 42 54.8	5.7	5.5	0.39
29	21 50	0 20 20.00	+ 0 26 10.0	6.9	6.6	0.44	14	22 22	3 53 8.37	19 0 16.7	5.7	5.5	0.39
30	21 51	0 24 45.02	0 53 26.7	6.8	6.5	0.44	15	22 23	3 58 7.78	19 17 9.4	5.7	5.5	0.39
May 1	21 51	0 29 10.15	+ 1 20 45.2	6.8	6.5	0.43	16	22 24	4 3 8.27	+19 33 32.4	5.7	5.4	0.38
2	21 52	0 33 35.41	1 48 4.8	6.8	6.5	0.43	17	22 25	4 8 9.84	19 49 24.9	5.7	5.4	0.38
3	21 52	0 38 0.85	2 15 24.9	6.7	6.4	0.43	18	22 26	4 13 12.49	20 4 46.5	5.7	5.4	0.38
4	21 53	0 42 26.51	2 42 44.8	6.7	6.4	0.43	19	22 27	4 18 16.19	20 19 36.5	5.6	5.4	0.38
5	21 53	0 46 52.42	3 10 3.9	6.7	6.4	0.43	20	22 28	4 23 20.92	20 33 54.2	5.6	5.4	0.38
6	21 54	0 51 18.60	+ 3 37 21.5	6.6	6.3	0.42	21	22 29	4 28 26.67	+20 47 39.0	5.6	5.4	0.38
7	21 55	0 55 45.09	4 4 36.9	6.6	6.3	0.42	22	22 30	4 33 33.41	21 0 50.5	5.6	5.4	0.38
8	21 55	1 0 11.92	4 31 49.4	6.6	6.3	0.42	23	22 32	4 38 41.11	21 13 27.9	5.6	5.3	0.38
9	21 55	1 4 39.12	4 58 58.4	6.5	6.2	0.42	24	22 33	4 43 49.77	21 25 30.8	5.6	5.3	0.38
10	21 56	1 9 6.73	5 26 3.2	6.5	6.2	0.42	25	22 34	4 48 59.36	21 36 58.7	5.6	5.3	0.38
11	21 56	1 13 34.78	+ 5 53 3.1	6.5	6.2	0.42	26	22 35	4 54 9.84	+21 47 51.0	5.5	5.3	0.38
12	21 57	1 18 3.29	6 19 57.4	6.5	6.2	0.41	27	22 37	4 59 21.19	21 58 7.3	5.5	5.3	0.38
13	21 57	1 22 32.29	6 46 45.5	6.4	6.1	0.41	28	22 38	5 4 33.38	22 7 47.0	5.5	5.3	0.38
14	21 58	1 27 1.82	7 13 26.5	6.4	6.1	0.41	29	22 39	5 9 46.38	22 16 49.7	5.5	5.3	0.38
15	21 58	1 31 31.91	7 39 59.9	6.4	6.1	0.41	30	22 40	5 15 0.14	22 25 15.0	5.5	5.3	0.38
16	21 59	1 36 2.59	+ 8 6 25.1	6.3	6.1	0.41	July 1	22 42	5 20 14.62	+22 33 2.5	5.5	5.2	0.38
17	21 59	1 40 33.88	+ 8 32 41.2	6.3	6.0	0.41	2	22 43	5 25 29.79	+22 40 11.7	5.5	5.2	0.38

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 42	5 20 14.62	+22 33 2.5	5.5	5.2	0.38	Aug. 16	23 40	9 20 15.69	+16 44 10.0	5.1	4.9	0.34
2	22 43	5 25 29.79	22 40 11.7	5.5	5.2	0.38	17	23 41	9 25 11.95	16 22 40.7	5.1	4.9	0.34
3	22 44	5 30 45.61	22 46 42.3	5.5	5.2	0.38	18	23 42	9 30 7.16	16 0 44.0	5.1	4.9	0.34
4	22 46	5 36 2.02	22 52 34.0	5.4	5.2	0.38	19	23 43	9 35 1.31	15 38 20.5	5.1	4.9	0.34
5	22 47	5 41 18.97	22 57 46.5	5.4	5.2	0.38	20	23 44	9 39 54.42	15 15 31.0	5.1	4.9	0.34
6	22 48	5 46 36.43	+23 2 19.4	5.4	5.2	0.38	21	23 45	9 44 46.49	+14 52 16.1	5.1	4.9	0.34
7	22 50	5 51 54.34	23 6 12.5	5.4	5.2	0.38	22	23 46	9 49 37.55	14 28 36.5	5.1	4.9	0.34
8	22 51	5 57 12.64	23 9 25.6	5.4	5.2	0.37	23	23 47	9 54 27.62	14 4 32.9	5.1	4.9	0.34
9	22 52	6 2 31.29	23 11 58.3	5.4	5.1	0.37	24	23 48	9 59 16.69	13 40 5.9	5.1	4.9	0.34
10	22 54	6 7 50.23	23 13 50.5	5.4	5.1	0.37	25	23 48	10 4 4.79	13 15 16.4	5.1	4.9	0.34
11	22 55	6 13 9.39	+23 15 2.2	5.4	5.1	0.37	26	23 49	10 8 51.95	+12 50 5.0	5.1	4.9	0.33
12	22 56	6 18 28.73	23 15 33.2	5.4	5.1	0.37	27	23 50	10 13 38.19	12 24 32.3	5.1	4.9	0.33
13	22 58	6 23 48.18	23 15 23.3	5.3	5.1	0.37	28	23 51	10 18 23.53	11 58 39.2	5.1	4.9	0.33
14	22 59	6 29 7.70	23 14 32.4	5.3	5.1	0.37	29	23 52	10 22 7.99	11 32 26.4	5.1	4.9	0.33
15	23 1	6 34 27.24	23 13 0.6	5.3	5.1	0.37	30	23 52	10 27 51.60	11 5 54.5	5.1	4.9	0.33
16	23 2	6 39 46.71	+23 10 47.9	5.3	5.1	0.37	31	23 53	10 32 34.38	+10 39 4.2	5.1	4.9	0.33
17	23 3	6 45 6.07	23 7 54.3	5.3	5.1	0.37	Sept. 1	23 54	10 37 16.37	10 11 56.4	5.1	4.9	0.33
18	23 5	6 50 25.27	23 4 19.7	5.3	5.1	0.37	2	23 55	10 41 57.60	9 44 31.6	5.1	4.9	0.33
19	23 6	6 55 44.25	23 0 4.3	5.3	5.1	0.37	3	23 55	10 46 38.08	9 16 50.7	5.1	4.9	0.33
20	23 7	7 1 2.96	22 55 8.3	5.3	5.1	0.37	4	23 56	10 51 17.85	8 48 54.4	5.1	4.9	0.33
21	23 9	7 6 21.34	+22 49 31.7	5.3	5.0	0.37	5	23 57	10 55 56.96	+ 8 20 43.4	5.1	4.9	0.33
22	23 10	7 11 39.35	22 43 14.8	5.3	5.0	0.36	6	23 58	11 0 35.43	7 52 18.4	5.1	4.9	0.33
23	23 11	7 16 56.94	22 36 17.7	5.3	5.0	0.36	7	23 58	11 5 13.28	7 23 40.2	5.1	4.9	0.33
24	23 13	7 22 14.06	22 28 40.7	5.3	5.0	0.36	8	23 59	11 9 50.55	6 54 49.5	5.1	4.9	0.33
25	23 14	7 27 30.67	22 20 23.9	5.2	5.0	0.36	9	24 0	11 14 27.28	6 25 47.0	5.1	4.9	0.33
26	23 15	7 32 46.72	+22 11 27.7	5.2	5.0	0.36	11	0 0	11 19 3.50	+ 5 56 33.5	5.1	4.9	0.33
27	23 17	7 38 2.18	22 1 52.4	5.2	5.0	0.36	12	0 1	11 23 39.24	5 27 9.8	5.1	4.9	0.33
28	23 18	7 43 17.00	21 51 38.2	5.2	5.0	0.36	13	0 2	11 28 14.54	4 57 36.5	5.1	4.9	0.33
29	23 19	7 48 31.13	21 40 45.5	5.2	5.0	0.36	14	0 2	11 32 49.43	4 27 54.5	5.1	4.9	0.33
30	23 21	7 53 44.55	21 29 14.7	5.2	5.0	0.36	15	0 3	11 37 23.96	3 58 4.5	5.1	4.9	0.33
31	23 22	7 58 57.22	+21 17 6.3	5.2	5.0	0.36	16	0 3	11 41 58.15	+ 3 28 7.1	5.1	4.9	0.33
Aug. 1	23 23	8 4 9.10	21 4 20.6	5.2	5.0	0.36	17	0 4	11 46 32.05	2 58 3.1	5.1	4.9	0.33
2	23 24	8 9 20.17	20 50 58.0	5.2	5.0	0.35	18	0 5	11 51 5.70	2 27 53.2	5.1	4.9	0.33
3	23 26	8 14 30.38	20 36 59.2	5.2	5.0	0.35	19	0 5	11 55 39.15	1 57 38.3	5.1	4.9	0.33
4	23 27	8 19 39.71	20 22 24.5	5.2	5.0	0.35	20	0 6	12 0 12.43	1 27 18.9	5.1	4.9	0.33
5	23 28	8 24 48.15	+20 7 14.4	5.2	4.9	0.35	21	0 7	12 4 45.58	+ 0 56 55.9	5.1	4.9	0.33
6	23 29	8 29 55.66	19 51 29.4	5.2	4.9	0.35	22	0 7	12 9 18.65	+ 0 26 30.0	5.1	4.9	0.33
7	23 30	8 35 2.21	19 35 10.1	5.2	4.9	0.35	23	0 8	12 13 51.69	− 0 3 58.1	5.1	4.9	0.33
8	23 32	8 40 7.80	19 18 17.0	5.2	4.9	0.35	24	0 8	12 18 24.73	0 34 27.6	5.1	4.9	0.33
9	23 33	8 45 12.40	19 0 50.8	5.2	4.9	0.35	25	0 9	12 22 57.82	1 4 57.9	5.1	4.9	0.33
10	23 34	8 50 15.98	+18 42 52.0	5.2	4.9	0.35	26	0 10	12 27 31.00	− 1 35 28.3	5.1	4.9	0.33
11	23 35	8 55 18.55	18 24 21.2	5.1	4.9	0.35	27	0 10	12 32 4.32	2 5 57.9	5.1	4.9	0.33
12	23 36	9 0 20.09	18 5 19.1	5.1	4.9	0.34	28	0 11	12 36 37.84	2 36 26.0	5.1	4.9	0.33
13	23 37	9 5 20.58	17 45 46.3	5.1	4.9	0.34	29	0 11	12 41 11.58	3 6 52.0	5.1	4.9	0.33
14	23 38	9 10 20.01	17 25 43.4	5.1	4.9	0.34	30	0 12	12 45 45.59	3 37 15.0	5.1	4.9	0.33
15	23 39	9 15 18.38	+17 5 11.1	5.1	4.9	0.34	Oct. 1	0 13	12 50 19.91	− 4 7 34.3	5.1	4.9	0.33
16	23 40	9 20 15.69	+16 44 10.0	5.1	4.9	0.34	2	0 13	12 54 54.59	− 4 37 49.3	5.2	4.9	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 13	12 50 19.91	− 4 7 34.3	5.1	4.9	0.33	Nov. 15	0 55	16 30 36.22	−22 18 29.7	5.5	5.2	0.38
2	0 13	12 54 54.59	4 37 49.3	5.2	4.9	0.33	16	0 57	16 35 55.64	22 31 58.5	5.5	5.2	0.38
3	0 14	12 59 29.67	5 7 59.1	5.2	4.9	0.33	17	0 58	16 41 16.05	22 44 47.9	5.5	5.2	0.38
4	0 15	13 4 5.20	5 38 2.9	5.2	4.9	0.33	18	1 0	16 46 37.41	22 56 57.2	5.5	5.3	0.38
5	0 15	13 8 41.21	6 8 0.0	5.2	4.9	0.33	19	1 1	16 51 59.69	23 8 25.9	5.5	5.3	0.38
6	0 16	13 13 17.74	− 6 37 49.6	5.2	4.9	0.33	20	1 2	16 57 22.84	−23 19 13.5	5.5	5.3	0.38
7	0 17	13 17 54.84	7 7 31.1	5.2	4.9	0.33	21	1 4	17 2 46.81	23 29 19.5	5.5	5.3	0.38
8	0 17	13 22 32.54	7 37 3.6	5.2	4.9	0.33	22	1 5	17 8 11.56	23 38 43.3	5.5	5.3	0.38
9	0 18	13 27 10.88	8 6 26.4	5.2	4.9	0.33	23	1 7	17 13 37.03	23 47 24.7	5.5	5.3	0.39
10	0 19	13 31 49.90	8 35 38.6	5.2	5.0	0.33	24	1 8	17 19 3.17	23 55 23.2	5.6	5.3	0.39
11	0 19	13 36 29.64	− 9 4 39.5	5.2	5.0	0.34	25	1 10	17 24 29.94	−24 2 38.3	5.6	5.3	0.39
12	0 20	13 41 10.12	9 33 28.2	5.2	5.0	0.34	26	1 11	17 29 57.27	24 9 9.7	5.6	5.3	0.39
13	0 21	13 45 51.38	10 2 4.1	5.2	5.0	0.34	27	1 13	17 35 25.10	24 14 57.1	5.6	5.3	0.39
14	0 22	13 50 33.45	10 30 26.2	5.2	5.0	0.34	28	1 14	17 40 53.38	24 20 0.2	5.6	5.4	0.39
15	0 22	13 55 16.38	10 58 33.8	5.2	5.0	0.34	29	1 16	17 46 22.05	24 24 18.8	5.6	5.4	0.39
16	0 23	14 0 0.19	−11 26 26.1	5.2	5.0	0.34	30	1 17	17 51 51.04	−24 27 52.6	5.6	5.4	0.40
17	0 24	14 4 44.91	11 54 2.3	5.2	5.0	0.34	Dec. 1	1 19	17 57 20.29	24 30 41.4	5.6	5.4	0.40
18	0 25	14 9 30.57	12 21 21.6	5.2	5.0	0.34	2	1 21	18 2 49.73	24 32 45.1	5.7	5.4	0.40
19	0 26	14 14 17.21	12 48 23.2	5.2	5.0	0.34	3	1 22	18 8 19.29	24 34 3.6	5.7	5.4	0.40
20	0 26	14 19 4.86	13 15 6.3	5.2	5.0	0.34	4	1 24	18 13 48.90	24 34 36.8	5.7	5.4	0.40
21	0 27	14 23 53.56	−13 41 30.1	5.2	5.0	0.34	5	1 25	18 19 18.51	−24 34 24.6	5.7	5.5	0.40
22	0 28	14 28 43.32	14 7 33.8	5.3	5.0	0.35	6	1 27	18 24 48.04	24 33 27.0	5.7	5.5	0.40
23	0 29	14 33 34.16	14 33 16.7	5.3	5.0	0.35	7	1 28	18 30 17.42	24 31 43.9	5.7	5.5	0.40
24	0 30	14 38 26.12	14 58 38.0	5.3	5.0	0.35	8	1 30	18 35 46.58	24 29 15.6	5.7	5.5	0.40
25	0 31	14 43 19.22	15 23 36.7	5.3	5.0	0.35	9	1 31	18 41 15.44	24 26 2.2	5.8	5.5	0.40
26	0 32	14 48 13.49	−15 48 12.2	5.3	5.1	0.35	10	1 33	18 46 43.94	−24 22 3.7	5.8	5.5	0.41
27	0 33	14 53 8.94	16 12 23.6	5.3	5.1	0.35	11	1 34	18 52 11.99	24 17 20.2	5.8	5.5	0.41
28	0 34	14 58 5.58	16 36 10.1	5.3	5.1	0.35	12	1 36	18 57 39.54	24 11 52.0	5.8	5.5	0.41
29	0 35	15 3 3.45	16 59 31.0	5.3	5.1	0.35	13	1 37	19 3 6.52	24 5 39.4	5.8	5.6	0.41
30	0 36	15 8 2.55	17 22 25.4	5.3	5.1	0.35	14	1 39	19 8 32.87	23 58 42.6	5.8	5.6	0.41
31	0 37	15 13 2.89	−17 44 52.6	5.3	5.1	0.36	15	1 40	19 13 58.52	−23 51 1.9	5.8	5.6	0.41
Nov. 1	0 38	15 18 4.49	18 6 51.8	5.3	5.1	0.36	16	1 42	19 19 23.41	23 42 37.7	5.9	5.6	0.41
2	0 39	15 23 7.35	18 28 22.1	5.3	5.1	0.36	17	1 43	19 24 47.49	23 33 30.3	5.9	5.6	0.41
3	0 40	15 28 11.47	18 49 22.9	5.3	5.1	0.36	18	1 45	19 30 10.70	23 23 40.2	5.9	5.6	0.41
4	0 42	15 33 16.84	19 9 53.3	5.4	5.1	0.36	19	1 46	19 35 33.00	23 13 7.7	5.9	5.7	0.41
5	0 43	15 38 23.48	−19 29 52.6	5.4	5.1	0.36	20	1 48	19 40 54.33	−23 1 53.3	5.9	5.7	0.41
6	0 44	15 43 31.37	19 49 19.9	5.4	5.1	0.36	21	1 49	19 46 14.63	22 49 57.4	5.9	5.7	0.41
7	0 45	15 48 40.50	20 8 14.6	5.4	5.1	0.37	22	1 50	19 51 33.87	22 37 20.6	6.0	5.7	0.41
8	0 46	15 53 50.87	20 26 35.9	5.4	5.2	0.37	23	1 52	19 56 52.00	22 24 3.5	6.0	5.7	0.41
9	0 48	15 59 2.46	20 44 23.1	5.4	5.2	0.37	24	1 53	20 2 8.99	22 10 6.6	6.0	5.7	0.41
10	0 49	16 4 15.24	−21 1 35.4	5.4	5.2	0.37	25	1 54	20 7 24.81	−21 55 30.5	6.0	5.7	0.41
11	0 50	16 9 29.19	21 18 12.1	5.4	5.2	0.37	26	1 56	20 12 39.42	21 40 15.7	6.0	5.8	0.41
12	0 51	16 14 44.29	21 34 12.6	5.4	5.2	0.37	27	1 57	20 17 52.79	21 24 22.8	6.1	5.8	0.41
13	0 53	16 20 0.52	21 49 36.1	5.4	5.2	0.37	28	1 58	20 23 4.89	21 7 52.5	6.1	5.8	0.41
14	0 54	16 25 17.84	22 4 22.0	5.5	5.2	0.37	29	1 59	20 28 15.70	20 50 45.6	6.1	5.8	0.42
15	0 55	16 30 36.22	−22 18 29.7	5.5	5.2	0.38	30	2 1	20 33 25.21	−20 33 2.6	6.1	5.8	0.42
16	0 57	16 35 55.64	−22 31 58.5	5.5	5.2	0.38	31	2 2	20 38 33.38	−20 14 44.2	6.1	5.9	0.42

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 9	19 34	14 50 15.34	−15 11 23.1	1.5	15.9	1.17	Feb. 24	16 50	15 6 53.50	−16 14 53.0	1.7	18.2	1.35
10	19 31	14 50 49.80	15 13 48.0	1.5	15.9	1.17	25	16 46	15 6 59.57	16 15 7.2	1.7	18.2	1.35
11	19 27	14 51 23.80	15 16 10.3	1.5	16.0	1.18	26	16 42	15 7 4.90	16 15 18.3	1.8	18.3	1.36
12	19 24	14 51 57.34	15 18 30.0	1.5	16.0	1.18	27	16 38	15 7 9.48	16 15 26.5	1.8	18.3	1.36
13	19 21	14 52 30.40	15 20 47.2	1.5	16.1	1.18	28	16 34	15 7 13.33	16 15 31.7	1.8	18.4	1.36
14	19 17	14 53 2.97	−15 23 1.7	1.5	16.1	1.19	Mar. 1	16 31	15 7 16.43	−16 15 33.9	1.8	18.5	1.37
15	19 14	14 53 35.05	15 25 13.5	1.5	16.1	1.19	2	16 27	15 7 18.78	16 15 33.1	1.8	18.5	1.37
16	19 10	14 54 6.63	15 27 22.7	1.5	16.2	1.20	3	16 23	15 7 20.39	16 15 29.2	1.8	18.6	1.38
17	19 7	14 54 37.69	15 29 29.4	1.6	16.2	1.20	4	16 19	15 7 21.25	16 15 22.4	1.8	18.6	1.38
18	19 4	14 55 8.24	15 31 33.3	1.6	16.3	1.20	5	16 15	15 7 21.35	16 15 12.5	1.8	18.7	1.39
19	19 0	14 55 38.26	−15 33 34.5	1.6	16.3	1.21	6	16 11	15 7 20.71	−16 14 59.7	1.8	18.7	1.39
20	18 57	14 56 7.75	15 35 33.1	1.6	16.4	1.21	7	16 7	15 7 19.32	16 14 43.9	1.8	18.8	1.40
21	18 53	14 56 36.70	15 37 29.0	1.6	16.4	1.22	8	16 3	15 7 17.18	16 14 25.0	1.8	18.9	1.40
22	18 50	14 57 5.11	15 39 22.1	1.6	16.5	1.22	9	15 59	15 7 14.28	16 14 3.2	1.8	18.9	1.40
23	18 46	14 57 32.98	15 41 12.4	1.6	16.5	1.22	10	15 55	15 7 10.63	16 13 38.5	1.8	19.0	1.41
24	18 43	14 58 0.28	−15 43 0.0	1.6	16.5	1.23	11	15 51	15 7 6.23	−16 13 10.7	1.8	19.0	1.41
25	18 39	14 58 27.00	15 44 44.8	1.6	16.6	1.23	12	15 47	15 7 1.07	16 12 40.0	1.8	19.1	1.41
26	18 36	14 58 53.16	15 46 26.9	1.6	16.6	1.24	13	15 43	15 6 55.16	16 12 6.2	1.8	19.1	1.42
27	18 32	14 59 18.75	15 48 6.2	1.6	16.7	1.24	14	15 39	15 6 48.51	16 11 29.5	1.8	19.2	1.42
28	18 29	14 59 43.74	15 49 42.7	1.6	16.7	1.24	15	15 35	15 6 41.13	16 10 50.0	1.8	19.2	1.42
29	18 25	15 0 8.14	−15 51 16.3	1.6	16.8	1.25	16	15 31	15 6 33.00	−16 10 7.5	1.8	19.3	1.43
30	18 22	15 0 31.96	15 52 47.1	1.6	16.8	1.25	17	15 27	15 6 24.14	16 9 22.1	1.8	19.3	1.43
31	18 18	15 0 55.17	15 54 15.2	1.6	16.9	1.26	18	15 23	15 6 14.55	16 8 33.8	1.9	19.4	1.43
Feb. 1	18 15	15 1 17.75	15 55 40.5	1.6	16.9	1.26	19	15 19	15 6 4.24	16 7 42.7	1.9	19.4	1.44
2	18 11	15 1 39.72	15 57 2.9	1.6	17.0	1.26	20	15 15	15 5 53.21	16 6 48.8	1.9	19.5	1.44
3	18 8	15 2 1.07	−15 58 22.4	1.6	17.0	1.27	21	15 10	15 5 41.48	−16 5 52.0	1.9	19.5	1.44
4	18 4	15 2 21.79	15 59 39.0	1.6	17.1	1.27	22	15 6	15 5 29.04	16 4 52.4	1.9	19.6	1.45
5	18 0	15 2 41.87	16 0 52.8	1.6	17.1	1.27	23	15 2	15 5 15.90	16 3 50.1	1.9	19.6	1.45
6	17 57	15 3 1.31	16 2 3.7	1.6	17.2	1.28	24	14 58	15 5 2.08	16 2 45.1	1.9	19.7	1.45
7	17 53	15 3 20.09	16 3 11.7	1.7	17.2	1.28	25	14 54	15 4 47.59	16 1 37.4	1.9	19.7	1.46
8	17 50	15 3 38.21	−16 4 16.7	1.7	17.3	1.28	26	14 50	15 4 32.42	−16 0 27.0	1.9	19.8	1.46
9	17 46	15 3 55.67	16 5 18.8	1.7	17.3	1.29	27	14 45	15 4 16.60	15 59 14.1	1.9	19.8	1.46
10	17 42	15 4 12.46	16 6 18.0	1.7	17.4	1.29	28	14 41	15 4 0.13	15 57 58.5	1.9	19.9	1.47
11	17 39	15 4 28.56	16 7 14.3	1.7	17.5	1.30	29	14 37	15 3 43.03	15 56 40.4	1.9	19.9	1.47
12	17 35	15 4 43.97	16 8 7.6	1.7	17.5	1.30	30	14 33	15 3 25.29	15 55 19.8	1.9	20.0	1.48
13	17 31	15 4 58.69	−16 8 57.9	1.7	17.6	1.31	31	14 28	15 3 6.93	−15 53 56.7	1.9	20.0	1.48
14	17 28	15 5 12.71	16 9 45.1	1.7	17.6	1.31	Apr. 1	14 24	15 2 47.97	15 52 31.2	1.9	20.0	1.48
15	17 24	15 5 26.02	16 10 29.4	1.7	17.7	1.31	2	14 20	15 2 28.41	15 51 3.3	1.9	20.1	1.49
16	17 20	15 5 38.63	16 11 10.8	1.7	17.7	1.32	3	14 16	15 2 8.26	15 49 33.0	1.9	20.1	1.49
17	17 16	15 5 50.52	16 11 49.2	1.7	17.8	1.32	4	14 11	15 1 47.54	15 48 0.5	1.9	20.2	1.49
18	17 13	15 6 1.69	−16 12 24.5	1.7	17.8	1.33	5	14 7	15 1 26.26	−15 46 25.6	1.9	20.2	1.50
19	17 9	15 6 12.14	16 12 56.8	1.7	17.9	1.33	6	14 3	15 1 4.42	15 44 48.5	1.9	20.2	1.50
20	17 5	15 6 21.87	16 13 26.0	1.7	18.0	1.33	7	13 59	15 0 42.04	15 43 9.2	1.9	20.3	1.50
21	17 1	15 6 30.88	16 13 52.3	1.7	18.0	1.34	8	13 54	15 0 19.13	15 41 27.8	1.9	20.3	1.50
22	16 57	15 6 39.15	16 14 15.5	1.7	18.1	1.34	9	13 50	14 59 55.71	15 39 44.4	1.9	20.4	1.51
23	16 54	15 6 46.69	−16 14 35.8	1.7	18.1	1.35	10	13 46	14 59 31.80	−15 37 59.0	2.0	20.4	1.51
24	16 50	15 6 53.50	−16 14 53.0	1.7	18.2	1.35	11	13 41	14 59 7.41	−15 36 11.6	2.0	20.4	1.51

Stellar magnitude at opposition in May, 1923, −2.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 11	13 41	14 59 7.41	−15 36 11.6	2.0	20.4	1.51	May 27	10 19	14 37 20.14	−14 1 34.8	2.0	20.5	1.51
12	13 37	14 58 42.56	15 34 22.4	2.0	20.5	1.51	28	10 14	14 36 55.17	13 59 48.7	2.0	20.5	1.51
13	13 33	14 58 17.27	15 32 31.3	2.0	20.5	1.52	29	10 10	14 36 30.64	13 58 4.7	2.0	20.5	1.51
14	13 28	14 57 51.55	15 30 38.4	2.0	20.5	1.52	30	10 6	14 36 6.56	13 56 22.9	2.0	20.5	1.51
15	13 24	14 57 25.41	15 28 43.8	2.0	20.5	1.52	31	10 1	14 35 42.94	13 54 43.5	2.0	20.4	1.50
16	13 20	14 56 58.88	−15 26 47.6	2.0	20.6	1.52	June 1	9 57	14 35 19.80	−13 53 6.3	2.0	20.4	1.50
17	13 15	14 56 31.98	15 24 49.9	2.0	20.6	1.52	2	9 53	14 34 57.15	13 51 31.4	2.0	20.4	1.50
18	13 11	14 56 4.73	15 22 50.7	2.0	20.6	1.52	3	9 48	14 34 35.00	13 49 59.1	1.9	20.3	1.50
19	13 6	14 55 37.14	15 20 50.1	2.0	20.7	1.52	4	9 44	14 34 13.36	13 48 29.3	1.9	20.3	1.49
20	13 2	14 55 9.24	15 18 48.2	2.0	20.7	1.52	5	9 40	14 33 52.26	13 47 2.1	1.9	20.3	1.49
21	12 58	14 54 41.05	−15 16 45.1	2.0	20.7	1.53	6	9 36	14 33 31.70	−13 45 37.5	1.9	20.2	1.49
22	12 53	14 54 12.58	15 14 40.9	2.0	20.7	1.53	7	9 31	14 33 11.68	13 44 15.7	1.9	20.2	1.48
23	12 49	14 53 43.86	15 12 35.6	2.0	20.7	1.53	8	9 27	14 32 52.23	13 42 56.6	1.9	20.1	1.48
24	12 44	14 53 14.91	15 10 29.3	2.0	20.8	1.53	9	9 23	14 32 33.36	13 41 40.3	1.9	20.1	1.48
25	12 40	14 52 45.74	15 8 22.0	2.0	20.8	1.53	10	9 19	14 32 15.08	13 40 27.0	1.9	20.1	1.47
26	12 35	14 52 16.38	−15 6 14.0	2.0	20.8	1.53	11	9 14	14 31 57.40	−13 39 16.6	1.9	20.0	1.47
27	12 31	14 51 46.85	15 4 5.3	2.0	20.8	1.53	12	9 10	14 31 40.32	13 38 9.1	1.9	20.0	1.47
28	12 27	14 51 17.16	15 1 55.9	2.0	20.8	1.53	13	9 6	14 31 23.85	13 37 4.7	1.9	19.9	1.46
29	12 22	14 50 47.33	14 59 46.0	2.0	20.8	1.53	14	9 2	14 31 8.01	13 36 3.3	1.9	19.9	1.46
30	12 18	14 50 17.39	14 57 35.7	2.0	20.8	1.53	15	8 58	14 30 52.80	13 35 5.1	1.9	19.8	1.46
May 1	12 13	14 49 47.36	−14 55 25.0	2.0	20.8	1.54	16	8 53	14 30 38.23	−13 34 10.1	1.9	19.8	1.46
2	12 9	14 49 17.26	14 53 14.0	2.0	20.8	1.54	17	8 49	14 30 24.31	13 33 18.2	1.9	19.7	1.45
3	12 5	14 48 47.11	14 51 2.8	2.0	20.8	1.54	18	8 45	14 30 11.05	13 32 29.5	1.9	19.7	1.45
4	12 0	14 48 16.92	14 48 51.5	2.0	20.8	1.54	19	8 41	14 29 58.44	13 31 44.1	1.9	19.6	1.45
5	11 56	14 47 46.72	14 46 40.2	2.0	20.8	1.54	20	8 37	14 29 46.50	13 31 2.1	1.9	19.6	1.44
6	11 51	14 47 16.53	−14 44 28.9	2.0	20.8	1.54	21	8 33	14 29 35.24	−13 30 23.4	1.9	19.5	1.44
7	11 47	14 46 46.35	14 42 17.8	2.0	20.8	1.54	22	8 29	14 29 24.65	13 29 47.9	1.9	19.5	1.44
8	11 42	14 46 16.21	14 40 6.9	2.0	20.8	1.54	23	8 25	14 29 14.74	13 29 15.7	1.9	19.4	1.43
9	11 38	14 45 46.15	14 37 56.4	2.0	20.8	1.54	24	8 20	14 29 5.51	13 28 47.0	1.9	19.4	1.43
10	11 33	14 45 16.19	14 35 46.3	2.0	20.8	1.54	25	8 16	14 28 56.96	13 28 21.7	1.8	19.3	1.43
11	11 29	14 44 46.33	−14 33 36.7	2.0	20.8	1.54	26	8 12	14 28 49.10	−13 27 59.8	1.8	19.3	1.42
12	11 25	14 44 16.60	14 31 27.7	2.0	20.8	1.53	27	8 8	14 28 41.92	13 27 41.3	1.8	19.2	1.42
13	11 20	14 43 47.02	14 29 19.5	2.0	20.8	1.53	28	8 4	14 28 35.44	13 27 26.2	1.8	19.2	1.42
14	11 16	14 43 17.62	14 27 12.2	2.0	20.8	1.53	29	8 0	14 28 29.65	13 27 14.6	1.8	19.1	1.41
15	11 11	14 42 48.41	14 25 5.8	2.0	20.8	1.53	30	7 56	14 28 24.55	13 27 6.4	1.8	19.1	1.41
16	11 7	14 42 19.41	−14 23 0.4	2.0	20.8	1.53	July 1	7 52	14 28 20.14	−13 27 1.6	1.8	19.0	1.41
17	11 3	14 41 50.65	14 20 56.1	2.0	20.8	1.53	2	7 48	14 28 16.42	13 27 0.2	1.8	19.0	1.40
18	10 58	14 41 22.14	14 18 53.0	2.0	20.7	1.53	3	7 44	14 28 13.40	13 27 2.2	1.8	18.9	1.40
19	10 54	14 40 53.91	14 16 51.3	2.0	20.7	1.52	4	7 40	14 28 11.08	13 27 7.7	1.8	18.9	1.39
20	10 49	14 40 25.98	14 14 50.9	2.0	20.7	1.52	5	7 36	14 28 9.46	13 27 16.6	1.8	18.8	1.39
21	10 45	14 39 58.36	−14 12 52.0	2.0	20.7	1.52	6	7 32	14 28 8.54	−13 27 29.0	1.8	18.8	1.39
22	10 41	14 39 31.07	14 10 54.6	2.0	20.7	1.52	7	7 28	14 28 8.32	13 27 44.8	1.8	18.7	1.38
23	10 36	14 39 4.12	14 8 59.0	2.0	20.6	1.52	8	7 24	14 28 8.81	13 28 4.0	1.8	18.7	1.38
24	10 32	14 38 37.54	14 7 5.2	2.0	20.6	1.52	9	7 21	14 28 10.00	13 28 26.6	1.8	18.6	1.38
25	10 27	14 38 11.34	14 5 13.1	2.0	20.6	1.52	10	7 17	14 28 11.88	13 28 52.7	1.8	18.6	1.37
26	10 23	14 37 45.54	−14 3 23.0	2.0	20.6	1.51	11	7 13	14 28 14.46	−13 29 22.2	1.8	18.5	1.37
27	10 19	14 37 20.14	−14 1 34.8	2.0	20.5	1.51	12	7 9	14 28 17.75	−13 29 55.0	1.8	18.5	1.36

Stellar magnitude at opposition in May, 1923, −2.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	18 35	13 15 19.69	−5 20 58.1	0.9	7.7	0.57	Feb. 15	15 36	13 17 15.53	−5 19 10.6	1.0	8.3	0.62
1	18 31	13 15 30.82	5 21 48.5	0.9	7.7	0.57	16	15 32	13 17 8.94	5 18 14.6	1.0	8.3	0.62
2	18 27	13 15 41.60	5 22 36.8	0.9	7.7	0.57	17	15 28	13 17 1.99	5 17 16.6	1.0	8.3	0.62
3	18 24	13 15 52.02	5 23 22.9	0.9	7.7	0.58	18	15 24	13 16 54.69	5 16 16.6	1.0	8.3	0.62
4	18 20	13 16 2.07	5 24 6.6	0.9	7.7	0.58	19	15 20	13 16 47.04	5 15 14.6	1.0	8.3	0.62
5	18 16	13 16 11.75	−5 24 48.0	0.9	7.7	0.58	20	15 16	13 16 39.03	−5 14 10.6	1.0	8.3	0.62
6	18 12	13 16 21.08	5 25 27.0	0.9	7.7	0.58	21	15 12	13 16 30.66	5 13 4.6	1.0	8.4	0.62
7	18 9	13 16 30.04	5 26 3.7	0.9	7.8	0.58	22	15 8	13 16 21.96	5 11 56.8	1.0	8.4	0.62
8	18 5	13 16 38.61	5 26 38.1	0.9	7.8	0.58	23	15 3	13 16 12.92	5 10 47.2	1.0	8.4	0.63
9	18 1	13 16 46.81	5 27 10.1	0.9	7.8	0.58	24	14 59	13 16 3.56	5 9 35.7	1.0	8.4	0.63
10	17 57	13 16 54.63	−5 27 39.7	0.9	7.8	0.58	25	14 55	13 15 53.87	−5 8 22.5	1.0	8.4	0.63
11	17 53	13 17 2.08	5 28 6.9	0.9	7.8	0.58	26	14 51	13 15 43.85	5 7 7.5	1.0	8.4	0.63
12	17 50	13 17 9.15	5 28 31.8	0.9	7.8	0.58	27	14 47	13 15 33.52	5 5 50.8	1.0	8.4	0.63
13	17 46	13 17 15.83	5 28 54.3	0.9	7.8	0.59	28	14 43	13 15 22.89	5 4 32.5	1.0	8.4	0.63
14	17 42	13 17 22.11	5 29 14.4	0.9	7.9	0.59	Mar. 1	14 39	13 15 11.94	5 3 12.5	1.0	8.4	0.63
15	17 38	13 17 28.01	−5 29 32.1	0.9	7.9	0.59	2	14 35	13 15 0.69	−5 1 50.9	1.0	8.4	0.63
16	17 34	13 17 33.52	5 29 47.4	0.9	7.9	0.59	3	14 31	13 14 49.16	5 0 27.8	1.0	8.5	0.63
17	17 30	13 17 38.63	5 30 0.3	0.9	7.9	0.59	4	14 27	13 14 37.33	4 59 3.1	1.0	8.5	0.63
18	17 27	13 17 43.36	5 30 10.7	0.9	7.9	0.59	5	14 22	13 14 25.22	4 57 36.9	1.0	8.5	0.63
19	17 23	13 17 47.69	5 30 18.8	0.9	7.9	0.59	6	14 18	13 14 12.84	4 56 9.3	1.0	8.5	0.63
20	17 19	13 17 51.62	−5 30 24.5	0.9	7.9	0.59	7	14 14	13 14 0.18	−4 54 40.3	1.0	8.5	0.63
21	17 15	13 17 55.15	5 30 27.8	0.9	7.9	0.59	8	14 10	13 13 47.25	4 53 10.0	1.0	8.5	0.63
22	17 11	13 17 58.28	5 30 28.6	0.9	8.0	0.59	9	14 6	13 13 34.07	4 51 38.3	1.0	8.5	0.63
23	17 7	13 18 1.02	5 30 27.1	0.9	8.0	0.60	10	14 2	13 13 20.64	4 50 5.3	1.0	8.5	0.64
24	17 3	13 18 3.36	5 30 23.3	0.9	8.0	0.60	11	13 58	13 13 6.97	4 48 31.1	1.0	8.5	0.64
25	16 59	13 18 5.31	−5 30 17.0	0.9	8.0	0.60	12	13 53	13 12 53.05	−4 46 55.8	1.0	8.5	0.64
26	16 55	13 18 6.86	5 30 8.2	0.9	8.0	0.60	13	13 49	13 12 38.90	4 45 19.4	1.0	8.5	0.64
27	16 52	13 18 8.01	5 29 57.1	0.9	8.0	0.60	14	13 45	13 12 24.54	4 43 41.9	1.0	8.5	0.64
28	16 48	13 18 8.77	5 29 43.7	0.9	8.1	0.60	15	13 41	13 12 9.96	4 42 3.4	1.0	8.5	0.64
29	16 44	13 18 9.13	5 29 28.0	1.0	8.1	0.60	16	13 37	13 11 55.17	4 40 23.9	1.0	8.5	0.64
30	16 40	13 18 9.10	−5 29 9.9	1.0	8.1	0.60	17	13 32	13 11 40.19	−4 38 43.4	1.0	8.5	0.64
31	16 36	13 18 8.67	5 28 49.4	1.0	8.1	0.60	18	13 28	13 11 25.02	4 37 2.2	1.0	8.6	0.64
Feb. 1	16 32	13 18 7.85	5 28 26.7	1.0	8.1	0.60	19	13 24	13 11 9.66	4 35 20.2	1.0	8.6	0.64
2	16 28	13 18 6.63	5 28 1.7	1.0	8.1	0.61	20	13 20	13 10 54.13	4 33 37.3	1.0	8.6	0.64
3	16 24	13 18 5.02	5 27 34.3	1.0	8.1	0.61	21	13 16	13 10 38.45	4 32 53.7	1.0	8.6	0.64
4	16 20	13 18 3.02	−5 27 4.6	1.0	8.1	0.61	22	13 12	13 10 22.61	−4 30 9.5	1.0	8.6	0.64
5	16 16	13 18 0.63	5 26 32.6	1.0	8.2	0.61	23	13 7	13 10 6.62	4 28 24.8	1.0	8.6	0.64
6	16 12	13 17 57.85	5 25 58.3	1.0	8.2	0.61	24	13 3	13 9 50.50	4 26 39.5	1.0	8.6	0.64
7	16 8	13 17 54.69	5 25 21.8	1.0	8.2	0.61	25	12 59	13 9 34.25	4 24 53.8	1.0	8.6	0.64
8	16 4	13 17 51.13	5 24 43.0	1.0	8.2	0.61	26	12 55	13 9 17.89	4 23 7.8	1.0	8.6	0.64
9	16 0	13 17 47.18	−5 24 2.1	1.0	8.2	0.61	27	12 51	13 9 1.41	−4 21 21.3	1.0	8.6	0.64
10	15 56	13 17 42.85	5 23 19.0	1.0	8.2	0.61	28	12 46	13 8 44.83	4 19 34.4	1.0	8.6	0.64
11	15 52	13 17 38.14	5 22 33.6	1.0	8.2	0.61	29	12 42	13 8 28.17	4 17 47.4	1.0	8.6	0.64
12	15 48	13 17 33.05	5 21 46.0	1.0	8.3	0.62	30	12 38	13 8 11.42	4 16 0.2	1.0	8.6	0.64
13	15 44	13 17 27.58	5 20 56.4	1.0	8.3	0.62	31	12 34	13 7 54.60	4 14 12.9	1.0	8.6	0.64
14	15 40	13 17 21.74	−5 20 4.6	1.0	8.3	0.62	Apr. 1	12 29	13 7 37.71	−4 12 25.4	1.0	8.6	0.64
15	15 36	13 17 15.53	−5 19 10.6	1.0	8.3	0.62	2	12 25	13 7 20.76	−4 10 38.0	1.0	8.6	0.64

Stellar magnitude at opposition in April, 1923, 0.5.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	12 29	13 7 37.71	−4 12 25.4	1.0	8.6	0.64	May 17	9 17	12 56 0.35	−3 4 5.1	1.0	8.4	0.63
2	12 25	13 7 20.76	4 10 38.0	1.0	8.6	0.64	18	9 13	12 55 49.86	3 3 11.8	1.0	8.4	0.62
3	12 21	13 7 3.76	4 8 50.6	1.0	8.6	0.64	19	9 9	12 55 39.68	3 2 20.5	1.0	8.4	0.62
4	12 17	13 6 46.72	4 7 3.3	1.0	8.6	0.64	20	9 5	12 55 29.80	3 1 31.2	1.0	8.4	0.62
5	12 13	13 6 29.66	4 5 16.1	1.0	8.6	0.64	21	9 1	12 55 20.23	3 0 44.2	1.0	8.3	0.62
6	12 8	13 6 12.57	−4 3 29.1	1.0	8.6	0.64	22	8 57	12 55 10.99	−2 59 59.4	1.0	8.3	0.62
7	12 4	13 5 55.47	4 1 42.4	1.0	8.6	0.64	23	8 52	12 55 2.06	2 59 16.8	1.0	8.3	0.62
8	12 0	13 5 38.36	3 59 56.0	1.0	8.6	0.64	24	8 48	12 54 53.44	2 58 36.3	1.0	8.3	0.62
9	11 56	13 5 21.25	3 58 9.9	1.0	8.6	0.64	25	8 44	12 54 45.16	2 57 58.0	1.0	8.3	0.62
10	11 52	13 5 4.16	3 56 24.3	1.0	8.6	0.64	26	8 40	12 54 37.21	2 57 22.0	1.0	8.3	0.62
11	11 47	13 4 47.09	−3 54 39.1	1.0	8.6	0.64	27	8 36	12 54 29.59	−2 56 48.3	1.0	8.3	0.62
12	11 43	13 4 30.06	3 52 54.4	1.0	8.6	0.64	28	8 32	12 54 22.30	2 56 16.8	1.0	8.3	0.62
13	11 39	13 4 13.07	3 51 10.4	1.0	8.6	0.64	29	8 28	12 54 15.35	2 55 47.5	1.0	8.2	0.62
14	11 35	13 3 56.12	3 49 27.0	1.0	8.6	0.64	30	8 24	12 54 8.73	2 55 20.5	1.0	8.2	0.61
15	11 30	13 3 39.24	3 47 44.3	1.0	8.6	0.64	31	8 20	12 54 2.45	2 54 55.9	1.0	8.2	0.61
16	11 26	13 3 22.43	−3 46 2.4	1.0	8.6	0.64	June 1	8 16	12 53 56.52	−2 54 33.5	1.0	8.2	0.61
17	11 22	13 3 5.71	3 44 21.3	1.0	8.6	0.64	2	8 12	12 53 50.94	2 54 13.5	1.0	8.2	0.61
18	11 18	13 2 49.07	3 42 41.1	1.0	8.6	0.64	3	8 8	12 53 45.71	2 53 55.7	1.0	8.2	0.61
19	11 14	13 2 32.52	3 41 1.9	1.0	8.6	0.64	4	8 4	12 53 40.82	2 53 40.3	1.0	8.2	0.61
20	11 9	13 2 16.08	3 39 23.6	1.0	8.6	0.64	5	8 0	12 53 36.29	2 53 27.2	1.0	8.2	0.61
21	11 5	13 1 59.76	−3 37 46.3	1.0	8.6	0.64	6	7 56	12 53 32.11	−2 53 16.5	1.0	8.1	0.61
22	11 1	13 1 43.55	3 36 10.1	1.0	8.6	0.64	7	7 52	12 53 28.29	2 53 8.1	1.0	8.1	0.61
23	10 57	13 1 27.48	3 34 35.0	1.0	8.6	0.64	8	7 48	12 53 24.83	2 53 2.1	1.0	8.1	0.61
24	10 53	13 1 11.56	3 33 1.2	1.0	8.6	0.64	9	7 44	12 53 21.73	2 52 58.5	1.0	8.1	0.60
25	10 48	13 0 55.78	3 31 28.6	1.0	8.6	0.64	10	7 40	12 53 18.99	2 52 57.2	1.0	8.1	0.60
26	10 44	13 0 40.16	−3 29 57.2	1.0	8.6	0.64	11	7 36	12 53 16.62	−2 52 58.3	1.0	8.1	0.60
27	10 40	13 0 24.71	3 28 27.1	1.0	8.6	0.64	12	7 32	12 53 14.61	2 53 1.7	1.0	8.1	0.60
28	10 36	13 0 9.42	3 26 58.5	1.0	8.6	0.64	13	7 28	12 53 12.97	2 53 7.5	1.0	8.0	0.60
29	10 32	12 59 54.31	3 25 31.3	1.0	8.5	0.64	14	7 24	12 53 11.70	2 53 15.7	1.0	8.0	0.60
30	10 28	12 59 39.39	3 24 5.5	1.0	8.5	0.64	15	7 20	12 53 10.80	2 53 26.3	0.9	8.0	0.60
May 1	10 23	12 59 24.66	−3 22 41.2	1.0	8.5	0.64	16	7 16	12 53 10.26	−2 53 39.2	0.9	8.0	0.60
2	10 19	12 59 10.13	3 21 18.4	1.0	8.5	0.64	17	7 12	12 53 10.08	2 53 54.5	0.9	8.0	0.60
3	10 15	12 58 55.80	3 19 57.2	1.0	8.5	0.64	18	7 8	12 53 10.28	2 54 12.2	0.9	8.0	0.60
4	10 11	12 58 41.68	3 18 37.6	1.0	8.5	0.63	19	7 4	12 53 10.85	2 54 32.2	0.9	8.0	0.59
5	10 7	12 58 27.77	3 17 19.6	1.0	8.5	0.63	20	7 1	12 53 11.80	2 54 54.6	0.9	8.0	0.59
6	10 2	12 58 14.09	−3 16 3.3	1.0	8.5	0.63	21	6 57	12 53 13.11	−2 55 19.3	0.9	7.9	0.59
7	9 58	12 58 0.64	3 14 48.7	1.0	8.5	0.63	22	6 53	12 53 14.79	2 55 46.3	0.9	7.9	0.59
8	9 54	12 57 47.43	3 13 35.8	1.0	8.5	0.63	23	6 49	12 53 16.83	2 56 15.7	0.9	7.9	0.59
9	9 50	12 57 34.47	3 12 24.7	1.0	8.5	0.63	24	6 45	12 53 19.24	2 56 47.4	0.9	7.9	0.59
10	9 46	12 57 21.76	3 11 15.5	1.0	8.5	0.63	25	6 41	12 53 22.01	2 57 21.4	0.9	7.9	0.59
11	9 42	12 57 9.31	−3 10 8.2	1.0	8.4	0.63	26	6 37	12 53 25.15	−2 57 57.6	0.9	7.9	0.59
12	9 38	12 56 57.12	3 9 2.8	1.0	8.4	0.63	27	6 33	12 53 28.65	2 58 36.1	0.9	7.9	0.59
13	9 33	12 56 45.20	3 7 59.3	1.0	8.4	0.63	28	6 29	12 53 32.51	2 59 16.9	0.9	7.8	0.59
14	9 29	12 56 33.56	3 6 57.7	1.0	8.4	0.63	29	6 26	12 53 36.72	3 0 0.0	0.9	7.8	0.58
15	9 25	12 56 22.20	3 5 58.1	1.0	8.4	0.63	30	6 22	12 53 41.30	3 0 45.2	0.9	7.8	0.58
16	9 21	12 56 11.13	−3 5 0.6	1.0	8.4	0.63	July 1	6 18	12 53 46.24	−3 1 32.7	0.9	7.8	0.58
17	9 17	12 56 0.35	−3 4 5.1	1.0	8.4	0.63	2	6 14	12 53 51.53	−3 2 22.4	0.9	7.8	0.58

Stellar magnitude at opposition in April, 1923, 0.5.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	16 38	23 15 19.46	−5 39 28.3	0.4	1.7	0.12	Aug. 16	13 33	23 11 25.59	−6 5 30.4	0.5	1.8	0.12
2	16 34	23 15 17.80	5 39 41.2	0.4	1.7	0.12	17	13 29	23 11 17.65	6 6 21.3	0.5	1.8	0.12
3	16 30	23 15 15.97	5 39 55.2	0.4	1.7	0.12	18	13 25	23 11 9.64	6 7 12.7	0.5	1.8	0.12
4	16 26	23 15 13.96	5 40 10.2	0.4	1.7	0.12	19	13 21	23 11 1.55	6 8 4.6	0.5	1.8	0.12
5	16 22	23 15 11.79	5 40 26.3	0.4	1.7	0.12	20	13 17	23 10 53.40	6 8 56.8	0.5	1.8	0.12
6	16 18	23 15 9.45	−5 40 43.5	0.4	1.7	0.12	21	13 13	23 10 45.18	−6 9 49.5	0.5	1.8	0.12
7	16 14	23 15 6.94	5 41 1.7	0.4	1.7	0.12	22	13 9	23 10 36.88	6 10 42.5	0.5	1.8	0.12
8	16 10	23 15 4.25	5 41 21.0	0.4	1.7	0.12	23	13 5	23 10 28.53	6 11 35.8	0.5	1.8	0.12
9	16 6	23 15 1.40	5 41 41.3	0.4	1.8	0.12	24	13 0	23 10 20.12	6 12 29.4	0.5	1.8	0.12
10	16 2	23 14 58.39	5 42 2.7	0.4	1.8	0.12	25	12 56	23 10 11.66	6 13 23.3	0.5	1.8	0.12
11	15 58	23 14 55.21	−5 42 25.1	0.4	1.8	0.12	26	12 52	23 10 3.14	−6 14 17.5	0.5	1.8	0.12
12	15 54	23 14 51.86	5 42 48.5	0.4	1.8	0.12	27	12 48	23 9 54.57	6 15 11.9	0.5	1.8	0.12
13	15 50	23 14 48.35	5 43 12.9	0.4	1.8	0.12	28	12 44	23 9 45.97	6 16 6.5	0.5	1.8	0.12
14	15 46	23 14 44.68	5 43 38.4	0.5	1.8	0.12	29	12 40	23 9 37.32	6 17 1.3	0.5	1.8	0.12
15	15 42	23 14 40.84	5 44 4.8	0.5	1.8	0.12	30	12 36	23 9 28.62	6 17 56.3	0.5	1.8	0.12
16	15 38	23 14 36.84	−5 44 32.2	0.5	1.8	0.12	31	12 32	23 9 19.89	−6 18 51.6	0.5	1.8	0.12
17	15 34	23 14 32.70	5 45 0.6	0.5	1.8	0.12	Sept. 1	12 28	23 9 11.13	6 19 47.0	0.5	1.8	0.12
18	15 30	23 14 28.40	5 45 29.9	0.5	1.8	0.12	2	12 24	23 9 2.34	6 20 42.5	0.5	1.8	0.12
19	15 26	23 14 23.94	5 46 0.1	0.5	1.8	0.12	3	12 20	23 8 53.53	6 21 38.0	0.5	1.8	0.12
20	15 22	23 14 19.33	5 46 31.3	0.5	1.8	0.12	4	12 16	23 8 44.69	6 22 33.7	0.5	1.8	0.12
21	15 18	23 14 14.58	−5 47 3.4	0.5	1.8	0.12	5	12 12	23 8 35.83	−6 23 29.3	0.5	1.8	0.12
22	15 14	23 14 9.68	5 47 36.3	0.5	1.8	0.12	6	12 7	23 8 26.96	6 24 25.0	0.5	1.8	0.12
23	15 10	23 14 4.64	5 48 10.2	0.5	1.8	0.12	7	12 3	23 8 18.09	6 25 20.8	0.5	1.8	0.12
24	15 6	23 13 59.45	5 48 44.9	0.5	1.8	0.12	8	11 59	23 8 9.20	6 26 16.5	0.5	1.8	0.12
25	15 2	23 13 54.11	5 49 20.4	0.5	1.8	0.12	9	11 55	23 8 0.32	6 27 12.1	0.5	1.8	0.12
26	14 58	23 13 48.64	−5 49 56.9	0.5	1.8	0.12	10	11 51	23 7 51.44	−6 28 7.6	0.5	1.8	0.12
27	14 54	23 13 43.04	5 50 34.2	0.5	1.8	0.12	11	11 47	23 7 42.56	6 29 3.0	0.5	1.8	0.12
28	14 50	23 13 37.30	5 51 12.2	0.5	1.8	0.12	12	11 43	23 7 33.69	6 29 58.4	0.5	1.8	0.12
29	14 46	23 13 31.43	5 51 51.1	0.5	1.8	0.12	13	11 39	23 7 24.83	6 30 53.6	0.5	1.8	0.12
30	14 42	23 13 25.42	5 52 30.8	0.5	1.8	0.12	14	11 35	23 7 15.99	6 31 48.7	0.5	1.8	0.12
31	14 38	23 13 19.29	−5 53 11.3	0.5	1.8	0.12	15	11 31	23 7 7.17	−6 32 43.6	0.5	1.8	0.12
Aug. 1	14 34	23 13 13.03	5 53 52.5	0.5	1.8	0.12	16	11 27	23 6 58.37	6 33 38.3	0.5	1.8	0.12
2	14 30	23 13 6.65	5 54 34.4	0.5	1.8	0.12	17	11 23	23 6 49.61	6 34 32.6	0.5	1.8	0.12
3	14 26	23 13 0.14	5 55 17.1	0.5	1.8	0.12	18	11 18	23 6 40.87	6 35 26.7	0.5	1.8	0.12
4	14 22	23 12 53.50	5 56 0.5	0.5	1.8	0.12	19	11 14	23 6 32.17	6 36 20.6	0.5	1.8	0.12
5	14 18	23 12 46.75	−5 56 44.6	0.5	1.8	0.12	20	11 10	23 6 23.52	−6 37 14.1	0.5	1.8	0.12
6	14 14	23 12 39.88	5 57 29.3	0.5	1.8	0.12	21	11 6	23 6 14.91	6 38 7.3	0.5	1.8	0.12
7	14 9	23 12 32.91	5 58 14.8	0.5	1.8	0.12	22	11 2	23 6 6.34	6 39 0.2	0.5	1.8	0.12
8	14 5	23 12 25.83	5 59 0.9	0.5	1.8	0.12	23	10 58	23 5 57.81	6 39 52.7	0.5	1.8	0.12
9	14 1	23 12 18.64	5 59 47.6	0.5	1.8	0.12	24	10 54	23 5 49.34	6 40 44.8	0.5	1.8	0.12
10	13 57	23 12 11.35	−6 0 34.9	0.5	1.8	0.12	25	10 50	23 5 40.94	−6 41 36.5	0.5	1.8	0.12
11	13 53	23 12 3.96	6 1 22.8	0.5	1.8	0.12	26	10 46	23 5 32.59	6 42 27.8	0.5	1.8	0.12
12	13 49	23 11 56.47	6 2 11.3	0.5	1.8	0.12	27	10 42	23 5 24.30	6 43 18.7	0.5	1.8	0.12
13	13 45	23 11 48.88	6 3 0.3	0.5	1.8	0.12	28	10 38	23 5 16.08	6 44 9.0	0.5	1.8	0.12
14	13 41	23 11 41.20	6 3 49.8	0.5	1.8	0.12	29	10 34	23 5 7.93	6 44 58.8	0.5	1.8	0.12
15	13 37	23 11 33.44	−6 4 39.9	0.5	1.8	0.12	30	10 30	23 4 59.85	−6 45 48.2	0.5	1.8	0.12
16	13 33	23 11 25.59	−6 5 30.4	0.5	1.8	0.12	Oct. 1	10 26	23 4 51.85	−6 46 37.0	0.5	1.8	0.12

Stellar magnitude at opposition in September, 1923, 6.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	10 26	23 4 51.85	−6 46 37.0	0.5	1.8	0.12	Nov. 15	7 25	23 1 0.02	−7 9 10.9	0.5	1.7	0.12
2	10 22	23 4 43.93	6 47 25.2	0.5	1.8	0.12	16	7 21	23 0 58.56	7 9 17.5	0.5	1.7	0.12
3	10 17	23 4 36.09	6 48 12.9	0.5	1.8	0.12	17	7 17	23 0 57.29	7 9 22.8	0.5	1.7	0.12
4	10 13	23 4 28.34	6 49 0.0	0.5	1.8	0.12	18	7 13	23 0 56.20	7 9 27.0	0.5	1.7	0.12
5	10 9	23 4 20.68	6 49 46.5	0.5	1.8	0.12	19	7 9	23 0 55.29	7 9 30.1	0.4	1.7	0.12
6	10 5	23 4 13.12	−6 50 32.3	0.5	1.8	0.12	20	7 5	23 0 54.57	−7 9 32.0	0.4	1.7	0.12
7	10 1	23 4 5.65	6 51 17.4	0.5	1.8	0.12	21	7 1	23 0 54.04	7 9 32.7	0.4	1.7	0.12
8	9 57	23 3 58.28	6 52 1.8	0.5	1.8	0.12	22	6 57	23 0 53.70	7 9 32.3	0.4	1.7	0.12
9	9 53	23 3 51.02	6 52 45.6	0.5	1.8	0.12	23	6 53	23 0 53.55	7 9 30.6	0.4	1.7	0.12
10	9 49	23 3 43.86	6 53 28.7	0.5	1.8	0.12	24	6 49	23 0 53.58	7 9 27.7	0.4	1.7	0.12
11	9 45	23 3 36.81	−6 54 11.0	0.5	1.8	0.12	25	6 45	23 0 53.80	−7 9 23.7	0.4	1.7	0.12
12	9 41	23 3 29.88	6 54 52.6	0.5	1.8	0.12	26	6 41	23 0 54.21	7 9 18.6	0.4	1.7	0.12
13	9 37	23 3 23.07	6 55 33.4	0.5	1.8	0.12	27	6 38	23 0 54.81	7 9 12.3	0.4	1.7	0.12
14	9 33	23 3 16.38	6 56 13.4	0.5	1.8	0.12	28	6 34	23 0 55.61	7 9 4.7	0.4	1.7	0.12
15	9 29	23 3 9.81	6 56 52.5	0.5	1.8	0.12	29	6 30	23 0 56.60	7 8 55.9	0.4	1.7	0.12
16	9 25	23 3 3.37	−6 57 30.8	0.5	1.8	0.12	30	6 26	23 0 57.77	−7 8 46.0	0.4	1.7	0.12
17	9 21	23 2 57.06	6 58 8.3	0.5	1.8	0.12	Dec. 1	6 22	23 0 59.12	7 8 34.9	0.4	1.7	0.12
18	9 17	23 2 50.88	6 58 45.0	0.5	1.8	0.12	2	6 18	23 1 0.67	7 8 22.6	0.4	1.7	0.12
19	9 13	23 2 44.83	6 59 20.8	0.5	1.8	0.12	3	6 14	23 1 2.42	7 8 9.2	0.4	1.7	0.11
20	9 9	23 2 38.92	6 59 55.7	0.5	1.8	0.12	4	6 10	23 1 4.36	7 7 54.6	0.4	1.7	0.11
21	9 5	23 2 33.15	−7 0 29.7	0.5	1.8	0.12	5	6 6	23 1 6.48	−7 7 38.8	0.4	1.7	0.11
22	9 1	23 2 27.51	7 1 2.7	0.5	1.8	0.12	6	6 2	23 1 8.79	7 7 21.9	0.4	1.7	0.11
23	8 57	23 2 22.02	7 1 34.9	0.5	1.8	0.12	7	5 58	23 1 11.30	7 7 3.7	0.4	1.7	0.11
24	8 53	23 2 16.67	7 2 6.1	0.5	1.8	0.12	8	5 55	23 1 14.00	7 6 44.3	0.4	1.7	0.11
25	8 49	23 2 11.47	7 2 36.4	0.5	1.8	0.12	9	5 51	23 1 16.88	7 6 23.8	0.4	1.7	0.11
26	8 44	23 2 6.42	−7 3 5.7	0.5	1.8	0.12	10	5 47	23 1 19.95	−7 6 2.2	0.4	1.7	0.11
27	8 40	23 2 1.53	7 3 34.0	0.5	1.8	0.12	11	5 43	23 1 23.21	7 5 39.4	0.4	1.7	0.11
28	8 36	23 1 56.79	7 4 1.2	0.5	1.8	0.12	12	5 39	23 1 26.66	7 5 15.4	0.4	1.7	0.11
29	8 32	23 1 52.20	7 4 27.5	0.5	1.8	0.12	13	5 35	23 1 30.29	7 4 50.2	0.4	1.7	0.11
30	8 28	23 1 47.78	7 4 52.8	0.5	1.8	0.12	14	5 31	23 1 34.11	7 4 23.9	0.4	1.7	0.11
31	8 24	23 1 43.51	−7 5 17.1	0.5	1.8	0.12	15	5 27	23 1 38.11	−7 3 56.5	0.4	1.7	0.11
Nov. 1	8 20	23 1 39.40	7 5 40.4	0.5	1.8	0.12	16	5 24	23 1 42.30	7 3 28.0	0.4	1.7	0.11
2	8 16	23 1 35.46	7 6 2.5	0.5	1.8	0.12	17	5 20	23 1 46.67	7 2 58.4	0.4	1.7	0.11
3	8 12	23 1 31.69	7 6 23.6	0.5	1.8	0.12	18	5 16	23 1 51.22	7 2 27.6	0.4	1.7	0.11
4	8 8	23 1 28.08	7 6 43.7	0.5	1.8	0.12	19	5 12	23 1 55.94	7 1 55.7	0.4	1.7	0.11
5	8 4	23 1 24.65	−7 7 2.7	0.5	1.8	0.12	20	5 8	23 2 0.84	−7 1 22.8	0.4	1.7	0.11
6	8 0	23 1 21.39	7 7 20.5	0.5	1.8	0.12	21	5 4	23 2 5.92	7 0 48.7	0.4	1.7	0.11
7	7 57	23 1 18.30	7 7 37.2	0.5	1.8	0.12	22	5 0	23 2 11.18	7 0 13.6	0.4	1.7	0.11
8	7 53	23 1 15.38	7 7 52.9	0.5	1.8	0.12	23	4 57	23 2 16.61	6 59 37.4	0.4	1.7	0.11
9	7 49	23 1 12.64	7 8 7.5	0.5	1.8	0.12	24	4 53	23 2 22.21	6 59 0.1	0.4	1.7	0.11
10	7 45	23 1 10.09	−7 8 21.0	0.5	1.8	0.12	25	4 49	23 2 27.99	−6 58 21.8	0.4	1.7	0.11
11	7 41	23 1 7.72	7 8 33.3	0.5	1.7	0.12	26	4 45	23 2 33.94	6 57 42.4	0.4	1.7	0.11
12	7 37	23 1 5.52	7 8 44.4	0.5	1.7	0.12	27	4 41	23 2 40.05	6 57 2.0	0.4	1.7	0.11
13	7 33	23 1 3.50	7 8 54.3	0.5	1.7	0.12	28	4 37	23 2 46.33	6 56 20.5	0.4	1.7	0.11
14	7 29	23 1 1.67	7 9 3.2	0.5	1.7	0.12	29	4 34	23 2 52.78	6 55 38.0	0.4	1.7	0.11
15	7 25	23 1 0.02	−7 9 10.9	0.5	1.7	0.12	30	4 30	23 2 59.40	−6 54 54.6	0.4	1.7	0.11
16	7 21	23 0 58.56	−7 9 17.5	0.5	1.7	0.12	31	4 26	23 3 6.18	−6 54 10.1	0.4	1.7	0.11

Stellar magnitude at opposition in September, 1923, 6.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	14 41	9 20 55.98	+15 41 38.1	0.3	1.2	0.09	Feb. 15	11 36	9 16 11.97	+16 4 0.0	0.3	1.3	0.09
1	14 37	9 20 51.05	15 42 1.9	0.3	1.2	0.09	16	11 32	9 16 5.43	16 4 30.4	0.3	1.3	0.09
2	14 33	9 20 46.02	15 42 26.2	0.3	1.2	0.09	17	11 27	9 15 58.92	16 5 0.6	0.3	1.3	0.09
3	14 29	9 20 40.90	15 42 50.9	0.3	1.2	0.09	18	11 23	9 15 52.43	16 5 30.6	0.3	1.3	0.09
4	14 25	9 20 35.69	15 43 16.0	0.3	1.2	0.09	19	11 19	9 15 45.98	16 6 0.5	0.3	1.3	0.09
5	14 21	9 20 30.41	+15 43 41.5	0.3	1.2	0.09	20	11 15	9 15 39.57	+16 6 30.2	0.3	1.3	0.09
6	14 17	9 20 25.05	15 44 7.2	0.3	1.2	0.09	21	11 11	9 15 33.20	16 6 59.7	0.3	1.3	0.09
7	14 13	9 20 19.60	15 44 33.3	0.3	1.2	0.09	22	11 7	9 15 26.86	16 7 29.0	0.3	1.3	0.09
8	14 9	9 20 14.07	15 44 59.8	0.3	1.2	0.09	23	11 3	9 15 20.56	16 7 58.1	0.3	1.3	0.09
9	14 5	9 20 8.48	15 45 26.6	0.3	1.2	0.09	24	10 59	9 15 14.32	16 8 26.9	0.3	1.3	0.09
10	14 1	9 20 2.82	+15 45 53.7	0.3	1.3	0.09	25	10 55	9 15 8.12	+16 8 55.5	0.3	1.3	0.09
11	13 57	9 19 57.08	15 46 21.2	0.3	1.3	0.09	26	10 51	9 15 1.97	16 9 23.9	0.3	1.3	0.09
12	13 53	9 19 51.27	15 46 48.9	0.3	1.3	0.09	27	10 47	9 14 55.88	16 9 52.0	0.3	1.3	0.09
13	13 49	9 19 45.40	15 47 16.9	0.3	1.3	0.09	28	10 43	9 14 49.84	16 10 19.8	0.3	1.3	0.09
14	13 45	9 19 39.46	15 47 45.2	0.3	1.3	0.09	Mar. 1	10 39	9 14 43.86	16 10 47.4	0.3	1.3	0.09
15	13 41	9 19 33.46	+15 48 13.7	0.3	1.3	0.09	2	10 35	9 14 37.94	+16 11 14.6	0.3	1.3	0.09
16	13 37	9 19 27.41	15 48 42.5	0.3	1.3	0.09	3	10 31	9 14 32.08	16 11 41.6	0.3	1.3	0.09
17	13 33	9 19 21.30	15 49 11.5	0.3	1.3	0.09	4	10 27	9 14 26.29	16 12 8.3	0.3	1.3	0.09
18	13 29	9 19 15.14	15 49 40.8	0.3	1.3	0.09	5	10 23	9 14 20.55	16 12 34.6	0.3	1.3	0.09
19	13 25	9 19 8.93	15 50 10.2	0.3	1.3	0.09	6	10 19	9 14 14.88	16 13 0.6	0.3	1.3	0.09
20	13 21	9 19 2.68	+15 50 39.8	0.3	1.3	0.09	7	10 15	9 14 9.29	+16 13 26.3	0.3	1.3	0.09
21	13 17	9 18 56.37	15 51 9.7	0.3	1.3	0.09	8	10 11	9 14 3.77	16 13 51.7	0.3	1.3	0.09
22	13 13	9 18 50.02	15 51 39.7	0.3	1.3	0.09	9	10 7	9 13 58.33	16 14 16.7	0.3	1.2	0.09
23	13 9	9 18 43.64	15 52 9.9	0.3	1.3	0.09	10	10 3	9 13 52.97	16 14 41.3	0.3	1.2	0.09
24	13 5	9 18 37.22	15 52 40.2	0.3	1.3	0.09	11	9 59	9 13 47.68	16 15 5.5	0.3	1.2	0.09
25	13 1	9 18 30.77	+15 53 10.7	0.3	1.3	0.09	12	9 55	9 13 42.47	+16 15 29.4	0.3	1.2	0.09
26	12 56	9 18 24.28	15 53 41.2	0.3	1.3	0.09	13	9 51	9 13 37.34	16 15 52.9	0.3	1.2	0.09
27	12 52	9 18 17.77	15 54 11.9	0.3	1.3	0.09	14	9 47	9 13 32.30	16 16 15.9	0.3	1.2	0.09
28	12 48	9 18 11.23	15 54 42.7	0.3	1.3	0.09	15	9 43	9 13 27.35	16 16 38.6	0.3	1.2	0.09
29	12 44	9 18 4.66	15 55 13.6	0.3	1.3	0.09	16	9 39	9 13 22.49	16 17 0.8	0.3	1.2	0.09
30	12 40	9 17 58.07	+15 55 44.6	0.3	1.3	0.09	17	9 35	9 13 17.72	+16 17 22.6	0.3	1.2	0.09
31	12 36	9 17 51.47	15 56 15.6	0.3	1.3	0.09	18	9 31	9 13 13.04	16 17 44.0	0.3	1.2	0.09
Feb. 1	12 32	9 17 44.84	15 56 46.6	0.3	1.3	0.09	19	9 27	9 13 8.46	16 18 5.0	0.3	1.2	0.09
2	12 28	9 17 38.20	15 57 17.7	0.3	1.3	0.09	20	9 23	9 13 3.98	16 18 25.5	0.3	1.2	0.09
3	12 24	9 17 31.56	15 57 48.9	0.3	1.3	0.09	21	9 19	9 12 59.59	16 18 45.5	0.3	1.2	0.09
4	12 20	9 17 24.91	+15 58 20.1	0.3	1.3	0.09	22	9 15	9 12 55.31	+16 19 5.0	0.3	1.2	0.09
5	12 16	9 17 18.26	15 58 51.2	0.3	1.3	0.09	23	9 11	9 12 51.13	16 19 24.2	0.3	1.2	0.09
6	12 12	9 17 11.60	15 59 22.3	0.3	1.3	0.09	24	9 7	9 12 47.05	16 19 42.9	0.3	1.2	0.09
7	12 8	9 17 4.94	15 59 53.5	0.3	1.3	0.09	25	9 3	9 12 43.08	16 20 1.0	0.3	1.2	0.09
8	12 4	9 16 58.28	16 0 24.5	0.3	1.3	0.09	26	8 59	9 12 39.21	16 20 18.7	0.3	1.2	0.09
9	12 0	9 16 51.63	+16 0 55.5	0.3	1.3	0.09	27	8 55	9 12 35.45	+16 20 35.9	0.3	1.2	0.09
10	11 56	9 16 44.98	16 1 26.5	0.3	1.3	0.09	28	8 51	9 12 31.80	16 20 52.6	0.3	1.2	0.09
11	11 52	9 16 38.34	16 1 57.4	0.3	1.3	0.09	29	8 47	9 12 28.26	16 21 8.7	0.3	1.2	0.09
12	11 48	9 16 31.72	16 2 28.3	0.3	1.3	0.09	30	8 43	9 12 24.84	16 21 24.4	0.3	1.2	0.09
13	11 44	9 16 25.12	16 2 59.0	0.3	1.3	0.09	31	8 39	9 12 21.52	16 21 39.6	0.3	1.2	0.09
14	11 40	9 16 18.53	+16 3 29.5	0.3	1.3	0.09	Apr. 1	8 35	9 12 18.31	+16 21 54.2	0.3	1.2	0.09
15	11 36	9 16 11.97	+16 4 0.0	0.3	1.3	0.09	2	8 31	9 12 15.23	+16 22 8.3	0.3	1.2	0.09

Stellar magnitude at opposition in February, 1923, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	8 35	9 12 18.31	+16 21 54.2	0.3	1.2	0.09	Nov. 15	17 53	9 31 25.60	+14 55 18.5	0.3	1.2	0.08
2	8 31	9 12 15.23	16 22 8.3	0.3	1.2	0.09	16	17 50	9 31 26.52	14 55 15.2	0.3	1.2	0.08
3	8 27	9 12 12.27	16 22 21.9	0.3	1.2	0.09	17	17 46	9 31 27.32	14 55 12.6	0.3	1.2	0.08
4	8 23	9 12 9.41	16 22 34.9	0.3	1.2	0.09	18	17 42	9 31 27.98	14 55 10.6	0.3	1.2	0.08
5	8 19	9 12 6.67	16 22 47.4	0.3	1.2	0.09	19	17 38	9 31 28.51	14 55 9.2	0.3	1.2	0.08
6	8 15	9 12 4.06	+16 22 59.4	0.3	1.2	0.09	20	17 34	9 31 28.90	+14 55 8.5	0.3	1.2	0.08
7	8 11	9 12 1.57	16 23 10.9	0.3	1.2	0.09	21	17 30	9 31 29.16	14 55 8.4	0.3	1.2	0.08
8	8 7	9 11 59.20	16 23 21.8	0.3	1.2	0.09	22	17 26	9 31 29.29	14 55 9.0	0.3	1.2	0.08
9	8 3	9 11 56.95	16 23 32.1	0.3	1.2	0.09	23	17 22	9 31 29.28	14 55 10.3	0.3	1.2	0.08
10	7 59	9 11 54.82	16 23 41.9	0.3	1.2	0.09	24	17 18	9 31 29.13	14 55 12.2	0.3	1.2	0.08
11	7 55	9 11 52.81	+16 23 51.1	0.3	1.2	0.09	25	17 14	9 31 28.85	+14 55 14.7	0.3	1.2	0.08
12	7 51	9 11 50.93	16 23 59.8	0.3	1.2	0.09	26	17 10	9 31 28.44	14 55 17.9	0.3	1.2	0.08
13	7 47	9 11 49.18	16 24 8.0	0.3	1.2	0.09	27	17 6	9 31 27.90	14 55 21.7	0.3	1.2	0.08
14	7 43	9 11 47.55	16 24 15.5	0.3	1.2	0.09	28	17 2	9 31 27.23	14 55 26.2	0.3	1.2	0.08
15	7 39	9 11 46.05	16 24 22.4	0.3	1.2	0.09	29	16 58	9 31 26.43	14 55 31.3	0.3	1.2	0.08
16	7 35	9 11 44.68	+16 24 28.8	0.3	1.2	0.09	30	16 54	9 31 25.49	+14 55 37.0	0.3	1.2	0.08
17	7 31	9 11 43.44	16 24 34.7	0.3	1.2	0.09	Dec. 1	16 51	9 31 24.42	14 55 43.4	0.3	1.2	0.08
18	7 27	9 11 42.33	16 24 39.9	0.3	1.2	0.09	2	16 47	9 31 23.21	14 55 50.5	0.3	1.2	0.08
19	7 23	9 11 41.35	16 24 44.5	0.3	1.2	0.09	3	16 43	9 31 21.87	14 55 58.2	0.3	1.2	0.08
20	7 19	9 11 40.50	16 24 48.6	0.3	1.2	0.09	4	16 39	9 31 20.41	14 56 6.5	0.3	1.2	0.08
21	7 16	9 11 39.78	+16 24 52.1	0.3	1.2	0.09	5	16 35	9 31 18.82	+14 56 15.4	0.3	1.2	0.08
22	7 12	9 11 39.18	16 24 55.0	0.3	1.2	0.09	6	16 31	9 31 17.10	14 56 24.9	0.3	1.2	0.08
23	7 8	9 11 38.72	16 24 57.3	0.3	1.2	0.09	7	16 27	9 31 15.24	14 56 35.1	0.3	1.2	0.08
24	7 4	9 11 38.39	16 24 59.1	0.3	1.2	0.09	8	16 23	9 31 13.25	14 56 45.8	0.3	1.2	0.08
25	7 0	9 11 38.19	16 25 0.2	0.3	1.2	0.08	9	16 19	9 31 11.14	14 56 57.2	0.3	1.2	0.08
26	6 56	9 11 38.13	+16 25 0.8	0.3	1.2	0.08	10	16 15	9 31 8.90	+14 57 9.2	0.3	1.2	0.08
27	6 52	9 11 38.19	16 25 0.8	0.3	1.2	0.08	11	16 11	9 31 6.54	14 57 21.8	0.3	1.2	0.08
28	6 48	9 11 38.38	16 25 0.2	0.3	1.2	0.08	12	16 7	9 31 4.05	14 57 35.0	0.3	1.2	0.09
29	6 44	9 11 38.70	16 24 59.0	0.3	1.2	0.08	13	16 3	9 31 1.44	14 57 48.8	0.3	1.2	0.09
30	6 40	9 11 39.16	16 24 57.3	0.3	1.2	0.08	14	15 59	9 30 58.72	14 58 3.2	0.3	1.2	0.09
May 1	6 36	9 11 39.75	+16 24 55.0	0.3	1.2	0.08	15	15 55	9 30 55.87	+14 58 18.2	0.3	1.2	0.09
	....	.....	.....	..	..	...	16	15 51	9 30 52.90	14 58 33.7	0.3	1.2	0.09
	....	.....	.....	..	..	...	17	15 47	9 30 49.82	14 58 49.8	0.3	1.2	0.09
Nov. 2	18 44	9 31 1.42	+14 57 0.2	0.3	1.2	0.08	18	15 43	9 30 46.61	14 59 6.5	0.3	1.2	0.09
3	18 40	9 31 4.07	14 56 48.6	0.3	1.2	0.08	19	15 39	9 30 43.29	14 59 23.6	0.3	1.2	0.09
4	18 36	9 31 6.59	+14 56 37.6	0.3	1.2	0.08	20	15 35	9 30 39.86	+14 59 41.3	0.3	1.2	0.09
5	18 32	9 31 8.98	14 56 27.2	0.3	1.2	0.08	21	15 31	9 30 36.31	14 59 59.6	0.3	1.2	0.09
6	18 29	9 31 11.23	14 56 17.5	0.3	1.2	0.08	22	15 27	9 30 32.65	15 0 18.4	0.3	1.2	0.09
7	18 25	9 31 13.36	14 56 8.4	0.3	1.2	0.08	23	15 23	9 30 28.89	15 0 37.7	0.3	1.2	0.09
8	18 21	9 31 15.36	14 55 59.9	0.3	1.2	0.08	24	15 19	9 30 25.01	15 0 57.6	0.3	1.2	0.09
9	18 17	9 31 17.22	+14 55 52.1	0.3	1.2	0.08	25	15 15	9 30 21.03	+15 1 18.0	0.3	1.2	0.09
10	18 13	9 31 18.95	14 55 44.9	0.3	1.2	0.08	26	15 11	9 30 16.95	15 1 38.8	0.3	1.2	0.09
11	18 9	9 31 20.54	14 55 38.3	0.3	1.2	0.08	27	15 7	9 30 12.76	15 2 0.1	0.3	1.2	0.09
12	18 5	9 31 22.00	14 55 32.4	0.3	1.2	0.08	28	15 3	9 30 8.46	15 2 21.9	0.3	1.2	0.09
13	18 1	9 31 23.34	14 55 27.1	0.3	1.2	0.08	29	14 59	9 30 4.07	15 2 44.1	0.3	1.2	0.09
14	17 57	9 31 24.54	+14 55 22.5	0.3	1.2	0.08	30	14 55	9 29 59.58	+15 3 6.9	0.3	1.2	0.09
15	17 53	9 31 25.60	+14 55 18.5	0.3	1.2	0.08	31	14 51	9 29 54.99	+15 3 30.1	0.3	1.2	0.09

Stellar magnitude at opposition in February, 1923, 7.7.

PART III.

PHENOMENA.

In the year 1923 there will be four eclipses, two of the Sun and two of the Moon.

I.—*A Partial Eclipse of the Moon*, March 2, 1923, visible at Washington; the beginning visible generally in western Asia, Europe, Africa, the Atlantic Ocean, South America, North America except in the extreme northwestern part, and the eastern part of the Pacific Ocean; the ending visible generally in Europe, Africa except the eastern part, the Atlantic Ocean, North America, South America, and the eastern part of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, March 2 d 15 h 57 m 27.0 s

Sun's right ascension	22 h 51 m 57.76 s	Hourly motion	9.34 s
Moon's right ascension	10 h 51 m 57.76 s	Hourly motion	143.76 s
Sun's declination	−7 ° 13 ′ 50.1 ″	Hourly motion	+ 0 ′ 57.2 ″
Moon's declination	+6 ° 21 ′ 59.4 ″	Hourly motion	−11 ′ 0.7 ″
Sun's equa. hor. parallax	8.9 ″	Sun's true semidiameter	16 ′ 8.0 ″
Moon's equa. hor. parallax	60 ′ 43.2 ″	Moon's true semidiameter	16 ′ 31.9 ″

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	
Moon enters penumbra	March	2 13 12.6	Greenwich Mean Time.
Moon enters umbra		2 14 27.8	
Middle of the eclipse		2 15 31.8	
Moon leaves umbra		2 16 35.8	
Moon leaves penumbra		2 17 50.8	

Contacts of Umbra with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith in Longitude from Greenwich,	and in Latitude.
	°	° ′	° ′
First	54 to E.	+34 42	+6 38
Last	20 to W.	+65 31	+6 15

Magnitude of the eclipse=0.376 (Moon's diameter=1.0).

II.—*An Annular Eclipse of the Sun*, March 16–17, 1923, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, March 17 d 0 h 24 m 3.6 s

Sun and Moon's R. A.	23 h 44 m 56.02 s	Hourly motions	9.14 s and 113.74 s
Sun's declination	−1 ° 37 ′ 55.0 ″	Hourly motion	+0 ′ 59.3 ″
Moon's declination	−2 ° 8 ′ 47.1 ″	Hourly motion	+9 ′ 17.8 ″
Sun's equa. hor. parallax	8.8 ″	Sun's true semidiameter	16 ′ 4.2 ″
Moon's equa. hor. parallax	54 ′ 13.6 ″	Moon's true semidiameter	14 ′ 45.8 ″

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	March	16 21 50.4	+56 43	−38 5
Central eclipse begins		16 23 5.5	+76 13	−50 49
Central eclipse at local apparent noon		17 0 24.1	+ 3 50	−36 40
Central eclipse ends		17 2 23.8	−56 40	−15 25
Eclipse ends		17 3 38.9	−37 31	− 2 39

III.—*A Partial Eclipse of the Moon*, August 25–26, 1923, visible at Washington; the beginning visible generally in North America except the extreme northeastern part, the western part of South America, the Pacific Ocean, Australia except the extreme southwestern part, and the extreme northeastern part of Asia; the ending visible generally in North America except the northeastern part, the extreme northwestern part of South America, the Pacific Ocean, Australia, and the eastern part of Asia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, Aug. 25 23 8 1.0 (d h m s)

Sun's right ascension	10 16 40.28	Hourly motion	9.17
Moon's right ascension	22 16 40.28	Hourly motion	124.32
	° ′ ″		′ ″
Sun's declination	+10 42 5.9	Hourly motion	− 0 51.8
Moon's declination	− 9 49 6.1	Hourly motion	+ 8 39.0
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 49.7
Moon's equa. hor. parallax	55 57.7	Moon's true semidiameter	15 14.2

CIRCUMSTANCES OF THE ECLIPSE.

Moon enters penumbra	Aug. 25 20 12.3	Greenwich Mean Time.
Moon enters umbra	25 21 51.8	
Middle of the eclipse	25 22 39.5	
Moon leaves umbra	25 23 27.3	
Moon leaves penumbra	26 1 6.4	

Contacts of Umbra with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith in Longitude from Greenwich,	and in Latitude.
	°	° ′	° ′
First	140 to E.	+148 4	−10 0
Last	171 to W.	+171 10	− 9 46

Magnitude of the eclipse=0.168 (Moon's diameter=1.0).

IV.—*A Total Eclipse of the Sun*, September 10, 1923, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, Sept. 10 8 30 9.1 (d h m s)

Sun and Moon's R. A.	11 12 29.37	Hourly motions	s 9.00 and 139.60
	° ′ ″		′ ″
Sun's declination	+5 6 3.7	Hourly motion	− 0 56.8
Moon's declination	+5 38 18.1	Hourly motion	−11 3.2
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 53.2
Moon's equa. hor. parallax	59 56.8	Moon's true semidiameter	16 19.3

CIRCUMSTANCES OF THE ECLIPSE.

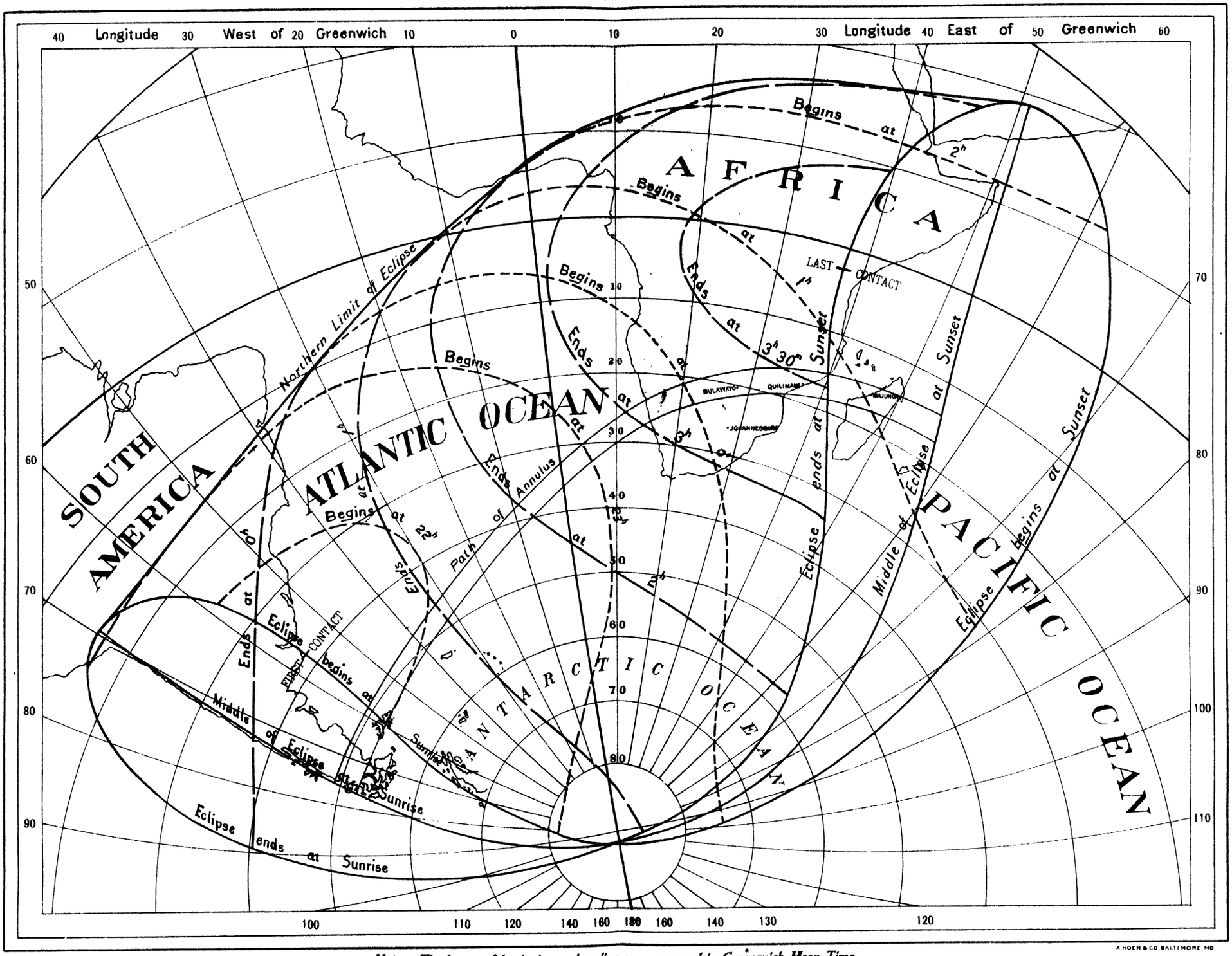
		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	Sept.	10 6 14.3	−171 51	+36 51
Central eclipse begins		10 7 16.9	−154 18	+48 16
Central eclipse at local apparent noon		10 8 30.2	+128 16	+37 58
Central eclipse ends		10 10 17.4	+ 63 51	+13 43
Eclipse ends		10 11 19.9	+ 80 31	+ 2 15

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, MARCH 16–17, 1923.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
21 50	−1.24067	−0.96488	−8.46502	+9.99982	325 18.6	+0.56999	+0.02395
22 0	−1.16015	−0.93931	−8.46432	+9.99982	327 48.6	+0.57000	+0.02397
10	1.07962	0.91375	8.46362	9.99982	330 18.7	0.57002	0.02398
20	0.99910	0.88818	8.46292	9.99982	332 48.7	0.57004	0.02400
30	0.91857	0.86261	8.46222	9.99982	335 18.7	0.57005	0.02401
40	0.83804	0.83704	8.46152	9.99982	337 48.8	0.57007	0.02403
50	0.75751	0.81146	8.46082	9.99982	340 18.8	0.57008	0.02404
23 0	−0.67697	−0.78588	−8.46011	+9.99982	342 48.9	+0.57009	+0.02405
10	0.59644	0.76030	8.45941	9.99982	345 18.9	0.57011	0.02407
20	0.51590	0.73472	8.45870	9.99982	347 48.9	0.57012	0.02408
30	0.43537	0.70914	8.45800	9.99982	350 19.0	0.57013	0.02409
40	0.35483	0.68355	8.45729	9.99982	352 49.0	0.57014	0.02410
50	0.27430	0.65797	8.45658	9.99982	355 19.1	0.57015	0.02411
0 0	−0.19376	−0.63238	−8.45587	+9.99982	357 49.1	+0.57016	+0.02412
10	0.11322	0.60679	8.45516	9.99982	0 19.2	0.57017	0.02413
20	−0.03269	0.58119	8.45444	9.99982	2 49.2	0.57018	0.02414
30	+0.04784	0.55560	8.45373	9.99982	5 19.2	0.57019	0.02415
40	0.12838	0.53000	8.45301	9.99982	7 49.3	0.57020	0.02416
50	0.20891	0.50441	8.45230	9.99983	10 19.3	0.57020	0.02416
1 0	+0.28944	−0.47881	−8.45158	+9.99983	12 49.4	+0.57021	+0.02417
10	0.36997	0.45321	8.45086	9.99983	15 19.4	0.57022	0.02418
20	0.45050	0.42761	8.45014	9.99983	17 49.4	0.57022	0.02418
30	0.53103	0.40201	8.44942	9.99983	20 19.5	0.57023	0.02419
40	0.61155	0.37640	8.44870	9.99983	22 49.5	0.57023	0.02419
50	0.69208	0.35080	8.44797	9.99983	25 19.6	0.57023	0.02419
2 0	+0.77260	−0.32519	−8.44725	+9.99983	27 49.6	+0.57024	+0.02420
10	0.85312	0.29958	8.44652	9.99983	30 19.7	0.57024	0.02420
20	0.93363	0.27398	8.44580	9.99983	32 49.7	0.57024	0.02420
30	1.01414	0.24837	8.44507	9.99983	35 19.7	0.57024	0.02421
40	1.09465	0.22276	8.44434	9.99983	37 49.8	0.57025	0.02421
50	1.17516	0.19715	8.44361	9.99983	40 19.8	0.57025	0.02421
3 0	+1.25566	−0.17153	−8.44287	+9.99983	42 49.9	+0.57025	+0.02421
10	1.33616	0.14592	8.44214	9.99983	45 19.9	0.57025	0.02421
20	1.41665	0.12031	8.44141	9.99983	47 49.9	0.57025	0.02421
30	1.49714	0.09469	8.44067	9.99983	50 20.0	0.57024	0.02420
40	+1.57763	−0.06908	−8.43993	+9.99983	52 50.0	+0.57024	+0.02420

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
h m					
21 0	+7.9059	+7.4074	+1.1762	+7.67204	+7.66987
22 0	7.9059	7.4077	1.1762	7.67203	7.66986
23 0	7.9060	7.4079	1.1762	7.67203	7.66986
0 0	7.9060	7.4081	1.1762	7.67202	7.66985
1 0	7.9060	7.4082	1.1762	7.67202	7.66985
2 0	7.9059	7.4083	1.1762	7.67201	7.66984
3 0	7.9058	7.4084	1.1762	7.67201	7.66984
4 0	+7.9057	+7.4085	+1.1762	+7.67200	+7.66984

ANNULAR ECLIPSE OF MARCH 16-17, 1923.



Note :- The hours of beginning and ending are expressed in Greenwich Mean Time.

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PATH OF ANNULAR PHASE DURING THE ECLIPSE OF THE SUN, MARCH 16–17, 1923.

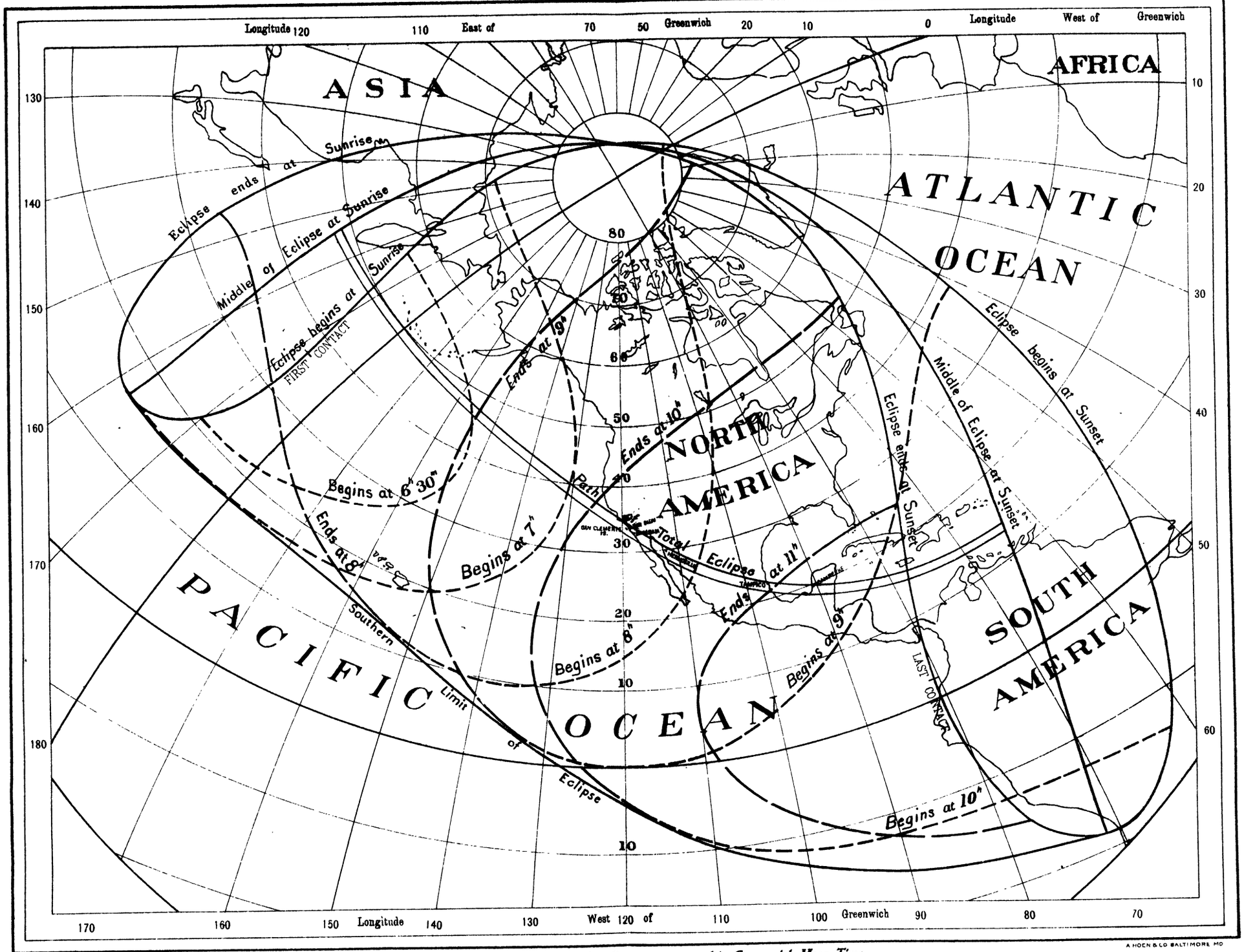
Greenwich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Annular Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	−49 11	+75 38	−50 49	+76 13	−52 29	+76 50	. . .
23h 10m	48 38.9	51 11.5	50 25.7	54 26.5	52 17.4	59 13.5	6 7.2
15	47 50.0	43 34.9	49 33.9	45 25.1	51 22.8	47 48.8	6 21.8
20	46 57.8	37 52.1	48 38.4	39 0.7	50 23.6	40 27.8	6 33.4
25	46 4.3	33 13.0	47 41.8	33 55.5	49 23.4	34 49.9	6 43.5
30	−45 10.0	+29 16.3	−46 44.5	+29 40.5	−48 22.8	+30 12.8	6 52.4
35	44 15.4	25 50.3	45 47.1	26 0.6	47 22.4	26 16.9	7 0.5
40	43 20.7	22 47.5	44 49.8	22 47.1	46 22.3	22 51.2	7 7.8
45	42 26.2	20 2.8	43 52.9	19 53.9	45 22.8	19 48.3	7 14.4
50	41 31.8	17 32.8	42 56.3	17 17.1	44 23.8	17 3.6	7 20.5
55	40 37.5	15 15.1	42 0.0	14 53.7	43 25.3	14 33.6	7 26.0
0 0	−39 43.4	+13 7.6	−41 4.0	+12 41.3	−42 27.3	+12 15.6	7 30.9
5	38 49.5	11 8.6	40 8.4	10 38.1	41 29.8	10 7.7	7 35.3
10	37 55.9	9 16.8	39 13.3	8 42.7	40 33.1	8 8.3	7 39.1
15	37 2.6	7 31.0	38 18.5	6 53.8	39 36.7	6 15.9	7 42.4
20	36 9.5	5 50.6	37 24.1	5 10.5	38 40.9	4 29.5	7 45.1
25	35 16.7	4 14.5	36 30.0	3 31.9	37 45.4	2 48.2	7 47.3
30	−34 24.0	+ 2 42.1	−35 36.2	+ 1 57.1	−36 50.5	+ 1 11.0	7 49.1
35	33 31.5	+ 1 12.6	34 42.8	+ 0 25.4	35 56.1	− 0 23.0	7 50.4
40	32 39.3	− 0 14.5	33 49.7	− 1 3.6	35 2.0	1 54.1	7 51.1
45	31 47.3	1 39.7	32 56.9	2 30.6	34 8.4	3 23.1	7 51.3
50	30 55.3	3 3.4	32 4.3	3 56.2	33 15.1	4 50.6	7 51.0
55	30 3.6	4 26.3	31 12.0	5 20.9	32 22.1	6 17.1	7 50.1
1 0	−29 12.0	− 5 48.9	−30 19.9	− 6 45.2	−31 29.5	− 7 43.2	7 48.9
5	28 20.5	7 11.6	29 28.0	8 9.7	30 37.2	9 9.5	7 47.1
10	27 29.0	8 34.9	28 36.2	9 34.8	29 45.1	10 36.5	7 44.7
15	26 37.5	9 59.5	27 44.6	11 1.2	28 53.3	12 4.9	7 41.9
20	25 46.3	11 25.8	26 53.3	12 29.5	28 1.9	13 35.3	7 38.6
25	24 55.1	12 54.7	26 2.0	14 0.4	27 10.5	15 8.4	7 34.8
30	−24 3.8	−14 26.8	−25 10.7	−15 34.7	−26 19.2	−16 45.2	7 30.4
35	23 12.5	16 2.9	24 19.5	17 13.4	25 28.1	18 26.8	7 25.5
40	22 21.0	17 44.2	23 28.2	18 57.6	24 37.0	20 14.3	7 20.0
45	21 29.4	19 32.0	22 36.9	20 48.8	23 46.0	22 9.4	7 14.0
50	20 37.5	21 28.2	21 45.4	22 49.0	22 54.9	24 14.2	7 7.5
55	19 45.3	23 35.0	20 53.7	25 0.7	22 3.7	26 31.6	7 0.3
2 0	−18 52.8	−25 55.4	−20 1.7	−27 27.5	−21 12.2	−29 6.0	6 52.3
5	17 59.7	28 34.6	19 9.2	30 15.6	20 20.4	32 4.7	6 43.4
10	17 5.6	31 40.5	18 15.8	33 34.7	19 27.8	35 40.6	6 33.4
15	16 10.1	35 28.9	17 21.0	37 45.6	18 33.8	40 23.0	6 21.7
20	15 11.9	40 37.2	16 23.1	43 48.0	17 35.8	48 5.6	6 6.7
Limits.	−13 46	−56 9	−15 25	−56 40	−17 6	−57 12	. . . .

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, SEPTEMBER 10, 1923.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
6 10	−1.26919	+0.93402	+8.95189	+9.99825	93 12.7	+0.53873	−0.00715
20	1.17865	0.90587	8.95167	9.99825	95 42.7	0.53872	0.00716
30	1.08810	0.87772	8.95146	9.99826	98 12.8	0.53872	0.00716
40	0.99754	0.84957	8.95124	9.99826	100 42.8	0.53871	0.00717
50	0.90699	0.82141	8.95102	9.99826	103 12.9	0.53870	0.00718
7 0	−0.81643	+0.79324	+8.95081	+9.99826	105 42.9	+0.53870	−0.00718
10	0.72588	0.76507	8.95059	9.99826	108 13.0	0.53869	0.00719
20	0.63532	0.73690	8.95037	9.99826	110 43.0	0.53868	0.00720
30	0.54475	0.70872	8.95016	9.99827	113 13.1	0.53867	0.00721
40	0.45419	0.68054	8.94994	9.99827	115 43.1	0.53866	0.00722
50	0.36363	0.65236	8.94972	9.99827	118 13.2	0.53865	0.00723
8 0	−0.27306	+0.62417	+8.94950	+9.99827	120 43.2	+0.53864	−0.00724
10	0.18250	0.59598	8.94929	9.99827	123 13.3	0.53863	0.00725
20	0.09193	0.56778	8.94907	9.99827	125 43.3	0.53861	0.00727
30	−0.00137	0.53958	8.94885	9.99828	128 13.4	0.53860	0.00728
40	+0.08920	0.51138	8.94864	9.99828	130 43.4	0.53858	0.00729
50	0.17976	0.48317	8.94842	9.99828	133 13.5	0.53857	0.00731
9 0	+0.27033	+0.45496	+8.94820	+9.99828	135 43.5	+0.53855	−0.00733
10	0.36089	0.42675	8.94798	9.99828	138 13.6	0.53854	0.00734
20	0.45146	0.39854	8.94776	9.99828	140 43.6	0.53852	0.00736
30	0.54202	0.37032	8.94755	9.99829	143 13.7	0.53850	0.00738
40	0.63259	0.34209	8.94733	9.99829	145 43.7	0.53849	0.00739
50	0.72315	0.31387	8.94711	9.99829	148 13.8	0.53847	0.00741
10 0	+0.81371	+0.28564	+8.94689	+9.99829	150 43.8	+0.53845	−0.00743
10	0.90427	0.25741	8.94667	9.99829	153 13.9	0.53843	0.00745
20	0.99482	0.22918	8.94645	9.99829	155 43.9	0.53841	0.00747
30	1.08538	0.20094	8.94623	9.99830	158 14.0	0.53838	0.00750
40	1.17593	0.17270	8.94601	9.99830	160 44.0	0.53836	0.00752
50	1.26648	0.14446	8.94580	9.99830	163 14.1	0.53834	0.00754
11 0	+1.35702	+0.11621	+8.94558	+9.99830	165 44.1	+0.53831	−0.00757
10	1.44757	0.08796	8.94536	9.99830	168 14.2	0.53829	0.00759
20	+1.53811	+0.05971	+8.94514	+9.99830	170 44.2	+0.53826	−0.00761

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
h m					
6 0	+7.9569	−7.4494	+1.1762	+7.66688	+7.66471
7 0	7.9569	7.4497	1.1762	7.66689	7.66472
8 0	7.9570	7.4501	1.1762	7.66689	7.66472
9 0	7.9570	7.4504	1.1762	7.66690	7.66473
10 0	7.9569	7.4507	1.1762	7.66690	7.66473
11 0	7.9569	7.4510	1.1762	7.66690	7.66474
12 0	+7.9568	−7.4512	+1.1762	+7.66691	+7.66474

TOTAL ECLIPSE OF SEPTEMBER 10, 1923



Note :- The hours of beginning and ending are expressed in Greenwich Mean Time.

A HOEN & CO BALTIMORE MD

PATH OF TOTAL PHASE DURING THE ECLIPSE OF THE SUN, SEPTEMBER 10, 1923.

Greenwich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Total Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	+48 45	−154 5	+48 16	−154 18	+47 47	−154 31	. . .
7h 20m	49 45.9	−171 19.2	49 14.3	−173 4.1	48 41.6	−174 37.3	1 52.8
25	49 40.2	+176 53.1	49 2.4	+175 54.7	48 24.3	+175 0.9	2 9.2
30	+49 11.2	+169 2.2	+48 30.8	+168 23.0	+47 50.4	+167 46.8	2 21.7
35	48 32.5	162 53.2	47 50.6	162 26.4	47 8.8	162 1.9	2 32.3
40	47 48.0	157 45.7	47 5.2	157 28.1	46 22.7	157 12.2	2 41.6
45	46 59.7	153 20.6	46 16.5	153 10.3	45 33.5	153 1.3	2 49.9
50	46 8.9	149 26.3	45 25.5	149 22.0	44 42.3	149 18.7	2 57.4
55	45 16.2	145 56.4	44 32.8	145 57.2	43 49.6	145 58.8	3 4.1
8 0	+44 22.0	+142 46.2	+43 38.8	+142 51.2	+42 55.8	+142 56.9	3 10.2
5	43 26.7	139 51.7	42 43.7	140 0.4	42 0.9	140 9.6	3 15.6
10	42 30.6	137 10.2	41 47.9	137 22.2	41 5.4	137 34.6	3 20.4
15	41 33.8	134 39.8	40 51.5	134 54.6	40 9.4	135 9.8	3 24.6
20	40 36.4	132 18.5	39 54.5	132 35.8	39 12.8	132 53.4	3 28.1
25	39 38.6	130 4.7	38 57.1	130 24.4	38 15.8	130 44.2	3 31.0
30	+38 40.3	+127 57.5	+37 59.3	+128 19.3	+37 18.5	+128 41.1	3 33.4
35	37 41.7	125 55.8	37 1.2	126 19.4	36 20.8	126 43.0	3 35.1
40	36 42.8	123 58.6	36 2.8	124 23.8	35 22.9	124 49.0	3 36.3
45	35 43.5	122 4.9	35 4.1	122 31.6	34 24.7	122 58.2	3 36.9
50	34 44.1	120 14.1	34 5.1	120 42.1	33 26.2	121 10.0	3 36.9
55	33 44.2	118 25.2	33 5.8	118 54.5	32 27.5	119 23.6	3 36.3
9 0	+32 44.0	+116 37.5	+32 6.2	+117 8.0	+31 28.4	+117 38.2	3 35.1
5	31 43.6	114 50.5	31 6.3	115 22.0	30 29.0	115 53.2	3 33.3
10	30 42.6	113 3.2	30 5.9	113 35.7	29 29.2	114 7.9	3 31.0
15	29 41.2	111 14.9	29 5.1	111 48.4	28 29.0	112 21.5	3 28.1
20	28 39.3	109 24.6	28 3.9	109 59.0	27 28.4	110 33.0	3 24.6
25	27 36.9	107 31.1	27 2.1	108 6.6	26 27.2	108 41.6	3 20.5
30	+26 33.8	+105 33.6	+25 59.7	+106 10.1	+25 25.5	+106 46.0	3 15.9
35	25 29.9	103 30.7	24 56.5	104 8.2	24 23.0	104 45.1	3 10.6
40	24 25.0	101 20.7	23 52.4	101 59.3	23 19.6	102 37.3	3 4.7
45	23 18.9	99 1.0	22 47.2	99 41.0	22 15.2	100 20.2	2 58.1
50	22 11.3	96 28.5	21 40.5	97 10.1	21 9.4	97 50.8	2 50.8
55	21 1.9	93 38.8	20 32.1	94 22.4	20 1.9	95 5.0	2 42.6
10 0	+19 49.6	+ 90 24.0	+19 21.1	+ 91 10.5	+18 52.1	+ 91 55.9	2 33.4
5	18 33.4	86 30.9	18 6.4	87 21.9	17 38.9	88 11.6	2 22.9
10	17 10.2	81 28.5	16 45.4	82 28.7	16 20.1	83 26.5	2 10.4
15	15 28.7	73 19.7	15 9.3	74 53.6	14 48.4	76 18.4	1 53.1
Limits.	+14 13	+ 63 40	+13 43	+ 63 51	+13 13	+ 64 1	. . .

152737°—1923——36

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, SEPT. 10, 1923.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magnitude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
Albany, N. Y.	8 41	256	212	9 34	0.42	10 24	146	99
Allegheny, Pa.	8 36	262	218	9 35	0.49	10 29	142	92
Amherst, Mass.	8 43	256	211	9 36	0.42	10 25	146	98
Ann Arbor, Mich.	8 28	262	222	9 29	0.49	10 24	143	96
Appleton, Wis.	8 19	262	228	9 21	0.49	10 18	144	99
Atlanta, Ga.	8 36	272	222	9 43	0.64	10 43	133	77
Augusta, Me.	8 43	253	209	9 33	0.38	10 20	148	102
Austin, Tex.	8 17	286	243	9 35	0.83	10 45	125	66
Baton Rouge, La.	8 29	281	231	9 42	0.76	10 48	127	68
Berkeley, Calif.	7 17	293	310	8 42	0.95	10 4	121	85
Bismarck, N. Dak.	7 56	267	249	9 3	0.55	10 7	141	103
Boise City, Idaho	7 27	281	285	8 45	0.75	10 1	130	97
Buffalo, N. Y.	8 35	258	217	9 31	0.45	10 23	145	98
Cambridge, Mass.	8 44	255	210	9 36	0.42	10 25	146	98
Carson City, Nev.	7 22	289	301	8 45	0.89	10 5	124	88
Charleston, W. Va.	8 36	265	220	9 37	0.54	10 33	139	88
Charlottesville, Va.	8 40	264	216	9 40	0.53	10 34	140	87
Cheyenne, Wyo.	7 51	277	260	9 7	0.68	10 17	134	90
Cincinnati, Ohio	8 31	266	223	9 34	0.54	10 31	140	88
Cleveland, Ohio	8 32	262	220	9 32	0.49	10 26	143	94
Columbia, Mo.	8 18	271	234	9 26	0.61	10 29	137	87
Columbia, S. C.	8 41	270	219	9 45	0.62	10 43	134	78
Columbus, Ohio	8 32	264	221	9 33	0.52	10 29	141	91
Denver, Colo.	7 52	279	261	9 9	0.71	10 20	132	87
Des Moines, Iowa	8 13	269	237	9 20	0.57	10 23	139	92
Dover, Del.	8 43	261	214	9 40	0.49	10 32	142	90
Evanston, Ill.	8 22	264	227	9 26	0.52	10 24	142	94
Flagstaff, Ariz.	7 41	289	282	9 5	0.88	10 23	124	76
Geneva, N. Y.	8 37	258	215	9 32	0.44	10 23	145	98
Greencastle, Ind.	8 26	267	226	9 30	0.55	10 29	139	89
Hanover, N. H.	8 41	254	211	9 33	0.40	10 22	147	101
Harrisburg, Pa.	8 40	260	215	9 37	0.48	10 30	143	92
Helena, Mont.	7 34	274	272	8 48	0.65	9 59	136	103
Honolulu, Hawaii	6 49	343	51	7 39	0.22	8 33	63	120
Iowa City, Iowa	8 16	267	233	9 22	0.56	10 23	140	93
Ithaca, N. Y.	8 38	258	214	9 33	0.44	10 24	145	97
Jackson, Miss.	8 29	278	230	9 40	0.72	10 44	130	72
Juneau, Alaska	7 4	268	285	8 10	0.61	9 16	136	133
Kansas City, Mo.	8 13	272	238	9 23	0.62	10 28	136	87
Little Rock, Ark.	8 22	276	234	9 34	0.69	10 38	132	77
Louisville, Ky.	8 30	268	224	9 34	0.57	10 33	138	86
Madison, Wis.	8 19	264	230	9 22	0.52	10 21	142	96
Minneapolis, Minn	8 11	264	236	9 15	0.51	10 15	142	100
Montgomery, Ala.	8 35	275	225	9 44	0.68	10 45	131	73
Mount Hamilton, Calif.	7 19	293	310	8 44	0.96	10 6	120	84
Mount Wilson, Calif.	7 29	295	304	8 55	0.98	10 17	119	74
Nashville, Tenn.	8 30	271	226	9 37	0.62	10 37	135	82

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, SEPT. 10, 1923.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magnitude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
New Haven, Conn.	8 43	257	211	9 37	0.44	10 27	145	96
New Orleans, La.	8 32	281	230	9 44	0.76	10 49	127	67
New York, N. Y.	8 43	258	212	9 38	0.46	10 28	144	94
Nome, Alaska	6 49	264	288	7 47	0.60	8 47	134	149
Oklahoma City, Okla.	8 11	279	244	9 26	0.72	10 34	131	78
Omaha, Nebr.	8 9	270	241	9 18	0.60	10 22	138	91
Orono, Me.	8 44	252	208	9 33	0.37	10 19	149	104
Oxford, Miss.	8 28	275	229	9 37	0.67	10 40	133	77
Panama, Panama	9 16	304	221	10 20	0.82	11 18	100	18
Philadelphia, Pa.	8 42	260	213	9 38	0.48	10 30	143	92
Phoenix, Ariz.	7 42	292	285	9 7	0.92	10 26	122	72
Pierre, S. Dak.	7 58	270	249	9 8	0.58	10 13	139	98
Portland, Oreg.	7 14	282	296	8 33	0.78	9 50	129	104
Poughkeepsie, N. Y.	8 42	258	212	9 36	0.44	10 26	145	96
Raleigh, N. C.	8 42	267	216	9 44	0.57	10 39	137	82
Richmond, Va.	8 42	264	215	9 41	0.53	10 36	139	86
Sacramento, Calif.	7 18	291	306	8 42	0.92	10 4	122	87
Salt Lake City, Utah	7 37	282	278	8 56	0.77	10 11	130	90
San Juan, P. R.	9 13	284	212	10 13	0.89	....	...	...
Santa Fe, N. Mex.	7 53	285	265	9 14	0.80	10 28	127	77
Seattle, Wash.	7 15	278	291	8 31	0.74	9 46	131	108
Springfield, Ill.	8 22	268	230	9 28	0.57	10 28	139	89
St. Louis, Mo.	8 22	270	231	9 29	0.60	10 31	137	86
Syracuse, N. Y.	8 38	257	214	9 32	0.43	10 23	146	98
Tallahassee, Fla.	8 40	276	222	9 48	0.71	10 50	129	69
Topeka, Kans.	8 11	273	240	9 22	0.64	10 27	136	86
Tuscaloosa, Ala.	8 32	275	226	9 41	0.68	10 43	132	75
Ukiah, Calif.	7 15	291	310	8 38	0.93	10 0	122	89
Urbana, Ill.	8 24	267	228	9 28	0.56	10 28	139	90
Washington, D. C.	8 41	262	215	9 39	0.50	10 32	141	90
Williams Bay, Wis.	8 21	264	228	9 24	0.52	10 22	142	95

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
80 B. Piscium	6.3	0 1 6.967	+0.0037	− 0 55 49.80	−0.052
4 Ceti	6.3	0 3 47.427	+0.0018	2 58 38.03	+0.009
5 Ceti	6.3	0 4 15.520	+0.0003	− 2 52 33.13	+0.014
98 B. Piscium	6.3	0 13 50.328	+0.0051	+ 1 15 38.69	+0.012
44 Piscium	6.0	0 21 27.283	−0.0014	+ 1 30 47.80	−0.023
10 Ceti	6.4	0 22 40.485	+0.0056	− 0 28 32.58	+0.011
155 B. Piscium	6.5	0 47 20.319	+0.0011	+ 2 58 1.93	−0.094
73 Piscium	6.2	1 0 53.183	+0.0022	5 14 38.23	−0.008
77 Piscium	6.4	1 1 50.066	+0.0011	4 29 55.63	−0.114
e Piscium	5.6	1 4 24.065	−0.0180	5 14 34.49	−0.171
f Piscium	5.3	1 13 49.546	−0.0033	+ 3 12 33.61	−0.026
μ Piscium	5.0	1 26 8.930	+0.0199	5 44 51.76	−0.027
ν Piscium	4.7	1 37 25.338	−0.0015	5 5 54.57	+0.003
39 B. Arietis	6.5	2 0 47.224	+0.0025	7 22 0.01	−0.032
64 Ceti	5.8	2 7 17.037	−0.0092	8 12 36.27	−0.107
ξ^1 Ceti	4.5	2 8 54.975	−0.0012	+ 8 29 9.78	−0.016
ξ Arietis	5.5	2 20 41.193	+0.0006	10 15 45.03	−0.022
25 Arietis	6.5	2 23 17.509	−0.0195	9 51 26.38	−0.200
389 B. Ceti	6.3	2 25 28.491	−0.0003	9 13 21.27	−0.003
31 Arietis	5.7	2 32 25.780	+0.0189	12 6 52.20	−0.085
85 Ceti	6.3	2 38 19.976	−0.0026	+10 24 51.63	−0.012
38 Arietis	5.2	2 40 45.648	+0.0081	12 7 21.46	−0.079
μ Ceti	4.4	2 40 46.593	+0.0188	9 47 23.86	−0.025
147 B. Arietis	5.8	3 2 9.947	+0.0016	12 53 27.90	−0.072
8 B. Tauri	6.2	3 19 55.704	....	12 21 27.09	...
f Tauri	4.3	3 26 37.162	+0.0016	+12 40 25.80	+0.002
30 B. Tauri	6.4	3 33 28.328	+0.0015	15 10 44.32	−0.003
179 B. Tauri	5.9	4 3 20.385	+0 0104	14 57 27.39	−0.044
193 B. Tauri	6.2	4 8 6.060	+0.0005	17 4 49.90	−0.014
48 Tauri	6.3	4 11 23.873	+0.0085	15 12 33.02	−0.024
γ Tauri	3.9	4 15 24.550	+0.0083	+15 26 34.24	−0.026
58 Tauri	5.4	4 16 14.135	+0.0071	14 54 43.46	−0.017
δ Tauri	3.9	4 18 29.500	+0.0076	17 21 47.15	−0.030
63 Tauri	5.7	4 18 59.821	+0.0074	16 35 55.35	−0.027
64 Tauri	4.9	4 19 39.309	+0.0084	17 16 0.49	−0.040
70 Tauri	6.4	4 21 13.426	+0.0073	+15 45 58.24	−0.026
71 Tauri	4.6	4 21 57.344	+0.0075	15 26 40.96	−0.020
75 Tauri	5.2	4 24 2.122	+0.0002	16 11 19.05	+0.020
θ^1 Tauri	4.2	4 24 10.385	+0.0071	15 47 32.99	−0.023
θ^2 Tauri	3.6	4 24 15.845	+0.0078	15 42 4.93	−0.020
80 Tauri	5.8	4 25 44.968	+0.0059	+15 28 15.99	−0.011
264 B. Tauri	4.8	4 26 9.100	+0.0084	16 1 39.61	−0.027
81 Tauri	5.5	4 26 15.208	+0.0069	15 31 31.77	−0.032
85 Tauri	6.0	4 27 27.736	+0.0070	15 41 15.60	−0.020
119 H^1. Tauri	6.2	4 29 5.442	+0.0025	17 51 18.97	−0.031
275 B. Tauri	6.5	4 29 13.595	+0.0010	+16 9 46.20	+0.019
α Tauri (*Aldebaran*)	1.1	4 31 30.001	+0.0047	16 21 20.55	−0.189
89 Tauri	5.8	4 33 44.883	+0.0072	15 52 48.75	−0.023
σ^1 Tauri	5.2	4 34 45.231	+0.0019	15 38 58.32	−0.065
σ^2 Tauri	4.9	4 34 52.121	+0.0062	15 45 59.80	−0.019
318 B. Tauri	5.7	4 52 55.377	−0.0008	+17 2 2.83	−0.011
m Tauri	5.0	5 2 53.848	+0.0381	18 32 35.00	+0.025
111 Tauri	5.1	5 19 55.741	+0.0168	17 18 47.53	−0.010
115 Tauri	5.3	5 22 40.568	+0.0016	17 53 50.72	−0.021
117 Tauri	6.0	5 23 33.391	+0.0017	17 10 33.21	−0.078
119 Tauri	4.9	5 27 41.873	+0.0007	+18 32 17.77	−0.004
167 H^1. Tauri	5.5	5 27 46.418	+0.0025	17 0 7.22	−0.040
120 Tauri	5.6	5 29 0.859	+0.0011	18 29 11.92	+0.001
122 Tauri	5.5	5 32 35.563	+0.0034	16 59 38.07	−0.037
130 Tauri	5.6	5 42 56.820	+0.0004	+17 42 5.42	−0.009

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
B. D. +19°1110	6.0	5 47 49.652	−0.0008	+19 50 56.71	−0.031
57 Orionis	5.8	5 50 23.156	+0.0003	19 44 8.98	−0.013
64 Orionis	5.1	5 58 53.907	+0.0014	19 41 35.14	−0.021
68 Orionis	5.7	6 7 27.748	+0.0012	19 48 32.38	−0.013
19 B. Geminorum	6.2	6 9 1.883	+0.0027	18 42 5.84	−0.042
124 H^1. Orionis	5.7	6 9 58.785	+0.0010	+17 55 44.95	−0.045
71 Orionis	5.1	6 10 19.068	−0.0062	19 11 1.73	−0.194
B. D. +17°1191	6.5	6 11 55.387	+0.0011	17 12 28.99	−0.031
287 B. Orionis	6.2	6 14 33.120	−0.0031	17 21 23.44	−0.037
292 B. Orionis	6.5	6 16 56.264	+0.0006	17 48 2.86	. . .
26 Geminorum	5.2	6 37 55.378	+0.0010	+17 43 18.45	−0.092
74 B. Geminorum	6.2	6 42 53.529	+0.0002	18 16 41.02	−0.056
110 B. Geminorum	6.2	6 57 56.828	. . . .	17 51 57.28	. . .
41 H^1. Geminorum	6.0	6 58 6.698	−0.0063	16 47 11.29	+0.006
λ Geminorum	3.6	7 13 40.171	−0.0029	16 40 49.62	−0.045
162 B. Geminorum	5.7	7 27 22.075	+0.0018	+17 15 5.12	−0.065
f Geminorum	5.3	7 35 1.871	−0.0002	17 51 4.30	+0.004
g Geminorum	5.0	7 41 40.107	−0.0048	18 41 56.66	−0.063
1 Cancri	6.0	7 52 37.248	−0.0021	15 59 49.48	−0.044
2 B. Cancri	6.0	7 54 8.044	+0.0003	16 43 38.47	+0.004
3 Cancri	5.7	7 56 22.726	−0.0001	+17 31 14.65	−0.010
5 Cancri	5.9	7 57 7.102	+0.0004	16 40 7.68	0.000
30 B. Cancri	6.1	8 6 39.465	−0.0007	14 51 29.50	−0.013
ζ Cancri (*mean*)	4.7	8 7 47.905	+0.0051	17 52 52.41	−0.129
d^2 Cancri	6.2	8 21 28.535	−0.0132	17 18 3.89	−0.153
29 Cancri	5.9	8 24 19.627	−0.0017	+14 27 59.80	−0.022
90 B. Cancri	6.3	8 31 48.776	+0.0006	15 34 51.01	−0.027
54 Cancri	6.3	8 46 44.318	−0.0075	15 38 14.01	+0.077
o^1 Cancri	5.1	8 52 57.422	+0.0041	15 37 8.41	+0.022
o^2 Cancri	5.7	8 53 17.339	+0.0043	15 52 40.55	+0.023
81 Cancri	6.4	9 8 4.925	−0.0359	+15 18 26.02	+0.244
π Cancri	5.6	9 10 58.993	−0.0022	15 15 42.49	−0.008
222 B. Cancri	6.3	9 13 41.291	+0.0046	11 49 27.77	−0.007
ξ Leonis	5.1	9 27 47.866	−0.0063	11 38 29.73	−0.084
o Leonis	3.8	9 37 2.597	−0.0096	10 14 36.48	−0.033
18 Leonis	5.8	9 42 14.609	−0.0006	+12 9 55.20	+0.008
19 Leonis	6.4	9 43 17.622	−0.0049	11 55 30.27	+0.008
R Leonis (*var.*)	4.6	9 43 25.132	−0 0005	11 47 12.42	−0.040
83 B. Leonis	5.9	9 52 21.103	−0 0074	9 17 55.47	+0.017
ν Leonis	5.0	9 54 4.907	−0.0028	12 48 45.26	−0.027
A Leonis	4.6	10 3 49.215	−0.0057	+10 22 31.94	−0.067
α Leonis (*Regulus*)	1.3	10 4 16.407	−0.0169	12 20 38.76	−0.002
44 Leonis	5.9	10 21 11.909	+0.0018	9 10 36.38	−0.041
45 Leonis	5.8	10 23 35.100	+0.0011	10 9 19.75	−0.003
ρ Leonis	3.8	10 28 45.526	−0.0004	9 42 12.08	−0.003
48 Leonis	5.2	10 30 47.089	−0.0072	+ 7 21 1.84	+0.047
49 Leonis	5.7	10 30 59.910	−0.0030	9 2 55.12	−0.010
37 Sextantis	6.3	10 42 5.198	−0.0010	6 46 45.63	−0.040
56 Leonis	6.1	10 52 1.681	−0.0013	6 35 48.18	−0.008
c Leonis	5.1	10 56 45.400	−0.0035	6 30 55.89	−0.025
χ Leonis	4.7	11 1 2.780	−0.0234	+ 7 45 9.85	−0.040
σ Leonis	4.1	11 17 10.029	−0.0062	6 27 5.86	−0.013
80 Leonis	6.4	11 21 52.692	−0.0051	4 17 3.00	−0.050
83 Leonis	6.3	11 22 51.444	−0.0492	3 25 59.19	+0.187
r Leonis	5.2	11 23 58.670	+0.0008	3 16 49.80	−0.016
89 Leonis	5.7	11 30 25.551	−0.0121	+ 3 29 16.83	−0.104
β Virginis	3.8	11 46 41.062	+0.0494	2 11 55.45	−0.275
27 B. Virginis	6.5	11 55 7.094	−0.0033	0 57 32.18	+0.034
10 Virginis	6.2	12 5 44.597	+0.0034	+ 2 19 48.99	−0.181
13 Virginis	5.9	12 14 43.415	+0.0019	− 0 21 33.39	−0.021

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
η Virginis	4.0	12 15 57.985	−0.0036	− 0 14 20.45	−0.027
γ Virginis (*mean*)	2.9	12 37 45.530	−0.0365	1 1 38.25	+0.004
38 Virginis	6.1	12 49 14.533	−0.0173	3 8 5.48	−0.004
91 G. Virginis	6.5	12 49 39.664	−0.0025	3 48 19.73	−0.070
k Virginis	5.7	12 55 41.441	−0.0027	3 23 49.05	−0.004
46 Virginis	6.1	12 56 37.914	−0.0026	− 2 57 16.98	+0.046
48 Virginis	6.5	12 59 56.262	−0.0033	3 14 56.57	−0.028
θ Virginis	4.4	13 5 57.657	−0.0029	5 7 41.85	−0.040
65 Virginis	6.0	13 19 19.370	−0.0016	4 31 19.20	−0.016
66 Virginis	5.7	13 20 32.612	+0.0105	4 45 43.08	−0.030
72 Virginis	6.1	13 26 24.541	+0.0023	− 6 4 23.59	+0.014
l Virginis	4.8	13 27 57.574	−0.0069	5 51 31.13	−0.045
80 Virginis	5.6	13 31 30.815	+0.0010	5 0 15.89	+0.075
m Virginis	5.2	13 37 34.075	−0.0073	8 18 53.93	+0.032
566 B. Virginis	6.4	13 39 53.669	−0.0049	5 6 41.58	−0.025
88 Virginis	6.5	13 44 16.128	−0.0032	− 6 27 13.68	−0.033
598 B. Virginis	6.1	13 50 55.708	−0.0121	7 40 50.09	−0.049
623 B. Virginis	6.5	14 0 16.704	−0.0026	8 53 17.19	+0.006
95 Virginis	5.4	14 2 38.308	−0.0098	8 56 47.58	+0.011
96 Virginis	6.5	14 4 54.283	−0.0005	9 58 13.49	+0.016
κ Virginis	4.3	14 8 47.140	+0.0006	− 9 54 57.61	+0.132
2 Libræ	6.3	14 19 16.824	−0.0014	11 21 47.08	−0.066
4 G. Libræ	6.5	14 20 32.399	−0.0046	11 19 14.45	−0.028
6 B. Libræ	6.2	14 32 53.858	−0.0591	11 58 42.43	+0.384
22 B. Libræ	6.4	14 43 42.623	+0.0013	12 30 59.26	−0.083
13 Libræ	5.7	14 50 11.826	−0.0048	−11 35 6.09	−0.020
ξ^2 Libræ	5.6	14 52 35.187	−0 0006	11 5 59.34	−0.001
17 Libræ	6.4	14 54 2.848	−0.0019	10 50 46.93	−0.021
18 Libræ	5.9	14 54 43.523	−0.0079	10 50 7.89	−0.077
130 B. Libræ	5.9	15 19 38.490	−0.0043	12 5 43.97	−0.038
γ Libræ	4.0	15 31 12.974	+0.0047	−14 32 1.05	+0.007
190 B. Libræ	6.5	15 39 5.613	−0.0009	14 47 50.50	−0.115
η Libræ	5.5	15 39 44.297	−0.0028	15 25 43.10	−0.079
195 B. Libræ	6.2	15 47 20.233	−0 0010	13 54 7.19	+0.001
θ Libræ	4.4	15 49 26.279	+0.0066	16 30 16.19	+0.119
202 B. Libræ	6.4	15 51 55.133	+0.0012	−14 10 26.85	−0.094
203 B. Libræ	6.2	15 52 13.250	+0.0047	14 36 17.10	. . .
48 Libræ	4.6	15 53 52.496	−0.0004	14 3 29.70	−0.026
49 Libræ	5.4	15 56 0.210	−0.0434	16 18 26.89	−0.391
91 B. Scorpii	6.1	16 11 30.542	. . . .	14 39 25.95	. . .
98 B. Scorpii	6.1	16 14 39.604	+0.0032	−14 41 11.87	−0.018
ϕ Ophiuchi	4.4	16 26 43.733	−0.0039	16 26 44.90	−0.029
24 Scorpii	5.0	16 37 7.022	−0.0017	17 35 39.47	−0.004
78 B. Ophiuchi	6.5	16 51 35.082	+0.0062	16 41 5.39	+0.024
90 B. Ophiuchi	6.5	16 55 15.042	−0.0047	18 7 47.62	−0.156
29 Ophiuchi	6.4	16 57 20.872	−0.0024	−18 46 24.31	−0.020
125 B. Ophiuchi	6.2	17 3 46.430	−0.0007	17 30 29.87	−0.049
164 B. Ophiuchi	6.0	17 15 24.341	−0.0003	17 40 36.54	+0.001
192 B. Ophiuchi	6.3	17 20 6.503	+0.0016	18 22 30.68	+0.009
305 B. Ophiuchi	6.3	17 51 23.252	+0.0019	18 47 22.50	−0.003
6 Sagittarii	6.5	17 56 54.674	+0.0005	−17 9 18.05	−0.004
32 G. Sagittarii	5.7	18 3 20.713	−0.0003	17 9 59.25	. . .
39 G. Sagittarii	6.3	18 6 40.857	−0.0027	19 51 29.80	−0.040
64 B. Sagittarii	6.1	18 10 59.303	. . . .	18 41 10.66	. . .
6 B. Scuti	5.9	18 12 42.830	+0.0007	17 24 4.56	+0.013
52 G. Sagittarii	6.4	18 12 57.639	+0.0004	−18 29 32.53	−0.036
17 H^1. Sagittarii	6.4	18 14 11.904	. . . .	18 39 1.31	. . .
Y Sagittarii (*var.*)	5.4	18 16 51.187	. . . .	18 53 43.52	−0.001
85 B. Sagittarii	6.0	18 23 26.898	−0.0006	17 50 53.40	+0.006
95 B. Sagittarii	5.7	18 25 40.397	+0.0041	−18 46 42.90	−0.072

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
100 B. Sagittarii	5.0	18 26 55.571	−0.0012	−18 27 24.02	−0.026
171 B. Sagittarii	6.1	18 58 32.284	0.0000	19 21 30.29	−0.035
173 B. Sagittarii	6.4	18 58 35.793	+0.0020	19 12 54.72	. . .
187 B. Sagittarii	6.4	19 2 38.133	+0.0036	18 51 29.30	−0.056
190 B. Sagittarii	5.4	19 3 45.313	+0.0001	19 24 43.55	−0.003
195 B. Sagittarii	6.3	19 5 15.755	+0 0019	−19 55 33.47	−0.050
d Sagittarii	5.0	19 13 7.822	−0.0015	19 5 28.33	−0.017
226 B. Sagittarii	6.4	19 17 6.467	+0.0002	19 22 45.85	+0.009
ρ Sagittarii	4.0	19 17 12.480	−0.0020	17 59 36.35	+0.015
45 Sagittarii	6.0	19 17 21.450	+0.0064	18 27 7.48	−0.082
266 B. Sagittarii	6.1	19 31 56.788	+0.0003	−19 1 26.56	−0.009
267 B. Sagittarii	5.8	19 32 35.394	+0.0011	18 24 11.47	−0.002
54 Sagittarii	5.4	19 36 18.797	+0.0046	16 28 15.61	−0.047
e Sagittarii	5.2	19 38 6.947	+0.0040	16 18 20.32	−0 015
g Sagittarii	5.1	19 53 35.093	+0.0004	15 41 47.89	−0.081
16 B. Capricorni	6.2	20 16 27.102	+0 0025	−15 1 42.95	+0.005
β Capricorni	3.2	20 16 41.237	+0.0030	15 1 31.97	+0.007
31 B. Capricorni	6.4	20 24 23.367	+0 0013	15 59 49.74	+0.019
27 G. Capricorni	6.2	20 26 45.465	−0 0058	15 18 54.10	−0.092
45 B. Capricorni	6.1	20 29 54.567	+0 0035	13 59 13.03	+0 060
47 B. Capricorni	6.2	20 31 10.937	+0.0055	−16 47 29.02	−0.033
τ Capricorni	5.2	20 34 58.147	+0.0006	15 13 32.73	−0 015
61 B. Capricorni	5.9	20 36 13.127	−0.0032	16 23 56.30	+0.082
94 B. Capricorni	5.7	20 53 22.179	+0.0046	16 19 42.26	+0 030
95 B. Capricorni	5.9	20 54 26.254	. . . .	14 46 52.43	. . .
29 Capricorni	5.5	21 11 29.267	+0.0016	−15 29 32.33	+0 004
53 B. Aquarii	6.5	21 11 46.662	+0.0004	13 31 19.82	−0.039
18 Aquarii	5.5	21 19 59.121	+0.0054	13 12 33.89	+0 007
72 B. Aquarii	6.5	21 24 3.590	−0.0045	11 54 8.56	+0.008
137 B. Capricorni	6.2	21 35 19.865	+0.0001	10 55 25.85	−0.010
λ Capricorni	5.5	21 42 23.511	+0.0015	−11 43 18.14	−0.004
151 B. Capricorni	6.1	21 45 31.467	−0.0009	13 4 56.36	+0 031
96 B. Aquarii	6.5	21 49 29.094	−0.0001	10 40 29.20	+0.006
e Aquarii	5.4	22 6 30.593	+0.0019	11 56 38.71	+0.020
θ Aquarii	4.3	22 12 46.296	+0.0074	8 10 1.93	−0.018
150 B. Aquarii	6.0	22 12 48.799	−0.0034	− 9 25 27.18	−0.005
ρ Aquarii	5.3	22 16 8.916	+0.0008	8 12 30.53	−0.008
170 B. Aquarii	6.0	22 19 29.991	+0.0012	7 35 2.50	+0.034
186 B. Aquarii	6.1	22 27 16.166	+0 0129	6 56 55.62	−0.129
167 G. Aquarii	6.3	22 34 19.640	+0.0010	8 17 52.33	+0.012
213 B. Aquarii	6.5	22 39 1.444	+0.0014	− 8 42 52.67	+0.031
67 Aquarii	6.4	22 39 13.085	+0.0015	7 21 59.10	−0.007
λ Aquarii	3.8	22 48 35.896	+0.0002	7 59 23.03	+0.035
78 Aquarii	6.3	22 50 33.576	−0.0017	7 36 51.29	−0.029
252 B. Aquarii	5.8	22 51 11.298	−0.0003	5 23 53.43	+0.009
197 G. Aquarii	6.3	22 53 18.017	−0.0024	− 5 13 18.85	+0.006
81 Aquarii	6.4	22 57 23.587	−0.0015	7 28 29.60	−0.001
263 B. Aquarii	6.1	22 57 32.656	+0.0007	5 7 32.38	+0.002
82 Aquarii	6.4	22 58 32.825	0 0000	6 59 16.11	−0.034
h Aquarii	5.4	23 1 8.917	+0.0081	8 6 34.49	+0.016
φ Aquarii	4.4	23 10 20.091	+0 0015	− 6 27 51.79	−0.194
293 B. Aquarii	5.5	23 11 36.287	−0.0011	3 54 58.59	+0.003
96 Aquarii	5.7	23 15 24.436	+0.0128	5 32 42.76	−0.009
316 B. Aquarii	6.5	23 16 16.347	+0.0191	4 20 19.40	−0.118
317 B. Aquarii	6.3	23 16 42.742	−0.0099	6 19 43.38	−0.065
337 B. Aquarii	6.4	23 25 33.260	+0.0121	− 4 57 7.75	−0.218
342 B. Aquarii	6.5	23 27 32.928	+0.0124	4 30 29.31	−0.172
20 Piscium	5.6	23 43 59.064	+0.0064	3 11 23.30	+0.002
24 Piscium	6.1	23 48 58.261	+0.0051	3 34 59.42	−0.048
29 Piscium	5.1	23 57 52.662	+0.0009	− 3 27 22.03	−0.012

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
111 Tauri	5.1	+1.30	− 9.1	+17 18.6	1 0 17.9	−10 21.7	+0.8325	0.5739	+0.0371	+90	+28
115 Tauri	5.3	1.30	9.1	17 53.7	1 30.1	− 9 12.0	+0.2572	0.5744	0.0350	+51	− 5
117 Tauri	6.0	1.30	9.2	17 10.4	1 53.2	− 8 49.6	+1.0340	0.5746	0.0344	+90	+43
119 Tauri	4.9	1.31	9.2	18 32.1	3 41.8	− 7 4.9	−0.3478	0.5753	0.0312	+15	−39
120 Tauri	5.6	1.31	9.2	18 29.0	4 16.2	− 6 31.6	−0.2757	0.5755	0.0301	+19	−35
130 Tauri	5.6	+1.32	− 9.7	+17 41.9	10 19.3	− 0 41.6	+0.7020	0.5779	+0.0192	+90	+22
19 B. Geminorum	6.2	1.34	10.3	18 41.9	21 32.2	+10 7.0	−0.2499	0.5815	−0.0015	+20	−30
124 H^1. Orionis	5.7	1.33	10.4	17 55.6	21 56.6	+10 30.6	+0.5590	0.5816	0.0022	+75	+15
71 Orionis	5.1	1.34	10.3	19 10.9	22 5.2	+10 38.9	−0.7562	0.5816	0.0025	− 9	−71
287 B. Orionis	6.2	1.33	10.5	17 21.2	23 53.7	−11 36.6	+1.1502	0.5821	0.0059	+90	+56
292 B. Orionis	6.5	+1.33	−10.6	+17 47.9	2 0 54.7	−10 37.8	+0.6776	0.5823	−0.0078	+90	+21
26 Geminorum	5.2	1.32	11.0	17 43.1	9 49.6	− 2 2.3	+0.6132	0.5842	0.0246	+81	+16
74 B. Geminorum	6.2	1.32	11.1	18 16.5	11 55.8	− 0 0.7	−0.0227	0.5846	0.0286	+33	−19
110 B. Geminorum	6.2	1.30	11.4	17 51.8	18 17.2	+ 6 6.6	+0.1856	0.5855	0.0406	+46	− 9
λ Geminorum	3.6	1.28	11.5	16 40.6	3 0 54.6	−11 30.7	+1.1031	0.5860	0.0531	+90	+47
162 B. Geminorum	5.7	+1.26	−11.7	+17 14.9	6 40.4	− 5 57.6	+0.1743	0.5862	−0.0637	+45	−12
f Geminorum	5.3	1.25	11.8	17 50.9	9 53.7	− 2 51.4	−0.6598	0.5862	0.0696	− 3	−67
1 Cancri	6.0	1.21	11.8	15 59.6	17 17.6	+ 4 16.1	+0.6873	0.5859	0.0828	+90	+15
2 B. Cancri	6.0	1.21	11.8	16 43.4	17 55.8	+ 4 52.8	−0.1176	0.5859	0.0840	+28	−30
3 Cancri	5.7	1.20	11.9	17 31.0	18 52.4	+ 5 47.4	−1.0140	0.5859	0.0856	−27	−73
5 Cancri	5.9	+1.20	−11.9	+16 39.9	19 11.1	+ 6 5.5	−0.1642	0.5858	−0.0862	+25	−33
29 Cancri	5.9	1.14	11.6	14 27.8	4 6 39.5	− 6 51.4	+0.9947	0.5846	0.1055	+90	+33
90 B. Cancri	6.3	1.12	11.7	15 34.7	9 49.4	− 3 48.5	−0.4892	0.5841	0.1106	+ 7	−57
54 Cancri	6.3	1.07	11.6	15 38.0	16 9.0	+ 2 17.2	−1.2764	0.5830	0.1204	−58	−75
222 B. Cancri	6.3	1.00	10.7	11 49.3	5 3 38.0	−10 38.9	+1.1371	0.5807	0.1368	+90	+42
ξ Leonis	5.1	+0.94	−10.4	+11 38.3	9 40.9	− 4 49.1	+0.4711	0.5793	−0.1446	+65	− 4
o Leonis	3.8	0.91	9.9	10 14.4	13 39.5	− 0 59.2	+1.3081	0.5783	0.1494	+79	+67
18 Leonis	5.8	0.88	10.2	12 9.8	15 54.1	+ 1 10.6	−0.9845	0.5778	0.1520	−23	−78
19 Leonis	6.4	0.88	10.2	11 55.3	16 21.3	+ 1 36.9	−0.8092	0.5777	0.1525	−11	−79
R Leonis (*var.*)	4.6	0.88	10.2	11 47.0	16 24.5	+ 1 40.0	−0.6768	0.5777	0.1526	− 3	−77
83 B. Leonis	5.9	+0.86	− 9.4	+ 9 17.8	20 16.2	+ 5 23.3	+1.2540	0.5768	−0.1569	+90	+53
A Leonis	4.6	0.81	9.4	10 22.4	6 1 14.7	+10 11.3	−0.6333	0.5756	0.1619	0	−74
44 Leonis	5.9	0.74	8.6	9 10.5	8 49.1	− 6 30.5	−0.6700	0.5738	0.1690	− 2	−79
48 Leonis	5.2	0.72	7.8	7 20.9	13 0.9	− 2 27.6	+0.4657	0.5729	0.1724	+64	− 7
49 Leonis	5.7	0.70	8.3	9 2.8	13 6.5	− 2 22.1	−1.2718	0.5729	0.1724	−52	−81
37 Sextantis	6.3	+0.67	− 7.3	+ 6 46.6	17 58.5	+ 2 19.6	+0.1802	0.5719	−0.1760	+45	−23
56 Leonis	6.1	0.63	7.0	6 35.7	22 21.2	+ 6 33.0	−0.4115	0.5710	0.1788	+12	−59
c Leonis	5.1	0.61	6.8	6 30.8	7 0 26.3	+ 8 33.7	−0.7034	0.5707	0.1800	− 4	−84
80 Leonis	6.4	0.51	5.2	4 17.0	11 33.6	− 4 42.3	−0.4769	0.5688	0.1852	+ 9	−65
83 Leonis	6.3	0.52	4.9	3 25.9	11 59.7	− 4 17.1	+0.3040	0.5688	0.1854	+53	−18
τ Leonis	5.2	+0.51	− 4.8	+ 3 16.8	12 29.5	− 3 48.3	+0.3662	0.5687	−0.1856	+57	−14
89 Leonis	5.7	0.48	4.7	3 29.2	15 21.4	− 1 2.4	−0.3767	0.5684	0.1864	+14	−58
β Virginis	3.8	0.41	3.7	2 11.9	22 35.5	+ 5 56.6	−0.4275	0.5676	0.1880	+11	−61
27 B. Virginis	6.5	0.38	2.9	+ 0 57.5	8 2 21.1	+ 9 34.5	+0.1191	0.5674	0.1886	+42	−28
13 Virginis	5.9	0.30	1.7	− 0 21.6	11 5.8	− 5 59.0	−0.1974	0.5670	0.1887	+24	−46
η Virginis	4.0	+0.29	− 1.7	− 0 14.4	11 39.1	− 5 26.9	−0.4238	0.5670	−0.1887	+11	−61
38 Virginis	6.1	0.14	+ 0.6	3 8.1	9 2 29.7	+ 8 52.9	−0.2735	0.5673	0.1855	+19	−51
91 G. Virginis	6.5	0.15	0.9	3 48.3	2 40.9	+ 9 3.6	+0.3712	0.5673	0.1855	+57	−14
k Virginis	5.7	0.12	0.9	3 23.8	5 22.0	+11 39.2	−0.5393	0.5675	0.1844	+ 5	−70
46 Virginis	6.1	0.10	0.8	2 57.3	5 47.1	−11 56.5	−1.0645	0.5676	0.1842	−29	−90
48 Virginis	6.5	+0.09	+ 1.0	− 3 14.9	7 15.4	−10 31.3	−1.0371	0.5677	−0.1836	−27	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
Name.		Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$									
			s	"	° ′	d	h m	h m				°	°
θ	Virginis	4.4	+0.08	+ 1.9	− 5 7.7	9	9 56.2	− 7 56.2	+0.3768	0.5679	−0.1824	+57	−14
	Saturn	0.9	. . .	. . .	5 27.0		14 43.2	− 3 19.1	−0.1637	0.5672	0.1796	+25	−44
65	Virginis	6.0	0.00	2.2	4 31.3		15 52.2	− 2 12.5	−1.3114	0.5686	0.1793	−60	−84
66	Virginis	5.7	0.00	2.3	4 45.7		16 24.6	− 1 41.2	−1.1651	0.5687	0.1789	−39	−90
72	Virginis	6.1	−0.02	3.0	6 4.3		19 0.6	+ 0 49.3	−0.2986	0.5690	0.1773	+17	−53
l	Virginis	4.8	−0.03	+ 3.0	− 5 51.5		19 41.8	+ 1 29.0	−0.6380	0.5691	−0.1769	− 2	−81
m	Virginis	5.2	0.06	4.2	8 18.8		23 56.7	+ 5 35.0	+1.1086	0.5698	0.1740	+82	+33
88	Virginis	6.5	0.12	3.7	6 27.2	10	2 54.2	+ 8 26.3	−1.2917	0.5703	0.1718	−57	−88
598 B.	Virginis	6.1	0.14	4.4	7 40.8		5 50.2	+11 16.2	−0.5471	0.5708	0.1694	+ 2	−70
623 B.	Virginis	6.5	0.18	5.1	8 53.2		9 56.8	− 8 46.0	−0.0101	0.5716	0.1659	+31	−35
95	Virginis	5.4	−0.19	+ 5.2	− 8 56.7		10 58.9	− 7 46.0	−0.1220	0.5718	−0.1649	+25	−42
96	Virginis	6.5	0.19	5.6	9 58.1		11 58.6	− 6 48.4	+0.7549	0.5720	0.1640	+81	+ 8
κ	Virginis	4.3	0.22	5.7	9 54.9		13 40.6	− 5 10.1	+0.4221	0.5724	0.1625	+58	−11
2	Libræ	6.3	0.26	6.5	11 21.7		18 15.8	− 0 44.6	+1.1589	0.5734	0.1579	+79	+38
4 G.	Libræ	6.5	0.27	6.5	11 19.1		18 48.8	− 0 12.7	+1.0292	0.5734	0.1573	+79	+27
6 B.	Libræ	6.2	−0.33	+ 7.0	−11 58.6	11	0 11.6	+ 4 58.6	+0.8684	0.5747	−0.1515	+79	+15
22 B.	Libræ	6.4	0.39	7.5	12 30.9		4 53.0	+ 9 30.0	+0.7190	0.5758	0.1460	+78	+ 6
13	Libræ	5.7	0.43	7.4	11 35.0		7 41.3	−11 47.7	−0.6351	0.5765	0.1426	− 6	−81
ξ^2	Libræ	5.6	0.44	7.2	11 5.9		8 43.2	−10 48.1	−1.2763	0.5767	0.1413	−59	−88
γ	Libræ	4.0	0.63	9.0	14 31.9	12	1 17.4	+ 5 10.2	+0.0701	0.5806	0.1184	+31	−31
190 B.	Libræ	6.5	−0.66	+ 9.1	−14 47.7		4 38.7	+ 8 24.2	−0.0489	0.5814	−0.1133	+24	−38
η	Libræ	5.5	0.67	9.3	15 25.6		4 55.1	+ 8 40.0	+0.5661	0.5815	0.1129	+63	− 3
θ	Libræ	4.4	0.71	9.7	16 30.1		9 2.3	−11 21.8	+1.2164	0.5823	0.1064	+74	+48
202 B.	Libræ	6.4	0.73	9.1	14 10.3		10 5.4	−10 21.0	−1.2819	0.5826	0.1048	−66	−81
203 B.	Libræ	6.2	0.73	9.2	14 36.1		10 13.0	−10 13.7	−0.8541	0.5826	0.1046	−23	−90
49	Libræ	5.4	−0.75	+ 9.7	−16 18.3		11 49.2	− 8 41.1	+0.7252	0.5829	−0.1020	+74	+ 7
ϕ	Ophiuchi	4.4	0.89	9.8	16 26.6	13	0 47.0	+ 3 48.2	−0.3139	0.5850	0.0800	+ 6	−54
	Venus	−4.3	. . .	. . .	17 16.0		0 49.4	+ 3 50.4	+0.5324	0.5544	0.0746	+57	− 5
24	Scorpii	5.0	0.94	10.0	17 35.5		5 8.9	+ 8 0.4	+0.5352	0.5856	0.0722	+57	− 4
78 B.	Ophiuchi	6.5	1.00	9.7	16 40.9		11 13.2	−10 8.8	−0.8072	0.5862	0.0612	−25	−90
90 B.	Ophiuchi	6.5	−1.02	+10.0	−18 7.6		12 45.5	− 8 39.8	+0.5907	0.5863	−0.0584	+60	− 1
29	Ophiuchi	6.4	1.03	10.1	18 46.2		13 38.2	− 7 49.1	+1.2042	0.5864	0.0568	+72	+48
125 B.	Ophiuchi	6.2	1.05	9.8	17 30.3		16 19.8	− 5 13.5	−0.2473	0.5865	0.0518	+ 7	−50
164 B.	Ophiuchi	6.0	1.10	9.6	17 40.4		21 12.3	− 0 31.8	−0.3037	0.5866	0.0426	+ 3	−54
192 B.	Ophiuchi	6.3	1.12	9.7	18 22.4		23 10.6	+ 1 22.1	+0.3383	0.5866	0.0389	+39	−16
305 B.	Ophiuchi	6.3	−1.23	+ 9.2	−18 47.2	14	12 18.3	− 9 59.4	+0.4230	0.5859	−0.0139	+43	−11
					NEW	*MOON.*							
137 B.	Capricorni	6.2	−1.21	+ 0.6	−10 55.4	18	16 4.6	− 9 40.6	−0.8380	0.5462	+0.1393	−18	−90
λ	Capricorni	5.5	1.20	+ 0.1	11 43.3		19 30.3	− 6 21.4	+0.5070	0.5445	0.1423	+63	− 6
96 B.	Aquarii	6.5	−1.17	− 0.1	−10 40.5		22 58.2	− 3 0.0	−0.1272	0.5428	+0.1453	+24	−42
θ	Aquarii	4.3	1.06	0.7	8 10.0	19	10 29.5	+ 8 9.8	−1.1249	0.5374	0.1540	−37	−90
150 B.	Aquarii	6.0	1.08	1.0	9 25.5		10 30.7	+ 8 11.0	+0.2455	0.5374	0.1540	+46	−21
ρ	Aquarii	5.3	1.05	0.9	8 12.5		12 10.8	+ 9 48.1	−0.8194	0.5366	0.1552	−14	−90
170 B.	Aquarii	6.0	1.04	0.9	7 35.1		13 51.7	+11 25.9	−1.2381	0.5359	0.1563	−49	−90
186 B.	Aquarii	6.1	−1.00	− 1.1	− 6 56.9		17 46.4	− 8 46.5	−1.3158	0.5342	+0.1586	−64	−81
167 G.	Aquarii	6.3	1.00	1.7	8 17.9		21 20.9	− 5 18.5	+0.7264	0.5327	0.1606	+82	+ 6
67	Aquarii	6.4	0.96	1.8	7 22.0		23 50.2	− 2 53.7	+0.1106	0.5317	0.1619	+39	−28
78	Aquarii	6.3	0.92	2.4	7 36.9	20	5 38.4	+ 2 44.2	+1.3306	0.5295	0.1646	+74	+68
252 B.	Aquarii	5.8	0.89	1.9	5 23.9		5 57.8	+ 3 3.0	−1.0421	0.5294	0.1647	−28	−90
197 G.	Aquarii	6.3	−0.88	− 1.9	− 5 13.3		7 2.9	+ 4 6.2	−1.0563	0.5290	+0.1652	−30	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
263 B. Aquarii	6.1	−0.86	−2.1	− 5 7.6	20 9 14.1	+ 6 13.5	−0.8000	0.5283	+0.1661	−12	−90
82 Aquarii	6.4	0.88	2.6	6 59.3	9 45.1	+ 6 43.6	+1.3267	0.5281	0.1663	+78	+64
293 B. Aquarii	5.5	0.79	2.4	3 55.0	16 31.2	−10 42.3	−0.9089	0.5259	0.1686	−18	−90
96 Aquarii	5.7	0.80	3.0	5 32.8	18 30.0	− 8 47.0	+1.2148	0.5253	0.1691	+85	+43
316 B. Aquarii	6.5	0.78	2.8	4 20.4	18 57.1	− 8 20.7	−0.0344	0.5251	0.1692	+32	−37
342 B. Aquarii	6.5	−0.73	−3.3	− 4 30.5	21 0 51.0	− 2 37.1	+1.1556	0.5236	+0.1706	+86	+37
20 Piscium	5.6	0.64	3.7	3 11.4	9 30.0	+ 5 47.0	+1.1887	0.5216	0.1720	+87	+40
80 B. Piscium	6.3	0.53	3.8	0 55.9	18 34.4	− 9 24.3	+0.2605	0.5200	0.1725	+50	−20
MARS	1.2	. . .	. . .	− 0 3.4	19 32.9	− 8 27.5	−0.5376	0.4902	0.1587	+ 5	−70
98 B. Piscium	6.3	0.44	3.6	+ 1 15.6	22 1 20.2	− 2 50.1	−0.9944	0.5192	0.1723	−23	−89
44 Piscium	6.0	−0.40	−3.9	+ 1 30.7	5 23.5	+ 1 6.3	−0.5757	0.5189	+0.1720	+ 3	−74
155 B. Piscium	6.5	0.25	4.5	2 58.0	19 11.3	− 9 29.5	+0.1732	0.5186	0.1694	+45	−25
73 Piscium	6.2	0.16	4.2	5 14.6	23 2 24.1	− 2 29.2	−1.1318	0.5190	0.1674	−35	−85
77 Piscium	6.4	0.16	4.6	4 29.9	2 54.3	− 1 59.8	−0.2225	0.5190	0.1673	+22	−47
e Piscium	5.6	0.14	4.4	5 14.5	4 16.2	− 0 40.3	−0.8182	0.5191	0.1668	−12	−85
μ Piscium	5.0	−0.02	−5.1	+ 5 44.8	15 47.7	+10 31.4	+0.5204	0.5206	+0.1622	+69	− 5
64 Ceti	5.8	+0.23	5.8	8 12.5	24 13 19.4	+ 7 25.4	+1.1649	0.5258	0.1499	+90	+41
ξ^1 Ceti	4.5	0.24	5.8	8 29.1	14 10.1	+ 8 14.6	+0.9866	0.5261	0.1493	+90	+26
ξ Arietis	5.5	0.32	5.6	10 15.7	20 14.0	− 9 52.3	−0.0795	0.5281	0.1449	+30	−36
25 Arietis	6.5	0.33	5.9	9 51.3	21 34.1	− 8 34.6	+0.5596	0.5285	0.1439	+73	0
31 Arietis	5.7	+0.40	−5.4	+12 6.8	25 2 14.1	− 4 2.8	−1.2610	0.5302	+0.1402	−52	−78
85 Ceti	6.3	0.42	6.2	10 24.8	5 14.0	− 1 8.3	+1.0247	0.5314	0.1376	+90	+31
38 Arietis	5.2	0.45	5.7	12 7.3	6 27.8	+ 0 3.3	−0.6835	0.5319	0.1366	− 4	−77
147 B. Arietis	5.8	0.56	6.3	12 53.4	17 12.2	+10 27.9	−0.1105	0.5365	0.1266	+28	−35
30 B. Tauri	6.4	0.74	6.6	15 10.6	26 8 34.4	+ 1 21.3	−0.7835	0.5439	0.1100	−10	−75
179 B. Tauri	5.9	+0.88	−7.8	+14 57.3	22 51.1	− 8 49.5	+0.9017	0.5514	+0.0921	+90	+27
193 B. Tauri	6.2	0.92	7.3	17 4.7	27 1 5.6	− 6 39.3	−1.1891	0.5526	0.0891	−44	−73
48 Tauri	6.3	0.92	8.0	15 12.4	2 38.4	− 5 9.6	+0.9675	0.5534	0.0870	+90	+33
γ Tauri	3.9	0.94	8.0	15 26.4	4 30.9	− 3 20.8	+0.8753	0.5544	0.0843	+90	+26
δ Tauri	3.9	0.97	7.5	17 21.7	5 57.1	− 1 57.4	−1.0745	0.5552	0.0823	−32	−73
63 Tauri	5.7	+0.97	−7.8	+16 35.8	6 11.2	− 1 43.8	−0.2315	0.5553	+0.0820	+22	−37
64 Tauri	4.9	0.98	7.6	17 15.9	6 29.6	− 1 26.0	−0.9260	0.5555	0.0816	−21	−73
70 Tauri	6.4	0.97	8.1	15 45.8	7 13.3	− 0 43.7	+0.7491	0.5558	0.0806	+90	+19
71 Tauri	4.6	0.97	8.3	15 26.5	7 33.7	− 0 24.1	+1.1222	0.5560	0.0800	+90	+46
75 Tauri	5.2	0.98	8.1	16 11.2	8 31.6	+ 0 31.9	+0.3978	0.5565	0.0786	+60	− 1
θ^1 Tauri	4.2	+0.98	−8.2	+15 47.4	8 35.4	+ 0 35.6	+0.8289	0.5566	+0.0786	+90	+24
θ^2 Tauri	3.6	0.98	8.3	15 41.9	8 37.9	+ 0 38.0	+0.9304	0.5566	0.0785	+90	+31
80 Tauri	5.8	0.98	8.4	15 28.1	9 19.2	+ 1 17.9	+1.2313	0.5570	0.0775	+90	+59
264 B. Tauri	4.8	0.99	8.2	16 1.5	9 30.4	+ 1 28.8	+0.6471	0.5571	0.0772	+84	+13
81 Tauri	5.5	0.99	8.4	15 31.4	9 33.2	+ 1 31.5	+1.1907	0.5571	0.0772	+90	+54
85 Tauri	6.0	+0.99	−8.4	+15 41.1	10 6.7	+ 2 3.9	+1.0588	0.5574	+0.0764	+90	+41
119 H¹. Tauri	6.2	1.02	7.8	17 51.2	10 51.8	+ 2 47.5	−1.2139	0.5578	0.0753	−49	−73
275 B. Tauri	6.5	1.00	8.3	16 9.6	10 55.6	+ 2 51.2	+0.6095	0.5578	0.0752	+80	+11
α Tauri (*Aldebar.*)	1.1	1.02	8.3	16 21.2	11 58.4	+ 3 51.9	+0.4799	0.5584	0.0736	+67	+ 4
89 Tauri	5.8	1.02	8.5	15 52.7	13 0.4	+ 4 51.8	+1.0654	0.5590	0.0721	+90	+42
σ^2 Tauri	4.9	+1.02	−8.6	+15 45.9	13 31.3	+ 5 21.6	+1.2240	0.5593	+0.0713	+90	+59
318 B. Tauri	5.7	1.11	8.8	17 1.9	21 44.8	−10 41.5	+0.3980	0.5636	0.0586	+60	+ 1
m Tauri	5.0	1.16	8.7	18 32.4	28 2 14.3	− 6 21.3	−0.9639	0.5660	0.0514	−24	−72
111 Tauri	5.1	1.21	9.6	17 18.6	9 49.7	+ 0 58.4	+0.6868	0.5699	0.0387	+90	+19
115 Tauri	5.3	1.22	9.5	17 53.7	11 2.6	+ 2 8.6	+0.1127	0.5704	0.0367	+41	−13
117 Tauri	6.0	+1.22	−9.7	+17 10.4	11 25.9	+ 2 31.1	+0.8917	0.5706	+0.0360	+90	+32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
119 Tauri	4.9	+1.24	− 9.5	+18 32.1	28 13 15.5	+ 4 16.9	−0.4890	0.5715	+0.0329	+ 7	−50
167 H¹. Tauri	5.5	1.23	9.9	17 0.0	13 17.5	+ 4 18.8	+1.1388	0.5715	0.0328	+90	+52
120 Tauri	5.6	1.24	9.6	18 29.0	13 50.2	+ 4 50.4	−0.4155	0.5718	0.0319	+11	−44
122 Tauri	5.5	1.24	10.0	16 59.5	15 24.6	+ 6 21.5	+1.2115	0.5726	0.0291	+90	+61
130 Tauri	5.6	1.28	10.2	17 41.9	19 56.2	+10 43.5	+0.5756	0.5746	0.0211	+76	+14
19 B. Geminorum	6.2	+1.36	−10.6	+18 41.9	29 7 12.8	− 2 24.3	−0.3532	0.5794	+0.0006	+15	−37
124 H¹. Orionis	5.7	1.35	10.8	17 55.6	7 37.2	− 2 0.7	+0.4561	0.5796	−0.0002	+65	+10
71 Orionis	5.1	1.36	10.6	19 10.9	7 45.9	− 1 52.3	−0.8580	0.5797	0.0004	−16	−71
B. D.+17°1191	6.5	1.35	11.0	17 12.3	8 27.2	− 1 12.5	+1.2100	0.5799	0.0017	+90	+63
287 B. Orionis	6.2	1.36	11.1	17 21.2	9 34.7	− 0 7.5	+1.0508	0.5804	0.0038	+90	+47
292 B. Orionis	6.5	+1.37	−11.0	+17 47.9	10 35.9	+ 0 51.4	+0.5809	0.5807	−0.0057	+77	+16
26 Geminorum	5.2	1.41	11.6	17 43.1	19 31.1	+ 9 27.2	+0.5349	0.5838	0.0225	+72	+12
74 B. Geminorum	6.2	1.43	11.6	18 16.5	21 37.1	+11 28.6	−0.0950	0.5844	0.0265	+29	−23
110 B. Geminorum	6.2	1.45	12.0	17 51.8	30 3 57.3	− 6 25.3	+0.1265	0.5862	0.0385	+42	−12
41 H¹. Geminorum	6.0	1.44	12.1	16 47.0	4 1.5	− 6 21.1	+1.2410	0.5862	0.0387	+88	+65
λ Geminorum	3.6	+1.46	−12.4	+16 40.6	10 32.4	− 0 4.8	+1.0543	0.5877	−0.0509	+90	+43
162 B. Geminorum	5.7	1.48	12.5	17 14.9	16 15.4	+ 5 25.4	+0.1424	0.5887	0.0618	+43	−13
f Geminorum	5.3	1.49	12.6	17 50.9	19 26.8	+ 8 29.7	−0.6797	0.5891	0.0677	− 4	−69
1 Cancri	6.0	1.49	13.0	15 59.6	31 2 45.2	− 8 28.2	+0.6751	0.5899	0.0812	+89	+14
2 B. Cancri	6.0	1.49	12.9	16 43.4	3 22.9	− 7 52.0	−0.1228	0.5899	0.0823	+28	−30
3 Cancri	5.7	+1.50	−12.9	+17 31.0	4 18.8	− 6 58.2	−1.0104	0.5900	−0.0840	−27	−73
5 Cancri	5.9	1.49	13.0	16 39.9	4 37.2	− 6 40.4	−0.1661	0.5900	0.0845	+25	−33
29 Cancri	5.9	1.49	13.3	14 27.8	15 54.2	+ 4 11.1	+1.0080	0.5903	0.1043	+90	+34
90 B. Cancri	6.3	+1.49	−13.2	+15 34.6	19 0.4	+ 7 10.4	−0.4553	0.5902	−0.1095	+ 9	−54

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54 Cancri	6.3	+1.48	−13.3	+15 38.0	1 1 12.0	−10 51.8	−1.2203	0.5899	−0.1196	−48	−75
222 B. Cancri	6.3	1.46	13.2	11 49.2	12 24.6	− 0 4.4	+1.1915	0.5888	0.1365	+90	+48
ξ Leonis	5.1	1.44	13.0	11 38.3	18 18.0	+ 5 35.8	+0.5454	0.5880	0.1447	+72	+ 1
18 Leonis	5.8	+1.41	−12.9	+12 9.7	2 0 20.7	+11 25.1	−0.8790	0.5870	−0.1524	−16	−78
19 Leonis	6.4	1.41	12.9	11 55.3	0 47.1	+11 50.5	−0.7050	0.5869	0.1530	− 5	−78
R Leonis (*var.*)	4.6	1.41	12.8	11 47.0	0 50.3	+11 53.6	−0.5742	0.5869	0.1530	+ 3	−68
A Leonis	4.6	1.38	12.5	10 22.3	9 24.8	− 3 50.9	−0.5134	0.5854	0.1628	+ 6	−64
44 Leonis	5.9	1.35	12.0	9 10.4	16 45.2	+ 3 13.4	−0.5353	0.5840	0.1701	+ 5	−67
48 Leonis	5.2	+1.33	−11.5	+ 7 20.8	20 49.0	+ 7 8.2	+0.5922	0.5832	−0.1736	+76	0
49 Leonis	5.7	1.32	11.8	9 2.7	20 54.4	+ 7 13.4	-1.1208	0.5832	0.1737	−34	−81
37 Sextantis	6.3	1.31	11.2	6 46.6	3 1 37.1	+11 45.9	+0.3192	0.5823	0.1774	+54	−15
56 Leonis	6.1	1.28	10.9	6 35.6	5 51.3	− 8 9.1	−0.2566	0.5815	0.1804	+20	−48
c Leonis	5.1	1.27	10.8	6 30.8	7 52.4	− 6 12.5	−0.5410	0.5811	0.1817	+ 5	−69
80 Leonis	6.4	+1.21	− 9.6	+ 4 16.9	18 38.3	+ 4 10.1	−0.3010	0.5792	−0.1871	+18	−52
83 Leonis	6.3	1.21	9.4	3 25.8	19 3.5	+ 4 34.3	+0.4695	0.5791	0.1873	+65	− 8
τ Leonis	5.2	1.21	9.3	3 16.7	19 32.4	+ 5 2.2	+0.5316	0.5790	0.1874	+70	− 5
89 Leonis	5.7	1.19	9.2	3 29.1	22 18.9	+ 7 42.7	−0.1970	0.5785	0.1884	+24	−46
β Virginis	3.8	1.15	8.3	2 11.8	4 5 19.5	− 9 31.8	−0.2380	0.5775	0.1901	+21	−48
27 B. Virginis	6.5	+1.13	− 7.7	+ 0 57.4	8 58.2	− 6 0.9	+0.3057	0.5770	−0.1906	+53	−18
13 Virginis	5.9	1.07	6.7	− 0 21.7	17 27.8	+ 2 10.5	+0.0024	0.5760	0.1907	+35	−34
η Virginis	4.0	1.06	6.6	0 14.5	18 0.1	+ 2 41.6	−0.2206	0.5760	0.1906	+22	−48
γ Virginis (*mean*)	2.9	0.98	5.6	1 1.7	5 3 28.0	+11 49.2	−1.2309	0.5752	0.1889	−45	−90
38 Virginis	6.1	0.95	4.5	3 8.2	8 27.6	− 7 21.9	−0.0607	0.5749	0.1873	+31	−38
91 G. Virginis	6.5	+0.96	− 4.3	− 3 48.4	8 38.5	− 7 11.4	+0.5770	0.5749	−0.1872	+73	− 3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'		N.	S.
			s	″	° ′	d h m	h m					°	°
k	Virginis	5.7	+0.93	−4.2	− 3 23.9	5 11 15.9	− 4 39.6	−0.3220	0.5748	−0.1861		+16	−54
46	Virginis	6.1	0.92	4.3	2 57.4	11 40.5	− 4 15.8	−0.8416	0.5747	0.1860		−14	−90
48	Virginis	6.5	0.91	4.0	3 15.0	13 6.8	− 2 52.6	−0.8138	0.5747	0.1853		−12	−90
θ	Virginis	4.4	0.90	3.2	5 7.8	15 44.0	− 0 21.0	+0.5869	0.5747	0.1841		+74	− 2
	SATURN	0.8	. . .	. . .	5 26.6	20 58.3	+ 4 42.1	−0.0546	0.5752	0.1815		+31	−38
65	Virginis	6.0	+0.83	−2.9	− 4 31.4	21 32.8	+ 5 15.4	−1.0830	0.5746	−0.1807		−31	−90
66	Virginis	5.7	0.83	2.8	4 45.8	22 4.7	+ 5 46.1	−0.9380	0.5746	0.1804		−21	−90
72	Virginis	6.1	0.82	2.1	6 4.4	6 0 37.8	+ 8 13.9	−0.0786	0.5746	0.1788		+29	−39
l	Virginis	4.8	0.80	2.1	5 51.6	1 18.3	+ 8 52.9	−0.4149	0.5746	0.1783		+11	−61
m	Virginis	5.2	0.78	0.9	8 18.9	5 29.0	−11 5.4	+1.3184	0.5747	0.1753		+79	+62
88	Virginis	6.5	+0.73	−1.3	− 6 27.2	8 23.7	− 8 16.8	−1.0631	0.5748	−0.1730		−31	−90
598 B.	Virginis	6.1	0.71	−0.6	7 40.8	11 17.2	− 5 29.3	−0.3241	0.5749	0.1705		+15	−54
623 B.	Virginis	6.5	0.68	+0.2	8 53.3	15 20.8	− 1 34.6	+0.2093	0.5751	0.1669		+44	−23
95	Virginis	5.4	0.67	0.3	8 56.8	16 22.2	− 0 35.3	+0.0979	0.5752	0.1659		+37	−29
96	Virginis	6.5	0.67	0.7	9 58.2	17 21.2	+ 0 21.6	+0.9696	0.5752	0.1650		+81	+22
κ	Virginis	4.3	+0.65	+0.9	− 9 54.9	19 2.1	+ 1 58.8	+0.6387	0.5753	−0.1634		+75	+ 1
4 G.	Libræ	6.5	0.60	1.8	11 19.2	7 0 7.6	+ 6 53.3	+1.2426	0.5757	0.1581		+79	+48
6 B.	Libræ	6.2	0.53	2.5	11 58.7	5 28.3	−11 57.4	+1.0818	0.5761	0.1521		+79	+31
22 B.	Libræ	6.4	0.48	3.0	12 30.9	10 8.5	− 7 27.2	+0.9319	0.5765	0.1466		+78	+20
13	Libræ	5.7	0.44	2.9	11 35.1	12 56.3	− 4 45.5	−0.4197	0.5768	0.1431		+ 6	−61
ξ^2	Libræ	5.6	+0.42	+2.8	−11 5.9	13 58.1	− 3 45.9	−1.0601	0.5769	−0.1418		−34	−90
γ	Libræ	4.0	0.24	5.2	14 31.9	8 6 34.1	−11 45.7	+0.2730	0.5785	0.1187		+43	−19
190 B.	Libræ	6.5	0.19	5.4	14 47.8	9 56.6	− 8 30.6	+0.1513	0.5788	0.1136		+35	−26
η	Libræ	5.5	0.19	5.7	15 25.6	10 13.1	− 8 14.6	+0.7668	0.5788	0.1132		+75	+ 9
195 B.	Libræ	6.2	0.14	5.3	13 54.0	13 28.2	− 5 6.6	−1.1584	0.5791	0.1081		−47	−90
202 B.	Libræ	6.4	+0.11	+5.5	−14 10.4	15 25.7	− 3 13.4	−1.0888	0.5793	−0.1050		−41	−90
203 B.	Libræ	6.2	0.12	5.7	14 36.2	15 33.5	− 3 5.8	−0.6603	0.5793	0.1048		−11	−86
49	Libræ	5.4	+0.10	6.3	16 18.3	17 10.5	− 1 32.4	+0.9208	0.5794	0.1023		+74	+20
φ	Ophiuchi	4.4	−0.07	6.9	16 26.6	9 6 17.2	+11 5.7	−0.1343	0.5802	0.0804		+16	−43
24	Scorpii	5.0	0.13	7.4	17 35.5	10 42.8	− 8 38.3	+0.7136	0.5804	0.0727		+72	+ 6
78 B.	Ophiuchi	6.5	−0.21	+7.2	−16 41.0	16 52.8	− 2 41.8	−0.6427	0.5805	−0.0618		−14	−84
90 B.	Ophiuchi	6.5	0.23	7.7	18 7.7	18 26.5	− 1 11.5	+0.7609	0.5805	0.0590		+72	+10
125 B.	Ophiuchi	6.2	0.28	7.6	17 30.4	22 4.5	+ 2 18.5	−0.0864	0.5804	0.0525		+16	−40
164 B.	Ophiuchi	6.0	0.34	7.7	17 40.5	10 3 2.2	+ 7 5.5	−0.1496	0.5803	0.0435		+11	−44
192 B.	Ophiuchi	6.3	0.36	7.9	18 22.4	5 2.6	+ 9 1.5	+0.4938	0.5802	0.0398		+51	− 7
305 B.	Ophiuchi	6.3	−0.53	+7.8	−18 47.2	18 25.7	− 2 4.5	+0.5610	0.5790	−0.0151		+54	− 2
6	Sagittarii	6.5	0.55	7.3	17 9.2	20 48.0	+ 0 12.7	−1.1812	0.5787	0.0108		−59	−90
32 G.	Sagittarii	5.7	0.58	7.3	17 9.9	23 34.0	+ 2 52.8	−1.1932	0.5783	−0.0057		−61	−90
64 B.	Sagittarii	6.1	0.62	7.6	18 41.0	11 2 51.5	+ 6 3.1	+0.3921	0.5778	+0.0004		+39	−12
6 B.	Scuti	5.9	0.63	7.2	17 24.0	3 36.2	+ 6 46.2	−0.9563	0.5776	0.0017		−40	−90
52 G.	Sagittarii	6.4	−0.63	+7.5	−18 29.4	3 42.6	+ 6 52.3	+0.1896	0.5776	+0.0019		+27	−24
17 H^1.	Sagittarii	6.4	0.64	7.6	18 38.9	4 14.6	+ 7 23.2	+0.3569	0.5775	0.0029		+37	−14
Y	Sagittarii (*var.*)	5.4	0.65	7.6	18 53.6	5 23.4	+ 8 29.6	+0.6190	0.5773	0.0050		+59	+ 1
85 B.	Sagittarii	6.0	0.68	7.2	17 50.8	8 14.5	+11 14.6	−0.4601	0.5768	0.0102		− 9	−65
95 B.	Sagittarii	5.7	0.69	7.4	18 46.6	9 12.3	−11 49.8	+0.5295	0.5766	0.0119		+51	− 4
100 B.	Sagittarii	5.0	−0.70	+7.3	−18 27.3	9 44.9	−11 18.3	+0.1975	0.5765	+0.0129		+28	−23
187 B.	Sagittarii	6.4	0.85	6.7	18 51.4	12 1 20.0	+ 3 43.6	+1.0437	0.5726	0.0406		+72	+30
ρ	Sagittarii	4.0	0.90	6.1	17 59.5	7 45.9	+ 9 56.0	+0.4257	0.5709	0.0515		+47	−11
45	Sagittarii	6.0	0.90	6.2	18 27.0	7 49.8	+ 9 59.9	+0.9158	0.5707	0.0517		+72	+20
267 B.	Sagittarii	5.8	0.95	5.7	18 24.1	14 36.4	− 7 27.8	+1.2549	0.5685	0.0629		+72	+57
54	Sagittarii	5.4	−0.94	+5.2	−16 28.2	16 16.4	− 5 51.3	−0.6936	0.5679	+0.0656		−17	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

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THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'		N.	S.
			s	″	° ′	d h m	h m					°	°
e	Sagittarii	5.2	−0.95	+ 5.2	−16 18.3	12 17 4.8	− 5 4.5	−0.8163	0.5676	+0.0669		−24	−90
g	Sagittarii	5.1	0.99	+ 4.6	15 41.7	13 0 2.7	+ 1 39.1	−0.9636	0.5651	0.0778		−33	−90
					NEW	*MOON.*							
342 B.	Aquarii	6.5	−0.88	− 4.2	− 4 30.6	17 8 32.2	+ 6 51.9	+1.0440	0.5260	+0.1703		+86	+27
20	Piscium	5.6	−0.82	− 4.7	− 3 11.5	17 9.3	− 8 46.1	+1.0669	0.5241	+0.1718		+87	+29
80 B.	Piscium	6.3	0.75	5.1	− 0 55.9	18 2 11.5	+ 0 0.5	+0.1282	0.5226	0.1724		+42	−27
98 B.	Piscium	6.3	0.69	5.2	+ 1 15.6	8 55.7	+ 6 33.1	−1.1345	0.5217	0.1722		−35	−89
44	Piscium	6.0	0.66	5.4	1 30.7	12 58.2	+10 28.6	−0.7191	0.5213	0.1719		− 5	−89
155 B.	Piscium	6.5	0.56	6.1	2 57.9	19 2 43.6	− 0 9.7	+0.0198	0.5206	0.1694		+36	−33
73	Piscium	6.2	−0.48	− 6.0	+ 5 14.5	9 55.7	+ 6 50.0	−1.2922	0.5206	+0.1673		−54	−85
77	Piscium	6.4	0.49	6.2	4 29.8	10 25.9	+ 7 19.4	−0.3814	0.5206	0.1671		+14	−58
e	Piscium	5.6	0.47	6.1	5 14.5	11 47.7	+ 8 38.8	−0.9793	0.5207	0.1667		−22	−85
μ	Piscium	5.0	0.37	6.8	5 44.8	23 19.5	− 4 9.2	+0.3568	0.5215	0.1620		+56	−14
64	Ceti	5.8	0.17	7.5	8 12.5	20 20 56.1	− 7 10.2	+0.9990	0.5250	0.1495		+90	+27
ξ^1	Ceti	4.5	−0.16	− 7.4	+ 8 29.0	21 47.1	− 6 20.6	+0.8200	0.5251	+0.1488		+90	+15
ξ	Arietis	5.5	0.09	7.2	10 15.6	21 3 53.6	− 0 25.0	−0.2515	0.5266	0.1444		+21	−46
25	Arietis	6.5	0.09	7.5	9 51.3	5 14.4	+ 0 53.5	+0.3908	0.5270	0.1433		+59	−10
389 B.	Ceti	6.3	0.08	7.8	9 13.2	6 22.1	+ 1 59.1	+1.2541	0.5272	0.1425		+90	+53
85	Ceti	6.3	−0.01	7.8	10 24.7	12 58.8	+ 8 24.1	+0.8592	0.5291	0.1370		+90	+19
38	Arietis	5.2	+0.02	− 7.3	+12 7.2	14 13.3	+ 9 36.3	−0.8588	0.5295	+0.1359		−15	−78
147 B.	Arietis	5.8	0.13	7.7	12 53.3	22 1 5.7	− 3 50.8	−0.2809	0.5331	0.1259		+19	−45
30 B.	Tauri	6.4	0.30	7.8	15 10.6	16 42.4	+11 17.1	−0.9547	0.5391	0.1092		−22	−75
179 B.	Tauri	5.9	0.44	8.8	14 57.3	23 7 15.5	+ 1 22.8	+0.7514	0.5453	0.0915		+90	+17
48	Tauri	6.3	0.48	8.9	15 12.4	11 7.5	+ 5 7.3	+0.8201	0.5471	0.0864		+90	+22
γ	Tauri	3.9	+0.50	− 8.9	+15 26.4	13 2.4	+ 6 58.6	+0.7282	0.5480	+0.0838		+90	+17
δ	Tauri	3.9	0.53	8.3	17 21.6	14 30.6	+ 8 23.9	−1.2384	0.5487	0.0818		−52	−73
63	Tauri	5.7	0.53	8.6	16 35.8	14 45.0	+ 8 37.8	−0.3876	0.5487	0.0815		+13	−47
64	Tauri	4.9	0.54	8.4	17 15.9	15 3.8	+ 8 56.0	−1.0883	0.5489	0.0811		−34	−73
70	Tauri	6.4	0.54	9.0	15 45.8	15 48.4	+ 9 39.2	+0.6026	0.5492	0.0801		+79	+10
71	Tauri	4.6	+0.54	− 9.1	+15 26.5	16 9.3	+ 9 59.4	+0.9795	0.5494	+0.0796		+90	+34
75	Tauri	5.2	0.55	8.9	16 11.2	17 8.4	+10 56.6	+0.2490	0.5499	0.0782		+50	−10
θ^1	Tauri	4.2	0.55	9.0	15 47.4	17 12.3	+11 0.3	+0.6842	0.5499	0.0781		+90	+15
θ^2	Tauri	3.6	0.55	9.0	15 41.9	17 14.9	+11 2.8	+0.7865	0.5499	0.0781		+90	+21
80	Tauri	5.8	0.55	9.2	15 28.1	17 57.1	+11 43.6	+1.0908	0.5502	0.0771		+90	+43
264 B.	Tauri	4.8	+0.56	− 9.0	+16 1.5	18 8.5	+11 54.7	+0.5012	0.5503	+0.0768		+69	+ 4
81	Tauri	5.5	0.56	9.2	15 31.4	18 11.4	+11 57.5	+1.0499	0.5504	0.0767		+90	+40
85	Tauri	6.0	0.56	9.2	15 41.1	18 45.7	−11 29.3	+0.9173	0.5506	0.0759		+90	+30
275 B.	Tauri	6.5	0.58	9.0	16 9.6	19 35.6	−10 41.0	+0.4642	0.5510	0.0748		+66	+ 3
α	Tauri (*Aldebar.*)	1.1	0.59	9.0	16 21.2	20 39.9	− 9 38.8	+0.3342	0.5515	0.0732		+56	− 4
89	Tauri	5.8	+0.60	− 9.2	+15 52.7	21 43.4	− 8 37.5	+0.9259	0.5520	+0.0717		+90	+31
σ^1	Tauri	5.2	0.60	9.4	15 38.8	22 11.7	− 8 10.1	+1.2092	0.5522	0.0710		+90	+57
σ^2	Tauri	4.9	0.60	9.3	15 45.8	22 14.9	− 8 6.9	+1.0863	0.5522	0.0709		+90	+44
318 B.	Tauri	5.7	0.69	9.3	17 1.9	24 6 39.9	+ 0 1.5	+0.2585	0.5562	0.0585		+50	− 7
m	Tauri	5.0	0.76	9.0	18 32.4	11 15.9	+ 4 28.3	−1.1133	0.5584	0.0514		−37	−72
111	Tauri	5.1	+0.82	− 9.9	+17 18.6	19 2.4	+11 59.0	+0.5597	0.5620	+0.0390		+74	+12
115	Tauri	5.3	0.84	9.8	17 53.7	20 17.1	−10 48.9	−0.0188	0.5626	0.0369		+33	−20
117	Tauri	6.0	0.84	10.0	17 10.4	20 41.0	−10 25.8	+0.7678	0.5628	0.0362		+90	+24
119	Tauri	4.9	0.86	9.7	18 32.1	22 33.2	− 8 37.4	−0.6244	0.5636	0.0331		− 1	−61
167 H^1.	Tauri	5.5	0.85	10.2	17 0.0	22 35.3	− 8 35.4	+1.0190	0.5637	0.0331		+90	+42
120	Tauri	5.6	+0.87	− 9.7	+18 29.0	23 8.8	− 8 3.0	−0.5497	0.5639	+0.0322		+ 3	−54

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
122 Tauri	5.5	+0.88	−10.3	+16 59.5	25 0 45.5	− 6 29.7	+1.0942	0.5646	+0.0295	+90	+49
130 Tauri	5.6	0.92	10.3	17 41.9	5 23.7	−. 2 1.1	+0.4563	0.5667	0.0216	+65	+ 8
19 B. Geminorum	6.2	1.04	10.6	18 41.9	16 56.3	+ 9 7.4	−0.4704	0.5717	0.0015	+ 8	−45
124 H¹. Orionis	5.7	1.04	10.8	17 55.6	17 21.2	+ 9 31.3	+0.3464	0.5719	0.0007	+57	+ 4
71 Orionis	5.1	1.04	10.5	19 10.9	17 30.2	+ 9 40.1	−0.9791	0.5719	+0.0005	−25	−71
B. D.+17°1191	6.5	+1.04	−11.1	+17 12.3	18 12.4	+10 20.8	+1.1077	0.5722	−0.0008	+90	+52
287 B. Orionis	6.2	1.05	11.1	17 21.2	19 21.4	+11 27.3	+0.9481	0.5727	0.0028	+90	+39
292 B. Orionis	6.5	1.07	11.0	17 47.9	20 24.0	−11 32.3	+0.4751	0.5731	0.0047	+67	+10
26 Geminorum	5.2	1.14	11.4	17 43.1	26 5 30.9	− 2 44.9	+0.4375	0.5766	0.0212	+64	+ 7
74 B. Geminorum	6.2	1.17	11.4	18 16.5	7 39.5	− 0 40.9	−0.1950	0.5773	0.0252	+23	−29
110 B. Geminorum	6.2	+1.22	−11.7	+17 51.8	14 7.3	+ 5 32.8	+0.0349	0.5795	−0.0370	+36	−17
41 H¹. Geminorum	6.0	1.21	12.1	16 47.0	14 11.5	+ 5 36.9	+1.1572	0.5795	0.0372	+90	+54
λ Geminorum	3.6	1.26	12.3	16 40.6	20 49.6	−11 59.5	+0.9756	0.5815	0.0494	+90	+37
162 B. Geminorum	5.7	1.31	12.4	17 14.9	27 2 38.1	− 6 23.7	+0.0644	0.5831	0.0601	+38	−18
·f Geminorum	5.3	1.33	12.3	17 50.9	5 52.3	− 3 16.6	−0.7580	0.5839	0.0660	− 9	−73
1 Cancri	6.0	+1.38	−12.9	+15 59.6	13 16.5	+ 3 51.3	+0.6111	0.5855	−0.0794	+80	+11
2 B. Cancri	6.0	1.38	12.8	16 43.4	13 54.6	+ 4 27.9	−0.1889	0.5856	0.0805	+24	−34
3 Cancri	5.7	1.39	12.6	17 31.0	14 51.1	+ 5 22.3	−1.0786	0.5858	0.0822	−33	−73
5 Cancri	5.9	1.39	12.8	16 39.9	15 9.7	+ 5 40.3	−0.2310	0.5859	0.0828	+21	−37
30 B. Cancri	6.1	1.41	13.3	14 51.3	19 9.5	+ 9 31.1	+1.2756	0.5865	0.0899	+82	+67
29 Cancri	5.9	+1.45	−13.5	+14 27.8	28 2 32.5	− 7 22.4	+0.9587	0.5876	−0.1026	+90	+31
90 B. Cancri	6.3	1.47	13.3	15 34.6	5 39.8	− 4 22.0	−0.5028	0.5880	0.1079	+ 6	−57
54 Cancri	6.3	1.49	13.3	15 38.0	11 52.7	+ 1 37.0	−1.2594	0.5886	0.1181	−55	−75
222 B. Cancri	6.3	+1.54	−13.9	+11 49.2	23 5.0	−11 35.8	+1.1628	0.5892	−0.1354	+90	+45

MARCH.

ξ Leonis	5.1	+1.56	−13.8	+11 38.3	1 4 56.7	− 5 57.3	+0.5249	0.5893	−0.1437	+70	0
18 Leonis	5.8	1.57	13.6	12 9.7	10 56.8	− 0 10.6	−0.8860	0.5894	0.1518	−17	−78
19 Leonis	6.4	1.57	13.6	11 55.3	11 23.0	+ 0 14.7	−0.7122	0.5893	0.1523	− 6	−78
R Leonis (*var.*)	4.6	+1.57	−13.7	+11 47.0	11 26.1	+ 0 17.7	−0.5820	0.5893	−0.1524	+ 2	−68
A Leonis	4.6	1.59	13.6	10 22.3	19 55.0	+ 8 27.6	−0.5105	0.5892	0.1627	+ 6	−64
44 Leonis	5.9	1.60	13.4	9 10.4	2 3 8.9	− 8 34.8	−0.5228	0.5889	0.1703	+ 6	−66
48 Leonis	5.2	1.61	13.3	7 20.8	7 8.5	− 4 44.1	+0.5999	0.5887	0.1741	+76	+ 1
49 Leonis	5.7	1.60	13.2	9 2.7	7 13.8	− 4 39.0	−1.0980	0.5887	0.1742	−32	−81
37 Sextantis	6.3	+1.61	−13.1	+ 6 46.5	11 51.1	− 0 12.0	+0.3346	0.5885	−0.1782	+55	−14
56 Leonis	6.1	1.61	12.8	6 35.6	16 0.0	+ 3 47.5	−0.2308	0.5883	0.1813	+22	−47
c Leonis	5.1	1.61	12.7	6 30.7	17 58.4	+ 5 41.6	−0.5099	0.5882	0.1828	+ 6	−66
80 Leonis	6.4	1.61	12.0	4 16.8	3 4 28.3	− 8 11.9	−0.2605	0.5876	0.1888	+20	−49
83 Leonis	6.3	1.60	11.9	3 25.8	4 52.9	− 7 48.2	+0.5007	0.5875	0.1890	+67	− 6
τ Leonis	5.2	+1.61	−11.9	+ 3 16.6	5 21.0	− 7 21.1	+0.5625	0.5875	−0.1891	+73	− 3
89 Leonis	5.7	1.60	11.8	3 29.1	8 2.9	− 4 45.3	−0.1540	0.5873	0.1902	+26	−43
β Virginis	3.8	1.61	11.2	2 11.7	14 51.5	+ 1 48.2	−0.1875	0.5870	0.1923	+24	−45
27 B. Virginis	6.5	1.60	10.7	+ 0 57.4	18 23.6	+ 5 12.4	+0.3520	0.5869	0.1930	+56	−15
13 Virginis	5.9	1.58	9.9	− 0 21.7	4 2 36.9	−10 52.5	+0.0603	0.5865	0.1933	+38	−31
η Virginis	4.0	+1.58	− 9.8	− 0 14.5	3 8.2	−10 22.5	−0.1588	0.5865	−0.1932	+26	−44
γ Virginis (*mean*)	2.9	1.53	8.9	1 1.8	12 16.8	− 1 34.0	−1.1454	0.5862	0.1918	−36	−90
38 Virginis	6.1	1.53	8.0	3 8.2	17 6.0	+ 3 4.5	+0.0096	0.5860	0.1902	+35	−34
91 G. Virginis	6.5	1.54	7.9	3 48.5	17 16.6	+ 3 14.6	+0.6372	0.5861	0.1900	+79	+ 1
k Virginis	5.7	1.52	7.7	3 23.9	19 48.4	+ 5 40.9	−0.2455	0.5861	0.1892	+21	−49
46 Virginis	6.1	+1.51	− 7.8	− 2 57.4	20 12.1	+ 6 3.6	−0.7562	0.5861	−0.1889	− 8	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S						AT CONJUNCTION IN R. A.						
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	Limiting Parallels. N.	S.
			s	″	° ′	d h m	h m				°	°
48	Virginis	6.5	+1.51	−7.6	− 3 15.1	4 21 35.4	+ 7 23.8	−0.7279	0.5861	−0.1883	− 7	−90
θ	Virginis	4.4	1.51	7.0	5 7.8	5 0 7.0	+ 9 49.8	+0.6513	0.5860	0.1870	+80	+ 2
	SATURN	0.7	. . .	. . .	4 58.6	3 42.8	−10 42.4	−0.1697	0.5882	0.1860	+24	−44
65	Virginis	6.0	1.47	6.5	4 31.4	5 43.4	− 8 46.3	−0.9874	0.5860	0.1838	−24	−90
66	Virginis	5.7	1.47	6.4	4 45.8	6 14.2	− 8 16.6	−0.8445	0.5860	0.1834	−14	−90
72	Virginis	6.1	+1.47	−5.9	− 6 4.5	8 41.8	− 5 54.4	+0.0018	0.5860	−0.1818	+33	−34
l	Virginis	4.8	1.46	5.9	5 51.6	9 20.8	− 5 16.9	−0.3285	0.5860	0.1813	+15	−54
88	Virginis	6.5	1.41	5.0	6 27.3	16 11.1	+ 1 18.3	−0.9626	0.5861	0.1759	−23	−90
598 B.	Virginis	6.1	1.40	4.4	7 40.9	18 58.5	+ 3 59.4	−0.2347	0.5861	0.1734	+20	−48
623 B.	Virginis	6.5	1.39	3.6	8 53.3	22 53.5	+ 7 45.8	+0.2914	0.5862	0.1697	+49	−18
95	Virginis	5.4	+1.38	−3.5	− 8 56.9	23 52.8	+ 8 42.8	+0.1823	0.5862	−0.1688	+43	−24
96	Virginis	6.5	1.38	3.2	9 58.3	6 0 49.7	+ 9 37.7	+1.0401	0.5862	0.1678	+81	+27
κ	Virginis	4.3	1.37	3.0	9 55.0	2 27.2	+11 11.6	+0.7152	0.5862	0.1661	+81	+ 6
4 G.	Librae	6.5	1.34	2.1	11 19.3	7 22.4	− 8 4.2	+1.3111	0.5863	0.1607	+77	+63
6 B.	Librae	6.2	1.28	1.3	11 58.7	12 32.5	− 3 5.5	+1.1546	0.5863	0.1546	+79	+38
22 B.	Librae	6.4	+1.25	−0.7	−12 31.0	17 3.7	+ 1 15.6	+1.0083	0.5864	−0.1489	+78	+26
13	Librae	5.7	1.21	0.7	11 35.1	19 46.3	+ 3 52.1	−0.3224	0.5864	0.1453	+12	−54
ξ^2	Librae	5.6	1.20	0.7	11 6.0	20 46.2	+ 4 49.8	−0.9530	0.5864	0.1440	−26	−90
17	Librae	6.4	1.18	−0.7	10 50.8	21 22.8	+ 5 25.0	−1.2950	0.5864	0.1431	−64	−83
γ	Librae	4.0	1.05	+2.0	14 32.0	7 12 54.0	− 3 38.4	+0.3618	0.5863	0.1203	+49	−14
190 B.	Librae	6.5	+1.01	+ 2.3	−14 47.8	16 11.4	− 0 28.3	+0.2416	0.5862	−0.1151	+41	−21
η	Librae	5.5	1.01	2.5	15 25.7	16 27.5	− 0 12.9	+0.8494	0.5862	0.1147	+75	+15
195 B.	Librae	6.2	0.96	2.3	13 54.1	19 37.9	+ 2 50.4	−1.0524	0.5861	0.1095	−37	−90
202 B.	Librae	6.4	0.94	2.6	14 10.4	21 32.8	+ 4 41.1	−0.9840	0.5860	0.1064	−32	−90
203 B.	Librae	6.2	0.94	2.7	14 36.2	21 40.3	+ 4 48.4	−0.5607	0.5860	0.1061	− 5	−74
48	Librae	4.6	+0.93	+2.6	−14 3.5	22 21.8	+ 5 28.3	−1.1884	0.5860	−0.1050	−51	−90
49	Librae	5.4	0.93	3.4	16 18.4	23 15.1	+ 6 19.6	+1.0020	0.5859	0.1035	+74	+26
φ	Ophiuchi	4.4	0.77	4.5	16 26.7	8 12 6.3	− 5 17.7	−0.0430	0.5850	0.0813	+21	−37
24	Scorpii	5.0	0.72	5.2	17 35.6	16 27.6	− 1 6.1	+0.7964	0.5846	0.0735	+73	+12
78 B.	Ophiuchi	6.5	0.63	5.2	16 41.0	22 32.2	+ 4 45.0	−0.5500	0.5838	0.0625	− 9	−73
90 B.	Ophiuchi	6.5	+0.61	+5.8	−18 7.7	9 0 4.8	+ 6 14.1	+0.8424	0.5836	−0.0596	+72	+15
125 B.	Ophiuchi	6.2	0.56	5.8	17 30.4	3 40.2	+ 9 41.6	+0.0005	0.5831	0.0530	+20	−34
164 B.	Ophiuchi	6.0	0.49	6.1	17 40.5	8 34.9	− 9 34.5	−0.0638	0.5823	0.0439	+16	−38
192 B.	Ophiuchi	6.3	0.47	6.4	18 22.4	10 34.3	− 7 39.5	+0.5751	0.5819	0.0403	+57	− 2
305 B.	Ophiuchi	6.3	0.28	7.0	18 47.3	23 52.7	+ 5 9.8	+0.6384	0.5790	0.0155	+61	+ 2
6	Sagittarii	6.5	+0.24	+6.4	−17 9.2	10 2 14.6	+ 7 26.7	−1.0986	0.5784	−0.0112	−50	−90
32 G.	Sagittarii	5.7	0.21	6.5	17 9.9	5 0.2	+10 6.3	−1.1120	0.5777	0.0061	−52	−90
64 B.	Sagittarii	6.1	0.16	7.0	18 41.1	8 17.5	−10 43.5	+0.4673	0.5768	−0.0001	+45	− 8
6 B.	Scuti	5.9	0.15	6.6	17 24.0	9 2.2	−10 0.4	−0.8781	0.5766	+0.0013	−35	−90
52 G.	Sagittarii	6.4	0.15	7.0	18 29.4	9 8.6	− 9 54.3	+0.2650	0.5766	0.0015	+31	−19
17 H[1].	Sagittarii	6.4	+0.14	+7.0	−18 38.9	9 40.6	− 9 23.4	+0.4317	0.5764	+0.0025	+43	−10
Y	Sagittarii (*var.*)	5.4	0.13	7.2	18 53.6	10 49.4	− 8 17.1	+0.6929	0.5761	0.0045	+67	+ 6
85 B.	Sagittarii	6.0	0.09	6.8	17 50.8	13 40.7	− 5 31.9	−0.3854	0.5753	0.0097	− 5	−59
95 B.	Sagittarii	5.7	0.08	7.2	18 46.6	14 38.6	− 4 36.1	+0.6021	0.5749	0.0115	+57	0
100 B.	Sagittarii	5.0	+0.07	7.0	18 27.3	15 11.2	− 4 4.6	+0.2705	0.5748	0.0125	+33	−19
187 B.	Sagittarii	6.4	−0.13	+6.9	−18 51.4	11 6 50.0	+11 1.0	+1.1102	0.5696	+0.0399	+72	+37
ρ	Sagittarii	4.0	0.21	6.5	17 59.5	13 18.6	− 6 43.9	+0.4890	0.5673	0.0507	+51	− 7
45	Sagittarii	6.0	0.21	6.7	18 27.0	13 22.6	− 6 40.1	+0.9797	0.5673	0.0508	+72	+25
54	Sagittarii	5.4	0.30	5.8	16 28.2	21 53.4	+ 1 33.2	−0.6365	0.5640	0.0646	−14	−83
e	Sagittarii	5.2	0.31	5.7	16 18.2	22 42.3	+ 2 20.4	−0.7599	0.5637	0.0658	−21	−90
g	Sagittarii	5.1	−0.39	+5.2	−15 41.7	12 5 44.4	+ 9 8.1	−0.9116	0.5609	+0.0766	−30	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
16 B. Capricorni	6.2	−0.49	+ 4.6	−15 1.6	12 16 16.7	− 4 40.6	−0.7429	0.5566	+0.0918	−17	−90
β Capricorni	3.2	0.48	4.6	15 1.5	16 23.2	− 4 34.3	−0.7360	0.5566	0.0920	−17	−90
31 B. Capricorni	6.4	0.53	4.6	15 59.8	19 58.6	− 1 6.1	+0.6478	0.5551	0.0969	+69	+ 2
27 G. Capricorni	6.2	0.53	4.4	15 18.8	21 5.1	− 0 1.7	+0.0218	0.5546	0.0984	+27	−33
45 B. Capricorni	6.1	0.53	4.0	13 59.2	22 33.7	+ 1 23.9	−1.2620	0.5540	0.1003	−62	−87
τ Capricorni	5.2	−0.56	+ 4.1	−15 13.5	13 0 56.4	+ 3 42.0	+0.3151	0.5530	+0.1034	+45	−17
95 B. Capricorni	5.9	0.64	3.4	14 46.8	10 10.5	−11 21.8	+0.8458	0.5493	0.1148	+76	+14
53 B. Aquarii	6.5	0.68	2.6	13 31.3	18 30.9	− 3 17.5	+0.4812	0.5460	0.1243	+58	− 8
18 Aquarii	5.5	0.71	2.2	13 12.5	22 30.0	+ 0 34.1	+0.6462	0.5445	0.1285	+72	+ 2
72 B. Aquarii	6.5	0.71	1.9	11 54.1	14 0 29.2	+ 2 29.6	−0.5170	0.5437	0.1305	+ 1	−69
137 B. Capricorni	6.2	−0.73	+ 1.3	−10 55.4	6 0.8	+ 7 50.8	−0.8464	0.5416	+0.1359	−18	−90
λ Capricorni	5.5	0.76	1.2	11 43.3	9 29.9	+11 13.4	+0.5023	0.5403	0.1391	+62	− 7
96 B. Aquarii	6.5	0.76	+ 0.7	10 40.5	13 1.0	− 9 22.0	−0.1445	0.5390	0.1422	+22	−43
θ Aquarii	4.3	0.79	− 0.5	8 10.0	15 0 41.3	+ 1 56.9	−1.1731	0.5351	0.1514	−42	−90
150 B. Aquarii	6.0	0.80	0.4	− 9 25.5	0 42.5	+ 1 58.1	+0.2066	0.5351	0.1514	+44	−23
				NEW	*MOON.*						
μ Piscium	5.0	−0.60	− 7.6	+ 5 44.7	19 6 4.3	+ 4 23.2	+0.3450	0.5231	+0.1624	+56	−14
64 Ceti	5.8	0.49	8.5	8 12.5	20 3 40.3	+ 1 21.6	+0.9883	0.5262	0.1497	+90	+26
ξ^1 Ceti	4.5	0.48	8.4	8 29.0	4 31.4	+ 2 11.1	+0.8088	0.5264	0.1491	+90	+14
ξ Arietis	5.5	−0.44	− 8.4	+10 15.6	10 38.2	+ 8 7.2	−0.2657	0.5276	+0.1446	+20	−46
25 Arietis	6.5	0.44	8.6	9 51.3	11 59.2	+ 9 25.9	+0.3786	0.5279	0.1436	+58	−10
389 B. Ceti	6.3	0.43	8.8	9 13.2	13 6.9	+10 31.5	+1.2449	0.5282	0.1428	+90	+52
85 Ceti	6.3	0.38	8.9	10 24.7	19 44.4	− 7 2.7	+0.8493	0.5297	0.1372	+90	+18
38 Arietis	5.2	0.36	8.5	12 7.2	20 59.2	− 5 50.2	−0.8751	0.5300	0.1361	−16	−78
147 B. Arietis	5.8	−0.29	− 8.9	+12 53.3	21 7 54.1	+ 4 45.1	−0.2945	0.5329	+0.1259	+18	−46
30 B. Tauri	6.4	0.16	9.0	15 10.6	23 37.1	− 4 0.6	−0.9710	0.5377	0.1091	−23	−75
179 B. Tauri	5.9	−0.04	9.6	14 57.3	22 14 19.4	+10 14.4	+0.7485	0.5427	0.0912	+90	+17
48 Tauri	6.3	0.00	9.7	15 12.4	18 14.4	− 9 58.1	+0.8187	0.5441	0.0861	+90	+22
γ Tauri	3.9	+0.02	9.7	15 26.4	20 11.0	− 8 5.2	+0.7266	0.5447	0.0835	+90	+17
δ Tauri	3.9	+0.03	− 9.2	+17 21.6	21 40.3	− 6 38.7	−1.2561	0.5453	+0.0815	−56	−73
63 Tauri	5.7	0.03	9.4	16 35.8	21 54.9	− 6 24.6	−0.3982	0.5454	0.0812	+12	−48
64 Tauri	4.9	0.04	9.2	17 15.9	22 14.0	− 6 6.1	−1.1048	0.5455	0.0808	−36	−73
70 Tauri	6.4	0.04	9.7	15 45.8	22 59.4	− 5 22.2	+0.6005	0.5458	0.0797	+78	+10
71 Tauri	4.6	0.04	9.8	15 26.5	23 20.5	− 5 1.8	+0.9806	0.5459	0.0792	+90	+34
75 Tauri	5.2	+0.05	− 9.6	+16 11.2	23 0 20.5	− 4 3.6	+0.2442	0.5463	+0.0779	+50	−10
θ^1 Tauri	4.2	0.05	9.8	15 47.4	0 24.5	− 3 59.8	+0.6831	0.5463	0.0778	+90	+15
θ^2 Tauri	3.6	0.06	9.8	15 41.9	0 27.1	− 3 57.3	+0.7863	0.5463	0.0777	+90	+21
80 Tauri	5.8	0.06	9.9	15 28.1	1 10.0	− 3 15.8	+1.0934	0.5466	0.0767	+90	+44
264 B. Tauri	4.8	0.07	9.7	16 1.5	1 21.6	− 3 4.6	+0.4986	0.5466	0.0764	+68	+ 4
81 Tauri	5.5	+0.06	− 9.9	+15 31.4	1 24.5	− 3 1.8	+1.0523	0.5467	+0.0764	+90	+40
85 Tauri	6.0	0.07	9.9	15 41.1	1 59.3	− 2 28.1	+0.9185	0.5469	0.0756	+90	+30
275 B. Tauri	6.5	0.08	9.7	16 9.6	2 50.0	− 1 38.9	+0.4617	0.5471	0.0744	+65	+ 2
α Tauri (*Aldebar.*)	1.1	0.09	9.8	16 21.2	3 55.4	− 0 35.7	+0.3309	0.5475	0.0729	+55	− 5
89 Tauri	5.8	0.10	9.9	15 52.6	4 59.8	+ 0 26.7	+0.9280	0.5479	0.0714	+90	+31
σ^1 Tauri	5.2	+0.10	−10.0	+15 38.8	5 28.6	+ 0 54.6	+1.2142	0.5481	+0.0707	+90	+57
σ^2 Tauri	4.9	0.10	10.0	15 45.8	5 32.0	+ 0 57.7	+1.0900	0.5481	0.0706	+90	+44
318 B. Tauri	5.7	0.18	9.9	17 1.9	14 6.0	+ 9 15.2	+0.2565	0.5513	0.0581	+50	− 7
m Tauri	5.0	0.24	9.5	18 32.4	18 47.4	−10 12.6	−1.1285	0.5530	0.0510	−39	−72
111 Tauri	5.1	0.31	10.2	17 18.6	24 2 43.8	− 2 31.9	+0.5636	0.5558	0.0387	+75	+12
115 Tauri	5.3	+0.32	−10.0	+17 53.7	4 0.2	− 1 18.1	−0.0212	0.5563	+0.0367	+33	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
			s	″	° ′	d h m	h m				°	°
117	Tauri	6.0	+0.32	−10.3	+17 10.4	24 4 24.7	− 0 54.5	+0.7745	0.5565	+0.0360	+90	+25
119	Tauri	4.9	0.34	9.9	18 32.1	6 19.5	+ 0 56.5	−0.6333	0.5571	0.0330	− 2	−62
167	H¹. Tauri	5.5	0.34	10.4	16 59.9	6 21.6	+ 0 58.5	+1.0289	0.5571	0.0329	+90	+43
120	Tauri	5.6	0.35	9.9	18 29.0	6 55.9	+ 1 31.7	−0.5576	0.5574	0.0320	+ 3	−55
122	Tauri	5.5	0.36	10.5	16 59.5	8 34.8	+ 3 7.3	+1.1056	0.5579	0.0293	+90	+49
130	Tauri	5.6	+0.41	−10.4	+17 41.9	13 19.9	+ 7 42.8	+0.4613	0.5595	+0.0215	+66	+ 8
19	B. Geminorum	6.2	0.53	10.4	18 41.9	25 1 10.6	− 4 50.5	−0.4748	0.5635	0.0016	+ 7	−46
124	H¹. Orionis	5.7	0.53	10.7	17 55.6	1 36.3	− 4 25.7	+0.3524	0.5637	0.0009	+57	+ 4
71	Orionis	5.1	0.54	10.3	19 10.9	1 45.4	− 4 16.9	−0.9900	0.5638	+0.0007	−26	−71
	B. D. +17°1191	6.5	0.54	11.0	17 12.3	2 28.8	− 3 35.0	+1.1236	0.5640	−0.0006	+90	+54
287	B. Orionis	6.2	+0.55	−11.0	+17 21.2	3 39.8	− 2 26.5	+0.9623	0.5644	−0.0026	+90	+40
292	B. Orionis	6.5	0.56	10.8	17 47.9	4 44.1	− 1 24.3	+0.4833	0.5647	0.0045	+67	+11
26	Geminorum	5.2	0.66	11.1	17 43.1	14 6.6	+ 7 38.7	+0.4469	0.5676	0.0208	+64	+ 7
74	B. Geminorum	6.2	0.68	10.9	18 16.5	16 19.0	+ 9 46.5	−0.1936	0 5682	0.0246	+23	−29
110	B. Geminorum	6.2	0.75	11.2	17 51.8	22 58.4	− 7 48.0	+0.0402	0.5701	0.0363	+37	−17
41	H¹. Geminorum	6 0	+0.75	−11.6	+16 47.0	23 2.8	− 7 43.8	+1.1777	0.5701	−0.0364	+90	+56
λ	Geminorum	3.6	0.82	11.7	16 40.6	26 5 52.9	− 1 8.2	+0.9945	0.5719	0.0484	+90	+38
162	B. Geminorum	5.7	0.88	11.6	17 14.9	11 52.1	+ 4 38.2	+0.0717	0.5734	0.0590	+39	−17
f	Geminorum	5.3	0.91	11.5	17 50.9	15 12.3	+ 7 51.4	−0.7613	0.5741	0.0648	−10	−73
1	Cancri	6.0	0.98	12.2	15 59.6	22 49.9	− 8 47.4	+0.6267	0.5758	0.0780	+81	+12
2	B. Cancri	6.0	+0.99	−11.9	+16 43.4	23 29.2	− 8 9.5	−0.1838	0.5759	−0.0791	+24	−34
3	Cancri	5.7	1.00	11.7	17 31.0	27 0 27.4	− 7 13.3	−1.0850	0.5761	0.0808	−34	−73
5	Cancri	5 9	1.01	11.9	16 39.9	0 46.6	− 6 51.8	−0.2262	0.5761	0.0813	+22	−36
29	Cancri	5.9	1.11	12.6	14 27.8	12 29.3	+ 4 22.7	+0.9787	0.5783	0.1009	+90	+32
90	B. Cancri	6.3	1.14	12.3	15 34.6	15 41.9	+ 7 28.3	−0.5003	0.5789	0.1062	+ 6	−57
54	Cancri	6.3	+1.20	−12.3	+15 38.0	22 5.0	−10 22.6	1.2650	0.5798	−0.1163	−56	−75
222	B. Cancri	6.3	1.30	13.2	11 49.2	28 9 34.2	+ 0 41.5	+1.1826	0.5813	0.1337	+90	+47
ξ	Leonis	5.1	1.35	13.1	11 38.3	15 33.8	+ 6 28.1	+0.5378	0.5820	0.1421	+71	0
18	Leonis	5.8	1.40	12.9	12 9.7	21 41.3	−11 37.9	−0.8852	0.5827	0.1502	−17	−78
19	Leonis	6.4	1.40	12.9	11 55.3	22 8.0	−11 12.2	−0.7101	0.5827	0.1508	− 5	−78
R	Leonis (*var.*)	4.6	+1.40	−13.0	+11 47.0	22 11.2	−11 9.1	−0.5789	0.5827	−0.1508	+ 2	−68
A	Leonis	4.6	1.46	13.0	10 22.3	29 6 49.0	− 2 50.2	−0.5069	0.5836	0.1613	+ 7	−64
44	Leonis	5.9	1.52	13.0	9 10.4	14 9.1	+ 4 13.7	−0.5194	0.5844	0.1691	+ 6	−65
48	Leonis	5.2	1.55	13.2	7 20.8	18 11.5	+ 8 7.2	+0.6075	0.5848	0.1732	+77	+ 1
49	Leonis	5.7	1.54	12.9	9 2.7	18 16.9	+ 8 12.4	−1.0971	0.5848	0.1732	−32	−81
37	Sextantis	6.3	+1.58	−13.0	+ 6 46.5	22 56.9	−11 17.9	+0.3400	0.5853	−0.1774	+55	−14
56	Leonis	6.1	1.61	12.9	6 35.6	30 3 7.6	− 7 16.6	−0.2278	0.5857	0.1808	+22	−47
c	Leonis	5.1	1.62	12.8	6 30.7	5 6.8	− 5 21.8	0.5077	0.5859	0.1823	+ 7	− 66
80	Leonis	6.4	1.68	12.4	4 16.8	15 38.6	+ 4 46.7	−0.2598	0.5870	0.1889	+20	−49
83	Leonis	6.3	1.68	12.4	3 25.8	16 3.1	+ 5 10.2	+0.5008	0.5871	0.1891	+67	− 7
τ	Leonis	5.2	+1.69	−12.5	+ 3 16.6	16 31.3	+ 5 37.4	+0.5624	0.5872	−0.1893	+73	− 3
89	Leonis	5.7	1.70	12.3	3 29.1	19 13.0	+ 8 13.1	−0.1542	0.5874	0.1905	+26	−43
β	Virginis	3.8	1.75	11.9	2 11.7	31 2 0.2	− 9 14.9	−0.1892	0.5882	0.1930	+24	−45
27	B. Virginis	6.5	1.76	11.7	+ 0 57.3	5 31.0	− 5 51.9	+0.3472	0.5887	0.1938	+56	−15
13	Virginis	5.9	1.79	11.0	− 0 21.7	13 40.0	+ 1 58.7	+0.0540	0.5897	0.1946	+38	−31
η	Virginis	4.0	+1.79	−11.0	− 0 14.5	14 10.9	+ 2 28.5	−0.1641	0.5898	−0.1946	+25	−44
γ	Virginis (*mean*)	2.9	+1.80	−10.1	− 1 1.8	23 12.2	+11 9.5	−1.1461	0.5910	−0.1937	−36	−90

APRIL.

38	Virginis	6.1	+1.83	− 9.6	− 3 8.3	1 3 56.6	− 8 16.8	−0.0016	0.5916	−0.1924	+34	−35

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
91 G. Virginis	6.5	+1.84	−9.6	− 3 48.5	1 4 7.0	− 8 6.7	+0.6204	0.5917	−0.1923	+77	0
k Virginis	5.7	1.84	9.3	3 24.0	6 36.0	· 5 43.3	−0.2555	0.5920	0.1914	+20	−50
46 Virginis	6.1	1.83	9.3	2 57.4	6 59.2	− 5 21.0	−0.7616	0.5920	0.1913	− 9	−90
48 Virginis	6.5	1.84	9.1	3 15.1	8 20.9	− 4 2.4	−0.7340	0.5923	0.1906	− 7	−90
θ Virginis	4.4	1.86	8.8	5 7.8	10 49.5	− 1 39.4	+0.6310	0.5926	0.1895	+78	0
SATURN	0.5	. . .	. . .	− 4 12.9	11 31.6	− 0 58.9	−0.3970	0.5957	−0.1905	+12	−59
65 Virginis	6.0	+1.84	−8.2	4 31.5	16 18.4	+ 3 37.0	−0.9926	0.5933	0.1865	−25	−90
66 Virginis	5.7	1.85	8.1	4 45.9	16 48.4	+ 4 5.9	−0.8515	0.5934	0.1862	−15	−90
72 Virginis	6.1	1.86	7.8	6 4.5	19 12.5	+ 6 24.6	−0.0155	0.5938	0.1846	+33	−35
l Virginis	4.8	1.86	7.7	5 51.6	19 50.6	+ 7 1.2	−0.3422	0.5939	0.1841	+14	−55
88 Virginis	6.5	+1.85	−6.9	− 6 27.3	2 2 30.2	−10 34.5	−0.9706	0.5947	−0.1788	−24	−90
598 B. Virginis	6.1	1.85	6.4	7 40.9	5 13.0	− 7 57.8	−0.2530	0.5951	0.1765	+19	−49
623 B. Virginis	6.5	1.86	5.8	8 53.4	9 1.3	− 4 18.3	+0.2645	0.5955	0.1729	+48	−20
95 Virginis	5.4	1.86	5.7	8 56.9	9 58.9	− 3 23.0	+0.1565	0.5957	0.1719	+41	−26
96 Virginis	6.5	1.87	5.4	9 58.3	10 54.1	· 2 29.8	+1.0019	0.5958	0.1709	+81	+24
κ Virginis	4.3	+1.86	−5.2	− 9 55.0	12 28.7	− 0 58.9	+0.6808	0.5960	−0.1692	+79	+ 3
4 G. Libræ	6.5	1.86	4.4	11 19.3	17 14.7	+ 3 36.1	+1.2655	0.5965	0.1639	+79	+52
6 B. Libræ	6.2	1.83	3.6	11 58.8	22 14.8	+ 8 24.8	+1.1086	0.5969	0.1578	+79	+34
22 B. Libræ	6.4	1.83	3.0	12 31.0	3 2 37.0	−11 23.2	+0.9623	0.5973	0.1520	+78	+22
13 Libræ	5.7	1.80	2.8	11 35.1	5 14.0	· 8 52.1	−0.3485	0.5974	0.1485	+10	−56
ξ^2 Libræ	5.6	+1.79	−2.8	−11 6.0	6 11.9	− 7 56.5	−0.9695	0.5975	−0.1471	−27	−90
17 Libræ	6.4	1.78	2.7	10 50.8	6 47.2	− 7 22.6	−1.3062	0.5975	0.1463	−68	−78
γ Libræ	4.0	1.72	−0.1	14 32.0	21 45.5	+ 7 1.1	+0.3179	0.5979	0.1231	+46	−17
190 B. Libræ	6.5	1.70	+0.4	14 47.8	4 0 55.7	+10 3.9	+0.1985	0.5978	0.1178	+38	−23
η Libræ	5.5	1.70	0.6	15 25.7	1 11.3	+10 18.8	+0.7958	0.5978	0.1173	+75	+11
195 B. Libræ	6.2	+1.65	+0.6	−13 54.1	4 14.8	−10 44.8	−1.0748	0.5977	−0.1120	−39	−90
202 B. Libræ	6.4	1.64	0.8	14 10.4	6 5.4	− 8 58.4	−1.0083	0.5976	0.1087	−34	−90
203 B. Libræ	6.2	1.64	1.0	14 36.3	6 12.8	− 8 51.4	−0.5922	0.5975	0.1086	− 7	−77
48 Libræ	4.6	1.63	0.9	14 3.5	6 52.7	− 8 13.0	−1.2095	0.5975	0.1074	−54	−90
49 Libræ	5.4	1.64	1.5	16 18.4	7 44.1	− 7 23.5	+0.9433	0.5975	0.1059	+74	+22
φ Ophiuchi	4.4	+1.52	+3.1	−16 26.7	20 7.6	+ 4 31.2	−0.0883	0.5961	−0.0831	+18	−40
24 Scorpii	5.0	1.49	3.9	17 35.6	5 0 19.8	+ 8 33.8	+0.7357	0.5955	0.0752	+73	+ 8
78 B. Ophiuchi	6.5	1.41	4.2	16 41.0	6 11.8	− 9 47.7	−0.5904	0.5943	0.0639	−11	−77
90 B. Ophiuchi	6.5	1.40	4.7	18 7.7	7 41.2	− 8 21.7	+0.7790	0.5939	0.0610	+72	+11
125 B. Ophiuchi	6.2	1.35	4.9	17 30.4	11 9.4	− 5 1.5	−0.0502	0.5932	0.0542	+18	−37
164 B. Ophiuchi	6.0	+1.30	+5.4	−17 40.5	15 54.5	− 0 27.2	−0.1148	0.5920	−0.0449	+13	−41
192 B. Ophiuchi	6.3	1.28	5.8	18 22.4	17 50.1	+ 1 24.0	+0.5137	0.5915	0.0411	+52	− 5
305 B. Ophiuchi	6.3	1.10	6.8	18 47.3	6 6 44.5	−10 10.8	+0.5737	0.5873	0.0160	+55	− 2
6 Sagittarii	6.5	1.06	6.4	17 9.2	9 2.4	− 7 58.0	−1.1396	0.5864	0.0115	−55	−90
32 G. Sagittarii	5.7	1.02	6.6	17 9.9	11 43.6	− 5 23.0	−1.1539	0.5854	0.0063	−57	−90
64 B. Sagittarii	6.1	+0.99	+7.3	−18 41.1	14 55.7	− 2 17.8	+0.4037	0.5841	−0.0002	+40	−12
6 B. Scuti	5.9	0.97	6.9	17 24.0	15 39.2	− 1 35.9	−0.9243	0.5838	+0.0012	−38	−90
52 G. Sagittarii	6.4	0.98	7.2	18 29.4	15 45.4	− 1 30.0	+0.2039	0.5838	0.0014	+27	−23
17 H^1. Sagittarii	6.4	0.97	7.3	18 38.9	16 16.6	− 0 59.9	+0.3684	0.5836	0.0024	+38	−14
Y Sagittarii (*var.*)	5.4	0.96	7.5	18 53.6	17 23.7	+ 0 4.7	+0.6261	0.5831	0.0045	+59	+ 1
85 B. Sagittarii	6.0	+0.91	+7.2	−17 50.8	20 10.8	+ 2 45.5	−0.4389	0.5819	+0.0097	− 8	−64
95 B. Sagittarii	5.7	0.90	7.6	18 46.6	21 7.3	+ 3 40.1	+0.5361	0.5815	0.0115	+52	− 4
100 B. Sagittarii	5.0	0.89	7.5	18 27.3	21 39.1	+ 4 10.8	+0.2085	0.5813	0.0124	+29	−23
187 B. Sagittarii	6.4	0.67	8.1	18 51.4	7 12 58.2	− 5 3.4	+1.0383	0.5742	0.0401	+72	+30
ρ Sagittarii	4.0	0.58	7.9	17 59.5	19 20.0	+ 1 4.9	+0.4236	0.5710	0.0511	+46	−11
45 Sagittarii	6.0	+0.58	+8.0	−18 27.0	19 24.0	+ 1 8.7	+0.9096	0.5710	+0.0512	+72	+20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
267 B. Sagittarii	5.8	+0.49	+ 8.0	−18 24.1	8 2 7.8	+ 7 38.4	+1.2445	0.5676	+0.0623	+72	+55
54 Sagittarii	5.4	0.47	7.4	16 28.1	3 47.3	+ 9 14.5	−0.6925	0.5667	0.0649	−17	−90
e Sagittarii	5.2	0.46	7.3	16 18.2	4 35.5	+10 1.1	−0.8151	0.5663	0.0662	−24	−90
g Sagittarii	5.1	0.37	7.0	15 41.7	11 32.6	− 7 16.2	−0.9664	0.5627	0.0770	−34	−90
16 B. Capricorni	6.2	0.24	6.6	15 1.6	21 59.4	+ 2 49.4	−0.7992	0.5574	0.0921	−20	−90
β Capricorni	3.2	+0.23	+ 6.6	−15 1.4	22 5.9	+ 2 55.7	−0.7925	0.5573	+0.0923	−20	−90
31 B. Capricorni	6.4	0.19	6.9	15 59.7	9 1 39.8	+ 6 22.5	+0.5844	0.5555	0.0971	+63	− 2
27 G. Capricorni	6.2	0.17	6.6	15 18.8	2 45.9	+ 7 26.4	−0.0382	0.5549	0.0986	+23	−37
τ Capricorni	5.2	0.13	6.5	15 13.4	6 36.0	+11 9.0	+0.2542	0.5530	0.1036	+41	−20
95 B. Capricorni	5.9	+0.02	6.0	14 46.8	15 48.4	− 3 56.6	+0.7851	0.5484	0.1149	+76	+10
53 B. Aquarii	6.5	−0.06	+ 5.2	−13 31.2	10 0 8.2	+ 4 7.1	+0.4242	0.5445	+0.1243	+55	−11
18 Aquarii	5.5	0.10	4.9	13 12.5	4 7.4	+ 7 58.8	+0.5901	0.5427	0.1284	+68	− 2
72 B. Aquarii	6.5	0.11	4.4	11 54.1	6 6.7	+ 9 54.3	−0.5702	0.5418	0.1304	− 2	−74
137 B. Capricorni	6.2	0.15	3.8	10 55.4	11 39.0	− 8 43.7	−0.8976	0.5395	0.1358	−22	−90
λ Capricorni	5.5	0.19	3.8	11 43.2	15 8.6	− 5 20.6	+0.4506	0.5380	0.1390	+58	−10
96 B. Aquarii	6.5	−0.22	+ 3.3	−10 40.4	18 40.4	− 1 55.2	−0.2123	0.5366	+0.1420	+19	−47
θ Aquarii	4.3	0.29	1.9	8 10.0	11 6 23.7	+ 9 26.6	−1.2179	0.5323	0.1511	−47	−90
150 B. Aquarii	6.0	0.31	2.2	9 25.4	6 25.0	+ 9 28.0	+0.1619	0.5323	0.1511	+41	−25
ρ Aquarii	5.3	0.31	1.8	8 12.5	8 6.7	+11 6.6	−0.9129	0.5318	0.1523	−21	−90
167 G. Aquarii	6.3	0.38	1.2	8 17.9	17 24.9	− 3 51.8	+0.6298	0.5289	0.1581	+76	0
67 Aquarii	6.4	−0.39	+ 0.8	− 7 22.0	19 56.2	− 1 25.0	+0.0067	0.5282	+0.1595	+33	−34
78 Aquarii	6.3	0.43	+ 0.5	7 36.8	12 1 48.5	+ 4 16.9	+1.2266	0.5267	0.1625	+83	+45
252 B. Aquarii	5.8	0.41	− 0.1	5 23.9	2 8.1	+ 4 36.0	−1.1611	0.5266	0.1627	−39	−90
197 G. Aquarii	6.3	0.41	0.2	5 13.3	3 14.0	+ 5 39.9	−1.1766	0.5263	0.1632	−41	−90
263 B. Aquarii	6.1	0.43	− 0.3	5 7.5	5 26.6	+ 7 48.7	−0.9214	0.5258	0.1643	−20	−90
82 Aquarii	6.4	−0.45	0.0	− 6 59.3	5 58.0	+ 8 19.2	+1.2174	0.5257	+0.1644	+84	+44
293 B. Aquarii	5.5	0.46	− 1.1	3 55.0	12 47.9	− 9 2.9	−1.0387	0.5243	0.1670	−28	−90
96 Aquarii	5.7	0.49	0.9	5 32.7	14 47.6	− 7 6.6	+1.0947	0.5239	0.1678	+85	+31
316 B. Aquarii	6.5	0.47	1.2	4 20.3	15 14.9	− 6 40.2	−0.1617	0.5239	0.1679	+25	−44
342 B. Aquarii	6.5	0.51	1.6	4 30.5	21 11.3	− 0 54.0	+1.0289	0.5229	0.1696	+86	+26
20 Piscium	5.6	−0.54	− 2.4	− 3 11.4	13 5 53.2	+ 7 32.8	+1.0550	0.5218	+0.1714	+87	+28
80 B. Piscium	6.3	0.55	3.4	− 0 55.9	14 59.4	− 7 36.6	+0.1169	0.5211	0.1724	+41	−28
				NEW MOON.							
30 B. Tauri	6.4	−0.42	− 9.6	+15 10.6	18 5 40.0	+ 3 49.7	−0.8818	0.5393	+0.1104	−17	−75
179 B. Tauri	5.9	−0.36	−10.1	+14 57.3	20 21.8	− 5 55.9	+0.8532	0.5438	+0.0922	+90	+24
193 B. Tauri	6.2	0.34	9.7	17 4.7	22 40.9	− 3 41.2	−1.2752	0.5445	0.0892	−61	−73
48 Tauri	6.3	0.34	10.2	15 12.4	19 0 17.0	− 2 8.1	+0.9268	0.5450	0.0871	+90	+29
γ Tauri	3.9	0.33	10.2	15 26.4	2 13.7	− 0 15.1	+0.8358	0.5456	0.0844	+90	+23
δ Tauri	3.9	0.31	9.8	17 21.6	3 43.1	+ 1 11.5	−1.1522	0.5460	0.0824	−40	−73
63 Tauri	5.7	−0.31	−10.0	+16 35.8	3 57.8	+ 1 25.7	−0.2914	0.5461	+0.0821	+18	−41
64 Tauri	4.9	0.31	9.8	17 15.8	4 16.9	+ 1 44.3	−1.0001	0.5462	0.0816	−26	−73
70 Tauri	6.4	0.31	10.2	15 45.8	5 2.3	+ 2 28.2	+0.7116	0.5464	0.0806	+90	+16
71 Tauri	4.6	0.31	10.3	15 26.5	5 23.5	+ 2 48.7	+1.0934	0.5466	0.0801	+90	+43
75 Tauri	5.2	0.30	10.1	16 11.1	6 23.6	+ 3 46.9	+0.3550	0.5469	0.0787	+57	− 4
θ^1 Tauri	4.2	−0.30	−10.2	+15 47.4	6 27.6	+ 3 50.8	+0.7956	0.5469	+0.0787	+90	+21
θ^2 Tauri	3.6	0.30	10.2	15 41.9	6 30.2	+ 3 53.3	+0.8993	0.5469	0.0786	+90	+28
80 Tauri	5.8	0.30	10.3	15 28.1	7 13.1	+ 4 34.9	+1.2080	0.5471	0.0776	+90	+55
264 B. Tauri	4.8	0.30	10.2	16 1.5	7 24.8	+ 4 46.2	+0.6112	0.5472	0.0773	+80	+11
81 Tauri	5.5	0.30	10.3	15 31.4	7 27.7	+ 4 49.0	+1.1669	0.5472	0.0773	+90	+51
85 Tauri	6.0	−0.30	−10.3	+15 41.1	8 2.6	+ 5 22.7	+1.0332	0.5473	+0.0764	+90	+38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
275 B. Tauri	6.5	-0.29	-10.2	+16 9.6	19 8 53.4	+ 6 12.0	+0.5753	0.5477	+0.0752	+76	+ 9
α Tauri (*Aldebar.*)	1.1	0.28	10.2	16 21.2	9 58.9	+ 7 15.3	+0.4446	0.5480	0.0737	+64	+ 1
89 Tauri	5.8	0.27	10.3	15 52.6	11 3.6	+ 8 18.0	+1.0450	0.5483	0.0722	+90	+40
σ^2 Tauri	4.9	0.28	10.4	15 45.8	11 35.8	+ 8 49.1	+1.2081	0.5484	0.0714	+90	+56
318 B. Tauri	5.7	0.22	10.3	17 1.9	20 11.8	- 6 51.5	+0.3769	0.5510	0.0588	+59	- 1
m Tauri	5.0	-0.17	-10.0	+18 32.4	20 0 54.7	- 2 17.9	1.0126	0.5523	+0.0516	-28	-72
111 Tauri	5.1	0.13	10.4	17 18.6	8 54.4	+ 5 36.3	+0.6937	0.5546	0.0392	+90	+19
115 Tauri	5.3	0.12	10.3	17 53.7	10 11.4	+ 6 40.7	+0.1060	0.5549	0.0372	+41	-13
117 Tauri	6.0	0.12	10.6	17 10.4	10 36.1	+ 7 4.4	+0.9070	0.5550	0.0365	+90	+33
119 Tauri	4.9	0.10	10.2	18 32.1	12 31.9	+ 8 56.5	-0.5090	0.5555	0.0335	+ 6	-51
167 H^1. Tauri	5.5	-0.10	-10.6	+16 59.9	12 34.0	+ 8 58.5	+1.1643	0.5555	+0.0334	+90	+55
120 Tauri	5.6	0.10	10.2	18 29.0	13 8.7	+ 9 32.1	-0.4325	0.5557	0.0325	+10	-45
122 Tauri	5.5	0.09	10.7	16 59.5	14 48.5	+11 8.5	+1.2430	0.5561	0.0298	+87	+65
130 Tauri	5.6	-0.05	10.5	17 41.9	19 36.5	- 8 13.0	+0.5968	0.5573	0.0220	+79	+15
19 B. Geminorum	6.2	+0.05	10.4	18 41.9	21 7 36.2	+ 3 22.5	0.3419	0.5601	0.0021	+15	- 36
124 H^1. Orionis	5.7	+0.06	-10.6	+17 55.6	8 2.2	+ 3 47.6	+0.4929	0.5602	+0.0013	+68	+12
71 Orionis	5.1	0.06	10.2	19 10.9	8 11.5	+ 3 56.6	-0.8615	0.5602	+0.0011	-16	-71
B. D. +17°1191	6.5	0.06	10.8	17 12.3	8 55.5	+ 4 39.2	+1.2715	0.5604	-0.0002	+76	+72
287 B. Orionis	6.2	0.07	10.8	17 21.2	10 7.6	+ 5 48.8	+1.1093	0.5606	0.0022	+90	+52
292 B. Orionis	6.5	0.08	10.6	17 47.9	11 12.9	+ 6 51.9	+0.6264	0.5608	0.0040	+82	+19
26 Geminorum	5 2	+0.17	-10.8	+17 43.1	20 45.0	- 7 55.4	+0.5931	0.5627	-0.0202	+78	+15
74 B. Geminorum	6.2	0.19	10.6	18 16.5	22 59.9	- 5 45.1	-0.0537	0.5631	0.0241	+31	-21
110 B. Geminorum	6 2	0.25	10.7	17 51.8	22 5 47.4	+ 0 48.5	+0.1844	0.5613	0.0357	+46	- 9
λ Geminorum	3 6	0.32	11.1	16 40.6	12 51.1	+ 7 37.6	+1.1515	0.5653	0.0477	+90	+52
162 B. Geminorum	5 7	0.39	10.8	17 14.9	18 59.0	-10 27.2	+0.2179	0.5662	0.0581	+48	- 9
f Geminorum	5.3	+0.42	-10.6	+17 50.9	22 24.3	- 7 8.9	0.6261	0.5666	-0.0639	- 1	-64
1 Cancri	6 0	0.50	11.2	15 59.6	23 6 14.4	+ 0 24.8	+0.7807	0.5675	0.0769	+90	+21
2 B. Cancri	6.0	0.51	10.9	16 43.5	6 54.7	+ 1 3.7	-0.0411	0.5676	0.0780	+32	-25
3 Cancri	5.7	0.52	10.6	17 31.1	7 54.6	+ 2 1.5	-0.9552	0.5677	0.0796	-23	-73
5 Cancri	5.9	0.52	10.9	16 39.9	8 14.3	+ 2 20.6	0.0843	0.5677	0.0802	+30	-28
29 Cancri	5 9	+0.66	-11.5	+14 27.8	20 18.1	-10 0 9	+1.1367	0.5689	-0.0995	+90	+46
90 B. Cancri	6.3	0.69	11.1	15 34.7	23 36.8	- 6 49.2	-0.3655	0.5692	0.1047	+14	-48
54 Cancri	6 3	0.76	10.9	15 38.1	24 6 12.2	- 0 27 6	1.1441	0.5697	0.1147	-38	-75
ξ Leonis	5.1	0.96	11.8	11 38.3	25 0 16.4	- 7 1.5	+0.6782	0.5713	0.1401	+87	+ 8
18 Leonis	5.8	1.03	11.4	12 9.7	6 36.5	- 0 54.8	-0.7712	0.5719	0.1480	- 9	-78
19 Leonis	6.4	+1.03	-11.4	+11 55.3	7 4.1	- 0 28.1	-0.5936	0.5720	-0.1486	+ 2	-69
R Leonis (*var.*)	4.6	1.04	11.5	11 47.0	7 7.4	- 0 24.9	-0.4603	0.5720	0.1487	+ 9	-59
A Leonis	4.6	1.14	11.6	10 22.3	16 2.9	+ 8 11.6	-0.3937	0.5729	0.1591	+13	-55
44 Leonis	5.9	1.22	11.6	9 10.4	23 37.7	- 8 29.7	-0.4129	0.5739	0.1670	+12	-58
48 Leonis	5.2	1.28	11.9	7 20.8	26 3 48.1	- 4 28.3	+0.7267	0.5745	0.1710	+90	+ 8
49 Leonis	5.7	+1.27	-11.4	+ 9 2.7	3 53.6	- 4 23.0	-1.0028	0.5745	-0.1711	-24	-81
37 Sextantis	6.3	1.33	11.8	6 46.6	8 42.6	+ 0 15.7	+0.4500	0.5752	0.1754	+63	- 8
56 Leonis	6.1	1.37	11.6	6 35.6	13 1.2	+ 4 25.0	-0.1302	0.5758	0.1788	+27	-41
c Leonis	5.1	1.39	11.5	6 30.7	15 4.0	+ 6 23.4	-0.4161	0.5762	0.1804	+12	-59
80 Leonis	6.4	1.51	11.4	4 16.9	27 1 53.9	- 7 9.9	-0.1776	0.5782	0.1873	+25	-44
83 Leonis	6.3	+1.51	-11.5	+ 3 25.8	2 19.2	- 6 45.5	+0.5915	0.5783	-0.1875	+75	- 2
τ Leonis	5.2	1.53	11.6	3 16.6	2 48.0	- 6 17.6	+0.6531	0.5784	0.1878	+82	+ 2
89 Leonis	5.7	1.55	11.3	3 29.1	5 34.1	- 3 37.7	-0.0755	0.5790	0.1891	+30	-39
β Virginis	3.8	1.64	11.1	2 11.7	12 31.4	+ 3 4.6	-0.1201	0.5805	0.1918	+28	-41
27 B. Virginis	6.5	1.66	11.0	+ 0 57.4	16 7.0	+ 6 32.3	+0.4164	0.5814	0.1928	+61	-12
13 Virginis	5.9	+1.75	-10.5	- 0 21.7	28 0 26.0	- 9 27.1	+0.1079	0.5835	-0.1941	+41	-29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'		N.	S.
			s	″	° ′	d h m	h m					°	°
η	Virginis	4.0	+1.75	−10.4	− 0 14.5	28 0 57.5	− 8 56.6	−0.1127	0.5836	−0.1942		+28	−41
γ	Virginis (*mean*)	2.9	1.81	9.6	1 1.8	10 7.7	− 0 6.7	−1.1146	0.5862	0.1937		−33	−90
38	Virginis	6.1	1.88	9.5	3 8.2	14 55.8	+ 4 30.8	+0.0291	0.5875	0.1927		+36	−33
91 G.	Virginis	6.5	1.89	9.6	3 48.5	15 6.3	+ 4 40.8	+0.6539	0.5876	0.1926		+81	+ 1
k	Virginis	5.7	1.90	9.2	3 24.0	17 37.0	+ 7 5.9	−0.2302	0.5883	0.1918		+22	−48
46	Virginis	6.1	+1.90	− 9.1	− 2 57.4	18 0.6	+ 7 28.5	−0.7393	0.5885	−0.1917		− 7	−90
48	Virginis	6.5	1.91	9.0	3 15.1	19 23.0	+ 8 47.9	−0.7135	0.5889	0.1913		− 6	−90
	Saturn	0.6	. . .	. . .	3 26.7	19 26.7	+ 8 51.5	−0.5349	0.5917	0.1923		+ 5	−70
θ	Virginis	4.4	1.95	9.0	5 7.8	21 53.0	+11 12.3	+0.6524	0.5896	0.1902		+80	+ 1
65	Virginis	6.0	1.97	8.2	4 31.5	29 3 24.3	− 7 28.8	0.9850	0.5913	0.1875		−24	−90
66	Virginis	5.7	+1.98	− 8.2	− 4 45.9	3 54.4	− 6 59.9	−0.8442	0.5915	−0.1872		−14	−90
72	Virginis	6.1	2.01	8.0	6 4.5	6 19.2	− 4 40.5	−0.0103	0.5922	0.1858		+33	−35
l	Virginis	4.8	2.00	7.9	5 51.6	6 57.4	− 4 3.7	−0.3386	0.5924	0.1854		+15	−55
88	Virginis	6.5	2.04	7.1	6 27.3	13 38.0	+ 2 21.6	0.9779	0.5944	0.1805		−24	−90
598 B.	Virginis	6.1	2.07	6.8	7 40.9	16 20.7	+ 4 58.1	−0.2646	0.5952	0.1782		+18	−50
623 B.	Virginis	6.5	+2.10	− 6.4	− 8 53.4	20 8.6	+ 8 37.3	+0.2457	0.5963	−0.1748		+46	−21
95	Virginis	5.4	2.10	6.2	8 56.9	21 5.9	+ 9 32.4	+0.1361	0.5967	0.1739		+40	−27
96	Virginis	6.5	2.12	6.1	9 58.3	22 1.0	+10 25.4	+0.9783	0.5969	0.1730		+81	+22
κ	Virginis	4.3	2.12	5.9	9 55.1	23 35.1	+11 55.9	+0.6550	0.5974	0.1714		+77	+ 2
4 G.	Libræ	6.5	2.16	5.2	11 19.3	30 4 19.4	− 7 30.9	+1.2290	0.5987	0.1663		+79	+46
6 B.	Libræ	6.2	+2.16	− 4.4	−11 58.8	9 16.9	− 2 44.9	+1.0630	0.6000	−0.1603		+79	+29
22 B.	Libræ	6.4	2.19	3.9	12 31.1	13 36.3	+ 1 24.4	+0.9094	0.6011	0.1547		+78	+18
13	Libræ	5 7	2.17	3.5	11 35.2	16 11.4	+ 3 53.5	−0.3985	0.6016	0.1511		+ 8	−60
ξ^2	Libræ	5.6	+2.17	− 3.3	−11 6.0	17 8.5	+ 4 48.3	−1.0172	0.6019	−0.1498		−31	−90

MAY.

γ	Libræ	4.0	+2.20	− 0.8	−14 32.0	1 8 26.2	− 4 30.1	+0.2369	0.6046	−0.1260		+41	−21
190 B.	Libræ	6.5	2.20	0.4	14 47.8	11 32.4	− 1 31.1	+0.1137	0.6049	0.1207		+33	−28
η	Libræ	5.5	2.20	− 0.2	15 25.7	11 47.7	− 1 16.6	+0.7050	0.6050	0.1202		+74	+ 5
195 B.	Libræ	6.2	+2.17	+ 0.1	−13 54.1	14 47.1	+ 1 35.7	−1.1516	0.6052	−0.1150		−46	−90
202 B.	Libræ	6.4	2.17	0.3	14 10.4	16 35.2	+ 3 19.5	−1.0883	0.6053	0.1117		−41	−90
203 B.	Libræ	6.2	2.18	0.4	14 36.3	16 42.3	+ 3 26.3	−0.6766	0.6053	0.1115		−12	−88
48	Libræ	4.6	2.16	0.5	14 3.5	17 21.3	+ 4 3.9	−1.2884	0.6054	0.1103		−69	−79
49	Libræ	5.4	2.18	0.7	16 18.4	18 11.5	+ 4 52.1	+0.8405	0.6054	0.1088		+74	+14
ϕ	Ophiuchi	4.4	+2.13	+ 2.7	−16 26.7	2 6 15.6	− 7 32.7	−0.1972	0.6054	−0.0858		+12	−47
24	Scorpii	5.0	2.12	3.5	17 35.6	10 20.5	− 3 37.5	+0.6107	0.6050	0.0777		+63	0
78 B.	Ophiuchi	6.5	2.07	4.1	16 41.0	16 2.1	+ 1 50.6	−0.7054	0.6043	0.0662		−18	−90
90 B.	Ophiuchi	6.5	2.07	4.5	18 7.7	17 28.8	+ 3 13.9	+0.6436	0.6041	0.0632		+65	+ 2
29	Ophiuchi	6.4	2.08	4.8	18 46.3	18 18.4	+ 4 1.5	+1.2353	0.6040	0.0616		+72	+53
125 B.	Ophiuchi	6.2	+2.04	+ 4.9	−17 30.4	20 50.6	+ 6 27.7	−0.1785	0.6035	−0.0563		+11	−46
164 B.	Ophiuchi	6.0	2.00	5.5	17 40.5	3 1 26.6	+10 52.8	−0.2478	0.6025	0.0469		+ 6	−50
192 B.	Ophiuchi	6.3	1.99	5.9	18 22.4	3 18.4	−11 19.7	+0.3695	0.6020	0.0430		+42	−14
305 B.	Ophiuchi	6.3	1.87	7.5	18 47.2	15 47.2	+ 0 39.8	+0.4146	0.5980	0.0172		+43	−11
64 B.	Sagittarii	6.1	1.77	8.2	18 41.0	23 41.9	+ 8 16.2	+0.2393	0.5948	−0.0011		+29	−21
6 B.	Scuti	5.9	+1.75	+ 8.0	−17 23.9	4 0 23.9	+ 8 56.7	−1.0692	0.5945	+0.0004		−49	−90
52 G.	Sagittarii	6.4	1.76	8.2	18 29.4	0 29.9	+ 9 2.4	+0.0417	0.5944	0.0006		+18	−32
17 H¹.	Sagittarii	6.4	1.76	8.3	18 38.9	1 0.1	+ 9 31.5	+0.2032	0.5942	0.0016		+27	−23
Y	Sagittarii (*var.*)	5.4	1.74	8.5	18 53.6	2 4.9	+10 33.7	+0.4560	0.5937	0.0038		+44	− 9
85 B.	Sagittarii	6.0	1.70	8.5	17 50.7	4 46.3	−10 51.0	−0.5953	0.5925	0.0091		−17	−78
95 B.	Sagittarii	5.7	+1.70	+ 8.8	−18 46.6	5 40.9	− 9 58.5	+0.3642	0.5920	+0.0109		+39	−14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	Υ″	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
100 B. Sagittarii	5.0	+1.69	+ 8.7	−18 27.3	4 6 11.7	− 9 28.9	+0.0411	0.5918	+0.0119	+19	−32
173 B. Sagittarii	6.4	1.52	9.9	19 12.7	19 18.8	+ 3 8.8	+1.1488	0.5849	0.0372	+71	+41
187 B. Sagittarii	6.4	1.50	9.9	18 51.3	21 0.5	+ 4 46.7	+0.8471	0.5840	0.0403	+72	+15
ρ Sagittarii	4.0	1.41	10.0	17 59.4	5 3 10.3	+10 42.9	+0.2374	0.5803	0.0514	+34	−21
45 Sagittarii	6.0	1.41	10.1	18 27.0	3 14.1	+10 46.5	+0.7163	0.5803	0.0516	+71	+ 7
267 B. Sagittarii	5.8	+1.32	+10.4	−18 24.0	9 45.6	− 6 56.1	+1.0430	0.5763	+0.0629	+72	+30
54 Sagittarii	5.4	1.29	9.8	16 28.1	11 22.1	− 5 23.0	−0.8676	0.5753	0.0656	−28	−90
e Sagittarii	5.2	1.28	9.8	16 18.2	12 8.9	− 4 37.9	−0.9889	0.5748	0.0669	−36	−90
g Sagittarii	5.1	1.19	9.7	15 41.6	18 54.1	+ 1 52.9	−1.1418	0.5706	0.0778	−48	−90
16 B. Capricorni	6.2	1.05	9.7	15 1.6	6 5 4.1	+11 41.7	−0.9811	0.5642	0.0932	−33	−90
β Capricorni	3.2	+1.05	+ 9.7	−15 1.4	5 10.5	+11 47.9	−0.9745	0.5641	+0.0933	−32	−90
31 B. Capricorni	6.4	1.00	10.0	15 59.7	8 39.1	− 8 50.6	+0.3846	0.5619	0.0983	+48	−13
27 G. Capricorni	6.2	0.99	9.8	15 18.7	9 43.6	− 7 48.3	−0.2308	0.5612	0.0997	+13	−49
τ Capricorni	5.2	0.94	9.7	15 13.4	13 28.4	− 4 11.1	+0.0576	0.5589	0.1048	+29	−32
95 B. Capricorni	5.9	0.82	9.5	14 46.7	22 28.8	+ 4 31.3	+0.5823	0.5533	0.1162	+65	− 2
53 B. Aquarii	6.5	+0.72	+ 8.9	−13 31.2	7 6 39.1	−11 34.4	+0.2259	0.5485	+0.1255	+42	−22
18 Aquarii	5.5	0.68	8.7	13 12.4	10 34.2	− 7 46.9	+0.3909	0.5463	0.1297	+53	−13
72 B. Aquarii	6.5	0.66	8.2	11 54.0	12 31.6	− 5 53.2	−0.7584	0.5452	0.1317	−13	−90
137 B. Capricorni	6.2	0.60	7.6	10 55.3	17 58.9	− 0 36.1	−1.0822	0.5423	0.1370	−36	−90
λ Capricorni	5.5	0.55	7.8	11 43.2	21 25.7	+ 2 44.0	+0.2560	0.5405	0.1401	+45	−20
96 B. Aquarii	6.5	+0.52	+ 7.3	−10 40.4	8 0 54.8	+ 6 6.6	−0.3825	0.5387	+0.1431	+10	−59
150 B. Aquarii	6.0	0.40	6.3	9 25.3	12 32.1	− 6 37.4	−0.0235	0.5334	0.1521	+30	−36
ρ Aquarii	5.3	0.39	5.8	8 12.4	14 12.9	− 4 59.8	−1.0908	0.5327	0.1533	−34	−90
167 G. Aquarii	6.3	0.29	5.3	8 17.8	23 27.2	+ 3 58.0	+0.4491	0.5290	0.1590	+61	−10
213 B. Aquarii	6.5	0.26	5.3	8 42.8	9 1 51.7	+ 6 18.1	+1.2903	0.5282	0.1604	+82	+55
67 Aquarii	6.4	+0.28	+ 4.9	− 7 21.9	1 57.6	+ 6 23.8	−0.1689	0.5281	+0.1604	+23	−45
λ Aquarii	3.8	0.22	4.7	7 59.3	6 47.6	+11 5.2	+1.2961	0.5265	0.1629	+82	+56
78 Aquarii	6.3	0.21	4.6	7 36.8	7 48.4	−11 55.8	+1.0504	0.5262	0.1634	+83	+28
252 B. Aquarii	5.8	0.23	3.9	5 23.8	8 8.0	−11 36.8	−1.3265	0.5261	0.1635	−66	−78
263 B. Aquarii	6.1	0.20	3.6	5 7.5	11 25.8	− 8 24.7	−1.0853	0.5251	0.1650	−32	−90
82 Aquarii	6.4	+0.18	+ 4.1	− 6 59.2	11 57.0	− 7 54.5	+1.0454	0.5250	+0.1652	+84	+27
293 B. Aquarii	5.5	0.15	2.7	3 54.9	18 46.0	− 1 17.4	−1.1956	0.5232	0.1678	−42	−90
URANUS	6.2	. . .	. . .	5 54.6	19 16.9	− 0 47.4	+1.0863	0.5218	0.1675	+85	+30
96 Aquarii	5.7	0.12	3.1	5 32.7	20 45.6	+ 0 38.7	+0.9326	0.5227	0.1685	+85	+19
316 B. Aquarii	6.5	0.13	2.6	4 20.3	21 12.8	+ 1 5.2	−0.3192	0.5226	0.1686	+17	−54
337 B. Aquarii	6.4	+0.08	+ 2.5	− 4 57.1	10 2 5.9	+ 5 49.6	+1.1846	0.5216	+0.1701	+86	+40
342 B. Aquarii	6.5	0.07	2.3	4 30.4	3 9.0	+ 6 50.9	+0.8744	0.5214	0.1703	+86	+15
20 Piscium	5.6	+0.01	1.4	3 11.4	11 51.1	− 8 42.0	+0.9113	0.5200	0.1721	+87	+17
80 B. Piscium	6.3	−0.04	+ 0.1	− 0 55.8	20 58.0	+ 0 9.3	−0.0127	0.5191	0.1731	+34	−35
98 B. Piscium	6.3	0.06	− 1.0	+ 1 15.6	11 3 45.5	+ 6 45.3	−1.2644	0.5187	0.1733	−49	−89
44 Piscium	6.0	−0.09	− 1.3	+ 1 30.8	7 49.6	+10 42.4	−0.8401	0.5187	+0.1731	−13	−89
155 B. Piscium	6.5	0.16	2.6	2 58.0	21 39.7	+ 0 9.0	−0.0694	0.5192	0.1713	+31	−38
77 Piscium	6.4	0.19	3.5	4 29.9	12 5 23.8	+ 7 39.8	−0.4531	0.5200	0.1694	+10	−63
e Piscium	5.6	0.20	3.8	5 14.5	6 45.8	+ 8 59.4	−1.0486	0.5201	0.1689	−27	−85
VENUS	−3.4	. . .	. . .	6 3.7	12 35.5	− 9 20.9	−0.9833	0.4703	0.1465	−23	−84
μ Piscium	5.0	−0.24	− 4.6	+ 5 44.8	18 18.9	− 3 47.3	+0.3189	0.5219	+0.1647	+54	−16
				NEW	*MOON.*						
111 Tauri	5.1	−0.30	−10.3	+17 18.6	17 14 35.0	−11 5.9	+0.8403	0.5572	+0.0410	+90	+28
115 Tauri	5.3	0.30	10.2	17 53.7	15 51.5	− 9 52.0	+0.2546	0.5576	0.0389	+50	− 5
117 Tauri	6.0	−0.30	−10.4	+17 10.4	16 16.0	− 9 28.2	+1.0561	0.5576	+0.0383	+90	+44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, Π	Y'	x'	y'	Limiting Parallels. N.	S.
			s	″	° ′	d h m	h m				°	°
119	Tauri	4.9	−0.29	−10.2	+18 32.1	17 18 11.2	− 7 36.9	−0.3568	0.5581	+0.0352	+14	−40
120	Tauri	5.6	0.29	10.2	18 29.0	18 47.8	− 7 1.5	−0.2795	0.5582	0.0342	+19	−35
130	Tauri	5.6	0.27	10.3	17 41.9	**18** 1 13.6	− 0 48.5	+0.7591	0.5597	0.0236	+90	+25
64	Orionis	5.1	0.23	10.0	19 41.4	8 32.7	+ 6 15.8	−1.2724	0.5612	0.0113	−69	−71
19 B.	Geminorum	6.2	0.21	10.2	18 41.9	13 10.4	+10 44.2	−0.1640	0.5620	0.0035	+25	−25
124 H¹.	Orionis	5.7	−0.21	−10.4	+17 55.6	13 36.4	+11 9.3	+0.6726	0.5621	+0.0027	+89	+22
71	Orionis	5.1	0.21	10.2	19 10.9	13 45.6	+11 18.3	−0.6836	0.5621	+0.0025	− 5	−65
292 B.	Orionis	6.5	0.19	10.4	17 47.9	16 46.6	− 9 47.1	+0.8104	0.5626	−0.0027	+90	+30
26	Geminorum	5.2	0.14	10.4	17 43.1	**19** 2 17.9	− 0 35.1	+0.7891	0.5638	0.0191	+90	+27
74 B.	Geminorum	6.2	0.12	10.2	18 16.5	4 32.8	+ 1 35.1	+0.1431	0.5641	0.0229	+43	−10
110 B.	Geminorum	6.2	−0.08	−10.2	+17 51.8	11 20.7	+ 8 9.2	+0.3894	0.5647	−0.0346	+60	+ 3
162 B.	Geminorum	5.7	+0.03	10.2	17 14.9	**20** 0 35.2	− 3 3.6	+0.4362	0.5654	0.0571	+64	+ 3
f	Geminorum	5.3	0.05	9.9	17 50.9	4 1.7	+ 0 15.9	−0.4096	0.5655	0.0629	+12	−47
1	Cancri	6.0	0.12	10.3	15 59.7	11 55.5	+ 7 53.4	+1.0123	0.5655	0.0759	+90	+37
2 B.	Cancri	6.0	0.13	10.0	16 43.5	12 36.2	+ 8 32.8	+0.1853	0.5656	0.0770	+46	−13
3	Cancri	5.7	+0.13	− 9.8	+17 31.1	13 36.7	+ 9 31.0	−0.7346	0.5655	−0.0786	− 7	−73
5	Cancri	5.9	0.14	10.0	16 40.0	13 56.6	+ 9 50.3	+0.1427	0.5655	0.0792	+43	−15
90 B.	Cancri	6.3	0.29	9.9	15 34.7	**21** 5 30.6	+ 0 52.1	−0.1324	0.5652	0.1035	+27	−33
54	Cancri	6.3	0.36	9.6	15 38.1	12 12.5	+ 7 20.2	−0.9169	0.5650	0.1134	−19	−75
o^1	Cancri	5.1	0.39	9.5	15 37.0	15 0.0	+10 1.9	−1.2186	0.5650	0.1174	−47	−75
ξ	Leonis	5.1	+0.58	−10.2	+11 38.3	**22** 6 39.1	+ 1 8.8	+0.9282	0.5645	−0.1384	+90	+24
18	Leonis	5.8	0.65	9.7	12 9.8	13 8.6	+ 7 24.9	−0.5406	0.5644	0.1463	+ 5	−65
19	Leonis	6.4	0.65	9.8	11 55.3	13 37.0	+ 7 52.3	−0.3607	0.5644	0.1468	+15	−52
R	Leonis (*var.*)	4.6	0.65	9.8	11 47.0	13 40.3	+ 7 55.5	−0.2257	0.5644	0.1469	+22	−43
A	Leonis	4.6	0.77	9.9	10 22.4	22 50.5	− 7 13.1	−0.1612	0.5645	0.1571	+26	−41
44	Leonis	5.9	+0.87	− 9.8	+ 9 10.4	**23** 6 38.8	+ 0 19.0	−0.1846	0.5648	−0.1649	+25	−43
ρ	Leonis	3.8	0.90	9.4	9 42.0	10 2.4	+ 3 35.5	−1.2885	0.5649	0.1680	−55	−81
48	Leonis	5.2	0.93	10.2	7 20.9	10 56.9	+ 4 28.2	+0.9695	0.5650	0.1688	+90	+24
49	Leonis	5.7	0.92	9.6	9 2.8	11 2.7	+ 4 33.8	−0.7864	0.5650	0.1689	−10	−81
37	Sextantis	6.3	1.00	10.1	6 46.6	16 1.0	+ 9 21.8	+0.6851	0.5653	0.1731	+87	+ 5
56	Leonis	6.1	+1.05	− 9.8	+ 6 35.6	20 28.0	−10 20.3	+0.0921	0.5657	−0.1766	+40	−28
c	Leonis	5.1	1.08	9.7	6 30.8	22 35.0	− 8 17.8	−0.2002	0.5660	0.1781	+24	−45
80	Leonis	6.4	1.23	9.6	4 16.9	**24** 9 47.3	+ 2 31.2	+0.0300	0.5675	0.1849	+37	−33
83	Leonis	6.3	1.22	9.8	3 25.8	10 13.5	+ 2 56.5	+0.8111	0.5676	0.1852	+90	+11
τ	Leonis	5.2	1.25	9.9	3 16.7	10 43.4	+ 3 25.4	+0.8731	0.5677	0.1854	+90	+15
89	Leonis	5.7	+1.28	− 9.6	+ 3 29.1	13 35.3	+ 6 11.3	+0.1292	0.5681	−0.1868	+42	−27
β	Virginis	3.8	1.40	9.5	2 11.8	20 47.4	−10 51.7	+0.0740	0.5696	0.1896	+39	−30
27 B.	Virginis	6.5	1.43	9.5	+ 0 57.4	**25** 0 30.7	− 7 16.1	+0.6138	0.5704	0.1906	+78	− 1
13	Virginis	5.9	1.55	9.1	− 0 21.7	9 7.2	+ 1 2.2	+0.2866	0.5726	0.1921	+52	−19
η	Virginis	4.0	1.55	9.0	0 14.5	9 39.8	+ 1 33.6	+0.0615	0.5728	0.1922	+38	−31
γ	Virginis (*mean*)	2.9	+1.65	− 8.2	− 1 1.8	19 9.0	+10 42.6	−0.9724	0.5756	−0.1920	−22	−90
38	Virginis	6.1	1.74	8.3	3 8.2	**26** 0 6.7	− 8 30.5	+0.1788	0.5772	0.1912	+45	−25
91 G.	Virginis	6.5	1.76	8.5	3 48.5	0 17.5	− 8 20.1	+0.8124	0.5773	0.1911	+87	+11
	SATURN	0.8	. . .	. . .	2 57.6	2 26.4	− 6 15.8	−0.4413	0.5796	0.1911	+10	−63
k	Virginis	5.7	1.78	8.0	3 24.0	2 53.2	− 5 49.9	−0.0898	0.5782	0.1905	+29	−40
46	Virginis	6.1	+1.78	− 7.8	− 2 57.4	3 17.4	− 5 26.7	−0.6069	0.5784	−0.1904	+ 1	−77
48	Virginis	6.5	1.80	7.8	3 15.1	4 42.5	− 4 4.6	−0.5835	0.5788	0.1899	+ 2	−75
θ	Virginis	4.4	1.85	8.0	5 7.8	7 17.2	− 1 35.5	+0.7962	0.5798	0.1891	+85	+10
65	Virginis	6.0	1.90	7.1	4 31.4	12 58.6	+ 3 53.4	−0.8753	0.5819	0.1866	−16	−90
66	Virginis	5.7	1.92	7.1	4 45.8	13 29.7	+ 4 23.4	−0.7336	0.5821	0.1863	− 7	−90
72	Virginis	6.1	+1.96	− 7.1	− 6 4.5	15 58.7	+ 6 47.0	+0.1056	0.5830	−0.1850	+40	−29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'		N.	S.
			s	″	° ′	d h m	h m					°	°
l	Virginis	4.8	+1.96	− 7.0	− 5 51.6	26 16 38.0	+ 7 24.9	−0.2282	0.5833	−0.1847		+21	−48
88	Virginis	6.5	2.03	6.2	6 27.3	23 29.6	− 9 58.7	−0.8901	0.5860	0.1802		−18	−90
598 B.	Virginis	6.1	2.07	6.1	7 40.9	27 2 16.6	− 7 17.9	−0.1749	0.5871	0.1781		+23	−45
623 B.	Virginis	6 5	2.13	5.8	8 53.4	6 10.1	− 3 33.1	+0.3321	0.5887	0.1749		+52	−16
95	Virginis	5.4	2.13	5.6	8 56.9	7 8.8	− 2 36.6	+0.2190	0.5891	0.1740		+45	−23
96	Virginis	6.5	+2.16	− 5.7	− 9 58.3	8 5.1	− 1 42.4	+1.0677	0.5895	−0.1731		+81	+29
κ	Virginis	4.3	2.17	5.4	9 55.0	9 41.4	− 0 9.7	+0.7369	0.5901	0.1716		+81	+ 6
4 G.	Libræ	6.5	2.24	5.0	11 19.3	14 31.9	+ 4 29.8	+1.3041	0.5921	0.1668		+78	+60
6 B.	Libræ	6.2	2.26	4.2	11 58.8	19 35.3	+ 9 21.7	+1.1233	0.5941	0.1611		+79	+34
22 B.	Libræ	6.4	2.33	3.7	12 31.0	23 59.2	−10 24.5	+0.9569	0.5959	0.1558		+78	+21
13	Libræ	5.7	+2.33	− 3.1	−11 35.2	28 2 36.8	− 7 53.0	−0.3669	0.5968	−0.1524		+10	−58
ξ^2	Libræ	5.6	2.33	2.9	11 6.0	3 34.7	− 6 57.3	−0.9922	0.5972	0.1511		−28	−90
γ	Libræ	4.0	2.47	0.7	14 32.0	19 2.6	+ 7 54.4	+0.2315	0.6023	0.1280		+41	−22
190 B.	Libræ	6.5	2.48	0.2	14 47.8	22 10.1	+10 54.6	+0.1001	0.6032	0.1228		+32	−29
η	Libræ	5.5	2.49	− 0.2	15 25.7	22 25.4	+11 9.3	+0.6924	0.6033	0.1224		+74	+ 4
195 B.	Libræ	6.2	+2.48	+ 0.4	−13 54.1	29 1 25.7	− 9 57.5	−1.1762	0.6040	−0.1172		−48	−90
202 B.	Libræ	6.4	2.48	0.7	14 10.4	3 14.2	− 8 13.3	−1.1168	0.6045	0.1140		43	−90
203 B.	Libræ	6.2	2.49	0.7	14 36.3	3 21.3	− 8 6.5	−0.7046	0.6045	0.1138		−13	−90
49	Libræ	5.4	2.51	0.7	16 18.4	4 50.8	− 6 40.4	+0.8115	0.6048	0.1111		+74	+12
φ	Ophiuchi	4.4	2.54	3.0	16 26.7	16 54.5	+ 4 54.5	−0.2563	0.6068	0.0884		+ 9	−51
24	Scorpii	5.0	+2.56	+ 3.7	−17 35.6	20 58.4	+ 8 48.6	+0.5409	0.6071	−0.0803		+57	− 4
78 B.	Ophiuchi	6.5	2.54	4.6	16 41.0	30 2 37.6	− 9 45.7	−0.7854	0.6073	0.0688		−23	−90
90 B.	Ophiuchi	6.5	2.56	4.8	18 7.7	4 3.6	− 8 23.1	+0.5564	0.6073	0.0658		+58	− 3
29	Ophiuchi	6.4	2.57	5.0	18 46.3	4 52.8	− 7 35.9	+1.1442	0.6072	0.0641		+72	+40
125 B.	Ophiuchi	6.2	2.54	5.4	17 30.4	7 23.4	− 5 11.3	−0.2707	0.6071	0.0589		+ 6	−52
164 B.	Ophiuchi	6.0	+2.53	+ 6.1	−17 40.5	11 56.4	− 0 49.1	−0.3498	0.6068	−0.0494		+ 1	−57
192 B.	Ophiuchi	6.3	2.53	6.5	18 22.4	13 46.8	+ 0 56.8	+0.2606	0.6066	0.0455		+35	−20
305 B.	Ophiuchi	6.3	2.48	8.4	18 47.2	31 2 4.1	−11 15.2	+0.2782	0.6041	0.0194		+33	−19
64 B.	Sagittarii	6.1	2.42	9.4	18 41.0	9 49.8	− 3 47.8	+0.0879	0.6018	0.0030		+21	−29
6 B.	Scuti	5.9	2.40	9.3	17 23.9	10 31.0	− 3 8.3	−1.2115	0.6015	0.0015		−63	−90
52 G.	Sagittarii	6.4	+2.42	+ 9.5	−18 29.4	10 36.8	− 3 2.6	−0.1096	0.6015	−0.0013		+ 9	−41
17 H¹.	Sagittarii	6.4	2.41	9.6	18 38.9	11 6.4	− 2 34.2	+0.0495	0.6013	−0.0003		+18	−32
Y	Sagittarii (*var.*)	5.4	2.41	9.8	18 53.6	12 9.9	− 1 33.2	+0.2981	0.6009	+0.0019		+33	−18
85 B.	Sagittarii	6.0	2.37	9.9	17 50.7	14 47.8	+ 0 58.5	−0.7495	0.5999	0.0074		−26	−90
95 B.	Sagittarii	5.7	2.38	10.2	18 46.5	15 41.3	+ 1 50.0	+0.2000	0.5995	0.0093		+28	−23
100 B.	Sagittarii	5 0	+2.37	+10.2	−18 27.2	16 11.4	+ 2 18.9	−0.1212	0.5993	+0.0103		+10	−42

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171 B.	Sagittarii	6.1	+2.26	+11.8	−19 21.3	1 4 58.3	− 9 23.7	+1.0968	0.5933	+0.0361		+71	+35
173 B.	Sagittarii	6.4	+2.26	+11.8	−19 12.7	4 59.8	− 9 22.2	+0.9514	0.5933	+0.0361		+71	+23
187 B.	Sagittarii	6.4	2.24	11.8	18 51.3	6 38.9	− 7 46.9	+0.6498	0.5924	0.0393		+64	+ 2
190 B.	Sagittarii	5.4	2.24	12.0	19 24.5	7 6.4	− 7 20.4	+1.2345	0.5921	0.0402		+71	+53
d	Sagittarii	5.0	2.20	12.3	19 5.3	10 57.9	− 3 37.7	+1.0781	0.5900	0.0476		+71	+33
ρ	Sagittarii	4.0	2.17	12.2	17 59.4	12 39.1	− 2 0.2	+0.0360	0.5890	0.0508		+22	−33
45	Sagittarii	6.0	+2.17	+12.3	−18 26.9	12 42.8	− 1 56.7	+0.5097	0.5890	+0.0509		+52	− 6
267 B.	Sagittarii	5.8	2.10	12.8	18 24.0	19 3.7	+ 4 10.0	+0.8221	0.5852	0.0625		+72	+13
54	Sagittarii	5.4	2.07	12.5	16 28.1	20 37.6	+ 5 40.5	−1.0695	0.5842	0.0653		−43	−90
e	Sagittarii	5.2	2.06	12.5	16 18.1	21 23.1	+ 6 24.2	−1.1906	0.5837	0.0666		−55	−90
16 B.	Capricorni	6.2	1.86	13.1	15 1.5	2 13 50.0	− 1 44.5	−1.2056	0.5729	0.0936		−54	−90
β	Capricorni	3.2	+1.86	+13.1	−15 1.3	13 56.2	− 1 38.5	−1.1992	0.5729	+0.0938		−53	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ′	d h m	h m				°	°
31 B. Capricorni	6.4	+1.83	+13.5	−15 59.6	2 17 19.0	+ 1 37.1	+0.1396	0.5705	+0.0988	+33	−27
27 G. Capricorni	6.2	1.81	13.3	15 18.7	18 21.6	+ 2 37.5	−0.4697	0.5699	0.1004	0	−66
47 B. Capricorni	6.2	1.79	13.8	16 47.3	20 19.1	+ 4 30.9	+1.2753	0.5685	0.1032	+74	+59
τ Capricorni	5.2	1.77	13.4	15 13.3	22 0.1	+ 6 8.4	−0.1891	0.5674	0.1055	+15	−46
61 B. Capricorni	5.9	1.76	13.8	16 23.7	22 33.6	+ 6 40.8	+1.1003	0.5670	0.1063	+74	+34
95 B. Capricorni	5.9	+1.66	+13.4	−14 46.6	3 6 45.7	− 9 24.0	+0.3202	0.5614	+0.1172	+46	−17
53 B. Aquarii	6.5	1.56	13.0	13 31.1	14 43.1	− 1 42.6	−0.0391	0.5561	0.1267	+26	−37
18 Aquarii	5.5	1.52	12.9	13 12.4	18 32.2	+ 1 58.9	+0.1212	0.5536	0.1310	+36	−28
72 B. Aquarii	6 5	1.49	12.5	11 53.9	20 26.6	+ 3 49.6	−1.0167	0.5524	0.1330	−31	−90
λ Capricorni	5.5	1.39	12.3	11 43.1	4 5 7.8	−11 46.2	−0.0190	0.5470	0.1415	+29	−36
96 B. Aquarii	6.5	+1.35	+11.9	−10 40.3	8 32.1	− 8 28.4	−0.6524	0.5449	+0.1446	− 6	−83
150 B. Aquarii	6.0	1.22	11.2	9 25.3	19 54.5	+ 2 32.6	−0.3011	0.5385	0.1537	+15	−53
167 G. Aquarii	6.3	1.11	10.3	8 17.7	5 6 37.4	−11 4.2	+0.1662	0.5332	0.1605	+42	−26
213 B. Aquarii	6.5	1.08	10.4	8 42.7	8 59.4	− 8 46.5	+1.0002	0.5321	0.1619	+82	+24
67 Aquarii	6.4	1.09	9.9	7 21.8	9 5.3	− 8 40.8	0.4463	0.5321	0.1619	+ 8	−63
λ Aquarii	3.8	+1.03	+ 9.9	− 7 59.2	13 50.6	− 4 4.1	+1.0071	0.5300	+0.1644	+83	+24
78 Aquarii	6.3	1.02	9.7	7 36.7	14 50.5	− 3 6.1	+0.7636	0.5296	0.1648	+83	+ 8
81 Aquarii	6 4	0.98	9.4	7 28.3	18 20.0	+ 0 17.2	+1.1919	0.5283	0.1664	+83	+41
82 Aquarii	6.4	0.98	9.2	6 59.1	18 55.5	+ 0 51.6	+0.7599	0.5280	0.1666	+84	+ 8
ϕ Aquarii	4.4	0.92	8.6	6 27.7	6 0 59.7	+ 6 45.0	+1.2104	0.5258	0.1690	+84	+42
Uranus	6.2	. . .	. . .	− 5 40.3	3 24.7	+ 9 5.8	+0.7578	0.5245	+0.1696	+85	+ 8
96 Aquarii	5.7	+0.91	+ 8.2	5 32.6	3 37.3	+ 9 18.0	+0.6520	0.5250	0.1699	+80	+ 1
316 B. Aquarii	6.5	0.92	7.7	4 20.2	4 4.3	+ 9 44.2	−0.5908	0.5248	0.1700	+ 2	−76
337 B. Aquarii	6.4	0.86	7.6	4 57.0	8 54.1	− 9 34.5	+0.9056	0.5234	0.1714	+86	+17
342 B. Aquarii	6.5	0.85	7.4	4 30.4	9 56.6	− 8 33.9	+0.5981	0.5231	0.1716	+75	− 2
20 Piscium	5.6	+0.78	+ 6.4	− 3 11.3	18 34.0	− 0 11.5	+0.6114	0.5211	+0.1734	+80	+ 1
80 B. Piscium	6.3	0.71	5.0	− 0 55.7	7 3 37.3	+ 8 36.2	−0.2695	0.5195	0.1743	+20	−51
44 Piscium	6.0	0.63	3.4	+ 1 30.9	14 26.0	− 4 53.7	−1.0820	0.5183	0.1742	−30	−89
10 Ceti	6.4	0.61	4.0	− 0 28.5	15 5.0	− 4 15.8	+1.2280	0.5183	0.1742	+90	+44
155 B. Piscium	6.5	0.53	1.8	+ 2 58.1	8 4 14.2	+ 8 31.0	−0.2969	0.5181	0.1723	+18	−52
77 Piscium	6.4	+0.48	+ 0.7	+ 4 29.9	11 58.1	− 7 58.3	−0.6680	0.5186	+0.1704	− 2	−82
e Piscium	5.6	0.47	+ 0.4	5 14.6	13 20.1	− 6 38.7	−1.2597	0.5187	0.1700	−48	−85
μ Piscium	5.0	0.39	− 0.6	5 44.9	9 0 53.7	+ 4 34.9	+0.1230	0.5202	0.1658	+42	−27
39 B. Arietis	6.5	0.26	2.4	7 22.0	19 8.3	− 1 42.1	+1.2722	0.5242	0.1563	+90	+53
64 Ceti	5.8	0.24	3.0	8 12.6	22 31.8	+ 1 35.5	+0.8638	0.5251	0.1541	+90	+17
ξ^1 Ceti	4.5	+0.24	− 3.1	+ 8 29.1	23 22.8	+ 2 25.0	+0.6887	0.5253	+0.1536	+88	+ 6
ξ Arietis	5.5	0.22	3.9	10 15.7	10 5 29.4	+ 8 20.9	−0.3537	0.5272	0.1493	+15	−53
25 Arietis	6.5	0.19	4.0	9 51.4	6 50.2	+ 9 39.3	+0.2954	0.5276	0.1483	+53	−15
389 B. Ceti	6.3	0.19	3.9	9 13.3	7 57.8	+10 44.9	+1.1648	0.5279	0.1474	+90	+41
85 Ceti	6.3	0.15	4.6	10 24.8	14 34.2	− 6 50.4	+0.8023	0.5302	0.1422	+90	+15
38 Arietis	5.2	+0.17	− 5.1	+12 7.3	15 48.8	− 5 38.1	−0.9114	0.5306	+0.1411	−18	−78
147 B. Arietis	5.8	0.10	6.0	12 53.4	11 2 40.5	+ 4 53.9	−0.2790	0.5346	0.1312	+19	−46
30 B. Tauri	6.4	+0.03	7.3	15 10.6	18 16.7	− 3 58.6	−0.8774	0.5408	+0.1147	−16	−75
				NEW	*MOON.*						
162 B. Geminorum	5.7	−0.09	− 9.6	+17 14.9	16 6 12.9	+ 4 21.4	+0.6049	0.5697	−0.0558	+80	+13
f Geminorum	5.3	0.08	9.4	17 50.9	9 37.1	+ 7 38.6	−0.2324	0.5697	0.0616	+22	−35
1 Cancri	6.0	0.03	9.5	15 59.7	17 25.8	− 8 49.0	+1.1994	0.5696	0.0748	+90	+55
2 B. Cancri	6.0	0.03	9.3	16 43.5	18 6.1	− 8 10.1	+0.3754	0.5695	0.0759	+59	− 2
3 Cancri	5.7	0.03	9.1	17 31.1	19 5.9	− 7 12.5	−0.5407	0.5695	0.0775	+ 4	−58
5 Cancri	5.9	−0.02	− 9.3	+16 40.0	19 25.6	− 6 53.4	+0.3351	0.5694	−0.0781	+56	− 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
Name.		Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$									
			s	″	° ′	d	h m	h m				°	°
d^2	Cancri	6.2	+0.03	−8.8	+17 17.9	17	6 15.4	+ 3 33.8	−1.2716	0.5687	−0.0955	−59	−73
90 B.	Cancri	6.3	0.08	9.0	15 34.7		10 51.6	+ 8 0.5	+0.0843	0.5683	0.1026	+40	−21
54	Cancri	6.3	0.12	8.6	15 38.1		17 31.1	− 9 33.8	−0.6911	0.5675	0.1126	− 4	−73
o^1	Cancri	5.1	0.15	8.5	15 37.0		20 17.7	− 6 53.1	−0.9895	0.5672	0.1166	−24	−75
o^2	Cancri	5.7	0.15	8.4	15 52.5		20 26.6	− 6 44.4	−1.2782	0.5672	0.1168	−58	−75
ξ	Leonis	5.1	+0.30	−8.8	+11 38.3	18	11 54.6	+ 8 11.6	+1.1779	0.5653	−0.1376	+90	+45
18	Leonis	5.8	0.36	8.3	12 9.8		18 24.7	− 9 31.7	−0.2888	0.5645	0.1455	+19	−47
19	Leonis	6.4	0.36	8.3	11 55.4		18 53.1	− 9 4.3	−0.1080	0.5645	0.1460	+29	−36
R	Leonis (*var.*)	4.6	0.37	8.4	11 47.1		18 56.5	− 9 1.0	+0.0275	0.5644	0.1461	+36	−28
A	Leonis	4.6	0.47	8.3	10 22.4	19	4 8.9	− 0 7.4	+0.0991	0.5634	0.1562	+41	−26
44	Leonis	5.9	+0.56	−8.1	+ 9 10.5		12 0.6	+ 7 28.2	+0.0798	0.5628	−0.1639	+39	−28
45	Leonis	5.8	0.57	7.7	10 9.2		13 5.5	+ 8 30.8	−1.1083	0.5627	0.1648	−33	−80
ρ	Leonis	3.8	0.59	7.7	9 42.1		15 26.2	+10 46.7	−1.0297	0.5625	0.1669	−26	−81
48	Leonis	5.2	0.62	8.4	7 20.9		16 21.3	+11 40.0	+1.2433	0.5625	0.1677	+90	+49
49	Leonis	5.7	0.61	7.8	9 2.8		16 27.1	+11 45.6	−0.5241	0.5624	0.1678	+ 6	−66
37	Sextantis	6.3	+0.69	−8.2	+ 6 46.6		21 28.8	− 7 23.0	+0.9591	0.5621	−0.1719	+90	+22
56	Leonis	6.1	0.74	8.0	6 35.7	20	1 59.4	− 3 1.6	+0.3628	0.5620	0.1753	+57	−13
c	Leonis	5.1	0.76	7.9	6 30.8		4 8.1	− 0 57.3	+0.0683	0.5620	0.1767	+39	−30
80	Leonis	6.4	0.92	7.7	4 16.9		15 32.0	+10 3.4	+0.2998	0.5621	0.1834	+53	−18
83	Leonis	6.3	0.92	7.9	3 25.9		15 58.6	+10 29.0	+1.0886	0.5621	0.1836	+90	+31
τ	Leonis	5.2	+0.95	−8.0	+ 3 16.7		16 29.1	+10 58.5	+1.1511	0.5622	−0.1838	+90	+37
89	Leonis	5.7	0.97	7.7	3 29.2		19 24.5	−10 12.0	+0.3991	0.5623	0.1851	+60	−12
β	Virginis	3.8	1.10	7.6	2 11.8	21	2 46.0	− 3 5.6	+0.3404	0.5629	0.1878	+56	−16
27 B.	Virginis	6.5	1.14	7.5	+ 0 57.4		6 34.6	+ 0 35.2	+0.8844	0.5633	0.1888	+90	+16
13	Virginis	5.9	1.27	7.2	− 0 21.7		15 24.4	+ 9 6.8	+0.5472	0.5646	0.1902	+71	− 5
η	Virginis	4.0	+1.27	−7.1	− 0 14.5		15 57.9	+ 9 39.1	+0.3188	0.5647	−0.1903	+54	−17
γ	Virginis (*mean*)	2 9	1.39	6.3	1 1.7	22	1 43.2	− 4 55.7	−0.7386	0.5667	0.1901	− 6	−90
38	Virginis	6.1	1.50	6.5	3 8.2		6 49.9	+ 0 0.3	+0.4224	0.5680	0.1892	+61	−12
91 G.	Virginis	6.5	1.52	6.7	3 48.4		7 1.1	+ 0 11.2	+1.0645	0.5680	0.1892	+87	+28
	Saturn	1.0	. . .	. . .	2 55.7		8 35.8	+ 1 42.6	−0.1215	0.5683	0.1886	+28	−42
k	Virginis	5.7	+1.54	−6.3	− 3 23.9		9 41.5	+ 2 46.0	+0.1464	0.5688	−0.1886	+43	−27
46	Virginis	6.1	1.54	6.1	2 57.4		10 6.5	+ 3 10.1	−0.3786	0.5689	0.1885	+14	−58
48	Virginis	6.5	1.56	6.0	3 15.0		11 34.3	+ 4 34.8	−0.3569	0.5693	0.1881	+15	−57
θ	Virginis	4.4	1.62	6.4	5 7.8		14 13.9	+ 7 8.8	+1.0389	0.5701	0.1872	+85	+26
65	Virginis	6.0	1.69	5.5	4 31.4		20 6.4	−11 11.1	−0.6655	0.5719	0.1848	− ?	−84
66	Virginis	5.7	+1.71	−5.5	− 4 45.8		20 38.5	−10 40.1	−0.5226	0.5721	−0.1846	+ 5	−69
72	Virginis	6.1	1.75	5.6	6 4.5		23 12.4	− 8 11.6	+0.3249	0.5730	0.1833	+53	−17
l	Virginis	4.8	1.76	5.4	5 51.6		23 53.0	− 7 32.5	−0.0149	0.5732	0.1829	+33	−36
80	Virginis	5.6	1.76	4.9	5 0.3	23	1 26.0	− 6 2.8	−1.1568	0.5737	0.1821	−38	−90
88	Virginis	6.5	1.85	4.7	6 27.3		6 58.3	− 0 42.4	−0.6987	0.5757	0.1787	− 6	−89
598 B.	Virginis	6.1	+1.91	−4.7	− 7 40.9		9 50.9	+ 2 4.0	+0.0220	0.5768	−0.1766	+34	−34
623 B.	Virginis	6.5	1.98	4.5	8 53.4		13 52.2	+ 5 56.7	+0.5290	0.5783	0.1736	+67	− 6
95	Virginis	5.4	1.99	4.4	8 56.9		14 52.9	+ 6 55.1	+0.4123	0.5788	0.1727	+58	−12
96	Virginis	6.5	2.02	4.6	9 58.3		15 51.1	+ 7 51.3	+1.2716	0.5791	0.1719	+81	+52
κ	Virginis	4.3	2.04	4.2	9 55.0		17 30.6	+ 9 27.2	+0.9327	0.5797	0.1705	+81	+19
6 B.	Libræ	6.2	+2.17	−3.2	−11 58.8	24	3 44.1	− 4 41.7	+1.3036	0.5839	−0.1604	+77	+60
22 B.	Libræ	6.4	2.26	2.8	12 31.0		8 16.6	− 0 19.2	+1.1247	0.5858	0.1552	+78	+35
13	Libræ	5.7	2.27	2.1	11 35.1		10 59.2	+ 2 17.3	−0.2238	0.5869	0.1520	+18	−48
ξ^2	Libræ	5.6	2.27	1.8	11 6.0		11 58.9	+ 3 14.8	−0.8599	0.5873	0.1507	−19	−90
17	Libræ	6.4	2.27	1.7	10 50.8		12 35.4	+ 3 49.9	−1.2048	0.5876	0.1500	−48	−90
18	Libræ	5.9	+2.27	−1.7	−10 50.2		12 52.4	+ 4 6.2	−1.2579	0.5877	−0.1496	−55	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S						AT CONJUNCTION IN R. A.							
Name.		Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels.	
			$\Delta\alpha$	$\Delta\delta$							N.	S.
			s	"	° ′	d h m	h m				°	°
γ	Libræ	4.0	+2.50	0.0	−14 32.0	25 3 54.5	5 25.8	+0.3437	0.5936	−0.1284	+48	−16
190 B.	Libræ	6.5	2.53	+ 0.4	14 47.8	7 7.1	2 20.4	+0.2029	0.5947	0.1234	+39	−23
η	Libræ	5.5	2.54	0.3	15 25.7	7 22.9	− 2 5.3	+0.8018	0.5948	0.1230	+75	+11
195 B.	Libræ	6.2	2.54	1.2	13 54.1	10 27.9	+ 0 52.6	−1.0966	0.5959	0.1180	−40	−90
202 B.	Libræ	6.4	2.56	1.4	14 10.4	12 19.2	+ 2 39.6	−1.0406	0.5965	0.1149	−36	−90
203 B.	Libræ	6.2	+2.57	+ 1.4	−14 36.3	12 26.6	+ 2 46.7	−0.6240	0.5965	−0.1147	− 8	−81
48	Libræ	4.6	2.56	1.6	14 3.5	13 6.7	+ 3 25.4	−1.2469	0.5967	0.1135	−58	−90
49	Libræ	5.4	2.59	1.2	16 18.4	13 58.3	+ 4 15.0	+0.9056	0.5970	0.1121	+74	+18
ϕ	Ophiuchi	4.4	2.70	3.5	16 26.7	26 2 18.5	− 7 53.6	−0.2044	0.6004	0.0899	+12	−47
24	Scorpii	5.0	2.74	4.1	17 35.6	6 27.2	− 3 54.6	+0.5898	0.6013	0.0820	+62	− 1
78 B.	Ophiuchi	6.5	+2.76	+ 5.2	−16 41.0	12 12.6	+ 1 37.3	−0.7622	0.6022	−0.0707	−21	−90
90 B.	Ophiuchi	6.5	2.79	5.2	18 7.7	13 39.9	+ 3 1.1	+0.5867	0.6024	0.0678	+60	− 2
29	Ophiuchi	6.4	2.81	5.4	18 46.3	14 29.9	+ 3 49.2	+1.1768	0.6025	0.0662	+72	+44
125 B.	Ophiuchi	6.2	2.79	6.0	17 30.4	17 2.9	+ 6 16.2	−0.2553	0.6028	0.0610	+ 7	−51
164 B.	Ophiuchi	6.0	2.81	6.8	17 40.5	21 39.6	+10 42.0	−0.3462	0.6031	0.0516	+ 1	−57
192 B.	Ophiuchi	6.3	+2.83	+ 7.0	−18 22.4	23 31.4	−11 30.6	+0.2634	0.6031	−0.0477	+35	−20
305 B.	Ophiuchi	6.3	2.85	9.1	18 47.2	27 11 55.6	+ 0 24.5	+0.2495	0.6025	0.0218	+32	−21
39 G.	Sagittarii	6.3	2.86	10.0	19 51.3	18 0.5	+ 6 15.1	+1.2373	0.6016	0.0090	+71	+54
64 B.	Sagittarii	6.1	2.84	10.4	18 41.0	19 43.5	+ 7 54.0	+0.0392	0.6013	0.0054	+18	−33
6 B.	Scuti	5.9	2.82	10.5	17 23.9	20 24.8	+ 8 33.7	−1.2654	0.6012	0.0039	−71	−80
52 G.	Sagittarii	6.4	+2.84	+10.5	−18 29.4	20 30.8	+ 8 39.5	−0.1608	0.6011	−0.0037	+ 7	−45
17 H¹.	Sagittarii	6.4	2.84	10.6	18 38.8	21 0.4	+ 9 7.9	−0.0024	0.6010	0.0027	+16	−35
Y	Sagittarii (*var.*)	5.4	2.84	10.7	18 53.5	22 4.0	+10 9.0	+0.2441	0.6008	0.0005	+30	−21
85 B.	Sagittarii	6.0	2.82	11.1	17 50.7	28 0 42.3	−11 18.9	−0.8120	0.6001	+0.0050	−30	−90
95 B.	Sagittarii	5.7	2.83	11.2	18 46.5	1 35.7	−10 27.5	+0.1370	0.5999	0.0069	+24	−27
100 B.	Sagittarii	5.0	+2.82	+11.3	−18 27.2	2 5.9	− 9 58.6	−0.1860	0.5998	+0.0079	+ 6	−46
171 B.	Sagittarii	6.1	2.80	13.1	19 21.3	14 51.3	+ 2 17.3	+1.0015	0.5954	0.0339	+71	+27
173 B.	Sagittarii	6.4	2.80	13.1	19 12.7	14 52.7	+ 2 18.7	+0.8561	0.5954	0.0340	+71	+16
187 B.	Sagittarii	6.4	2.78	13.3	18 51.3	16 31.4	+ 3 53.6	+0.5505	0.5947	0.0372	+55	− 4
190 B.	Sagittarii	5.4	2.79	13.4	19 24.5	16 58.8	+ 4 20.0	+1.1338	0.5946	0.0381	+71	+39
d	Sagittarii	5.0	+2.76	+13.8	−19 5.2	20 48.8	+ 8 1.2	+0.9680	0.5929	+0.0456	+71	+24
ρ	Sagittarii	4.0	2.74	14.0	17 59.4	22 29.3	+ 9 37.9	−0.0767	0.5921	0.0488	+16	−39
45	Sagittarii	6.0	2.75	14.0	18 26.9	22 33.0	+ 9 41.5	+0.3962	0.5921	0.0490	+44	−12
267 B.	Sagittarii	5.8	2.70	14.7	18 23.9	29 4 50.7	− 8 14.9	+0.6932	0.5890	0.0608	+70	+ 5
54	Sagittarii	5.4	2.67	14.7	16 28.0	6 23.6	− 6 45.6	−1.1971	0.5882	0.0636	−56	−90
31 B.	Capricorni	6.4	+2.52	+16.3	−15 59.6	30 2 48.8	−11 5.0	−0.0346	0.5762	+0.0980	+23	−37
27 G.	Capricorni	6.2	2.50	16.2	15 18.6	3 50.4	−10 5.7	−0.6428	0.5756	0.0996	− 11	−84
47 B.	Capricorni	6.2	2.50	16.6	16 47.2	5 46.1	− 8 14.1	+1.0891	0.5744	0.1025	+74	+33
τ	Capricorni	5.2	2.47	16.4	15 13.3	7 25.4	− 6 38.3	−0.3705	0.5733	0.1049	+ 5	−58
61 B.	Capricorni	5.9	2.47	16.7	16 23.7	7 58.2	− 6 6.7	+0.9106	0.5730	0.1057	+74	+19
95 B.	Capricorni	5.9	+2.39	+16.7	−14 46.6	16 1.8	+ 1 40.0	+0.1195	0.5677	+0.1169	+34	−28
53 B.	Aquarii	6.5	+2.31	+16.7	−13 31.1	23 50.2	+ 9 12.4	−0.2512	0.5626	+0.1267	+14	−50

JULY.

18	Aquarii	5.5	+2.28	+16.7	−13 12.3	1 3 34.8	−11 10.5	−0.0984	0.5602	+0.1311	+23	−41
72 B.	Aquarii	6.5	2.25	16.5	11 53.9	5 27.0	− 9 22.1	−1.2311	0.5590	0.1332	−52	−90
λ	Capricorni	5.5	2.17	16.5	11 43.0	13 57.8	− 1 8.2	−0.2536	0.5536	0.1421	+16	−50
86 B.	Aquarii	6.5	2.14	16.2	10 40.2	17 18.0	+ 2 5.3	−0.8870	0.5515	0.1452	−20	−90
150 B.	Aquarii	6.0	2.03	15.8	9 25.2	2 4 26.6	−11 7.5	−0.5527	0.5449	0.1545	+ 1	−72
167 G.	Aquarii	6.3	+1.93	+15.2	− 8 17.6	14 56.9	− 0 57.1	−0.1003	0.5392	+0.1616	+27	−41

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ′	d h m	h m				°	°
213 B. Aquarii	6.5	+1.90	+15.3	− 8 42.6	2 17 16.2	+ 1 17.9	+0.7251	0.5380	+0.1629	+82	+ 6
67 Aquarii	6.4	1.91	14.8	7 21.7	17 22.0	+ 1 23.6	−0.7104	0.5379	0.1630	− 7	−90
λ Aquarii	3.8	1.86	14.9	7 59.1	22 1.9	+ 5 54.9	+0.7279	0.5356	0.1655	+83	+ 6
78 Aquarii	6.3	1.85	14.7	7 36.6	23 0.8	+ 6 52.0	+0.4855	0.5351	0.1660	+64	− 8
81 Aquarii	6.4	1.81	14.5	7 28.3	3 2 26.5	+10 11.4	+0.9080	0.5336	0.1676	+83	+17
82 Aquarii	6.4	+1.81	+14.3	− 6 59.0	3 1.4	+10 45.2	+0.4790	0.5333	+0.1678	+64	− 9
ϕ Aquarii	4.4	1.76	13.8	6 27.6	8 59.3	− 7 27.7	+0.9224	0.5307	0.1702	+84	+18
URANUS	6.1	. . .	. . .	5 39.8	11 29.5	− 5 2.0	+0.4857	0.5302	0.1712	+65	− 8
96 Aquarii	5.7	1.74	13.5	5 32.5	11 34.3	− 4 57.3	+0.3666	0.5297	0.1710	+56	−15
316 B. Aquarii	6.5	1.75	13.0	4 20.1	12 0.8	− 4 31.6	−0.8677	0.5295	0.1712	−15	−90
317 B. Aquarii	6.3	+1.72	+13.7	− 6 19.5	12 14.2	− 4 18.6	+1.3316	0.5295	+0.1713	+77	+65
337 B. Aquarii	6.4	1.69	12.9	4 56.9	16 46.0	+ 0 5.2	+0.6162	0.5278	0.1726	+77	− 1
342 B. Aquarii	6.5	1.68	12.7	4 30.3	17 47.6	+ 1 4.8	+0.3104	0.5274	0 1729	+53	−18
20 Piscium	5.6	1.61	11.8	3 11.2	4 2 17.6	+ 9 19.9	+0.3512	0.5247	0.1745	+56	−16
24 Piscium	6.1	1.58	11.8	3 34.8	4 53.3	+11 51.0	+1.2350	0.5240	0.1749	+87	+45
80 B. Piscium	6.3	+1.54	+10.4	− 0 55.7	11 14.2	− 5 59.3	−0.5551	0.5224	+0.1754	+ 4	−72
10 Ceti	6.4	1.43	9.4	− 0 28.4	22 34.8	+ 5 1.7	+0.9361	0.5204	0.1752	+90	+19
155 B. Piscium	6.5	1.35	7.1	+ 2 58.2	5 11 38.3	− 6 17.4	−0.5765	0.5192	0.1732	+ 3	−74
77 Piscium	6.4	1.29	5.9	4 30.0	19 19.8	+ 1 10.9	−0.9419	0.5190	0.1712	−19	−86
μ Piscium	5.0	1.20	4.4	5 44.9	6 8 13.2	−10 18.0	−0.1434	0.5198	0.1665	+27	−42
39 B. Arietis	6.5	+1.03	+ 2.2	+ 7 22.0	7 2 27.8	+ 7 25.2	+1.0236	0.5228	+0.1570	+90	+28
64 Ceti	5.8	1.01	1.6	8 12.6	5 51.7	+10 43.1	+0.6204	0.5236	0.1549	+79	+ 2
ξ^1 Ceti	4.5	1.01	1.5	8 29.2	6 42.8	+11 32.7	+0.4467	0.5237	0.1543	+63	− 8
ξ Arietis	5.5	0.97	0.3	10 15.8	12 50.2	− 6 30.7	−0.5857	0.5254	0.1501	+ 2	− 70
25 Arietis	6.5	0.95	0.2	9 51.4	14 11.2	− 5 12.1	+0.0644	0.5257	0.1490	+38	−28
389 B. Ceti	6.3	+0.94	+ 0.5	+ 9 13.4	15 19.0	− 4 6.3	+0.9342	0.5261	+0.1483	+90	+22
85 Ceti	6.3	0.89	− 0.5	10 24.9	21 56.7	+ 2 19.7	+0.5822	0.5281	0.1430	+75	+ 1
38 Arietis	5.2	0.91	1.2	12 7.3	23 11.5	+ 3 32.2	−1.1276	0.5285	0.1420	−35	−78
147 B. Arietis	5.8	0.81	2.4	12 53.4	8 10 5.6	− 9 53.2	−0.4785	0.5324	0.1322	+ 8	− 59
8 B. Tauri	6.2	0.72	3.0	12 21.4	19 1.4	− 1 13.7	+1.2503	0.5359	0.1233	+90	+56
30 B. Tauri	6.4	+0.70	− 4.3	+15 10.7	9 1 45.3	+ 5 17.7	−1.0485	0.5387	+0.1160	−29	−75
179 B. Tauri	5.9	0.58	5.3	14 57.4	16 21.8	− 4 33.2	+0.7630	0.5450	0.0983	+90	+17
48 Tauri	6.3	0.54	5.7	15 12.5	20 15.0	− 0 47.5	+0.8590	0.5468	0.0932	+90	+24
γ Tauri	3.9	0.53	5.9	15 26.5	22 10.5	+ 1 4.3	+0.7801	0.5477	0.0907	+90	+19
δ Tauri	3.9	0.54	6.4	17 21.7	23 39.1	+ 2 30.1	−1.1861	0.5483	0.0887	−44	−73
63 Tauri	5.7	+0.53	− 6.2	+16 35.8	23 53.6	+ 2 44.1	−0.3295	0.5484	+0.0883	+16	−44
64 Tauri	4.9	0.53	6.4	17 15.9	10 0 12.4	+ 3 2.3	−1.0315	0.5486	0.0879	−28	−73
70 Tauri	6.4	0.51	6.1	15 45.9	0 57.4	+ 3 45.9	+0.6731	0.5489	0.0869	+88	+13
71 Tauri	4.6	0.50	6.1	15 26.6	1 18.3	+ 4 6.0	+1.0543	0.5490	0.0864	+90	+39
75 Tauri	5.2	0.50	6.3	16 11.2	2 17.8	+ 5 3.7	+0.3269	0.5495	0.0857	+55	− 6
θ^1 Tauri	4.2	+0.50	− 6.2	+15 47.4	2 21.8	+ 5 7.4	+0.7649	0.5495	+0.0850	+90	+19
θ^2 Tauri	3.6	0.50	6.2	15 42.0	2 24.3	+ 5 9.9	+0.8681	0.5495	0.0849	+90	+26
80 Tauri	5.8	0.49	6.2	15 28.2	3 6.8	+ 5 51.0	+1.1789	0.5499	0.0839	+90	+51
264 B. Tauri	4.8	0.49	6.3	16 1.6	3 18.2	+ 6 2.0	+0.5874	0.5500	0.0836	+77	+ 9
81 Tauri	5.5	0.49	6.2	15 31.4	3 21.1	+ 6 5.0	+1.1395	0.5499	0.0836	+90	+47
85 Tauri	6.0	+0.48	− 6.3	+15 41.2	3 55.6	+ 6 38.2	+1.0102	0.5502	+0.0827	+90	+36
275 B. Tauri	6.5	0.48	6.4	16 9.7	4 45.9	+ 7 27.0	+0.5603	0.5506	0.0816	+75	+ 7
α Tauri (*Aldebar.*)	1.1	0.47	6.7	16 21.2	5 50.5	+ 8 29.5	+0.4370	0.5511	0.0800	+64	0
89 Tauri	5.8	0.46	6.5	15 52.7	6 54.4	+ 9 31.2	+1.0394	0.5516	0.0785	+90	+39
σ^2 Tauri	4.9	0.46	6.5	15 45.9	7 26.2	+10 2.0	+1.2045	0.5518	0.0778	+90	+55
318 B. Tauri	5.7	+0.40	− 7.3	17 1.9	15 54.8	− 5 46.0	+0.4293	0.5555	+0.0652	+63	+ 2

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S						AT CONJUNCTION IN R. A.						
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	Limiting Parallels. N.	S.
			s	″	° ′	d h m	h m				°	°
m	Tauri	5.0	+0.40	−7.8	+18 32.5	10 20 33 1	− 1 16.9	−0.9223	0.5575	+0.0581	−20	−72
111	Tauri	5.1	0.32	8.0	17 18.7	11 4 21.1	+ 6 18.4	+0.8168	0.5606	0.0455	+90	+26
115	Tauri	5.3	0.31	8.1	17 53.7	5 39.6	+ 7 31.3	+0.2410	0.5611	0.0435	+50	− 7
117	Tauri	6.0	0.30	8.1	17 10.4	6 3.7	+ 7 54.6	+1.0381	0.5613	0.0428	+90	+42
119	Tauri	4.9	0.30	8.3	18 32.2	7 57.3	+ 9 44.4	−0.3558	0.5620	0.0397	+15	−41
120	Tauri	5.6	+0.29	−8.4	+18 29.1	8 33.3	+10 19.2	−0.2765	0.5622	+0.0387	+19	−35
					NEW	*MOON.*						
18	Leonis	5.8	+0.23	−7.3	+12 9.8	16 0 16.9	− 1 52.1	−0.1249	0.5706	−0.1455	+28	37
19	Leonis	6.4	0.24	7.4	11 55.4	0 44.8	− 1 25.3	+0.0555	0.5705	0.1460	+38	−27
R	Leonis (*var.*)	4.6	+0.24	−7.4	+11 47.1	0 48.1	− 1 22.0	+0.1902	0.5705	−0.1461	+46	−19
A	Leonis	4.6	0.30	7.1	10 22.4	9 51.2	+ 7 22.2	+0.2751	0.5691	0.1563	+52	−16
44	Leonis	5.9	0.37	6.8	9 10.5	17 35.6	− 9 9.5	+0.2668	0.5679	0.1642	+51	−17
45	Leonis	5.8	0 37	6.5	10 9.2	18 39.5	− 8 7.8	−0.9140	0.5678	0.1651	−18	−80
ρ	Leonis	3.8	0.39	6.4	9 42.1	20 58.2	− 5 54.0	−0.8331	0.5675	0.1671	−12	−81
49	Leonis	5.7	+0.40	−6.5	+ 9 2.8	21 58.2	− 4 56.0	−0.3286	0.5673	−0.1681	+17	−52
37	Sextantis	6.3	0.47	6.8	6 46.6	17 2 56.0	− 0 8.5	+1.1542	0.5667	0.1722	+90	+39
56	Leonis	6.1	0.51	6.5	6 35.7	7 23.4	+ 4 9.7	+0.5655	0.5661	0.1755	+73	− 2
c	Leonis	5.1	0.53	6.3	6 30.8	9 30.7	+ 6 12.6	+0.2745	0.5659	0.1769	+51	−18
χ	Leonis	4.7	0.52	5.8	7 45.1	11 26.2	+ 8 4.1	−1.3334	0.5657	0.1782	−69	−73
σ	Leonis	4.1	+0.62	−5.6	+ 6 27.0	18 41.2	− 8 55.8	−1.3093	0.5651	−0.1825	−57	−83
80	Leonis	6.4	0.66	6.0	4 17.0	20 48.4	− 6 53.0	+0.5160	0.5649	0.1835	+69	− 6
83	Leonis	6.3	0.65	6.1	3 25.9	21 14.8	− 6 27.5	+1.3037	0.5649	0.1837	+87	+57
89	Leonis	5.7	0.70	6.0	3 29.2	18 0 39.3	− 3 9.9	+0.6182	0.5648	0.1852	+78	0
β	Virginis	3.8	0.83	5.8	2 11.8	7 58.9	+ 3 54.6	+0.5647	0.5645	0.1878	+73	− 4
27 B.	Virginis	6.5	+0.86	−5.7	+ 0 57.4	11 46.9	+ 7 34.8	+1.1109	0.5644	−0.1887	+90	+32
10	Virginis	6.2	0.90	4.9	+ 2 19.7	16 31.0	−11 47.9	−1.1897	0.5645	0.1895	−40	−88
13	Virginis	5.9	0.98	5.3	− 0 21.6	20 36.6	− 7 53.6	+0.7776	0.5646	0.1899	+90	+ 9
η	Virginis	4.0	0.98	5.2	0 14.4	21 10.1	− 7 21.3	+0.5492	0.5647	0.1900	+72	− 5
γ	Virginis (*mean*)	2.9	1.09	4.5	1 1.7	19 6 57.6	+ 2 5.9	0.5099	0.5655	0.1895	+ 7	−68
38	Virginis	6.1	+1.19	−4.7	− 3 8.2	12 6.3	+ 7 4.0	+0.6550	0.5661	−0.1887	+82	+ 1
91 G.	Virginis	6.5	1.20	4.9	3 48.4	12 17.6	+ 7 14.9	+1.2998	0.5661	0.1886	+86	+55
k	Virginis	5.7	1.24	4.4	3 23.9	14 59.3	+ 9 51.1	+0.3776	0.5664	0.1878	+58	−14
	SATURN	1.1	. . .	. . .	3 22.2	15 14.8	+10 6.0	+0.3004	0.5646	0.1868	+53	−18
46	Virginis	6.1	1.24	4.2	2 57.4	15 24.6	+10 15.4	−0.1497	0.5665	0.1878	+26	−44
48	Virginis	6.5	+1.26	−4.2	− 3 15.0	16 53.1	+11 40.9	−0.1282	0.5667	−0.1874	+27	−42
θ	Virginis	4.4	1.32	4.6	5 7.8	19 34.3	− 9 43.5	+1.2740	0.5673	0.1865	+85	+50
65	Virginis	6.0	1.38	3.6	4 31.4	20 1 30.9	− 3 59.3	−0.4417	0.5682	0.1840	+10	−63
66	Virginis	5.7	1.40	3.7	4 45.8	2 3.4	− 3 27.8	−0.2984	0.5683	0.1837	+18	−53
72	Virginis	6.1	1.45	3.8	6 4.5	4 39.5	− 0 57.1	+0.5533	0.5689	0.1824	+70	− 4
l	Virginis	4.8	+1.45	−3.7	− 5 51.6	5 20.6	− 0 17.5	+0.2110	0.5690	−0.1820	+46	−23
80	Virginis	5.6	1.46	3.1	5 0.3	6 55.0	+ 1 13.6	−0.9394	0.5694	0.1811	−20	−90
88	Virginis	6.5	1.56	3.0	6 27.3	12 32.5	+ 6 39.3	−0.4820	0.5707	0.1776	+ 7	− 66
598 B.	Virginis	6.1	1.61	3.1	7 40.9	15 28.1	+ 9 28.6	+0.2422	0.5715	0.1756	+47	−22
623 B.	Virginis	6.5	1.69	3.0	8 53.3	19 33.9	−10 34.2	+0.7504	0.5725	0.1725	+82	+ 7
95	Virginis	5.4	+1.70	−2.8	− 8 56.8	20 35.8	− 9 34.5	+0.6320	0.5728	−0.1717	+75	0
κ	Virginis	4.3	1.75	2.8	9 55.0	23 16.6	− 6 59.4	+1.1549	0.5736	0.1693	+81	+37
13	Libræ	5.7	2.02	0.9	11 35.1	21 17 9.0	+10 14.6	−0.0306	0.5791	0.1510	+28	−37
ξ^2	Libræ	5.6	2.02	0.5	11 6.0	18 10.3	+11 13.6	−0.6748	0.5795	0.1498	− 7	−86
17	Libræ	6.4	2.03	0.4	10 50.8	18 47.7	+11 49.6	−1.0243	0.5797	0.1490	−31	−90
18	Libræ	5.9	+2.03	−0.4	−10 50.1	19 5.1	−11 53.7	−1.0783	0.5798	−0.1487	−35	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
130 B. Libræ	5.9	+2.19	+ 0.8	−12 5.7	22 5 39.2	− 1 42.7	−1.3053	0.5832	−0.1349	−70	−75
γ Libræ	4.0	2.29	0.8	14 32.0	10 31.3	+ 2 58.6	+0.5204	0.5848	0.1279	+61	− 6
190 B. Libræ	6.5	2.34	1.2	14 47.8	13 49.3	+ 6 9.4	+0.3732	0.5859	0.1229	+50	−14
η Libræ	5.5	2.35	1.1	15 25.7	14 5.5	+ 6 24.9	+0.9788	0.5860	0.1226	+75	+23
195 B. Libræ	6.2	2.36	2.2	13 54.1	17 15.8	+ 9 28.1	−0.9472	0.5869	0.1177	−28	−90
202 B. Libræ	6.4	+2.39	+ 2.3	−14 10.4	19 10.2	+11 18.2	−0.8936	0.5875	−0.1147	−25	−90
203 B. Libræ	6.2	2.40	2.2	14 36.2	19 17.7	+11 25.5	−0.4721	0.5875	0.1144	0	−66
48 Libræ	4.6	2.40	2.5	14 3.5	19 59.0	−11 54.7	−1.1037	0.5878	0.1133	−41	−90
49 Libræ	5.4	2.43	1.8	16 18.4	20 52.1	−11 3.6	+1.0739	0.5881	0.1119	+74	+32
91 B. Scorpii	6.1	2.49	3.6	14 39.4	23 3 17.3	− 4 53.0	−1.2822	0.5898	0.1012	−67	−80
φ Ophiuchi	4.4	+2.59	+ 4.1	−16 26.7	9 33.4	+ 1 9.0	−0.0706	0.5914	−0.0902	+20	−39
24 Scorpii	5.0	2.65	4.5	17 35.6	13 49.1	+ 5 15.0	+0.7260	0.5923	0.0825	+73	+ 7
78 B. Ophiuchi	6.5	2.70	5.8	16 41.0	19 44.1	+10 56.5	−0.6528	0.5935	0.0714	−14	−85
90 B. Ophiuchi	6.5	2.73	5.6	18 7.7	21 13.9	−11 37.1	+0.7097	0.5937	0.0686	+71	+ 6
125 B. Ophiuchi	6.2	2.75	6.4	17 30.4	24 0 42.4	− 8 16.6	−0.1486	0.5943	0.0619	+13	−44
164 B. Ophiuchi	6.0	+2.80	+ 7.2	−17 40.5	5 26.4	− 3 43.5	−0.2492	0.5948	−0.0527	+ 7	−50
192 B. Ophiuchi	6.3	2.83	7.4	18 22.4	7 21.2	− 1 53.1	+0.3639	0.5949	0.0489	+42	−14
305 B. Ophiuchi	6.3	2.92	9.4	18 47.2	20 3.8	+10 20.4	+0.3258	0.5953	0.0235	+37	−16
64 B. Sagittarii	6.1	2.95	10.8	18 41.0	25 4 2.2	− 5 59.4	+0.0978	0.5948	0.0073	+22	−29
6 B. Scuti	5.9	2.93	11.1	17 23.9	4 44.3	− 5 19.0	−1.2210	0.5947	0.0058	−64	−90
52 G. Sagittarii	6.4	+2.95	+10.9	−18 29.4	4 50.4	− 5 13.1	−0.1057	0.5947	−0.0056	+10	−41
17 H¹. Sagittarii	6.4	2.96	11.0	18 38.8	5 20.6	− 4 44.0	+0.0533	0.5947	0.0046	+19	−32
Y Sagittarii (*var.*)	5.4	2.97	11.2	18 53.5	6 25.6	− 3 41.5	+0.3001	0.5945	−0.0025	+33	−18
85 B. Sagittarii	6.0	2.96	11.7	17 50.7	9 7.0	− 1 6.3	−0.7713	0.5941	+0.0030	−28	−90
95 B. Sagittarii	5.7	2.98	11.7	18 46.5	10 1.6	− 0 13.8	+0.1849	0.5940	0.0048	+27	−24
100 B. Sagittarii	5.0	+2.97	+11.8	−18 27.2	10 32.3	+ 0 15.7	−0.1420	0.5939	+0.0059	+ 8	−43
171 B. Sagittarii	6.1	3.02	13.6	19 21.3	23 31.1	−11 14.9	+1.0295	0.5911	0.0317	+71	+29
173 B. Sagittarii	6.4	3.02	13.7	19 12.7	23 32.6	−11 13.4	+0.8830	0.5911	0.0317	+71	+18
187 B. Sagittarii	6.4	3.02	13.9	18 51.3	26 1 12.7	− 9 37.2	+0.5716	0.5906	0.0350	+56	− 2
190 B. Sagittarii	5.4	3.02	13.9	19 24.5	1 40.5	− 9 10.4	+1.1583	0.5904	0.0359	+71	+42
d Sagittarii	5.0	+3.02	+14.5	−19 5.2	5 33.8	− 5 25.9	+0.9832	0.5892	+0.0434	+71	+25
ρ Sagittarii	4.0	3.00	14.8	17 59.4	7 15.6	− 3 47.9	−0.0722	0.5886	0.0466	+16	−39
45 Sagittarii	6.0	3.01	14.8	18 26.9	7 19.3	− 3 44.3	+0.4037	0.5886	0.0467	+44	−12
267 B. Sagittarii	5.8	3.01	15.6	18 23.9	13 41.5	+ 2 23.7	+0.6898	0.5862	0.0586	+69	+ 5
54 Sagittarii	5.4	2.98	15.9	16 28.0	15 15.4	+ 3 54.1	−1.2149	0.5856	0.0614	−59	−90
31 B. Capricorni	6.4	+2.94	+18.0	−15 59.5	27 11 48.8	− 0 17.1	−0.0854	0.5761	+0.0961	+20	−40
27 G. Capricorni	6.2	2.92	18.0	15 18.6	12 50.6	+ 0 42.6	−0.6974	0.5757	0.0977	−14	−90
47 B. Capricorni	6.2	2.94	18.2	16 47.2	14 46.6	+ 2 34.4	+1.0359	0.5745	0.1007	+74	+29
τ Capricorni	5.2	2.91	18.3	15 13.2	16 26.1	+ 4 10.4	−0.4309	0.5737	0.1031	+ 2	−63
61 B. Capricorni	5.9	2.92	18.4	16 23.6	16 59.0	+ 4 42.1	+0.8525	0.5733	0.1040	+74	+15
95 B. Capricorni	5.9	+2.87	+18.8	−14 46.6	28 1 2.7	−11 31.1	+0.0442	0.5689	+0.1153	+29	−32
53 B. Aquarii	6.5	2.83	19.2	13 31.0	8 50.2	− 3 59.6	−0.3411	0.5646	0.1255	+ 9	−56
18 Aquarii	5.5	2.81	19.3	13 12.2	12 34.1	− 0 23.3	−0.1946	0.5625	0.1300	+18	−46
λ Capricorni	5.5	2.74	19.5	11 43.0	22 53.7	+ 9 35.6	−0.3675	0.5566	0.1414	+10	−58
151 B. Capricorni	6.1	2.74	19.7	13 4.6	29 0 21.3	+11 0.3	+1.2833	0.5558	0.1428	+77	+56
96 B. Aquarii	6.5	+2.72	+19.4	−10 40.2	2 12.5	−11 12.1	−1.0056	0.5547	+0.1445	−29	−90
150 B. Aquarii	6.0	2.65	19.3	9 25.1	13 15.6	− 0 30.6	−0.6887	0.5487	0.1542	− 7	−88
167 G. Aquarii	6.3	2.58	19.0	8 17.6	23 39.6	+ 9 33.6	−0.2523	0.5433	0.1615	+19	−50
213 B. Aquarii	6.5	2.56	19.0	8 42.6	30 1 57.4	+11 47.0	+0.5678	0.5422	0.1630	+70	− 4
67 Aquarii	6.4	2.57	18.8	7 21.7	2 3.1	+11 52.5	−0.8641	0.5422	0.1630	−17	−90
λ Aquarii	3.8	+2.53	+18.8	− 7 59.1	6 40.0	− 7 39.1	+0.5641	0.5399	+0.1657	+70	− 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. Δα	Red'ns from 1923.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*		N.	S.
			s	″	° ′	d h m	h m					°	°
78	Aquarii	6.3	+2.53	+18.6	− 7 36.5	30 7 38.2	− 6 42.8	+0.3211	0.5395	+0.1662		+52	−17
81	Aquarii	6.4	2.50	18.5	7 28.2	11 1.5	− 3 25.7	+0.7380	0.5379	0.1678		+83	+ 6
82	Aquarii	6.4	2.50	18.4	6 59.0	11 36.0	− 2 52.3	+0.3095	0.5377	0.1681		+52	−18
ϕ	Aquarii	4.4	2.46	18.0	6 27.6	17 29.7	+ 2 50.6	+0.7445	0.5352	0.1706		+84	+ 7
	URANUS	6.1	. . .	. . .	5 52.5	19 1.8	+ 4 19.9	+0.3750	0.5358	0.1717		+57	−14
96	Aquarii	5.7	+2.45	+17.8	− 5 32.4	20 2.9	+ 5 19.2	+0.1877	0.5341	+0.1715		+45	−24
316 B.	Aquarii	6.5	2.46	17.4	4 20.0	20 29.1	+ 5 44.6	−1.0431	0.5339	0.1716		−28	−90
317 B.	Aquarii	6.3	2.43	17.9	6 19.4	20 42.4	+ 5 57.5	+1.1487	0.5338	0.1717		+84	+36
337 B.	Aquarii	6.4	2.41	17.3	4 56.8	31 1 11.0	+10 17.9	+0.4309	0.5321	0.1731		+61	−11
342 B.	Aquarii	6.5	2.41	17.2	4 30.2	2 11.8	+11 16.9	+0.1250	0.5318	0.1734		+41	−28
20	Piscium	5.6	+2.35	+16.5	− 3 11.1	10 35.9	− 4 34.1	+0.1576	0.5288	+0.1751		+44	−26
24	Piscium	6.1	2.33	16.4	3 34.7	13 9.8	− 2 4.7	+1.0362	0.5281	0.1755		+87	+26
80 B.	Piscium	6.3	+2.30	+15.3	− 0 55.6	19 26.4	+ 4 0.7	−0.7526	0.5263	+0.1760		− 7	−90

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10	Ceti	6.4	+2.21	+14.4	− 0 28.3	1 6 40.1	− 9 5.2	+0.7265	0.5237	+0.1758		+90	+ 6
155 B.	Piscium	6.5	2.14	12.2	+ 2 58.2	19 36.8	+ 3 28.9	−0.7873	0.5218	0.1738		− 9	−88
77	Piscium	6.4	2.10	11.0	4 30.1	2 3 15.1	+10 53.9	−1.1540	0.5212	0.1717		−36	−86
μ	Piscium	5.0	2.01	9.4	5 45.0	16 4.6	− 0 38.8	−0.3588	0.5211	0.1669		+15	−56
39 B.	Arietis	6.5	+1.86	+ 7.0	+ 7 22.1	3 10 17.2	− 6 57.7	+0.8102	0.5227	+0.1572		+90	+13
64	Ceti	5.8	1.83	6.3	8 12.7	13 41.0	− 3 39.9	+0.4084	0.5232	0.1550		+60	−10
ξ^1	Ceti	4.5	1.83	6.2	8 29.3	14 32.2	− 2 50.1	+0.2351	0.5234	0.1545		+49	−19
ξ	Arietis	5.5	1.80	4.9	10 15.8	20 40.2	+ 3 7.1	−0.7948	0.5246	0.1502		−10	−80
25	Arietis	6.5	1.77	4.8	9 51.5	22 1.3	+ 4 25.8	−0.1441	0.5248	0.1492		+27	−40
389 B.	Ceti	6.3	+1.76	+ 5.0	+ 9 13.4	23 9.3	+ 5 31.8	+0.7263	0.5251	+0.1483		+90	+ 9
85	Ceti	6.3	1.72	3.9	10 24.9	4 5 48.3	+11 59.0	+0.3780	0.5267	0.1431		+58	−10
μ	Ceti	4.4	1.71	4.0	9 47.5	7 3.8	−10 47.7	+1.2477	0.5270	0.1421		+90	+52
147 B.	Arietis	5.8	1.64	1.7	12 53.5	18 0.8	− 0 10.3	−0.6755	0.5302	0.1323		− 3	−75
8 B.	Tauri	6.2	1.53	0.9	12 21.5	5 2 59.9	+ 8 32.5	+1.0624	0.5332	0.1234		+90	+35
f	Tauri	4.3	+1.51	+ 0.5	+12 40.4	6 21.4	+11 47.9	+1.1215	0.5344	+0.1198		+90	+41
30 B.	Tauri	6.4	1.51	− 0.8	15 10.7	9 46.9	− 8 52.9	−1.2340	0.5357	0.1161		−49	−75
179 B.	Tauri	5.9	1.35	2.2	14 57.4	6 0 30.8	+ 5 23.5	+0.5948	0.5417	0.0986		+78	+ 7
48	Tauri	6.3	1.32	2.6	15 12.5	4 26.0	+ 9 11.3	+0.6951	0.5433	0.0936		+90	+14
γ	Tauri	3.9	1.30	2.9	15 26.5	6 22.6	+11 4.2	+0.6182	0.5441	0.0911		+80	+10
58	Tauri	5.4	+1.28	− 2.8	+14 54.7	6 46.6	+11 27.4	+1.2356	0.5443	+0.0905		+90	+58
63	Tauri	5.7	1.29	3.5	16 35.9	8 6.6	−11 15.1	−0.4914	0.5449	0.0888		+ 7	−55
64	Tauri	4.9	1.30	3.7	17 15.9	8 25.6	−10 56.7	−1.1944	0.5450	0.0883		−45	−73
70	Tauri	6.4	1.27	3.3	15 45.9	9 11.0	−10 12.7	+0.5141	0.5453	0.0873		+70	+ 4
71	Tauri	4.6	1.26	3.2	15 26.6	9 32.1	− 9 52.3	+0.8964	0.5455	0.0868		+90	+27
75	Tauri	5.2	+1.26	− 3.5	+16 11.3	10 32.1	− 8 54.3	+0.1688	0.5460	+0.0855		+45	−15
θ^1	Tauri	4.2	1.26	3.4	15 47.5	10 36.1	− 8 50.4	+0.6077	0.5460	0.0854		+79	+ 9
θ^2	Tauri	3.6	1.26	3.4	15 42.0	10 38.7	− 8 47.9	+0.7110	0.5460	0.0853		+90	+16
80	Tauri	5.8	1.24	3.4	15 28.2	11 21.5	− 8 6.4	+1.0232	0.5463	0.0844		+90	+37
264 B.	Tauri	4.8	1.25	3.6	16 1.6	11 33.1	− 7 55.2	+0.4309	0.5464	0.0841		+63	0
81	Tauri	5.5	+1.24	− 3.4	+15 31.5	11 36.0	− 7 52.4	+0.9840	0.5464	+0.0840		+90	+34
85	Tauri	6.0	1.24	3.5	15 41.2	12 10.8	− 7 18.7	+0.8550	0.5466	0.0832		+90	+25
275 B.	Tauri	6.5	1.23	3.7	16 9.7	13 1.5	− 6 29.6	+0.4054	0.5470	0.0821		+61	− 2
α	Tauri (*Aldebar.*)	1.1	1.23	4.0	16 21.3	14 6.8	− 5 26.4	+0.2831	0.5475	0.0806		+52	− 8
89	Tauri	5.8	1.21	3.9	15 52.7	15 11.2	− 4 24.1	+0.8879	0.5480	0.0791		+90	+28
σ^1	Tauri	5.2	+1.20	− 3.9	+15 38.9	15 40.0	− 3 56.2	+1.1773	0.5482	+0.0784		+90	+52

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
σ^2 Tauri	4.9	+1.20	−3.9	+15 45.9	6 15 43.3	− 3 53.0	+1.0538	0.5482	+0.0783	+90	+40
318 B. Tauri	5.7	1.12	5.0	17 2.0	7 0 16.4	+ 4 23.4	+0.2875	0.5519	0.0659	+53	− 6
m Tauri	5.0	1.11	5.8	18 32.5	4 57.0	+ 8 54.8	−1.0602	0.5540	0.0589	−32	−72
111 Tauri	5.1	1.00	6.1	17 18.7	12 51.7	− 7 26.2	+0.6012	0.5574	0.0465	+90	+18
115 Tauri	5.3	0.99	6.4	17 53.7	14 7.8	− 6 12.7	+0.1164	0.5579	0.0445	+42	−13
117 Tauri	6.0	+0.98	−6.2	+17 10.4	14 32.1	− 5 49.2	+0.9147	0.5581	+0.0438	+90	+33
119 Tauri	4.9	0.97	6.7	18 32.2	16 26.4	− 3 58.7	−0.4779	0.5589	0.0407	+ 8	−50
167 H¹. Tauri	5.5	0.95	6.3	17 0.0	16 28.5	− 3 56.7	+1.1838	0.5589	0.0407	+90	+57
120 Tauri	5.6	0.96	6.7	18 29.1	17 2.7	− 3 23.6	−0.3977	0.5592	0.0397	+12	−44
130 Tauri	5.6	0.89	7.0	17 42.0	23 24.8	+ 2 45.5	+0.6688	0.5618	0.0292	+88	+19
19 B. Geminorum	6.2	+0.78	−7.9	+18 42.0	8 11 11.8	− 9 51.5	−0.1806	0.5662	+0.0091	+24	−27
124 H¹. Orionis	5.7	0.77	7.7	17 55.6	11 37.3	− 9 26.9	+0.6504	0.5664	0.0083	+86	+20
71 Orionis	5.1	0.77	8.1	19 10.9	11 46.4	− 9 18.2	−0.6919	0.5664	0.0081	− 5	−66
292 B. Orionis	6.5	0.74	7.8	17 47.9	14 44.0	− 6 26.7	+0.8042	0.5674	+0.0028	+90	+30
26 Geminorum	5.2	0.65	8.3	17 43.2	9 0 3.6	+ 2 33.5	+0.8343	0.5704	−0.0137	+90	+30
74 B. Geminorum	6.2	+0.64	−8.4	+18 16.5	2 15.3	+ 4 40.6	+0.2077	0.5710	−0.0176	+48	− 6
110 B. Geminorum	6.2	0.58	8.5	17 51.8	8 52.8	+11 4.1	+0.4875	0.5728	0.0296	+68	+ 9
162 B. Geminorum	5.7	0.48	8.7	17 14.9	21 43.9	− 0 32.1	+0.6033	0.5755	0.0527	+79	+13
				NEW	*MOON.*						
σ Leonis	4.1	+0.46	−4.8	+ 6 27.0	14 1 27.4	− 0 22.1	−1.2005	0.5731	−0.1840	−41	−84
80 Leonis	6.4	0.50	5.0	4 17.0	3 31.5	+ 1 37.7	+0.6075	0.5730	0.1850	+77	− 1
89 Leonis	5.7	0.53	4.8	3 29.2	7 16.8	+ 5 15.1	+0.7126	0.5726	0.1868	+90	+ 5
β Virginis	3.8	0.63	4.6	2 11.8	14 25.7	−11 51.1	+0.6667	0.5723	0.1894	+81	+ 2
27 B. Virginis	6.5	0.64	4.3	0 57.5	18 8.3	− 8 16.3	+1.2109	0.5721	0.1904	+90	+42
10 Virginis	6.2	+0.66	−3.7	+ 2 19.8	22 48.8	− 3 45.8	−1.0629	0.5719	−0.1912	−28	−88
13 Virginis	5.9	0.72	3.8	− 0 21.6	15 2 46.0	+ 0 3.2	+0.8885	0.5719	0.1916	+90	+16
η Virginis	4.0	0.73	3.8	0 14.4	3 18.8	+ 0 34.8	+0.6626	0.5719	0.1916	+83	+ 2
γ Virginis (*mean*)	2.9	0.80	3.0	1 1.7	12 53.9	+ 9 49.7	−0.3801	0.5720	0.1911	+14	−58
38 Virginis	6.1	0.89	3.1	3 8.1	17 56.7	− 9 18.2	+0.7780	0.5722	0.1901	+87	+ 9
k Virginis	5.7	+0.93	−2.8	− 3 23.9	20 46.6	− 6 34.2	+0.5045	0.5723	−0.1893	+67	− 7
46 Virginis	6.1	0.93	2.6	2 57.3	21 11.4	− 6 10.2	−0.0186	0.5723	0.1892	+33	−36
48 Virginis	6.5	0.95	2.6	3 15.0	22 38.4	− 4 46.4	+0.0034	0.5724	0.1888	+35	−35
Saturn	1.1	. . .	. .	4 12.5	16 0 8.1	− 3 19.9	+0.6856	0.5693	0.1867	+84	+ 3
65 Virginis	6.0	1.05	2.1	4 31.4	7 7.8	+ 3 25.1	−0.3046	0.5731	0.1852	+17	−53
66 Virginis	5.7	+1.07	−2.1	− 4 45.8	7 39.9	+ 3 56.0	−0.1620	0.5732	−0.1849	+25	−44
72 Virginis	6.1	1.11	2.2	6 4.4	10 13.6	+ 6 24.4	+0.6851	0.5735	0.1835	+83	+ 3
l Virginis	4.8	1.11	2.1	5 51.6	10 54.3	+ 7 3.5	+0.3451	0.5735	0.1831	+55	−16
80 Virginis	5.6	1.12	1.5	5 0.3	12 27.4	+ 8 33.3	−0.7981	0.5737	0.1822	−11	−90
88 Virginis	6.5	1.20	1.4	6 27.3	18 0.8	−10 5.1	−0.3424	0.5744	0.1786	+14	−56
598 B. Virginis	6.1	+1.25	−1.5	− 7 40.9	20 54.5	− 7 17.6	+0.3786	0.5748	−0.1765	+56	−14
623 B. Virginis	6.5	1.32	1.3	8 53.3	17 0 58.0	− 3 22.7	+0.8854	0.5754	0.1732	+82	+16
95 Virginis	5.4	1.33	1.2	8 56.8	1 59.3	− 2 23.7	+0.7677	0.5756	0.1724	+82	+ 8
κ Virginis	4.3	1.38	−1.1	9 55.0	4 39.0	+ 0 10.4	+1.2892	0.5760	0.1700	+81	+55
13 Libræ	5.7	1.63	+0.5	11 35.1	22 27.2	− 6 39.9	+0.1062	0.5793	0.1512	+36	−20
ξ^2 Libræ	5.6	+1.64	+0.8	−11 6.0	23 28.5	− 5 40.8	−0.5379	0.5795	−0.1500	+ 1	−71
17 Libræ	6.4	1.64	1.0	10 50.8	18 0 5.9	− 5 4.9	−0.8874	0.5796	0.1492	−21	−90
18 Libræ	5.9	1.64	1.0	10 50.1	0 23.2	− 4 48.2	−0.9415	0.5797	0.1489	−24	−90
130 B. Libræ	5.9	1.80	2.1	12 5.7	10 58.8	+ 5 24.2	−1.1737	0.5818	0.1349	−46	−90
γ Libræ	4.0	1.91	1.9	14 32.0	15 52.5	+10 7.2	+0.6528	0.5827	0.1278	+72	+ 2
190 B. Libræ	6.5	+1.96	+2.2	−14 47.8	19 11.8	−10 40.9	+0.5042	0.5834	−0.1229	+59	− 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
η Libræ	5.5	+1.97	+ 2.1	-15 25.7	18 19 28.1	-10 25.2	+1.1113	0.5834	-0.1225	+75	+35
195 B. Libræ	6.2	1.99	3.2	13 54.1	22 39.9	- 7 20.5	-0.8216	0.5840	0.1175	-20	-90
202 B. Libræ	6.4	2.02	3.3	14 10.4	19 0 35.4	- 5 29.3	-0.7690	0.5841	0.1145	-17	-90
203 B. Libræ	6.2	2.03	3.2	14 36.2	0 43.0	- 5 22.0	-0.3162	0.5844	0.1143	+ 7	-56
48 Libræ	4.6	2.02	3.5	14 3.4	1 24.7	- 4 41.8	-0.9803	0.5845	0.1132	-31	-90
49 Libræ	5.4	+2.05	+ 2.6	-16 18.4	2 18.2	- 3 50.2	+1.2042	0.5847	-0.1117	+74	+46
91 B. Scorpii	6.1	2.13	4.4	14 39.4	8 47.7	+ 2 24.8	-1.1647	0.5858	0.1010	-48	-90
98 B. Scorpii	6.1	2.15	4.6	14 41.1	10 6.6	+ 3 40.8	-1.2667	0.5860	0.0988	-63	-85
ϕ Ophiuchi	4.4	2.24	4.7	16 26.7	15 8.6	+ 8 31.5	+0.0184	0.5867	0.0901	+27	-32
24 Scorpii	5.0	2.31	5.0	17 35.6	19 28.0	-11 18.8	+0.8466	0.5873	0.0824	+73	+15
78 B. Ophiuchi	6.5	+2.38	+ 6.3	-16 41.0	20 1 28.6	- 5 31.6	-0.5445	0.5879	-0.0715	- 8	-73
90 B. Ophiuchi	6.5	2.41	5.9	18 7.7	2 59.9	- 4 3.7	+0.8257	0.5880	0.0686	+72	+14
125 B. Ophiuchi	6.2	2.44	6.8	17 30.4	6 32.0	- 0 39.5	-0.0408	0.5883	0.0621	+19	-37
164 B. Ophiuchi	6.0	2.50	7.5	17 40.5	11 21.2	+ 3 58.9	-0.1459	0.5885	0.0529	+12	-44
192 B. Ophiuchi	6.3	2.54	7.6	18 22.4	13 18.1	+ 5 51.3	+0.4703	0.5886	0.0492	+50	- 8
305 B. Ophiuchi	6.3	+2.68	+ 9.5	-18 47.2	21 2 15.9	- 5 40.0	+0.4215	0.5884	-0.0241	+44	-11
64 B. Sagittarii	6.1	2.75	10.7	18 41.0	10 24.4	+ 2 10.2	+0.1846	0.5877	0.0081	+27	-24
6 B. Scuti	5.9	2.73	11.2	17 23.9	11 7.5	+ 2 51.6	-1.1164	0.5876	0.0067	-56	-90
52 G. Sagittarii	6.4	2.75	10.9	18 29.4	11 13.7	+ 2 57.6	-0.0211	0.5876	0.0065	+15	-36
17 H¹. Sagittarii	6.4	2.76	10.9	18 38.8	11 44.6	+ 3 27.4	+0.1385	0.5876	0.0055	+24	-27
Y Sagittarii (*var.*)	5.4	+2.77	+11.0	-18 53.5	12 50.9	+ 4 31.2	+0.3866	0.5874	-0.0033	+39	-13
85 B. Sagittarii	6.0	2.77	11.7	17 50.7	15 35.9	+ 7 10.0	0.6970	0.5870	+0.0020	-23	-90
95 B. Sagittarii	5.7	2.80	11.6	18 46.5	16 31.6	+ 8 3.7	+0.2671	0.5869	0.0038	+31	-20
100 B. Sagittarii	5.0	2.80	11.8	18 27.2	17 3.0	+ 8 33.9	0.0631	0.5868	0.0049	+12	-39
171 B. Sagittarii	6.1	2.91	13.4	19 21.3	22 6 18.7	- 2 39.8	+1.1064	0.5841	0.0303	+71	+36
173 B. Sagittarii	6.4	+2.91	+13.4	-19 12.7	6 20.2	- 2 38.3	+0.9585	0.5841	+0.0304	+71	+23
187 B. Sagittarii	6.4	2.91	13.7	18 51.3	8 2.5	- 0 59.8	+0.6427	0.5837	0.0336	+63	+ 2
190 B. Sagittarii	5.4	2.92	13.7	19 24.5	8 30.9	- 0 32.4	+1.2343	0.5835	0.0345	+71	+54
d Sagittarii	5.0	2.94	14.3	19 5.2	12 29.2	+ 3 17.2	+1.0536	0.5824	0.0418	+71	+31
ρ Sagittarii	4.0	2.93	14.8	17 59.4	14 13.1	+ 4 57.2	-0.0131	0.5820	0.0450	+19	-36
45 Sagittarii	6.0	+2.94	+14.6	-18 26.9	14 16.9	+ 5 0.9	+0.4671	0.5820	+0.0452	+49	- 8
267 B. Sagittarii	5.8	2.97	15.5	18 23.9	20 47.0	+11 16.9	+0.7491	0.5799	0.0569	+72	+ 8
54 Sagittarii	5.4	2.95	16.0	16 28.0	22 22.8	-11 10.8	-1.1739	0.5794	0.0597	54	-90
31 B. Capricorni	6.4	3.02	13.3	15 59.5	23 19 18.9	+ 9 0.7	-0.0556	0.5712	0.0943	+22	-38
27 G. Capricorni	6.2	3.01	18.4	15 18.6	20 21.8	+10 1.3	-0.6735	0.5707	0.0959	-13	-88
47 B. Capricorni	6.2	+3.03	+18.4	-16 47.2	22 19.6	+11 55.1	+1.0712	0.5698	+0.0988	+74	+32
τ Capricorni	5.2	3.02	18.8	15 13.2	24 0 0.7	-10 27.3	-0.4086	0.5691	0.1013	+ 3	-61
61 B. Capricorni	5.9	3.03	18.7	16 23.6	0 34.1	- 9 55.1	+0.8840	0.5689	0.1021	+74	+17
95 B. Capricorni	5.9	3.02	19.5	14 46.6	8 45.0	- 2 1.1	+0.0611	0.5651	0.1136	+30	-31
53 B. Aquarii	6.5	3.02	20.0	13 31.0	16 38.5	+ 5 36.4	-0.3346	0.5615	0.1238	+10	-56
18 Aquarii	5.5	+3.02	+20.3	-13 12.2	20 24.8	+ 9 15.2	0.1910	0.5597	+0.1283	+18	-46
λ Capricorni	5.5	3.01	20.8	11 43.0	25 6 50.4	- 4 40.0	-0.3748	0.5548	0.1398	+ 9	-58
151 B. Capricorni	6.1	3.01	20.8	13 4.6	8 18.8	- 3 14.5	+1.2827	0.5540	0.1413	+77	+56
96 B. Aquarii	6.5	3.00	20.9	10 40.1	10 10.9	- 1 26.0	-1.0192	0.5532	0.1432	-30	-90
150 B. Aquarii	6.0	2.98	21.1	9 25.1	21 18.1	+ 9 19.6	-0.7107	0.5480	0.1531	- 8	-90
167 G. Aquarii	6.3	+2.96	+21.1	- 8 17.5	26 7 44.5	- 4 33.8	-0.2820	0.5435	+0.1608	+17	-52
213 B. Aquarii	6.5	2.95	21.1	8 42.5	10 2.6	- 2 20.1	+0.5384	0.5425	0.1623	+67	- 5
67 Aquarii	6.4	2.95	21.0	7 21.6	10 8.3	- 2 14.5	0.8975	0.5425	0.1623	-19	-90
λ Aquarii	3.8	2.94	21.0	7 59.0	14 45.6	+ 2 14.2	+0.5304	0.5406	0.1650	+67	- 6
78 Aquarii	6.3	2.94	20.9	7 36.5	15 43.8	+ 3 10.6	+0.2861	0.5402	0.1656	+50	-19
81 Aquarii	6.4	+2.93	+20.9	- 7 28.1	19 7.4	+ 6 27.9	+0.7008	0.5389	+0.1673	+83	+ 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
82 Aquarii	6.4	+2.93	+20.8	− 6 58.9	26 19 41.8	+ 7 1.2	+0.2710	0.5387	+0.1676	+49	−20
Uranus	6.1	. . .	. . .	6 14.6	27 1 24.1	−11 26.9	+0.4362	0.5383	0.1709	+61	−11
ϕ Aquarii	4.4	2.91	20.5	6 27.5	1 35.4	−11 15.9	+0.7018	0.5365	0.1702	+84	+ 4
96 Aquarii	5.7	2.91	20.5	5 32.4	4 8.1	− 8 47.6	+0.1420	0.5356	0.1712	+42	−27
316 B. Aquarii	6.5	2.92	20.3	4 20.0	4 34.6	− 8 22.2	−1.0909	0.5354	0.1714	−32	−90
317 B. Aquarii	6.3	+2.89	20.5	− 6 19.4	4 47.9	− 8 9.3	+1.1039	0.5353	+0.1715	+84	+32
337 B. Aquarii	6.4	2.90	20.1	4 56.8	9 16.0	− 3 49.3	+0.3816	0.5338	0.1730	+58	−14
342 B. Aquarii	6.5	2.90	20.0	4 30.2	10 16.7	− 2 50.4	+0.0746	0.5335	0.1732	+38	−31
20 Piscium	5.6	2.87	19.6	3 11.1	18 39.3	+ 5 17.2	+0.1013	0.5310	0.1752	+40	−29
24 Piscium	6.1	2.85	19.4	3 34.7	21 12.7	+ 7 46.0	+0.9787	0.5302	0.1756	+87	+22
80 B. Piscium	6.3	+2.84	18.7	− 0 55.5	28 3 27.9	10 10.0	−0.8152	0.5287	+0.1762	−11	−90
10 Ceti	6.4	2.80	17.9	− 0 28.2	14 38.6	+ 0 41.0	+0.6580	0.5263	0.1761	+83	+ 2
155 B. Piscium	6.5	2.77	16.0	+ 2 58.3	29 3 31.5	10 48.6	−0.8619	0.5244	0.1742	−14	−88
77 Piscium	6.4	2.75	15.0	4 30.2	11 7.7	− 3 25.7	−1.2316	0.5236	0.1722	−45	−86
f Piscium	5.3	2.69	14.7	3 12.8	17 25.5	+ 2 41.2	+1.2673	0.5233	0.1700	+90	+50
μ Piscium	5.0	+2.70	13.4	+ 5 45.1	23 54.0	+ 8 58.4	−0.4405	0.5231	+0.1673	+10	−62
ν Piscium	4.7	2.63	13.0	5 6.1	30 5 49.2	− 9 16.7	+1.2597	0.5232	0.1645	+90	+50
39 B. Arietis	6.5	2.59	11.0	7 22.2	18 3.8	+ 2 36.6	+0.7259	0.5240	0.1575	+90	+ 8
64 Ceti	5.8	2.57	10.3	8 12.8	21 27.5	+ 5 54.3	+0.3234	0.5243	0.1552	+54	−15
ξ^1 Ceti	4.5	2.57	10.2	8 29.3	22 18.6	+ 6 43.9	+0.1500	0.5244	0.1547	+44	−24
ξ Arietis	5.5	+2.56	+ 8.9	+10 15.9	31 4 26.6	−11 18.9	−0.8817	0.5252	+0.1503	−16	−80
25 Arietis	6.5	2.52	8.8	9 51.6	5 47.8	− 9 59.9	−0.2301	0.5254	0.1493	+22	−45
389 B. Ceti	6.3	2.52	8.9	9 13.5	6 55.8	− 8 54.0	+0.6417	0.5256	0.1484	+82	+ 4
85 Ceti	6.3	2.48	7.7	10 25.0	13 35.4	− 2 26.2	+0.2928	0.5267	0.1431	+53	−15
μ Ceti	4.4	+2.48	+ 7.8	+ 9 47.5	14 51.1	− 1 12.7	+1.1644	0.5270	+0.1420	+90	+42

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147 B. Arietis	5.8	+2.43	+ 5.4	+12 53.6	1 1 50.4	+ 9 26.9	−0.7624	0.5294	+0.1321	− 8	−78
8 B. Tauri	6.2	2.33	4.4	12 21.5	10 52.6	− 5 47.1	+0.9821	0.5317	0.1231	+90	+29
f Tauri	4.3	+2.31	+ 3.9	+12 40.5	14 15.4	− 2 30.5	+1.0422	0.5327	+0.1195	+90	+34
179 B. Tauri	5.9	2.17	0.7	14 57.5	2 8 34.7	− 8 44.9	+0.5181	0.5385	0.0983	+70	+ 3
48 Tauri	6.3	2.13	+ 0.2	15 12.6	12 32.5	− 4 54.4	+0.6201	0.5399	0.0933	+81	+ 9
γ Tauri	3.9	2.12	− 0.2	15 26.6	14 30.5	− 3 0.1	+0.5438	0.5406	0.0907	+73	+ 5
58 Tauri	5.4	2.10	0.0	14 54.7	14 54.7	− 2 36.8	+1.1644	0.5407	0.0902	+90	+49
63 Tauri	5.7	+2.11	− 0.8	+16 35.9	16 15.7	− 1 18.2	−0.5708	0.5412	+0.0884	+ 2	−62
64 Tauri	4.9	2.12	1.1	17 16.0	16 35.0	− 0 59.6	−1.2772	0.5412	0.0880	−61	−73
70 Tauri	6.4	2.09	0.6	15 46.0	17 20.9	− 0 15.1	+0.4401	0.5416	0.0870	+64	0
71 Tauri	4.6	2.08	0.6	15 26.7	17 42.3	+ 0 5.6	+0.8245	0.5417	0.0865	+90	+22
75 Tauri	5.2	2.08	0.9	16 11.3	18 43.0	+ 1 4.5	+0.0935	0.5421	0.0851	+40	−19
θ^1 Tauri	4.2	+2.07	− 0.8	+15 47.5	18 47.1	+ 1 8.4	+0.5346	0.5421	+0.0851	+72	+ 5
θ^2 Tauri	3.6	2.07	0.8	15 42.1	18 49.7	+ 1 10.9	+0.6386	0.5422	0.0850	+83	+11
80 Tauri	5.8	2.06	0.8	15 28.3	19 33.1	+ 1 52.9	+0.9525	0.5424	0.0840	+90	+31
264 B. Tauri	4.8	2.07	1.0	16 1.6	19 44.8	+ 2 4.2	+0.3572	0.5425	0.0837	+57	− 4
81 Tauri	5.5	2.06	0.8	15 31.5	19 47.8	+ 2 7.2	+0.9133	0.5425	0.0837	+90	+29
85 Tauri	6.0	+2.05	− 1.0	+15 41.2	20 23.0	+ 2 41.2	+0.7838	0.5427	+0.0829	+90	+20
275 B. Tauri	6.5	2.05	1.2	16 9.8	21 14.4	+ 3 31.0	+0.3322	0.5430	0.0817	+56	− 6
α Tauri (*Aldebar.*)	1.1	2.04	1.6	16 21.3	22 20.5	+ 4 35.1	+0.2096	0.5434	0.0802	+48	−12
89 Tauri	5.8	2.02	1.4	15 52.8	23 25.7	+ 5 38.1	+0.8180	0.5438	0.0787	+90	+23
σ^1 Tauri	5.2	2.01	1.4	15 38.9	23 54.9	+ 6 6.4	+1.1091	0.5440	0.0781	+90	+45
σ^2 Tauri	4.9	+2.01	− 1.4	+15 46.0	23 58.2	+ 6 9.6	+0.9850	0.5440	+0.0780	+90	+34

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
318 B. Tauri	5.7	+1.93	−2.9	+17 2.0	3 8 38.5	− 9 26.7	+0.2177	0.5473	+0.0657	+48	−10
m Tauri	5.0	1.93	3.9	18 32.5	13 23.4	− 4 50.9	−1.1360	0.5491	0.0587	−39	−72
111 Tauri	5.1	1.80	4.4	17 18.7	21 25.4	+ 2 55.3	+0.6288	0.5522	0.0464	+83	+15
115 Tauri	5.3	1.78	4.8	17 53.8	22 42.7	+ 4 10.1	+0.0511	0.5527	0.0444	+38	−17
117 Tauri	6.0	1.76	4.6	17 10.5	23 7.4	+ 4 34.0	+0.8544	0.5528	0.0437	+90	+29
119 Tauri	4.9	+1.76	−5.2	+18 32.2	4 1 3.6	+ 6 26.4	−0.5458	0.5536	+0.0407	+ 4	−55
167 H¹. Tauri	5.5	1.74	4.7	17 0.0	1 5.7	+ 6 28.4	+1.1258	0.5535	0.0406	+90	+50
120 Tauri	5.6	1.75	5.3	18 29.1	1 40.4	+ 7 2.0	−0.4649	0.5538	0.0397	+ 8	−48
122 Tauri	5.5	1.71	5.0	16 59.6	3 20.5	+ 8 38.7	+1.2208	0.5544	0.0371	+90	+61
130 Tauri	5.6	1.66	5.7	17 42.0	8 8.8	−10 42.7	+0.6107	0.5562	0.0293	+80	+15
19 B. Geminorum	6.2	+1.52	−7.1	+18 42.0	20 7.2	+ 0 51.7	−0.2383	0.5605	+0.0094	+21	−30
124 H¹. Orionis	5.7	1.51	6.9	17 55.6	20 33.2	+ 1 16.9	+0.5976	0.5606	0.0087	+79	+17
71 Orionis	5.1	1.52	7.4	19 10.9	20 42.4	+ 1 25.8	−0.7524	0.5607	0.0084	− 9	−71
287 B. Orionis	6.2	1.48	6.9	17 21.3	22 38.0	+ 3 17.4	+1.2275	0.5614	0.0051	+90	+65
292 B. Orionis	6.5	1.47	7.1	17 47.9	23 43.0	+ 4 20.2	+0.7536	0.5618	+0.0033	+90	+27
26 Geminorum	5.2	+1.35	−7.8	+17 43.2	5 9 11.3	−10 30.8	+0.7880	0.5648	−0.0131	+90	+28
74 B. Geminorum	6.2	1.33	8.2	18 16.5	11 25.1	− 8 21.6	+0.1591	0.5656	0.0170	+44	− 8
110 B. Geminorum	6.2	1.24	8.4	17 51.8	18 8.4	− 1 52.3	+0.4434	0.5675	0.0289	+64	+ 6
162 B. Geminorum	5.7	1.09	8.9	17 14.9	6 7 9.7	+10 41.7	+0.5654	0.5710	0.0519	+75	+11
f Geminorum	5.3	1.05	9.2	17 50.9	10 31.9	−10 3.2	−0.2523	0.5718	0.0578	+20	−36
1 Cancri	6.0	+0.96	−9.0	+15 59.7	18 14.2	− 2 37.2	+1.1973	0.5734	−0.0713	+90	+55
2 B. Cancri	6.0	0.95	9.1	16 43.5	18 53.8	− 1 59.1	+0.3838	0.5735	0.0724	+59	− 1
3 Cancri	5.7	0.95	9.4	17 31.1	19 52.6	− 1 2.3	0.5194	0.5737	0.0741	+ 5	−56
5 Cancri	5.9	0.91	9.2	16 40.0	20 12.0	− 0 43.6	+0.3490	0.5737	0.0747	+57	− 3
ζ Cancri (*mean*)	4.7	0.90	9.6	17 52.7	7 0 51.3	+ 3 45.8	−1.2839	0.5746	0.0827	−67	−72
d^2 Cancri	6.2	+0.82	−9.6	+17 17.9	6 48.1	+ 9 29.9	−1.1962	0.5755	−0.0927	−45	−73
90 B. Cancri	6.3	0.79	9.1	15 34.7	11 17.2	−10 10 5	+0.1601	0.5761	0.1002	+44	−16
54 Cancri	6.3	0.72	9.0	15 38.1	17 44.8	− 3 56.9	−0.5787	0.5768	0.1106	+ 2	−64
o^1 Cancri	5.1	0.71	9.0	15 37.0	20 26.1	− 1 21.3	−0.8618	0.5771	0.1149	−15	−75
o^2 Cancri	5.7	0.71	9.1	+15 52.5	20 34.7	− 1 13.0	−1.1454	0.5771	0.1151	−38	−75
					NEW MOON.						
SATURN	1.0	. . .	. .	− 5 19.1	12 12 17.4	+10 27.8	+0.9716	0.5783	−0.1876	+85	+22
65 Virginis	6.0	+0.80	−1.1	4 31.3	14 45.5	−11 9.5	−0.2850	0.5827	0.1881	+18	−52
66 Virginis	5.7	0.81	1.1	4 45.7	15 16.6	−10 39.6	−0.1443	0.5827	0.1879	+26	−43
72 Virginis	6.1	+0.84	−1.1	− 6 4.4	17 45.8	− 8 15.8	+0.6912	0.5830	−0.1865	+83	+ 4
l Virginis	4.8	0.83	1.0	5 51.5	18 25.2	− 7 37.9	+0.3560	0.5830	0.1861	+55	−15
80 Virginis	5.6	0.84	0.6	5 0.3	19 55.4	− 6 10.9	−0.7710	0.5832	0.1852	− 9	−90
566 B. Virginis	6.4	0.87	0.2	5 6.7	23 28.1	− 2 46.0	−1.3172	0.5837	0.1828	−62	−82
88 Virginis	6.5	0.90	0.3	6 27.2	13 1 18.9	− 0 59.4	−0.3215	0.5839	0.1815	+16	−54
598 B. Virginis	6.1	+0.93	−0.3	− 7 40.8	4 7.5	+ 1 43.1	+0.3898	0.5842	−0.1793	+57	−13
623 B. Virginis	6.5	0.99	−0.1	8 53.3	8 3.8	+ 5 30.6	+0.8899	0.5847	0.1760	+82	+16
95 Virginis	5.4	0.99	0.0	8 56.8	9 3.3	+ 6 27.9	+0.7738	0.5848	0.1751	+82	+ 9
κ Virginis	4.3	1.04	+0.2	9 55.0	11 38.4	+ 8 57.3	+1.2884	0.5852	0.1727	+81	+55
13 Libræ	5.7	1.23	1.7	11 35.1	14 4 57.2	+ 1 37.6	+0.1213	0.5874	0.1534	+37	−28
ξ^2 Libræ	5.6	+1.23	+2.0	−11 6.0	5 56.8	+ 2 35.0	−0.5150	0.5875	−0.1521	+ 2	−69
17 Libræ	6.4	1.24	2.1	10 50.7	6 33.3	+ 3 10.1	−0.8604	0.5876	0.1514	−19	−90
18 Libræ	5.9	1.23	2.1	10 50.1	6 50.2	+ 3 26.4	−0.9139	0.5876	0.1510	−23	−90
130 B. Libræ	5.9	1.37	3.1	12 5.7	17 10.4	−10 36.7	−1.1452	0.5888	0.1366	−43	−90
γ Libræ	4.0	1.47	3.0	14 32.0	21 57.6	− 6 0.2	+0.6612	0.5893	0.1294	+72	+ 2
190 B. Libræ	6.5	+1.50	+3.3	−14 47.8	15 1 12.7	− 2 52.5	+0.5140	0.5896	−0.1243	+60	− 6

OCCULTATIONS, 1923.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ′	d h m	h m				°	°
η Libræ	5.5	+1.52	+ 3.1	−15 25.7	15 1 28.7	- 2 37.2	+1.1150	0.5896	−0.1239	+75	+35
195 B. Libræ	6.2	1.53	4.1	13 54 1	4 36.7	+ 0 23.8	−0.7992	0.5899	0.1188	−18	−90
202 B. Libræ	6.4	1.56	4.2	14 10.4	6 30.0	+ 2 12.9	−0.7475	0.5900	0.1157	−15	−90
203 B. Libræ	6.2	1.57	4.1	14 36.2	6 37.4	+ 2 20.0	−0.3286	0.5901	0.1155	+ 9	−55
48 Libræ	4.6	1.56	4.4	14 3.4	7 18.3	+ 2 59.3	−0.9570	0.5901	0.1143	−29	−90
49 Libræ	5.4	+1.58	+ 3.5	−16 18.4	8 10.9	+ 3 49.9	+1.2074	0.5901	−0.1129	+74	+46
91 B. Scorpii	6.1	1.66	5.2	14 39.3	14 33.6	+ 9 58.2	−1.1417	0.5905	0.1020	−46	−90
98 B. Scorpii	6.1	1.68	5.3	14 41.1	15 51.4	+11 13.0	−1.2433	0.5905	0.0997	−59	−90
ϕ Ophiuchi	4.4	1.76	5.4	16 26.7	20 48.9	− 8 0.8	+0.0607	0.5906	0.0908	+27	−31
24 Scorpii	5.0	1.84	5.6	17 35.6	16 1 5.0	− 3 54.3	+0.8532	0.5906	0.0831	+73	+15
78 B. Ophiuchi	6.5	+1.90	+ 6.8	−16 41.0	7 1.5	+ 1 48.7	−0.5300	0.5905	−0.0720	− 7	−71
90 B. Ophiuchi	6.5	1.93	6.4	18 7.7	8 31.9	+ 3 15.6	+0.8324	0.5904	0.0691	+72	+14
125 B. Ophiuchi	6.2	1.96	7.1	17 30.4	12 2.1	+ 6 37.9	−0.0299	0.5903	0.0624	+20	−37
164 B. Ophiuchi	6.0	2.02	7.8	17 40.5	16 49.2	+11 14.3	−0.1352	0.5899	0.0532	+13	−43
192 B. Ophiuchi	6.3	2.06	7.8	18 22.4	18 45.4	−10 54.0	+0.4783	0.5897	0.0494	+50	− 8
305 B. Ophiuchi	6.3	+2.22	+ 9.4	−18 47.2	17 7 40.7	+ 1 32.2	+0.4288	0.5879	−0 0242	+44	−10
61 B. Sagittarii	6.1	2.30	10.5	18 41.0	15 49.4	+ 9 22.6	+0.1914	0.5862	0.0082	+27	−24
6 B. Scuti	5.9	2.29	11.0	17 23.9	16 32.6	+10 4.1	−1.1389	0.5861	0.0068	−55	−90
52 G. Sagittarii	6.4	2.31	10.6	18 29.4	16 38.8	+10 10.0	−0.0146	0.5861	−0.0066	+15	−36
17 H¹. Sagittarii	6.4	2.32	10.7	18 38.8	17 9.7	+10 39.9	+0.1451	0.5860	0.0056	+24	−26
Y Sagittarii (*var.*)	5.4	+2.33	+10.8	−18 53.5	18 16.2	+11 43.9	+0.3931	0.5857	−0.0035	+40	−12
85 B. Sagittarii	6.0	2.35	11.5	17 50.7	21 1.7	− 9 36.7	−0.6907	0.5851	+0.0019	−23	−90
95 B. Sagittarii	5.7	2.37	11.2	18 46.5	21 57.6	− 8 42.9	+0.2732	0.5848	0.0037	+32	−19
100 B. Sagittarii	5.0	2.37	11.4	18 27.2	22 29.1	− 8 12.6	−0.0573	0.5847	0.0047	+13	−38
171 B. Sagittarii	6.1	2.52	12.7	19 21.3	18 11 49.5	+ 4 38.3	+1.1130	0.5808	0.0301	+71	+37
173 B. Sagittarii	6.4	+2.52	+12.8	−19 12.7	11 51.0	+ 4 39.8	+0.9618	0.5808	+0.0301	+71	+24
187 B. Sagittarii	6 4	2.53	13.1	18 51.3	13 34.1	+ 6 19.1	+0.6483	0.5802	0.0333	+63	+ 2
190 B. Sagittarii	5.4	2.54	13.0	19 24.5	14 2.8	+ 6 46.7	+1.2412	0.5800	0.0341	+71	+55
d Sagittarii	5.0	2.57	13.6	19 5.2	18 3.1	+10 38.4	+1.0602	0.5786	0.0415	+71	+32
ρ Sagittarii	4.0	2.57	14.1	17 59.4	19 48.0	−11 40.6	−0.0095	0.5780	0.0446	+19	−35
45 Sagittarii	6.0	+2.58	+13.9	−18 26.9	19 51.9	−11 36.7	+0.4721	0.5780	+0.0447	+49	− 8
267 B. Sagittarii	5.8	2.63	14.7	18 23.9	19 2 26.0	− 5 16.7	+0.7548	0.5755	0.0564	+72	+ 9
54 Sagittarii	5.1	2.62	15.5	16 28.0	4 2.9	− 3 43.3	−1.1753	0.5749	0.0592	54	−90
31 B. Capricorni	6.4	2.78	17.6	15 59.5	20 1 15.4	− 7 15.4	−0.0542	0.5660	0.0934	+22	−38
27 G. Capricorni	6.2	2.77	17.7	15 18.6	2 19.2	− 6 13.8	−0.6752	0.5655	0.0949	−13	−88
47 B. Capricorni	6.2	+2.81	+17.5	−16 47.2	4 18.7	− 4 18.4	+1.0785	0.5646	+0.0979	+74	+32
τ Capricorni	5.2	2.80	18.1	15 13.2	6 1.3	− 2 39.3	−0.4091	0.5639	0.1003	+ 3	−61
61 B. Capricorni	5.9	2.81	17.9	16 23.6	6 35.2	− 2 6.6	+0.8903	0.5636	0.1011	+74	+17
95 B. Capricorni	5.9	2.85	18.8	14 46.6	14 53.4	+ 5 54.7	+0.0631	0.5599	0.1125	+30	−31
53 B. Aquarii	6.5	2.88	19.5	13 31.0	22 54.0	−10 20.6	−0.3348	0.5563	0.1227	+10	−56
18 Aquarii	5.5	+2.90	+19.8	−13 12.2	21 2 43.8	− 6 38.4	−0.1903	0.5546	+0.1272	+18	−46
λ Capricorni	5.5	2.94	20.5	11 43.0	13 18.6	+ 3 35.8	−0.3745	0.5501	0.1387	+ 9	−58
151 B. Capricorni	6.1	2.95	20.3	13 4.6	14 48.3	+ 5 2.5	+1.2928	0.5494	0.1402	+77	+59
96 B. Aquarii	6.5	2.95	20.8	10 40.1	16 41.9	+ 6 52.5	−1.0224	0.5486	0.1421	−30	−90
150 B. Aquarii	6.0	2.98	21.2	9 25.1	22 3 58.3	− 6 12.6	−0.7106	0.5440	0.1521	− 8	−90
167 G. Aquarii	6.3	+3.01	+21.4	− 8 17.5	14 32.4	+ 4 1.7	−0.2779	0.5400	+0.1599	+17	−51
213 B. Aquarii	6.5	3.02	21.3	8 42.5	16 52.1	+ 6 17.1	+0.5471	0.5393	0.1614	+68	− 5
67 Aquarii	6.4	3.02	21.5	7 21.6	16 57.9	+ 6 22.7	−0.8962	0.5392	0.1615	−19	−90
λ Aquarii	3.8	3.03	21.4	7 59.0	21 38.2	+10 54.5	+0.5399	0.5376	0.1643	+68	− 5
78 Aquarii	6.3	3.03	21.4	7 36.5	22 37.1	+11 51.5	+0.2945	0.5373	0.1649	+50	−18
81 Aquarii	6.4	+3.04	+21.3	− 7 28.1	23 2 2.6	− 8 49.2	+0.7119	0.5361	+0.1667	+83	+ 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'		N.	S.
			s	″	° ′	d h m	h m					°	°
82	Aquarii	6.4	+3.04	+21.4	− 6 58.9	23 2 37.5	− 8 15.5	+0.2801	0.5360	+0.1670		+50	−19
	URANUS	6.1	. . .	. . .	6 39.5	6 21.9	− 4 37.9	+0.5578	0.5365	0.1695		+70	− 4
ϕ	Aquarii	4.4	3.05	21.1	6 27.5	8 34.4	− 2 29.4	+0.7140	0.5342	0.1697		+84	+ 5
96	Aquarii	5.7	3.07	21.2	5 32.4	11 8.7	+ 0 0.2	+0.1523	0.5334	0.1707		+43	−26
316 B.	Aquarii	6.5	3.08	21.2	4 20.0	11 35.1	+ 0 25.9	−1.0858	0.5334	0.1709		−31	−90
317 B.	Aquarii	6 3	+3.05	+21.1	− 6 19.4	11 48.5	+ 0 38.8	+1.1185	0.5332	+0.1710		+84	+33
337 B.	Aquarii	6.4	3.08	21.0	4 56.8	16 18.7	+ 5 1.0	+0.3941	0.5320	0.1726		+58	−13
342 B.	Aquarii	6.5	3.08	21.0	4 30.1	17 19.8	+ 6 0.2	+0.0862	0.5318	0.1729		+39	−30
20	Piscium	5.6	3.09	20.8	3 11.0	24 1 45.8	− 9 48.6	+0.1152	0.5298	0.1750		+41	−28
24	Piscium	6.1	3.09	20.6	3 34.6	4 20.1	− 7 19.0	+0.9964	0.5292	0.1755		+87	+23
80 B.	Piscium	6.3	+3.11	+20.3	− 0 55.5	10 37.2	− 1 13.2	−0.8016	0.5280	+0.1763		−10	−90
10	Ceti	6.4	3.11	19.5	− 0 28.2	21 50.2	+ 9 40.3	+0.6797	0.5263	0.1765		+84	+ 3
155 B.	Piscium	6.5	3.14	18.2	+ 2 58.3	25 10 44.7	− 1 47.8	−0.8396	0.5249	0.1748		−13	−88
77	Piscium	6.1	3.16	17.3	4 30.2	18 21.2	+ 5 35.3	−1.2071	0.5245	0.1729		−42	−86
f	Piscium	5.3	3.12	16.8	3 12.8	26 0 39.0	+11 42.3	+1.2993	0.5244	0.1708		+88	+57
μ	Piscium	5.0	+3.16	+15.9	+ 5 45.1	7 7.3	− 6 0.6	−0.4092	0.5244	+0.1682		+12	−59
ν	Piscium	4.7	3.12	15.3	5 6.2	13 2.3	− 0 16.0	+1.2963	0.5246	0.1653		+88	+56
39 B.	Arietis	6.5	3.13	13.5	7 22.2	27 1 16.2	+11 36.6	+0.7663	0.5254	0.1583		+90	+10
64	Ceti	5.8	3.12	12.8	8 12.8	4 39.7	− 9 5.8	+0.3645	0.5257	0.1561		+57	−12
ξ^1	Ceti	4.5	3.13	12.7	8 29.4	5 30.8	− 8 16.3	+0.1910	0.5258	0.1555		+46	−22
ξ	Arietis	5.5	+3.14	+11.6	+10 15.9	11 38.4	− 2 19.4	0.8404	0.5266	+0.1511		−13	−80
25	Arietis	6.5	3.11	11.4	9 51.6	12 59.6	− 1 0.6	−0.1869	0.5267	0.1501		+24	−42
389 B.	Ceti	6.3	3.11	11.5	9 13.5	14 7.6	+ 0 5.4	+0.6872	0.5269	0.1492		+88	+ 7
85	Ceti	6.3	3.10	10.3	10 25.0	20 47.0	+ 6 33.0	+0.3403	0.5279	0.1438		+56	−12
μ	Ceti	4.4	3.10	10.2	9 47.6	22 2.7	+ 7 46.5	+1.2144	0.5281	0.1427		+90	+48
147 B.	Arietis	5.8	+3.09	+ 7.9	+12 53.6	28 9 2.4	− 5 33.4	−0.7132	0.5301	+0.1327		− 5	−77
8 B.	Tauri	6.2	3.02	6.8	12 21.6	18 5.6	+ 3 13.5	+1.0400	0.5321	0.1235		+90	+33
f	Tauri	4.3	3.00	6.2	12 40.5	21 29.0	+ 6 30.7	+1.1018	0.5328	0.1199		+90	+39
30 B.	Tauri	6.4	3.03	5.0	15 10.8	29 0 56.8	+ 9 52.4	−1.2693	0.5336	0.1161		−55	−75
179 B.	Tauri	5.9	2.92	2.7	14 57.5	15 53.5	+ 0 21.6	+0.5828	0.5375	0.0984		+76	+ 6
48	Tauri	6.3	+2.89	+ 2.1	+15 12.6	19 53.0	+ 4 13.8	+0.6867	0.5386	+0.0933		+90	+13
γ	Tauri	3.9	2.88	1.7	15 26.6	21 51.9	+ 6 8.9	+0.6103	0.5391	0.0908		+80	+ 9
58	Tauri	5.4	2.86	1.8	14 54.8	22 16.3	+ 6 32.6	+1.2344	0.5392	0.0902		+90	+58
63	Tauri	5.7	2.88	1.1	16 35.9	23 38.0	+ 7 51.8	−0.5098	0.5396	0.0885		+ 6	−57
64	Tauri	4.9	2.90	0.8	17 16.0	23 57.4	+ 8 10.5	−1.2201	0.5397	0.0880		−49	−73
70	Tauri	6.4	+2.86	+ 1.2	+15 46.0	30 0 43.7	+ 8 55.3	+0.5071	0.5399	+0.0870		+69	+ 3
71	Tauri	4.6	2.85	1.2	15 26.7	1 5.3	+ 9 16.3	+0.8937	0.5400	0.0865		+90	+27
75	Tauri	5.2	2.85	0.9	16 11.3	2 6.6	+10 15.6	+0.1588	0.5403	0.0851		+44	−15
θ^1	Tauri	4.2	2.84	0.9	15 47.6	2 10.6	+10 19.6	+0.6025	0.5403	0.0851		+79	+ 9
θ^2	Tauri	3.6	2.84	1.0	15 42.1	2 13.3	+10 22.2	+0.7070	0.5403	0.0850		+90	+15
80	Tauri	5.8	+2.83	+ 0.9	+15 28.3	2 57.0	+11 4.5	+1.0230	0.5405	+0.0840		+90	+37
264 B.	Tauri	4.8	2.84	0.7	16 1.7	3 8.9	+11 16.0	+0.4244	0.5406	0.0838		+63	− 1
81	Tauri	5.5	2.83	0.9	15 31.5	3 11.9	+11 18.9	+0.9836	0.5405	0.0837		+90	+34
85	Tauri	6.0	2.83	0.7	15 41.3	3 47.4	+11 53.3	+0.8537	0.5407	0.0829		+90	+25
275 B.	Tauri	6.5	2.82	0.5	16 9.8	4 39.3	−11 16.4	+0.3996	0.5410	0.0817		+61	− 2
α	Tauri (*Aldebar.*)	1.1	+2.82	+ 0.1	+16 21.3	5 46.0	−10 11.8	+0.2766	0.5413	+0.0802		+52	− 9
89	Tauri	5.8	2.80	0.2	15 52.8	6 51.9	− 9 8.0	+0.8890	0.5416	0.0787		+90	+27
σ^1	Tauri	5.2	2.79	0.2	15 39.0	7 21.4	− 8 39.4	+1.1821	0.5417	0.0780		+90	+52
σ^2	Tauri	4.9	2.80	+ 0.2	15 46.0	7 24.7	− 8 36.2	+1.0572	0.5418	0.0779		+90	+40
318 B.	Tauri	5.7	2.73	− 1.5	17 2.0	16 10.8	− 0 6.7	+0.2874	0.5442	0.0655		+53	− 6
m	Tauri	5.0	+2.74	− 2.7	+18 32.5	20 59.2	+ 4 32.5	−1.0750	0.5456	+0.0585		−33	−72

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'		N.	S.
			s	"	° ′	d h m	h m					°	°
111	Tauri	5.1	+2.60	− 3.5	+17 18.7	1 5 8.1	−11 34.3	+0.7045	0.5481	+0.0462		+90	+19
115	Tauri	5.3	2.59	3.9	17 53.8	6 26.6	−10 18.2	+0.1225	0.5484	0.0443		+42	−13
117	Tauri	6.0	2.57	3.8	17 10.5	6 51.6	− 9 54.1	+0.9323	0.5485	0.0436		+90	+34
119	Tauri	4.9	2.58	4.4	18 32.2	8 49.7	− 7 59.7	−0.4789	0.5491	0.0405		+ 8	−50
167	Π^1. Tauri	5.5	2.55	3.9	17 0.1	8 51.8	− 7 57.7	+1.2064	0.5491	0.0405		+90	+59
120	Tauri	5.6	+2.57	− 4.5	+18 29.1	9 27.1	− 7 23.6	−0.3972	0.5493	+0.0396		+12	−44
130	Tauri	5.6	2.47	5.1	17 42.0	16 2.0	− 1 1.6	+0.6885	0.5512	0.0292		+90	+20
19	B. Geminorum	6.2	2.34	7.0	18 42.0	2 4 14.0	+10 46.3	−0.1671	0.5545	0.0094		+25	−26
124	Π^1. Orionis	5.7	2.32	6.8	17 55.6	4 40.5	+11 12.0	+0.6769	0.5546	0.0086		+90	+21
71	Orionis	5.1	2.33	7.4	19 10.9	4 49.9	+11 21.0	−0.6859	0.5547	0.0084		− 5	−66
292	B. Orionis	6.5	+2.28	− 7.1	+17 47.9	7 54.2	− 9 40.9	+0.8346	0.5555	+0.0033		+90	+32
26	Geminorum	5.2	2.15	8.2	17 43.2	17 34.8	− 0 19.7	+0.8699	0.5579	−0.0130		+90	+33
74	B. Geminorum	6.2	2 12	8.6	18 16.5	19 51.5	+ 1 52.6	+0.2346	0.5585	0.0168		+49	− 4
110	B. Geminorum	6.2	2.02	9.1	17 51.8	3 2 44.2	+ 8 31.4	+0.5216	0.5601	0.0285		+71	+11
162	B. Geminorum	5.7	1.84	10.1	17 14.9	16 4.2	− 2 35.9	+0.6436	0.5630	0.0513		+84	+15
f	Geminorum	5.3	+1.80	−10.5	+17 50.9	19 31.4	+ 0 44.2	−0.1833	0.5637	−0.0571		+24	−32
g	Geminorum	5.0	1.76	11.0	18 41.8	22 30.4	+ 3 37.1	−1.2619	0.5643	0.0622		−59	−72
1	Cancri	6.0	1.67	10.4	15 59.7	4 3 25.0	+ 8 21.6	+1.2799	0.5652	0.0705		+77	+70
2	B. Cancri	6.0	1.67	10.7	16 43.5	4 5.7	+ 9 0.8	+0.4578	0.5653	0.0716		+65	+ 3
3	Cancri	5.7	1.66	11.0	17 31.1	5 5.9	+ 9 58.9	−0.4550	0.5655	0.0733		+ 9	−51
5	Cancri	5.9	+1.65	−10.7	+16 40.0	5 25.8	+10 18.2	+0.4223	0.5656	−0.0738		+62	+ 1
ζ	Cancri (*mean*)	4.7	1.60	11.5	17 52.7	10 11.9	− 9 5.6	−1.2285	0.5664	0.0818		−50	−73
d^2	Cancri	6.2	1.50	11.5	17 17.9	16 17.3	− 3 12.9	−1.1413	0.5674	0.0917		−39	−73
90	B. Cancri	6.3	1.11	11.0	15 34.7	20 52.7	+ 1 12.9	+0.2268	0.5682	0.0991		+49	−12
54	Cancri	6.3	1.35	11.1	15 38.0	5 3 29.3	+ 7 35.6	−0.5213	0.5691	0.1095		+ 6	−59
o^1	Cancri	5.1	+1.32	−11.2	+15 37.0	6 14.2	+10 14.7	−0.8079	0.5695	−0.1138		−12	−75
o^2	Cancri	5.7	1.32	11.3	15 52.5	6 23.0	+10 23.2	−1.0940	0.5695	0.1140		−33	−75
81	Cancri	6.4	1.21	11.0	15 18.2	12 54.4	− 7 19.1	−1.2718	0.5704	0.1238		−56	−75
18	Leonis	5.8	1.07	10.2	12 9.8	6 3 54.5	+ 7 9.3	−0.0436	0.5724	0.1447		+32	−32
19	Leonis	6.4	1.06	10.1	11 55.3	4 22.1	+ 7 36.0	+0.1360	0.5725	0.1453		+43	−22
R	Leonis (*var.*)	4.6	+1.06	−10.1	+11 47.0	4 25.4	+ 7 39.2	+0.2699	0.5725	−0.1454		+51	−15
A	Leonis	4.6	0.97	9.5	10 22.4	13 20.4	− 7 44.7	+0.3637	0.5736	0.1565		+57	−11
44	Leonis	5.9	0.91	8.9	9 10.5	20 54.6	− 0 26.7	+0.3627	0.5746	0.1650		+57	−12
45	Leonis	5.8	0.90	9.1	10 9.2	21 56.9	+ 0 33.4	−0.8011	0.5748	0.1661		−10	−80
ρ	Leonis	3.8	0.88	8.9	9 42.1	7 0 11.8	+ 2 43.4	−0.7185	0.5751	0.1685		− 5	−81
49	Leonis	5.7	+0.87	− 8.7	+ 9 2.8	1 10.2	+ 3 39.8	−0.2204	0.5753	−0.1695		+23	−45
37	Sextantis	6.3	0.85	8.0	6 46.6	5 58.8	+ 8 18.1	+1.2426	0.5759	0.1742		+90	+49
56	Leonis	6.1	0.82	7.7	6 35.7	10 17.0	−11 32.9	+0.6661	0.5766	0.1780		+84	+ 4
c	Leonis	5.1	0.81	7.6	6 30.8	12 19.7	− 9 34.7	+0.3813	0.5769	0.1797		+58	−12
χ	Leonis	4.7	0.77	− 7.7	+ 7 45.0	14 10.8	− 7 47.6	−1.1945	0.5772	0.1812		−41	−83
					NEW	*MOON.*							
130	B. Libræ	5.9	+1.05	+ 3.6	−12 5.7	12 1 45.9	− 0 13.4	−1.2075	0.5996	−0.1400		−50	−90
γ	Libræ	4.0	1.12	3.8	14 32.0	6 23.3	+ 4 13.2	+0.5663	0.6002	0.1326		+64	− 3
190	B. Libræ	6.5	1.15	4.0	14 47.8	9 31.7	+ 7 14.3	+0.4188	0.6005	0.1274		+53	−12
η	Libræ	5.5	+1.16	+ 3.9	−15 25.7	9 47.2	+ 7 29.1	+1.0100	0.6005	−0.1270		+75	+26
195	B. Libræ	6.2	1.16	4.7	13 54.0	12 48.7	+10 23.5	−0.8757	0.6008	0.1218		−23	−90
202	B. Libræ	6.4	1.18	4.8	14 10.4	14 38.1	−11 51.3	−0.8262	0.6009	0.1186		−20	−90
203	B. Libræ	6.2	1.19	4.8	14 36.2	14 45.3	−11 44.4	−0.4143	0.6010	0.1184		+ 4	−62
48	Libræ	4.6	1.19	5.0	14 3.4	15 24.7	−11 6.6	−1.0330	0.6010	0.1173		−35	−90
49	Libræ	5.4	+1.19	+ 4.3	−16 18.4	16 15.5	−10 17.7	+1.0958	0.6010	−0.1157		+74	+33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
91 B. Scorpii	6.1	+1.26	+ 5.7	−14 39.3	12 22 25.1	− 4 22.6	−1.2200	0.6013	−0.1046	−55	−90
ϕ Ophiuchi	4.4	1.33	6.0	16 26.6	13 4 27.6	+ 1 25.6	−0.0408	0.6013	0.0931	+22	−37
24 Scorpii	5.0	1.39	6.2	17 35.6	8 35.1	+ 5 23.5	+0.7366	0.6011	0.0851	+73	+ 7
78 B. Ophiuchi	6.5	1.44	7.2	16 41.0	14 20.0	+10 54.9	−0.6286	0.6006	0.0737	−12	−82
90 B. Ophiuchi	6.5	1.46	6.8	18 7.7	15 47.4	−11 41.2	+0.7121	0.6004	0.0708	+72	+ 6
125 B. Ophiuchi	6.2	+1.49	+ 7.5	−17 30.4	19 10.9	− 8 25.7	−0.1389	0.6000	−0.0640	+13	−43
164 B. Ophiuchi	6.0	1.54	8.1	17 40.5	23 49.1	− 3 58.3	−0.2450	0.5993	0.0545	+ 7	−50
192 B. Ophiuchi	6.3	1.58	8.1	18 22.4	14 1 41.8	− 2 10.0	+0.3587	0.5989	0.0507	+42	−15
305 B. Ophiuchi	6.3	1.71	9.4	18 47.2	14 14.8	+ 9 53.7	+0.3052	0.5959	0.0248	+36	−17
64 B. Sagittarii	6.1	1.79	10.4	18 41.0	22 10.9	− 6 28.5	+0.0685	0.5933	0.0086	+20	−31
6 B. Scuti	5.9	+1.78	+10.9	−17 23.9	22 53.0	− 5 47.9	−1.2460	0.5931	−0.0071	−68	−86
52 G. Sagittarii	6.4	1.80	10.5	18 29.4	22 59.0	− 5 42.2	−0.1353	0.5930	0.0069	+ 9	−43
17 H¹. Sagittarii	6.4	1.81	10.5	18 38.8	23 29.3	− 5 13.0	+0.0224	0.5929	0.0059	+17	−34
Y Sagittarii (*var.*)	5.4	1.82	10.6	18 53.6	15 0 34.2	− 4 10.6	+0.2671	0.5924	−0.0037	+31	−20
85 B. Sagittarii	6.0	1.84	11.2	17 50.7	3 15.8	− 1 35.2	−0.8048	0.5915	+0.0017	−30	−90
95 B. Sagittarii	5.7	+1.86	+10.9	−18 46.5	4 10.4	− 0 42.6	+0.1479	0.5911	+0.0036	+24	−26
100 B. Sagittarii	5.0	1.86	11.1	18 27.2	4 41.2	− 0 13.0	−0.1791	0.5909	0.0046	+ 6	−46
171 B. Sagittarii	6.1	2.01	12.1	19 21.3	17 45.4	−11 38.3	+0.9777	0.5853	0.0302	+71	+25
173 B. Sagittarii	6.4	2.01	12.2	19 12.7	17 46.9	−11 36.8	+0.8309	0.5853	0.0303	+71	+14
187 B. Sagittarii	6.4	2.02	12.5	18 51.3	19 28.2	− 9 59.3	+0.5173	0.5845	0.0335	+52	− 6
190 B. Sagittarii	5.4	+2.03	+12.4	−19 24.5	19 56.3	− 9 32.2	+1.1048	0.5843	+0.0344	+71	+36
d Sagittarii	5.0	2.07	12.8	19 5.3	23 52.7	− 5 44.6	+0.9258	0.5824	0.0418	+71	+21
ρ Sagittarii	4.0	2.07	13.4	17 59.4	16 1 36.0	− 4 5.0	−0.1348	0.5816	0.0450	+12	−43
45 Sagittarii	6.0	2.08	13.2	18 26.9	1 39.8	− 4 1.4	+0.3428	0.5815	0.0451	+40	−15
266 B. Sagittarii	6.1	2.15	13.6	19 1.2	7 52.0	+ 1 57.2	+1.2532	0.5784	0.0563	+71	+57
267 B. Sagittarii	5.8	+2.15	+13.8	−18 24.0	8 8.5	+ 2 13.1	+0.6238	0.5782	+0.0567	+63	+ 1
31 B. Capricorni	6.4	2.34	16.1	15 59.6	17 6 46.0	+ 0 2.6	0.1761	0.5661	0.0938	+15	−46
27 G. Capricorni	6.2	2.34	16.6	15 18.6	7 49.5	+ 1 3.9	−0.7945	0.5655	0.0953	−20	−90
47 B. Capricorni	6.2	2.38	16.2	16 47.2	9 48.6	+ 2 58.9	+0.9532	0.5644	0.0982	+74	+22
τ Capricorni	5.2	2.38	16.9	15 13.3	11 30.8	+ 4 37.6	−0.5286	0.5635	0.1007	− 4	−71
61 B. Capricorni	5.9	+2.39	+16.6	−16 23.7	12 4.6	+ 5 10.2	+0.7666	0.5631	+0.1015	+74	+ 9
95 B. Capricorni	5.9	2.15	17.5	14 46.6	20 21.9	−10 49.4	−0.0546	0.5586	0.1128	+24	−38
53 B. Aquarii	6.5	2.52	18.2	13 31.0	18 4 22.8	− 3 4.5	−0.4482	0.5544	0.1229	+ 3	−64
18 Aquarii	5.5	2.55	18.5	13 12.3	8 13.1	+ 0 38.3	−0.3020	0.5524	0.1274	+12	−53
λ Capricorni	5.5	2.63	19.2	11 43.0	18 50.5	+10 55.0	−0.4801	0.5471	0.1388	+ 3	−66
151 B. Capricorni	6.1	+2.64	+18.9	−13 4.6	20 20.6	−11 37.9	+1.1887	0.5464	+0.1402	+77	+42
96 B. Aquarii	6.5	2.65	19.6	10 40.2	22 14.8	− 9 47.2	−1.1260	0.5456	0.1421	−39	−90
150 B. Aquarii	6.0	2.73	20.1	9 25.1	19 9 35.8	+ 1 12.2	−0.8062	0.5405	0.1520	−14	−90
167 G. Aquarii	6.3	2.81	20.3	8 17.5	20 15.1	+11 31.7	−0.3637	0.5363	0.1598	+13	−57
213 B. Aquarii	6.5	2.82	20.2	8 42.5	22 36.1	−10 11.6	+0.4653	0.5355	0.1613	+62	− 9
67 Aquarii	6.4	+2.82	+20.5	− 7 21.6	22 41.9	−10 6.0	−0.9810	0.5354	+0.1614	−24	−90
λ Aquarii	3.8	2.85	20.3	7 59.0	20 3 24.9	− 5 31.4	+0.4629	0.5337	0.1642	+62	− 9
78 Aquarii	6.3	2.86	20.4	7 36.5	4 24.3	− 4 33.9	+0.2178	0.5334	0.1647	+46	−23
81 Aquarii	6.4	2.88	20.3	7 28.2	7 51.8	− 1 12.6	+0.6400	0.5323	0.1666	+78	0
82 Aquarii	6.4	2.89	20.4	6 58.9	8 26.9	− 0 38.6	+0.2077	0.5322	0.1669	+46	−23
URANUS	6.1	. . .	. . .	− 6 59.8	10 31.0	+ 1 21.7	+0.5708	0.5326	+0.1684	+72	− 3
ϕ Aquarii	4.4	+2.93	+20.2	6 27.5	14 27.3	+ 5 11.0	+0.6494	0.5304	0.1697	+79	+ 1
96 Aquarii	5.7	2.96	20.5	5 32.4	17 3.1	+ 7 42.1	+0.0891	0.5297	0.1708	+39	−30
316 B. Aquarii	6.5	2.97	20.6	4 20.0	17 29.8	+ 8 8.1	−1.1520	0.5296	0.1709	−37	−90
317 B. Aquarii	6.3	2.94	20.2	6 19.4	17 43.3	+ 8 21.1	+1.0587	0.5295	0.1710	+84	+28
337 B. Aquarii	6.4	+2.99	+20.2	− 4 56.8	22 16.2	−11 14.0	+0.3376	0.5284	+0.1726	+55	−16

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
342 B. Aquarii	6.5	+3.00	+20.3	− 4 30.2	20 23 17.9	−10 14.2	+0.0299	0.5281	+0.1729	+36	−33
20 Piscium	5.6	3.05	20.3	3 11.0	21 7 48.8	− 1 58.3	+0.0694	0.5263	0.1752	+39	−31
24 Piscium	6 1	3.06	20.0	3 34.7	10 24.5	+ 0 32.8	+0.9565	0.5259	0.1757	+87	+20
80 B. Piscium	6.3	3.12	20.1	0 55.5	16 44.9	+ 6 42.0	−0.8386	0.5249	0.1766	−12	−90
10 Ceti	6.4	3.18	19.4	− 0 28.2	22 4 3.7	− 6 18.7	+0.6620	0.5236	0.1770	+83	+ 2
155 B. Piscium	6.5	+3.27	+18.6	+ 2 58.3	17 3.6	+ 6 18.6	−0.8429	0.5230	+0.1755	−13	−88
77 Piscium	6.4	3.32	17.9	4 30.2	23 0 42.7	−10 15.6	−1.2002	0.5230	0.1738	−41	−86
f Piscium	5.3	3.31	17.2	3 12.8	7 2.4	− 4 6.8	+1.3211	0.5231	0.1718	+83	+60
μ Piscium	5.0	3 39	16.6	5 45.1	13 32.4	+ 2 11.8	−0.3815	0.5235	0.1693	+14	−57
39 B. Arietis	6.5	3.44	14.2	7 22.2	24 7 44.0	− 4 8.0	+0.8229	0.5254	0.1598	+90	+13
64 Ceti	5.8	+3.45	+13.7	+ 8 12.8	11 7.7	− 0 50.3	+0.4253	0.5260	+0.1576	+62	− 9
ξ^1 Ceti	4.5	3.46	13.7	8 29.4	11 58.8	− 0 0.7	+0.2529	0.5261	0.1570	+50	−19
ξ Arietis	5.5	3.50	12.7	10 16.0	18 6.7	+ 5 56.5	−0.7712	0.5270	0.1527	− 8	−80
25 Arietis	6.5	3.48	12.4	9 51.6	19 27.9	+ 7 15.3	−0.1148	0.5273	0.1517	+28	−38
389 B. Ceti	6.3	3.48	12.4	9 13.6	20 35.9	+ 8 21.3	+0.7622	0.5275	0.1508	+90	+11
85 Ceti	6.3	+3.51	+11.4	+10 25.0	25 3 15.4	− 9 11.2	+0.4242	0.5288	+0.1455	+62	− 8
38 Arietis	5.2	3.55	11.0	12 7.5	4 30.6	− 7 58.1	−1.2935	0.5290	0.1444	−58	−78
μ Ceti	4.4	3.51	11.2	9 47.6	4 31.0	− 7 57.7	+1.3014	0.5290	0.1444	+83	+62
147 B. Arietis	5.8	3.56	9.1	12 53.6	15 30.2	+ 2 41.9	−0.6139	0.5313	0.1344	+ 1	−70
8 B. Tauri	6.2	3.53	7.7	12 21.6	26 0 32.8	+11 28.2	+1.1542	0.5333	0.1252	+90	+43
f Tauri	4.3	+3.53	+ 7.1	+12 40.5	3 56.0	− 9 14.8	+1.2206	0.5342	+0.1216	+90	+52
30 B. Tauri	6.4	3.58	6.2	15 10.8	7 23.5	− 5 53.5	−1.1504	0.5350	0.1177	−38	−75
179 B. Tauri	5.9	3.53	3.6	14 57.5	22 19.5	+ 8 35.1	+0.7236	0.5387	0.0998	+90	+15
48 Tauri	6.3	3.52	2.8	15 12.6	27 2 19.0	−11 32.8	+0.8325	0.5396	0.0947	+90	+22
γ Tauri	3.9	3.52	2.4	15 26.6	4 17.8	− 9 37.7	+0.7582	0.5402	0.0921	+90	+18
δ Tauri	3.9	+3.55	+ 1.8	+17 21.8	5 49.0	− 8 9.3	−1.2336	0.5405	+0.0901	−51	−73
63 Tauri	5.7	3.53	1.9	16 36.0	6 4.0	− 7 54.8	−0.3632	0.5406	0.0898	+15	−46
64 Tauri	4.9	3 55	1.7	17 16.0	6 23.4	− 7 36.0	−1.0753	0.5406	0.0894	−32	−73
70 Tauri	6.4	3.51	1.8	15 46.0	7 9.7	− 6 51.1	+0.6579	0.5408	0.0883	+86	+12
71 Tauri	4.6	3.50	1.8	15 26.7	7 31.3	− 6 30.2	+1.0461	0.5409	0.0878	+90	+38
75 Tauri	5.2	+3.50	+ 1.6	+16 11.3	8 32.6	− 5 30.8	+0.3102	0.5412	+0.0864	+54	− 7
θ^1 Tauri	4.2	3.50	1.6	15 47.6	8 36.7	− 5 26.8	+0.7553	0.5412	0.0864	+90	+18
θ^2 Tauri	3.6	3.50	1.6	15 42.1	8 39.4	− 5 24.2	+0.8602	0.5412	0.0863	+90	+25
80 Tauri	5.8	3.49	1.5	15 28.3	9 23.1	− 4 41.9	+1.1780	0.5414	0.0853	+90	+51
264 B. Tauri	4.8	3.50	1.4	16 1.7	9 35.0	− 4 30.3	+0.5777	0.5414	0.0850	+76	+ 8
81 Tauri	5.5	+3.49	+ 1.4	+15 31.6	9 38.0	− 4 27.4	+1.1388	0.5415	+0.0850	+90	+47
85 Tauri	6 0	3.49	1.3	15 41.3	10 13.6	− 3 52.9	+1.0090	0.5416	0.0842	+90	+36
275 B. Tauri	6.5	3.49	1.1	16 9.8	11 5.5	− 3 2.7	+0.5545	0.5418	0.0830	+74	+ 7
α Tauri (*Aldebar.*)	1.1	3.49	0.7	16 21.4	12 12.3	− 1 58.0	+0.4323	0.5421	0.0815	+63	0
89 Tauri	5.8	3.48	0.8	15 52.8	13 18.2	− 0 54.1	+1.0479	0.5424	0.0799	+90	+39
σ^2 Tauri	4.9	+3.47	+ 0.7	+15 46.0	13 51.1	− 0 22.2	+1.2173	0.5425	+0.0792	+90	+56
318 B. Tauri	5.7	3.44	− 1.2	17 2.0	22 38.2	+ 8 8.2	+0.4539	0.5446	0.0666	+65	+ 3
m Tauri	5.0	3.47	2.3	18 32.5	28 3 27.6	−11 11.6	−0.9100	0.5457	0.0595	−19	−72
111 Tauri	5.1	3.36	3.5	17 18.7	11 38.6	− 3 16.3	+0.8853	0.5475	0.0471	+90	+30
115 Tauri	5.3	3.34	3.9	17 53.8	12 57.5	− 1 59.9	+0.3013	0.5478	0.0451	+54	− 3
117 Tauri	6.0	+3.32	− 3.8	+17 10.5	13 22.8	− 1 35.4	+1.1159	0.5479	+0.0444	+90	+49
119 Tauri	4.9	3.34	4.5	18 32.2	15 21.5	+ 0 19.4	−0.3014	0.5483	0.0414	+18	−37
120 Tauri	5.6	3.33	4.6	18 29.1	15 59.2	+ 0 55.9	−0.2187	0.5484	0.0404	+23	−32
130 Tauri	5.6	3.25	5.5	17 42.0	22 36.8	+ 7 20.7	+0.8787	0.5498	0.0299	+90	+32
57 Orionis	5.8	3.26	6.6	19 44.0	29 2 8.3	+10 45.5	−1.2622	0.5504	0.0243	−61	−71
64 Orionis	5.1	+3.22	− 7.3	+19 41.5	6 9.5	− 9 21.3	−1.1290	0.5512	+0.0178	−39	−71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
68 Orionis	5.7	+3.18	− 8.0	+19 48.4	29 10 11.5	− 5 27.1	−1.1959	0.5519	+0.0112	−47	−71
19 B. Geminorum	6.2	3.15	7.8	18 42.0	10 55.8	− 4 44.3	+0.0258	0.5520	0.0100	+36	−15
124 II¹. Orionis	5.7	3.13	7.6	17 55.6	11 22.5	− 4 18.4	+0.8766	0.5521	0.0093	+90	+34
71 Orionis	5.1	3.15	8.1	19 10.9	11 32.0	− 4 9.3	−0.4967	0.5521	0.0090	+ 7	−48
292 B. Orionis	6.5	3.09	8.0	17 47.9	14 38.4	− 1 9.0	+1.0377	0.5527	+0.0039	+90	+46
26 Geminorum	5.2	+2.97	− 9.5	+17 43.1	30 0 26.9	+ 8 20.1	+1.0793	0.5542	−0.0123	+90	+49
74 B. Geminorum	6.2	2.96	10.0	18 16.5	2 45.7	+10 34.4	+0.4393	0.5545	0.0162	+64	+ 7
110 B. Geminorum	6.2	2.86	10.8	17 51.8	9 45.2	− 6 40.1	+0.7321	0.5554	0.0279	+90	+23
162 B. Geminorum	5.7	2.67	12.2	17 14.9	23 21.0	+ 6 28.5	+0.8599	0.5569	0.0505	+90	+29
f Geminorum	5.3	2.63	12.7	17 50.9	31 2 52.6	+ 9 53.1	+0.0239	0.5572	0.0563	+36	−20
g Geminorum	5.0	+2.60	−13.4	+18 41.7	5 55.8	−11 9.8	−1.0677	0.5575	−0.0613	−32	−72
2 B. Cancri	6.0	2.50	13.2	16 43.4	11 39.2	− 5 38.0	+0.6736	0.5580	0.0706	+89	+15
3 Cancri	5.7	2.49	13.6	17 31.0	12 40.9	− 4 38.3	−0.2509	0.5581	0.0723	+21	−37
5 Cancri	5.9	2.48	13.3	16 39.9	13 1.3	− 4 18.7	+0.6377	0.5581	0.0729	+83	+13
ζ Cancri (*mean*)	4.7	+2.42	−14.2	+17 52.6	17 54.8	+ 0 25.0	−1.0350	0.5585	−0.0807	−29	−73

NOVEMBER.

d^2 Cancri	6.2	+2.31	−14.5	+17 17.8	1 0 10.2	+ 6 27.7	−0.9480	0.5590	−0.0905	−22	−73
90 B. Cancri	6.3	2.24	14.1	15 34.6	4 53.4	+11 1.3	+0.4379	0.5594	0.0979	+64	− 1
54 Cancri	6.3	+2.14	−14.4	+15 38.0	11 41.6	− 6 24.3	−0.3229	0.5598	−0.1081	+17	−45
o^1 Cancri	5.1	2.11	14.6	15 36.9	14 31.5	− 3 40.1	−0.6118	0.5601	0.1123	0	−67
o^2 Cancri	5.7	2.11	14.7	15 52.4	14 40.6	− 3 31.3	−0.9051	0.5601	0.1125	−18	−75
81 Cancri	6.4	1.98	14.5	15 18.2	21 24.2	+ 2 58.6	−1.0890	0.5606	0.1221	−32	−75
π Cancri	5.6	1.98	14.8	15 15.5	22 43.3	+ 4 15.0	−1.2024	0.5607	0.1240	−44	−75
18 Leonis	5.8	+1.78	−13.9	+12 9.7	2 12 53.3	− 6 4.0	+0.1469	0.5621	−0.1429	+44	−22
19 Leonis	6.4	1.77	13.8	11 55.3	13 21.8	− 5 36.4	+0.3288	0.5621	0.1435	+55	−12
R Leonis (*var.*)	4.6	1.78	13.8	11 47.0	13 25.2	− 5 33.1	+0.4645	0.5621	0.1435	+65	− 4
ν Leonis	5.0	1.71	14.1	12 48.5	18 14.1	− 0 54.1	−1.3049	0.5627	0.1494	−61	−76
A Leonis	4.6	1.66	13.3	10 22.3	22 37.6	+ 3 20.4	+0.5514	0.5632	0.1546	+72	− 1
44 Leonis	5.9	+1.57	−12.7	+ 9 10.4	3 6 26.6	+10 53.4	+0.5418	0.5643	−0.1632	+71	− 2
45 Leonis	5.8	1.55	13.0	10 9.1	7 30.8	+11 55.3	−0.6395	0.5645	0.1643	0	−75
ρ Leonis	3.8	1.52	12.8	9 42.0	9 50.0	− 9 50.3	−0.5583	0.5649	0.1666	+ 4	−69
49 Leonis	5.7	1.51	12.5	9 2.7	10 50.2	− 8 52.1	−0.0546	0.5650	0.1676	+32	−35
56 Leonis	6.1	1.41	11.4	6 35.6	20 14.0	+ 0 12.1	+0.8312	0.5667	0.1763	+90	+14
c Leonis	5.1	+1.39	−11.3	+ 6 30.7	22 20.3	+ 2 14.1	+0.5398	0.5671	−0.1781	+71	− 4
χ Leonis	4.7	1.34	11.6	7 45.0	4 0 14.7	+ 4 4.4	−1.0585	0.5676	0.1796	−28	−83
σ Leonis	4.1	1.29	10.8	6 26.9	7 23.4	+10 58.2	−1.0375	0.5692	0.1848	−26	−84
80 Leonis	6.4	1.29	10.0	4 16.9	9 28.3	−11 1.2	+0.7664	0.5697	0.1862	+90	+ 9
89 Leonis	5.7	1.25	9.6	3 29.1	13 14.3	− 7 23.1	+0.8617	0.5706	0.1884	+90	+14
β Virginis	3.8	+1.25	− 8.9	+ 2 11.8	20 22.2	− 0 30.4	+0.7965	0.5726	−0.1920	+90	+10
27 B. Virginis	6.5	1.18	8.0	0 57.4	5 0 3.0	+ 3 2.7	+1.3265	0.5737	0.1934	+82	+61
10 Virginis	6.2	1.13	8.2	+ 2 19.7	4 40.1	+ 7 29.9	−0.9412	0.5751	0.1949	−19	−88
13 Virginis	5.9	1.13	7.1	− 0 21.7	8 33.3	+11 14.8	+0.9801	0.5764	0.1958	+90	+22
η Virginis	4.0	1.12	7.1	0 14.5	9 5.5	+11 45.8	+0.7550	0.5766	0.1959	+90	+ 7
γ Virginis (*mean*)	2.9	+1.03	− 6.0	− 1 1.7	18 26.7	− 3 13.3	−0.3012	0.5799	−0.1966	+18	−53
38 Virginis	6.1	1.04	5.1	3 8.2	23 20.0	+ 1 29.3	+0.8227	0.5817	0.1963	+87	+11
k Virginis	5.7	1.04	4.8	3 23.9	6 2 3.9	+ 4 7.2	+0.5449	0.5828	0.1958	+71	− 5
46 Virginis	6.1	+1.03	− 4.8	− 2 57.4	2 27.8	+ 4 30.3	+0.0305	0.5830	−0.1958	+36	−33

NEW MOON.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
125 B. Ophiuchi	6.2	+1.24	+ 7.6	−17 30.4	10 4 53.0	+ 3 4.5	−0.2883	0.6109	−0.0668	+ 6	−53
164 B. Ophiuchi	6.0	1.26	8.1	17 40.5	9 21.7	+ 7 22.3	−0.4003	0.6104	0.0571	− 1	−61
192 B. Ophiuchi	6.3	1.28	8.2	18 22.4	11 10.4	+ 9 6.6	+0.1910	0.6101	0.0532	+31	−24
305 B. Ophiuchi	6.3	1.37	9.4	18 47.2	23 16.6	− 3 16.5	+0.1193	0.6074	0.0267	+25	−28
39 G. Sagittarii	6.3	1.42	9.7	19 51.3	11 5 14.3	+ 2 26.9	+1.0682	0.6055	0.0137	+71	+32
64 B. Sagittarii	6.1	+1.42	+10.2	−18 41.0	6 55.4	+ 4 3.9	−0.1243	0.6049	−0.0100	+ 9	−43
52 G. Sagittarii	6.4	1.43	10.3	18 29.4	7 41.8	+ 4 48.5	−0.3257	0.6016	0.0083	− 2	−56
17 H¹. Sagittarii	6.4	1.44	10.4	18 38.8	8 11.0	+ 5 16.4	−0.1712	0.6045	0.0072	+ 7	−45
Y Sagittarii (*var.*)	5.4	1.44	10.4	18 53.6	9 13.5	+ 6 16.5	+0.0680	0.6041	−0.0050	+20	−31
85 B. Sagittarii	6.0	1.45	10.9	17 50.7	11 49.2	+ 8 45.9	−0.9894	0.6030	+0.0006	−42	−90
95 B. Sagittarii	5.7	+1.48	+10.7	−18 46.5	12 41.8	+ 9 36.6	−0.0537	0.6026	+0.0025	+12	−38
100 B. Sagittarii	5.0	1.47	10.8	18 27.2	13 11.5	+10 5.1	−0.3758	0.6024	0.0035	− 5	−59
171 B. Sagittarii	6.1	1.59	11.7	19 21.3	12 1 47.4	− 1 48.5	+0.7473	0.5962	0.0299	+71	+ 8
173 B. Sagittarii	6.4	1.59	11.8	19 12.7	1 48.8	− 1 47.1	+0.6029	0.5962	0.0300	+58	− 1
187 B. Sagittarii	6.4	1.60	12.0	18 51.3	3 26.5	− 0 13.2	+0.2928	0.5953	0.0333	+36	−18
190 B. Sagittarii	5.4	+1.60	+11.9	−19 24.5	3 53.6	+ 0 12.8	+0.8702	0.5951	+0.0342	+71	+17
d Sagittarii	5.0	1.64	12.3	19 5.3	7 41.8	+ 3 52.3	+0.6905	0.5929	0.0418	+68	+ 5
226 B. Sagittarii	6.4	1.65	12.3	19 22.6	9 19.1	+ 5 25.9	+1.0550	0.5920	0.0419	+71	+31
ρ Sagittarii	4.0	1.64	12.7	17 59.4	9 21.5	+ 5 28.2	−0.3547	0.5920	0.0450	0	−58
45 Sagittarii	6.0	1.65	12.5	18 26.9	9 25.2	+ 5 31.7	+0.1152	0.5919	0.0451	+26	−28
266 B. Sagittarii	6.1	+1.70	+12.8	−19 1.2	15 24.7	+11 17.6	+1.0062	0.5882	+0.0566	+71	+27
267 B. Sagittarii	5.8	1.70	13.1	18 24.0	15 40.7	+11 33.1	+0.3864	0.5881	0.0571	+44	−13
31 B. Capricorni	6.4	1.89	15.1	15 59.6	13 13 36.8	+ 8 40.9	−0.4158	0.5736	0.0948	+ 2	−62
27 G. Capricorni	6.2	1.89	15.3	15 18.6	14 38.5	+ 9 40.4	−1.0264	0.5728	0.0964	−36	−90
47 B. Capricorni	6.2	1.93	14.9	16 47.2	16 34.4	+11 32.2	+0.6974	0.5715	0.0994	+73	+ 5
τ Capricorni	5.2	+1.93	+15.6	−15 13.3	18 13.9	−10 51.8	− 0.7657	0.5704	+0.1018	−18	−90
61 B. Capricorni	5.9	1.94	15.3	16 23.7	18 46.8	−10 20.1	+0.5126	0.5700	0.1026	+58	− 6
94 B. Capricorni	5.7	2.02	15.5	16 19.4	14 2 23.2	− 2 59.6	+1.2656	0.5648	0.1134	+74	+55
95 B. Capricorni	5.9	2.01	16.0	14 46.6	2 51.9	− 2 31.9	−0.3004	0.5645	0.1141	+10	−54
53 B. Aquarii	6.5	2.09	16.7	13 31.1	10 42.3	+ 5 2.5	−0.6909	0.5593	0.1242	−11	−90
18 Aquarii	5.5	+2.12	+16.9	−13 12.3	14 28.0	+ 8 40.6	−0.5465	0.5568	+0.1287	− 2	−72
λ Capricorni	5.5	2.22	17.5	11 43.0	15 0 54.3	− 5 13.8	− 0.7220	0.5503	0.1401	−10	−90
151 B. Capricorni	6.1	2.24	17.1	13 4.7	2 23.1	− 3 47.9	+0.9324	0.5494	0.1415	+77	+19
e Aquarii	5.4	2.33	17.5	11 56.4	12 25.0	+ 5 54.7	+1.1917	0.5436	0.1507	+79	+41
150 B. Aquarii	6.0	2.36	18.3	9 25.1	15 28.2	+ 8 52.0	−1.0412	0.5420	0.1532	−30	−90
167 G. Aquarii	6.3	+2.47	+18.5	− 8 17.6	16 2 2.0	− 4 54.0	− 0.5956	0.5366	+0.1609	0	−76
213 B. Aquarii	6.5	2.49	18.4	8 42.6	4 22.0	− 2 38.3	+0.2306	0.5356	0.1624	+46	−22
67 Aquarii	6.4	2.49	18.8	7 21.7	4 27.9	− 2 32.6	− 1.2078	0.5356	0.1624	−44	−90
λ Aquarii	3.8	2.53	18.5	7 59.1	9 9.2	+ 2 0.2	+0.2325	0.5335	0.1652	+47	−22
78 Aquarii	6.3	2.54	18.5	7 36.5	10 8.4	+ 2 57.6	−0.0105	0.5331	0.1657	+33	−36
81 Aquarii	6.4	+2.57	+18.5	− 7 28.2	13 35.1	+ 6 18.0	+0.4131	0.5317	+0.1675	+59	−12
82 Aquarii	6.4	2.58	18.6	6 59.0	14 10.1	+ 6 51.9	−0.0167	0.5315	0.1678	+33	−36
URANUS	6.1	. . .	. . .	7 9.3	15 22.5	+ 8 2.1	+0.3732	0.5314	0.1685	+56	−15
ϕ Aquarii	4.4	2.64	18.4	6 27.6	20 9.5	−11 19.5	+0.4297	0.5292	0.1705	+61	−11
96 Aquarii	5.7	2.68	18.7	5 32.4	22 45.1	− 8 48.6	−0.1257	0.5283	0.1716	+27	−42
317 B Aquarii	6.3	+2.66	+18.4	− 6 19.4	23 25.2	− 8 9.7	+0.8415	0.5281	+0.1718	+84	+12
337 B Aquarii	6.4	2.73	18.5	4 56.8	17 3 58.0	− 3 44.8	+0.1283	0.5267	0.1735	+42	−28
342 B Aquarii	6.5	2.74	18.6	4 30.2	4 59.8	− 2 44.9	−0.1771	0.5264	0.1738	+25	−45
20 Piscium	5.6	2.82	18.7	3 11.1	13 31.2	+ 5 31.5	−0.1264	0.5241	0.1760	+28	−42
24 Piscium	6.1	2.84	18.4	3 34.7	16 7.3	+ 8 3.1	+0.7629	0.5236	0.1765	+87	+ 7
80 B Piscium	6.3	+2.92	+18.7	− 0 55.5	22 28.9	− 9 46.5	−1.0200	0.5223	+0.1773	−25	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1923.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'		N.	S.
			s	"	° ′	d h m	h m					°	°
10	Ceti	6.4	+3.03	+18.0	− 0 28.2	18 9 50.4	+ 1 15.3	+0.4978	0.5208	+0.1778		+67	− 8
155 B.	Piscium	6.5	3.17	17.6	+ 2 58.3	22 51.4	−10 3.2	−0.9831	0.5200	0.1765		−22	−88
77	Piscium	6.4	3.26	17.1	4 30.2	19 6 36.2	− 2 34.6	−1.3256	0.5201	0.1748		−60	−81
f	Piscium	5.3	3.28	16.1	3 12.8	12 58.0	+ 3 36.2	+1.2089	0.5204	0.1730		+90	+42
μ	Piscium	5.0	3.39	15.9	5 45.1	19 30.2	+ 9 57.2	−0.4807	0.5209	0.1706		+ 9	−65
ν	Piscium	4.7	+3.40	+15.0	+ 5 6.2	20 1 28.1	− 8 15.3	+1.2502	0.5216	+0.1680		+90	+48
39 B.	Arietis	6.5	3.53	13.7	7 22.2	13 47.1	+ 3 42.5	+0.7638	0.5235	0.1614		+90	+10
64	Ceti	5.8	3.56	13.3	8 12.8	17 11.6	+ 7 1.0	+0.3736	0.5242	0.1593		+58	−12
ξ^1	Ceti	4.5	3.57	13.3	8 29.4	18 3.0	+ 7 50.9	+0.2030	0.5244	0.1587		+47	−21
ξ	Arietis	5.5	3.65	12.6	10 16.0	21 0 12.1	−10 10.8	−0.8076	0.5257	0.1545		−10	−80
25	Arietis	6.5	+3.63	+12.1	+ 9 51.6	1 33.5	− 8 51.8	−0.1480	0.5259	+0.1535		+27	−40
389 B.	Ceti	6.3	3.64	12.0	9 13.6	2 41.7	− 7 45.6	+0.7318	0.5262	0.1527		+90	+ 9
85	Ceti	6.3	3.70	11.1	10 25.0	9 22.0	− 1 17.1	+0.4088	0.5278	0.1475		+61	− 9
38	Arietis	5.2	3.75	11.0	12 7.5	10 37.4	− 0 3.9	−1.3061	0.5281	0.1464		−60	−77
μ	Ceti	4.4	3.71	10.8	9 47.6	10 37.9	− 0 3.4	+1.2889	0.5281	0.1464		+86	+59
147 B.	Arietis	5.8	+3.82	+ 9.2	+12 53.6	21 37.7	+10 36.9	−0.6015	0.5311	+0.1366		+ 2	−69
8 B.	Tauri	6.2	3.83	7.5	12 21.6	22 6 40.1	− 4 37.0	+1.1867	0.5336	0.1276		+90	+47
f	Tauri	4.3	3.85	7.0	12 40.5	10 3.1	− 1 20.2	+1.2605	0.5346	0.1239		+89	+57
30 B.	Tauri	6.1	3.93	6.4	15 10.8	13 30.2	+ 2 0.7	−1.1018	0.5356	0.1201		−33	−75
179 B.	Tauri	5.9	3.95	3.4	14 57.5	23 4 23.9	− 7 33.1	+0.8042	0.5401	0.1023		+90	+19
48	Tauri	6.3	+3.96	+ 2.7	+15 12.6	8 22.5	− 3 41.9	+0.9217	0.5412	+0.0972		+90	+28
γ	Tauri	3.9	3.96	2.2	15 26.6	10 20.9	− 1 47.2	+0.8516	0.5418	0.0946		+90	+23
δ	Tauri	3.9	4.02	1.9	17 21.8	11 51.7	− 0 19.3	−1 1361	0.5423	0.0926		−38	−73
63	Tauri	5.7	4.00	1.9	16 36.0	12 6.6	− 0 4.8	−0.2655	0.5423	0.0922		+20	−40
64	Tauri	4.9	4.02	1.8	17 16.0	12 25.9	+ 0 13.9	−0.9765	0.5424	0.0918		−23	−73
70	Tauri	6.4	+3.97	+ 1.7	+15 46.0	13 12.0	+ 0 58.6	+0.7574	0.5426	+0.0908		+90	+18
71	Tauri	4.6	3.96	1.6	15 26.7	13 33.5	+ 1 19.4	+1.1462	0.5429	0.0903		+90	+47
75	Tauri	5.2	3.98	1.4	16 11.3	14 34.6	+ 2 18.6	+0.4127	0.5430	0.0889		+62	− 2
θ^1	Tauri	4.2	3.97	1.4	15 47.6	14 38.6	+ 2 22.5	+0.8578	0.5430	0.0888		+90	+24
θ^2	Tauri	3.6	3.97	1.4	15 42.1	14 41.3	+ 2 25.1	+0.9628	0.5430	0.0887		+90	+32
80	Tauri	5.8	+3.96	+ 1.3	+15 28.3	15 24.9	+ 3 7.3	+1.2820	0.5433	+0.0877		+79	+68
264 B.	Tauri	4.8	3.98	1.2	16 1.7	15 36.7	+ 3 18.8	+0.6824	0.5433	0.0875		+90	+14
81	Tauri	5.5	3.96	1.2	15 31.6	15 39.7	+ 3 21.7	+1.2433	0.5434	0.0874		+90	+59
85	Tauri	6.0	3.97	1.1	15 41.3	16 15.1	+ 3 56.0	+1.1148	0.5435	0.0866		+90	+44
119 H^1.	Tauri	6.2	4.02	0.8	17 51.3	17 2.8	+ 4 42.1	−1.2187	0.5437	0.0855		−48	−73
275 B.	Tauri	6.5	+3.98	+ 0.9	+16 9.8	17 6.8	+ 4 46.0	+0.6623	0.5437	+0.0854		+87	+13
α	Tauri (*Aldebar.*)	1.1	3.98	0.5	16 21.4	18 13.3	+ 5 50.4	+0.5425	0.5440	0.0839		+73	+ 6
89	Tauri	5.8	3.97	+ 0.4	15 52.8	19 18.9	+ 6 54.0	+1.1601	0.5444	0.0823		+90	+49
318 B.	Tauri	5.7	3.98	− 1.5	17 2.0	24 4 36.2	− 8 6.3	+0.5854	0.5468	0.0690		+77	+10
m	Tauri	5.0	4.05	2.6	18 32.5	9 24.1	− 3 27.7	−0.7688	0.5480	0.0618		− 9	−72
111	Tauri	5.1	+3.97	− 4.2	+17 18.7	17 32.7	+ 4 25.3	+1.0423	0.5500	+0.0493		+90	+42
115	Tauri	5.3	3.96	4.5	17 53.8	18 51.2	+ 5 41.3	+0.4607	0.5502	0.0473		+66	+ 5
117	Tauri	6.0	3.94	4.6	17 10.5	19 16.3	+ 6 5.6	+1.2763	0.5503	0.0466		+75	+71
119	Tauri	4.9	3.97	5.0	18 32.2	21 14.4	+ 7 59.8	−0.1377	0.5508	0.0435		+27	−28
120	Tauri	5.6	3.97	5.2	18 29.1	21 51.9	+ 8 36.1	−0.0539	0.5509	0.0425		+32	−23
130	Tauri	5.6	+3.91	− 6.4	+17 42.0	25 4 27.7	− 9 1.0	+1.0563	0.5522	+0.0319		+90	+45
	B. D. +19°1110	6.0	3.95	7.2	19 50.8	6 45.9	− 6 47.3	−1.2381	0.5526	0.0282		−54	−71
57	Orionis	5.8	3.94	7.4	19 44.0	7 58.2	− 5 37.4	−1.0803	0.5528	0.0262		−33	−71
64	Orionis	5.1	3.92	8.2	19 41.4	11 58.5	− 1 44.9	−0.9403	0.5534	0.0196		−22	−71
68	Orionis	5.7	3.90	9.0	19 48.4	15 59.7	+ 2 8.4	−1.0008	0.5540	0.0130		−26	−71
19 B.	Geminorum	6.2	+3.86	− 9.0	+18 41.9	16 43.8	+ 2 51.0	+0.2240	0.5541	+0.0117		+49	− 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

Name.	Mag.	Red'ns from 1923.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	Limiting Parallels. N.	S.
		s	″	° ′	d h m	h m				°	°
124 H¹. Orionis	5.7	+3.84	− 8.9	+17 55.6	**25** 17 10.4	+ 3 16.8	+1.0769	0.5512	+0.0110	+90	+48
71 Orionis	5.1	3.86	9.3	19 10.9	17 19.9	+ 3 25.9	−0.2981	0.5512	0.0108	+18	−34
2γ2 B. Orionis	6.5	3.81	9.4	17 47.9	20 25.8	+ 6 25.8	+1.2439	0.5546	+0.0056	+86	+67
74 B. Geminorum	6.2	3.72	11.7	18 16.5	**26** 8 31.8	− 5 52.2	+0.6637	0.5558	−0.0147	+88	+20
110 B. Geminorum	6.2	3.65	12 8	17 51.7	15 31.4	+ 0 53.6	+0.9680	0.5563	0.0265	+90	+38
162 B. Geminorum	5.7	+3.50	−14.8	+17 14.8	**27** 5 9.2	− 9 55.9	+1.1154	0.5567	−0.0492	+90	+48
f Geminorum	5.3	3.47	15.1	17 50.8	8 42.0	− 6 30.2	+0.2792	0.5567	0.0551	+52	− 6
g Geminorum	5.0	3.44	16.1	18 41.7	11 46.2	− 3 32.1	−0.8156	0.5567	0.0601	−13	−72
2 B. Cancri	6.0	3.34	16.2	16 43.4	17 32.1	+ 2 2.3	+0.9430	0.5566	0.0695	+90	+32
3 Cancri	5.7	3.34	16.6	17 31.0	18 34.3	+ 3 2.5	+0.0131	0.5566	0.0711	+36	−22
5 Cancri	5.9	+3.33	−16.4	+16 39.9	18 54.8	+ 3 22.2	+0.9084	0.5566	−0.0716	+90	+30
ζ Cancri (*mean*)	4.7	3.29	17 1	17 52.6	23 51.2	+ 8 8.7	−0.7722	0.5564	0.0795	− 9	−73
d^2 Cancri	6.2	3.18	18.0	17 17.8	**28** 6 10.8	− 9 44.3	−0.6798	0.5562	0.0893	− 3	−70
90 B. Cancri	6.3	3.11	17.8	15 31.6	10 57.8	5 6.9	+0.7220	0.5560	0.0965	+90	+15
54 Cancri	6.3	3.01	18 3	15 37.9	17 52.3	+ 1 33.8	−0.0418	0.5556	0.1067	+33	−29
o^1 Cancri	5.1	+2 98	−18.5	+15 36.8	20 45.1	+ 4 20.9	−0.3353	0.5555	−0.1108	+17	−46
o^2 Cancri	5.7	2.98	18.6	15 52.4	20 51.1	+ 4 29.9	−0.6286	0.5555	0.1111	0	−68
81 Cancri	6.4	2.85	18.7	15 18 1	**29** 3 45.6	+11 7.5	−0.8124	0.5552	0.1206	−11	−75
π Cancri	5.6	2.86	19.0	15 15.4	5 6.3	−11 34.5	0.9269	0.5552	0.1224	−19	−75
18 Leonis	5.8	2.65	18.6	12 9.6	19 36.2	+ 2 26.5	+0.4416	0.5548	0.1410	+64	− 6
19 Leonis	6.4	+2.64	−18.5	+11 55.2	20 5.4	+ 2 54.8	+0.6260	0.5548	−0.1415	+80	+ 5
R Leonis (*var.*)	4.6	2.64	18 5	11 46.9	20 8.9	+ 2 58.1	+0.7636	0.5548	0.1416	+90	+13
ν Leonis	5.0	2.57	18.9	12 48.4	**30** 1 5.6	+ 7 45.0	−1.0312	0.5548	0.1474	−26	−78
A Leonis	4.6	2 50	18 2	10 22.2	5 36.6	−11 53.1	+0.8514	0.5548	0.1525	+90	+17
α Leonis (*Reg.*)	1 3	2.49	18.8	12 20.3	5 49.2	−11 40.8	−1.2456	0.5548	0.1527	−48	−78
44 Leonis	5.9	+2.40	−17.7	+ 9 10.3	13 39 8	− 4 5.9	+0.8397	0.5551	−0.1609	+90	+15
45 Leonis	5.8	2 39	18.0	10 9.0	14 46.2	− 3 1.7	−0.3606	0.5552	0.1620	+15	−54
ρ Leonis	3 8	2.36	17.8	9 41.9	17 9.9	− 0 42.8	−0.2795	0.5553	0.1643	+20	−49
49 Leonis	5.7	+2.34	−17.6	+ 9 2.6	18 12.1	+ 0 17.4	+0.2318	0.5554	−0.1653	+49	−20

DECEMBER.

56 Leonis	6.1	+2.22	−16.5	+ 6 35.5	**1** 3 55.0	+ 9 40.7	+1.1260	0.5562	−0.1738	+90	+35
c Leonis	5 1	2.20	16.4	6 30.7	6 5.8	+11 47.3	+0.8280	0.5566	0.1755	+90	+13
χ Leonis	4.7	2.15	16.8	7 44.9	8 4.3	−10 18.2	−0.7990	0.5568	0.1770	−10	−83
σ Leonis	4.1	+2.08	−16.0	+ 6 26.8	15 28.8	− 3 8.6	−0.7854	0.5580	−0.1822	− 9	−84
80 Leonis	6.4	2.06	15.1	4 16.8	17 38.3	− 1 3.4	+1.0473	0.5583	0.1835	+90	+28
89 Leonis	5.7	2.02	14.7	3 29.0	21 32.9	+ 2 43.2	+1.1396	0.5591	0.1858	+90	+35
β Virginis	3.8	2.00	13.9	2 11.7	**2** 4 57.2	+ 9 52.5	+1.0634	0.5608	0.1893	+90	+28
10 Virginis	6.2	1.85	13.2	+ 2 19.6	13 34.3	− 5 48.1	−0.7180	0.5632	0.1924	− 5	−88
13 Virginis	5.9	+1.84	−11.8	− 0 21.8	17 36.5	− 1 54.2	+1.2294	0.5645	−0.1934	+90	+44
η Virginis	4.0	1.83	11.8	0 14.5	18 9.9	− 1 21.9	+0.9995	0.5647	0.1935	+90	+23
γ Virginis (*mean*)	2.9	1.70	10.6	1 1.8	**3** 3 52.6	+ 8 0.6	−0.0931	0.5682	0.1946	+30	−40
38 Virginis	6.1	1.70	9.4	3 8.2	8 56.7	−11 5.9	+1.0385	0.5702	0.1944	+87	+26
k Virginis	5.7	1.69	9.0	3 24.0	11 46.6	− 8 22.0	+0.7500	0.5713	0.1939	+87	+ 6
46 Virginis	6.1	+1.68	− 9.1	− 2 57.4	12 11.4	− 7 58.1	+0.2267	0.5715	−0.1939	+48	−23
48 Virginis	6.5	1.67	8.9	3 15.1	13 38.2	− 6 34.4	+0.2409	0.5722	0.1937	+49	−22
65 Virginis	6.0	1.60	7.5	4 31.4	22 3.3	+ 1 32.8	−0.1097	0.5760	0.1914	+28	−41
66 Virginis	5.7	1.62	7.4	4 45.8	22 34.9	+ 2 3.2	+0.0287	0.5762	0.1913	+36	−34
72 Virginis	6.1	1.60	6.7	6 4.5	**4** 1 6.3	+ 4 29.2	+0.8533	0.5775	0.1902	+84	+13
l Virginis	4.8	+1.58	− 6.7	− 5 51.6	1 46.2	+ 5 7.6	+0.5130	0.5778	−0.1900	+67	− 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S						AT CONJUNCTION IN R. A.						
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels.	
		$\Delta\alpha$	$\Delta\delta$							N.	S.
		s	"	° ′	d h m	h m				°	°
80 Virginis	5.6	+1.57	− 6.7	− 5 0.4	4 3 17.6	+ 6 35.7	−0.6260	0.5785	−0.1892	0	−79
566 B. Virginis	6.4	1.53	6.3	5 6.8	6 52.1	+10 2.4	−1.1917	0.5803	0.1875	−41	−90
88 Virginis	6.5	1.54	5.7	6 27.3	8 43.6	+11 49.8	−0.2056	0.5813	0.1863	+23	−47
598 B. Virginis	6.1	1.53	5.1	7 40.9	11 32.6	− 9 27.4	+0.4885	0.5827	0.1846	+65	− 8
623 B. Virginis	6.5	1.52	4.2	8 53.4	15 28.6	− 5 40.1	+0.9628	0.5848	0.1819	+82	+21
95 Virginis	5.4	+1.51	− 4.1	− 8 56.9	16 27.9	− 4 43.0	+0.8409	0.5853	−0.1811	+82	+12
13 Libræ	5.7	1.42	0.8	11 35.1	5 12 1.8	− 9 53.4	+0.0739	0.5957	0.1615	+35	−31
ξ^2 Libræ	5.6	1.41	− 0.8	11 6.0	12 59.7	− 8 57.8	−0.5587	0.5962	−0.1603	0	−73
				NEW	*MOON.*						
187 B. Sagittarii	6.4	+1.43	+11.5	−18 51.3	9 13 42.2	+11 50.6	+0.1013	0.6052	+0.0318	+24	−30
190 B. Sagittarii	5.4	1.44	11.5	19 24.5	14 8.5	−11 44.2	+0.6705	0.6050	0.0327	+65	+ 3
195 B. Sagittarii	6.3	1.44	11.4	19 55.4	14 44.0	−11 10.1	+1.2055	0.6047	0 0340	+71	+48
d Sagittarii	5.0	1.45	11.8	19 5.3	17 49.7	− 8 11.8	+0.4848	0.6031	0.0405	+50	− 8
226 B. Sagittarii	6.4	1.46	11.9	19 22.6	19 24.0	− 6 41.1	+0.8411	0.6023	0.0438	+71	+14
ρ Sagittarii	4.0	+1.44	+12.2	−17 59.4	19 26.4	− 6 38.8	−0.5503	0.6022	+0.0439	−11	−74
45 Sagittarii	6.0	1.46	12.0	18 26.9	19 29.9	− 6 35.5	−0.0866	0.6022	0.0440	+11	−40
266 B. Sagittarii	6.1	1.48	12.3	19 1.2	10 1 18.1	− 1 0.9	+0.7892	0.5989	0.0558	+71	+10
267 B. Sagittarii	5.8	1.48	12.5	18 21.0	1 33.5	− 0 46.0	+0.1685	0.5987	0.0563	+30	−26
31 B. Capricorni	6.4	1.60	14.1	15 59.6	22 45.4	− 4 22.5	−0.6610	0.5844	0.0953	−12	−87
27 G. Capricorni	6.2	+1.60	+14.2	−15 18.7	23 45.1	− 3 25.0	−1.2642	0.5836	+0.0969	−63	−85
47 B. Capricorni	6.2	1.63	13.9	16 47.3	11 1 36.9	− 1 37.3	+0.4311	0 5823	0.1000	+51	−11
τ Capricorni	5.2	1.63	14.4	15 13.3	3 13.0	− 0 4.8	−1.0128	0.5811	0.1025	−35	−90
61 B. Capricorni	5.9	1.63	14.2	16 23.7	3 44.8	+ 0 25.9	+0.2457	0.5807	0.1034	+39	−21
94 B. Capricorni	5.7	1.70	14.4	16 19.5	11 5.6	+ 7 30.7	+0.9768	0.5753	0.1145	+74	+23
95 B. Capricorni	5.9	+1.69	+14.8	−14 46.6	11 33.4	+ 7 57.5	−0.5666	0.5749	+0.1151	− 5	−75
29 Capricorni	5.5	1.75	14.7	15 29.3	19 0.4	− 8 51.3	+1.0667	0.5694	0.1254	+75	+30
53 B. Aquarii	6.5	1.75	15.2	13 31.1	19 8.0	− 8 44.0	−0.9612	0.5692	0.1255	−28	−90
18 Aquarii	5.5	1.79	15.4	13 12.3	22 46.3	− 5 13.3	−0.8232	0.5665	0.1301	−18	−90
λ Capricorni	5.5	1.87	15.9	11 43.0	12 8 52.8	+ 4 32.5	−1.0069	0.5591	0.1418	−29	−90
151 B. Capricorni	6.1	+1.88	+15.5	−13 4.7	10 18.8	+ 5 55.5	+0.6231	0.5581	+0.1433	+71	0
e Aquarii	5.4	1.98	15.7	11 56.4	20 3.0	− 8 39.6	+0 8723	0.5514	0.1526	+79	+15
167 G. Aquarii	6.3	2.11	16.6	8 17.6	13 9 18.6	+ 4 10.3	− 0.8983	0.5431	0.1628	−19	−90
213 B. Aquarii	6.5	2.14	16.4	8 42.6	11 35.3	+ 6 22.7	−0.0826	0.5417	0.1643	+28	−40
λ Aquarii	3.8	2.19	16.5	7 59.1	16 15.9	+10 54.6	−0.0815	0.5391	0.1670	+29	−40
78 Aquarii	6.3	+2.20	+16.5	− 7 36.6	17 13.7	+11 50.5	−0.3218	0.5386	+0.1676	+16	−55
81 Aquarii	6.4	2.23	16.4	7 28.2	20 36.0	− 8 53.4	+0.0970	0.5368	0.1693	+39	−30
82 Aquarii	6.4	2.24	16.6	6 59.0	21 10.2	− 8 20.3	−0.3282	0.5365	0.1697	+16	−55
h Aquarii	5.4	2.26	16.2	8 6.3	22 27.7	− 7 5.2	+1.0944	0.5358	0.1703	+82	+31
URANUS	6.2	. . .	. . .	7 4.6	22 38.1	− 6 55.1	+0.0213	0.5351	0.1701	+35	−34
ϕ Aquarii	4.4	+2.31	+16.3	− 6 27.6	14 3 2.6	− 2 38.8	+0.1141	0.5336	+0.1724	+41	29
96 Aquarii	5.7	2.35	16.7	5 32.4	5 35.3	− 0 10.7	−0.4353	0.5324	0.1734	+10	−63
317 B. Aquarii	6.3	2.33	16.3	6 19.5	6 14.7	+ 0 27.4	+0.5227	0.5321	0.1736	+68	− 7
337 B. Aquarii	6.4	2.41	16.4	4 56.9	10 42.9	+ 4 47.6	−0.1823	0.5302	0.1752	+24	−46
342 B. Aquarii	6.5	2.42	16.5	4 30.2	11 43.6	+ 5 46.4	−0.4846	0.5297	0.1755	+ 8	−66
20 Piscium	5.6	+2.51	+16.6	− 3 11.1	20 7.6	−10 4.6	−0.4305	0.5266	+0.1775	+11	−62
24 Piscium	6.1	2.54	16.3	3 34.7	22 41.7	− 7 35.1	+0.4532	0.5258	0.1780	+63	−10
29 Piscium	5.1	2.58	16.0	3 27.1	15 3 18.1	− 3 6.8	+1.1384	0.5244	0.1786	+87	+34
80 B. Piscium	6.3	2.63	16.7	0 55.6	4 59.0	− 1 28.9	−1.3118	0.5239	0.1788	−57	−86
4 Ceti	6.3	2.62	15.9	2 58.4	6 22.4	− 0 7.9	+1.1674	0.5235	0.1789	+88	+37
5 Ceti	6.3	+2.62	+16.0	− 2 52.3	6 37.0	+ 0 6.3	+1.1006	0.5235	+0.1789	+88	+31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.						
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	Limiting Parallels.	
		$\Delta\alpha$	$\Delta\delta$							N.	S.
		s	"	° ′	d h m	h m				°	°
10 Ceti	6.4	+2.76	+16.0	− 0 28.3	15 16 14.6	+ 9 27.1	+0.2058	0.5213	+0.1791	+47	−24
155 B. Piscium	6.5	2.94	15.8	+ 2 58.3	16 5 14.6	− 1 55.5	−1.2522	0.5195	0.1776	−46	−88
f Piscium	5.3	3.08	14.4	3 12.8	19 16.6	+11 42.3	+0.9513	0.5190	0.1741	+90	+20
μ Piscium	5.0	3.22	14.4	5 45.1	17 1 48.7	− 5 56.8	−0.7220	0.5192	0.1717	− 5	−85
ν Piscium	4.7	3.24	13.4	5 6.1	7 47.0	− 0 8.8	+1.0145	0.5197	0.1691	+90	+25
39 B. Arietis	6.5	+3.41	+12.3	+ 7 22.2	20 7.6	+11 50.5	+0.5531	0.5212	+0.1627	+72	− 3
64 Ceti	5.8	3.45	12.0	8 12.8	23 32.7	− 8 50.3	+0.1706	0.5219	0.1605	+45	−24
ξ^1 Ceti	4.5	3.48	12.0	8 29.4	18 0 24.2	− 8 0.4	+0.0020	0.5220	0.1600	+35	−33
ξ Arietis	5.5	3.58	11.6	10 15.9	6 34.5	− 2 0.8	−0.9941	0.5233	0.1559	−23	−80
25 Arietis	6.5	3.56	11.0	9 51.6	7 56.2	− 0 41.6	−0.3328	0.5236	0.1549	+16	−52
389 B. Ceti	6.3	+3.58	+10.9	+ 9 13.5	9 4.6	+ 0 24.9	+0.5481	0.5239	+0.1541	+72	− 2
85 Ceti	6.3	3.66	10.1	10 25.0	15 46.3	+ 6 54.8	+0.2401	0.5255	0.1489	+49	−18
μ Ceti	4.4	3.68	9.7	9 47.6	17 2.4	+ 8 8.7	+1.1217	0.5259	0.1479	+90	+37
147 B. Arietis	5.8	3.83	8.5	12 53.6	19 4 4.3	− 5 9.0	−0.7410	0.5290	0.1383	− 6	−78
8 B. Tauri	6.2	3.89	6.7	12 21.6	13 8.1	+ 3 38.5	+1.0657	0.5319	0.1294	+90	+35
f Tauri	4.3	+3.93	+ 6.1	+12 40.5	16 31.5	+ 6 55.7	+1.1474	0.5330	+0.1259	+90	+42
30 B. Tauri	6.4	4.02	6.0	15 10.8	19 59.0	+10 17.0	−1.2032	0.5343	0.1222	−44	−75
179 B. Tauri	5.9	4.12	2.8	14 57.5	20 10 53.1	+ 0 43.7	+0.7357	0.5395	0.1046	+90	+15
48 Tauri	6.3	4.15	2.0	15 12.6	14 51.5	+ 4 34.6	+0.8625	0.5409	0.0995	+90	+23
γ Tauri	3.9	4.17	1.7	15 26.6	16 49.8	+ 6 29.3	+0.7973	0.5416	0.0970	+90	+20
δ Tauri	3.9	+4.23	+ 1.6	+17 21.8	18 20.4	+ 7 57.0	−1.1826	0.5422	+0.0950	−43	−73
63 Tauri	5.7	4.21	1.4	16 35.9	18 35.3	+ 8 11.5	−0.3133	0.5423	0.0946	+18	−43
64 Tauri	4.9	4.23	1.4	17 16.0	18 54.6	+ 8 30.2	−1.0220	0.5424	0.0942	−27	−73
70 Tauri	6.4	4.19	1.1	15 46 0	19 40.6	+ 9 14.7	+0.7102	0.5426	0.0932	+90	+15
71 Tauri	4.6	4.18	1.0	15 26.7	20 2.1	+ 9 35.6	+1.0990	0.5428	0.0927	+90	+42
75 Tauri	5.2	+4.20	+ 0.9	+16 11.3	21 3.0	+10 34.5	+0.3695	0.5431	+0.0913	+59	− 5
θ^1 Tauri	4.2	4.20	0.8	15 47.6	21 7.1	+10 38.6	+0.8138	0.5432	0.0912	+90	+21
θ^2 Tauri	3.6	4.20	0.8	15 42.1	21 9.7	+10 41.1	+0.9186	0.5432	0.0912	+90	+28
80 Tauri	5.8	4.19	0.6	15 28.3	21 53.2	+11 23.2	+1.2390	0.5434	0.0902	+90	+58
264 B. Tauri	4.8	4.21	0.6	16 1.7	22 5.0	+11 34.6	+0.6411	0.5435	0.0899	+84	+11
81 Tauri	5.5	+4.20	+ 0.5	+15 31.5	22 8.0	+11 37.5	+1.2009	0.5435	+0.0899	+90	+53
85 Tauri	6.0	4.20	0.4	15 41.3	22 43.3	−11 48.3	+1.0742	0.5437	0.0890	+90	+40
119 H^1. Tauri	6.2	4.27	0.5	17 51.3	23 30.9	−11 2.2	−1.2522	0.5440	0.0880	−54	−73
275 B. Tauri	6.5	4.21	+ 0.3	16 9.8	23 34.8	−10 58.4	+0.6247	0.5440	0.0879	+82	+10
α Tauri (*Aldebar.*)	1.1	4.23	− 0.1	16 21.3	21 0 41.2	− 9 54.2	+0.5079	0.5444	0.0863	+70	+ 4
89 Tauri	5.8	+4.22	− 0.2	+15 52.8	1 46.6	− 8 50.8	+1.1267	0.5448	+0.0848	+90	+46
318 B. Tauri	5.7	4.28	2.1	17 2.0	11 1.9	+ 0 6.8	+0.5757	0.5479	0.0715	+76	+ 9
m Tauri	5.0	4.38	3.0	18 32.5	15 48.4	+ 4 44.1	−0.7634	0.5494	0.0644	− 9	−72
111 Tauri	5.1	4.34	4.9	17 18.7	23 54.1	−11 25.9	+1.0621	0.5519	0.0519	+90	+43
115 Tauri	5.3	4.34	5.2	17 53.8	22 1 12.0	−10 10.4	+0.4853	0.5522	0.0498	+68	+ 6
119 Tauri	4.9	+4.36	− 5.7	+18 32.2	3 34.3	− 7 52.8	−0.1057	0.5530	+0.0460	+29	−26
120 Tauri	5.6	4.36	5.8	18 29.1	4 11.5	− 7 16.8	−0.0206	0.5531	0.0450	+34	−21
130 Tauri	5.6	4.34	7.3	17 42.0	10 44.2	− 0 56.9	+1.1015	0.5548	0.0344	+90	+48
B. D. +19°1110	6.0	4.40	7.8	19 50.8	13 1.3	+ 1 15.7	−1.1800	0.5553	0.0307	−44	−71
57 Orionis	5.8	4.40	8.0	19 44.0	14 13.0	+ 2 24.9	−1.0200	0.5557	0.0287	−28	−71
64 Orionis	5.1	+4.39	− 8.9	+19 41.4	18 11.1	+ 6 15.2	−0.8711	0.5565	+0.0221	−17	−71
68 Orionis	5.7	4.39	9.8	19 48.4	22 10.0	+10 6.2	−0.9222	0.5574	0.0154	−20	−71
19 B. Geminorum	6.2	4.36	10.0	18 41.9	22 53.6	+10 48.4	+0.3001	0.5575	0.0142	+54	0
124 H^1. Orionis	5.7	4.34	10.1	17 55.6	23 20.0	+11 13.8	+1.1513	0.5576	0.0134	+90	+55
71 Orionis	5.1	4.36	10.2	19 10.9	23 29.4	+11 23.0	−0.2191	0.5576	+0.0131	+23	−29
74 B. Geminorum	6.2	+4.30	−13.2	+18 16.5	23 14 31.7	+ 1 55.1	+0.7736	0.5599	−0.0126	+90	+27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
110 B. Geminorum	6.2	+4.25	-14.5	+17 51.7	23 21 26.6	+ 8 36.1	+1.0921	0.5605	-0.0245	+90	+49
162 B. Geminorum	5.7	4.16	17.0	17 14.8	24 10 55.1	- 2 22.5	+1.2677	0.5611	0.0476	+80	+68
f Geminorum	5.3	4.15	17.6	17 50.8	14 25.4	+ 1 0.7	+0.4409	0.5610	0.0535	+64	+ 3
g Geminorum	5.0	4.14	18.3	18 41.6	17 27.6	+ 3 56.8	-0.6453	0.5610	0.0586	- 2	-65
2 B. Cancri	6.0	4.06	18.9	16 43.3	23 9.8	+ 9 27.4	+1.1205	0.5608	0.0681	+90	+47
3 Cancri	5.7	+4.07	-19.2	+17 30.9	25 0 11.4	+10 26.9	+0.1945	0.5608	-0.0697	+47	-12
5 Cancri	5.9	4.05	19.1	16 39.8	0 31.7	+10 46.5	+1.0887	0.5608	0.0703	+90	+44
ζ Cancri (*mean*)	4.7	4.04	20.1	17 52.5	5 25.1	- 8 30.0	-0.5799	0.5605	0.0782	+ 3	-61
d^2 Cancri	6.2	3.95	20.9	17 17.7	11 41.2	- 2 26.5	-0.4768	0.5600	0.0882	+ 8	-54
90 B. Cancri	6.3	3.89	21.1	15 34.5	16 25.8	+ 2 8.5	+0.9320	0.5595	0.0955	+90	+29
54 Cancri	6.3	+3.81	-21.8	+15 37.9	23 17.4	+ 8 46.3	+0.1800	0.5588	-0.1058	+46	-16
o^1 Cancri	5.1	3.79	22.1	15 36.8	26 2 9.2	+11 32.4	-0.1092	0.5584	0.1099	+29	-32
o^2 Cancri	5.7	3.79	22.2	15 52.3	2 18.3	+11 41.1	-0.4025	0.5584	0.1101	+13	-51
81 Cancri	6.4	3.67	22.5	15 18.1	9 7.6	- 5 43.2	-0.5769	0.5576	0.1197	+ 3	-65
π Cancri	5.6	3.69	22.9	15 15.3	10 28.0	- 4 25.4	-0.6898	0.5574	0.1215	- 4	-74
18 Leonis	5.8	+3.50	-23.0	+12 9.5	27 0 56.8	+ 9 34.5	+0.7003	0.5556	-0.1401	+90	+ 9
19 Leonis	6.4	3.49	23.0	11 55.1	1 26.0	+10 2.6	+0.8860	0.5556	0.1406	+90	+21
R Leonis (*var.*)	4.6	3.49	23.0	11 46.8	1 29.5	+10 6.0	+1.0241	0.5555	0.1407	+90	+31
ν Leonis	5.0	3.43	23.5	12 48.4	6 27.0	- 9 6.2	-0.7725	0.5550	0.1465	- 8	-78
A Leonis	4.6	3.37	23.0	10 22.1	10 59.0	- 4 43.3	+1.1235	0.5545	0.1515	+90	+38
α Leonis (*Reg.*)	1.3	+3.36	-23.5	+12 20.3	11 11.7	- 4 31.0	-0.9840	0.5545	-0.1517	-23	-78
44 Leonis	5.9	3.28	22.8	9 10.2	19 5.3	+ 3 6.9	+1.1197	0.5538	0.1598	+90	+36
45 Leonis	5.8	3.26	23.1	10 8.9	20 12.2	+ 4 11.7	-0.0874	0.5537	0.1608	+30	-37
ρ Leonis	3.8	3.23	23.0	9 41.8	22 37.2	+ 6 31.9	-0.0041	0.5535	0.1631	+35	-32
49 Leonis	5.7	3.22	22.8	9 2.5	23 40.0	+ 7 32.6	+0.5114	0.5534	0.1641	+69	- 4
c Leonis	5.1	+3.08	-21.9	+ 6 30.6	28 11 42.6	- 4 48.6	+1.1198	0.5529	-0.1740	+90	+35
χ Leonis	4.7	3.03	22.3	7 44.8	13 42.9	- 2 52.2	-0.5214	0.5529	0.1754	+ 7	-67
σ Leonis	4.1	2.96	21.6	6 26.7	21 15.1	+ 4 25.1	-0.5069	0.5531	0.1804	+ 7	-67
10 Virginis	6.2	2.73	19.0	+ 2 19.5	29 19 52.0	+ 2 17.2	-0.4449	0.5553	0.1901	+11	-63
η Virginis	4.0	2.70	17.5	- 0 14.6	30 0 35.6	+ 6 51.3	+1.2945	0.5562	0.1911	+89	+53
γ Virginis (*mean*)	2.9	+2.56	-16.3	- 1 1.9	10 36.6	- 7 27.9	+0.1786	0.5586	-0.1920	+46	-25
38 Virginis	6.1	2.55	14.9	3 8.3	15 51.1	- 2 24.0	+1.3235	0.5601	0.1918	+82	+59
k Virginis	5.7	2.54	14.5	3 24.1	18 46.9	+ 0 25.9	+1.0276	0.5610	0.1914	+87	+25
46 Virginis	6.1	2.52	14.6	2 57.5	19 12.5	+ 0 50.6	+0.4951	0.5611	0.1914	+67	- 8
48 Virginis	6.5	2.51	14.4	3 15.2	20 42.4	+ 2 17.4	+0.5080	0.5616	0.1911	+68	- 7
65 Virginis	6.0	+2.44	-12.9	- 4 31.5	31 5 26.2	+10 43.3	+0.1406	0.5648	-0.1889	+43	-27
66 Virginis	5.7	2.45	12.7	4 45.9	5 59.0	+11 15.0	+0.2808	0.5650	0.1887	+51	-20
72 Virginis	6.1	2.43	11.9	6 4.6	8 36.2	-10 13.2	+1.1161	0.5660	0.1877	+84	+32
l Virginis	4.8	2.41	11.9	5 51.7	9 17.6	- 9 33.3	+0.7689	0.5663	0.1875	+85	+ 8
80 Virginis	5.6	2.39	11.9	5 0.5	10 52.5	- 8 1.7	-0.3922	0.5669	0.1868	+13	-59
566 B. Virginis	6.4	+2.34	-11.4	- 5 6.9	14 35.4	- 4 26.5	-0.9737	0.5686	-0.1850	-22	-90
88 Virginis	6.5	2.35	10.7	6 27.4	16 31.2	- 2 34.8	+0.0267	0.5694	0.1840	+35	-34
598 B. Virginis	6.1	2.33	9.9	7 41.0	19 26.9	+ 0 14.7	+0.7283	0.5707	0.1823	+83	+ 5
623 B. Virginis	6.5	+2.32	- 8.9	- 8 53.4	23 32.2	+ 4 11.5	+1.2041	0.5727	-0.1797	+82	+41

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's Name.	Mag.	Immersion. Washington. Sidereal Time.	Immersion. Washington. Mean Time.	Immersion. Angle East from— North Point.	Immersion. Angle East from— Vertex.	Emersion. Washington. Sidereal Time.	Emersion. Washington. Mean Time.	Emersion. Angle East from— North Point.	Emersion. Angle East from— Vertex.	Duration of Occultation.
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 1	124 H.[1] Orionis ‡	5.7	12 26	17 41	79	27	13 16	18 32	293	244	0 50
2	110 B. Geminorum	6.2	7 55	13 7	50	22	8 48	14 1	328	285	0 53
6	37 Sextantis	6.3	6 10	11 7	68	119	7 1	11 58	329	17	0 50
10	6 B. Libræ	6.2	13 46	18 26	134	146	15 2	19 42	271	264	1 16
12	Venus	-4.3	13 54	18 22	57	90	14 50	19 18	334	357	0 56
19	150 B. Aquarii	6.0	2 23	6 30	20	334	3 8	7 14	296	247	0 45
27	275 B. Tauri	6.5	0 29	4 4	88	143	1 41	5 16	241	291	1 12
27	α Tauri (*Aldebar.*)	1.1	1 51	5 27	79	129	3 15	6 50	251	285	1 23
28	130 Tauri ‡	5.6	12 11	15 41	84	32	13 3	16 32	284	236	0 52
29	292 B. Orionis	6.5	0 11	3 38	88	141	1 9	4 36	260	315	0 58
29	26 Geminorum	5.2	11 48	15 14	84	30	12 44	16 9	293	240	0 56
30	162 B. Geminorum	5.7	7 25	10 48	42	44	8 10	11 32	338	316	0 45
Feb. 1	ξ Leonis	5.1	9 34	12 48	122	119	10 51	14 6	281	250	1 17
2	48 Leonis	5.2	12 49	15 59	91	51	13 52	17 2	317	270	1 3
3	83 Leonis	6.3	9 49	12 56	106	134	11 6	14 12	306	311	1 16
3	τ Leonis	5.2	10 33	13 40	110	126	11 51	14 57	303	294	1 18
6	κ Virginis	4.3	9 27	12 22	147	195	10 17	13 12	256	300	0 50
23	70 Tauri	6.4	9 50	11 38	113	60	10 44	12 32	242	190	0 54
23	θ[1] Tauri ‡	4.2	11 13	13 0	114	64	12 1	13 48	241	195	0 48
25	124 H.[1] Orionis	5.7	11 37	13 16	38	344	12 8	13 47	334	281	0 31
27	1 Cancri	6.0	5 44	7 17	162	207	6 18	7 51	212	250	0 34
Mar. 3	27 B. Virginis	6.5	11 26	12 42	56	65	12 3	13 19	358	355	0 37
4	91 G. Virginis	6.5	9 40	10 52	143	184	10 41	11 53	266	298	1 1
7	49 Libræ	5.4	17 14	18 13	132	114	18 22	19 21	250	219	1 8
9	305 B. Ophiuchi	6.3	17 23	18 15	44	50	18 22	19 13	321	314	0 58
20	25 Arietis	6.5	7 39	7 49	74	22	8 41	8 51	262	210	1 2
22	179 B. Tauri	5.9	10 21	10 22	150	99	10 46	10 47	202	152	0 25
23	318 B. Tauri	5.7	10 8	10 6	32	338	10 40	10 38	328	275	0 33
24	130 Tauri	5.6	8 50	8 44	98	45	10 4	9 58	269	214	1 13
25	26 Geminorum	5.2	9 39	9 29	92	39	10 51	10 40	286	231	1 11
28	ξ Leonis	5.1	10 49	10 27	106	75	12 4	11 41	298	253	1 14
29	48 Leonis	5.2	14 8	13 42	76	28	14 59	14 32	327	276	0 50
30	83 Leonis	6.3	10 44	10 14	101	114	11 58	11 28	311	300	1 14
30	τ Leonis	5.2	11 27	10 57	104	103	12 42	12 11	309	285	1 14
Apr. 5	192 B. Ophiuchi †	6.3	11 49	10 56	82	133	12 46	11 52	300	347	0 56
19	α Tauri (*Aldebar.*)	1.1	7 2	5 14	101	52	8 19	6 31	250	196	1 17
21	292 B. Orionis	6.5	8 31	6 35	147	100	9 22	7 26	225	172	0 51
28	91 G. Virginis	6.5	11 32	9 8	122	143	12 47	10 23	292	293	1 15
May 1	49 Libræ	5.4	14 54	12 18	114	128	16 12	13 35	278	275	1 18
2	90 B. Ophiuchi	6.5	13 33	10 53	87	126	14 41	12 1	299	328	1 8
4	187 B. Sagittarii	6.4	17 47	14 58	85	102	19 12	16 24	266	264	1 25
6	95 B. Capricorni	5.9	19 49	16 52	9	25	20 27	17 30	318	325	0 38
9	96 Aquarii †	5.7	16 45	13 36	86	138	17 44	14 36	242	293	0 59
19	110 B. Geminorum	6.2	10 41	6 54	70	15	11 39	7 52	312	257	0 58
23	37 Sextantis	6.3	15 49	11 46	76	24	16 36	12 32	324	272	0 47
June 1	267 B. Sagittarii	5.8	17 24	12 45	78	106	18 46	14 7	271	282	1 22
5	82 Aquarii †	6.4	16 49	11 54	51	103	17 45	12 50	278	328	0 56
9	64 Ceti	5.8	20 34	15 23	80	132	21 38	16 27	238	290	1 4

† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle East from—		Washington.		Angle East from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
June 22	θ Virginis	4.4	15 46	9 45	152	115	16 41	10 40	253	209	0 55
23	623 B. Virginis	6.5	14 45	8 40	44	32	15 13	9 8	2	344	0 28
23	κ Virginis ‡	4.3	19 23	13 17	120	70	20 18	14 12	267	215	0 54
25	49 Libræ	5.4	14 10	7 57	140	164	15 15	9 2	256	266	1 5
26	90 B. Ophiuchi	6.5	13 17	7 1	80	121	14 21	8 4	308	340	1 3
28	173 B. Sagittarii	6.4	14 31	8 6	114	160	15 33	9 8	252	291	1 2
28	171 B. Sagittarii	6.1	14 46	8 22	157	201	15 16	8 51	209	250	0 29
July 2	213 B. Aquarii †	6.5	17 0	10 20	44	95	17 55	11 14	286	335	0 54
2	λ Aquarii	3.8	23 16	16 35	79	71	0 38	17 56	227	200	1 22
7	85 Ceti	6.3	22 8	15 8	37	89	23 9	16 8	279	329	1 0
9	γ Tauri	3.9	22 15	15 6	90	143	23 14	16 4	238	292	0 58
10	α Tauri (*Aldebar.*)	1.1	8 39	1 28	91	36	9 47	2 36	263	209	1 8
18	27 B. Virginis	6.5	15 33	7 50	187	141	15 52	8 8	220	172	0 19
19	38 Virginis	6.1	15 3	7 16	77	43	16 1	8 14	330	289	0 58
22	η Libræ	5.5	17 3	9 4	128	109	18 14	10 15	259	226	1 11
23	24 Scorpii	5.0	16 6	8 3	78	86	17 22	9 19	305	294	1 16
26	267 B. Sagittarii	5.8	15 8	6 54	68	114	16 12	7 57	291	330	1 4
27	47 B. Capricorni	6.2	16 22	8 4	129	174	17 12	8 53	218	256	0 49
27	61 B. Capricorni	5.9	19 13	10 53	78	97	20 38	12 19	254	253	1 25
30	φ Aquarii	4.4	19 16	10 45	44	89	20 24	11 53	275	313	1 8
Aug. 9	162 B. Geminorum †	5.7	0 2	14 51	93	140	0 54	15 43	266	317	0 52
22	*d* Sagittarii	5.0	16 10	6 9	150	186	16 49	6 48	211	241	0 39
26	81 Aquarii	6.4	0 17	13 59	87	66	1 31	15 13	220	185	1 14
26	82 Aquarii	6.4	1 45	15 27	8	331	2 27	16 8	302	259	0 41
28	10 Ceti †	6.4	18 16	7 51	19	70	18 52	8 27	304	355	0 36
30	39 B. Arietis	6.5	21 40	11 7	60	111	22 52	12 19	253	300	1 12
30	64 Ceti	5.8	2 48	16 14	43	28	4 12	17 37	269	231	1 23
Sept. 2	71 Tauri †	4.6	21 24	10 40	91	141	22 19	11 34	241	294	0 54
2	θ^2 Tauri	3.6	22 32	11 47	64	117	23 34	12 48	265	319	1 1
2	θ^1 Tauri	4.2	22 38	11 52	41	94	23 29	12 44	288	342	0 51
2	264 B. Tauri	4.8	0 0	13 15	5	59	0 25	13 40	322	16	0 25
2	85 Tauri	6.0	0 17	13 31	120	174	1 7	14 22	206	258	0 50
2	275 B. Tauri	6.5	1 34	14 48	37	88	2 40	15 54	289	331	1 6
2	α Tauri (*Aldebar.*)	1.1	3 15	16 29	30	63	4 20	17 34	300	307	1 5
3	111 Tauri	5.1	1 25	14 35	106	161	2 32	15 42	229	280	1 7
4	124 H.[1] Orionis	5.7	0 25	13 32	91	144	1 27	14 34	254	309	1 2
6	5 Cancri †	5.9	0 31	13 30	38	85	1 2	14 1	325	14	0 31
18	173 B. Sagittarii	6.4	17 35	5 48	112	131	18 53	7 6	242	244	1 18
18	171 B. Sagittarii	6.1	17 59	6 12	162	176	18 22	6 35	193	201	0 23
18	187 B. Sagittarii	6.4	20 19	8 32	49	31	21 28	9 40	293	263	1 9
22	213 B. Aquarii	6.5	23 52	11 48	51	32	1 12	13 8	257	223	1 20
27	389 B. Ceti †	6.3	19 37	7 14	36	86	20 23	8 0	287	339	0 46
27	85 Ceti	6.3	4 11	15 47	63	30	5 37	17 12	259	211	1 26
29	179 B. Tauri	5.9	21 32	9 1	36	87	22 17	9 46	293	346	0 45
29	48 Tauri	6.3	2 5	13 34	124	168	3 1	14 29	201	231	0 56
29	γ Tauri	3.9	5 24	16 51	144	114	6 3	17 30	194	154	0 39
Oct. 2	26 Geminorum †	5.2	23 34	10 50	148	196	23 59	11 15	203	254	0 25
2	74 B. Geminorum	6.2	1 57	13 13	20	76	2 26	13 42	329	25	0 29

† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle East from—		Washington.		Angle East from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Oct. 4	90 B. Cancri	6.3	2 53	14 1	47	100	3 34	14 42	323	17	0 41
12	η Libræ	5.5	18 35	5 13	133	97	19 33	6 11	248	205	0 58
17	61 B. Capricorni	5.9	19 58	6 16	64	73	21 25	7 43	264	253	1 26
20	ϕ Aquarii	4.4	22 35	8 41	52	62	0 3	10 8	253	239	1 27
27	318 B. Tauri	5.7	8 35	18 12	97	43	9 46	19 22	260	205	1 11
Nov. 2	*A* Leonis	4.6	7 0	16 14	147	195	7 59	17 13	248	288	0 59
3	*c* Leonis	5.1	6 30	15 40	147	197	7 22	16 32	251	299	0 52
16	81 Aquarii	6.4	0 27	8 47	26	4	1 34	9 54	279	244	1 7
16	Uranus	6.1	2 44	11 3	53	9	3 50	12 10	260	211	1 6
20	39 B. Arietis	6.5	22 59	7 3	81	127	0 18	8 22	226	259	1 19
20	64 Ceti	5.8	4 21	12 24	70	30	5 43	13 46	250	201	1 22
20	ξ^1 Ceti	4.5	5 44	13 47	40	351	6 47	14 50	285	233	1 3
23	70 Tauri	6.4	22 14	6 7	84	136	23 14	7 6	244	299	1 0
23	θ^1 Tauri	4.2	23 57	7 49	134	188	0 31	8 23	191	245	0 34
23	75 Tauri	5.2	0 0	7 52	30	84	0 52	8 44	296	349	0 51
23	264 B. Tauri	4.8	0 59	8 51	106	159	2 5	9 57	219	266	1 7
23	275 B. Tauri	6.5	3 23	11 14	140	170	4 1	11 53	189	203	0 38
23	α Tauri (*Aldebar.*)	1.1	4 58	12 50	121	107	6 6	13 58	217	178	1 8
24	115 Tauri	5.3	5 31	13 18	109	104	6 55	14 42	240	200	1 24
25	19 B. Geminorum	6.2	2 28	10 12	28	83	3 13	10 57	316	9	0 45
29	18 Leonis	5.8	5 17	12 45	121	174	6 25	13 52	265	315	1 8
29	19 Leonis	6.4	6 25	13 52	179	228	6 45	14 13	210	258	0 20
30	49 Leonis †	5.7	3 49	11 13	68	118	4 35	11 59	319	10	0 46
Dec. 12	151 B. Capricorni	6.1	22 25	5 3	49	39	23 44	6 22	264	237	1 18
15	10 Ceti ‡	6.4	5 51	12 16	39	348	6 43	13 7	282	230	0 51
18	85 Ceti	6.3	4 52	11 5	46	5	6 8	12 21	277	227	1 15
20	179 B. Tauri	5.9	21 43	3 49	71	123	22 42	4 48	256	309	0 59
20	70 Tauri	6.4	9 45	15 49	164	110	9 57	16 2	188	135	0 12
20	75 Tauri ‡	5.2	10 52	16 56	53	2	11 39	17 43	300	252	0 46
21	318 B. Tauri	5.7	22 6	4 9	45	95	22 53	4 56	290	342	0 47
24	*f* Geminorum	5.3	1 35	7 25	79	132	2 35	8 25	280	334	1 0
27	49 Leonis	5.7	13 28	19 4	67	21	14 16	19 52	341	291	0 47
30	46 Virginis †	6.1	6 55	12 21	137	189	7 46	13 11	263	314	0 50
30	48 Virginis	6.5	8 30	13 55	132	181	9 31	14 56	275	319	1 1

† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0.	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.22	−3.10	44.21	July 5	− 1.09	+3.37	122.44
6	− 0.21	3.67	338.36	10	+ 1.18	3.89	56.27
11	2.63	4.21	272.52	15	3.43	4.38	350.10
16	5.01	4.72	206.68	20	5.64	4.85	283.95
21	7.32	5.19	140.85	25	7.80	5.28	217.80
26	− 9.55	−5.62	75.01	30	+ 9.88	+5.68	151.66
31	11.69	6.00	9.18	Aug. 4	11.88	6.03	85.53
Feb. 5	13.71	6.34	303.35	9	13.78	6.35	19.42
10	15.61	6.62	237.51	14	15.58	6.62	313.32
15	17.37	6.86	171.68	19	17.26	6.84	247.23
20	−19.00	−7.04	105.83	24	+18.83	+7.02	181.16
25	20.48	7.16	39.98	29	20.26	7.15	115.10
Mar. 2	21.80	7.23	334.12	Sept. 3	21.56	7.22	49.05
7	22.97	7.25	268.24	8	22.72	7.25	343.02
12	23.97	7.21	202.36	13	23.74	7.22	277.00
17	−24.81	−7.11	136.46	18	+24.60	+7.14	210.99
22	25.47	6.96	70.54	23	25.30	7.01	144.99
27	25.96	6.76	4.60	28	25.83	6.83	79.00
Apr. 1	26.28	6.51	298.65	Oct. 3	26.20	6.59	13.02
6	26.41	6.21	232.67	8	26.39	6.31	307.05
11	−26.37	−5.87	166.68	13	+26.40	+5.98	241.10
16	26.13	5.48	100.66	18	26.22	5.60	175.14
21	25.72	5.06	34.63	23	25.85	5.18	109.20
26	25.12	4.60	328.57	28	25.28	4.72	43.26
May 1	24.33	4.11	262.49	Nov. 2	24.52	4.22	337.33
6	−23.37	−3.59	196.40	7	+23.56	+3.69	271.40
11	22.23	3.05	130.29	12	22.40	3.13	205.48
16	20.92	2.49	64.17	17	21.05	2.54	139.57
21	19.44	1.91	358.03	22	19.52	1.94	73.66
26	17.82	1.32	291.87	27	17.81	1.32	7.76
31	−16.05	−0.72	225.71	Dec. 2	+15.94	+0.68	301.87
June 5	14.15	−0.11	159.54	7	13.92	+0.04	235.98
10	12.14	+0.49	93.36	12	11.77	−0.60	170.10
15	10.04	1.09	27.18	17	9.51	1.24	104.23
20	7.86	1.68	320.99	22	7.17	1.86	38.36
25	− 5.63	+2.26	254.81	27	+ 4.77	−2.48	332.50
30	− 3.37	+2.82	188.62	32	+ 2.34	−3.07	266.64

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while B_0 and L_0 are the heliographic latitudes and longitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on January 1, 1854, Greenwich Mean Noon.

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Date.	Mean Equator.			Orbit.		Mean Longitude. ☾	Mean Solar Days.	Motion in Mean Longitude.
	i	Δ	☊′	Γ′	☊			
	° ′	° ′	° ′	° ′	° ′	° ′		° ′
Jan. 0	24 58.5	354 41.7	−0 21.4	190 7.4	174 22.2	72 10.2	0.1	1 19.06
10	24 58.4	354 11.8	0 23.4	191 14.2	173 50.5	203 56.0	0.2	2 38.12
20	24 58.3	353 41.8	0 25.4	192 21.1	173 18.7	335 41.8	0.3	3 57.18
30	24 58.2	353 11.9	0 27.4	193 27.9	172 46.9	107 27.7	0.4	5 16.23
Feb. 9	24 58.1	352 41.9	0 29.4	194 34.8	172 15.1	239 13.5	0.5	6 35.29
							0.6	7 54.35
19	24 58.0	352 12.0	−0 31.4	195 41.6	171 43.4	10 59.3	0.7	9 13.41
Mar. 1	24 57.9	351 42.0	0 33.4	196 48.5	171 11.6	142 45.2	0.8	10 32.47
11	24 57.8	351 12.1	0 35.4	197 55.3	170 39.8	274 31.0	0.9	11 51.53
21	24 57.6	350 42.1	0 37.4	199 2.1	170 8.0	46 16.9	1.0	13 10.58
31	24 57.5	350 12.1	0 39.4	200 9.0	169 36.3	178 2.7	2.0	26 21.17
							3.0	39 31.75
Apr. 10	24 57.3	349 42.2	−0 41.4	201 15.8	169 4.5	309 48.5	4.0	52 42.33
20	24 57.2	349 12.2	0 43.4	202 22.7	168 32.7	81 34.4	5.0	65 52.92
30	24 57.0	348 42.2	0 45.3	203 29.5	168 1.0	213 20.2	6.0	79 3.50
May 10	24 56.8	348 12.3	0 47.3	204 36.3	167 29.2	345 6.0	7.0	92 14.09
20	24 56.7	347 42.3	0 49.3	205 43.2	166 57.4	116 51.9	8.0	105 24.67
30	24 56.5	347 12.3	−0 51.3	206 50.0	166 25.6	248 37.7	9.0	118 35.25
June 9	24 56.3	346 42.3	0 53.2	207 56.9	165 53.9	20 23.6	10.0	131 45.84
19	24 56.1	346 12.4	0 55.2	209 3.7	165 22.1	152 9.4	Hours.	° ′
29	24 55.9	345 42.4	0 57.2	210 10.6	164 50.3	283 55.2	1	0 32.94
July 9	24 55.7	345 12.4	0 59.1	211 17.4	164 18.6	55 41.1	2	1 5.88
							3	1 38.82
19	24 55.4	344 42.4	−1 1.0	212 24.2	163 46.8	187 26.9	4	2 11.76
29	24 55.2	344 12.4	1 3.0	213 31.1	163 15.0	319 12.8	5	2 44.70
Aug. 8	24 55.0	343 42.4	1 4.9	214 37.9	162 43.2	90 58.6	6	3 17.65
18	24 54.8	343 12.4	1 6.9	215 44.8	162 11.5	222 44.4	7	3 50.59
28	24 54.5	342 42.4	1 8.8	216 51.6	161 39.7	354 30.2	8	4 23.53
							9	4 56.47
Sept. 7	24 54.2	342 12.4	−1 10.7	217 58.5	161 7.9	126 16.1	10	5 29.41
17	24 54.0	341 42.3	1 12.7	219 5.3	160 36.1	258 1.9	11	6 2.35
27	24 53.7	341 12.3	1 14.6	220 12.1	160 4.4	29 47.8	12	6 35.29
Oct. 7	24 53.4	340 42.3	1 16.5	221 19.0	159 32.6	161 33.6	13	7 8.23
17	24 53.1	340 12.2	1 18.4	222 25.8	159 0.8	293 19.5	14	7 41.17
							15	8 14.11
27	24 52.8	339 42.2	−1 20.3	223 32.7	158 29.1	65 5.3	16	8 47.06
Nov. 6	24 52.5	339 12.1	1 22.2	224 39.5	157 57.3	196 51.1	17	9 20.00
16	24 52.2	338 42.1	1 24.1	225 46.3	157 25.5	328 37.0	18	9 52.94
26	24 51.9	338 12.0	1 26.0	226 53.2	156 53.7	100 22.8	19	10 25.88
Dec. 6	24 51.6	337 42.0	1 27.8	228 0.0	156 22.0	232 8.6	20	10 58.82
16	24 51.3	337 11.9	−1 29.7	229 6.9	155 50.2	3 54.5	21	11 31.76
26	24 50.9	336 41.8	1 31.6	230 13.7	155 18.4	135 40.3	22	12 4.70
36	24 50.6	336 11.8	−1 33.4	231 20.6	154 46.6	267 26.2	23	12 37.64

Daily motion of Γ′ . . . . . +6′.684
Daily motion of ☊ . . . . . −3′.177

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Jan.	1	−5.06	+6.56	−0.01	+0.01	81.40	+1.50	358.74
	2	4.82	6.30	0.01	0.01	93.52	1.49	4.68
	3	4.31	5.68	0.01	0.01	105.64	1.47	10.46
	4	3.61	4.71	0.01	0.01	117.77	1.46	15.65
	5	2.79	3.45	0.01	0.01	129.90	1.44	19.90
	6	−1.90	+1.97	−0.01	+0.01	142.03	+1.42	22.95
	7	0.98	+0.37	0.00	0.01	154.17	1.40	24.63
	8	−0.07	−1.26	0.00	0.01	166.32	1.38	24.87
	9	+0.82	2.81	0.00	0.01	178.47	1.36	23.68
	10	1.70	4.18	0.00	0.01	190.63	1.35	21.11
	11	+2.54	−5.30	0.00	+0.01	202.80	+1.33	17.29
	12	3.32	6.09	0.00	0.01	214.97	1.32	12.42
	13	4.01	6.52	0.00	0.01	227.15	1.31	6.81
	14	4.55	6.57	0.00	0.01	239.33	1.30	0.80
	15	4.90	6.25	0.00	0.01	251.52	1.28	354.82
	16	+5.00	−5.60	0.00	+0.01	263.71	+1.27	349.25
	17	4.80	4.66	0.00	0.01	275.90	1.26	344.40
	18	4.31	3.51	0.00	0.01	288.09	1.25	340.48
	19	3.52	2.21	0.00	0.01	300.28	1.24	337.59
	20	2.48	−0.83	−0.01	0.01	312.46	1.23	335.78
	21	+1.24	+0.56	−0.01	+0.01	324.64	+1.22	335.04
	22	−0.12	1.92	0.01	0.01	336.81	1.21	335.32
	23	1.53	3.20	0.01	0.01	348.98	1.20	336.60
	24	2.89	4.34	0.01	0.01	1.14	1.19	338.85
	25	4.10	5.31	0.01	0.01	13.30	1.17	342.03
	26	−5.09	+6.05	−0.01	+0.01	25.45	+1.16	346.10
	27	5.78	6.54	0.02	0.02	37.60	1.14	350.96
	28	6.10	6.71	0.02	0.02	49.74	1.12	356.45
	29	6.03	6.53	0.02	0.02	61.88	1.10	2.32
	30	5.58	5.99	0.02	0.02	74.01	1.07	8.23
	31	−4.79	+5.09	−0.02	+0.02	86.14	+1.05	13.76
Feb.	1	3.71	3.85	0.02	0.02	98.27	1.02	18.50
	2	2.45	2.35	0.02	0.02	110.40	0.99	22.09
	3	−1.10	+0.68	0.01	0.01	122.53	0.96	24.28
	4	+0.25	−1.03	0.01	0.01	134.67	0.92	24.95
	5	+1.52	−2.67	−0.01	+0.01	146.81	+0.89	24.09
	6	2.66	4.12	0.01	0.01	158.96	0.86	21.79
	7	3.64	5.30	0.01	0.01	171.11	0.83	18.20
	8	4.42	6.15	0.01	0.01	183.28	0.80	13.55
	9	5.01	6.63	0.01	0.01	195.45	0.78	8.13
	10	+5.37	−6.73	−0.01	+0.01	207.62	+0.75	2.28
	11	5.52	6.46	0.01	0.01	219.81	0.73	356.37
	12	5.43	5.86	0.01	0.01	232.00	0.71	350.76
	13	5.11	4.97	0.01	0.01	244.19	0.69	345.76
	14	4.56	3.85	0.01	0.01	256.38	0.67	341.59
	15	+3.78	−2.56	−0.01	+0.01	268.58	+0.65	338.39
	16	+2.79	−1.17	−0.01	+0.01	280.78	+0.63	336.24

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Feb.	16	+2.79	−1.17	−0.01	+0.01	280.78	+0.63	336.24
	17	1.63	+0.26	0.01	0.01	292.98	0.61	335.16
	18	+0.33	1.66	0.01	0.02	305.17	0.59	335.13
	19	−1.05	2.98	0.02	0.02	317.36	0.57	336.11
	20	2.45	4.17	0.02	0.02	329.55	0.55	338.06
	21	−3.80	+5.19	−0.02	+0.02	341.73	+0.53	340.93
	22	5.02	6.00	0.02	0.02	353.91	0.51	344.67
	23	6.03	6.55	0.02	0.02	6.08	0.49	349.19
	24	6.77	6.82	0.02	0.02	18.25	0.47	354.36
	25	7.15	6.76	0.02	0.02	30.41	0.44	359.98
	26	−7.14	+6.35	−0.02	+0.02	42.56	+0.41	5.79
	27	6.70	5.57	0.02	0.02	54.71	0.38	11.44
	28	5.84	4.45	0.02	0.02	66.86	0.35	16.54
Mar.	1	4.60	3.02	0.02	0.02	79.00	0.32	20.68
	2	3.07	+1.35	0.02	0.02	91.14	0.28	23.53
	3	−1.35	−0.43	−0.02	+0.02	103.28	+0.24	24.86
	4	+0.43	2.18	0.02	0.02	115.43	0.20	24.57
	5	2.15	3.77	0.02	0.02	127.57	0.17	22.68
	6	3.69	5.10	0.02	0.02	139.73	0.13	19.35
	7	4.96	6.07	0.02	0.02	151.88	0.09	14.83
	8	+5.91	−6.64	−0.02	+0.02	164.05	+0.06	9.46
	9	6.51	6.82	0.01	0.02	176.22	+0.03	3.60
	10	6.76	6.61	0.01	0.02	188.40	0.00	357.66
	11	6.68	6.07	0.01	0.02	200.59	−0.03	351.98
	12	6.29	5.23	0.02	0.02	212.78	0.06	346.86
	13	+5.64	−4.15	−0.02	+0.02	224.98	−0.08	342.53
	14	4.77	2.90	0.02	0.02	237.19	0.11	339.12
	15	3.72	1.53	0.02	0.02	249.40	0.13	336.72
	16	2.52	−0.10	0.02	0.02	261.61	0.15	335.36
	17	+1.22	+1.31	0.02	0.02	273.82	0.18	335.04
	18	−0.14	+2.67	−0.02	+0.02	286.03	−0.20	335.75
	19	1.53	3.90	0.02	0.02	298.24	0.22	337.44
	20	2.90	4.97	0.02	0.02	310.45	0.24	340.06
	21	4.20	5.83	0.02	0.02	322.66	0.26	343.56
	22	5.39	6.44	0.02	0.02	334.86	0.28	347.83
	23	−6.40	+6.78	−0.02	+0.02	347.06	−0.30	352.74
	24	7.17	6.81	0.02	0.02	359.25	0.32	358.13
	25	7.64	6.52	0.02	0.02	11.43	0.34	3.76
	26	7.75	5.89	0.02	0.02	23.61	0.37	9.35
	27	7.46	4.92	0.02	0.02	35.79	0.40	14.55
	28	−6.74	+3.64	−0.02	+0.02	47.95	−0.42	19.02
	29	5.60	2.09	0.02	0.02	60.12	0.45	22.42
	30	4.07	+0.37	0.02	0.02	72.28	0.49	24.44
	31	2.23	−1.41	0.02	0.02	84.43	0.52	24.90
Apr.	1	−0.22	3.11	0.02	0.02	96.59	0.56	23.70
	2	+1.81	−4.58	−0.02	+0.02	108.74	−0.59	20.88
	3	+3.70	−5.72	−0.02	+0.02	120.90	−0.62	16.66

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Apr.	1	−0.22	−3.11	−0.02	+0.02	96.59	−0.56	23.70
	2	+1.81	4.58	0.02	0.02	108.74	0.59	20.88
	3	3.70	5.72	0.02	0.02	120.90	0.62	16.66
	4	5.30	6.45	0.02	0.02	133.07	0.66	11.36
	5	6.52	6.75	0.02	0.02	145.24	0.69	5.41
	6	+7.28	−6.64	−0.02	+0.02	157.42	−0.72	359.27
	7	7.59	6.16	0.02	0.02	169.61	0.75	353.36
	8	7.46	5.37	0.02	0.02	181.80	0.78	348.00
	9	6.95	4.34	0.02	0.02	194.00	0.80	343.44
	10	6.12	3.12	0.02	0.02	206.21	0.82	339.81
	11	+5.06	−1.79	−0.02	+0.02	218.42	−0.85	337.19
	12	3.83	−0.39	0.02	0.02	230.64	0.87	335.59
	13	2.48	+1.01	0.02	0.02	242.86	0.89	335.03
	14	+1.09	2.36	0.02	0.02	255.08	0.91	335.48
	15	−0.30	3.61	0.02	0.02	267.31	0.92	336.93
	16	−1.67	+4.70	−0.02	+0.02	279.54	−0.94	339.34
	17	2.96	5.59	0.02	0.02	291.77	0.96	342.68
	18	4.16	6.25	0.02	0.02	303.99	0.97	346.72
	19	5.24	6.63	0.02	0.02	316.22	0.98	351.49
	20	6.16	6.72	0.02	0.02	328.44	1.00	356.75
	21	−6.88	+6.50	−0.03	+0.02	340.65	−1.01	2.27
	22	7.36	5.96	0.03	0.02	352.86	1.02	7.78
	23	7.55	5.11	0.02	0.02	5.07	1.04	13.00
	24	7.40	3.96	0.02	0.02	17.27	1.06	17.60
	25	6.88	2.56	0.02	0.02	29.46	1.08	21.29
	26	−5.96	+0.96	−0.02	+0.02	41.64	−1.10	23.80
	27	4.63	−0.74	0.02	0.02	53.82	1.12	24.90
	28	2.94	2.42	0.02	0.02	66.00	1.14	24.44
	29	−0.99	3.96	0.02	0.02	78.17	1.17	22.35
	30	+1.07	5.23	0.02	0.02	90.34	1.19	18.72
May	1	+3.08	−6.11	−0.02	+0.02	102.52	−1.22	13.77
	2	4.86	6.57	0.02	0.02	114.69	1.24	7.89
	3	6.26	6.58	0.02	0.02	126.87	1.26	1.57
	4	7.18	6.18	0.02	0.02	139.06	1.28	355.33
	5	7.60	5.45	0.02	0.02	151.25	1.30	349.59
	6	+7.53	−4.45	−0.02	+0.02	163.44	−1.32	344.64
	7	7.03	3.26	0.02	0.02	175.65	1.33	340.68
	8	6.17	1.94	0.02	0.02	187.86	1.35	337.75
	9	5.04	−0.56	0.02	0.02	200.08	1.36	335.89
	10	3.74	+0.82	0.02	0.02	212.30	1.38	335.08
	11	+2.34	+2.16	−0.02	+0.03	224.53	−1.39	335.29
	12	+0.93	3.40	0.02	0.03	236.77	1.40	336.50
	13	−0.44	4.49	0.02	0.03	249.00	1.41	338.67
	14	1.73	5.40	0.02	0.03	261.24	1.42	341.75
	15	2.90	6.07	0.02	0.03	273.49	1.43	345.67
	16	−3.94	+6.48	−0.02	+0.03	285.73	−1.43	350.32
	17	−4.82	+6.60	−0.02	+0.03	297.97	−1.44	355.51

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

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		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
May	17	−4.82	+6.60	−0.02	+0.03	297.97	−1.44	355.51
	18	5.55	6.41	0.02	0.03	310.21	1.44	1.01
	19	6.10	5.91	0.02	0.03	322.44	1.44	6.55
	20	6.46	5.11	0.02	0.03	334.67	1.45	11.83
	21	6.59	4.03	0.02	0.02	346.90	1.45	16.54
	22	−6.48	+2.71	−0.02	+0.02	359.12	−1.45	20.41
	23	6.07	+1.21	0.02	0.02	11.33	1.46	23.19
	24	5.33	−0.39	0.02	0.02	23.54	1.46	24.70
	25	4.25	2.01	0.02	0.02	35.74	1.47	24.78
	26	2.84	3.52	0.01	0.02	47.93	1.48	23.36
	27	−1.16	−4.82	−0.01	+0.02	60.12	−1.48	20.41
	28	+0.67	5.80	0.01	0.02	72.31	1.49	16.05
	29	2.51	6.38	0.01	0.02	84.49	1.50	10.54
	30	4.19	6.52	0.01	0.02	96.68	1.51	4.32
	31	5.56	6.23	0.01	0.02	108.86	1.52	357.88
June	1	+6.51	−5.56	−0.01	+0.02	121.05	−1.53	351.75
	2	6.97	4.60	0.01	0.02	133.24	1.53	346.33
	3	6.94	3.41	0.01	0.03	145.44	1.54	341.89
	4	6.48	2.08	0.01	0.03	157.65	1.54	338.55
	5	5.65	−0.69	0.01	0.03	169.86	1.54	336.33
	6	+4.54	+0.70	−0.01	+0.03	182.08	−1.55	335.21
	7	3.25	2.04	0.01	0.03	194.31	1.55	335.14
	8	1.88	3.28	0.01	0.03	206.54	1.55	336.08
	9	+0.50	4.38	0.01	0.03	218.77	1.55	338.00
	10	−0.82	5.30	0.01	0.03	231.01	1.55	340.84
	11	−2.00	+5.99	−0.01	+0.03	243.26	−1.55	344.54
	12	3.03	6.42	0.01	0.03	255.51	1.55	349.02
	13	3.86	6.57	0.02	0.03	267.76	1.54	354.12
	14	4.51	6.40	0.02	0.03	280.01	1.54	359.63
	15	4.96	5.92	0.02	0.03	292.26	1.53	5.25
	16	−5.23	+5.13	−0.02	+0.03	304.51	−1.52	10.68
	17	5.33	4.06	0.01	0.03	316.75	1.51	15.58
	18	5.25	2.76	0.01	0.03	328.99	1.50	19.66
	19	4.99	+1.29	0.01	0.03	341.23	1.49	22.68
	20	4.52	−0.28	0.01	0.03	353.46	1.48	24.47
	21	−3.83	−1.86	−0.01	+0.03	5.68	−1.47	24.90
	22	2.90	3.35	0.01	0.03	17.90	1.46	23.91
	23	1.74	4.65	−0.01	0.03	30.11	1.46	21.49
	24	−0.39	5.66	0.00	0.03	42.31	1.45	17.69
	25	+1.07	6.31	0.00	0.03	54.51	1.44	12.70
	26	+2.54	−6.55	0.00	+0.03	66.70	−1.43	6.82
	27	3.88	6.36	0.00	0.03	78.89	1.42	0.48
	28	4.98	5.78	0.00	0.03	91.08	1.42	354.17
	29	5.73	4.86	0.00	0.03	103.27	1.41	348.38
	30	6.08	3.68	0.00	0.03	115.46	1.40	343.47
July	1	+6.00	−2.34	0.00	+0.03	127.66	−1.39	339.64
	2	+5.53	−0.92	0.00	+0.03	139.86	−1.38	336.97

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

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		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
July	1	+6.00	−2.34	0.00	+0.03	127.66	−1.39	339.64
	2	5.53	−0.92	0.00	0.03	139.86	1.38	336.97
	3	4.72	+0.52	0.00	0.03	152.07	1.37	335.46
	4	3.64	1.90	0.00	0.03	164.28	1.36	335.06
	5	2.39	3.18	0.00	0.03	176.50	1.35	335.70
	6	+1.05	+4.32	0.00	+0.03	188.73	−1.34	337.33
	7	−0.28	5.27	0.00	0.03	200.96	1.33	339.90
	8	1.53	6.00	0.00	0.03	213.20	1.32	343.34
	9	2.63	6.47	−0.01	0.03	225.44	1.31	347.58
	10	3.52	6.65	0.01	0.03	237.68	1.30	352.50
	11	−4.18	+6.53	−0.01	+0.03	249.93	−1.29	357.92
	12	4.59	6.09	0.01	0.03	262.18	1.27	3.59
	13	4.75	5.32	0.01	0.03	274.44	1.26	9.18
	14	4.69	4.26	−0.01	0.03	286.69	1.24	14.33
	15	4.43	2.95	0.00	0.03	298.94	1.22	18.73
	16	−4.00	+1.45	0.00	+0.03	311.19	−1.20	22.08
	17	3.42	−0.15	0.00	0.03	323.43	1.18	24.18
	18	2.71	1.76	0.00	0.03	335.67	1.15	24.92
	19	1.87	3.27	0.00	0.03	347.90	1.13	24.24
	20	−0,92	4.60	0.00	0.03	0.13	1.11	22.16
	21	+0.12	−5.64	0.00	+0.03	12.34	−1.09	18.75
	22	1.21	6.34	0.00	0.03	24.55	1.07	14.16
	23	2.31	6.65	0.00	0.03	36.76	1.04	8.65
	24	3.34	6.55	0.00	0.03	48.96	1.02	2.56
	25	4.23	6.05	0.00	0.03	61.15	1.00	356.33
	26	+4.90	−5.20	−0.01	+0.03	73.34	−0.98	350.40
	27	5.29	4.07	0.01	0.03	85.53	0.95	345.17
	28	5.36	2.74	0.01	0.03	97.72	0.93	340.93
	29	5.10	−1.29	−0.01	0.03	109.91	0.91	337.81
	30	4.52	+0.19	0.00	0.03	122.11	0.89	335.87
	31	+3.66	+1.64	0.00	+0.03	134.30	−0.87	335.08
Aug.	1	2.58	2.98	0.00	0.03	146.51	0.85	335.39
	2	1.34	4.18	0.00	0.03	158.71	0.83	336.71
	3	+0.03	5.19	0.00	0.03	170.92	0.81	338.99
	4	−1.27	5.98	0.00	0.03	183.14	0.80	342.15
	5	−2.48	+6.52	0.00	+0.03	195.37	−0.78	346.11
	6	3.54	6.77	0.00	0.03	207.60	0.76	350.78
	7	4.37	6.73	0.00	0.03	219.83	0.74	356.01
	8	4.93	6.36	0.00	0.03	232.07	0.72	1.59
	9	5.19	5.67	0.00	0.03	244.31	0.70	7.24
	10	−5.13	+4.67	0.00	+0.03	256.56	−0.68	12.62
	11	4.78	3.38	0.00	0.03	268.81	0.66	17.36
	12	4.15	1.87	0.00	0.03	281.05	0.63	21.15
	13	3.30	+0.22	0.00	0.03	293.30	0.61	23.70
	14	2.29	−1.46	0.00	0.03	305.54	0.58	24.85
	15	−1.17	−3.06	0.00	+0.03	317.78	−0.55	24.53
	16	0.00	−4.47	+0.01	+0.03	330.02	−0.52	22.74

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		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Aug.	16	0.00	−4.47	+0.01	+0.03	330.02	−0.52	22.74
	17	+1.15	5.59	0.01	0.03	342.24	0.49	19.59
	18	2.25	6.36	0.01	0.03	354.46	0.46	15.24
	19	3.24	6.74	0.01	0.03	6.68	0.43	9.95
	20	4.08	6.70	0.01	0.03	18.88	0.40	4.06
	21	+4.74	−6.28	+0.01	+0.03	31.08	−0.37	357.94
	22	5.19	5.51	0.01	0.03	43.27	0.34	352.02
	23	5.41	4.45	0.01	0.03	55.46	0.30	346.66
	24	5.37	3.16	0.01	0.03	67.65	0.27	342.16
	25	5.08	1.73	0.01	0.03	79.83	0.24	338.71
	26	+4.54	−0.24	+0.01	+0.03	92.01	−0.21	336.39
	27	3.77	+1.24	0.01	0.03	104.19	0.18	335.23
	28	2.79	2.64	0.01	0.03	116.38	0.15	335.18
	29	1.66	3.90	0.01	0.03	128.56	0.13	336.19
	30	+0.41	4.98	0.01	0.04	140.75	0.10	338.18
	31	−0.90	+5.84	+0.01	+0.04	152.95	−0.08	341.06
Sept.	1	2.20	6.46	0.01	0.04	165.15	0.06	344.76
	2	3.42	6.80	+0.01	0.04	177.35	0.04	349.18
	3	4.49	6.84	0.00	0.04	189.56	−0.02	354.17
	4	5.34	6.58	0.00	0.04	201.77	0.00	359.56
	5	−5.91	+6.00	0.00	+0.04	213.99	+0.02	5.13
	6	6.15	5.11	0.00	0.04	226.22	0.04	10.58
	7	6.01	3.92	+0.01	0.03	238.45	0.06	15.57
	8	5.49	2.48	0.01	0.03	250.68	0.08	19.77
	9	4.61	+0.85	0.01	0.03	262.92	0.11	22.86
	10	−3.40	−0.87	+0.01	+0.03	275.16	+0.13	24.59
	11	1.96	2.56	0.01	0.03	287.39	0.16	24.80
	12	−0.38	4.08	0.01	0.03	299.62	0.19	23.45
	13	+1.23	5.33	0.01	0.03	311.85	0.22	20.61
	14	2.74	6.22	0.01	0.03	324.07	0.26	16.46
	15	+4.06	−6.70	+0.01	+0.03	336.29	+0.29	11.27
	16	5.13	6.75	0.01	0.03	348.50	0.32	5.41
	17	5.89	6.40	0.02	0.03	0.70	0.35	359.28
	18	6.33	5.70	0.02	0.03	12.89	0.39	353.31
	19	6.46	4.70	0.02	0.03	25.08	0.42	347.85
	20	+6.30	−3.47	+0.02	+0.03	37.26	+0.46	343.19
	21	5.88	2.09	0.02	0.03	49.44	0.49	339.52
	22	5.24	−0.62	0.02	0.04	61.61	0.52	336.93
	23	4.41	+0.85	0.02	0.04	73.78	0.55	335.46
	24	3.42	2.26	0.01	0.04	85.95	0.58	335.10
	25	+2.30	+3.56	+0.01	+0.04	98.12	+0.61	335.80
	26	+1.08	4.68	0.01	0.04	110.29	0.64	337.51
	27	−0.20	5.60	0.01	0.04	122.46	0.66	340.14
	28	1.51	6.27	0.01	0.04	134.63	0.68	343.61
	29	2.80	6.68	0.01	0.04	146.81	0.70	347.81
	30	−4.03	+6.80	+0.01	+0.04	158.99	+0.72	352.60
Oct.	1	−5.14	+6.63	+0.01	+0.04	171.17	+0.73	357.81

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		c
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Oct.	1	−5.14	+6.63	+0.01	+0.04	171.17	+0.73	357.81
	2	6.05	6.15	0.01	0.04	183.36	0.75	3.25
	3	6.70	5.38	0.01	0.04	195.56	0.76	8.64
	4	7.03	4.33	0.01	0.04	207.76	0.78	13.72
	5	6.98	3.01	0.01	0.04	219.97	0.79	18.17
	6	−6.49	+1.49	+0.01	+0.04	232.18	+0.81	21.69
	7	5.55	−0.17	0.01	0.03	244.39	0.83	24.00
	8	4.19	1.87	0.01	0.03	256.61	0.85	24.89
	9	2.48	3.47	0.01	0.03	268.83	0.87	24.20
	10	−0.54	4.85	0.01	0.03	281.05	0.89	21.91
	11	+1.47	−5.88	+0.01	+0.03	293.27	+0.91	18.13
	12	3.38	6.50	0.01	0.03	305.49	0.94	13.10
	13	5.03	6.67	0.01	0.03	317.70	0.96	7.22
	14	6.31	6.41	0.01	0.03	329.90	0.99	0.94
	15	7.15	5.77	0.01	0.03	342.10	1.02	354.75
	16	+7.56	−4.81	+0.02	+0.03	354.29	+1.05	349.05
	17	7.55	3.62	0.02	0.04	6.47	1.08	344.16
	18	7.18	2.28	0.02	0.04	18.64	1.11	340.26
	19	6.51	−0.85	0.02	0.04	30.81	1.14	337.43
	20	5.62	+0.59	0.02	0.04	42.97	1.16	335.72
	21	+4.56	+1.98	+0.02	+0.04	55.13	+1.19	335.10
	22	3.39	3.27	0.01	0.04	67.29	1.22	335.54
	23	2.15	4.41	0.01	0.04	79.44	1.24	336.99
	24	+0.86	5.35	0.01	0.04	91.59	1.26	339.38
	25	−0.44	6.05	0.01	0.04	103.74	1.28	342.64
	26	−1.72	+6.50	+0.01	+0.04	115.89	+1.29	346.66
	27	2.98	6.66	0.01	0.04	128.05	1.30	351.31
	28	4.17	6.54	0.01	0.04	140.20	1.31	356.41
	29	5.26	6.12	0.01	0.04	152.36	1.32	1.76
	30	6.20	5.43	0.01	0.04	164.53	1.32	7.11
	31	−6.92	+4.47	+0.01	+0.04	176.70	+1.32	12.20
Nov.	1	7.37	3.27	0.01	0.04	188.87	1.33	16.76
	2	7.46	1.87	0.01	0.04	201.05	1.33	20.52
	3	7.13	+0.32	0.01	0.04	213.24	1.34	23.23
	4	6.34	−1.30	0.01	0.04	225.43	1.35	24.69
	5	−5.07	−2.88	+0.01	+0.04	237.63	+1.35	24.70
	6	3.37	4.30	0.01	0.03	249.83	1.35	23.15
	7	−1.35	5.45	0.01	0.03	262.04	1.36	20.03
	8	+0.84	6.22	0.01	0.03	274.24	1.37	15.47
	9	3.00	6.53	0.01	0.03	286.45	1.39	9.77
	10	+4.91	−6.39	+0.01	+0.04	298.65	+1.40	3.39
	11	6.44	5.82	0.01	0.04	310.84	1.42	356.89
	12	7.47	4.90	0.01	0.04	323.03	1.43	350.78
	13	7.98	3.72	0.01	0.04	335.22	1.45	345.46
	14	8.01	2.38	0.01	0.04	347.40	1.47	341.17
	15	+7.60	−0.96	+0.01	+0.04	359.57	+1.48	338.03
	16	+6.86	+0.48	+0.01	+0.04	11.73	+1.50	336.03

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Nov.	16	+6.86	+0.48	+0.01	+0.04	11.73	+1.50	336.03
	17	5.85	1.86	0.01	0.04	23.89	1.52	335.16
	18	4.68	3.14	0.01	0.04	36.04	1.54	335.36
	19	3.40	4.27	0.01	0.04	48.19	1.55	336.56
	20	2.08	5.21	0.01	0.04	60.33	1.56	338.72
	21	+0.77	+5.92	+0.01	+0.04	72.47	+1.57	341.77
	22	−0.51	6.38	0.01	0.04	84.61	1.58	345.61
	23	1.73	6.56	0.01	0.04	96.74	1.58	350.13
	24	2.89	6.46	0.01	0.04	108.88	1.58	355.16
	25	3.96	6.06	+0.01	0.04	121.02	1.57	0.49
	26	−4.94	+5.39	0.00	+0.04	133.16	+1.57	5.87
	27	5.78	4.47	0.00	0.04	145.30	1.56	11.02
	28	6.46	3.31	0.00	0.04	157.45	1.55	15.68
	29	6.92	1.97	0.00	0.04	169.60	1.54	19.60
	30	7.08	+0.50	0.00	0.04	181.76	1.52	22.55
Dec.	1	−6.90	−1.04	0.00	+0.04	193.92	+1.51	24.35
	2	6.32	2.56	0.00	0.04	206.09	1.50	24.86
	3	5.29	3.96	0.00	0.04	218.27	1.49	23.95
	4	3.83	5.14	0.00	0.04	230.45	1.49	21.55
	5	−2.02	6.00	0.00	0.04	242.64	1.48	17.69
	6	+0.02	−6.45	0.00	+0.04	254.83	+1.47	12.53
	7	2.10	6.44	0.00	0.04	267.03	1.47	6.40
	8	4.03	5.98	0.00	0.04	279.22	1.47	359.80
	9	5.64	5.13	+0.01	0.04	291.41	1.47	353.30
	10	6.79	3.96	0.01	0.04	303.60	1.47	347.43
	11	+7.44	−2.60	+0.01	+0.04	315.78	+1.47	342.58
	12	7.58	−1.13	+0.01	0.04	327.96	1.47	338.93
	13	7.26	+0.36	0.00	0.04	340.13	1.47	336.52
	14	6.57	1.78	0.00	0.04	352.30	1.48	335.30
	15	5.59	3.09	0.00	0.04	4.46	1.48	335.22
	16	+4.41	+4.24	0.00	+0.04	16.61	+1.48	336.17
	17	3.12	5.20	0.00	0.04	28.75	1.48	338.09
	18	1.79	5.93	0.00	0.04	40.89	1.48	340.91
	19	+0.49	6.40	0.00	0.04	53.03	1.48	344.54
	20	−0.75	6.60	0.00	0.04	65.16	1.47	348.89
	21	−1.88	+6.52	0.00	+0.04	77.29	+1.46	353.82
	22	2.89	6.14	0.00	0.04	89.42	1.45	359.12
	23	3.78	5.47	0.00	0.04	101.55	1.43	4.56
	24	4.54	4.54	0.00	0.04	113.68	1.41	9.85
	25	5.16	3.38	0.00	0.04	125.81	1.39	14.69
	26	−5.62	+2.03	0.00	+0.04	137.94	+1.37	18.81
	27	5.89	+0.56	0.00	0.04	150.08	1.34	21.99
	28	5.94	−0.96	0.00	0.04	162.23	1.32	24.04
	29	5.73	2.46	0.00	0.04	174.38	1.29	24.85
	30	5.22	3.86	0.00	0.04	186.53	1.26	24.34
	31	−4.38	−5.05	0.00	+0.04	198.69	+1.24	22.45
	32	−3.22	−5.95	0.00	+0.04	210.86	+1.22	19.20

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.882	40	358	42.3	−0.7	July 5	0.688	68	174	56.8	−0.5
6	0.792	54	353	52.3	0.6	10	0.830	49	181	65.0	1.0
11	0.648	73	348	62.2	−0.5	15	0.942	28	192	68.0	1.4
16	0.439	97	343	62.5	0.0	20	0.994	9	223	63.4	1.7
21	0.200	127	337	39.9	+0.8	25	0.989	12	348	54.3	1.5
26	0.032	159	317	7.7	+2.2	30	0.950	26	6	45.4	−1.0
31	0.027	161	201	5.9	2.3	Aug. 4	0.897	37	13	38.7	0.6
Feb. 5	0.148	135	180	25.4	1.3	9	0.843	47	18	34.2	0.3
10	0.301	113	174	36.9	0.8	14	0.788	55	21	31.5	−0.1
15	0.435	97	171	38.5	0.5	19	0.734	62	23	30.3	+0.1
20	0.542	85	167	36.2	+0.3	24	0.676	69	25	30.2	+0.2
25	0.625	76	164	33.3	0.2	29	0.613	77	27	31.0	0.4
Mar. 2	0.691	67	161	31.0	0.2	Sept. 3	0.539	86	28	32.4	0.5
7	0.747	60	157	29.7	+0.1	8	0.450	96	30	33.7	0.6
12	0.796	54	154	29.4	0.0	13	0.340	109	32	33.4	0.8
17	0.842	47	152	30.3	−0.2	18	0.212	125	35	27.9	+1.2
22	0.885	40	149	32.5	0.4	23	0.082	147	41	14.3	1.9
27	0.928	31	147	36.5	0.7	28	0.006	171	86	1.2	2.9
Apr. 1	0.968	21	143	42.6	1.1	Oct. 3	0.056	153	196	11.9	2.0
6	0.995	8	131	51.2	1.5	8	0.240	121	205	43.2	+0.7
11	0.993	10	346	61.3	−1.7	13	0.481	92	208	64.1	−0.2
16	0.937	29	337	68.8	1.4	18	0.692	67	210	64.4	0.6
21	0.817	51	337	68.8	1.0	23	0.836	48	210	54.5	0.8
26	0.658	72	339	61.3	−0.5	28	0.920	33	210	44.0	0.9
May 1	0.496	90	341	50.5	+0.1	Nov. 2	0.966	21	209	36.0	0.9
6	0.350	107	343	39.4	+0.6	7	0.989	12	207	30.5	−0.9
11	0.226	123	345	28.6	1.1	12	0.998	5	202	27.1	0.9
16	0.124	139	347	17.7	1.7	17	1.000	2	37	25.1	0.8
21	0.047	155	351	7.6	2.4	22	0.995	8	25	24.4	0.7
26	0.006	171	8	1.1	3.1	27	0.985	14	20	24.8	0.6
31	0.007	170	134	1.2	+3.1	Dec. 2	0.969	20	16	26.2	−0.6
June 5	0.048	155	151	7.4	2.4	7	0.944	27	12	29.1	0.5
10	0.117	140	155	16.2	1.8	12	0.906	36	7	33.6	0.5
15	0.205	126	158	24.7	1.3	17	0.847	46	2	40.4	0.5
20	0.306	113	161	32.2	0.9	22	0.754	60	358	49.5	0.5
25	0.419	99	165	39.6	+0.5	27	0.609	77	354	58.6	−0.3
30	0.547	85	169	47.7	0.0	32	0.403	101	349	58.6	+0.1

NOTATION.

k—the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i—the angle between the Sun and Earth, as seen from the planet.

θ—the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L—the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.274	116.8	197.0	211.9	−4.4	July 5	0.949	26.0	176.1	49.4	−3.3
6	0.315	111.7	195.7	207.4	4.4	10	0.956	24.1	179.3	48.9	3.3
11	0.352	107.2	194.2	199.3	4.3	15	0.963	22.1	182.6	48.4	3.3
16	0.387	103.0	192.5	189.5	4.3	20	0.969	20.2	186.1	47.9	3.4
21	0.420	99.2	190.5	179.0	4.2	25	0.975	18.2	189.6	47.5	3.4
26	0.450	95.7	188.4	168.4	−4.2	30	0.980	16.3	193.1	47.2	−3.4
31	0.478	92.5	186.1	158.2	4.1	Aug. 4	0.984	14.3	196.8	46.9	3.4
Feb. 5	0.505	89.4	183.8	148.6	4.1	9	0.988	12.4	200.6	46.6	3.4
10	0.530	86.5	181.3	139.6	4.0	14	0.992	10.5	204.7	46.4	3.4
15	0.554	83.8	178.7	131.2	4.0	19	0.994	8.6	209.3	46.2	3.4
20	0.577	81.2	176.2	123.6	−3.9	24	0.996	6.7	215.1	46.1	−3.4
25	0.598	78.6	173.6	116.6	3.9	29	0.998	4.9	223.4	46.0	3.5
Mar. 2	0.619	76.2	171.1	110.2	3.8	Sept. 3	0.999	3.3	238.3	45.9	3.5
7	0.639	73.9	168.7	104.3	3.8	8	1.000	2.1	272.1	45.9	3.5
12	0.658	71.6	166.4	99.0	3.7	13	1.000	2.3	323.5	45.9	3.5
17	0.676	69.4	164.2	94.1	−3.7	18	0.999	3.6	351.0	45.9	−3.5
22	0.693	67.2	162.2	89.6	3.6	23	0.998	5.2	2.8	46.0	3.5
27	0.710	65.1	160.4	85.5	3.6	28	0.996	6.9	8.8	46.1	3.4
Apr. 1	0.727	63.0	158.8	81.8	3.6	Oct. 3	0.994	8.7	12.3	46.2	3.4
6	0.742	61.0	157.4	78.4	3.5	8	0.992	10.4	14.3	46.4	3.4
11	0.758	59.0	156.3	75.3	−3.5	13	0.989	12.2	15.4	46.6	−3.4
16	0.772	57.0	155.4	72.4	3.5	18	0.985	13.9	15.8	46.9	3.4
21	0.787	55.0	154.8	69.8	3.5	23	0.981	15.6	15.7	47.2	3.4
26	0.800	53.1	154.4	67.4	3.4	28	0.977	17.3	15.2	47.6	3.4
May 1	0.814	51.1	154.3	65.2	3.4	Nov. 2	0.973	19.0	14.2	48.0	3.4
6	0.827	49.2	154.4	63.2	−3.4	7	0.968	20.7	12.9	48.4	−3.4
11	0.839	47.3	154.8	61.4	3.4	12	0.962	22.4	11.3	48.9	3.4
16	0.851	45.3	155.5	59.7	3.4	17	0.956	24.1	9.5	49.5	3.3
21	0.863	43.4	156.4	58.2	3.3	22	0.950	25.8	7.4	50.2	3.3
26	0.874	41.5	157.6	56.8	3.3	27	0.944	27.4	5.1	50.9	3.3
31	0.885	39.6	159.1	55.5	−3.3	Dec. 2	0.937	29.1	2.7	51.6	−3.3
June 5	0.896	37.7	160.8	54.4	3.3	7	0.930	30.8	0.2	52.4	3.3
10	0.906	35.7	162.8	53.3	3.3	12	0.922	32.4	357.7	53.3	3.3
15	0.916	33.8	165.0	52.4	3.3	17	0.914	34.1	355.2	54.3	3.4
20	0.925	31.9	167.5	51.5	3.3	22	0.906	35.8	352.8	55.4	3.4
25	0.933	29.9	170.2	50.7	−3.3	27	0.897	37.5	350.5	56.6	−3.4
30	0.941	28.0	173.1	50.0	−3.3	32	0.887	39.2	348.3	57.8	−3.4

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN MIDNIGHT.

Date.	Light-Time.	Stellar Magnitude.	P	$A_\oplus+180°$	$D_\oplus$	$A_\odot-A_\oplus$	$D_\odot$	$\odot_\sigma$
	m		°	°	°	°	°	°
Jan. 1	12.66	+1.0	341.71	76.69	−24.35	+42.11	−21.30	296.67
3	12.78	1.0	340.90	78.29	24.49	41.76	21.06	297.86
5	12.90	1.0	340.11	79.90	24.62	41.39	20.81	299.05
7	13.02	1.0	339.32	81.52	24.73	41.02	20.56	300.23
9	13.15	1.0	338.55	83.13	24.82	40.63	20.30	301.41
11	13.27	+1.1	337.79	84.74	−24.90	+40.24	−20.03	302.59
13	13.39	1.1	337.04	86.36	24.95	39.84	19.75	303.77
15	13.52	1.1	336.31	87.98	24.99	39.43	19.46	304.94
17	13.64	1.1	335.58	89.59	25.01	39.01	19.17	306.11
19	13.77	1.1	334.88	91.21	25.01	38.58	18.87	307.27
21	13.89	+1.2	334.18	92.82	−24.99	+38.15	−18.56	308.43
23	14.01	1.2	333.51	94.43	24.95	37.72	18.25	309.59
25	14.14	1.2	332.85	96.04	24.90	37.28	17.94	310.74
27	14.26	1.2	332.20	97.64	24.83	36.83	17.61	311.89
29	14.39	1.2	331.58	99.24	24.74	36.38	17.28	313.04
31	14.51	+1.2	330.97	100.84	−24.64	+35.92	−16.95	314.18
Feb. 2	14.63	1.3	330.38	102.43	24.51	35.47	16.61	315.31
4	14.76	1.3	329.81	104.01	24.37	35.01	16.26	316.45
6	14.88	1.3	329.27	105.59	24.22	34.55	15.91	317.58
8	15.01	1.3	328.74	107.17	24.04	34.08	15.56	318.70
10	15.13	+1.3	328.23	108.73	−23.85	+33.62	−15.20	319.83
12	15.25	1.3	327.74	110.29	23.65	33.16	14.84	320.94
14	15.38	1.4	327.28	111.85	23.43	32.69	14.47	322.06
16	15.50	1.4	326.84	113.39	23.19	32.23	14.10	323.17
18	15.62	1.4	326.42	114.93	22.94	31.76	13.73	324.28
20	15.74	+1.4	326.02	116.46	−22.67	+31.30	−13.35	325.38
22	15.87	1.4	325.65	117.98	22.39	30.84	12.97	326.48
24	15.99	1.4	325.30	119.49	22.10	30.38	12.59	327.58
26	16.11	1.5	324.97	120.99	21.79	29.93	12.20	328.67
28	16.23	1.5	324.67	122.48	21.47	29.48	11.81	329.76
Mar. 2	16.35	+1.5	324.39	123.97	−21.14	+29.02	−11.42	330.84
4	16.47	1.5	324.14	125.44	20.79	28.58	11.03	331.92
6	16.59	1.5	323.91	126.90	20.43	28.13	10.63	333.00
8	16.71	+1.5	323.70	128.36	−20.06	+27.69	−10.24	334.07
	....	..	.....	.....	....	....	....	.....
Dec. 10	18.30	+1.8	36.20	308.93	+18.67	−25.77	+23.42	102.05
12	18.18	1.8	36.35	310.23	18.31	26.09	23.33	102.96
14	18.05	1.8	36.48	311.52	17.95	26.40	23.24	103.87
16	17.92	1.8	36.59	312.81	17.57	26.70	23.14	104.78
18	17.79	1.8	36.67	314.09	17.18	27.00	23.03	105.69
20	17.66	+1.8	36.74	315.37	+16.79	−27.29	+22.92	106.60
22	17.53	1.8	36.79	316.64	16.39	27.58	22.80	107.52
24	17.40	1.8	36.82	317.91	15.98	27.86	22.68	108.44
26	17.27	1.8	36.83	319.17	15.56	28.14	22.55	109.36
28	17.13	1.7	36.81	320.43	15.14	28.41	22.41	110.28
30	16.99	+1.7	36.78	321.69	+14.71	−28.68	+22.27	111.20
32	16.86	+1.7	36.73	322.94	+14.27	−28.94	+22.12	112.13

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN MIDNIGHT.

Date.		k	Diameter.	i	q	Q	Central Meridian.		Mean Time of Transit of Zero Meridian.	
							Of Date.	Of Intermediate Date.	Of Date.	Of Intermediate Date.
			″	°	″	°	°	°	h m	h m
Jan.	1	0.890	6.15	38.79	0.68	67.50	59.93	50.00	7 53.5	8 34.3
	3	0.891	6.09	38.51	0.66	67.37	40.08	30.15	9 15.2	9 56.0
	5	0.893	6.03	38.23	0.65	67.25	20.22	10.29	10 36.8	11 17.7
	7	0.894	5.97	37.95	0.63	67.14	0.36	350.43	11 58.5	12 39.4
	9	0.896	5.92	37.66	0.62	67.05	340.50	330.57	13 20.2	14 1.0
	11	0.897	5.86	37.37	0.60	66.97	320.64	310.71	14 41.9	15 22.7
	13	0.899	5.81	37.08	0.59	66.90	300.78	290.85	16 3.6	16 44.4
	15	0.900	5.75	36.79	0.57	66.85	280.92	270.99	17 25.3	18 6.1
	17	0.902	5.70	36.49	0.56	66.81	261.06	251.13	18 47.0	19 27.8
	19	0.904	5.65	36.19	0.54	66.78	241.20	231.27	20 8.7	20 49.5
	21	0.905	5.60	35.89	0.53	66.76	221.34	211.41	21 30.4	22 11.2
	23	0.907	5.55	35.59	0.52	66.75	201.48	191.55	22 52.1	23 32.9
	25	0.908	5.50	35.28	0.51	66.76	181.63	171.70	.. ...	0 13.7
	27	0.910	5.45	34.97	0.49	66.79	161.78	151.85	0 54.6	1 35.4
	29	0.911	5.41	34.66	0.48	66.82	141.93	132.01	2 16.2	2 57.0
	31	0.913	5.36	34.35	0.47	66.87	122.09	112.17	3 37.8	4 18.6
Feb.	2	0.914	5.31	34.03	0.46	66.93	102.25	92.34	4 59.4	5 40.2
	4	0.916	5.27	33.72	0.44	67.00	82.42	72.51	6 21.0	7 1.8
	6	0.917	5.23	33.40	0.43	67.08	62.59	52.68	7 42.5	8 23.3
	8	0.919	5.18	33.08	0.42	67.18	42.77	32.87	9 4.1	9 44.8
	10	0.920	5.14	32.76	0.41	67.29	22.96	13.06	10 25.6	11 6.3
	12	0.922	5.10	32.43	0.40	67.41	3.16	353.26	11 47.0	12 27.7
	14	0.923	5.06	32.11	0.39	67.54	343.36	333.46	13 8.5	13 49.2
	16	0.925	5.02	31.78	0.38	67.69	323.57	313.67	14 29.9	15 10.5
	18	0.926	4.98	31.45	0.37	67.85	303.78	293.89	15 51.2	16 31.9
	20	0.928	4.94	31.12	0.36	68.02	284.01	274.12	17 12.5	17 53.2
	22	0.930	4.90	30.79	0.35	68.20	264.24	254.36	18 33.8	19 14.5
	24	0.931	4.86	30.45	0.34	68.39	244.49	234.61	19 55.1	20 35.7
	26	0.933	4.83	30.12	0.33	68.60	224 74	214.87	21 16.3	21 56.9
	28	0.934	4.79	29.78	0.32	68.82	205.00	195.13	22 37.5	23 18.0
Mar.	2	0.935	4.76	29.44	0.31	69.05	185.27	175.41	23 58.6	. . . . .
	4	0.937	4.72	29.10	0.30	69.29	165.55	155.70	0 39.1	1 19.7
	6	0.938	4.69	28.76	0.29	69.54	145.84	135.99	2 0.2	2 40.7
	8	0.940	4.66	28.42	0.28	69.80	126.14	116.30	3 21.2	4 1.7
		....	...	....	...	....	.....	.....	.....	.....
Dec.	10	0.955	4.25	24.48	0.19	290.53	302.28	292.54	15 57.3	16 37.4
	12	0.954	4.28	24.86	0.20	290.21	282.79	273.05	17 17.4	17 57.5
	14	0.952	4.31	25.23	0.21	289.88	263.31	253.57	18 37.5	19 17.5
	16	0.951	4.34	25.61	0.21	289.54	243.84	234.10	19 57.6	20 37.6
	18	0.949	4.37	25.98	0.22	289.19	224.37	214.64	21 17.6	21 57.6
	20	0.948	4.40	26.35	0.23	288.84	204.91	195.18	22 37.6	23 17.6
	22	0.947	4.44	26.72	0.24	288.47	185.45	175.73	23 57.6	.. ...
	24	0.945	4.47	27.09	0.24	288.10	166.00	156.28	0 37.6	1 17.5
	26	0.944	4.50	27.45	0.25	287.72	146.55	136.83	1 57.5	2 37.5
	28	0.942	4.54	27.81	0.26	287.32	127.11	117.39	3 17.4	3 57.4
	30	0.941	4.58	28.18	0.27	286.92	107.68	97.96	4 37.4	5 17.3
	32	0.939	4.61	28.54	0.28	286.52	88.24	78.52	5 57.2	6 37.2

152737°—1923——40

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN MIDNIGHT.

Date.		Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}+180°$	$D_{\odot}$
		m		°	°	°	°	°
Jan.	1	49.08	−1.4	18.26	87.58	−3.07	78.83	−3.01
	8	48.25	1.4	17.92	88.67	3.10	79.36	3.01
	15	47.38	1.5	17.61	89.66	3.13	79.90	3.02
	22	46.48	1.5	17.32	90.55	3.16	80.43	3.03
	29	45.55	1.5	17.07	91.32	3.19	80.96	3.03
Feb.	5	44.61	−1.6	16.86	91.97	−3.21	81.50	−3.04
	12	43.67	1.6	16.69	92.48	3.24	82.03	3.04
	19	42.73	1.7	16.56	92.85	3.26	82.56	3.04
	26	41.82	1.7	16.48	93.08	3.28	83.10	3.05
Mar.	5	40.94	1.8	16.46	93.15	3.30	83.63	3.05
	12	40.11	−1.8	16.48	93.06	−3.32	84.17	−3.05
	19	39.34	1.9	16.56	92.83	3.34	84.70	3.06
	26	38.65	1.9	16.69	92.45	3.35	85.24	3.06
Apr.	2	38.04	2.0	16.86	91.93	3.35	85.77	3.06
	9	37.53	2.0	17.07	91.29	3.36	86.31	3.06
	16	37.13	−2.0	17.31	90.55	−3.35	86.84	−3.06
	23	36.85	2.0	17.57	89.73	3.34	87.38	3.07
	30	36.68	2.0	17.85	88.86	3.33	87.92	3.07
May	7	36.64	2.0	18.12	87.97	3.31	88.45	3.07
	14	36.71	2.0	18.39	87.08	3.28	88.99	3.07
	21	36.91	−2.0	18.65	86.24	−3.25	89.53	−3.07
	28	37.23	2.0	18.88	85.46	3.22	90.06	3.07
June	4	37.65	2.0	19.08	84.78	3.19	90.60	3.07
	11	38.17	2.0	19.25	84.20	3.15	91.14	3.07
	18	38.78	1.9	19.38	83.76	3.12	91.68	3.07
	25	39.46	−1.9	19.47	83.45	−3.08	92.22	−3.07
July	2	40.21	1.8	19.52	83.28	3.05	92.75	3.07
	9	41.02	1.8	19.52	83.26	3.02	93.29	3.06
	16	41.86	1.8	19.49	83.39	2.99	93.83	3.06
	23	42.73	1.7	19.41	83.67	2.96	94.37	3.06
	30	43.62	−1.7	19.30	84.08	−2.94	94.91	−3.06
Aug.	6	44.51	1.6	19.14	84.63	2.92	95.45	3.06
	13	45.40	1.6	18.95	85.30	2.90	95.99	3.05
	20	46.27	1.5	18.72	86.09	2.89	96.53	3.05
	27	47.12	1.5	18.46	86.99	2.88	97.07	3.05
Sept.	3	47.94	−1.5	18.15	87.98	−2.87	97.62	−3.04
	10	48.71	1.4	17.82	89.07	2.86	98.16	3.04
	17	49.44	1.4	17.45	90.24	2.86	98.70	3.03
	24	50.11	1.4	17.04	91.49	2.85	99.24	3.03
Oct.	1	50.72	1.3	16.61	92.80	2.85	99.78	3.02
	8	51.26	−1.3	16.15	94.17	−2.85	100.33	−3.02
	15	51.73	1.3	15.66	95.59	2.85	100.87	3.01
	22	52.12	1.3	15.14	97.05	2.85	101.41	3.01
	29	52.43	−1.3	14.60	98.54	−2.85	101.96	−3.00
		....	..	....	....	...	....	...
Dec.	25	51.75	−1.3	9.63	111.07	−2.84	106.40	−2.94
	32	51.28	−1.3	9.01	112.53	−2.84	106.95	−2.94

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN MIDNIGHT.

Date.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	i	q	Q	Central Meridian.		Correction for Phase.
							System I.	System II.	
		"	"	°	"	°	°	°	°
Jan.	1	33.34	2.21	8.74	0.20	288.10	250.32	249.14	+0.33
	8	33.91	2.25	9.29	0.22	287.66	275.03	220.44	0.38
	15	34.53	2.29	9.75	0.25	287.24	299.87	191.86	0.41
	22	35.20	2.34	10.11	0.27	286.86	324.83	163.41	0.44
	29	35.92	2.39	10.35	0.29	286.50	349.93	135.09	0.46
Feb.	5	36.68	2.44	10.46	0.30	286.18	15.16	106.90	+0.47
	12	37.48	2.49	10.44	0.31	285.89	40.52	78.85	0.47
	19	38.30	2.54	10.28	0.31	285.63	66.02	50.93	0.46
	26	39.13	2.60	9.97	0.30	285.40	91.65	23.15	0.43
Mar.	5	39.97	2.65	9.50	0.28	285.20	117.41	355.50	0.39
	12	40.80	2.71	8.89	0.25	285.01	143.30	327.97	+0.34
	19	41.59	2.76	8.12	0.21	284.82	169.31	300.56	0.29
	26	42.34	2.81	7.21	0.17	284.60	195.41	273.25	0.23
Apr.	2	43.02	2.85	6.16	0.12	284.30	221.60	246.03	0.17
	9	43.60	2.89	4.98	0.08	283.84	247.85	218.86	0.11
	16	44.07	2.92	3.71	0.04	282.96	274.13	191.74	+0.06
	23	44.41	2.95	2.36	0.02	280.89	300.43	164.62	+0.02
	30	44.61	2.96	0.98	0.00	272.31	326.70	137.48	0.00
May	7	44.67	2.97	0.54	0.00	134.51	352.92	110.29	0.00
	14	44.57	2.96	1.92	0.01	114.80	19.06	83.02	−0.02
	21	44.33	2.94	3.29	0.04	111.80	45.08	55.63	−0.05
	28	43.96	2.92	4.60	0.07	110.67	70.96	28.11	0.09
June	4	43.47	2.89	5.82	0.11	110.09	96.69	0.43	0.15
	11	42.87	2.85	6.93	0.15	109.75	122.25	332.58	0.21
	18	42.20	2.80	7.91	0.20	109.52	147.63	304.55	0.27
	25	41.47	2.75	8.76	0.24	109.33	172.82	276.33	−0.33
July	2	40.69	2.70	9.46	0.28	109.16	197.82	247.94	0.39
	9	39.90	2.65	10.01	0.30	108.98	222.65	219.36	0.44
	16	39.09	2.60	10.42	0.32	108.80	247.31	190.61	0.47
	23	38.30	2.54	10.69	0.33	108.61	271.80	161.70	0.50
	30	37.52	2.49	10.81	0.33	108.39	296.15	132.63	−0.51
Aug.	6	36.76	2.44	10.81	0.33	108.14	320.36	103.44	0.51
	13	36.04	2.39	10.68	0.31	107.87	344.44	74.12	0.50
	20	35.36	2.35	10.43	0.29	107.57	8.42	44.69	0.47
	27	34.73	2.31	10.08	0.27	107.24	32.31	15.17	0.44
Sept.	3	34.14	2.27	9.62	0.24	106.88	56.11	345.58	−0.40
	10	33.59	2.23	9.08	0.21	106.47	79.85	315.91	0.36
	17	33.10	2.20	8:45	0.18	106.03	103.54	286.19	0.31
	24	32.66	2.17	7.75	0.15	105.55	127.19	256.43	0.26
Oct.	1	32.27	2.14	6.98	0.12	105.02	150.81	226.64	0.21
	8	31.93	2.12	6.16	0.09	104.42	174.41	196.84	−0.16
	15	31.64	2.10	5.28	0.07	103.75	198.00	167.02	0.12
	22	31.40	2.09	4.37	0.05	102.95	221.60	137.22	0.08
	29	31.21	2.07	3.42	0.03	101.96	245.22	107.42	−0.05
		....	...	....	...	.....	.....	.....	...
Dec.	25	31.62	2.10	4.66	0.05	281.01	233.40	20.69	+0.09
	32	31.91	2.12	5.58	0.08	280.15	257.53	351.41	+0.14

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM I.

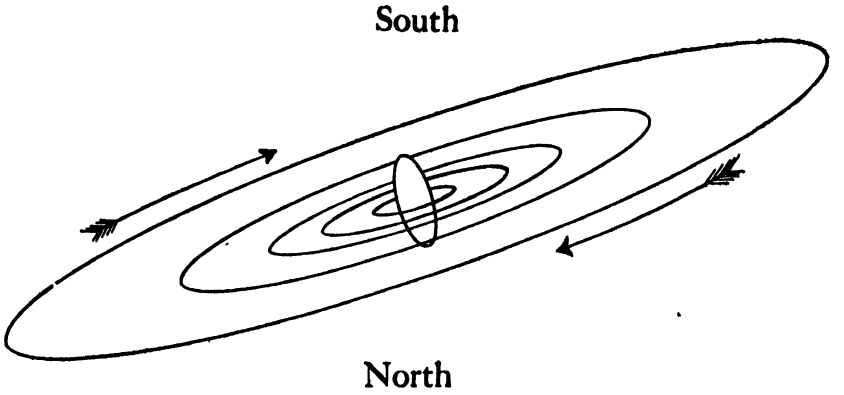
GREENWICH MEAN TIME.

Transit of Zero Meridian.	Interval between Successive Transits.	Transit of Zero Meridian.	Interval between Successive Transits.	Transit of Zero Meridian.	Interval between Successive Transits.
d h m	h m	d h m	h m	d h m	h m
Jan. 1 14 59.38	9 50.55	Apr. 18 5 42.36	9 50.41	Aug. 2 20 30.41	9 50.61
3 16 12.16		20 6 54.40		4 21 43.44	
5 17 24.92		22 8 6.43		6 22 56.49	
7 18 37.67		24 9 18.47		9 0 9.55	
9 19 50.40		26 10 30.51		11 1 22.63	
11 21 3.11	9 50.54	28 11 42.55	9 50.41	13 2 35.72	9 50.62
13 22 15.81		30 12 54.60		15 3 48.82	
15 23 28.49		May 2 14 6.65		17 5 1.94	
18 0 41.15		4 15 18.71		19 6 15.08	
20 1 53.80		6 16 30.78		21 7 28.22	
22 3 6.43	9 50.52	8 17 42.86	9 50.42	23 8 41.38	9 50.63
24 4 19.04		10 18 54.96		25 9 54.54	
26 5 31.64		12 20 7.07		27 11 7.72	
28 6 44.22		14 21 19.20		29 12 20.91	
30 7 56.78		16 22 31.35		31 13 34.11	
Feb. 1 9 9.32	9 50.50	18 23 43.52	9 50.44	Sept. 2 14 47.31	9 50.64
3 10 21.85		21 0 55.70		4 16 0.53	
5 11 34.36		23 2 7.91		6 17 13.75	
7 12 46.85		25 3 20.15		8 18 26.98	
9 13 59.32		27 4 32.40		10 19 40.22	
11 15 11.78	9 50.48	29 5 44.68	9 50.47	12 20 53.47	9 50.65
13 16 24.22		31 6 56.98		14 22 6.72	
15 17 36.64		June 2 8 9.30		16 23 19.98	
17 18 49.05		4 9 21.65		19 0 33.24	
19 20 1.44		6 10 34.02		21 1 46.51	
21 21 13.81	9 50.47	8 11 46.42	9 50.49	23 2 59.79	9 50.66
23 22 26.16		10 12 58.85		25 4 13.06	
25 23 38.50		12 14 11.30		27 5 26.35	
28 0 50.82		14 15 23.78		29 6 39.63	
Mar. 2 2 3.12		16 16 36.28		Oct. 1 7 52.92	
4 3 15.41	9 50.45	18 17 48.81	9 50.52	3 9 6.21	9 50.66
6 4 27.68		20 19 1.36		5 10 19.50	
8 5 39.94		22 20 13.94		7 11 32.80	
10 6 52.18		24 21 26.54		9 12 46.10	
12 8 4.40		26 22 39.18		11 13 59.40	
14 9 16.61	9 50.44	28 23 51.83	9 50.54	13 15 12.69	9 50.66
16 10 28.80		July 1 1 4.51		15 16 25.99	
18 11 40.98		3 2 17.22		17 17 39.29	
20 12 53.15		5 3 29.94		19 18 52.59	
22 14 5.30		7 4 42.69		21 20 5.89	
24 15 17.44	9 50.42	9 5 55.47	9 50.57	23 21 19.19	9 50.66
26 16 29.57		11 7 8.27		25 22 32.48	
28 17 41.68		13 8 21.09		27 23 45.78	
30 18 53.79		15 9 33.93		. . . . .	
Apr. 1 20 5.88		17 10 46.79		. . . . .	
3 21 17.96	9 50.41	19 11 59.68	9 50.59	Dec. 20 7 29.53	9 50.62
5 22 30.04		21 13 12.58		22 8 42.62	
7 23 42.11		23 14 25.51		24 9 55.70	
10 0 54.17		25 15 38.45		26 11 8.77	
12 2 6.22		27 16 51.41		28 12 21.82	
14 3 18.27	9 50.41	29 18 4.39	9 50.60	30 13 34.86	9 50.60
16 4 30.32		31 19 17.39		32 14 47.89	

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM II.

GREENWICH MEAN TIME.

Transit of Zero Meridian.			Interval between Successive Transits.	Transit of Zero Meridian.			Interval between Successive Transits.	Transit of Zero Meridian.			Interval between Successive Transits.
	d	h m	h m		d	h m	h m		d	h m	h m
Jan.	1	15 2.91	9 55.73	Apr.	19	4 11.78	9 55.58	Aug.	4	17 26.50	9 55.79
	3	16 41.58			21	5 49.69			6	19 5.44	
	5	18 20.24			23	7 27.61			8	20 44.40	
	7	19 58.88			25	9 5.53			10	22 23.37	
	9	21 37.50			27	10 43.45			13	0 2.35	
	11	23 16.10	9 55.71		29	12 21.37	9 55.59		15	1 41.35	9 55.81
	14	0 54.69		May	1	13 59.29			17	3 20.37	
	16	2 33.26			3	15 37.23			19	4 59.39	
	18	4 11.81			5	17 15.17			21	6 38.43	
	20	5 50.35			7	18 53.13			23	8 17.48	
	22	7 28.87	9 55.70		9	20 31.09	9 55.60		25	9 56.54	9 55.82
	24	9 7.37			11	22 9.08			27	11 35.62	
	26	10 45.85			13	23 47.08			29	13 14.70	
	28	12 24.32			16	1 25.10			31	14 53.79	
	30	14 2.77			18	3 3.13		Sept.	2	16 32.90	
Feb.	1	15 41.20	9 55.68		20	4 41.19	9 55.62		4	18 12.01	9 55.83
	3	17 19.61			22	6 19.27			6	19 51.13	
	5	18 58.01			24	7 57.37			8	21 30.26	
	7	20 36.39			26	9 35.50			10	23 9.40	
	9	22 14.75			28	11 13.65			13	0 48.54	
	11	23 53.09	9 55.66		30	12 51.82	9 55.64		15	2 27.69	9 55.83
	14	1 31.41		June	1	14 30.02			17	4 6.85	
	16	3 9.72			3	16 8.24			19	5 46.01	
	18	4 48.00			5	17 46.49			21	7 25.17	
	20	6 26.27			7	19 24.76			23	9 4.35	
	22	8 4.53	9 55.64		9	21 3.06	9 55.67		25	10 43.52	9 55.84
	24	9 42.76			11	22 41.39			27	12 22.70	
	26	11 20.98			14	0 19.74			29	14 1.89	
	28	12 59.18			16	1 58.12		Oct.	1	15 41.07	
Mar.	2	14 37.36			18	3 36.52			3	17 20.26	
	4	16 15.53	9 55.63		20	5 14.95	9 55.70		5	18 59.46	9 55.84
	6	17 53.68			22	6 53.41			7	20 38.65	
	8	19 31.82			24	8 31.90			9	22 17.85	
	10	21 9.93			26	10 10.41			11	23 57.04	
	12	22 48.04			28	11 48.94			14	1 36.24	
	15	0 26.12	9 55.61		30	13 27.50	9 55.72		16	3 15.44	9 55.84
	17	2 4.19		July	2	15 6.09			18	4 54.64	
	19	3 42.25			4	16 44.70			20	6 33.84	
	21	5 20.29			6	18 23.33			22	8 13.03	
	23	6 58.32			8	20 1.99			24	9 52.23	
	25	8 36.34	9 55.60		10	21 40.67	9 55.75		26	11 31.42	9 55.84
	27	10 14.34			12	23 19.38			28	13 10.61	
	29	11 52.34			15	0 58.11			30	14 49.80	
	31	13 30.32			17	2 36.86			.	. . . . .	
Apr.	2	15 8.29			19	4 15.63			.	. . . . .	
	4	16 46.25	9 55.59		21	5 54.42	9 55.77	Dec.	20	2 20.25	9 55.80
	6	18 24.20			23	7 33.23			22	3 59.24	
	8	20 2.14			25	9 12.07			24	5 38.22	
	10	21 40.08			27	10 50.92			26	7 17.18	
	12	23 18.01			29	12 29.79			28	8 56.13	
	15	0 55.94	9 55.58		31	14 8.68	9 55.78		30	10 35.07	9 55.78
	17	2 33.86		Aug.	2	15 47.58			32	12 13.99	



APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF OPPOSITION, MAY 5, 1923, AS SEEN IN AN INVERTING TELESCOPE, AND ELONGATED IN THE RATIO OF THREE TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

In the above diagram the central ellipse represents the disk of Jupiter, and the inner orbit is that of Satellite V.

In the diagrams of the configurations of Jupiter's four brighter satellites, pages 635–655, Jupiter is represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Greenwich time stated above the diagrams are indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d h m s	d
I.	1 18 28 35.946	= 1.769 860 49
II.	3 13 17 53.736	= 3.554 094 17
III.	7 3 59 35.856	= 7.166 387 22
IV.	16 18 5 6.916	=16.753 552 27
V.	0 11 57 27.635	= 0.498 236 52
VI.		=266.00
VII.		=276.67

SATELLITE V.

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h			d	h			d	h	
Feb.	9	13.4	E.	May	10	5.3	E.	Feb.	9	19.4	W.	May	10	11.3	W.
	19	12.5	E.		20	4.4	E.		19	18.5	W.		20	10.4	W.
Mar.	1	11.6	E.		30	3.5	E.	Mar.	1	17.6	W.		30	9.4	W.
	11	10.8	E.	June	9	2.6	E.		11	16.7	W.	June	9	8.6	W.
	21	9.9	E.		19	1.7	E.		21	15.8	W.		19	7.7	W.
	31	8.9	E.		29	0.8	E.		31	14.9	W.		29	6.8	W.
Apr.	10	8.0	E.	July	9	0.0	E.	Apr.	10	14.0	W.	July	9	5.9	W.
	20	7.1	E.		18	23.1	E.		20	13.1	W.		19	5.1	W.
	30	6.2	E.		28	22.3	E.		30	12.2	W.		29	4.2	W.

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	2	1	37.3	Mar.	24	11	8.1	June	13	19	11.9	Sept.	3	4	54.4
	3	20	6.6		26	5	34.6		15	13	38.8		4	23	24.0
	5	14	35.9		28	0	1.1		17	8	5.7		6	17	53.7
	7	9	5.2		29	18	27.6		19	2	32.7		8	12	23.4
	9	3	34.4		31	12	54.0		20	20	59.8		10	6	53.1
	10	22	3.5	Apr.	2	7	20.3		22	15	26.8		12	1	22.9
	12	16	32.7		4	1	46.7		24	9	54.0		13	19	52.7
	14	11	1.8		5	20	12.9		26	4	21.2		15	14	22.6
	16	5	30.8		7	14	39.1		27	22	48.5		17	8	52.4
	17	23	59.8		9	9	5.3		29	17	15.9		19	3	22.4
	19	18	28.7		11	3	31.4	July	1	11	43.3		20	21	52.3
	21	12	57.5		12	21	57.5		3	6	10.9		22	16	22.4
	23	7	26.4		14	16	23.5		5	0	38.4		24	10	52.3
	25	1	55.1		16	10	49.4		6	19	6.1		26	5	22.4
	26	20	23.8		18	5	15.5		8	13	33.8		27	23	52.4
	28	14	52.4		19	23	41.5		10	8	1.7		29	18	22.6
	30	9	21.0		21	18	7.5		12	2	29.5	Oct.	1	12	52.6
Feb.	1	3	49.5		23	12	33.4		13	20	57.5		3	7	22.8
	2	22	18.0		25	6	59.3		15	15	25.5		5	1	53.0
	4	16	46.3		27	1	25.2		17	9	53.6		6	20	23.2
	6	11	14.7		28	19	51.1		19	4	21.7		8	14	53.3
	8	5	42.9		30	14	17.0		20	22	49.9		10	9	23.6
	10	0	11.2	May	2	8	42.8		22	17	18.2		12	3	53.9
	11	18	39.3		4	3	8.7		24	11	46.6		13	22	24.1
	13	13	7.4		5	21	34.6		26	6	14.9		15	16	54.4
	15	7	35.3		7	16	0.5		28	0	43.4		17	11	24.8
	17	2	3.3		9	10	26.4		29	19	11.9		19	5	55.0
	18	20	31.2		11	4	52.3		31	13	40.6		21	0	25.4
	20	14	59.0		12	23	18.3	Aug.	2	8	9.2		22	18	55.7
	22	9	26.7		14	17	44.3		4	2	37.9		24	13	26.1
	24	3	54 4		16	12	10.3		5	21	6.7		26	7	56.5
	25	22	22.0		18	6	36.3		7	15	35.6		28	2	26.9
	27	16	49.5		20	1	2.4		9	10	4.4		29	20	57.2
Mar.	1	11	17.0		21	19	28.4		11	4	33.4		31	15	27.7
	3	5	44.4		23	13	54.6		12	23	2.4	Nov.	2	9	58.1
	5	0	11.7		25	8	20.7		14	17	31.5		..	..	....
	6	18	39.0		27	2	46.9		16	12	0.6	Dec.	14	22	8.0
	8	13	6.2		28	21	13.2		18	6	29.7		16	16	38.3
	10	7	33.3		30	15	39.5		20	0	58.9		18	11	8.5
	12	2	0.4	June	1	10	5.9		21	19	28.2		20	5	38.8
	13	20	27.4		3	4	32.3		23	13	57.5		22	0	9.1
	15	14	54.3		4	22	58.8		25	8	26.8		23	18	39.3
	17	9	21.2		6	17	25.3		27	2	56.3		25	13	9.5
	19	3	48.0		8	11	51.8		28	21	25.8		27	7	39.7
	20	22	14.8		10	6	18.5		30	15	55.3		29	2	9.8
	22	16	41.4		12	0	45.2	Sept.	1	10	24.8		30	20	40.1

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h m		d	h m		d	h m		d	h m
Jan.	3	8 7.3	Mar.	26	1 24.3	June	15	15 51.3	Sept.	5	9 29.4
	6	21 28.7		29	14 34.4		19	5 3.6		8	22 51.3
	10	10 49.2	Apr.	2	3 44.8		22	18 15.4		12	12 13.8
	14	0 9.7		5	16 54.0		26	7 28.7		16	1 36.2
	17	13 29.6		9	6 3.7		29	20 41.7		19	14 59.1
	21	2 49.4		12	19 12.2	July	3	9 56.0		23	4 22.0
	24	16 8.5		16	8 21.2		6	23 10.1		26	17 45.2
	28	5 27.5		19	21 29.1		10	12 25.6		30	7 8.4
	31	18 45.7		23	10 37.7		14	1 40.8	Oct.	3	20 31.9
Feb.	4	8 4.0		26	23 45.2		17	14 57.2		7	9 55.5
	7	21 21.3		30	12 53.6		21	4 13.5		10	23 19.2
	11	10 38.7	May	4	2 1.0		24	17 31.0		14	12 43.0
	14	23 55.1		7	15 9.4		28	6 48.3		18	2 6.9
	18	13 11.5		11	4 16.8		31	20 6.7		21	15 30.9
	22	2 26.8		14	17 25.4	Aug.	4	9 24.9		25	4 55.0
	25	15 42.2		18	6 33.1		7	22 44.2		28	18 19.0
Mar.	1	4 56.5		21	19 42.1		11	12 3.3	Nov.	1	7 43.2
	4	18 10.9		25	8 50.4		15	1 23.4		..	.. ..
	8	7 24.1		28	22 0.0		18	14 43.3	Dec.	17	13 55.4
	11	20 37.5	June	1	11 9.0		22	4 4.1		21	3 18.9
	15	9 49.6		5	0 19.4		25	17 24.7		24	16 42.2
	18	23 1.9		8	13 29.2		29	6 46.2		28	6 5.4
	22	12 12.9		12	2 40.5	Sept.	1	20 7.5		31	19 28.5

SATELLITE III.

	d	h m		d	h m		d	h m		d	h m
Jan.	7	17 59.5	Apr.	3	15 52.7	June	28	8 20.2	Sept.	22	8 41.3
	14	22 10.6		10	19 14.9	July	5	12 0.4		29	13 3.2
	22	2 19.1		17	22 34.8		12	15 44.8	Oct.	6	17 26.3
	29	6 23.5		25	1 52.5		19	19 33.4		13	21 50.8
Feb.	5	10 24.0	May	2	5 9.6		26	23 26.8		21	2 16.4
	12	14 20.3		9	8 25.9	Aug.	3	3 24.2		28	6 42.9
	19	18 12.2		16	11 42.7		10	7 26.2		..	.. ..
	26	22 0.2		23	15 0.8		17	11 31.4		..	.. ..
Mar.	6	1 43.5		30	18 21.2		24	15 39.8		..	.. ..
	13	5 22.8	June	6	21 45.1		31	19 51.0	Dec.	17	14 0.1
	20	8 57.0		14	1 12.4	Sept.	8	0 5.0		24	18 27.3
	27	12 26.9		21	4 44.5		15	4 22.1		31	22 53.1

SATELLITE IV.

	d	h m		d	h m		d	h m		d	h m
Jan.	10	21 0.1	Apr.	4	10 32.8	June	26	12 0.0	Sept.	18	6 34.4
	27	15 49.9		21	1 8.2	July	13	4 27.8	Oct.	5	2 34.3
Feb.	13	9 53.5	May	7	15 22.0		29	21 50.5		21	22 56.6
Mar.	2	3 2.7		24	5 40.4	Aug.	15	16 3.8		..	.. ..
	18	19 14.6	June	9	20 27.2	Sept.	1	11 1.4	Dec.	28	9 21.4

DIFFERENTIAL COORDINATES OF SATELLITE VI.

FOR GREENWICH MEAN MIDNIGHT.

Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
Jan. 1	+0 28	−20.1	Apr. 11	−4 16	+11.7	July 20	+3 2	− 4.6
5	+0 13	20.6	15	4 8	13.8	24	2 59	7.0
9	−0 3	21.0	19	3 58	15.8	28	2 53	9.2
13	0 19	21.3	23	3 45	17.6	Aug. 1	2 44	11.3
17	0 36	21.3	27	3 30	19.2	5	2 34	13.1
21	−0 53	−21.2	May 1	−3 12	+20.7	9	+2 23	−14.7
25	1 10	20.9	5	2 51	21.9	13	2 10	16.1
29	1 27	20.5	9	2 29	22.8	17	1 56	17.4
Feb. 2	1 44	19.8	13	2 5	23.4	21	1 41	18.4
6	2 1	19.0	17	1 39	23.7	25	1 26	19.2
10	−2 17	−18.0	21	−1 13	+23.7	29	+1 10	−19.9
14	2 34	16.8	25	0 45	23.4	Sept. 2	0 54	20.4
18	2 49	15.5	29	−0 18	22.8	6	0 39	20.8
22	3 4	14.0	June 2	+0 10	21.8	10	0 23	21.0
26	3 18	12.3	6	0 36	20.6	14	+0 8	21.1
Mar. 2	−3 32	−10.5	10	+1 2	+19.0	18	−0 8	−21.0
6	3 44	8.6	14	1 25	17.2	22	0 22	20.8
10	3 55	6.6	18	1 47	15.3	26	0 37	20.5
14	4 4	4.4	22	2 6	13.1	30	0 50	20.0
18	4 12	− 2.2	26	2 23	10.7	Oct. 4	1 4	19.5
22	−4 18	+ 0.1	30	+2 38	+ 8.3	8	−1 16	−18.8
26	4 22	2.5	July 4	2 49	5.7	12	1 28	18.0
30	4 24	4.8	8	2 57	3.1	16	1 40	17.1
Apr. 3	4 24	7.2	12	3 2	+ 0.4	20	1 51	16.1
7	−4 21	+ 9.5	16	+3 3	− 2.1	24	−2 1	−15.0

DIFFERENTIAL COORDINATES OF SATELLITE VII.

Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
Jan. 1	−1 36	−5.7	Apr. 11	+2 23	+10.1	July 20	+2 39	+5.2
5	1 50	6.3	15	2 45	10.7	24	2 22	4.4
9	2 2	6.8	19	3 7	11.3	28	2 4	3.7
13	2 13	7.1	23	3 27	11.7	Aug. 1	1 46	2.9
17	2 23	7.3	27	3 45	12.0	5	1 28	2.1
21	−2 31	−7.4	May 1	+4 2	+12.3	9	+1 10	+1.2
25	2 36	7.4	5	4 16	12.5	13	0 52	+0.4
29	2 40	7.2	9	4 28	12.6	17	0 34	−0.5
Feb. 2	2 40	6.8	13	4 39	12.6	21	+0 16	1.4
6	2 38	6.2	17	4 47	12.6	25	−0 2	2.2
10	−2 33	−5.5	21	+4 52	+12.5	29	−0 19	−3.0
14	2 24	4.7	25	4 56	12.3	Sept. 2	0 35	3.8
18	2 14	3.8	29	4 57	12.1	6	0 51	4.6
22	2 0	2.7	June 2	4 56	11.8	10	1 6	5.3
26	1 44	1.6	6	4 53	11.5	14	1 20	5.9
Mar. 2	−1 27	−0.4	10	+4 48	+11.0	18	−1 33	−6.4
6	1 7	+0.7	14	4 41	10.5	22	1 45	6.8
10	0 46	2.0	18	4 31	10.1	26	1 55	7.1
14	0 24	3.2	22	4 21	9.6	30	2 4	7.4
18	−0 1	4.4	26	4 9	9.0	Oct. 4	2 11	7.5
22	+0 23	+5.5	30	+3 56	+ 8.4	8	−2 16	−7.5
26	0 47	6.6	July 4	3 42	7.8	12	2 20	7.3
30	1 12	7.6	8	3 28	7.2	16	2 21	7.0
Apr. 3	1 36	8.5	12	3 12	6.6	20	2 20	6.5
7	+2 0	+9.3	16	+2 56	+ 5.9	24	−2 18	−5.8

SATELLITES OF JUPITER, 1923.

GREENWICH MEAN TIME.

JANUARY.

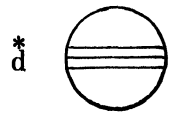
d	h	m		d	h	m		d	h	m		d	h	m	
1	2	10	I. Sh. I.	9	23	38	I.*Tr. I.	18	12	53	III. Tr. E.	26	10	8	II. Tr. I.
	3	11	I. Tr. I.						18	53	I. Sh. I.		12	25	II. Tr. E.
	4	19	I. Sh. E.	10	0	41	I. Sh. E.		20	3	I.*Tr. I.		18	5.9	I. Ec. D.
	5	20	I. Tr. E.		1	46	I. Tr. E.		21	2	I.*Sh. E.		21	28	I.*Oc. R.
	10	40	II. Sh. I.		7	23.2	II. Ec. D.		22	11	I.*Tr. E.				
	12	46	II. Tr. I.		11	59	II. Oc. R.					27	15	14	I. Sh. I.
	13	3	II. Sh. E.		19	51.3	I. Ec. D.	19	5	7	II. Sh. I.		16	27	I. Tr. I.
	15	6	II. Tr. E.		23	8	I.*Oc. R.		7	29	II. Sh. E.		17	23	I. Sh. E.
	23	29.6	I.*Ec. D.						7	30	II. Tr. I.		18	35	I. Tr. E.
				11	2	32	III. Sh. I.		9	48	II. Tr. E.				
2	2	42	I. Oc. R.		4	19	III. Sh. E.		16	12.9	I. Ec. D.	28	1	48.6	II. Ec. D.
	20	38	I.*Sh. I.		7	7	III. Tr. I.		19	33	I.*Oc. R.		4	11.9	II. Ec. R.
	21	41	I.*Tr. I.		8	46	III. Tr. E.						4	18	II. Oc. D.
	22	47	I.*Sh. E.		17	0	I. Sh. I.	20	13	21	I. Sh. I.		6	37	II. Oc. R.
	23	49	I.*Tr. E.		18	7	I. Tr. I.		14	32	I. Tr. I.		12	34.3	I. Ec. D.
					19	9	I. Sh. E.		15	30	I. Sh. E.		15	57	I. Oc. R.
3	4	49.4	II. Ec. D.		20	15	I.*Tr. E.		16	40	I. Tr. E.				
	9	18	II. Oc. R.						23	14.4	II.*Ec. D.	29	0	32.3	III. Ec. D.
	17	57.9	I. Ec. D.	12	2	32	II. Sh. I.						2	19.6	III. Ec. R.
	21	11	I.*Oc. R.		4	49	II. Tr. I.	21	1	37.8	II. Ec. R.		5	38	III. Oc. D.
	22	35	III.*Sh. I.		4	55	II. Sh. E.		1	40	II. Oc. D.		7	9	III. Oc. R.
					7	8	II. Tr. E.		3	59	II. Oc. R.		9	43	I. Sh. I.
4	0	22	III. Sh. E.		14	19.7	I. Ec. D.		10	41.1	I. Ec. D.		10	56	I. Tr. I.
	2	53	III. Tr. I.		17	37	I. Oc. R.		14	2	I. Oc. R.		11	52	I. Sh. E.
	4	35	III. Tr. E.						20	34.7	III.*Ec. D.		13	4	I. Tr. E.
	15	7	I. Sh. I.	13	11	28	I. Sh. I.		22	22.5	III.*Ec. R.		20	58	II.*Sh. I.
	16	10	I. Tr. I.		12	36	I. Tr. I.						23	20	II.*Sh. E.
	17	16	I. Sh. E.		13	37	I. Sh. E.	22	1	32	III. Oc. D.		23	27	II.*Tr. I.
	18	19	I. Tr. E.		14	44	I. Tr. E.		3	6	III. Oc. R.				
	23	57	II.*Sh. I.		20	40.3	II.*Ec. D.		7	50	I. Sh. I.	30	1	43	II. Tr. E.
									9	1	I. Tr. I.		7	2.6	I. Ec. D.
5	2	7	II. Tr. I.	14	1	20	II. Oc. R.		9	59	I. Sh. E.		10	25	I. Oc. R.
	2	20	II. Sh. E.		8	47.9	I. Ec. D.		11	9	I. Tr. E.				
	4	27	II. Tr. E.		12	6	I. Oc. R.		18	24	II. Sh. I.	31	4	11	I. Sh. I.
	12	26.4	I. Ec. D.		16	36.6	III. Ec. D.		20	46	II.*Sh. E.		5	24	I. Tr. I.
	15	41	I. Oc. R.		18	24.7	III. Ec. R.		20	49	II.*Tr. I.		6	20	I. Sh. E.
					21	22	III.*Oc. D.		23	7	II.*Tr. E.		7	32	I. Tr. E.
6	9	35	I. Sh. I.		23	0	III.*Oc. R.						15	5.5	II. Ec. D.
	10	39	I. Tr. I.					23	5	9.5	I. Ec. D.		17	28.8	II. Ec. R.
	11	44	I. Sh. E.	15	5	57	I. Sh. I.		8	31	I. Oc. R.		17	37	II. Oc. D.
	12	48	I. Tr. E.		7	5	I. Tr. I.						19	55	II.*Oc. R.
	18	6.4	II. Ec. D.		8	5	I. Sh. E.	24	2	18	I. Sh. I.				
	22	39	II.*Oc. R.		9	13	I. Tr. E.		3	29	I. Tr. I.				
					15	50	II. Sh. I.		4	27	I. Sh. E.				
7	6	54.6	I. Ec. D.		18	10	II. Tr. I.		5	38	I. Tr. E.				
	10	10	I. Oc. R.		18	12	II. Sh. E.		12	31.3	II. Ec. D.				
	12	39.0	III. Ec. D.		20	28	II.*Tr. E.		14	54.7	II. Ec. R.				
	14	27.6	III. Ec. R.						14	59	II. Oc. D.				
	17	9	III. Oc. D.	16	3	16.3	I. Ec. D.		17	18	II. Oc. R.				
	18	50	III. Oc. R.		6	36	I. Oc. R.		23	37.7	I.*Ec. D.				
8	4	3	I. Sh. I.	17	0	25	I. Sh. I.	25	3	0	I. Oc. R.				
	5	8	I. Tr. I.		1	34	I. Tr. I.		10	26	III. Sh. I.				
	6	12	I. Sh. E.		2	34	I. Sh. E.		12	12	III. Sh. E.				
	7	17	I. Tr. E.		3	42	I. Tr. E.		15	25	III. Tr. I.				
	13	15	II. Sh. I.		9	57.2	II. Ec. D.		16	57	III. Tr. E.				
	15	29	II. Tr. I.		14	39	II. Oc. R.		20	46	I.*Sh. I.				
	15	38	II. Sh. E.		21	44.5	I.*Ec. D.		21	58	I.*Tr. I.				
	17	48	II. Tr. E.						22	55	I.*Sh. E.				
				18	1	4	I. Oc. R.								
9	1	23.0	I. Ec. D.		6	29	III. Sh. I.	26	0	6	I. Tr. E.				
	4	39	I. Oc. R.		8	16	III. Sh. E.		7	41	II. Sh. I.				
	22	32	I.*Sh. I.		11	18	III. Tr. I.		10	3	II. Sh. E.				

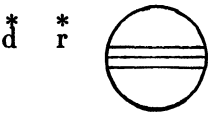
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc.. occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

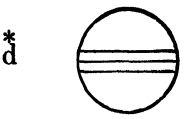
GREENWICH MEAN TIME.

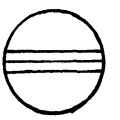
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 21h 45m for an Inverting Telescope.

Day.	West.	East.
1	2· ·1 ○ 4· ·3	
2	○1· ·2 ·4 ○ 3·	
3	4· ○ ·1 ·3 ·2	
4	4· 3· 1· ○ 2·	
5	4· 3· 2· ○ ·1	
6	·4 ·3 1· ○	·2●
7	·4 ○ ·3 1· 2·	
8	·4 ·1 ·2 ○ ·3	
9	·4 ·2 ○1· 3·	
10	·4 ○ ·3 ·2	·1●
11	3· 1· ○ 2· ·4	
12	3· 2· ○ ·1 ·4	
13	·3 1· ○ ·4	·2●
14	○ 1· 2· ·4	·3●
15	·1 2· ○ ·3 4·	
16	·2 ○ 1· 3· 4·	
17	○ ·2 ·3 4·	·1●
18	○1· 3· ○ 4· 2·	
19	3· ·2 ·4 ○ ·1	
20	4· ·3 1· ·2 ○	
21	4· ○ ·1 ·2	·3●
22	○2· 4· ·1 ○ ·3	
23	·4 ·2 ○ 1· 3·	
24	·4 ·1 ○ ·2 3·	
25	·4 3· ○ 2· ·1	
26	3· ·4 ·2 ○ ·1	
27	·3 ·2 ·1 ○ ·4	
28	·3 ○ ·1 ·2 ·4	
29	1· 2○· ·3 ·4	
30	·2 ○ 1· ·3 ·4	
31	·1 ○ ·2 3· 4·	

GREENWICH MEAN TIME.

FEBRUARY.

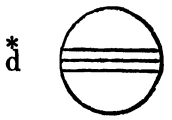
d	h	m		d	h	m		d	h	m		d	h	m	
1	1	30.8	I. Ec. D.	9	1	46	I. Tr. I.	17	3	8	I. Oc. R.	25	14	34	II. Oc. D.
	4	54	I. Oc. R.		2	41	I. Sh. E.		20	54	I.*Sh. I.		16	50	II. Oc. R.
	14	24	III. Sh. I.		3	54	I. Tr. E.		22	7	I.*Tr. I.		20	6.6	I.*Ec. D.
	16	10	III. Sh. E.		12	49	II. Sh. I.		23	3	I.*Sh. E.		23	26	I. Oc. R.
	19	30	III.*Tr. I.		15	11	II. Sh. E.								
	20	58	III.*Tr. E.		15	19	II. Tr. I.	18	0	15	I. Tr. E.	26	16	21.1	III. Ec. D.
	22	40	I.*Sh. I.		17	34	II. Tr. E.		9	32.0	II. Ec. D.		17	16	I.*Sh. I.
	23	53	I. Tr. I.		21	52.3	I.*Ec. D.		11	54.9	II. Ec. R.		18	7.3	III.*Ec. R.
									12	3	II. Oc. D.		18	26	I.*Tr. I.
2	0	48	I. Sh. E.	10	1	15	I. Oc. R.		14	20	II. Oc. R.		19	25	I.*Sh. E.
	2	1	I. Tr. E.		19	1	I.*Sh. I.		18	13.6	I.*Ec. D.		20	34	I.*Tr. E.
	10	15	II. Sh. I.		20	15	I.*Tr. I.		21	35	I.*Oc. R.		21	22	III.*Oc. D.
	12	37	II. Sh. E.		21	10	I.*Sh. E.						22	39	III.*Oc. R.
	12	45	II. Tr. I.		22	22	I.*Tr. E.	19	12	23.8	III. Ec. D.				
	15	1	II. Tr. E.						14	10.1	III. Ec. R.	27	7	14	II. Sh. I.
	19	59.2	I.*Ec. D.	11	6	57.4	II. Ec. D.		15	22	I. Sh. I.		9	34	II. Sh. E.
	23	22	I.*Oc. R.		9	20.4	II. Ec. R.		16	35	I. Tr. I.		9	36	II. Tr. I.
					9	30	II. Oc. D.		17	31	I. Sh. E.		11	49	II. Tr. E.
3	17	8	I. Sh. I.		11	47	II. Oc. R.		17	32	III. Oc. D.		14	34.9	I. Ec. D.
	18	21	I. Tr. I.		16	20.5	I. Ec. D.		18	43	I.*Tr. E.		17	54	I.*Oc. R.
	19	17	I.*Sh. E.		19	44	I.*Oc. R.		18	52	III.*Oc. R.				
	20	29	I.*Tr. E.									28	11	44	I. Sh. I.
				12	8	26.7	III. Ec. D.	20	4	40	II. Sh. I.		12	54	I. Tr. I.
4	4	22.9	II. Ec. D.		10	13.4	III. Ec. R.		7	1	II. Sh. E.		13	53	I. Sh. E.
	6	46.1	II. Ec. R.		13	29	I. Sh. I.		7	7	II. Tr. I.		15	1	I. Tr. E.
	6	55	II. Oc. D.		13	38	III. Oc. D.		9	21	II. Tr. E.				
	9	13	II. Oc. R.		14	43	I. Tr. I.		12	41.8	I. Ec. D.				
	14	27.4	I. Ec. D.		15	2	III. Oc. R.		16	3	I. Oc. R.				
	17	51	I. Oc. R.		15	38	I. Sh. E.								
					16	51	I. Tr. E.	21	9	51	I. Sh. I.				
5	4	29.7	III. Ec. D.						11	3	I. Tr. I.				
	6	16.8	III. Ec. R.	13	2	6	II. Sh. I.		12	0	I. Sh. E.				
	9	40	III. Oc. D.		4	27	II. Sh. E.		13	10	I. Tr. E.				
	11	8	III. Oc. R.		4	36	II. Tr. I.		22	49.2	II.*Ec. D.				
	11	36	I. Sh. I.		6	51	II. Tr. E.								
	12	50	I. Tr. I.		10	48.8	I. Ec. D.	22	1	12.0	II. Ec. R.				
	13	45	I. Sh. E.		14	12	I. Oc. R.		1	19	II. Oc. D.				
	14	58	I. Tr. E.						3	35	II. Oc. R.				
	23	33	II.*Sh. I.	14	7	58	I. Sh. I.		7	10.1	I. Ec. D.				
					9	11	I. Tr. I.		10	31	I. Oc. R.				
6	1	54	II. Sh. E.		10	6	I. Sh. E.								
	2	2	II. Tr. I.		11	19	I. Tr. E.	23	2	17	III. Sh. I.				
	4	18	II. Tr. E.		20	14.5	II.*Ec. D.		4	1	III. Sh. E.				
	8	55.7	I. Ec. D.		22	37.4	II.*Ec. R.		4	19	I. Sh. I.				
	12	19	I. Oc. R.		22	47	II.*Oc. D.		5	31	I. Tr. I.				
									6	28	I. Sh. E.				
7	6	4	I. Sh. I.	15	1	3	II. Oc. R.		7	20	III. Tr. I.				
	7	18	I. Tr. I.		5	17.0	I. Ec. D.		7	38	I. Tr. E.				
	8	13	I. Sh. E.		8	40	I. Oc. R.		8	37	III. Tr. E.				
	9	26	I. Tr. E.		22	19	III.*Sh. I.		17	57	II.*Sh. I.				
	17	39.9	II. Ec. D.						20	18	II.*Sh. E.				
	20	3.0	II.*Ec. R.	16	0	4	III. Sh. E.		20	22	II.*Tr. I.				
	20	13	II.*Oc. D.		2	26	I. Sh. I.		22	35	II.*Tr. E.				
	22	30	II.*Oc. R.		3	28	III. Tr. I.								
					3	39	I. Tr. I.	24	1	38.4	I. Ec. D.				
8	3	24.0	I. Ec. D.		4	35	I. Sh. E.		4	59	I. Oc. R.				
	6	47	I. Oc. R.		4	48	III. Tr. E.		22	47	I.*Sh. I.				
	18	22	III.*Sh. I.		5	47	I. Tr. E.		23	58	I. Tr. I.				
	20	7	III.*Sh. E.		15	23	II. Sh. I.								
	23	31	III.*Tr. I.		17	44	II. Sh. E.	25	0	56	I. Sh. E.				
					17	52	II. Tr. I.		2	6	I. Tr. E.				
9	0	33	I. Sh. I.		20	6	II.*Tr. E.		12	6.9	II. Ec. D.				
	0	55	III. Tr. E.		23	45.3	I. Ec. D.		14	29.6	II. Ec. R.				

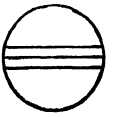
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

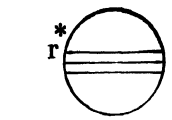
GREENWICH MEAN TIME.

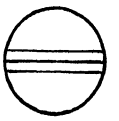
FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 20h 45m for an Inverting Telescope.

Day.	West.	East.
1	○3·	○ 1· 2· 4·
2	3· 2· ○	4· ·1●
3	·3 ·2 1.○	4·
4	·3 4○. ·1 ·2	
5	4· 1· ○ 2· ·3	
6	4· 2· ○ ·1 ·3	
7	4· ·1 ○ 3· ·2●	
8	4· 3○· 1· 2·	
9	·4 3· 2.·1 ○	
10	○1· ·4 ·3 ·2 ○	
11	·4 ·3 ○·1 ·2	
12	1.·4 ○ ·3 2·	
13	2· ○ ·4 ·1 ·3	
14	1· ○ 3.·4 ·2●	
15	○ 3.1· ·2 ·4	
16	3· 2.·1 ○ ·4	
17	3· ·2 1○· 4·	
18	·3 ○ ·2 4· ·1●	
19	1· ○·3 2· 4·	
20	2· ○ ·1 4· ·3	
21	1· 4.·2 ○ 3·	
22	4· ○ 3.1· ·2	
23	○2· 4· 3· ·1 ○	
24	4· 3· ·2 ○ 1·	
25	4· ·3 ○ ·2 ·1●	
26	·4 1.·3 ○ 2·	
27	·4 2· ○ ·1 ·3	
28	·4 1.·2 ○ 3·	

GREENWICH MEAN TIME.

MARCH.

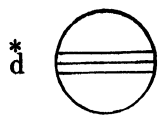
d	h	m		d	h	m		d	h	m		d	h	m	
1	1	24.1	II. Ec. D.	9	10	15	I. Sh. E.	17	7	17.5	I. Ec. D.	26	3	38.9	I. Ec. D.
	3	46.7	II. Ec. R.		11	18	I. Tr. E.		10	25	I. Oc. R.		6	38	I. Oc. R.
	3	49	II. Oc. D.		11	55	III. Sh. E.								
	6	4	II. Oc. R.		14	49	III. Tr. I.	18	4	27	I. Sh. I.	27	0	49	I. Sh. I.
	9	3.1	I. Ec. D.		16	0	III. Tr. E.		5	26	I. Tr. I.		1	40	I. Tr. I.
	12	21	I. Oc. R.		23	4	II. Sh. I.		6	36	I. Sh. E.		2	59	I. Sh. E.
									7	34	I. Tr. E.		3	48	I. Tr. E.
2	6	12	I. Sh. I.	10	1	13	II. Tr. I.		19	52.6	II.*Ec. D.		8	11.5	III. Ec. D.
	6	14	III. Sh. I.		1	24	II. Sh. E.						9	56.8	III. Ec. R.
	7	21	I. Tr. I.		3	28	II. Tr. E.	19	0	9	II. Oc. R.		11	54	III. Oc. D.
	7	58	III. Sh. E.		5	24.4	I. Ec. D.		1	45.8	I. Ec. D.		13	0	III. Oc. R.
	8	21	I. Sh. E.		8	37	I. Oc. R.		4	52	I. Oc. R.		17	27	II.*Sh. I.
	9	29	I. Tr. E.						22	56	I. Sh. I.		19	9	II.*Tr. I.
	11	7	III. Tr. I.	11	2	34	I. Sh. I.		23	53	I. Tr. I.		19	47	II.*Sh. E.
	12	20	III. Tr. E.		3	38	I. Tr. I.						21	21	II.*Tr. E.
	20	31	II.*Sh. I.		4	43	I. Sh. E.	20	1	5	I. Sh. E.		22	7.2	I.*Ec. D.
	22	49	II.*Tr. I.		5	46	I. Tr. E.		2	1	I. Tr. E.				
	22	51	II.*Sh. E.		17	17.1	II.*Ec. D.		4	13.9	III. Ec. D.	28	1	5	I. Oc. R.
					21	45	II.*Oc. R.		5	59.5	III. Ec. R.		19	17	I.*Sh. I.
3	1	3	II. Tr. E.		23	52.7	I. Ec. D.		8	23	III. Oc. D.		20	7	I.*Tr. I.
	3	31.4	I. Ec. D.						9	31	III. Oc. R.		21	27	I.*Sh. E.
	6	48	I. Oc. R.	12	3	4	I. Oc. R.		14	54	II. Sh. I.		22	14	I.*Tr. E.
					21	2	I.*Sh. I.		16	49	II.*Tr. I.				
4	0	41	I. Sh. I.		22	5	I.*Tr. I.		17	14	II.*Sh. E.	29	11	45.7	II. Ec. D.
	1	49	I. Tr. I.		23	11	I. Sh. E.		19	1	II.*Tr. E.		15	41	II.*Oc. R.
	2	50	I. Sh. E.						20	14.1	I.*Ec. D.		16	35.5	I.*Ec. D.
	3	56	I. Tr. E.	13	0	13	I. Tr. E.		23	19	I. Oc. R.		19	31	I.*Oc. R.
	14	41.9	II. Ec. D.		0	16.5	III. Ec. D.								
	19	18	II.*Oc. R.		2	2.2	III. Ec. R.	21	17	24	I.*Sh. I.	30	13	46	I. Sh. I.
	21	59.6	I.*Ec. D.		4	48	III. Oc. D.		18	20	I.*Tr. I.		14	33	I. Tr. I.
					5	58	III. Oc. R.		19	33	I.*Sh. E.		15	55	I.*Sh. E.
5	1	16	I. Oc. R.		12	21	II. Sh. I.		20	28	I.*Tr. E.		16	41	I.*Tr. E.
	19	9	I.*Sh. I.		14	27	II. Tr. I.						22	4	III.*Sh. I.
	20	16	I.*Tr. I.		14	41	II. Sh. E.	22	9	10.0	II. Ec. D.		23	48	III. Sh. E.
	20	18.5	III.*Ec. D.		16	39	II.*Tr. E.		13	20	II. Oc. R.				
	21	18	I.*Sh. E.		18	21.0	I.*Ec. D.		14	42.3	I. Ec. D.	31	1	31	III. Tr. I.
	22	4.4	III.*Ec. R.		21	31	I.*Oc. R.		17	45	I.*Oc. R.		2	34	III. Tr. E.
	22	24	I.*Tr. E.										6	44	II. Sh. I.
				14	15	30	I. Sh. I.	23	11	52	I. Sh. I.		8	18	II. Tr. I.
6	1	7	III. Oc. D.		16	32	I.*Tr. I.		12	47	I. Tr. I.		9	4	II. Sh. E.
	2	20	III. Oc. R.		17	40	I.*Sh. E.		14	2	I. Sh. E.		10	30	II. Tr. E.
	9	47	II. Sh. I.		18	40	I.*Tr. E.		14	54	I. Tr. E.		11	3.8	I. Ec. D.
	12	3	II. Tr. I.						18	6	III.*Sh. I.		13	58	I. Oc. R.
	12	8	II. Sh. E.	15	6	34.5	II. Ec. D.		19	50	III.*Sh. E.				
	14	15	II. Tr. E.		10	57	II. Oc. R.		22	2	III.*Tr. I.				
	16	27.9	I. Ec. D.		12	49.2	I. Ec. D.		23	6	III. Tr. E.				
	19	43	I.*Oc. R.		15	58	I. Oc. R.								
								24	4	11	II. Sh. I.				
7	13	37	I. Sh. I.	16	9	59	I. Sh. I.		5	59	II. Tr. I.				
	14	43	I. Tr. I.		10	59	I. Tr. I.		6	31	II. Sh. E.				
	15	46	I. Sh. E.		12	8	I. Sh. E.		8	11	II. Tr. E.				
	16	51	I.*Tr. E.		13	7	I. Tr. E.		9	10.7	I. Ec. D.				
					14	8	III. Sh. I.		12	12	I. Oc. R.				
8	3	59.2	II. Ec. D.		15	52	III. Sh. E.								
	8	31	II. Oc. R.		18	27	III.*Tr. I.	25	6	21	I. Sh. I.				
	10	56.2	I. Ec. D.		19	35	III.*Tr. E.		7	13	I. Tr. I.				
	14	10	I. Oc. R.						8	30	I. Sh. E.				
				17	1	37	II. Sh. I.		9	21	I. Tr. E.				
9	8	6	I. Sh. I.		3	38	II. Tr. I.		22	28.2	II.*Ec. D.				
	9	11	I. Tr. I.		3	58	II. Sh. E.								
	10	11	III. Sh. I.		5	51	II. Tr. E.	26	2	31	II. Oc. R.				

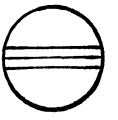
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

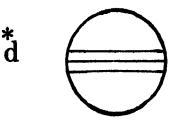
GREENWICH MEAN TIME.

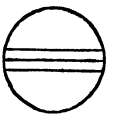
MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 19h 30m for an Inverting Telescope.

Day.	West.	East.
1	·4 ○	·1 ·2 3·
2	·1 3· ○ 2· ·4	
3	3· 2· ○ 1· ·4	
4	·3 ·1 ○ ·2	·4
5	·3 1 ○ · 2·	·4
6	2· ○ ·3	4· ·1 ●
7	·2 1· ○	·3 4·
8	○ ·1 ·2 3·	4·
9	1· 3· ○ 2· 4·	
10	3· 2· 4· ○ 1·	
11	·3 4· ·1 ○	·2 ●
12	4· ·3 ○ 1· 2·	
13	4· 2· ○ ·3	·1 ●
14	·4 ·2 1· ○	·3
15	·4 ○ ·1 ·2 3·	
16	○3· ·4 1· ○ 2·	
17	3· ·4 2· ○ ·1	
18	·4 ·3 ·1 ·2 ○	
19	·3 ○ 1· ·4 ·2	
20	·1 2· ○ ·3	·4
21	○1· ·2 ○	·3 ·4
22	○ ·1 ·2 3·	·4
23	1· 3 ○ · 2·	4·
24	3· 2· ○ ·1	4·
25	·3 ·1 ·2 ○	4·
26	·3 ○ 4· 1· ·2	
27	○2· 4· ·1 ○ ·3	
28	4· ·2 1 ○.	·3
29	4· ○ ·2	3· ·1 ●
30	4· 1· ○ 3· 2·	
31	·4 3· 2· ○ ·1	

GREENWICH MEAN TIME.

APRIL.

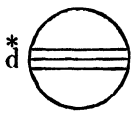
d	h	m		d	h	m		d	h	m		d	h	m	
1	8	14	I. Sh. I.	10	5	12	I. Tr. I.	18	3	47.2	I. Ec. D.	27	21	21	I.*Sh. I.
	9	0	I. Tr. I.		6	46	I. Sh. E.		4	11	II. Tr. E.		21	32	I.*Tr. I.
	10	24	I. Sh. E.		7	19	I. Tr. E.		6	19	I. Oc. R.		23	31	I. Sh. E.
	11	7	I. Tr. E.		16	5.9	III.*Ec. D.						23	41	I. Tr. E.
					17	51.1	III.*Ec. R.	19	0	59	I. Sh. I.				
2	1	4.0	II. Ec. D.		18	43	III.*Oc. D.		1	22	I. Tr. I.	28	13	55	III.*Sh. I.
	4	52	II. Oc. R.		19	47	III.*Oc. R.		3	9	I. Sh. E.		14	52	III.*Tr. I.
	5	32.1	I. Ec. D.		22	34	II. Sh. I.		3	30	I. Tr. E.		15	39	III.*Sh. E.
	8	24	I. Oc. R.		23	43	II. Tr. I.		19	34.0	II.*Ec. D.		15	58	III.*Tr. E.
									22	15.5	I. Ec. D.		16	58	II.*Sh. I.
3	2	43	I. Sh. I.	11	0	54	II. Sh. E.		22	36	II. Oc. R.		17	19	II.*Tr. I.
	3	26	I. Tr. I.		1	53.8	I. Ec. D.						18	37.4	I.*Ec. D.
	4	52	I. Sh. E.		1	56	II. Tr. E.	20	0	45	I. Oc. R.		19	17	II.*Sh. E.
	5	34	I. Tr. E.		4	35	I. Oc. R.		19	27	I.*Sh. I.		19	32	II.*Tr. E.
	12	8.7	III. Ec. D.		23	5	I. Sh. I.		19	48	I.*Tr. I.		20	55	I.*Oc. R.
	13	53.9	III. Ec. R.		23	38	I. Tr. I.		21	37	I.*Sh. E.				
	15	21	III.*Oc. D.						21	57	I. Tr. E.	29	15	50	I.*Sh. I.
	16	25	III.*Oc. R.	12	1	15	I. Sh. E.						15	58	I.*Tr. I.
	20	1	II.*Sh. I.		1	46	I. Tr. E.	21	9	57	III. Sh. I.		18	0	I.*Sh. E.
	21	27	II.*Tr. I.		16	57.7	II.*Ec. D.		11	36	III. Tr. I.		18	7	I.*Tr. E.
	22	21	II.*Sh. E.		20	19	II.*Oc. R.		11	42	III. Sh. E.				
	23	39	II. Tr. E.		20	22.1	I.*Ec. D.		12	39	III. Tr. E.	30	11	29.3	II. Ec. D.
					23	1	I. Oc. R.		14	24	II.*Sh. I.		13	5.9	I.*Ec. D.
4	0	0.4	I. Ec. D.						15	5	II.*Tr. I.		14	1	II.*Oc. R.
	2	50	I. Oc. R.	13	17	33	I.*Sh. I.		16	43.9	I.*Ec. D.		15	21	I.*Oc. R.
	21	11	I.*Sh. I.		18	4	I.*Tr. I.		16	44	II.*Sh. E.				
	21	53	I.*Tr. I.		19	43	I.*Sh. E.		17	18	II.*Tr. E.				
	23	21	I. Sh. E.		20	12	I.*Tr. E.		19	10	I.*Oc. R.				
5	0	0	I. Tr. E.	14	6	0	III. Sh. I.	22	13	56	I.*Sh. I.				
	14	21.6	II. Ec. D.		7	44	III. Sh. E.		14	14	I.*Tr. I.				
	18	1	II.*Oc. R.		8	18	III. Tr. I.		16	6	I.*Sh. E.				
	18	28.8	I.*Ec. D.		9	20	III. Tr. E.		16	23	I.*Tr. E.				
	21	17	I.*Oc. R.		11	51	II. Sh. I.								
					12	51	II. Tr. I.	23	8	52.7	II. Ec. D.				
6	15	39	I.*Sh. I.		14	11	II.*Sh. E.		11	12.3	I. Ec. D.				
	16	19	I.*Tr. I.		14	50.5	I.*Ec. D.		11	45	II. Oc. R.				
	17	49	I.*Sh. E.		15	3	II.*Tr. E.		13	37	I.*Oc. R.				
	18	27	I.*Tr. E.		17	27	I.*Oc. R.								
								24	8	24	I. Sh. I.				
7	2	2	III. Sh. I.	15	12	2	I. Sh. I.		8	40	I. Tr. I.				
	3	46	III. Sh. E.		12	30	I. Tr. I.		10	34	I. Sh. E.				
	4	57	III. Tr. I.		14	12	I.*Sh. E.		10	49	I. Tr. E.				
	5	59	III. Tr. E.		14	38	I.*Tr. E.								
	9	17	II. Sh. I.					25	0	1.6	III. Ec. D.				
	10	35	II. Tr. I.	16	6	16.3	II. Ec. D.		2	26	III. Oc. R.				
	11	37	II. Sh. E.		9	18.8	I. Ec. D.		3	41	II. Sh. I.				
	12	47	II. Tr. E.		9	28	II. Oc. R.		4	12	II. Tr. I.				
	12	57.1	I. Ec. D.		11	53	I. Oc. R.		5	40.7	I. Ec. D.				
	15	43	I.*Oc. R.						6	1	II. Sh. E.				
				17	6	30	I. Sh. I.		6	25	II. Tr. E.				
8	10	8	I. Sh. I.		6	56	I. Tr. I.		8	3	I. Oc. R.				
	10	45	I. Tr. I.		8	40	I. Sh. E.								
	12	18	I. Sh. E.		9	4	I. Tr. E.	26	2	53	I. Sh. I.				
	12	53	I. Tr. E.		20	3.8	III.*Ec. D.		3	6	I. Tr. I.				
					21	48.9	III.*Ec. R.		5	3	I. Sh. E.				
9	3	40.0	II. Ec. D.		22	3	III. Oc. D.		5	15	I. Tr. E.				
	7	11	II. Oc. R.		23	7	III. Oc. R.		22	10.5	II. Ec. D.				
	7	25.4	I. Ec. D.												
	10	9	I. Oc. R.	18	1	7	II. Sh. I.	27	0	9.0	I. Ec. D.				
					1	58	II. Tr. I.		0	52	II. Oc. R.				
10	4	36	I. Sh. I.		3	27	II. Sh. E.		2	29	I. Oc. R.				

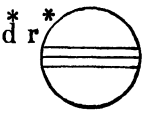
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

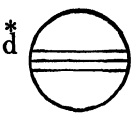
GREENWICH MEAN TIME.

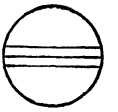
APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 18h 0m for an Inverting Telescope.

Day.	West.	East
1	·4 3· ·2 1· ○	
2	·4 ·3 ○ 1· ·2	
3	·4 ·1 ○ ·3 2·	
4	2· ○ ·4 1· ·3	
5	· ·○1 ·4 3·	·2●
6	○1· ○ 3· 2· ·4	
7	3· 2· ○ ·1	·4
8	3· ·2 1· ○	4·
9	·3 ○ ·1 ·2	4·
10	·3 ·1 ○ 2·	4·
11	2· ○ 1· 4· ·3	
12	·1 ○ 4·	3· ·2●
13	4· ○ 1·	3· 2·
14	4· 3· 2· ○ ·1	
15	4· 3· ·2 1· ○	
16	4· ·3 ○ ·1 ·2	
17	·4 1· · ○3 2·	
18	·4 2· ○ 1· ·3	
19	·4 ·1· ○2	3·
20	·4 ○1·	3· ·2
21	3· 2· ○	·4 ·1●
22	3· ·2 1· ○	·4
23	·3 ○ ·1 ·2	·4
24	1· ·3 ○ 2·	·4
25	2· ○ 1· ·3	4·
26	·1 ·2 ○	·3 4·
27	○ 1· ·2 3· 4·	
28	○2· 3· ○ ·1 4·	
29	○1· 3· ·2 4· ○	
30	·3 4· ○ ·1 ·2	

GREENWICH MEAN TIME.

MAY.

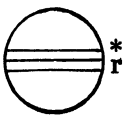
d	h	m		d	h	m		d	h	m		d	h	m	
1	10	18	I. Sh. I.	10	6	34	I. Tr. I.	19	5	15	I. Sh. E.	27	7	34	III. Sh. E.
	10	24	I. Tr. I.		6	41	I. Sh. I.		23	58	I. Oc. D.		22	56	I. Tr. I.
	12	28	I. Sh. E.		8	43	I. Tr. E.		23	59	II. Tr. I.		23	28	I. Sh. I.
	12	33	I. Tr. E.		8	51	I. Sh. E.								
								20	0	38	III. Tr. I.	28	1	5	I. Tr. E.
2	4	0.1	III. Ec. D.	11	3	9	II. Oc. D.		0	39	II. Sh. I.		1	38	I. Sh. E.
	5	45.2	III. Ec. R.		3	48	I. Oc. D.		1	51	III. Sh. I.		20	9	I. Oc. D.
	6	14	II. Sh. I.		5	45.1	II. Ec. R.		1	56	III. Tr. E.		20	51	II. Oc. D.
	6	25	II. Tr. I.		6	5.7	I. Ec. R.		2	14	II. Tr. E.		22	50.7	I. Ec. R.
	7	34.3	I. Ec. D.						2	28.1	I. Ec. R.				
	8	34	II. Sh. E.	12	1	1	I. Tr. I.		2	58	II. Sh. E.	29	0	18.2	II. Ec. R.
	8	39	II. Tr. E.		1	10	I. Sh. I.		3	35	III. Sh. E.		17	23	I.*Tr. I.
	9	47	I. Oc. R.		3	9	I. Tr. E.		21	11	I. Tr. I.		17	57	I.*Sh. I.
					3	20	I. Sh. E.		21	33	I. Sh. I.		19	32	I.*Tr. E.
3	4	47	I. Sh. I.		21	22	III. Tr. I.		23	20	I. Tr. E.		20	6	I. Sh. E.
	4	50	I. Tr. I.		21	45	II. Tr. I.		23	43	I. Sh. E.				
	6	57	I. Sh. E.		21	52	III. Sh. I.					30	14	35	I.*Oc. D.
	6	59	I. Tr. E.		22	5	II. Sh. I.	21	18	24	I.*Oc. D.		15	22	II.*Tr. I.
					22	14	I. Oc. D.		18	34	II.*Oc. D.		16	30	II.*Sh. I.
4	0	47.3	II. Ec. D.		22	35	III. Tr. E.		20	56.6	I. Ec. R.		17	19.2	I.*Ec. R.
	2	2.7	I. Ec. D.		23	36	III. Sh. E.		21	41.2	II. Ec. R.		17	38	II.*Tr. E.
	3	9	II. Oc. R.										17	38	III.*Oc. D.
	4	13	I. Oc. R.	13	0	0	II. Tr. E.	22	15	37	I.*Tr. I.		18	49	II.*Sh. E.
	23	16	I. Sh. I.		0	25	II. Sh. E.		16	2	I.*Sh. I.		19	4	III.*Oc. R.
	23	16	I. Tr. I.		0	34.2	I. Ec. R.		17	46	I.*Tr. E.		19	52.3	III.*Ec. D.
					19	27	I.*Tr. I.		18	12	I.*Sh. E.		21	37.7	III. Ec. R.
5	1	25	I. Tr. E.		19	39	I.*Sh. I.								
	1	26	I. Sh. E.		21	35	I. Tr. E.	23	12	50	I.*Oc. D	31	11	49	I. Tr. I.
	17	53	III.*Sh. I.		21	49	I. Sh. E.		13	6	II.*Tr. I.		12	25	I. Sh. I.
	18	7	III.*Tr. I.						13	56	II.*Sh. I.		13	58	I.*Tr. E.
	19	16	III.*Tr. E.	14	16	17	II.*Oc. D.		14	20	III.*Oc. D.		14	35	I.*Sh. E.
	19	31	II.*Sh. I.		16	40	I.*Oc. D.		15	22	II.*Tr. E.				
	19	32	II.*Tr. I.		19	2.7	I.*Ec. R.		15	25.1	I.*Ec. R.				
	19	38	III.*Sh. E.		19	4.3	II.*Ec. R.		15	42	III.*Oc. R.				
	20	31	I.*Oc. D.						15	54.2	III.*Ec. D.				
	21	46	II. Tr. E.	15	13	53	I.*Tr. I.		16	15	II.*Sh. E.				
	21	51	II. Sh. E.		14	7	I.*Sh. I.		17	39.6	III.*Ec. R.				
	22	40.4	I. Ec. R.		16	1	I.*Tr. E.								
					16	17	I.*Sh. E.	24	10	4	I. Tr. I.				
6	17	42	I.*Tr. I.						10	31	I. Sh. I.				
	17	44	I.*Sh. I.	16	10	52	II. Tr. I.		12	12	I. Tr. E.				
	19	51	I.*Tr. E.		11	4	III. Oc. D.		12	40	I. Sh. E.				
	19	54	I.*Sh. E.		11	6	I. Oc. D.								
					11	22	II. Sh. I.	25	7	17	I. Oc. D.				
7	14	2	II.*Oc. D.		13	7	II.*Tr. E.		7	42	II. Oc. D.				
	14	57	I.*Oc. D.		13	31.1	I.*Ec. R.		9	53.6	I. Ec. R.				
	16	27.4	II.*Ec. R.		13	41	II.*Sh. E.		10	59.2	II. Ec. R.				
	17	8.8	I.*Ec. R.		13	41.5	III.*Ec. R.								
								26	4	30	I. Tr. I.				
8	12	8	I. Tr. I.	17	8	19	I. Tr. I.		4	59	I. Sh. I.				
	12	13	I. Sh. I.		8	36	I. Sh. I.		6	39	I. Tr. E.				
	14	17	I.*Tr. E.		10	28	I. Tr. E.		7	9	I. Sh. E.				
	14	23	I.*Sh. E.		10	46	I. Sh. E.								
								27	1	43	I. Oc. D.				
9	7	50	III. Oc. D.	18	5	25	II. Oc. D.		2	14	II. Tr. I.				
	8	38	II. Tr. I.		5	32	I. Oc. D.		3	13	II. Sh. I.				
	8	48	II. Sh. I.		7	59.6	I. Ec. R.		3	56	III. Tr. I.				
	9	23	I. Oc. D.		8	22.2	II. Ec. R.		4	22.1	I. Ec. R.				
	9	43.3	III. Ec. R.						4	30	II. Tr. E.				
	10	53	II. Tr. E.	19	2	45	I. Tr. I.		5	19	III. Tr. E.				
	11	8	II. Sh. E.		3	5	I. Sh. I.		5	32	II. Sh. E.				
	11	37.3	I. Ec. R.		4	54	I. Tr. E.		5	50	III. Sh. I.				

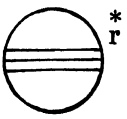
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

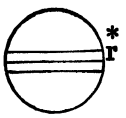
GREENWICH MEAN TIME.

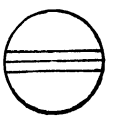
MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 17h 0m for an Inverting Telescope.

Day.	West.	East.
1	4 3 1	2
2	4 2	3 1
3	4 2 1	3
4	4	1 2 3
5	4 1 3	2
6	3 2 4	1
7	3	4 2 1
8	3 1	2 4
9	2	3 1 4
10	2 1	3 4
11	1 2	3 4
12	1	3 2 4
13	2 3	1 4
14	3	4 1 2
15	3	1 4 2
16	4 2	3 1
17	4 2 1	3
18	4	3 1 2 3
19	4 1	2 3
20	4 2 3	1
21	4 3	2 1
22	1 4 3	2
23	4 2	1 3
24	2 1	4 3
25		2 1 4 3
26	1	2 3 4
27	2 3	1 4
28	3	2 1 4
29	3	1 2 4
30	2	3 4 1
31	2 1	4 3

GREENWICH MEAN TIME.

JUNE.

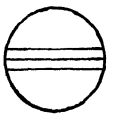
d	h	m		d	h	m		d	h	m		d	h	m	
1	9	2	I. Oc. D.	10	6	48	II. Tr. I.	18	5	13	I. Sh. I.	27	2	43	I. Tr. E.
	10	0	II. Oc. D.			8 10.6	I. Ec. R.		6	26	I. Tr. E.		3	46	I. Sh. E.
	11	47.7	I. Ec. R.			8 21	II. Sh. I.		7	22	I. Sh. E.		21	44	I. Oc. D.
	13	36.4	II.*Ec. R.			9 6	II. Tr. E.								
					10	40	III. Tr. I.	19	1	28	I. Oc. D.	28	0	42	II. Tr. I.
2	6	16	I. Tr. I.		10	40	II. Sh. E.		3	53	II. Oc. D.		0	56.7	I. Ec. R.
	6	54	I. Sh. I.		12	12	III. Tr. E.		4	33.6	I. Ec. R.		2	48	II. Sh. I.
	8	25	I. Tr. E.		13	47	III.*Sh. I.		8	9.8	II. Ec. R.		3	1	II. Tr. E.
	9	4	I. Sh. E.		15	32	III.*Sh. E.		22	44	I. Tr. I.		5	6	II. Sh. E.
									23	41	I. Sh. I.		7	28	III. Oc. D.
3	3	28	I. Oc. D.	11	2	29	I. Tr. I.						9	12	III. Oc. R.
	4	30	II. Tr. I.		3	18	I. Sh. I.	20	0	53	I. Tr. E.		11	47.6	III. Ec. D.
	5	47	II. Sh. I.		4	38	I. Tr. E.		1	51	I. Sh. E.		13	33.9	III.*Ec. R.
	6	16.3	I. Ec. R.		5	27	I. Sh. E.		19	55	I. Oc. D.	29	16	11	I.*Oc. D.
	6	47	II. Tr. E.		23	41	I. Oc. D.		22	19	II. Tr. I.		19	25.3	I. Ec. R.
	7	16	III. Tr. I.						23	2.2	I. Ec. R.		19	31	II. Oc. D.
	8	6	II. Sh. E.	12	1	31	II. Oc. D.								
	8	43	III. Tr. E.		2	39.1	I. Ec. R.	21	0	13	II. Sh. I.	30	0	5.2	II. Ec. R.
	9	49	III. Sh. I.		5	32.6	II. Ec. R.		0	37	II. Tr. E.		13	29	I.*Tr. I.
	11	33	III. Sh. E.		20	56	I. Tr. I.		2	32	II. Sh. E.		14	34	I.*Sh. I.
					21	46	I. Sh. I.		3	54	III. Oc. D.		15	38	I.*Tr. E
4	0	42	I. Tr. I.		23	5	I. Tr. E.		5	34	III. Oc. R.		16	43	I.*Sh. E.
	1	23	I. Sh. I.		23	56	I. Sh. E.		7	48.8	III. Ec. D.				
	2	51	I. Tr. E.						9	34.8	III. Ec. R.				
	3	32	I. Sh. E.	13	18	8	I.*Oc. D.		17	12	I.*Tr. I.				
	21	54	I. Oc. D.		19	58	II. Tr. I.		18	10	I.*Sh. I.				
	23	10	II. Oc. D.		21	7.7	I. Ec. R.		19	21	I. Tr. E.				
					21	39	II. Sh. I.		20	19	I. Sh. E.				
5	0	44.8	I. Ec. R.		22	16	II. Tr. E.								
	2	55.4	II. Ec. R.		23	57	II. Sh. E.	22	14	22	I.*Oc. D.				
	19	9	I.*Tr. I.						17	5	II.*Oc. D.				
	19	52	I. Sh. I.	14	0	25	III. Oc. D.		17	30.8	I.*Ec. R.				
	21	18	I. Tr. E.		2	0	III. Oc. R.		21	28.0	II. Ec. R.				
	22	1	I. Sh. E.		3	49.6	III. Ec. D.								
					5	35.3	III. Ec. R.	23	11	39	I. Tr. I.				
6	16	21	I.*Oc. D.		15	23	I.*Tr. I.		12	39	I. Sh. I.				
	17	39	II.*Tr. I.		16	15	I.*Sh. I.		13	48	I.*Tr. E.				
	19	4	II.*Sh. I.		17	32	I.*Tr. E.		14	48	I.*Sh. E.				
	19	13.4	I.*Ec. R.		18	25	I.*Sh. E.								
	19	56	II. Tr. E.					24	8	49	I. Oc. D.				
	21	0	III. Oc. D.	15	12	34	I. Oc. D.		11	30	II. Tr. I.				
	21	23	II. Sh. E.		14	41	II.*Oc. D.		11	59.4	I. Ec. R.				
	22	31	III. Oc. R.		15	36.3	I.*Ec. R.		13	31	II.*Sh. I.				
	23	51.0	III. Ec. D.		18	50.7	II.*Ec. R.		13	49	II.*Tr. E.				
									15	49	II.*Sh. E.				
7	1	36.5	III. Ec. R.	16	9	50	I. Tr. I.		17	38	III.*Tr. I.				
	13	36	I.*Tr. I.		10	44	I. Sh. I.		19	19	III. Tr. E.				
	14	20	I.*Sh. I.		11	59	I. Tr. E.		21	45	III. Sh. I.				
	15	45	I.*Tr. E.		12	53	I. Sh. E.		23	29	III. Sh. E.				
	16	30	I.*Sh. E.												
				17	7	1	I. Oc. D.	25	6	6	I. Tr. I.				
8	10	48	I. Oc. D.		9	8	II. Tr. I.		7	8	I. Sh. I.				
	12	19	II. Oc. D.		10	4.9	I. Ec. R.		8	15	I. Tr. E.				
	13	42.0	I.*Ec. R.		10	56	II. Sh. I.		9	17	I. Sh. E.				
	16	13.5	II.*Ec. R.		11	26	II. Tr. E.								
					13	14	II.*Sh. E.	26	3	17	I. Oc. D.				
9	8	3	I. Tr. I.		14	7	III.*Tr. I.		6	18	II. Oc. D.				
	8	49	I. Sh. I.		15	43	III.*Tr. E.		6	28.1	I. Ec. R.				
	10	11	I. Tr. E.		17	46	III.*Sh. I.		10	47.0	II. Ec. R.				
	10	59	I. Sh. E.		19	30	III. Sh. E.								
								27	0	34	I. Tr. I.				
10	5	14	I. Oc. D.	18	4	17	I. Tr. I.		1	37	I. Sh. I.				

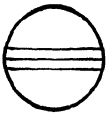
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

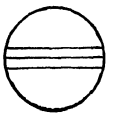
GREENWICH MEAN TIME.

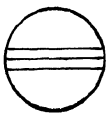
JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

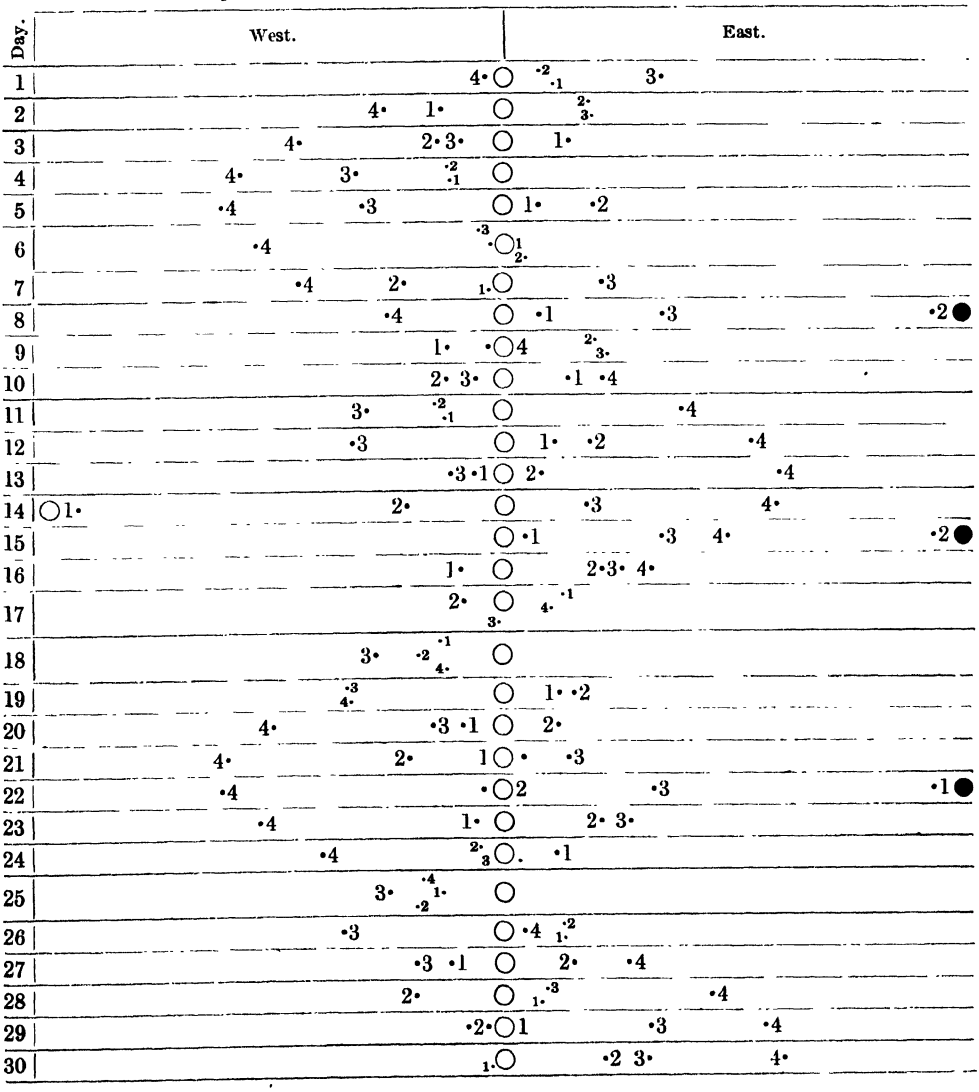
I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 16h 0m for an Inverting Telescope.



GREENWICH MEAN TIME.

JULY.

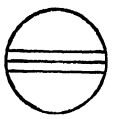
d	h	m		d	h	m		d	h	m		d	h	m	
1	10	39	I. Oc. D.	9	2	44	III. Tr. E.	16	15	2	I.*Sh. E.	24	18	55.4	II. Ec. D.
	13	54.0	I.*Ec. R.		5	43	III. Sh. I.						21	15.4	II. Ec. R.
	13	54	II.*Tr. I.		7	29	III. Sh. E.	17	8	49	I. Oc. D.				
	16	5	II.*Sh. I.		9	47	I. Tr. I.		12	12.1	I. Ec. R.	25	8	2	I. Tr. I.
	16	14	II.*Tr. E.		10	58	I. Sh. I.		13	45	II.*Oc. D.		9	17	I. Sh. I.
	18	23	II. Sh. E.		11	57	I. Tr. E.		16	9	II.*Oc. R.		10	11	I. Tr. E.
	21	15	III. Tr. I.		13	7	I.*Sh. E.		16	18.3	II.*Ec. D.		11	26	I. Sh. E.
	23	0	III. Tr. E.						18	38.4	II. Ec. R.				
				10	6	57	I. Oc. D.					26	5	10	I. Oc. D.
2	1	44	III. Sh. I.		10	17.3	I. Ec. R.	18	6	8	I. Tr. I.		8	35.5	I. Ec. R.
	3	29	III. Sh. E.		11	14	II. Oc. D.		7	22	I. Sh. I.		10	36	II. Tr. I.
	7	56	I. Tr. I.		13	37	II.*Oc. R.		8	17	I. Tr. E.		12	58	II.*Tr. E.
	9	3	I. Sh. I.		13	41.1	II.*Ec. D.		9	31	I. Sh. E.		13	8	II.*Sh. I.
	10	5	I. Tr. E.		16	1.4	II.*Ec. R.						15	26	II.*Sh. E.
	11	12	I. Sh. E.					19	3	17	I. Oc. D.		22	28	III. Oc. D.
				11	4	15	I. Tr. I.		6	40.7	I. Ec. R.				
3	5	6	I. Oc. D.		5	27	I. Sh. I.		8	4	II. Tr. I.	27	0	25	III. Oc. R.
	8	22.6	I. Ec. R.		6	25	I. Tr. E.		10	25	II. Tr. E.		2	30	I. Tr. I.
	8	45	II. Oc. D.		7	36	I. Sh. E.		10	33	II. Sh. I.		3	42.8	III. Ec. D.
	13	24.2	II.*Ec. R.						12	51	II. Sh. E.		3	46	I. Sh. I.
				12	1	25	I. Oc. D.		18	36	III. Oc. D.		4	39	I. Tr. E.
4	2	24	I. Tr. I.		4	46.0	I. Ec. R.		20	30	III. Oc. R.		5	30.3	III. Ec. R.
	3	32	I. Sh. I.		5	34	II. Tr. I.		23	43.6	III. Ec. D.		5	55	I. Sh. E.
	4	33	I. Tr. E.		7	55	II. Tr. E.						23	38	I. Oc. D.
	5	41	I. Sh. E.		7	58	II. Sh. I.	20	0	36	I. Tr. I.				
	23	34	I. Oc. D.		10	16	II. Sh. E.		1	30.8	III. Ec. R.	28	3	4.3	I. Ec. R.
					14	49	III.*Oc. D.		1	51	I. Sh. I.		5	36	II. Oc. D.
5	2	51.3	I. Ec. R.		16	40	III.*Oc. R.		2	46	I. Tr. E.		8	0	II. Oc. R.
	3	7	II. Tr. I.		19	45.0	III. Ec. D.		4	0	I. Sh. E.		8	13.6	II. Ec. D.
	5	23	II. Sh. I.		21	31.8	III. Ec. R.		21	45	I. Oc. D.		10	33.6	II. Ec. R.
	5	27	II. Tr. E.		22	43	I. Tr. I.						20	59	I. Tr. I.
	7	41	II. Sh. E.		23	56	I. Sh. I.	21	1	9.5	I. Ec. R.		22	15	I. Sh. I.
	11	6	III. Oc. D.						3	2	II. Oc. D.		23	8	I. Tr. E.
	12	54	III. Oc. R.	13	0	53	I. Tr. E.		5	25	II. Oc. R.				
	15	46.4	III.*Ec. D.		2	4	I. Sh. E.		5	36.5	II. Ec. D.	29	0	24	I. Sh. E.
	17	33.0	III. Ec. R.		19	53	I. Oc. D.		7	56.6	II. Ec. R.		18	7	I. Oc. D.
	20	52	I. Tr. I.		23	14.7	I. Ec. R.		19	5	I. Tr. I.		21	33.0	I. Ec. R.
	22	0	I. Sh. I.						20	20	I. Sh. I.		23	53	II. Tr. I.
	23	1	I. Tr. E.	14	0	29	II. Oc. D.		21	14	I. Tr. E.				
					2	52	II. Oc. R.		22	28	I. Sh. E.	30	2	15	II. Tr. E.
6	0	9	I. Sh. E.		2	59.4	II. Ec. D.						2	26	II. Sh. I.
	18	1	I. Oc. D.		5	19.6	II. Ec. R.	22	16	13	I.*Oc. D.		4	44	II. Sh. E.
	21	20.0	I. Ec. R.		17	12	I. Tr. I.		19	38.1	I. Ec. R.		12	27	III. Tr. I.
	21	59	II. Oc. D.		18	24	I. Sh. I.		21	20	II. Tr. I.		14	23	III.*Tr. E.
					19	21	I. Tr. E.		23	41	II. Tr. E.		15	27	I.*Tr. I.
7	0	21	II. Oc. R.		20	33	I. Sh. E.		23	51	II. Sh. I.		16	44	I. Sh. I.
	0	22.1	II. Ec. D.										17	37	I. Tr. E.
	2	42.4	II. Ec. R.	15	14	21	I.*Oc. D.	23	2	8	II. Sh. E.		17	41	III. Sh. I.
	15	20	I.*Tr. I.		17	43.4	I. Ec. R.		8	33	III. Tr. I.		18	52	I. Sh. E.
	16	29	I.*Sh. I.		18	49	II. Tr. I.		10	26	III. Tr. E.		19	27	III. Sh. E.
	17	29	I. Tr. E.		21	10	II. Tr. E.		13	33	I.*Tr. I.				
	18	38	I. Sh. E.		21	15	II. Sh. I.		13	42	III.*Sh. I.	31	12	35	I. Oc. D.
					23	33	II. Sh. E.		14	48	I.*Sh. I.		16	1.7	I. Ec. R.
8	12	29	I. Oc. D.						15	28	III.*Sh. E.		18	55	II. Oc. D.
	15	48.6	I.*Ec. R.	16	4	43	III. Tr. I.		15	42	I.*Tr. E.		21	19	II. Oc. R.
	16	20	II.*Tr. I.		6	34	III. Tr. E.		16	57	I. Sh. E.		21	32.3	II. Ec. D.
	18	40	II. Sh. I.		9	43	III. Sh. I.						23	52.3	II. Ec. R.
	18	41	II. Tr. E.		11	28	III. Sh. E.	24	10	41	I. Oc. D.				
	20	58	II. Sh. E.		11	40	I. Tr. I.		14	6.8	I.*Ec. R.				
					12	53	I. Sh. I.		16	19	II. Oc. D.				
9	0	56	III. Tr. I.		13	49	I.*Tr. E.		18	43	II. Oc. R.				

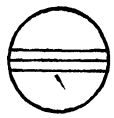
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

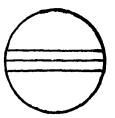
GREENWICH MEAN TIME.

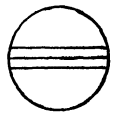
JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.  * r

III.  * d * r

II.  * r

IV. No Eclipse. 

Configurations at 15h 0m for an Inverting Telescope.

Day.	West.	East.
1	○2•	○ ·1 3· 4•
2	·2 3· 1•	○ 4•
3	3•	○ ·2 ·1 4•
4	·3 ·1 4○. 2•	
5	·2 4·	○ ·3 1•
6	4• ·2 ·1	○ ·3
7	4• 1○.	·2 3•
8	4• 2○ ·	3• ·1●
9	·4 ·2 3. 1•	○
10	·4 3•	○ ·1 ·2●
11	·4 ·3 1•	○ 2•
12	·2 ·4	○ 1• ·3●
13	·2 ·1	○ ·4 ·3
14		○ 1• ·2 ·4 3·
15		○ 2• 3• ·4 ·1●
16	2• 3• 1•	○ ·4
17	3•	○ ·1 4• ·2●
18	·3 1•	○ 2• 4•
19	2• ·3	○ ·1 4•
20	·2 ·1	○ 4• ·3
21		4○ 1• ·2 3•
22	4•	• ○1 2• 3•
23	○1• 4• 2• 3•	○
24	4• 3•	•○2 ·1
25	4• ·3 1•	○ 2•
26	·4	·3 2. ○ ·1
27	·4 ·2 ·1	○ ·3
28	·4	○ 1· ·2 ·3
29		·1 ·4 ○ 2• 3•
30	2•	1○ • ·4 3·
31	3•	·2 ○ ·4 ·1●

GREENWICH MEAN TIME.

AUGUST.

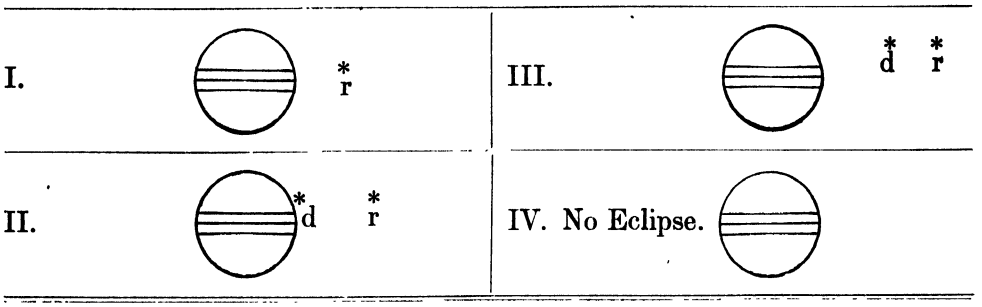
d	h	m		d	h	m		d	h	m		d	h	m	
1	9	56	I. Tr. I.	9	18	8	II. Tr. E.	17	11	40	I. Sh. E.	25	18	37	II. Oc. R.
	11	12	I. Sh. I.		18	19	II. Sh. I.		12	33	III.*Oc. R.		18	40.3	II. Ec. D.
	12	5	I. Tr. E.		20	37	II. Sh. E.		15	40.4	III. Ec. D.		20	59.9	II. Ec. R.
	13	21	I.*Sh. E.						17	29.3	III. Ec. R.				
				10	6	21	I. Tr. I.					26	4	44	I. Tr. I.
2	7	4	I. Oc. D.		6	26	III. Oc. D.	18	5	24	I. Oc. D.		5	55	I. Sh. I.
	10	30.4	I. Ec. R.		7	36	I. Sh. I.		8	49.0	I. Ec. R.		6	53	I. Tr. E.
	13	10	II.*Tr. I.		8	27	III. Oc. R.		13	31	II.*Oc. D.		8	4	I. Sh. E.
	15	32	II.*Tr. E.		8	30	I. Tr. E.		15	56	II. Oc. R.				
	15	44	II.*Sh. I.		9	45	I. Sh. E.		16	3.9	II. Ec. D.	27	1	51	I. Oc. D.
	18	1	II. Sh. E.		11	41.4	III. Ec. D.		18	23.6	II. Ec. R.		5	12.6	I. Ec. R.
					13	29.7	III.*Ec. R.						10	24	II. Tr. I.
3	2	25	III. Oc. D.					19	2	46	I. Tr. I.		12	47	II.*Tr. E.
	4	24	III. Oc. R.	11	3	28	I. Oc. D.		4	0	I. Sh. I.		12	49	II.*Sh. I.
	4	25	I. Tr. I.		6	54.0	I. Ec. R.		4	56	I. Tr. E.		15	7	II. Sh. E.
	5	41	I. Sh. I.		10	51	II. Oc. D.		6	9	I. Sh. E.		23	13	I. Tr. I.
	6	34	I. Tr. E.		13	16	II.*Oc. R.		23	54	I. Oc. D.				
	7	41.8	III. Ec. D.		13	27.3	II.*Ec. D.					28	0	24	I. Sh. I.
	7	50	I. Sh. E.		15	47.0	II. Ec. R.	20	3	17.7	I. Ec. R.		1	23	I. Tr. E.
	9	29.7	III. Ec. R.						7	44	II. Tr. I.		2	33	I. Sh. E.
				12	0	50	I. Tr. I.		10	7	II. Tr. E.		4	43	III. Tr. I.
4	1	33	I. Oc. D.		2	5	I. Sh. I.		10	13	II. Sh. I.		6	46	III. Tr. E.
	4	59.1	I. Ec. R.		2	59	I. Tr. E.		12	31	II.*Sh. E.		9	37	III. Sh. I.
	8	13	II. Oc. D.		4	14	I. Sh. E.		21	15	I. Tr. I.		11	25	III. Sh. E.
	10	37	II. Oc. R.		21	57	I. Oc. D.		22	29	I. Sh. I.		20	20	I. Oc. D.
	10	50.5	II. Ec. D.						23	25	I. Tr. E.		23	41.4	I. Ec. R.
	13	10.4	II.*Ec. R.	13	1	22.7	I. Ec. R.								
	22	54	I. Tr. I.		5	5	II. Tr. I.	21	0	33	III. Tr. I.	29	5	34	II. Oc. D.
					7	27	II. Tr. E.		0	38	I. Sh. E.		7	58	II. Oc. R.
5	0	10	I. Sh. I.		7	37	II. Sh. I.		2	35	III. Tr. E.		7	58.6	II. Ec. D.
	1	3	I. Tr. E.		9	55	II. Sh. E.		5	38	III. Sh. I.		10	18.2	II. Ec. R.
	2	19	I. Sh. E.		19	19	I. Tr. I.		7	25	III. Sh. E.		17	43	I. Tr. I.
	20	2	I. Oc. D.		20	27	III. Tr. I.		18	23	I. Oc. D.		18	53	I. Sh. I.
	23	27.8	I. Ec. R.		20	34	I. Sh. I.		21	46.5	I. Ec. R.		19	52	I. Tr. E.
					21	28	I. Tr. E.						21	1	I. Sh. E.
6	2	28	II. Tr. I.		22	27	III. Tr. E.	22	2	52	II. Oc. D.				
	4	50	II. Tr. E.		22	42	I. Sh. E.		5	16	II. Oc. R.	30	14	50	I. Oc. D.
	5	1	II. Sh. I.						5	22.3	II. Ec. D.		18	10.1	I. Ec. R.
	7	19	II. Sh. E.	14	1	38	III. Sh. I.		7	41.9	II. Ec. R.		23	45	II. Tr. I.
	16	25	III. Tr. I.		3	25	III. Sh. E.		15	45	I. Tr. I.				
	17	22	I. Tr. I.		16	26	I. Oc. D.		16	58	I. Sh. I.	31	2	7	II. Sh. I.
	18	23	III. Tr. E.		19	51.5	I. Ec. R.		17	55	I. Tr. E.		2	8	II. Tr. E.
	18	39	I. Sh. I.						19	6	I. Sh. E.		4	25	II. Sh. E.
	19	32	I. Tr. E.	15	0	11	II. Oc. D.						12	12	I.*Tr. I.
	20	47	I. Sh. E.		2	36	II. Oc. R.	23	12	52	I.*Oc. D.		13	21	I.*Sh. I.
	21	39	III. Sh. I.		2	45.8	II. Ec. D.		16	15.1	I. Ec. R.		14	22	I. Tr. E.
	23	26	III. Sh. E.		5	5.5	II. Ec. R.		21	4	II. Tr. I.		15	30	I. Sh. E.
					13	48	I.*Tr. I.		23	27	II. Tr. E.		18	49	III. Oc. D.
7	14	30	I.*Oc. D.		15	3	I. Sh. I.		23	31	II. Sh. I.		20	54	III. Oc. R.
	17	56.6	I. Ec. R.		15	57	I. Tr. E.						23	38.0	III. Ec. D.
	21	32	II. Oc. D.		17	11	I. Sh. E.	24	1	49	II. Sh. E.				
	23	56	II. Oc. R.						10	14	I. Tr. I.				
				16	10	55	I. Oc. D.		11	26	I. Sh. I.				
8	0	9.2	II. Ec. D.		14	20.2	I.*Ec. R.		12	24	I.*Tr. E.				
	2	29.0	II. Ec. R.		18	24	II. Tr. I.		13	35	I.*Sh. E.				
	11	51	I. Tr. I.		20	47	II. Tr. E.		14	38	III. Oc. D.				
	13	8	I.*Sh. I.		20	55	II. Sh. I.		16	42	III. Oc. R.				
	14	1	I.*Tr. E.		23	13	II. Sh. E.		19	39.3	III. Ec. D.				
	15	16	I.*Sh. E.						21	28.7	III. Ec. R.				
				17	8	17	I. Tr. I.								
9	8	59	I. Oc. D.		9	31	I. Sh. I.	25	7	22	I. Oc. D.				
	12	25.3	I. Ec. R.		10	27	I. Tr. E.		10	43.9	I. Ec. R.				
	15	46	II. Tr. I.		10	30	III. Oc. D.		16	12	II. Oc. D.				

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13h 45m for an Inverting Telescope.

Day.	West.	East.
1	·3 1· ○	·2 ·4
2	○2· ·3 ○ ·1	·4
3	·2 1· ○ ·3	4·
4	○ ·2 1.	·3 4·
5	·1 ○	2· 3· 4·
6	2· 3○ ·1· 4·	
7	3· ·24· ·○1	
8	○1· ·3 4. ○	·2
9	4· ·3 ○2. ·1	
10	4· 2· 1· ○ ·3	
11	·4 ○ ·1 ·3	·2●
12	·4 ·1 ○	2· 3·
13	·4 2· ○ 3. 1·	
14	4· 3. ·2 ·1 ○	
15	3· 1○. 4 ·2	
16	·3 ○ 2· ·4	·1●
17	2· 1· ○·3	·4
18	○ ·1 ·3	·4 ·2●
19	1· ○	2· 3· ·4
20	2· ○ 1. 3.	4·
21	2. 3. ·1 ○	4·
22	3· ○1· ·2	4·
23	·3 ○ 4. 2.	·1●
24	2· 4· 1. ○ 3	
25	4· ·○2 ·1	·3
26	4· 1· ○	·2 3·
27	4· 2·○	1·3·
28	·4 ·2 1. 3. ○	
29	·4 3· ○ 1. ·2	
30	·4 ·3 ·○1	2·
31	○1· 4. ·3 ○	
2		

GREENWICH MEAN TIME.

SEPTEMBER.

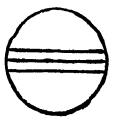
d	h	m		d	h	m		d	h	m		d	h	m	
1	1	27.9	III. Ec. R.	10	5	48	I. Oc. D.	18	8	17	I. Sh. E.	27	1	39	I. Tr. I.
	9	19	I. Oc. D.		9	2.5	I. Ec. R.		17	28	III. Tr. I.		2	32	I. Sh. I.
	12	38.9	I.*Ec. R.		15	50	II. Tr. I.		19	34	III. Tr. E.		3	49	I. Tr. E.
	18	55	II. Oc. D.		18	1	II. Sh. I.		21	33	III. Sh. I.		4	41	I. Sh. E.
	23	36.1	II. Ec. R.		18	14	II. Tr. E.		23	23	III. Sh. E.		22	47	I. Oc. D.
					20	19	II. Sh. E.								
2	6	42	I. Tr. I.					19	2	17	I. Oc. D.	28	1	49.8	I. Ec. R.
	7	50	I. Sh. I.	11	3	10	I. Tr. I.		5	26.2	I. Ec. R.		10	46	II. Tr. I.
	8	52	I. Tr. E.		4	14	I. Sh. I.		13	47	II. Oc. D.		12	31	II. Sh. I.
	9	59	I. Sh. E.		5	20	I. Tr. E.		18	5.6	II. Ec. R.		13	8	II. Tr. E.
					6	23	I. Sh. E.		23	39	I. Tr. I.		14	50	II. Sh. E.
3	3	49	I. Oc. D.		13	11	III.*Tr. I.						20	9	I. Tr. I.
	7	7.5	I. Ec. R.		15	16	III. Tr. E.	20	0	37	I. Sh. I.		21	1	I. Sh. I.
	13	7	II.*Tr. I.		17	35	III. Sh. I.		1	49	I. Tr. E.		22	19	I. Tr. E.
	15	25	II. Sh. I.		19	24	III. Sh. E.		2	46	I. Sh. E.		23	10	I. Sh. E.
	15	30	II. Tr. E.						20	47	I. Oc. D.				
	17	43	II. Sh. E.	12	0	17	I. Oc. D.		23	54.9	I. Ec. R.	29	11	59	III.*Oc. D.
					3	31.3	I. Ec. R.						14	7	III. Oc. R.
4	1	11	I. Tr. I.		11	1	II. Oc. D.	21	7	58	II. Tr. I.		15	34.2	III. Ec. D.
	2	19	I. Sh. I.		15	30.0	II. Ec. R.		9	55	II. Sh. I.		17	17	I. Oc. D.
	3	21	I. Tr. E.		21	40	I. Tr. I.		10	22	II. Tr. E.		17	26.3	III. Ec. R.
	4	28	I. Sh. E.		22	42	I. Sh. I.		12	14	II.*Sh. E.		20	18.5	I. Ec. R.
	8	56	III. Tr. I.		23	50	I. Tr. E.		18	9	I. Tr. I.				
	11	0	III. Tr. E.						19	6	I. Sh. I.	30	5	56	II. Oc. D.
	13	36	III.*Sh. I.	13	0	51	I. Sh. E.		20	19	I. Tr. E.		9	58.6	II. Ec. R.
	15	25	III. Sh. E.		18	47	I. Oc. D.		21	15	I. Sh. E.		14	39	I. Tr. I.
	22	19	I. Oc. D.		21	59.9	I. Ec. R.						15	29	I. Sh. I.
								22	7	38	III. Oc. D.		16	49	I. Tr. E.
5	1	36.3	I. Ec. R.	14	5	12	II. Tr. I.		9	45	III. Oc. R.		17	38	I. Sh. E.
	8	17	II. Oc. D.		7	19	II. Sh. I.		11	34.7	III. Ec. D.				
	12	54.2	II.*Ec. R.		7	36	II. Tr. E.		13	26.3	III. Ec. R.				
	19	41	I. Tr. I.		9	37	II. Sh. E.		15	17	I. Oc. D.				
	20	48	I. Sh. I.		16	10	I. Tr. I.		18	23.6	I. Ec. R.				
	21	51	I. Tr. E.		17	11	I. Sh. I.								
	22	56	I. Sh. E.		18	20	I. Tr. E.	23	3	10	II. Oc. D.				
					19	20	I. Sh. E.		7	23.3	II. Ec. R.				
6	16	48	I. Oc. D.						12	39	I.*Tr. I.				
	20	5.0	I. Ec. R.	15	3	19	III. Oc. D.		13	35	I. Sh. I.				
					5	25	III. Oc. R.		14	49	I. Tr. E.				
7	2	28	II. Tr. I.		7	35.8	III. Ec. D.		15	44	I. Sh. E.				
	4	43	II. Sh. I.		9	26.8	III. Ec. R.								
	4	51	II. Tr. E.		13	17	I. Oc. D.	24	9	47	I. Oc. D.				
	7	1	II. Sh. E.		16	28.7	I. Ec. R.		12	52.3	I. Ec. R.				
	14	11	I. Tr. I.						21	22	II. Tr. I.				
	15	16	I. Sh. I.	16	0	24	II. Oc. D.		23	13	II. Sh. I.				
	16	21	I. Tr. E.		4	47.8	II. Ec. R.		23	45	II. Tr. E.				
	17	25	I. Sh. E.		10	40	I. Tr. I.								
	23	2	III. Oc. D.		11	40	I. Sh. I.	25	1	32	II. Sh. E.				
					12	50	I.*Tr. E.		7	9	I. Tr. I.				
8	1	8	III. Oc. R.		13	49	I. Sh. E.		8	3	I. Sh. I.				
	3	36.6	III. Ec. D.						9	19	I. Tr. E.				
	5	27.1	III. Ec. R.	17	7	47	I. Oc. D.		10	12	I. Sh. E.				
	11	18	I. Oc. D.		10	57.4	I. Ec. R.		21	47	III. Tr. I.				
	14	33.8	I. Ec. R.		18	35	II. Tr. I.		23	54	III. Tr. E.				
	21	39	II. Oc. D.		20	37	II. Sh. I.								
					20	59	II. Tr. E.	26	1	32	III. Sh. I.				
9	2	12.0	II. Ec. R.		22	56	II. Sh. E.		3	23	III. Sh. E.				
	8	40	I. Tr. I.						4	17	I. Oc. D.				
	9	45	I. Sh. I.	18	5	9	I. Tr. I.		7	21.1	I. Ec. R.				
	10	50	I. Tr. E.		6	9	I. Sh. I.		16	33	II. Oc. D.				
	11	54	I. Sh. E.		7	19	I. Tr. E.		20	41.0	II. Ec. R.				

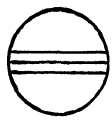
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

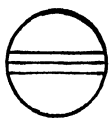
GREENWICH MEAN TIME.

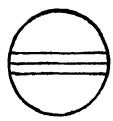
SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 12h 30m for an Inverting Telescope.

Day.	West.	East.
1	·2 ○ ·3	·1●
2	1· ○ ·2 ·4 ·3	
3	2○· ·1 3· ·4	
4	·2 1· 3·○ ·4	
5	3· ○ 1· ·4	·2●
6	·3 ·1 ○ 2· 4·	
7	·3 2· 1○· 4·	
8	·2 ○ ·3 4·	·1●
9	1· ○4· ·2 ·3	
10	4· ○ 2· ·1 3·	
11	4· 2· 1· 3○·	
12	4· 3· ○ 1·	·2●
13	4· ·3 ·1 ○ 2·	
14	·4 ·3 2· ○ 1·	
15	·4 ·2 ·○1 ·3	
16	○1· ·4 ○ ·2 ·3	
17	·4 ○ ·1 2· 3·	
18	2· 1· ○ ·4 3·	
19	3· ·○2 ·1 ·4	
20	3· ·1 ○ 2· ·4	
21	·3 2·○ 1· ·4	
22	·2 ·1○ 4·	·3●
23	○ ·2 ·3 4· 1·	
24	○ 2· 3· 4·	·1●
25	2· 1· ○ 3· 4·	
26	3· ·2₄○. ·1	
27	3· 4· 1· ○ ·2	
28	○2· 4· ·3 ○ 1·	
29	4· ·2 ·1 ○	·3●
30	4· ○1· ·2 ·3	

GREENWICH MEAN TIME.

OCTOBER.

d	h	m		d	h	m		d	h	m		d	h	m	
1	11	47	I.*Oc. D.	8	16	42.0	I. Ec. R.	16	5	46	II. Tr. I.	23	9	39	II. Sh. I.
	14	47.2	I. Ec. R.						7	3	II. Sh. I.		11	0	II. Tr. E.
				9	2	57	II. Tr. I.		8	10	II. Tr. E.		11	59	II. Sh. E.
2	0	9	II. Tr. I.		4	26	II. Sh. I.		9	22	II. Sh. E.		15	11	I. Tr. I.
	1	50	II. Sh. I.		5	21	II. Tr. E.		13	10	I. Tr. I.		15	41	I. Sh. I.
	2	32	II. Tr. E.		6	45	II. Sh. E.		13	47	I. Sh. I.		17	21	I. Tr. E.
	4	9	II. Sh. E.		11	10	I.*Tr. I.		15	21	I. Tr. E.		17	50	I. Sh. E.
	9	9	I. Tr. I.		11	52	I. Sh. I.		15	56	I. Sh. E.				
	9	58	I. Sh. I.		13	20	I. Tr. E.					24	12	20	I. Oc. D.
	11	19	I. Tr. E.		14	2	I. Sh. E.	17	10	19	I. Oc. D.		15	0.3	I. Ec. R.
	12	7	I.*Sh. E.						10	57	III. Tr. I.		15	23	III. Tr. I.
				10	6	32	III. Tr. I.		13	5	III. Tr. E.		17	27	III. Sh. I.
3	2	9	III. Tr. I.		8	18	I. Oc. D.		13	5.6	I. Ec. R.		17	31	III. Tr. E.
	4	15	III. Tr. E.		8	39	III. Tr. E.		13	28	III. Sh. I.		19	21	III. Sh. E.
	5	30	III. Sh. I.		9	29	III. Sh. I.		15	21	III. Sh. E.				
	6	17	I. Oc. D.		11	10.8	I.*Ec. R.					25	3	43	II. Oc. D.
	7	22	III. Sh. E.		11	22	III.*Sh. E.	18	0	55	II. Oc. D.		7	0.6	II. Ec. R.
	9	16.0	I. Ec. R.		22	7	II. Oc. D.		4	26.0	II. Ec. R.		9	41	I. Tr. I.
	19	20	II. Oc. D.						7	40	I. Tr. I.		10	10	I. Sh. I.
	23	16.2	II. Ec. R.	11	1	51.2	II. Ec. R.		8	15	I. Sh. I.		11	52	I. Tr. E.
					5	40	I. Tr. I.		9	51	I. Tr. E.		12	19	I. Sh. E.
4	3	39	I. Tr. I.		6	21	I. Sh. I.		10	25	I. Sh. E.				
	4	26	I. Sh. I.		7	50	I. Tr. E.					26	6	51	I. Oc. D.
	5	49	I. Tr. E.		8	30	I. Sh. E.	19	4	49	I. Oc. D.		9	29.0	I. Ec. R.
	6	36	I. Sh. E.						7	34.2	I. Ec. R.		22	1	II. Tr. I.
				12	2	48	I. Oc. D.		19	11	II. Tr. I.		22	57	II. Sh. I.
5	0	47	I. Oc. D.		5	39.5	I. Ec. R.		20	21	II. Sh. I.				
	3	44.7	I. Ec. R.		16	21	II. Tr. I.		21	35	II. Tr E.	27	0	25	II. Tr. E.
	13	33	II. Tr. I.		17	44	II. Sh. I.		22	40	II. Sh. E.		1	17	II. Sh. E.
	15	8	II. Sh. I.		18	45	II. Tr. E.						4	12	I. Tr. I.
	15	56	II. Tr. E.		20	3	II. Sh. E.	20	2	11	I. Tr. I.		4	38	I. Sh. I.
	17	27	II. Sh. E.						2	44	I. Sh. I.		6	22	I. Tr. E.
	22	9	I. Tr. I.	13	0	10	I. Tr. I.		4	21	I. Tr. E.		6	48	I. Sh. E.
	22	55	I. Sh. I.		0	50	I. Sh. I.		4	53	I. Sh. E.				
					2	20	I. Tr. E.		23	20	I. Oc. D.	28	1	21	I. Oc. D.
6	0	20	I. Tr. E.		2	59	I. Sh. E.						3	57.7	I. Ec. R.
	1	4	I. Sh. E.		20	47	III. Oc. D.	21	1	12	III. Oc. D.		5	36	III. Oc. D.
	16	22	III. Oc. D.		21	19	I. Oc. D.		2	3.0	I. Ec. R.		9	23.3	III. Ec. R.
	18	30	III. Oc. R.		22	55	III. Oc. R.		3	21	III. Oc. R.		17	8	II. Oc. D.
	19	18	I. Oc. D.		23	31.5	III. Ec. D.		3	29.9	III. Ec. D.		20	17.9	II. Ec. R.
	19	33.0	III. Ec. D.						5	24.3	III. Ec. R.		22	42	I. Tr. I.
	21	25.8	III. Ec. R.	14	0	8.2	I. Ec. R.		14	19	II. Oc. D.		23	7	I. Sh. I.
	22	13.4	I. Ec. R.		1	25.2	III. Ec. R.		17	43.3	II. Ec. R.				
					11	31	II. Oc. D.		20	41	I. Tr. I.	29	0	52	I. Tr. E.
7	8	44	II. Oc. D.		15	8.7	II. Ec. R.		21	12	I. Sh. I.		1	16	I. Sh. E.
	12	33.8	II. Ec. R.		18	40	I. Tr. I.		22	51	I. Tr. E.		19	52	I. Oc. D.
	16	39	I. Tr. I.		19	18	I. Sh. I.		23	22	I. Sh. E.		22	26.3	I. Ec. R.
	17	24	I. Sh. I.		20	50	I. Tr. E.								
	18	50	I. Tr. E.		21	27	I. Sh. E.	22	17	50	I. Oc. D.				
	19	33	I. Sh. E.						20	31.6	I. Ec. R.				
				15	15	49	I. Oc. D.								
8	13	48	I. Oc. D.		18	36.9	I. Ec. R.	23	8	36	II. Tr. I.				

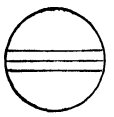
By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from October 30 to December 16.

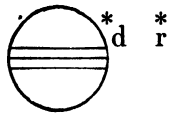
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

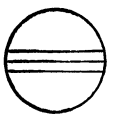
GREENWICH MEAN TIME.

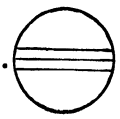
OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 11h 15m for an Inverting Telescope.

Day.	West.	East.
1	·4	·○1 2· 3·
2	○1· ·4 2·	○ 3·
3	·4 ·2 3·	○ ·1
4	3· ·4 1·	○ ·2
5	·3	○2· ·4 ·1
6	2· ·1 ·3	○ ·4
7	○ 1· ·3	·4 ·2●
8	·1	○ 2· ·3 ·1
9	○1· 2·	○ 3· 4·
10	·2 3·	○·1 4·
11	3· 1·	○ ·2 4·
12	·3	○ 2··1 4·
13	2· 1.·3	4○·
14	·2 4·	○ 1· ·3
15	4· ·1	○ 2· ·3
16	4· 2·	○1· 3·
17	○3· 4· ·2	○ ·1●
18	·4 3· 1·	○ ·2
19	·4 ·3	○ ·1 2·
20	·4 2.·3 1·	○
21	·4 ·2	○ ·3 1.
22	·1	○ ·4 ·2 ·3
23		○ 1· 3· ·4 2·
24	·2	○1 3· ·4
25	○1· 3·	○ ·2 ·4
26	3·	○ ·1 2· 4·
27	·3 2. 1·	○ 4·
28	·2	○ ·3 ·1 4·
29	·1	○ 4.·2 ·3

GREENWICH MEAN TIME.

DECEMBER.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from October 30 to December 16.

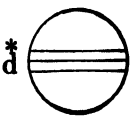
d	h	m		d	h	m		d	h	m		d	h	m	
17	11	16.2	III. Ec. D.	21	3	1	III. Tr. I.	24	17	21	III. Oc. D.	28	9	37	III. Tr. E.
	11	55.3	II. Ec. D.			3 10	III. Sh. E.			17 53	II. Oc. R.				
	12	23	I. Sh. I.			3 30	I. Sh. E.			19 33	III. Oc. R.	29	0	27.6	I. Ec. D.
	12	48	I. Tr. I.			3 59	I. Tr. E.							3 16	I. Oc. R.
	14	33	I. Sh. E.			4 30	II. Oc. R.	25	11	30.6	I. Ec. D.		21	42	I. Sh. I.
	14	58	I. Tr. E.			5 12	III. Tr. E.		14	15	I. Oc. R.		22	18	I. Tr. I.
	15	6	III. Oc. R.		22	33.6	I. Ec. D.						22	26	II. Sh. I.
	15	6	II. Oc. R.					26	8	45	I. Sh. I.		23	41	II.*Tr. I.
				22	1	15	I. Oc. R.		9	8	II. Sh. I.		23	51	I.*Sh. E.
18	9	36.5	I. Ec. D.		19	49	I. Sh. I.		9	18	I. Tr. I.				
	12	14	I. Oc. R.		19	50	II. Sh. I.		10	17	II. Tr. I.	30	0	28	I. Tr. E.
					20	18	I. Tr. I.		10	55	I. Sh. E.		0	46	II. Sh. E.
19	6	32	II. Sh. I.		20	51	II. Tr. I.		11	28	II. Sh. E.		2	3	II. Tr. E.
	6	52	I. Sh. I.		21	58	I. Sh. E.		11	29	I. Tr. E.		18	56.2	I. Ec. D.
	7	18	I. Tr. I.		22	10	II. Sh. E.		12	39	II. Tr. E.		21	46	I. Oc. R.
	7	26	II. Tr. I.		22	29	I. Tr. E.								
	8	52	II. Sh. E.		23	13	II.*Tr. E.	27	5	59.2	I. Ec. D.	31	16	10	I. Sh. I.
	9	1	I. Sh. E.						8	45	I. Oc. R.		16	48	I. Tr. I.
	9	28	I. Tr. E.	23	17	2.2	I. Ec. D.						17	1.8	II. Ec. D.
	9	49	II. Tr. E.		19	45	I. Oc. R.	28	3	14	I. Sh. I.		18	20	I. Sh. E.
									3	45.2	II. Ec. D.		18	58	I. Tr. E.
20	4	5.1	I. Ec. D.	24	14	17	I. Sh. I.		3	48	I. Tr. I.		19	12.8	III. Ec. D.
	6	45	I. Oc. R.		14	28.6	II. Ec. D.		5	9	III. Sh. I.		20	39	II. Oc. R.
					14	48	I. Tr. I.		5	23	I. Sh. E.		21	15.3	III. Ec. R.
21	1	10	III. Sh. I.		15	14.8	III. Ec. D.		5	58	I. Tr. E.		21	47	III. Oc. D.
	1	12.0	II. Ec. D.		16	26	I. Sh. E.		7	8	III. Sh. E.		23	59	III. Oc. R.
	1	20	I. Sh. I.		16	59	I. Tr. E.		7	16	II. Oc. R.				
	1	48	I. Tr. I.		17	16.4	III. Ec. R.		7	26	III. Tr. I.				

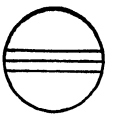
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

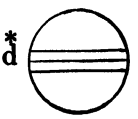
GREENWICH MEAN TIME.

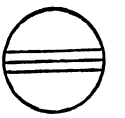
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 

III. 

II. 

IV. No Eclipse. 

Configurations at 23h 30m for an Inverting Telescope.

Day.	West.	East.
1	○	
2	○	
3	○	
4	○	
5	○	
6	○	
7	○	
8	○	
9	○	
10	○	
11	○	
12	○	
13	○	
14	○	
15	○	
16	○	
17	1· ○	·3 ·2 4·
18	○	1· 2· 4· ·3
19	2· ·1 ○ 4·	3·
20	4· ·2 ○ 3· 1·	
21	4· 3· ○	·2 ·1●
22	4· ·3 1· 2· ○	
23	4· ·3 ·2 ○	·1
24	·4 1· ○	·3 ·2
25	·4 ○	·1 2· ·3
26	·4 2· ·1 ○	3·
27	·4 ·2 ⊙ 1· 3·	
28	3· · ○ 1	·4 ·2
29	○1· 3· ○ 2·	·4
30	·3·2 ○ ·1	·4
31	1· ○ ·2	·4 ·3●

ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE, AND MAGNITUDE OF SATURN'S RINGS.

Greenwich Mean Midnight.		a	b	P	B	U	ω	B'	U'	Stellar Mag.
		"	"	° ′	° ′	° ′	° ′	° ′	° ′	
Jan.	2	38.66	+ 7.93	−2 12.1	+11 50.6	71 14.2	42 13.1	+ 9 22.3	23 40.2	+0.9
	10	39.19	8.11	2 10.0	11 56.5	71 32.8	42 13.1	9 29.0	23 54.6	0.9
	18	39.74	8.26	2 8.5	11 59.6	71 45.4	42 13.1	9 35.7	24 9.1	0.9
	26	40.29	8.38	2 7.8	11 59.9	71 51.7	42 13.0	9 42.4	24 23.6	0.8
Feb.	3	40.84	8.46	2 7.8	11 57.4	71 51.5	42 13.0	9 49.0	24 38.1	0.8
	11	41.37	+ 8.51	−2 8.6	+11 52.3	71 45.1	42 13.0	+ 9 55.7	24 52.6	+0.8
	19	41.86	8.52	2 10.0	11 44 5	71 32.5	42 12.9	10 2.4	25 7.1	0.7
	27	42.31	8.49	2 12.0	11 34.5	71 14.3	42 12.9	10 9.0	25 21.6	0.7
Mar.	7	42.69	8.42	2 14.6	11 22.4	70 51.1	42 12.8	10 15.6	25 36.1	0.6
	15	43.00	8.31	2 17.6	11 8.8	70 23.6	42 12.8	10 22.2	25 50.6	0.6
	23	43.22	+ 8.17	−2 21.0	+10 53.9	69 52.8	42 12.8	+10 28.8	26 5.1	+0.6
	31	43.35	8.00	2 24.7	10 38.3	69 19.8	42 12.7	10 35.3	26 19.6	0.5
Apr.	8	43.38	7.81	2 28.4	10 22.5	68 45.8	42 12.7	10 41.9	26 34.1	0.5
	16	43.32	7.61	2 32.1	10 7.1	68 11.9	42 12.6	10 48.4	26 48.7	0.6
	24	43.16	7.40	2 35.7	9 52.5	67 39.2	42 12.6	10 55.0	27 3.2	0.6
May	2	42.91	+ 7.19	−2 39.0	+ 9 39.4	67 8.8	42 12.6	+11 1.5	27 17.7	+0.7
	10	42.58	7.00	2 41.9	9 28.0	66 41.7	42 12.5	11 8.0	27 32.3	0.7
	18	42.18	6.83	2 44.4	9 18.8	66 18.7	42 12.5	11 14.5	27 46.8	0.8
	26	41.72	6.67	2 46.4	9 12.1	66 0.5	42 12.5	11 20.9	28 1.3	0.8
June	3	41.22	6.54	2 47.8	9 8.0	65 47.6	42 12.4	11 27.4	28 15.9	0.9
	11	40.70	+ 6.44	−2 48.6	+ 9 6.7	65 40.2	42 12.4	+11 33.8	28 30.4	+0.9
	19	40.15	6.37	2 48.8	9 8.2	65 38.7	42 12.4	11 40.2	28 44.9	1.0
	27	39.60	6.34	2 48.3	9 12.5	65 42.9	42 12.3	11 46.6	28 59.5	1.0
July	5	39.06	6.33	2 47.2	9 19.5	65 53.0	42 12.3	11 53.0	29 14.0	1.0
	13	38.53	6.35	2 45.5	9 29.1	66 8.6	42 12.2	11 59.4	29 28.6	1.0
	21	38.02	+ 6.40	−2 43.3	+ 9 41.1	66 29.7	42 12.2	+12 5.8	29 43.2	+1.1
	29	37.54	6.47	2 40.4	9 55.4	66 55.9	42 12.2	12 12.1	29 57.7	1.1
Aug.	6	37.09	6.56	2 37.1	10 11.6	67 26.9	42 12.1	12 18.5	30 12.3	1.1
	14	36.68	6.68	2 33.2	10 29.6	68 2.3	42 12.1	12 24.8	30 26.9	1.1
	22	36.31	6.82	2 28.9	10 49.2	68 41.6	42 12.0	12 31.1	30 41.5	1.1
	30	35.98	+ 6.97	−2 24.2	+11 10.1	69 24.6	42 12.0	+12 37.4	30 56.1	+1.0
Sept.	7	35.71	7.14	2 19.1	11 32.1	70 10.8	42 12.0	12 43.6	31 10.7	1.0
	15	35.48	7.32	2 13.7	11 54.8	70 59.6	42 11.9	12 49.9	31 25.3	1.0
	23	35.30	7.52	2 8.0	12 18.0	71 50.7	42 11.9	12 56.1	31 39.9	1.0
Oct.	1	35.17	7.73	2 2.0	12 41.6	72 43.5	42 11.9	13 2.3	31 54.5	1.0
	9	35.09	+ 7.95	−1 55.9	+13 5.2	73 37.7	42 11.8	+13 8.5	32 9.2	+0.9
	17	35.07	8.17	1 49.7	13 28.6	74 32.6	42 11.8	13 14.7	32 23.8	0.9
	25	35.10	8.41	1 43.4	13 51.6	75 27.7	42 11.8	13 20.9	32 38.4	0.9
Nov.	2	35.19	8.65	1 37.1	14 13.9	76 22.5	42 11.7	13 27.0	32 53.0	0.9
	10	35.33	8.90	1 30.8	14 35.3	77 16.5	42 11.7	13 33.2	33 7.7	0.9
	18	35.52	+ 9.15	−1 24.7	+14 55.6	78 9.0	42 11.6	+13 39.3	33 22.3	+0.9
	26	35.76	9.40	1 18.9	15 14.6	78 59.5	42 11.6	13 45.4	33 37.0	0.9
Dec.	4	36.05	9.65	1 13.3	15 32.0	79 47.4	42 11.6	13 51.5	33 51.6	0.9
	12	36.38	9.91	1 8.0	15 47.8	80 32.1	42 11.5	13 57.5	34 6.3	0.9
	20	36.77	10.15	1 3.2	16 1.8	81 12.9	42 11.5	14 3.6	34 21.0	0.9
	28	37.20	+10.40	−0 58.9	+16 13.7	81 49.3	42 11.4	+14 9.6	34 35.6	+0.9
	36	37.66	+10.63	−0 55.2	+16 23.5	82 20.8	42 11.4	+14 15.6	34 50.3	+0.9

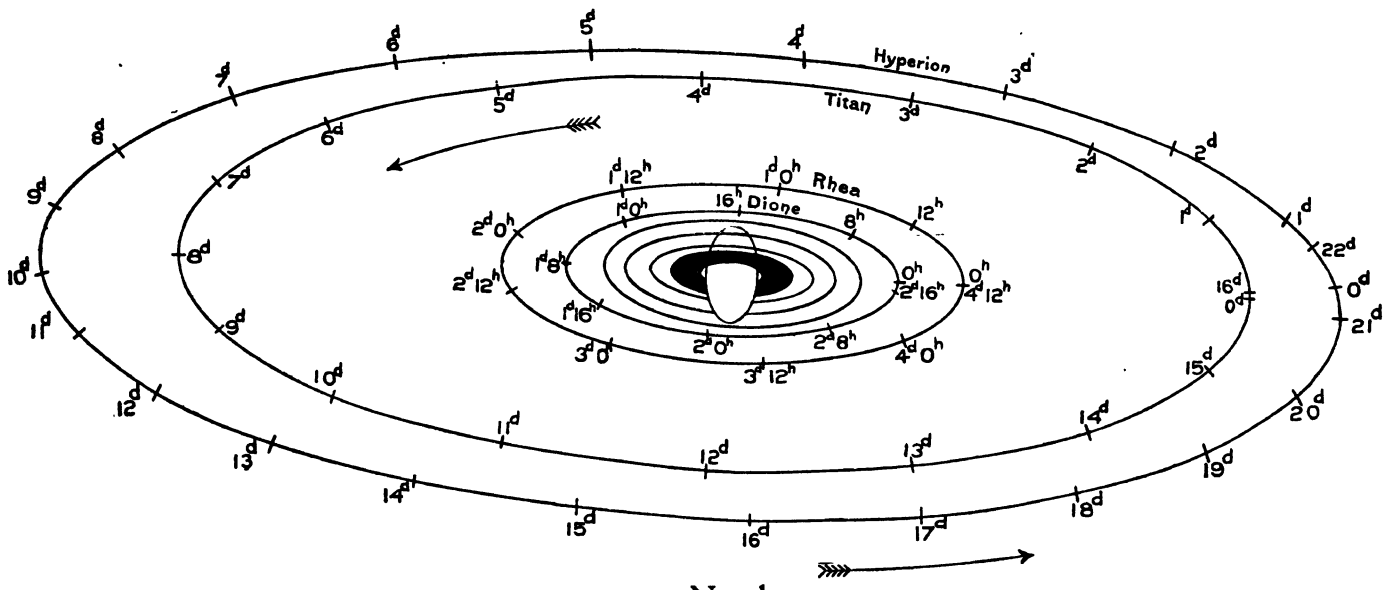
The factor to be multiplied by a and b to obtain the axes of—

The inner ellipse of the outer ring=0.8801, log factor=9.9445
The outer ellipse of the inner ring=0.8599, log factor=9.9344
The inner ellipse of the inner ring=0.6650, log factor=9.8228
The inner ellipse of the dusky ring=0.5486, log factor=9.7392.

NOTE.—The positive sign of B indicates that the visible surface of the rings is the northern one.

152737°—1923—42

South



North

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN, AT DATE OF OPPOSITION, APRIL 7, 1923, AS SEEN IN AN INVERTING TELESCOPE, AND ELONGATED IN THE RATIO OF TWO TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

Names of the Satellites.	Mean Synodic Periods.	
	d	h
I. Mimas.	0	22.6
II. Enceladus.	1	8.9
III. Tethys.	1	21.3
IV. Dione.	2	17.7
V. Rhea.	4	12.5
VI. Titan.	15	23.3
VII. Hyperion.	21	7.6
VIII. Iapetus.	79	22.1
IX. Phœbe.	523	15.6

GREENWICH MEAN TIME.

In the diagram on the preceding page the points of the orbits marked "0" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as cricular, and the time of any greatest elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. For Titan, Hyperion, and Iapetus the eccentricity is taken into account, and for Iapetus the time both of the greatest elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., Eastern Elongation. I., Inferior Conjunction (south of planet).
W., Western Elongation. S., Superior Conjunction (north of planet).

MIMAS.

Greatest Elongations Visible in the United States.

	d h		d h		d h		d h		d h		d h
Jan.	3 1.7 E.	Feb.	11 15.6 E.	Mar.	18 1.1 W.	Apr.	18 14.6 E.	May	24 21.4 W.	July	15 17.5 W.
	4 0.4 E.		13 1.6 W.		18 23.7 W.		19 13.3 E.		25 20.0 W.		16 16.1 W.
	4 23.0 E.		14 0.2 W.		19 22.3 W.		20 0.6 W.		26 18.6 W.		17 14.8 W.
	5 21.6 E.		14 22.8 W.		20 20.9 W.		20 23.2 W.		27 17.2 W.		18 13.4 W.
	6 20.2 E.		15 21.4 W.		21 19.6 W.		21 21.8 W.		28 15.8 W.		23 17.8 E.
	7 18.8 E.		16 20.0 W.		22 18.2 W.		22 20.4 W.		29 14.5 W.		24 16.4 E.
	11 2.0 W.		17 18.6 W.		23 16.8 W.		23 19.0 W.		30 13.1 W.		25 15.0 E.
	12 0.6 W.		18 17.3 W.		24 15.4 W.		24 17.6 W.	June	1 21.6 E.		26 13.7 E.
	12 23.2 W.		19 15.9 W.		25 14.0 W.		25 16.3 W.		2 20.2 E.	Aug.	1 16.7 W.
	13 21.8 W.		21 1.8 E.		26 1.3 E.		26 14.9 W.		3 18.9 E.		2 15.3 W.
	14 20.5 W.		22 0.4 E.		26 12.6 W.		27 13.5 W.		4 17.5 E.		3 14.0 W.
	15 19.1 W.		22 23.0 E.		26 23.9 E.		28 23.4 E.		5 16.1 E.		4 12.6 W.
	16 17.7 W.		23 21.6 E.		27 22.5 E.		29 22.0 E.		6 14.7 E.		9 17.0 E.
	19 2.2 E.		24 20.3 E.		28 21.1 E.		30 20.6 E.		7 13.3 E.		10 15.6 E.
	20 0.9 E.		25 18.9 E.		29 19.8 E.	May	1 19.3 E.		10 20.5 W.		11 14.3 E.
	20 23.5 E.		26 17.5 E.		30 18.4 E.		2 17.9 E.		11 19.1 W.		12 12.9 E.
	21 22.1 E.		27 16.1 E.		31 17.0 E.		3 16.5 E.		12 17.8 W.		.....
	22 20.7 E.		28 14.7 E.	Apr.	1 15.6 E.		4 15.1 E.		13 16.4 W.		.....
	23 19.3 E.	Mar.	1 2.0 W.		2 14.2 E.		5 13.7 E.		14 15.0 W.	Dec.	5 1.8 W.
	24 17.9 E.		2 0.6 W.		3 12.8 E.		6 12.3 E.		15 13.6 W.		6 0.4 W.
	27 2.5 W.		2 23.3 W.		4 0.1 W.		7 22.3 W.		19 19.4 E.		6 23.1 W.
	28 1.1 W.		3 21.9 W.		4 22.8 W.		8 20.9 W.		20 18.0 E.		7 21.7 W.
	28 23.7 W.		4 20.5 W.		5 21.4 W.		9 19.5 W.		21 16.6 E.		13 2.1 E.
	29 22.3 W.		5 19.1 W.		6 20.0 W.		10 18.1 W.		22 15.3 E.		14 0.7 E.
	30 21.0 W.		6 17.7 W.		7 18.6 W.		11 16.7 W.		23 13.9 E.		14 23.3 E.
	31 19.6 W.		7 16.3 W.		8 17.2 W.		12 15.3 W.		27 19.7 W.		15 22.0 E.
Feb.	1 18.2 W.		8 14.9 W.		9 15.8 W.		13 14.0 W.		28 18.3 W.		16 20.6 E.
	2 16.8 W.		10 0.9 E.		10 14.4 W.		14 12.6 W.		29 16.9 W.		21 2.4 W.
	4 2.7 E.		10 23.5 E.		11 13.0 W.		15 22.5 E.		30 15.5 W.		22 1.0 W.
	5 1.3 E.		11 22.1 E.		12 0.4 E.		16 21.1 E.	July	1 14.2 W.		22 23.6 W.
	6 0.0 E.		12 20.7 E.		12 23.0 E.		17 19.7 E.		6 18.6 E.		23 22.2 W.
	6 22.6 E.		13 19.3 E.		13 21.6 E.		18 18.4 E.		7 17.2 E.		24 20.9 W.
	7 21.1 E.		14 17.9 E.		14 20.2 E.		19 17.0 E.		8 15.8 E.		29 2.7 E.
	8 19.8 E.		15 16.5 E.		15 18.8 E.		20 15.6 E.		9 14.5 E.		30 1.3 E.
	9 18.4 E.		16 15.2 E.		16 17.4 E.		21 14.2 E.		10 13.1 E.		30 23.9 E.
	10 17.0 E.		17 13.8 E.		17 16.0 E.		22 12.8 E.		14 18.9 W.		31 22.5 E.

GREENWICH MEAN TIME.

ENCELADUS.

	d h		d h		d h		d h		d h
Jan.	1 5.7 E.	Feb.	9 23.4 E.	Mar.	21 16.8 E.	Apr.	30 10.3 E.	June	9 3.8 E.	July	18 21.7 E.
	2 14.6 E.		11 8.3 E.		23 1.7 E.	May	1 19.1 E.		10 12.7 E.		20 6.6 E.
	3 23.5 E.		12 17.1 E.		24 10.6 E.		3 4.0 E.		11 21.6 E.		21 15.5 E.
	5 8.4 E.		14 2.0 E.		25 19.4 E.		4 12.9 E.		13 6.5 E.		23 0.3 E.
	6 17.3 E.		15 10.9 E.		27 4.3 E.		5 21.8 E.		14 15.4 E.		24 9.2 E.
	8 2.2 E.		16 19.8 E.		28 13.2 E.		7 6.6 E.		16 0.3 E.		25 18.1 E.
	9 11.1 E.		18 4.7 E.		29 22.1 E.		8 15.5 E.		17 9.2 E.		27 3.0 E.
	10 20.0 E.		19 13.5 E.		31 7.0 E.		10 0.4 E.		18 18.1 E.		28 11.9 E.
	12 4.8 E.		20 22.4 E.	Apr.	1 15.8 E.		11 9.3 E.		20 2.9 E.		29 20.8 E.
	13 13.7 E.		22 7.3 E.		3 0.7 E.		12 18.2 E.		21 11.8 E.		31 5.7 E.
	14 22.6 E.		23 16.2 E.		4 9.6 E.		14 3.0 E.		22 20.7 E.	Aug.	1 14.6 E.
	16 7.5 E.		25 1.0 E.		5 18.5 E.		15 11.9 E.		24 5.6 E.		2 23.5 E.
	17 16.4 E.		26 9.9 E.		7 3.3 E.		16 20.8 E.		25 14.5 E.		4 8.4 E.
	19 1.3 E.		27 18.8 E.		8 12.2 E.		18 5.7 E.		26 23.4 E.		5 17.3 E.
	20 10.1 E.	Mar.	1 3.7 E.		9 21.1 E.		19 14.6 E.		28 8.3 E.		7 2.2 E.
	21 19.0 E.		2 12.6 E.		11 6.0 E.		20 23.5 E.		29 17.2 E.		8 11.1 E.
	23 3.9 E.		3 21.4 E.		12 14.8 E.		22 8.3 E.	July	1 2.1 E.		9 20.0 E.
	24 12.8 E.		5 6.3 E.		13 23.7 E.		23 17.2 E.		2 11.0 E.		.....
	25 21.7 E.		6 15.2 E.		15 8.6 E.		25 2.1 E.		3 19.8 E.		.....
	27 6.6 E.		8 0.1 E.		16 17.5 E.		26 11.0 E.		5 4.7 E.	Dec.	19 10.2 E.
	28 15.4 E.		9 8.9 E.		18 2.4 E.		27 19.9 E.		6 13.6 E.		20 19.1 E.
	30 0.3 E.		10 17.8 E.		19 11.2 E.		29 4.8 E.		7 22.5 E.		22 4.0 E.
	31 9.2 E.		12 2.7 E.		20 20.1 E.		30 13.6 E.		9 7.4 E.		23 12.9 E.
Feb.	1 18.1 E.		13 11.6 E.		22 5.0 E.		31 22.5 E.		10 16.3 E.		24 21.8 E.
	3 3.0 E.		14 20.4 E.		23 13.9 E.	June	2 7.4 E.		12 1.2 E.		26 6.7 E.
	4 11.8 E.		16 5.3 E.		24 22.7 E.		3 16.3 E.		13 10.1 E.		27 15.6 E.
	5 20.7 E.		17 14.2 E.		26 7.6 E.		5 1.2 E.		14 19.0 E.		29 0.4 E.
	7 5.6 E.		18 23.1 E.		27 16.5 E.		6 10.1 E.		16 3.9 E.		30 9.3 E.
	8 14.5 E.		20 7.9 E.		29 1.4 E.		7 19.0 E.		17 12.8 E.		31 18.2 E.

TETHYS.

	d h		d h		d h		d h		d h		d h
Jan.	2 7.6 E.	Feb.	10 23.0 E.	Mar.	22 14.2 E.	May	1 5.3 E.	June	9 20.6 E.	July	19 12.3 E.
	4 4.9 E.		12 20.3 E.		24 11.5 E.		3 2.6 E.		11 18.0 E.		21 9.6 E.
	6 2.2 E.		14 17.6 E.		26 8.8 E.		4 23.9 E.		13 15.3 E.		23 6.9 E.
	7 23.5 E.		16 14.9 E.		28 6.1 E.		6 21.2 E.		15 12.6 E.		25 4.2 E.
	9 20.8 E.		18 12.2 E.		30 3.4 E.		8 18.5 E.		17 9.9 E.		27 1.6 E.
	11 18.2 E.		20 9.5 E.	Apr.	1 0.7 E.		10 15.8 E.		19 7.2 E.		28 22.9 E.
	13 15.5 E.		22 6.8 E.		2 22.0 E.		12 13.1 E.		21 4.5 E.		30 20.2 E.
	15 12.8 E.		24 4.1 E.		4 19.2 E.		14 10.4 E.		23 1.8 E.	Aug.	1 17.6 E.
	17 10.1 E.		26 1.4 E.		6 16.5 E.		16 7.7 E.		24 23.1 E.		3 14.9 E.
	19 7.4 E.		27 22.7 E.		8 13.8 E.		18 5.0 E.		26 20.5 E.		5 12.2 E.
	21 4.7 E.	Mar.	1 20.0 E.		10 11.1 E.		20 2.3 E.		28 17.8 E.		7 9.5 E.
	23 2.0 E.		3 17.3 E.		12 8.4 E.		21 23.6 E.		30 15.1 E.		.....
	24 23.3 E.		5 14.6 E.		14 5.7 E.		23 20.9 E.	July	2 12.4 E.		.....
	26 20.6 E.		7 11.9 E.		16 3.0 E.		25 18.2 E.		4 9.7 E.	Dec.	17 14.7 E.
	28 17.9 E.		9 9.2 E.		18 0.3 E.		27 15.5 E.		6 7.0 E.		19 12.1 E.
	30 15.2 E.		11 6.5 E.		19 21.6 E.		29 12.8 E.		8 4.4 E.		21 9.4 E.
Feb.	1 12.5 E.		13 3.8 E.		21 18.8 E.		31 10.1 E.		10 1.7 E.		23 6.7 E.
	3 9.8 E.		15 1.0 E.		23 16.1 E.	June	2 7.4 E.		11 23.0 E.		25 4.0 E.
	5 7.1 E.		16 22.3 E.		25 13.4 E.		4 4.7 E.		13 20.3 E.		27 1.4 E.
	7 4.4 E.		18 19.6 E.		27 10.7 E.		6 2.0 E.		15 17.6 E.		28 22.7 E.
	9 1.7 E.		20 16.9 E.		29 8.0 E.		7 23.3 E.		17 15.0 E.		30 20.0 E.

GREENWICH MEAN TIME.

DIONE.

	d h		d h		d h		d h		d h
Jan.	3 2.7 E.	Feb. 13 4.0 E.		Mar. 26 4.9 E.		May 6 5.7 E.		June 16 6.8 E.		July 27 8.4 E.
	5 20.4 E.		15 21.7 E.		28 22.5 E.		8 23.4 E.		19 0.5 E.		30 2.1 E.
	8 14.1 E.		18 15.4 E.		31 16.2 E.		11 17.0 E.		21 18.2 E.	Aug. 1 19.8 E.
	11 7.8 E.		21 9.0 E.	Apr. 3 9.8 E.			14 10.7 E.		24 11.9 E.		4 13.6 E.
	14 1.5 E.		24 2.7 E.		6 3.5 E.		17 4.4 E.		27 5.6 E.		7 7.3 E.
	16 19.2 E.		26 20.3 E.		8 21.1 E.		19 22.0 E.		29 23.3 E.		10 1.0 E.
	19 12.9 E.	Mar. 1 14.0 E.			11 14.8 E.		22 15.7 E.	July 2 17.0 E.			.....
	22 6.6 E.		4 7.7 E.		14 8.4 E.		25 9.4 E.		5 10.7 E.		.....
	25 0.3 E.		7 1.3 E.		17 2.1 E.		28 3.0 E.		8 4.4 E.	Dec. 14 1.0 E.
	27 18.0 E.		9 19.0 E.		19 19.8 E.		30 20.7 E.		10 22.1 E.		16 18.7 E.
	30 11.6 E.		12 12.6 E.		22 13.4 E.	June 2 14.4 E.			13 15.8 E.		19 12.4 E.
Feb.	2 5.3 E.		15 6.3 E.		25 7.1 E.		5 8.1 E.		16 9.5 E.		22 6.1 E.
	4 23.0 E.		17 23.9 E.		28 0.7 E.		8 1.8 E.		19 3.3 E.		24 23.9 E.
	7 16.7 E.		20 17.6 E.		30 18.4 E.		10 19.5 E.		21 21.0 E.		27 17.6 E.
	10 10.4 E.		23 11.2 E.	May 3 12.0 E.			13 13.1 E.		24 14.7 E.		30 11.3 E.

RHEA.

	d h		d h		d h		d h		d h
Jan.	4 22.6 E.	Feb. 14 14.4 E.		Mar. 27 5.5 E.		May 6 20.5 E.		June 16 12.0 E.		July 27 4.2 E.
	9 11.1 E.		19 2.8 E.		31 17.9 E.		11 8.9 E.		21 0.4 E.		31 16.7 E.
	13 23.5 E.		23 15.2 E.	Apr. 5 6.2 E.			15 21.2 E.		25 12.9 E.	Aug. 5 5.2 E.
	18 12.0 E.		28 3.5 E.		9 18.5 E.		20 9.6 E.		30 1.3 E.		9 17.8 E.
	23 0.4 E.	Mar. 4 15.9 E.			14 6.8 E.		24 22.0 E.	July 4 13.8 E.			.....
	27 12.8 E.		9 4.2 E.		18 19.2 E.		29 10.4 E.		9 2.2 E.		.....
Feb.	1 1.2 E.		13 16.5 E.		23 7.5 E.	June 2 22.8 E.			13 14.7 E.	Dec. 23 10.5 E.
	5 13.6 E.		18 4.9 E.		27 19.8 E.		7 11.2 E.		18 3.2 E.		27 23.0 E.
	10 2.0 E.		22 17.2 E.	May 2 8.2 E.			11 23.6 E.		22 15.7 E.		32 11.5 E.

TITAN.

	d h		d h		d h		d h		d h
Jan.	4 0.3 E.	Feb. 20 20.5 E.		Apr. 9 13.7 E.		May 27 7.1 E.		July 14 3.5 E.		.....
	11 23.3 W.		28 18.8 W.		17 11.4 W.	June 4 4.8 W.			22 1.9 W.		.....
	19 23.5 E.	Mar. 8 18.4 E.			25 11.3 E.		12 5.5 E.		30 3.0 E.	Dec. 5 5.6 E.
	27 22.2 W.		16 16.4 W.	May 3 8.9 W.			20 3.4 W.	Aug. 7 1.7 W.			13 6.0 W.
Feb.	4 22.2 E.		24 16.1 E.		11 9.1 E.		28 4.3 E.		15 2.9 E.		21 5.6 E.
	12 20.7 W.	Apr. 1 13.9 W.			19 6.7 W.	July 6 2.4 W.			23 1.8 W.		29 6.1 W.

HYPERION.

	d h		d h		d h		d h		d h
Jan.	11 5.4 E.	Feb. 22 23.1 E.		Apr. 6 14.4 E.		May 19 5.2 E.		June 30 21.4 E.		Aug. 12 14.9 E.
	20 13.2 W.	Mar. 4 6.3 W.			15 20.7 W.		28 11.6 W.	July 10 4.9 W.			.....
Feb.	1 14.5 E.		16 6.9 E.		27 21.7 E.	June 9 13.1 E.			22 6.0 E.	Dec. 18 14.0 E.
	10 22.1 W.		25 13.7 W.	May 7 3.9 W.			18 19.9 W.		31 14.5 W.		28 7.3 W.

IAPETUS.

	d h		d h		d h		d h		d h
Jan.	17 13.5 W.	Feb. 27 11.4 E.		Apr. 6 4.6 W.		May 16 15.8 E.		June 23 17.8 W.		Aug. 4 5.5 E.
Feb.	7 8.5 S.	Mar. 18 3.8 I.			26 14.0 S.	June 4 11.5 I.		July 14 14.3 S.		Dec. 24 2.6 S.

DIFFERENTIAL COORDINATES OF PHOEBE.

FOR GREENWICH MEAN MIDNIGHT.

Date.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Date.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Date.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$
	m s	′ ″		m s	′ ″		m s	′ ″
Jan. 1	+0 55.5	−6 34	Apr. 15	−1 11.8	+ 9 26	July 28	−2 5.1	+15 48
3	0 53.4	6 19	17	1 13.8	9 42	30	2 5.1	15 47
5	0 51.2	6 3	19	1 15.8	9 57	Aug. 1	2 5.0	15 45
7	0 49.0	5 47	21	1 17.8	10 12	3	2 4.8	15 43
9	0 46.8	5 30	23	1 19.7	10 27	5	2 4.6	15 40
11	+0 44.5	−5 13	25	−1 21.6	+10 41	7	−2 4.3	+15 37
13	0 42.2	4 55	27	1 23.4	10 56	9	2 4.1	15 34
15	0 39.9	4 38	29	1 25.2	11 10	11	2 3.7	15 30
17	0 37.5	4 20	May 1	1 27.0	11 23	13	2 3.3	15 26
19	0 35.0	4 1	3	1 28.7	11 36	15	2 2.9	15 22
21	+0 32.6	−3 43	5	−1 30.4	+11 49	17	−2 2.5	+15 18
23	0 30.1	3 24	7	1 32.1	12 2	19	2 2.0	15 13
25	0 27.5	3 6	9	1 33.7	12 14	21	2 1.4	15 8
27	0 25.0	2 47	11	1 35.2	12 26	23	2 0.8	15 2
29	0 22.5	2 28	13	1 36.8	12 38	25	2 0.2	14 56
31	+0 19.9	−2 8	15	−1 38.3	+12 49	27	−1 59.6	+14 50
Feb. 2	0 17.3	1 49	17	1 39.7	13 0	29	1 58.9	14 44
4	0 14.6	1 30	19	1 41.2	13 11	31	1 58.1	14 37
6	0 12.0	1 10	21	1 42.5	13 21	Sept. 2	1 57.3	14 30
8	0 9.4	0 50	23	1 43.9	13 31	4	1 56.4	14 23
10	+0 6.7	−0 30	25	−1 45.2	+13 41	6	−1 55.6	+14 15
12	0 4.0	−0 11	27	1 46.4	13 50	8	1 54.6	14 7
14	+0 1.4	+0 9	29	1 47.7	13 59	10	1 53.7	13 59
16	−0 1.3	0 29	31	1 48.8	14 8	12	1 52.7	13 50
18	0 3.9	0 49	June 2	1 50.0	14 16	14	1 51.6	13 41
20	−0 6.6	+1 9	4	−1 51.1	+14 24	16	−1 50.5	+13 32
22	0 9.2	1 29	6	1 52.1	14 31	..	....	....
24	0 11.9	1 49	8	1 53.2	14 39	..	....	....
26	0 14.5	2 8	10	1 54.2	14 46	Nov. 16	−0 58.0	+ 6 53
28	0 17.2	2 28	12	1 55.1	14 52	18	0 55.7	6 37
Mar. 2	−0 19.8	+2 48	14	−1 56.0	+14 58	20	−0 53.4	+ 6 20
4	0 22.4	3 7	16	1 56.8	15 4	22	0 51.1	6 4
6	0 25.0	3 27	18	1 57.6	15 10	24	0 48.7	5 47
8	0 27.5	3 47	20	1 58.4	15 15	26	0 46.3	5 30
10	0 30.1	4 6	22	1 59.2	15 20	28	0 43.9	5 13
12	−0 32.6	+4 25	24	−1 59.9	+15 24	30	−0 41.4	+ 4 56
14	0 35.2	4 44	26	2 0.5	15 28	Dec. 2	0 39.0	4 39
16	0 37.7	5 3	28	2 1.1	15 32	4	0 36.5	4 22
18	0 40.1	5 22	30	2 1.7	15 36	6	0 33.9	4 4
20	0 42.6	5 41	July 2	2 2.2	15 39	8	0 31.4	3 47
22	−0 45.0	+6 0	4	−2 2.7	+15 41	10	−0 28.8	+ 3 29
24	0 47.4	6 18	6	2 3.1	15 44	12	0 26.3	3 11
26	0 49.8	6 36	8	2 3.5	15 46	14	0 23.7	2 54
28	0 52.1	6 54	10	2 3.8	15 48	16	0 21.1	2 36
30	0 54.4	7 12	12	2 4.1	15 49	18	0 18.4	2 18
Apr. 1	−0 56.7	+7 30	14	−2 4.4	+15 50	20	−0 15.8	+ 2 0
3	0 59.0	7 47	16	2 4.6	15 50	22	0 13.1	1 42
5	1 1.2	8 4	18	2 4.8	15 51	24	0 10.5	1 24
7	1 3.4	8 21	20	2 5.0	15 51	26	0 7.8	1 6
9	1 5.6	8 38	22	2 5.1	15 51	28	0 5.1	0 48
11	−1 7.7	+8 54	24	−2 5.1	+15 51	30	−0 2.4	+ 0 30
13	−1 9.8	+9 10	26	−2 5.2	+15 50	32	+0 0.3	+ 0 11

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.	Enceladus.		Tethys.		Time from Eastern Elongation.	Dione.	
	p^1	F		p^1	F	p^1	F		p^1	F
h	°		d h	°		°		d h	°	
0.0	88.0	1.000	0 0	88.0	1.000	88.0	1.000	0 0	88.0	1.000
0.5	89.3	0.991	0 1	90.0	0.982	89.5	0.991	0 2	90.0	0.982
1.0	90.7	0.963	0 2	92.2	0.930	91.1	0.963	0 4	92.1	0.930
1.5	92.2	0.917	0 3	94.7	0.846	92.8	0.918	0 6	94.6	0.845
2.0	93.9	0.854	0 4	97.8	0.733	94.7	0.856	0 8	97.8	0.732
2.5	95.8	0.776	0 5	102.3	0.596	97.0	0.779	0 10	102.3	0.595
3.0	98.3	0.683	0 6	109.8	0.444	99.8	0.688	0 12	109.8	0.442
3.5	101.6	0.580	0 7	125.3	0.291	103.5	0.586	0 14	125.3	0.289
4.0	106.5	0.468	0 8	164.8	0.186	108.9	0.477	0 16	165.3	0.184
4.5	114.5	0.352	0 9	217.6	0.232	117.6	0.365	0 18	218.3	0.233
5.0	130.0	0.243	0 10	240.9	0.374	133.6	0.262	0 20	241.2	0.376
5.5	163.4	0.171	0 11	250.9	0.530	164.6	0.195	0 22	251.1	0.532
6.0	208.2	0.190	0 12	256.4	0.675	204.2	0.211	1 0	256.5	0.677
6.5	233.3	0.283	0 13	260.0	0.799	229.2	0.295	1 2	260.1	0.801
7.0	245.1	0.396	0 14	262.8	0.897	241.9	0.403	1 4	262.9	0.898
7.5	251.6	0.511	0 15	265.1	0.964	249.2	0.515	1 6	265.1	0.964
8.0	255.8	0.620	0 16	267.1	0.997	253.9	0.622	1 8	267.2	0.997
8.5	258.7	0.720	0 17	269.1	0.995	257.3	0.721	1 10	269.1	0.994
9.0	261.0	0.807	0 18	271.2	0.958	259.9	0.807	1 12	271.2	0.956
9.5	262.8	0.880	0 19	273.5	0.887	262.0	0.879	1 14	273.5	0.885
10.0	264.4	0.936	0 20	276.3	0.786	263.8	0.936	1 16	276.3	0.783
10.5	265.8	0.976	0 21	280.1	0.659	265.5	0.975	1 18	280.2	0.655
11.0	267.2	0.996	0 22	286.0	0.512	267.0	0.996	1 20	286.1	0.508
11.5	268.5	0.999	0 23	296.8	0.357	268.5	0.999	1 22	297.1	0.352
12.0	269.8	0.982	1 0	322.8	0.220	270.1	0.983	2 0	323.9	0.215
12.5	271.2	0.947	1 1	17.6	0.192	271.7	0.949	2 2	19.4	0.192
13.0	272.9	0.895	1 2	53.3	0.307	273.4	0.898	2 4	54.1	0.311
13.5	274.6	0.826	1 3	67.3	0.461	275.5	0.831	2 6	67.7	0.466
14.0	276.7	0.742	1 4	74.3	0.613	277.9	0.749	2 8	74.6	0.618
14.5	279.5	0.645	1 5	78.6	0.747	281.0	0.654	2 10	78.8	0.751
15.0	283.2	0.538	1 6	81.7	0.857	285.2	0.549	2 12	81.8	0.861
15.5	289.0	0.424	1 7	84.1	0.938	291.5	0.438	2 14	84.2	0.941
16.0	299.1	0.309	1 8	86.2	0.986	302.0	0.327	2 16	86.3	0.987
16.5	319.9	0.208	1 9	88.2	1.000	322.3	0.232	2 18	88.3	1.000
17.0	1.5	0.166	1 10	90.2	0.978	358.8	0.190	2 20	90.3	0.976
17.5	40.2	0.221	1 11			34.8	0.235			
18.0	58.8	0.325	1 12			54.5	0.331			
18.5	68.0	0.440	1 13			64.8	0.442			
19.0	73 4	0.554	1 14			71.0	0.553			
19.5	77.0	0.660	1 15			75.2	0.658			
20.0	79.6	0.755	1 16			78.2	0.752			
20.5	81.7	0.837	1 17			80.6	0.834			
21.0	83.4	0.904	1 18			82.6	0.901			
21.5	85.0	0.954	1 19			84.4	0.951			
22.0	86.4	0.986	1 20			86.0	0.984			
22.5	87.7	0.999	1 21			87.5	0.999			
23.0	89.0	0.994	1 22			89.0	0.996			

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

Time from Eastern Elongation.		Rhea.		Time from Eastern Elongation.		Titan.		Hyperion.		Time from Eastern Elongation.	Iapetus.	
		p^1	F			p^1	F	p^1	F		p^1	F
d	h	°		d	h	°		°		d	°	
0	0	88.0	1.000	0	0	88.0	0.971	88.0	0.929	0	102.0	0.991
0	3	89.8	0.985	0	10	89.8	0.957	89.4	0.908	2	104.0	0.975
0	6	91.8	0.942	0	20	91.7	0.915	90.9	0.870	4	106.1	0.934
0	9	94.0	0.872	1	6	93.8	0.848	92.6	0.815	6	108.4	0.870
0	12	96.7	0.777	1	16	96.4	0.757	94.5	0.744	8	111.2	0.784
0	15	100.2	0.660	2	2	99.7	0.647	96.9	0.658	10	114.8	0.680
0	18	105.4	0.528	2	12	104.7	0.521	100.2	0.560	12	119.7	0.561
0	21	114.3	0.387	2	22	112.9	0.386	104.8	0.451	14	127.6	0.433
1	0	133.1	0.254	3	8	129.8	0.257	112.6	0.339	16	141.9	0.309
1	3	176.1	0.183	3	18	168.9	0.178	127.9	0.231	18	171.5	0.218
1	6	220.8	0.246	4	4	216.0	0.222	162.4	0.158	20	215.0	0.222
1	9	240.8	0.377	4	14	238.4	0.342	209.5	0.179	22	243.2	0.317
1	12	250.1	0.518	5	0	248.5	0.478	234.5	0.272	24	256.9	0.442
1	15	255.5	0.651	5	10	254.2	0.609	245.9	0.385	26	264.4	0.570
1	18	259.1	0.769	5	20	257.9	0.729	252.1	0.498	28	269.3	0.689
1	21	261.8	0.866	6	6	260.7	0.831	256.0	0.606	30	272.8	0.793
2	0	264.1	0.938	6	16	262.8	0.915	258.8	0.705	32	275.5	0.879
2	3	266.0	0.983	7	2	264.7	0.977	260.9	0.793	34	277.8	0.945
2	6	267.9	1.000	7	12	266.4	1.015	262.6	0.870	36	279.8	0.987
2	9	269.7	0.987	7	22	268.0	1.028	264.1	0.934	38	281.7	1.007
2	12	271.6	0.946	8	8	269.5	1.018	265.4	0.985	40	283.6	1.003
2	15	273.8	0.878	8	18	271.2	0.982	266.5	1.022	42	285.6	0.975
2	18	276.5	0.784	9	4	273.0	0.924	267.6	1.045	44	287.7	0.925
2	21	279.9	0.669	9	14	275.1	0.843	268.7	1.056	46	290.1	0.855
3	0	285.0	0.537	10	0	277.8	0.743	269.8	1.053	48	293.0	0.767
3	3	293.5	0.396	10	10	281.3	0.626	270.9	1.038	50	296.7	0.663
3	6	311.2	0.262	10	20	286.6	0.498	272.0	1.011	52	302.0	0.548
3	9	352.3	0.184	11	6	295.8	0.363	273.2	0.973	54	310.1	0.428
3	12	38.6	0.238	11	16	315.2	0.239	274.5	0.925	56	324.5	0.312
3	15	59.9	0.367	12	2	358.0	0.177	276.0	0.866	58	352.1	0.230
3	18	69.6	0.508	12	12	41.1	0.238	277.7	0.798	60	31.4	0.229
3	21	75.2	0.643	12	22	60.7	0.362	279.8	0.723	62	59.3	0.310
4	0	78.9	0.762	13	8	69.9	0.495	282.3	0.642	64	73.9	0.425
4	3	81.7	0.860	13	18	75.3	0.623	285.6	0.555	66	82.1	0.545
4	6	83.9	0.934	14	4	78.9	0.736	290.2	0.464	68	87.4	0.660
4	9	85.9	0.981	14	14	81.6	0.831	297.1	0.373	70	91.2	0.763
4	12	87.7	1.000	15	0	83.8	0.903	308.2	0.287	72	94.1	0.850
4	15	89.6	0.989	15	10	85.7	0.950	327.5	0.217	74	96.6	0.916
				15	20	87.5	0.970	358.1	0.187	76	98.7	0.965
				16	6	89.3	0.964	29.0	0.215	78	100.7	0.989
				16	16			48.7	0.284	80	102.7	0.988
				17	2			60.0	0.370	82	104.6	0.964
				17	12			67.0	0.460			
				17	22			71.7	0.548			
				18	8			75.1	0.632			
				18	18			77.7	0.710			
				19	4			79.9	0.778			
				19	14			81.7	0.836			
				20	0			83.3	0.882			
				20	10			84.8	0.914			
				20	20			86.2	0.930			
				21	6			87.5	0.932			
				21	16			88.9	0.918			

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

FOR GREENWICH MEAN MIDNIGHT.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 1	+0.8	26.3	−0.2	33.7	−1.3	41.8	−0.2	53.5
6	0.7	26.5	0.2	34.0	1.2	42.1	0.2	54.0
11	0.6	26.8	0.2	34.3	1.2	42.5	0.1	54.4
16	0.4	27.0	0.2	34.6	1.2	42.9	0.1	54.9
21	0.3	27.2	0.2	34.9	1.2	43.2	0.1	55.4
26	+0.2	27.5	−0.2	35.2	−1.2	43.6	−0.1	55.8
31	0.0	27.7	0.2	35.5	1.2	44.0	0.1	56.3
Feb. 5	−0.1	27.9	0.2	35.8	1.2	44.4	0.1	56.8
10	0.2	28.2	0.2	36.1	1.2	44.7	0.1	57.3
15	0.4	28.4	0.2	36.4	1.2	45.1	0.1	57.7
20	−0.6	28.6	−0.2	36.7	−1.2	45.4	−0.2	58.1
25	0.7	28.8	0.2	36.9	1.2	45.7	0.2	58.5
Mar. 2	0.9	28.9	0.2	37.1	1.2	46.0	0.2	58.8
7	1.0	29.1	0.3	37.3	1.2	46.2	0.2	59.2
12	1.2	29.2	0.3	37.5	1.2	46.4	0.2	59.5
17	−1.3	29.3	−0.3	37.7	−1.3	46.6	−0.3	59.7
22	1.4	29.4	0.4	37.8	1.3	46.8	0.3	59.9
27	1.6	29.5	0.4	37.9	1.3	46.9	0.4	60.0
Apr. 1	1.7	29.6	0.4	37.9	1.4	46.9	0.4	60.1
6	1.8	29.6	0.5	37.9	1.4	47.0	0.4	60.1
11	−1.9	29.6	−0.5	37.9	−1.4	46.9	−0.5	60.1
16	2.0	29.5	0.6	37.9	1.5	46.9	0.5	60.0
21	2.1	29.5	0.6	37.8	1.5	46.8	0.6	59.9
26	2.2	29.4	0.6	37.7	1.5	46.6	0.6	59.7
May 1	2.2	29.3	0.7	37.5	1.6	46.5	0.6	59.5
6	−2.3	29.1	−0.7	37.4	−1.6	46.3	−0.6	59.3
11	2.3	29.0	0.7	37.2	1.6	46.0	0.7	59.0
16	2.4	28.8	0.8	37.0	1.6	45.8	0.7	58.6
21	2.4	28.6	0.8	36.7	1.6	45.5	0.7	58.2
26	2.4	28.4	0.8	36.5	1.6	45.2	0.8	57.8
31	−2.3	28.2	−0.8	36.2	−1.6	44.8	−0.8	57.4
June 5	2.3	28.0	0.8	35.9	1.6	44.5	0.8	57.0
10	2.3	27.8	0.8	35.6	1.6	44.1	0.8	56.5
15	2.2	27.5	0.8	35.3	1.6	43.8	0.8	56.0
20	2.1	27.3	0.8	35.0	1.6	43.4	0.8	55.6
25	−2.0	27.1	−0.8	34.7	−1.6	43.0	−0.8	55.1
30	1.9	26.8	0.8	34.4	1.6	42.6	0.8	54.6
July 5	1.8	26.6	0.8	34.1	1.6	42.3	0.8	54.1
10	1.6	26.4	0.8	33.9	1.5	41.9	0.8	53.7
15	1.5	26.2	0.8	33.6	1.5	41.6	0.7	53.2
20	−1.3	25.9	−0.7	33.3	−1.4	41.2	−0.7	52.8
25	−1.2	25.7	−0.7	33.0	−1.4	40.9	−0.7	52.3
..	..	...	..	...	..	...	..	...
Dec. 22	+1.8	25.1	+1.0	32.2	+1.1	39.9	+0.9	51.1
27	1.7	25.3	1.0	32.5	1.1	40.2	1.0	51.5
32	+1.6	25.5	+1.1	32.7	+1.2	40.5	+1.0	51.9

FOR GREENWICH MEAN MIDNIGHT.

Date.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 1	−0.5	74.7	+0.1	173	−0.4	210	+0.4	505
6	0.5	75.4	0.1	175	0.4	212	0.5	509
11	0.4	76.0	0.1	176	0.4	213	0.5	513
16	0.4	76.7	0.1	178	0.3	215	0.5	518
21	0.4	77.3	0.2	179	0.3	217	0.5	523
26	−0.4	78.0	+0.2	181	−0.3	219	+0.5	527
31	0.4	78.7	0.2	182	0.3	221	0.5	532
Feb. 5	0.4	79.3	0.2	184	0.3	223	0.5	536
10	0.4	80.0	0.2	185	0.3	225	0.5	540
15	0.4	80.6	0.1	187	0.4	226	0.5	544
20	−0.4	81.2	+0.1	188	−0.4	228	+0.5	548
25	0.5	81.7	0.1	189	0.4	229	0.4	552
Mar. 2	0.5	82.2	+0.1	191	0.4	231	0.4	555
7	0.5	82.6	0.0	192	0.4	232	0.4	558
12	0.6	83.0	0.0	192	0.4	233	0.3	561
17	−0.6	83.4	0.0	193	−0.5	234	+0.3	563
22	0.6	83.6	0.0	194	0.5	235	0.2	565
27	0.7	83.8	−0.1	194	0.6	235	0.2	566
Apr. 1	0.7	83.9	0.1	195	0.6	236	0.1	567
6	0.7	84.0	0.2	195	0.6	236	+0.1	567
11	−0.8	84.0	−0.2	195	−0.7	236	0.0	567
16	0.8	83.9	0.2	194	0.7	236	0.0	566
21	0.8	83.7	0.3	194	0.7	235	−0.1	565
26	0.9	83.4	0.3	193	0.8	234	0.2	564
May 1	0.9	83.1	0.3	193	0.8	233	0.2	562
6	−1.0	82.7	−0.4	192	−0.8	232	−0.2	559
11	1.0	82.3	0.4	191	0.8	231	0.3	556
16	1.0	81.8	0.4	190	0.9	230	0.3	553
21	1.0	81.3	0.4	189	0.9	228	0.4	549
26	1.0	80.8	0.5	187	0.9	227	0.4	546
31	−1.1	80.2	−0.5	186	−0.9	225	−0.4	542
June 5	1.1	79.6	0.5	184	0.9	223	0.4	537
10	1.1	78.9	0.5	183	0.9	222	0.4	533
15	1.1	78.3	0.5	181	0.9	220	0.4	529
20	1.1	77.6	0.5	180	0.9	218	0.4	524
25	−1.1	76.9	−0.5	178	−0.9	216	−0.4	520
30	1.1	76.3	0.5	177	0.9	214	0.4	515
July 5	1.1	75.6	0.5	175	0.9	212	0.4	511
10	1.0	75.0	0.5	174	0.9	211	0.4	506
15	1.0	74.3	0.4	172	0.9	209	0.4	502
20	−1.0	73.7	−0.4	171	−0.9	207	−0.3	498
25	−1.0	73.1	−0.4	169	−0.8	205	−0.3	494
..	..	..	..	..	..	..	..	..
Dec. 22	+0.7	71.4	+1.2	165	+0.7	200	+1.8	482
27	0.8	71.9	1.2	167	0.7	202	1.8	486
32	+0.8	72.5	+1.3	168	+0.7	204	+1.8	490

Uranus is in opposition September 8, 1923, but at this date the Earth is very near the plane of the orbits of the satellites, and hence the apparent orbits approximate straight lines. For this reason the diagram of the apparent orbits is not given.

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
June 4 17.8	June 8 12.6	May 30 3.6	June 1 5.3	May 19 22.9	May 24 7.4	June 14 19.7 N.
12 7.3	16 2.0	June 7 10.5	9 12.2	28 15.8	June 2 0.3	21 13.3 S.
19 20.7	23 15.4	15 17.4	17 19.1	June 6 8.7	10 17.2	28 6.8 N.
27 10.2	July 1 4.9	24 0.3	26 2.0	15 1.6	19 10.1	July 5 0.4 S.
July 4 23.6	8 18.4	July 2 7.2	July 4 8.9	23 18.6	28 3.0	11 17.9 N.
12 13.1	16 7.8	10 14.1	12 15.8	July 2 11.5	July 6 20.0	18 11.5 S.
20 2.5	23 21.3	18 21.0	20 22.7	11 4.4	15 12.9	25 5.1 N.
27 16.0	31 10.7	27 3.9	29 5.6	19 21.4	24 5.8	31 22.6 S.
Aug. 4 5.5	Aug. 8 0.2	Aug. 4 10.8	Aug. 6 12.6	28 14.3	Aug. 1 22.8	Aug. 7 16.2 N.
11 18.9	15 13.7	12 17.8	14 19.5	Aug. 6 7.2	10 15.7	14 9.8 S.
19 8.4	23 3.1	21 0.7	23 2.4	15 0.2	19 8.7	21 3.4 N.
26 21.9	30 16.6	29 7.6	31 9.3	23 17.2	28 1.6	27 21.0 S.
Sept. 3 11.3	Sept. 7 6.1	Sept. 6 14.5	Sept. 8 16.3	Sept. 1 10.1	Sept. 5 18.6	Sept. 3 14.6 N.
11 0.8	14 19.5	14 21.5	16 23.2	10 3.1	14 11.6	10 8.2 S.
18 14.3	22 9.0	23 4.4	25 6.1	18 20.1	23 4.5	17 1.8 N.
26 3.8	29 22.5	Oct. 1 11.4	Oct. 3 13.1	27 13.0	Oct. 1 21.5	23 19.3 S.
Oct. 3 17.2	Oct. 7 12.0	9 18.3	11 20.0	Oct. 6 6.0	10 14.5	30 12.9 N.
11 6.7	15 1.5	18 1.2	20 3.0	14 23.0	19 7.5	Oct. 7 6.5 S.
18 20.2	22 15.0	26 8.2	28 9.9	23 15.9	28 0.4	14 0.1 N.
26 9.7	30 4.4	Nov. 3 15.1	Nov. 5 16.8	Nov. 1 8.9	Nov. 5 17.4	20 17.7 S.
Nov. 2 23.2	Nov. 6 17.9	11 22.1	13 23.8	10 1.9	14 10.4	27 11.3 N.
10 12.7	14 7.4	20 5.0	22 6.7	18 18.8	23 3.3	Nov. 3 4.9 S.
18 2.1	21 20.9	28 11.9	30 13.7	27 11.8	Dec. 1 20.3	9 22.5 N.
25 15.6	29 10.4	Dec. 6 18.9	Dec. 8 20.6	Dec. 6 4.8	10 13.2	16 16.0 S.
Dec. 3 5.1	Dec. 6 23.8	15 1.8	17 3.5	14 21.7	19 6.2	23 9.6 N.

For Ariel every third greatest elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Ariel, $2^d\ 12^h.489$; of Umbriel, $4^d\ 3^h.460$; of Titania, $8^d\ 16^h.941$; of Oberon, $13^d\ 11^h.118$.

Time from Northern Elongation.		Ariel.		Umbriel.		Time from Northern Elongation.		Titania.		Time from Northern Elongation.		Oberon.	
		p^1	F	p^1	F			p^1	F			p^1	F
d	h	°		°		d	h	°		d	h	°	
0	0	345.0	1.000	345.0	1.000	0	0	345.0	1.000	0	0	345.0	1.000
0	2	345.2	0.978	345.1	0.992	0	5	345.2	0.989	0	8	345.2	0.988
0	4	345.5	0.915	345.3	0.968	0	10	345.3	0.955	0	16	345.3	0.952
0	6	345.7	0.812	345.4	0.929	0	15	345.5	0.900	1	0	345.5	0.893
0	8	346.1	0.674	345.6	0.875	0	20	345.7	0.825	1	8	345.7	0.813
0	10	346.7	0.508	345.8	0.807	1	1	346.0	0.731	1	16	346.0	0.713
0	12	348.1	0.320	346.0	0.727	1	6	346.3	0.620	2	0	346.4	0.596
0	14	353.7	0.119	346.3	0.634	1	11	346.8	0.496	2	8	347.0	0.464
0	16	153.9	0.093	346.6	0.532	1	16	347.7	0.360	2	16	348.0	0.321
0	18	161.7	0.295	347.2	0.421	1	21	349.6	0.217	3	0	351.0	0.172
0	20	163.1	0.486	348.2	0.304	2	2	0.0	0.071	3	8	34.8	0.024
0	22	163.8	0.655	350.6	0.182	2	7	152.8	0.086	3	16	157.7	0.142
1	0	164.2	0.797	3.2	0.057	2	12	160.7	0.233	4	0	161.6	0.292
1	2	164.5	0.904	150.9	0.074	2	17	162.4	0.375	4	8	162.9	0.437
1	4	164.8	0.973	159.9	0.198	2	22	163.3	0.510	4	16	163.5	0.571
1	6	165.0	1.000	161.9	0.320	3	3	163.7	0.633	5	0	163.9	0.691
1	8	165.2	0.983	162.9	0.436	3	8	164.1	0.741	5	8	164.2	0.794
1	10	165.4	0.925	163.4	0.546	3	13	164.3	0.834	5	16	164.4	0.879
1	12	165.7	0.827	163.8	0.647	3	18	164.5	0.907	6	0	164.6	0.942
1	14	166.1	0.693	164.1	0.738	3	23	164.7	0.960	6	8	164.8	0.983
1	16	166.7	0.529	164.3	0.817	4	4	164.9	0.991	6	16	165.0	1.000
1	18	167.8	0.343	164.5	0.883	4	9	165.0	1.000	7	0	165.1	0.992
1	20	172.2	0.143	164.6	0.935	4	14	165.2	0.986	7	8	165.3	0.961
1	22	329.7	0.068	164.8	0.972	4	19	165.3	0.950	7	16	165.5	0.906
2	0	341.3	0.271	164.9	0.994	5	0	165.5	0.893	8	0	165.7	0.830
2	2	343.0	0.463	165.0	1.000	5	5	165.7	0.816	8	8	166.0	0.734
2	4	343.7	0.636	165.1	0.990	5	10	166.0	0.720	8	16	166.3	0.619
2	6	344.2	0.781	165.3	0.964	5	15	166.3	0.607	9	0	166.8	0.491
2	8	344.5	0.893	165.4	0.923	5	20	166.9	0.482	9	8	167.8	0.350
2	10	344.7	0.967	165.6	0.867	6	1	167.8	0.345	9	16	170.0	0.200
2	12	344.9	0.999	165.8	0.797	6	6	170.0	0.202	10	0	186.5	0.049
2	14	345.2	0.988	166.0	0.715	6	11	184.3	0.054	10	8	335.7	0.111
2	16			166.3	0.621	6	16	334.8	0.100	10	16	341.2	0.263
2	18			166.7	0.517	6	21	341.0	0.248	11	0	342.7	0.409
2	20			167.3	0.405	7	2	342.6	0.390	11	8	343.4	0.546
2	22			168.4	0.287	7	7	343.3	0.523	11	16	343.9	0.669
3	0			171.2	0.165	7	12	343.8	0.645	12	0	344.2	0.776
3	2			190.4	0.043	7	17	344.1	0.752	12	8	344.4	0.864
3	4			333.6	0.091	7	22	344.3	0.842	12	16	344.6	0.932
3	6			340.3	0.214	8	3	344.5	0.913	13	0	344.8	0.977
3	8			342.1	0.335	8	8	344.7	0.964	13	8	344.9	0.998
3	10			343.0	0.451	8	13	344.9	0.993	13	16	345.1	0.996
3	12			343.5	0.560	8	18	345.0	1.000				
3	14			343.8	0.660								
3	16			344.1	0.749								
3	18			344.3	0.827								
3	20			344.5	0.891								
3	22			344.6	0.941								
4	0			344.8	0.976								
4	2			344.9	0.996								
4	4			345.0	0.999								

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F \frac{a(\rho)}{\rho}$.

FOR GREENWICH MEAN MIDNIGHT.

Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$				Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
	°	″	″	″	″		°	″	″	″	″
May 10	0.0	12.9	17.9	29.4	39.4	Sept. 7	+0.1	13.9	19.3	31.7	42.4
15	0.0	12.9	18.0	29.5	39.5	12	0.2	13.9	19.3	31.7	42.3
20	0.0	13.0	18.1	29.7	39.7	17	0.2	13.8	19.3	31.6	42.3
25	0.0	13.0	18.1	29.8	39.8	22	0.2	13.8	19.3	31.6	42.3
30	0.0	13.1	18.2	29.9	40.0	27	0.2	13.8	19.2	31.6	42.2
June 4	0.0	13.1	18.3	30.0	40.1	Oct. 2	+0.2	13.8	19.2	31.5	42.2
9	0.0	13.2	18.4	30.1	40.3	7	0.3	13.8	19.2	31.5	42.1
14	0.0	13.3	18.4	30.3	40.5	12	0.3	13.7	19.1	31.4	42.0
19	−0.1	13.3	18.5	30.4	40.6	17	0.3	13.7	19.1	31.3	41.9
24	0.1	13.4	18.6	30.5	40.8	22	0.3	13.6	19.0	31.2	41.7
29	−0.1	13.4	18.7	30.6	41.0	27	+0.3	13.6	19.0	31.1	41.6
July 4	0.0	13.5	18.8	30.8	41.1	Nov. 1	0.3	13.6	18.9	31.0	41.4
9	0.0	13.5	18.8	30.9	41.3	6	0.3	13.5	18.8	30.9	41.3
14	0.0	13.6	18.9	31.0	41.4	11	0.4	13.5	18.7	30.8	41.1
19	0.0	13.6	19.0	31.1	41.6	16	0.4	13.4	18.7	30.6	41.0
24	0.0	13.6	19.0	31.2	41.7	21	+0.4	13.3	18.6	30.5	40.8
29	0.0	13.7	19.1	31.3	41.8	26	0.4	13.3	18.5	30.4	40.6
Aug. 3	0.0	13.7	19.1	31.4	42.0	Dec. 1	0.4	13.2	18.4	30.2	40.4
8	0.0	13.8	19.2	31.4	42.1	6	0.4	13.2	18.4	30.1	40.3
13	0.0	13.8	19.2	31.5	42.2	11	0.4	13.1	18.3	30.0	40.1
18	+0.1	13.8	19.2	31.6	42.2	16	+0.3	13.1	18.2	29.9	39.9
23	0.1	13.8	19.3	31.6	42.3	21	0.3	13.0	18.1	29.7	39.8
28	0.1	13.8	19.3	31.6	42.3	26	0.3	13.0	18.0	29.6	39.6
Sept. 2	+0.1	13.9	19.3	31.7	42.3	31	+0.3	12.9	18.0	29.5	39.4

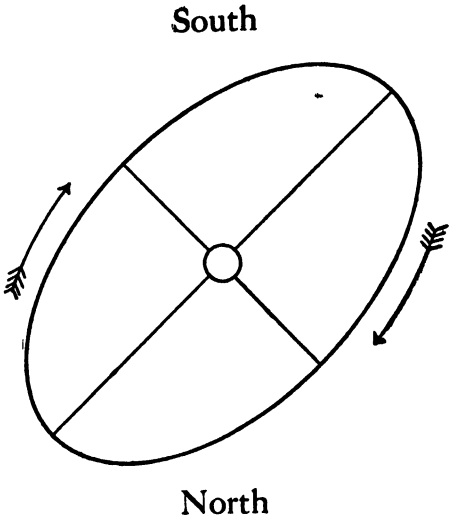
SATELLITE OF NEPTUNE, 1923.

Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$
d h	°		d h	°			°	″		°	″
0 0	134.0	1.000	3 0	311.8	0.999	Jan. 1	+0.3	16.7	May 1	−1.8	16.3
0 3	129.6	0.994	3 3	307.3	0.987	6	0.2	16.7	6	1.8	16.2
0 6	125.0	0.977	3 6	302.7	0.964	11	+0.1	16.7	11	1.8	16.2
0 9	120.2	0.948	3 9	297.7	0.930	16	0.0	16.7	16	1.7	16.1
0 12	115.1	0.910	3 12	292.4	0.888	21	−0.1	16.7	21	1.7	16.1
0 15	109.5	0.863	3 15	286.4	0.838	26	−0.2	16.8	26	−1.6	16.0
0 18	103.1	0.810	3 18	279.7	0.783	31	0.4	16.8	..	. .	. . .
0 21	95.9	0.754	3 21	271.9	0.727	Feb. 5	0.5	16.8	Oct. 13	+2.3	16.0
1 0	87.5	0.699	4 0	262.8	0.673	10	0.6	16.8	18	2.4	16.0
1 3	77.7	0.649	4 3	252.3	0.627	15	0.7	16.8	23	2.4	16.0
1 6	66.4	0.609	4 6	240.4	0.594	20	−0.9	16.7	28	+2.5	16.1
1 9	53.9	0.584	4 9	227.5	0.579	25	1.0	16.7	Nov. 2	2.6	16.1
1 12	40.7	0.579	4 12	214.3	0.584	Mar. 2	1.1	16.7	7	2.6	16.2
1 15	27.8	0.594	4 15	201.8	0.608	7	1.2	16.7	12	2.6	16.2
1 18	15.8	0.627	4 18	190.5	0.648	12	1.3	16.7	17	2.6	16.3
1 21	5.3	0.673	4 21	180.7	0.698	17	−1.4	16.6	22	+2.7	16.3
2 0	356.2	0.726	5 0	172.2	0.753	22	1.5	16.6	27	2.6	16.4
2 3	348.4	0.782	5 3	165.0	0.809	27	1.6	16.6	Dec. 2	2.6	16.4
2 6	341.6	0.837	5 6	158.6	0.862	Apr. 1	1.6	16.5	7	2.6	16.4
2 9	335.7	0.887	5 9	153.0	0.909	6	1.7	16.5	12	2.6	16.5
2 12	330.3	0.930	5 12	147.8	0.947	11	−1.8	16.5	17	+2.5	16.5
2 15	325.4	0.963	5 15	143.1	0.976	16	1.8	16.4	22	2.5	16.6
2 18	320.7	0.986	5 18	138.5	0.994	21	1.8	16.4	27	2.4	16.6
2 21	316.2	0.998	5 21	134.1	1.000	26	−1.8	16.3	32	+2.3	16.6

Position angle of satellite $p=p^1+(P-P_0)$.

Apparent distance of satellite $s=F\frac{a(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, FEBRUARY 6, 1923, AS SEEN IN AN INVERTING TELESCOPE



GREENWICH MEAN TIME OF GREATEST ELONGATION.

	d	h				d	h				d	h				d	h	
Jan.	2	19.7	E.	Mar.	5	13.4	W.	May	6	6.7	E.	July	6	23.3	W.	Nov.	4	9.0	E.
	5	18.2	W.		8	11.9	E.		9	5.2	W.		9	21.8	E.		7	7.5	W.
	8	16.8	E.		11	10.5	W.		12	3.8	E.		. .	. . .			10	6.0	E.
	11	15.3	W.		14	9.0	E.		15	2.3	W.	Sept.	12	12.3	E.		13	4.6	W.
	14	13.9	E.		17	7.6	W.		18	0.8	E.		15	10.7	W.		16	3.1	E.
	17	12.4	W.		20	6.1	E.		20	23.3	W.		18	9.2	E.		19	1.6	W.
	20	11.0	E.		23	4.7	W.		23	21.8	E.		21	7.7	W.		22	0.1	E.
	23	9.5	W.		26	3.2	E.		26	20.3	W.		24	6.2	E.		24	22.6	W.
	26	8.1	E.		29	1.8	W.		29	18.8	E.		27	4.7	W.		27	21.1	E.
	29	6.7	W.	Apr.	1	0.3	E.	June	1	17.4	W.		30	3.1	E.		30	19.6	W.
Feb.	1	5.2	E.		3	22.9	W.		4	15.8	E.	Oct.	3	1.6	W.	Dec.	3	18.2	E.
	4	3.8	W.		6	21.4	E.		7	14.4	W.		6	0.1	E.		6	16.7	W.
	7	2.3	E.		9	19.9	W.		10	12.8	E.		8	22.6	W.		9	15.2	E.
	10	0.9	W.		12	18.5	E.		13	11.3	W.		11	21.1	E.		12	13.7	W.
	12	23.4	E.		15	17.0	W.		16	9.8	E.		14	19.6	W.		15	12.3	E.
	15	22.0	W.		18	15.6	E.		19	8.3	W.		17	18.1	E.		18	10.8	W.
	18	20.6	E.		21	14.1	W.		22	6.8	E.		20	16.6	W.		21	9.4	E.
	21	19.1	W.		24	12.6	E.		25	5.3	W.		23	15.0	E.		24	7.9	W.
	24	17.7	E.		27	11.2	W.		28	3.8	E.		26	13.5	W.		27	6.4	E.
	27	16.2	W.		30	9.7	E.	July	1	2.3	W.		29	12.0	E.		30	5.0	W.
Mar.	2	14.8	E.	May	3	8.2	W.		4	0.8	E.	Nov.	1	10.5	W.		33	3.5	E.

In the above diagram the central circle represents the planet.
The sidereal period of the satellite of Neptune is $5^d\ 21^h.044$.

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m			°	′
Jan.	2	11	–	☉	in Perihelion.		
	5	6	34	☌☿☾	. . . . . ☿	+ 3	11
	5	20	–	☿	in Perihelion.		
	9	14	43	☌♄☾	. . . . . ♄	+ 0	10
	10	13	–	□♄☉			
	11	8	2	☌♃☾	. . . . . ♃	− 2	59
	12	22	–	☿	Greatest elong. E.	18	56
	13	0	49	☌♀☾	. . . . . ♀	− 0	31
	15	11	–	☿	in ♌		
	18	3	1	☌☿☾	. . . . . ☿	− 2	24
	19	6	–	☿	Stationary.		
	20	1	–	☿	in Perihelion.		
	20	6	18	☌♁☾	. . . . . ♁	− 1	45
	21	19	33	☌♂☾	. . . . . ♂	+ 0	29
	27	19	–	♀	Greatest Hel. Lat. N.		
	28	16	–	☌☿☉	Inferior.		
	30	8	–	☿	Greatest Hel. Lat. N.		
	30	8	–	♄	Stationary.		
Feb.	1	14	6	☌☿☾	. . . . . ☿	+ 3	10
	3	20	–	♀	Greatest elong. W.	46	55
	5	20	58	☌♄☾	. . . . . ♄	+ 0	3
	6	2	–	☍☿☉			
	7	5	–	□♃☉			
	7	18	34	☌♃☾	. . . . . ♃	− 3	17
	9	8	–	☿	Stationary.		
	11	8	7	☌♀☾	. . . . . ♀	− 1	59
	12	18	–	♂	in ♌		
	13	6	2	☌☿☾	. . . . . ☿	− 2	16
	16	16	46	☌♁☾	. . . . . ♁	− 1	32
	19	20	2	☌♂☾	. . . . . ♂	+ 2	57
	22	17	–	☿	Greatest elong. W.	26	42
	22	19	–	☿	in ♍		
	28	23	32	☌☿☾	. . . . . ☿	+ 3	15
Mar.	2	–	–	☾	Par. ecl. vis. at Wash.		
	4	16	–	☌♁☉			
	5	1	–	☿	in Aphelion.		
	5	3	43	☌♄☾	. . . . . ♄	+ 0	10
	5	13	–	♃	Stationary.		
	7	2	55	☌♃☾	. . . . . ♃	− 3	20
	13	4	38	☌♀☾	. . . . . ♀	− 2	47
	15	–	–	♁	Greatest Hel. Lat. S.		
	15	8	14	☌☿☾	. . . . . ☿	− 3	49
	16	2	24	☌♁☾	. . . . . ♁	− 1	23
	17	–	–	☉	Ann. ecl. invis. at Wash.		
	20	19	46	☌♂☾	. . . . . ♂	+ 4	45
	21	3	29	☉	enters ♈, Spring com.		
	21	6	–	☌☿♁	. . . . . ☿	− 1	40
	24	21	–	♀	in ♍		
	25	10	–	☿	Greatest Hel. Lat. S.		
	28	9	4	☌☿☾	. . . . . ☿	+ 3	18
Apr.	1	11	32	☌♄☾	. . . . . ♄	+ 0	24
	3	10	5	☌♃☾	. . . . . ♃	− 3	11
	7	3	–	☍♄☉			
	8	6	–	☌☿☉	Superior.		
	12	7	27	☌♀☾	. . . . . ♀	− 1	43
	12	11	6	☌♁☾	. . . . . ♁	− 1	14
	13	10	–	☿	in ♌		
	13	22	–	☌♀♁	. . . . . ♀	− 0	23
	16	11	25	☌☿☾	. . . . . ☿	+ 4	23
	18	0	–	☿	in Perihelion.		
	18	18	34	☌♂☾	. . . . . ♂	+ 5	43
	24	17	10	☌☿☾	. . . . . ☿	+ 3	11
	26	13	–	☿	Stationary.		
	28	5	–	♀	in Aphelion.		
	28	8	–	☿	Greatest Hel. Lat. N.		
	28	19	27	☌♄☾	. . . . . ♄	+ 0	33
	30	16	13	☌♃☾	. . . . . ♃	− 2	58
May	5	2	–	☍♃☉			
	5	5	–	☿	Greatest elong. E.	21	7
	6	12	–	□☿☉			
	9	19	17	☌♁☾	. . . . . ♁	− 0	59
	12	12	36	☌♀☾	. . . . . ♀	+ 0	53
	16	18	11	☌☿☾	. . . . . ☿	+ 6	19
	17	10	–	☿	Stationary.		
	17	16	4	☌♂☾	. . . . . ♂	+ 5	57
	20	17	–	♀	Greatest Hel. Lat. S.		
	21	19	–	☿	in ♍		
	21	23	42	☌☿☾	. . . . . ☿	+ 2	56
	26	2	26	☌♄☾	. . . . . ♄	+ 0	27
	27	21	20	☌♃☾	. . . . . ♃	− 2	54
	28	15	–	☌☿☉	Inferior.		
June	1	0	–	☿	in Aphelion.		
	6	3	25	☌♁☾	. . . . . ♁	− 0	42
	8	20	–	□☍☉			
	9	18	–	☿	Stationary.		
	11	19	53	☌♀☾	. . . . . ♀	+ 3	28
	12	9	48	☌☿☾	. . . . . ☿	+ 0	41
	15	11	56	☌♂☾	. . . . . ♂	+ 5	33
	17	11	–	♄	Stationary.		
	18	5	57	☌☿☾	. . . . . ☿	+ 2	40
	21	4	–	☌☿♀	. . . . . ☿	− 2	38
	21	9	–	☿	Greatest Hel. Lat. S.		
	21	23	3	☉	enters ♋, Summer com.		
	22	8	36	☌♄☾	. . . . . ♄	+ 0	5
	22	17	–	☿	Greatest elong. W.	22	33
	22	23	–	♁	Stationary.		
	24	2	9	☌♃☾	. . . . . ♃	− 3	4
July	3	11	29	☌♁☾	. . . . . ♁	− 0	27
	4	3	–	☌☿♀	. . . . . ☿	− 0	47
	5	12	–	☉	in Aphelion.		

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m		° ′
July	6	8	–	□♄☉	
	7	8	–	♃	Stationary.
	10	9	–	☿	in ♌
	12	4	30	☌☿☾	☿ + 4 37
	12	16	8	☌☿☾	☿ + 5 0
	14	6	8	☌♂☾	♂ + 4 40
	15	0	–	☿	in Perihelion.
	15	13	31	☌♆☾	♆ + 2 28
	16	0	–	♀	in ♌
	19	15	15	☌♄☾	♄ − 0 18
	21	8	9	☌♃☾	♃ − 3 24
	21	22	–	☌☿☉	Superior.
	25	7	–	☿	Greatest Hel. Lat. N.
	25	14	–	☌☿♂	☿ + 0 39
	30	19	2	☌♇☾	♇ − 0 21
	30	23	–	☌☿♆	☿ + 1 35
Aug.	3	1	–	□♃☉	
	8	8	–	☌♂☉	
	11	3	–	☌♆☉	
	11	10	4	☌♀☾	♀ + 3 46
	11	23	1	☌♂☾	♂ + 3 22
	11	23	12	☌♆☾	♆ + 2 22
	12	3	–	☌♂♆	♂ + 0 59
	13	13	27	☌☿☾	☿ + 0 39
	16	0	8	☌♄☾	♄ − 0 41
	16	18	–	♂	Greatest Hel. Lat. N.
	17	16	–	☌♀♆	♀ + 0 58
	17	17	6	☌♃☾	♃ − 3 45
	17	18	–	☿	in ♍
	18	12	–	♀	in Perihelion.
	23	4	–	☌♀♂	♀ + 0 6
	25	–	–	☾	Par. ecl. vis. at Wash.
	27	1	24	☌♇☾	♇ − 0 24
	28	0	–	☿	in Aphelion.
Sept.	2	10	–	☿	Greatest elong. E. 27 9
	8	10	34	☌♆☾	♆ + 2 18
	8	19	–	☍♇☉	
	9	12	–	♀	Greatest Hel. Lat. N.
	9	15	6	☌♂☾	♂ + 1 44
	9	23	–	☌♀☉	Superior.
	10	–	–	☉	Tot. ecl. vis. as par. at W.
	10	9	44	☌♀☾	♀ + 0 56
	11	23	1	☌☿☾	☿ − 6 44
	12	12	17	☌♄☾	♄ − 0 59
	14	6	9	☌♃☾	♃ − 4 1
	15	14	–	☿	Stationary.
	17	8	–	☿	Greatest Hel. Lat. S.
	21	17	–	♂	in Aphelion.
	23	6	22	☌♇☾	♇ − 0 31
	23	14	4	☉	enters ♎, Autumn com.

	d	h	m		° ′
Sept.	25	17	–	☌☿♀	☿ − 4 57
	28	16	–	☌☿☉	Inferior.
Oct.	5	22	5	☌♆☾	♆ + 2 11
	6	9	–	☿	in ♌
	7	0	¬	☿	Stationary.
	8	6	49	☌♂☾	♂ − 0 3
	8	14	6	☌☿☾	☿ − 1 0
	8	18	–	☌♀♄	♀ − 1 22
	10	3	24	☌♄☾	♄ − 1 13
	10	6	2	☌♀☾	♀ − 2 45
	11	0	–	☿	in Perihelion.
	11	23	24	☌♃☾	♃ − 4 11
	14	4	–	☿	Greatest elong. W. 18 7
	15	–	–	♄	Greatest Hel. Lat. N.
	16	23	–	☌♄☉	
	20	10	31	☌♇☾	♇ − 0 31
	21	6	–	☿	Greatest Hel. Lat. N.
	29	12	–	☌☿♄	☿ − 0 42
Nov.	2	7	47	☌♆☾	♆ + 1 58
	4	8	–	☌♀♃	♀ − 0 45
	4	14	–	♀	in ♍
	5	22	17	☌♂☾	♂ − 1 49
	6	19	47	☌♄☾	♄ − 1 27
	7	17	31	☌☿☾	☿ − 3 53
	8	19	42	☌♃☾	♃ − 4 18
	9	3	45	☌♀☾	♀ − 5 17
	13	7	–	□♆☉	
	13	17	–	☿	in ♍
	15	12	–	☌☿☉	Superior.
	16	15	22	☌♇☾	♇ − 0 21
	19	18	–	☌☿♃	☿ − 1 25
	22	10	–	☌♃☉	
	23	9	–	♆	Stationary.
	23	20	–	♇	Stationary.
	23	23	–	☿	in Aphelion.
	29	14	34	☌♆☾	♆ + 1 41
Dec.	1	20	–	☌♂♄	♂ − 1 30
	4	11	0	☌♄☾	♄ − 1 43
	4	13	22	☌♂☾	♂ − 3 19
	6	9	–	□♇☉	
	6	16	59	☌♃☾	♃ − 4 23
	8	10	45	☌☿☾	☿ − 6 47
	8	20	–	♀	in Aphelion.
	9	5	14	☌♀☾	♀ − 5 30
	13	22	38	☌♇☾	♇ − 0 1
	14	8	–	☿	Greatest Hel. Lat. S.
	22	8	54	☉	enters ♑, Winter com.
	26	19	22	☌♆☾	♆ + 1 29
	27	4	–	☿	Greatest elong. E. 19 46
	31	10	–	♀	Greatest Hel. Lat. S.
	31	22	47	☌♄☾	♄ − 1 59

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
1	Abbadia, France	+43 22 52.2	−11 34.4	69	9.999317	+ 0 7 0.1	+ 1.15
2	Adelaide, S. Australia	−34 55 38.0 *a*	+10 52.4	41 *b*	9.999526	− 9 14 20.07 *a*	− 91.06
3	Adelaide, S. Australia	−34 55 37.4 *c*	+10 52.4	. . .	9.999523	− 9 14 20.17 *c*	− 91.06
4	Albany, N. Y.	+42 39 12.7 *a*	−11 33.1	70 *a*	9.999336	+ 4 55 7.12 *a*	+ 48.48
5	Albany, N. Y.	+42 39 49.5 *a*	−11 33.1	52	9.999335	+ 4 54 59.97 *a*	+ 48.46
6	Algiers, Algeria	+36 47 50	−11 6.7	342	9.999501	− 0 12 8.38	− 1.99
7	Allegheny, Pa.	+40 28 58.1 *d*	−11 26.7	370 *d*	9.999411	+ 5 20 5.39 *d*	+ 52.58
8	Allegheny, Pa.	+40 27 41.6	−11 26.6	. . .	9.999387	+ 5 20 2.93	+ 52.58
9	Amherst, Mass.	+42 21 56.5 *e*	−11 32.5	110 *e*	9.999346	+ 4 50 5.93 *e*	+ 47.66
10	Amherst, Mass.	+42 22 17.1 *f*	−11 32.5	. . .	9.999338	+ 4 50 4.67 *f*	+ 47.65
11	Ann Arbor, Mich.	+42 16 48.7 *a*	−11 32.3	282 *a*	9.999360	+ 5 34 55.27 *a*	+ 55.02
12	Appleton, Wis.	+44 15 39.2 *g*	−11 35.4	242	9.999307	+ 5 53 35.92 *g*	+ 58.09
13	Arcetri, Italy	+43 45 14.4	−11 34.9	184	9.999316	− 0 45 1.30	− 7.40
14	Arequipa, Peru	−16 22 28.0 *h*	+ 6 15.2	2451 *h*	0.000052	+ 4 46 11.73 *h*	+ 47.02
15	Armagh, Ireland	+54 21 12.7 *c*	−10 59.6	61 *c*	9.999040	+ 0 26 35.4 *c*	+ 4.37
16	Athens, Greece	+37 58 19.7 *i*	−11 14.3	107 *i*	9.999456	− 1 34 53 *i*	− 15.59
17	Baltimore, Md.	+39 17 52.0 *j*	−11 21.5	36 *j*	9.999418	+ 5 6 29.1 *j*	+ 50.35
18	Bamberg, Bavaria	+49 53 6.0 *c*	−11 26.0	299 *c*	9.999167	− 0 43 33.57 *c*	− 7.16
19	Barcelona, Spain	+41 25 18	−11 30.0	420	9.999391	− 0 8 28.0	− 1.39
20	Beloit, Wis.	+42 30 8.4	−11 32.8	. . .	9.999335	+ 5 56 7.4	+ 58.50
21	Bergedorf, Germany	+53 28 46.2	−11 6.1	35	9.999060	− 0 40 57.74	− 6.73
22	Berkeley, Cal.	+37 52 23.6	−11 13.7	97	9.999458	+ 8 9 2.82	+ 80.34
23	Berlin-Babelsberg., Pr.	+52 24 24.2 *e*	−11 13.1	82 *e*	9.999089	− 0 52 25.49 *e*	− 8.61
24	Berlin, Prussia	+52 30 16.7 *k*	−11 12.5	47 *k*	9.999085	− 0 53 34.80 *k*	− 8.80
25	Berlin, Prussia	+52 31 13.1	−11 12.4	. . .	9.999081	− 0 53 34.41	− 8.80
26	Berlin, Prussia	+52 31 30.7	−11 12.4	. . .	9.999081	− 0 53 27.40	− 8.78
27	Berlin, Prussia	+52 29 7	−11 12.6	38	9.999084	− 0 53 54.2	− 8.86
28	Berne, Switzerland	+46 57 8.7	−11 34.2	573	9.999260	− 0 29 45.70 *a*	− 4.89
29	Besançon, France	+47 14 59.0	−11 33.7	312	9.999235	− 0 23 57.13	− 3.93
30	Birr Castle, Ireland	+53 5 47	−11 8.7	56	9.999071	+ 0 31 40.9	+ 5.20
31	Bloomington, Ind.	+39 9 56 *d*	−11 20.8	238 *d*	9.999435	+ 5 46 5 *d*	+ 56.85
32	Bogota, Colombia	+ 4 35 55.2 *c*	− 1 50.8	2634	0.000170	+ 4 56 23.5	+ 48.69
33	Bombay (Colaba), India	+18 53 36.2 *c*	− 7 5.1	14 *c*	9.999849	− 4 51 15.72 *c*	− 47.85
34	Bonn, Prussia	+50 43 45.0 *k*	−11 22.3	62 *l*	9.999130	+ 0 28 23.17 *k*	− 4.66
35	Bordeaux(Floirac), France	+44 50 7.2 *a*	−11 35.6	73	9.999281	+ 0 2 5.51 *a*	+ 0.34
36	Boston, Mass.	+42 20 58 *m*	−11 32.5	31 *m*	9.999341	+ 4 44 19.1 *m*	+ 46.71
37	Boston, Mass.	+42 21 32.5	−11 32.5	48	9.999342	+ 4 44 15.0	+ 46.70
38	Bothkamp, Prussia	+54 12 9.6 *n*	−11 0.8	32 *n*	9.999042	− 0 40 31.02 *n*	− 6.66
39	Bremen, Germany	+53 4 36	−11 8.8	. . .	9.999067	− 0 35 15	− 5.79
40	Breslau, Prussia	+51 6 55.8 *k*	−11 20.4	147 *k*	9.999126	− 1 8 8.72 *k*	− 11.20
41	Brisbane, Queensland	−27 28 0.0	+ 9 28.3	. . .	9.999691	−10 12 6.17	−100.55
42	Brussels(Uccle), Belgium	+50 47 55.5 *a*	−11 21.9	105 *a*	9.999131	− 0 17 26.05 *a*	− 2.86
43	Brussels, Belgium	+50 51 10.6 *c*	−11 21.7	. . .	9.999123	− 0 17 28.02 *c*	− 2.87
44	Budapest, Hungary	+47 29 34.7 *c*	−11 33.2	131 *c*	9.999217	− 1 16 15.3 *c*	− 12.53
45	Cambridge, England	+52 12 51.6	−11 14.3	28	9.999091	− 0 0 22.75	− 0.06
46	Cambridge, Mass	+42 22 47.6 *o*	−11 32.6	24	9.999340	+ 4 44 31.05 *o*	+ 46.74
47	Cape of Good Hope	−33 56 3.5 *p*	+10 43.6	13 *p*	9.999548	− 1 13 54.76 *p*	− 12.14

a Meridian circle.
b Standard barometer.
c Transit instrument.
d Transit instrument pier.
e Center of large dome.
f Center of dome tower.
g Center of dome.
h Transit pier.
i Cercle Syngros.
j Center of instrument house.
k Center of observatory.
l Floor of meridian room.
m Foot of pillar of 7-in. equatorial.
n Cube of equatorial.
o Dome of 15-in. equatorial.
p 8-in. meridian circle.

No.	Authority for— Latitude.	Longitude.	Description.
1	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Obs. Paris Acad. of Sci., Hendaye.
2	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., since 1884.
3	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., before 1884.
4	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., since 1893.
5	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., before 1893.
6	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	At Bouzaréah. Old Obs. 3'.8 S., 8s E.
7	*Publications* of Obs., 1909.	*Publications* of Obs., 1909.	[a] Obs. Western Univ. of Pa., since 1905.
8	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Western Univ. of Pa., before 1905.
9	Letter from Director, 1913.	Letter from Director, 1913.	Amherst College Obs., since 1903.
10	Letter from Director, 1913.	Letter from Director, 1913.	Lawrence Obs., before 1903.
11	*Publications* of Obs., 1915.	*Publications* of Obs., 1915.	Detroit Obs., Univ. of Mich.
12	See footnote ([b]).	See footnote ([b]).	Underwood Obs., Lawrence College.
13	*Pubbl. dell'Osserv.*, 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
14	*Harvard Annals*, 1903.	*Harvard Annals*, 1903.	Branch of Harvard Coll. Obs.
15	*Armagh Catalogue of Stars*, 1840.	*Armagh Catalogue of Stars*, 1840.	Armagh Observatory.
16	*Annales de l'Obs.*, 1910.	Letter from Director, 1913.	[c] National Observatory.
17	Letter from Director, 1913.	Letter from Director, 1913.	Johns Hopkins Univ. Obs.
18	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Remeis Observatory.
19	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Fabra Obs., Acad. of Sci. and Arts.
20	Letter from Director, 1897.	Letter from Director, 1897.	Smith Obs., Beloit College.
21	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Hamburg Obs., since 1909.
22	Letter from Director, 1897.	See footnote ([d]).	Students' Obs., Univ. of Cal.
23	See footnote ([e]).	See footnote ([e]).	University Obs., since 1913.
24	*Astron. Nach.*, Nr. 3545, 1898.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Obs., 1835 to 1913.
25	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., before 1835.
26	*Astron. Nach.*, Nr. 3170, 1893.	*Astron. Nach.*, Nr. 3170, 1893.	Urania Observatory.
27	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Treptow Observatory.
28	*Berliner Jahrbuch.*	*Astron. Nach.*, Nr. 3202, 1893.	Observatory, Cantonal Univ.
29	*Astron. Nach.*, Nr. 2805, 1887.	*Astron. Nach.*, Nr. 2805, 1887.	National Observatory.
30	British *Nautical Almanac.*	British *Nautical Almanac.*	Private Obs. of Earl of Rosse.
31	Letter from Director, 1913.	Letter from Director, 1913.	Kirkwood Obs., Univ. of Ind.
32	Letter from Director, 1913.	Letter from Director, 1913.	National Observatory.
33	Letter from Director, 1913.	Letter from Director, 1913.	Government Observatory.
34	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
35	Letter from Director, 1897.	*Annales de l'Obs.*, 1885.	Obs., Univ. of Bordeaux.
36	Letter from Director, 1909.	Letter from Director, 1909.	Boston Univ. Obs., since 1908.
37	Letter from Director, 1895.	Letter from Director, 1895.	Boston Univ. Obs., before 1908.
38	*Beob. zu Bothkamp*, 1872.	Letter from Director, 1913.	Obs. of Herr von Bülow.
39	*Astron. Nach.*, Nr. 15, 1822.	*Astron. Nach.*, Nr. 15, 1822.	Formerly Olber's Obs.
40	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
41	British *Nautical Almanac.*	[f] British *Nautical Almanac.*	Brisbane Observatory.
42	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., since 1891.
43	*Annales de l'Obs.*, 1857.	Letter from Director, 1913.	Royal Obs., before 1891.
44	*Astron. Nach.*, Nr. 2752, 1886.	*Astron. Nach.*, Nr. 2752, 1886.	University Observatory.
45	Letter from Director, 1879.	Letter from Director, 1879.	University Observatory.
46	*Harvard Annals*, 1887.	*U. S. C. and G. S. Report*, 1897.	Harvard College Obs.
47	*Cape Gen. Catalogue of Stars*, 1885.	*Monthly Notices, R. A. S.*, Nov. 1908.	Royal Observatory.

[a] Name of Western Univ. of Pa. changed in 1908; now the Univ. of Pittsburgh.
[b] *Professional Papers, Corps of Engineers, U. S. A.*, 1882.
[c] Old meridian circle 0".4 S., 0s.1 W. of Cercle Syngros.
[d] *Publications of the Astronomical Society of the Pacific*, No. 165, 1916.
[e] *Veröffentlichungen der Universitätssternwarte zu Berlin-Babelsberg, Band III, Heft I.*
[f] With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
48	Carloforte, Sardinia	+39 8 8.9 *a*	−11 20.7	18 *a*	9.999421	−0 33 14.9 *a*	− 5.46
49	Catania, Sicily	+37 30 13.2 *b*	−11 11.4	49 *b*	9.999464	−1 0 20.70 *b*	− 9.91
50	Charkow, Russia	+50 0 9.9 *c*	−11 25.5	138 *d*	9.999153	−2 24 55.75 *c*	−23.81
51	Charlottesville, Va.	+38 2 1.2 *e*	−11 14.6	259 *e*	9.999465	+5 14 5.33 *e*	+51.60
52	Chicago, Ill.	+41 50 1.0	−11 31.2	. . .	9.999352	+5 50 26.84	+57.57
53	Christiania, Norway	+59 54 44.0 *c*	−10 4.6	25 *c*	9.998908	−0 42 53.50 *c*	− 7.05
54	Cincinnati, Ohio	+39 8 19.8 *f*	−11 20.7	247 *f*	9.999437	+5 37 41.40 *f*	+55.48
55	Cincinnati, Ohio	+39 6 26.5	−11 20.5	. . .	9.999421	+5 37 59.00	+55.52
56	Cleveland, Ohio	+41 30 14.5 *g*	−11 30.2	215 *g*	9.999375	+5 26 25.86 *g*	+53.62
57	Clinton, N. Y.	+43 3 17.0	−11 33.9	276	9.999340	+5 1 37.45	+49.55
58	Coimbra, Portugal	+40 12 24.5	−11 25.6	99	9.999400	+0 33 43.1	+ 5.54
59	Columbia, Mo.	+38 56 51.7 *h*	−11 19.7	225 *i*	9.999440	+6 9 18.33 *h*	+60.67
60	Columbus, Ohio	+39 59 50.4 *h*	−11 24.7	233 *h*	9.999414	+5 32 2.60 *h*	+54.55
61	Copenhagen, Denmark	+55 41 12.6	−10 48.6	14	9.999005	−0 50 18.69 *j*	− 8.26
62	Cordova, Arg. Rep.	−31 25 15.5 *k*	+10 18.0	434 *k*	9.999634	+4 16 48.22 *k*	+42.19
63	Cracow, Austria	+50 3 52.0 *c*	−11 25.2	221 *c*	9.999157	−1 19 50.27 *c*	−13.12
64	Danzig, Prussia	+54 21 18.0	−10 59.6	3	9.999036	−1 14 39.6	−12.26
65	Dehra Dun, India	+30 18 51.8 *l*	−10 5.3	681 *l*	9.999676	−5 12 11.76 *l*	−51.29
66	Denver, Colo.	+39 40 36.4 *c*	−11 23.3	1644 *m*	9.999518	+6 59 47.72 *c*	+68.96
67	Des Moines, Iowa	+41 36 0	−11 30.5	296	9.999378	+6 14 30.56	+61.52
68	Dorpat (Jurjew), Russia	+58 22 47.2 *c*	−10 22.1	67 *c*	9.998945	−1 46 53.22 *c*	−17.56
69	Dresden, Saxony	+51 2 16.8	−11 20.8	121	9.999126	−0 54 54.74	− 9.02
70	Dublin, Ireland	+53 23 13.1 *c*	−11 6.7	86 *c*	9.999066	+0 25 21.1 *c*	+ 4.16
71	Dun Echt, Scotland	+57 9 36	−10 34.8	141	9.998979	+0 9 40.0	+ 1.59
72	Durham, England	+54 46 6.2 *b*	−10 56.4	107 *n*	9.999033	+0 6 19.75 *b*	+ 1.04
73	Dusseldorf, Prussia	+51 12 25.0 *o*	−11 19.9	46 *o*	9.999117	−0 27 2.69 *o*	− 4.44
74	Edinburgh, Scotland	+55 55 30.0 *c*	−10 46.5	134 *p*	9.999007	+0 12 44.22 *c*	+ 2.09
75	Edinburgh, Scotland	+55 57 23.2 *q*	−10 46.2	106 *r*	9.998995	+0 12 43.05 *q*	+ 2.09
76	Elmira, N. Y.	+42 6 25	−11 31.9	. . .	9.999345	+5 7 13.90	+50.47
77	Evanston, Ill.	+42 3 33.4	−11 31.8	175	9.999358	+5 50 42.3	+57.61
78	Flagstaff, Ariz.	+35 12 30.5	−10 54.7	2210	9.999667	+7 26 44.58	+73.39
79	Gaithersburg, Md.	+39 8 13.2 *a*	−11 20.7	165	9.999431	+5 8 47.73	+50.73
80	Geneva, N. Y.	+42 52 46.2	−11 33.6	152	9.999336	+5 8 1.00	+50.60
81	Geneva, Switzerland	+46 11 59.3 *c*	−11 35.2	407 *c*	9.999268	−0 24 36.61 *c*	− 4.04
82	Genoa, Italy	+44 25 9.3 *c*	−11 35.5	105	9.999293	−0 35 41.28 *c*	− 5.86
83	Georgetown, D. C.	+38 54 26.7 *f*	−11 19.5	47	9.999429	+5 8 18.26 *f*	+50.65
84	Glasgow, Mo.	+39 13 45.6	−11 21.1	227	9.999433	+6 11 18.08	+61.00
85	Glasgow, Scotland	+55 52 42.8 *c*	−10 46.9	55 *s*	9.999003	+0 17 10.55 *c*	+ 2.82
86	Gotha, Germany	+50 56 37.9 *o*	−11 21.2	322 *c*	9.999142	−0 42 50.51 *o*	− 7.04
87	Gotha, Germany	+50 56 4.4 *b*	−11 21.2	360 *b*	9.999145	−0 42 55.09 *b*	− 7.05
88	Göttingen, Prussia	+51 31 48.1 *t*	−11 18.2	161 *t*	9.999116	−0 39 46.22 *t*	− 6.53
89	Greencastle, Ind.	+39 38 46.6 *c*	−11 23.1	262 *c*	9.999425	+5 47 24.36 *c*	+57.07
90	Greenwich, England	+51 28 38.2 *c*	−11 18.5	49 *c*	9.999110	0 0 0.00 *c*	0.00
91	Hamburg, Germany	+53 33 6.0	−11 5.6	25	9.999057	−0 39 53.60 *c*	− 6.55
92	Hamburg, Germany	+53 32 51.3 *h*	−11 5.6	30 *h*	9.999058	−0 39 53.46 *h*	− 6.55
93	Hanover, N. H.	+43 42 15.3	−11 34.8	183	9.999317	+4 49 8.02	+47.50

a Zenith telescope.
b Transit instrument.
c Meridian circle.
d Barometer in meridian room.
e Center of large dome.
f Center of dome.
g Zenith telescope pier.
h Transit pier.
i Observatory bench mark.
j Center of observatory.
k Old meridian circle.
l Floor level of zenith sector pillar.
m Main floor.
n Barometer in transit room.
o Equatorial.
p Standard barometer.
q Point midway between transit instrument and mural circle.
r Floor of main building.
s Floor of meridian circle room.
t Position of meridian circle before 1888.

No.	Authority for— Latitude.	Longitude.	Description.
48	See footnote (*a*).	Letter from Director, 1913.	International Lat. Obs.
49	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs. of Catania and Etna.
50	*Annales de l'Obs.*, 1904.	*Annales de l'Obs.*, 1904.	University Observatory.
51	Letter from Director, 1913.	Letter from Director, 1913.	Leander McCormick Obs., Univ. Va.
52	U. S. Lake Survey, 1864.	Smithsonian *Report*, 1886.	*b* Dearborn Observatory.
53	*Astron. Nach.*, Nr. 3193, 1893.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
54	*Publications* of the Obs., 1908.	*Astronomical Journal*, 1897.	Cincinnati Obs., since 1873.
55	Letter from Director, 1897.	*Astronomical Journal*, 1854.	Cincinnati Obs., before 1873.
56	Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
57	*Astron. Nach.*, Nr. 2553, 1883.	*Astron. Nach.*, Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
58	*Eph. Astron. de Coimbra*, 1889.	*Eph. Astron. de Coimbra*, 1889.	University Observatory.
59	*Trans. Acad. of Sci. of St. Louis*, 1894.	*Trans. Acad. of Sci. of St. Louis*, 1894.	Laws Obs., Univ. of Mo.
60	Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
61	British *Nautical Almanac*.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
62	*Resultados del Obs.*, 1887.	*Resultados del Obs.*, 1887.	National Observatory.
63	Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
64	Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
65	*Great Trig. Survey of India*, 1906.	Letter from Supt. of Survey, 1913.	Haig Obs., Trig. Survey of India.
66	Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
67	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Drake Univ. Obs.
68	*Publikationen der Sternw.*, 1911.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
69	*Berliner Jahrbuch*.	*Berliner Jahrbuch*.	*c* Baron Engelhardt's Obs.
70	*Trans. Royal Dublin Soc.*, 1889.	*Trans. Royal Irish Acad.*, 1838.	Dunsink Obs., Trinity College.
71	Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	*d* Lord Crawford's Obs.
72	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
73	*Astron. Nach.*, Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
74	*Monthly Notices, R. A. S.*, 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
75	*Monthly Notices, R. A. S.*, 1836.	*Edinburgh Observations*, 1858.	*e* Royal Obs. before 1895; Calton Hill.
76	Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
77	Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
78	British *Nautical Almanac*.	British *Nautical Almanac*.	Lowell Observatory.
79	See footnote (*a*).	See footnote (*f*).	International Lat. Obs.
80	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Smith Observatory.
81	*Memoire* par J. Pidoux, 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Municipal Observatory.
82	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Hydrographic Institute.
83	See footnote (*g*).	See footnote (*g*).	Georgetown College Obs.
84	*Astron. Nach.*, Nr. 2625, 1884.	*Washington Observations*, 1877.	Morrison Observatory.
85	*First Glasgow Catalogue*, 1870.	*Monthly Notices, R. A. S.*, 1865.	University Observatory.
86	Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
87	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857.
88	*Astron. Nach.*, Nr. 4428, 1910.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
89	Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
90	*Greenwich Observations*, 1910.	*Greenwich Observations*, 1910.	*h* Royal Observatory.
91	Letter, Director new Obs., 1913.	*Astron. Nach.*, Nr. 3993, 1905.	*i* Hamburg Observatory before 1909.
92	Letter from Director, 1913.	Letter from Director, 1913.	*j* Imperial Marine Obs.
93	Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.

a *Resultate des Internationalen Breitendienstes*, 1900-1908.
b Transferred to Evanston, Ill., in 1887.
c Instruments transferred to Univ. of Kasan in 1897.
d Instruments transferred to Royal Obs. at Edinburgh in 1896.
e City Obs. since 1896.
f *Resultate des Internationalen Breitendienstes*, Band I, 1903.
g Based upon data from the U. S. C. and G. Survey.
h Point of reference before 1851, 7½ ft. N., 19 ft. W.
i At Bergedorf since 1909.
j Transit instrument before 1908, 0″.5 N., 0ˢ.04 W.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
94	Haverford, Pa. . . .	+40 0 40.1 *a*	−11 24.8	. . .	9.999398	+5 1 12.70 *a*	+49.48
95	Heidelberg, Baden . .	+49 23 55.2 *b*	−11 27.8	567 *b*	9.999198	−0 34 53.13 *b*	− 5.73
96	Heidelberg, Baden . .	+49 23 55.7 *c*	−11 27.8	570 *c*	9.999198	−0 34 52 96 *c*	− 5.73
97	Heidelberg, Baden . .	+49 24 34.3 *d*	−11 27.8	126 *d*	9.999168	−0 34 46.80 *d*	− 5.71
98	Helsingfors, Finland .	+60 9 42.3 *e*	−10 1.5	33 *e*	9.998903	−1 39 49.10 *e*	−16.40
99	Herény, Hungary . .	+47 15 47.4	−11 33.7	229	9.999229	−1 6 24.7	−10.91
100	Hong Kong, China . .	+22 18 13.2 *f*	− 8 7.4	33 *f*	9.999793	−7 36 41.86 *f*	−75.01
101	Iowa City, Iowa . . .	+41 40 0	−11 30.7	183	9.999369	+6 6 6	+60.14
102	Ithaca, N. Y.	+42 26 47.3 *g*	−11 32.6	256 *g*	9.999354	+5 5 55.99 *g*	+50.26
103	Ithaca, N. Y.	+42 26 51.4	−11 32.6	. . .	9.999337	+5 5 56.47	+50.26
104	Jamaica, West Indies .	+18 24 51 *h*	− 6 55.9	540 *h*	9.999892	+5 11 29.48 *h*	+51.17
105	Jena, Saxe-Weimar . .	+50 55 34.9 *i*	−11 21.3	165 *i*	9.999132	−0 46 20.22 *i*	− 7.61
106	Jena, Saxe-Weimar . .	+50 55 35.8	−11 21.3	155	9.999131	−0 46 20.31	− 7.61
107	Jena, Saxe-Weimar . .	+50 56 11.0	−11 21.3	174	9.999132	−0 46 20.73	− 7.61
108	Johannesburg, Transvaal	−26 10 54.6 *j*	+ 9 9.8	1804 *j*	9.999840	−1 52 18.0 *j*	−18.45
109	Kalocsa, Hungary . .	+46 31 41.7 *h*	−11 34.8	117 *k*	9.999240	−1 15 54.12 *h*	−12.47
110	Kasan, Russia . . .	+55 50 20.0 *e*	−10 47.3	98 *e*	9.999007	−3 15 15.61 *e*	−32.08
111	Kasan, Russia . . .	+55 47 23.9 *l*	−10 47.7	79 *l*	9.999007	−3 16 29.00 *l*	−32.28
112	Kew, England . . .	+51 28 6	−11 18.5	10	9.999108	+0 1 15.1	+ 0.21
113	Kief, Russia	+50 27 10.0 *m*	−11 23.5	179 *e*	9.999145	−2 2 0.56 *e*	−20.04
114	Kiel, Prussia	+54 20 27.6 *e*	−10 59.7	52 *e*	9.999040	−0 40 35.45 *e*	− 6.67
115	Kis-Kartal, Hungary .	+47 41 54.8	−11 32.8	. . .	9.999202	−1 18 11.7	−12.85
116	Konigsberg, Prussia .	+54 42 50.5 *e*	−10 56.8	24 *e*	9.999029	−1 21 58.97 *e*	−13.47
117	Kremsmunster, Austria	+48 3 23.1 *e*	−11 32.0	384 *e*	9.999220	−0 56 31.58 *e*	− 9.29
118	La Plata, Arg. Rep. .	−34 54 31.8 *n*	+10 52.2	18 *n*	9.999525	+3 51 44.8 *n*	+38.07
119	Leiden, Netherlands .	+52 9 19.8 *e*	−11 14.6	6 *e*	9.999090	−0 17 56.15 *e*	− 2.95
120	Leipzig, Saxony . . .	+51 20 5.9 *o*	−11 19.2	119 *o*	9.999118	−0 49 33.92 *o*	− 8.14
121	Leipzig, Saxony . . .	+51 20 20.1	−11 19.2	. . .	9.999110	−0 49 29.92	− 8.13
122	Liege, Belgium . . .	+50 37 6	−11 22.8	127	9.999137	−0 22 15.44	− 3.66
123	Lisbon(Tapada), Portugal	+38 42 30.5 *p*	−11 18.5	95 *p*	9.999437	+0 36 44.68 *p*	+ 6.04
124	Liverpool, England . .	+53 24 4.8	−11 6.6	61	9.999064	+0 12 17.33	+ 2.02
125	Liverpool, England . .	+53 24 47.8	−11 6.5	. . .	9.999059	+0 12 0.11	+ 1.97
126	Lund, Sweden . . .	+55 41 51.6 *o*	−10 48.5	38	9.999006	−0 52 44.97 *o*	− 8.67
127	Lund, Sweden . . .	+55 52 12.0	−10 47.0	. . .	9.999000	−0 52 47.50	− 8.67
128	Lussinpiccolo, Austria .	+44 32 11.0	−11 35.5	42	9.999286	−0 57 52.41	− 9.51
129	Lyons, France . . .	+45 41 41.0	−11 35.5	299	9.999274	−0 19 8.52 *q*	− 3.14
130	Madison, Wis. . . .	+43 4 36.8 *e*	−11 33.9	292 *r*	9.999340	+5 57 37.90 *e*	+58.75
131	Madras, India . . .	+13 4 8.0 *e*	− 5 5.5	7	9.999926	−5 20 59.14	−52.73
132	Madrid, Spain . . .	+40 24 30.0 *s*	−11 26.4	655 *s*	9.999433	+0 14 45.09 *s*	+ 2.42
133	Manila, P. I.	+14 34 41	− 5 38.2	3	9.999908	−8 3 54.2	−79.48
134	Mare Island, Cal. . .	+38 5 55.8 *t*	−11 15.0	18 *t*	9.999447	+8 9 5.63 *t*	+80.35
135	Markree, Ireland . .	+54 10 31.8	−11 1.0	45	9.999044	+0 33 48.4	+ 5.55
136	Marseilles, France . .	+43 18 19 *e*	−11 34.3	75 *u*	9.999320	−0 21 34.55 *e*	− 3.54
137	Marseilles, France . .	+43 17 52	−11 34.3	27	9.999317	−0 21 28.1	− 3.53
138	Mauritius (Port Louis) .	−20 5 39	+ 7 27.7	54	9.999832	−3 50 12.6	−37.82
139	Melbourne, Victoria .	−37 49 53.2 *v*	+11 13.4	28 *w*	9.999454	−9 39 53.92 *v*	−95.26

a Zenith telescope.
b Repsold meridian circle.
c Bruce telescope.
d Equatorial.
e Meridian circle.
f Transit instrument.
g Top of east pier in transit room.
h Transit instrument pier.
i Bamberg equatorial.
j International latitude hut.
k Seven-inch equatorial.
l Center of great dome.
m Photographic equatorial, 41 feet south of prime vertical transit.
n Gautier meridian circle.
o Center of observatory.
p Center of dome.
q Pier of small meridian circle.
r Main floor.
s Center of rotunda.
t East transit instrument.
u Barometer.
v Old meridian circle.
w Floor of meridian room.

No.	Authority for— Latitude.	Longitude.	Description.
94	*Proc. Amer. Ph. Soc.*, 1883.	*Proc. Amer. Ph. Soc.*, 1883.	Haverford College Obs.
95	Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
96	*Publik. des Obs., Königstuhl*, 1902.	*Publik. des Obs., Königstuhl*, 1902.	Astrophys. Inst., Königstuhl Obs.
97	*Publik. des Obs., Königstuhl*, 1902.	*Publik. des Obs., Königstuhl*, 1902.	[a] Dr. Wolf's Obs. before 1898.
98	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
99	*Astron. Nach.*, Nr. 2633, 1884.	British *Nautical Almanac*.	Astrophysical Observatory.
100	*Hong Kong Observations*, 1897.	Letter from Director, 1897.	Colonial Observatory.
101	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Obs., Univ. of Iowa.
102	Letter from the Dean, 1913.	Letter from the Dean, 1913.	[b] Fuertes Obs., Cornell Univ.
103	Letter from the Dean, 1913.	Letter from the Dean, 1913.	[c] Fuertes Obs., Cornell Univ.
104	*Memoirs, R. A. S.*, 1879.	See footnote ([d]).	Mr. Hall's Obs., Montego Bay.
105	Letter from Director, 1913.	Letter from Director, 1913.	Univ. Obs., since 1888.
106	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Univ. Obs., before 1888.
107	*V. J. S. Astron. Gesell.*, 1910.	*V. J. S. Astron. Gesell.*, 1910.	The late Dr. Winkler's Obs.
108	Transvaal Obs. *Circular*, 1910.	Transvaal Obs. *Circular*, 1910.	Union Obs., formerly Transvaal Obs.
109	Letter from Director, 1913.	Letter from Director, 1913.	Archiepiscopal Haynald Obs.
110	Letter from Director, 1913.	Publications of the Obs., 1911.	Englehardt Obs., Univ. of Kasan.
111	Publications of the Obs., 1911.	Letter from Director, 1913.	University Observatory.
112	Letter from Director, 1897.	Letter from Director, 1897.	Meteorological Obs., London.
113	*Annales de l'Obs.*, Vol. IV, 1893.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
114	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	[e] Royal University Obs.
115	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Near Aszód, Hungary.
116	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
117	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Benedictines.
118	Letter from Director, 1913.	Letter from Director, 1913.	National Univ. Obs.
119	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
120	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Obs., since 1861.
121	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1861.
122	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	University Obs., Cointe.
123	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Lisbon.
124	*Monthly Notices, R. A. S.*, 1894.	*Monthly Notices, R. A. S.*, 1894.	Bidston, Birkenhead, since 1867.
125	British *Nautical Almanac*, 1872.	British *Nautical Almanac*, 1872.	Liverpool Obs., before 1867.
126	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Univ. Obs., since 1867.
127	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Royal Univ. Obs., before 1867.
128	Letter from Director, 1897.	Letter from Director, 1897.	Manora Observatory.
129	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of the Univ., St. Ganis Laval.
130	*Publications* of the Obs., 1892.	Letter from Director, 1912.	Washburn Obs., Univ. of Wis.
131	*Great Trig. Survey of India*, 1906.	*Great Trig. Survey of India*, 1901.	Obs. founded by East India Co.
132	*Annuario del Obs.*, 1912.	*Astron. Nach.*, Nr. 3993, 1905.	Astron. and Meteorolog. Obs.
133	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Meteorological Observatory.
134	Letter from Director, 1913.	*Lick Obs. Bulletin*, 1908.	Chronom. and Time Sta., Navy Yd.
135	*Astron. Nach.*, Nr. 758, 1851.	British *Nautical Almanac*, 1901.	Col. Cooper's Observatory.
136	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	See footnote ([f]).
137	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	See footnote ([g]).
138	Mag. and Meteor. *Results*, 1908.	Mag. and Meteor. *Results*, 1908.	Royal Alfred Obs.
139	*Astron. Results*, 1881–84.	[h] *Astron. Results*, 1881–84.	[i] Government Observatory.

[a] Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1898.
[b] Since 1902.
[c] Before 1902.
[d] *British Report on Transit of Venus*, 1882.
[e] Old position of meridian circle, 0″.9 N., 0ˢ.12 E.
[f] National Obs., Univ. of Aix-Marseilles, since 1864–66.
[g] National Obs., at Accoules, before 1864–66.
[h] With the new values of the longitudes of Adelaide and Sydney.
[i] Transferred from Williamstown in 1861.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
140	Meudon, France	+48 48 18	−11 29.8	162	9.999185	−0 8 55.6	− 1.47
141	Middletown, Conn.	+41 33 16.0	−11 30.4	. . .	9.999359	+4 50 37.18	+47.74
142	Milan, Italy	+45 27 59.3	−11 35.6	120	9.999268	−0 36 45.88 *a*	− 6.04
143	Minneapolis, Minn.	+44 58 40.0 *b*	−11 35.7	260 *b*	9.999290	+6 12 57.04 *b*	+61.27
144	Mizusawa, Japan	+39 8 3.6 *c*	−11 20.7	62	9.999424	−9 24 30.75	−92.74
145	Modena, Italy	+44 38 51.4	−11 35.6	64	9.999285	−0 43 43.40	− 7.18
146	Montevideo, Uruguay	−34 54 33	+10 52.2	24	9.999525	+3 44 51.4	+36.94
147	Montreal, Canada	+45 30 20 *d*	−11 35.6	57 *d*	9.999262	+4 54 18.63 *d*	+48.35
148	Moscow (Presnia), Russia	+55 45 19.5	−10 48.0	150 *e*	9.999012	−2 30 17.03 *e*	−24.69
149	Mount Hamilton, Cal.	+37 20 25.6 *b*	−11 10.4	1284 *b*	9.999552	+8 6 34.89 *b*	+79.93
150	Mount Wilson, Cal.	+34 12 59.5 *f*	−10 46.2	1799 *f*	9.999663	+7 52 14.33 *f*	+77.58
151	Mount Wilson, Cal.	+34 12 55	−10 46.1	1727 *g*	9.999658	+7 52 14.3	+77.58
152	Munich, Bavaria	+48 8 45.5 *h*	−11 31.7	529 *h*	9.999227	−0 46 26.02 *h*	− 7.63
153	Naples, Italy	+40 51 46.3	−11 28.1	164	9.999388	−0 57 1.70 *i*	− 9.37
154	Nashville, Tenn.	+36 8 54.4 *b*	−11 2.0	172 *j*	9.999505	+5 47 12.2	+57.04
155	Neuchâtel, Switzerland	+46 59 50.6	−11 34.1	488	9.999254	−0 27 49.90 *e*	− 4.57
156	New Brunswick, N. J.	+40 30 1.4 *b*	−11 26.7	21 *b*	9.999387	+4 57 47.45 *b*	+48.92
157	New Haven, Conn.	+41 19 22.3	−11 29.6	40	9.999368	+4 51 40.58	+47.92
158	New Haven, Conn.	+41 18 36.5	−11 29.6	. . .	9.999365	+4 51 42.16	+47.92
159	New York, N. Y.	+40 48 34.6	−11 27.9	25	9.999380	+4 55 50	+48.60
160	New York, N. Y.	+40 45 23.1	−11 27.7	. . .	9.999379	+4 55 53.64	+48.61
161	Nice, France	+43 43 16.9 *k*	−11 34.9	378	9.999330	−0 29 12.15 *k*	− 4.80
162	Nikolaieff, Russia	+46 58 22.1	−11 34.2	55	9.999225	−2 7 53.78 *i*	−21.01
163	North Abington, Mass.	+42 7 43.8 *l*	−11 31.9	43 *l*	9.999348	+4 43 45.56 *l*	+46.61
164	Northampton, Mass.	+42 19 1.9 *b*	−11 32.4	70 *b*	9.999345	+4 50 33.10 *b*	+47.73
165	Northfield, Minn.	+44 27 41.6 *m*	−11 35.5	290 *m*	9.999305	+6 12 35.92 *m*	+61.21
166	Oakland, Cal.	+37 48 5 *e*	−11 13.2	11 *e*	9.999454	+8 9 6.55 *e*	+80.35
167	Odessa, Russia	+46 28 37.5	−11 34.9	. . .	9.999234	−2 3 2.18 *b*	−20.21
168	Odessa, Russia	+46 28 36.7 *e*	−11 34.9	55 *e*	9.999237	−2 3 2.04 *e*	−20.21
169	O-Gyalla, Hungary	+47 52 27.3	−11 32.4	113	9.999206	−1 12 45.49	−11.95
170	Omaha, Nebr.	+41 16 5.6 *b*	−11 29.5	344 *b*	9.999390	+6 23 46.96 *b*	+63.05
171	Orono, Me.	+44 54 0	−11 35.6	38	9.999277	+4 34 40.3	+45.12
172	Ottawa, Canada	+45 23 39.1 *e*	−11 35.6	85 *n*	9.999267	+5 2 51.98 *e*	+49.75
173	Oxford, Miss.	+34 22 12.6	−10 47.5	. . .	9.999536	+5 58 7.18	+58.83
174	Oxford, England	+51 45 35.6 *e*	−11 16.9	65 *o*	9.999104	+0 5 2.6	+ 0.83
175	Oxford, England	+51 45 34.2	−11 16.9	64	9.999104	+0 5 0.40	+ 0.82
176	Padua, Italy	+45 24 1.0 *p*	−11 35.6	31 *q*	9.999263	−0 47 29.13 *p*	− 7.80
177	Palermo, Sicily	+38 6 44.0 *r*	−11 15.1	76 *e*	9.999451	−0 53 25.87	− 8.78
178	Paris, France	+48 50 11.2 *s*	−11 29.8	67 *t*	9.999178	−0 9 20.93 *u*	− 1.53
179	Perth, West Australia	−31 57 8.9 *e*	+10 23.8	60	9.999597	−7 43 21.51 *e*	−76.12
180	Philadelphia, Pa.	+39 58 2.1 *v*	−11 24.6	74 *v*	9.999404	+5 1 6.81 *v*	+49.46
181	Pola, Austria	+44 51 48.6 *e*	−11 35.6	32 *e*	9.999277	−0 55 23.07 *e*	− 9.10
182	Potsdam, Prussia	+52 22 56.0 *w*	−11 13.3	97 *w*	9.999091	−0 52 15.86 *w*	− 8.59
183	Poughkeepsie, N. Y.	+41 41 18	−11 30.8	61	9.999360	+4 55 33.6 *b*	+48.55
184	Prague, Bohemia	+50 5 16.0 *v*	−11 25.1	197 *v*	9.999155	−0 57 40.28 *v*	− 9.47
185	Princeton, N. J.	+40 20 55.8	−11 26.1	75	9.999395	+4 58 39.44	+49.06
186	Princeton, N. J	+40 20 57.8 *e*	−11 26.1	65 *e*	9.999394	+4 58 37.61 *e*	+49.06

a Center of great dome.
b Transit instrument.
c Zenith telescope.
d East transit pier.
e Meridian circle.
f Snow telescope pier.
g Floor.
h West dome.
i Center of observatory.
j Bench mark on obs. steps.
k Small meridian circle.
l Base of pillar of 5-in. equatorial.
m Meridian circle pier.
n Bench mark in east wall.
o Barometer basin.
p Axis of tower.
q Barometer.
r Center of south dome.
s South facade of observatory.
t Level of obs. terrace.
u Cassini's Meridian.
v Center of dome.
w Center of middle dome.

No.	Authority for— Latitude.	Longitude.	Description.
140	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Seine-et-Oise, near Paris.
141	Letter from Director, 1894.	Letter from Director, 1894.	Wesleyan University Obs.
142	*Pubbl. del R. Osserv.*, 1914.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory, Brera.
143	Letter from Director, 1915.	Letter from Director, 1915.	Obs. Univ. of Minn.
144	See footnote (*a*).	*Les Obs. Astron.*, Bruxelles, 1907.	International Lat. Obs.
145	Letter from Director, 1913.	Letter from Director, 1913.	Royal Univ. Geophysical Obs.
146	Letter from Director, 1919.	Letter from Director, 1919.	Meteorolog. Inst., Central Obs.
147	Letter from Director, 1912.	*U. S. C. and G. S. Report*, 1897.	McGill University Obs.
148	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Imperial Univ.
149	*Publications* of the Obs., 1900.	*U. S. C. and G. S. Report*, 1897.	Lick Obs., Univ. of Cal.
150	*Astrophysical Journal*, 1906.	*Astrophysical Journal*, 1906.	Solar Obs., Carnegie Inst.
151	Letter from C. G. Abbot, 1912.	Letter from C. G. Abbot, 1912.	Branch of Smithson. Astrophys. Obs.
152	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
153	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3202, 1893.	Royal Obs., Capo di Monte.
154	Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
155	Swiss Triangulation, 1890.	*Astron. Nach.*, Nr. 3202, 1893.	Cantonal Observatory.
156	Letter from Director, 1913.	Letter from Director, 1913.	Schanck Obs., Rutgers College.
157	Letter from Director, 1893.	See footnote (*b*).	Yale Univ. Obs., since 1882.
158	Letter, Director new Obs., 1893.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
159	*Contributions from the Obs.*, 1906.	*Contributions from the Obs.*, 1906.	Columbia Univ. Obs., since 1897.
160	Letter from Director, 1879.	British *Nautical Almanac*.	Columbia Univ. Obs., before 1897.
161	*Annales de l'Obs.*, Tome II, 1887.	*Astron. Nach.*, Nr. 3993, 1905.	Mt. Gros, near Nice.
162	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3202, 1893.	Naval Observatory.
163	Letter from Director, 1917.	Letter from Director, 1917.	Mr. Burbeck's Observatory.
164	Letter from Director, 1913.	Harvard *Annals*, 1893.	Smith College Obs.
165	Letter from Director, 1912.	*Publications* of Obs., 1901.	[c] Goodsell Obs., Carleton College.
166	Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
167	Pulkowa *Mitteilungen*, No. 56, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Branch of Pulkowa Obs.
168	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
169	Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
170	Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
171	Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
172	Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Observatory.
173	Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Obs. Univ. of Mississippi.
174	*Radcliffe Catalogue of Stars*, 1900.	*Radcliffe Observations*, 1842.	Radcliffe Observatory.
175	*Oxford Astron. Observations*, 1878.	*Oxford Astron. Observations*, 1878	University Observatory.
176	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
177	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Royal Observatory.
178	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Observatory of Paris.
179	*Meridian Observations*, Vol. 2, 1908.	[d] *Meridian Observations*, Vol. 2, 1908.	Government Observatory.
180	Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
181	Letter from Director, 1913.	Letter from Director, 1913.	See footnote (*e*).
182	*Veroff. K. Preuss. Geol. Inst.*, 1905.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Astrophysical Obs.
183	Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Vassar College Obs.
184	Prague *Observations*, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial and Royal Obs.
185	Letter from Director, 1913.	Letter from Director, 1913.	Halsted Obs., Princeton Univ.
186	Letter from Director, 1913.	*Washington Observations*, 1878.	Obs. of Instruction, Princeton Univ.

[a] *Resultate des Internationalen Breitendienstes*, 1900–1908.
[b] Based upon data from the U. S. C. and G. Survey.
[c] Old Observatory, 1877–1886, 415 feet W.
[d] With the new value of the longitude of Sydney.
[e] Observatory of Imperial and Royal Hydrographic Office.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
187	Providence, R. I. . .	+41 50 21	−11 31.2	64	9.999356	+ 4 45 35.95	+46.92
188	Providence, R. I. . .	+41 49 46.4	−11 31.2	. . .	9.999352	+ 4 45 37.64	+46.92
189	Pulkowa, Russia . . .	+59 46 18.7 *a*	−10 6.2	75 *b*	9.998914	− 2 1 18.57 *a*	−19.93
190	Quebec, Canada . . .	+46 47 59.2	−11 34.4	90	9.999231	+ 4 44 52.71 *c*	+46.80
191	Quito, Ecuador . . .	− 0 14 0	+ 0 5.6	2908	0.000198	+ 5 14 6.66	+51.60
192	Riga, Russia	+56 57 9.3	−10 36.9	. . .	9.998974	− 1 36 28.10 *d*	−15.85
193	Rio de Janeiro, Brazil .	−22 54 23.8 *e*	+ 8 17.7	62 *e*	9.999784	+ 2 52 41.4 *e*	+28.37
194	Rochester, N. Y. . .	+43 10 36.7 *n*	−11 34.1	150 *n*	9.999328	+ 5 10 29.64 *n*	+51.01
195	Rome, Italy	+41 53 53.6 *f*	−11 31.3	51 *g*	9.999354	− 0 49 55.12 *f*	− 8.20
196	Rome, Italy	+41 53 33.6 *f*	−11 31.3	65 *b*	9.999355	− 0 49 56.34 *f*	− 8.20
197	Rome, Italy	+41 54 12.4 *f*	−11 31.4	100 *f*	9.999357	− 0 49 48.02 *f*	− 8.18
198	Rome, Italy	+41 54 16.7	−11 31.4	75 *g*	9.999355	− 0 49 49.28 *f*	− 8.18
199	San Fernando, Spain .	+36 27 42.0 *h*	−11 4.3	30 *h*	9.999488	+ 0 24 49.32 *h*	+ 4.08
200	San Fernando, Spain .	+36 31 7	−11 4.7	. . .	9.999485	+ 0 25 10.82	+ 4.14
201	San Francisco, Cal. . .	+37 47 27.9	−11 13.2	. . .	9.999454	+ 8 9 42.86 *i*	+80.45
202	San Luis, Arg. Rep. .	−33 17 45.7	+10 37.6	800	9.999616	+ 4 25 22	+43.60
203	Santiago, Chile . . .	−33 26 42 *f*	+10 39.0	520 *f*	9.999594	+ 4 42 46.0 *f*	+46.45
204	Santiago, Chile . . .	−33 26 25	+10 38.9	619	9.999600	+ 4 42 36.5	+46.42
205	Santiago, Chile . . .	−33 33 46 *c*	+10 40.1	580 *c*	9.999595	+ 4 42 46 *c*	+46.45
206	South Bethlehem, Pa. .	+40 36 23.2 *e*	−11 27.2	110	9.999391	+ 5 1 31.96 *e*	+49.53
207	South Hadley, Mass. .	+42 15 18.2 *c*	−11 32.2	76 *c*	9.999346	+ 4 50 20.40 *c*	+47.70
208	Springfield, Ill. . . .	+39 48 58.6 *c*	−11 23.9	187 *c*	9.999416	+ 5 58 34.20 *c*	+58.90
209	St. Louis, Mo. . . .	+38 38 3.0	−11 18.1	. . .	9.999432	+ 6 0 49.26	+59.27
210	St. Petersburg, Russia .	+59 56 32.0	−10 4.2	4	9.998906	− 2 1 11.4	−19.91
211	Stockholm, Sweden .	+59 20 32.7 *f*	−10 11.3	44 *f*	9.998922	− 1 12 13.97 *f*	−11.87
212	Stonyhurst, England .	+53 50 40	−11 3.4	117 *f*	9.999056	+ 0 9 52.68	+ 1.62
213	Strassburg, Alsace . .	+48 35 0.3 *f*	−11 30.5	144 *f*	9.999190	− 0 31 4.52 *f*	− 5.11
214	Swarthmore, Pa. . .	+39 54 23.3	−11 24.3	. . .	9.999401	+ 5 1 24.89	+49.52
215	Sydney, N. S. W. . .	−33 51 41.1	+10 42.9	44	9.999552	−10 4 49.31	−99.36
216	Syracuse, N. Y. . . .	+43 2 13.1	−11 33.9	160	9.999332	+ 5 4 33.36	+50.03
217	Syracuse, N. Y. . . .	+43 0 48.8 *j*	−11 33.8	137 *k*	9.999332	+ 5 4 34.31 *j*	+50.03
218	Tacubaya, Mexico . .	+19 24 17.9 *f*	− 7 14.8	2285 *f*	9.999995	+ 6 36 46.67 *f*	+65.18
219	Tashkent, Turkestan .	+41 19 31.3	−11 29.6	457	9.999396	− 4 37 10.80	−45.53
220	Taunton, Mass. . . .	+41 54 0	−11 31.3	8	9.999351	+ 4 44 20	+46.71
221	Teramo, Italy . . .	+42 39 27 *l*	−11 33.1	398	9.999358	− 0 54 56	− 9.02
222	Tokyo, Japan	+35 39 17.0 *f*	−10 58.3	25	9.999507	− 9 18 58.22 *r*	−91.82
223	Toronto, Canada . . .	+43 39 46.0 *m*	−11 34.8	110 *n*	9.999313	+ 5 17 34.70 *n*	+52.17
224	Toronto, Canada . . .	+43 40 0.8 *n*	−11 34.8	116 *n*	9.999313	+ 5 17 35.60 *n*	+52.17
225	Toulouse, France . .	+43 36 44.0	−11 34.7	194	9.999320	− 0 5 51.23	− 0.96
226	Triest, Austria . . .	+45 38 35.5 *j*	−11 35.5	68 *o*	9.999260	− 0 55 5.23 *j*	− 9.05
227	Triest, Austria . . .	+45 38 45.4 *p*	−11 35.5	26 *o*	9.999257	− 0 55 3.0	− 9.04
228	Tschardjui, Turkestan .	+39 8 11.0 *l*	−11 20.7	188 *l*	9.999433	− 4 14 17.2 *l*	−41.77
229	Tschardjui, Turkestan .	+39 8 10.7 *l*	−11 20.7	167	9.999431	− 4 13 57.3	−41.72
230	Tulse Hill, England .	+51 26 47	−11 18.6	48	9.999111	+ 0 0 27.7	+ 0.08
231	Turin, Italy	+45 2 16.3 *q*	−11 35.7	616 *q*	9.999313	− 0 31 5.96 *q*	− 5.11
232	Turin, Italy	+45 4 8.3 *f*	−11 35.7	276 *o*	9.999288	− 0 30 47.15 *f*	− 5.06
233	Tuscaloosa, Ala. . . .	+33 12 36.8 *f*	−10 36.7	69	9.999568	+ 5 50 11.74 *f*	+57.53

a Center of observatory.
b Main floor.
c Transit instrument.
d Tower of school.
e Center of dome.
f Meridian circle.
g Barometer.
h Center of building, ground floor.
i West transit pier.
j Equatorial pier.
k Intersection of equatorial axes.
l Zenith telescope.
m Main dome.
n Transit pier.
o Barometer cistern.
p Stone pier in terrace wall.
q Prime vertical instrument.
r Great transit instrument.

No.	Authority for— Latitude.	Longitude.	Description.
187	Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
188	*Astron. Nach.*, Nr. 2254, 1879.	*Astron. Nach.*, Nr. 2254, 1879.	Mr. Seagrave's Observatory.
189	*Description de l'Obs.*, 1845.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. Central Nicolas.
190	Letter from Director, 1912.	Letter from Director, 1912.	Quebec Obs., Plains of Abraham.
191	Letter from Director, 1897.	Letter from Director, 1897.	National Observatory.
192	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Polytechnic School Obs.
193	See footnote (*a*).	See footnote (*a*).	National Observatory.
194	U. S. C. and G. Survey.	U. S. C. and G. Survey.	Obs., Bausch & Lomb Optical Co.
195	*Memorie del R. Osserv.*, 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
196	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
197	Letter from Director, 1913.	Letter from Director, 1913.	Vatican Obs., since 1906–7.
198	*Pubbl. della Specola Vaticana*, 1905.	*Astron. Nach.*, Nr. 3993, 1905.	*b* Vatican Obs., before 1906–7.
199	*Annales del Obs.*, 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
200	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	*c* Naval Obs., before 1797.
201	Letter from Director, 1897.	*U. S. C. and G. S. Report*, 1897.	Davidson Observatory.
202	Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
203	Letter from Director, 1913.	Letter from Director, 1913.	*d* National Obs., since 1862.
204	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	*e* National Obs., before 1862.
205	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., Espejo.
206	Letter from Director, 1913.	*Washington Observations*, 1875.	Sayre Obs., Lehigh Univ.
207	*Amer. Jour. of Sci.*, 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
208	Letter from Director, 1916.	Letter from Director, 1916.	Obs. of Illinois Watch Co.
209	Letter from Director, 1897.	*U. S. C. and G. S. Report*, 1897.	*f* Washington University Obs.
210	*Astron. Nach.*, Nr. 2582, 1884.	*Astron. Nach.*, Nr. 2582, 1884.	Imperial University Obs.
211	Letter from Director, 1914.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of Acad. of Sci.
212	Letter from Director, 1913.	*Monthly Notices, R. A. S.*, 1851.	Stonyhurst College Obs.
213	*Annalen* der Sternw., 1896.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
214	Letter from Director, 1912.	Letter from Director, 1912.	Sproul Obs., Swarthmore College.
215	*Astron. Results*, 1879–81.	See footnote (*g*).	Government Observatory.
216	Letter from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
217	Letter from Director, 1914.	Letter from Director, 1914.	Roe Observatory.
218	*Boletin del Obs.*, 1914.	*Annuario del Obs.*, 1902.	National Observatory.
219	Letter from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
220	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
221	*Pubbl. dell'Osserv.*, 1900.	Letter from Director, 1913.	Collurania Observatory.
222	*Annales de l'Obs.*, 1894.	*Annales de l'Obs.*, 1894.	University Observatory.
223	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
224	Letter from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
225	*Annales de l'Obs.*, 1912.	British *Nautical Almanac*.	University Observatory.
226	Letter from Director, 1913.	Letter from Director, 1913.	*h* Imperial and Royal Maritime Obs.
227	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	*i* Imperial and Royal Maritime Obs.
228	*Astron. Nach.*, Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
229	See footnote (*j*).	See footnote (*k*).	International Lat. Obs., before 1909.
230	British *Nautical Almanac*.	British *Nautical Almanac*.	Obs. of Sir W. Huggins, London.
231	Letter from Director, 1915.	Letter from Director, 1915.	*l* Royal Obs. of the Univ., since 1913.
232	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	*m* Royal Obs. of the Univ., before 1913.
233	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.

a Green and Davis, *Telegraphic Determinations of Longitudes on the East Coast of South America*, 1880.
b In the Gregorian tower.
c In Cadiz.
d In Quinta Normal.
e On the hill Santa Lucia, in Santiago.
f Old observatory 0ʰ.125 E.
g Letter from Government Astronomer at Adelaide, 1913.
h Since 1898.
i Before 1898.
j *Resultate des Internationalen Breitendienstes*, 1900–1908.
k *Resultate des Internationalen Breitendienstes*, Band I, 1903.
l At Pino Torinese.
m At Palazzo Madama.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
234	Ukiah, Cal.	+39 8 12.1 *a*	−11 20.7	220 *a*	9.999435	+ 8 12 50.3 *a*	+ 80.96
235	Upsala, Sweden	+59 51 29.4 *b*	−10 5.2	21 *b*	9.998909	− 1 10 30.12 *b*	− 11.58
236	Urbana, Ill.	+40 6 20.2 *c*	−11 25.2	236 *c*	9.999412	+ 5 52 53.90 *c*	+ 57.97
237	Utrecht, Netherlands	+52 5 9.7 *d*	−11 15.0	12 *d*	9.999093	− 0 20 31.0 *d*	− 3.37
238	Utrecht, Netherlands	+52 5 13	−11 15.0	23	9.999093	− 0 20 28.9	− 3.36
239	Venice, Italy	+45 26 10.5 *e*	−11 35.6	15 *e*	9.999261	− 0 49 22.12 *e*	− 8.11
240	Victoria, B. C.	+48 31 15.7 *m*	−11 30.7	. . .	9.999182	+ 8 13 40.17 *m*	+ 81.10
241	Vienna, Austria	+48 13 55.1 *f*	−11 31.5	240 *g*	9.999205	− 1 5 21.35 *f*	− 10.74
242	Vienna, Austria	+48 12 35.5	−11 31.6	186 *g*	9.999202	− 1 5 31.61	− 10.76
243	Vienna, Austria	+48 12 53.8	−11 31.6	214	9.999204	− 1 5 25.17	− 10.75
244	Vienna, Austria	+48 12 46.7 *e*	−11 31.6	285	9.999209	− 1 5 10.96	− 10.71
245	Warsaw, Russia	+52 13 4.6 *e*	−11 14.3	121 *e*	9.999097	− 1 24 7.25 *e*	− 13.82
246	Washington, D. C.	+38 55 14.0 *h*	−11 19.6	82 *i*	9.999431	+ 5 8 15.78 *h*	+ 50.64
247	Washington, D. C.	+38 53 38.7 *j*	−11 19.4	31 *k*	9.999428	+ 5 8 12.15 *j*	+ 50.63
248	Washington, D. C.	+38 53 17.3 *l*	−11 19.4	10 *l*	9.999427	+ 5 8 6.24 *l*	+ 50.61
249	Washington, D. C.	+38 56 14.8 *m*	−11 19.7	. . .	9.999425	+ 5 8 0.0 *m*	+ 50.60
250	Wellesley, Mass.	+42 17 34.8	−11 32.3	61	9.999344	+ 4 45 12.7	+ 46.85
251	Wellington, N. Z.	−41 17 3.8 *b*	+11 29.5	127 *b*	9.999375	−11 39 4.27 *b*	−114.84
252	West Point, N. Y.	+41 23 22.1	−11 29.9	170	9.999375	+ 4 55 50.55	+ 48.60
253	Wilhelmshaven, Germany	+53 31 52.1 *e*	−11 5.7	9 *e*	9.999057	− 0 32 35.06 *e*	− 5.35
254	Williams Bay, Wis.	+42 34 12.6 *n*	−11 33.0	320 *n*	9.999355	+ 5 54 13.24 *n*	+ 58.19
255	Williamstown, Mass.	+42 42 30	−11 33.2	213	9.999344	+ 4 52 50	+ 48.10
256	Winchester, Mass.	+42 27 11	−11 32.7	30	9.999338	+ 4 44 32.4	+ 46.74
257	Windsor, N. S. W.	−33 36 30.8 *b*	+10 40.6	16 *k*	9.999556	−10 3 19.9	− 99.11
258	Zô-Sè, China	+31 5 48.0 *e*	−10 14.4	100 *e*	9.999619	− 8 4 44.82 *e*	− 79.63
259	Zurich, Switzerland	+47 22 38.3 *e*	−11 33.5	469 *e*	9.999243	− 0 34 12.26 *e*	− 5.62

a Zenith telescope.
b Transit instrument.
c 12-inch equatorial.
d Altazimuth pier.
e Meridian circle.
f Central dome.
g Barometer cistern.
h Center of the clock room.
i Ground floor of main building.
j Small dome.
k Barometer.
l Siderostat pier.
m Center of dome.
n 40-inch equatorial.

No.	Authority for— Latitude.	Longitude.	Description.
234	See footnote (*a*).	Letter from Director, 1912.	International Lat. Obs.
235	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
236	Letter from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
237	Letter from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
238	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
239	Letter from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
240	Letter from Director, 1917.	Letter from Director, 1917.	Dominion Astrophysical Obs.
241	See footnote (*b*).	*Astron. Nach.*, Nr. 3993, 1905.	*c* Imperial and Royal Univ. Obs.
242	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	*d* Imperial and Royal Univ. Obs.
243	*Berliner Jahrbuch.*	*Berliner Jahrbuch.*	Oppolzer Obs., Josephstadt.
244	*Publik. der Sternw.*, 1892.	*Astron. Nach.*, Nr. 3993, 1905.	Kuffner Obs., Ottakring.
245	*Astron. Nach.*, Nr. 4666, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
246	*U. S. Naval Obs. Publications*, 1900.	*U. S. C. and G. S. Report*, 1897.	U. S. N. Obs., Georgetown Heights.
247	See footnote (*e*).	*U. S. C. and G. S. Report*, 1897.	U. S. Naval Obs., 1842–1893.
248	Letter from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
249	*Astronomical Journal*, 1897.	*Astronomical Journal*, 1897.	Catholic Univ. Obs., Brookland.
250	Letter from Director, 1912.	*Les Obs. Astron.*, Bruxelles, 1907.	Whitin Obs., Wellesley College.
251	See footnote (*f*).	See footnote (*f*).	Hector Observatory.
252	Letter from Director, 1891.	Letter from Director, 1891.	*g* U. S. Military Academy.
253	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Naval Obs.
254	*Astrophysical Journal*, 1901.	*Astrophysical Journal*, 1901.	Yerkes Obs., Univ. of Chicago.
255	Letter from Director, 1893.	Letter from Director, 1893.	*Field Memorial Obs., Williams Coll.*
256	Letter from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
257	*Monthly Notices, R.A.S.*, 1884.	*h Monthly Notices, R. A. S.*, 1888.	Mr. John Tebbutt's Obs.
258	*Annales de l'Obs.*, 1907.	*Annales de l'Obs.*, 1907.	Obs. of the Jesuits near Shanghai.
259	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

a *Resultate des Internationalen Breitendienstes*, 1900–1908.
b *Astron. Arbeiten des K. K. Gradmessungs-Bureau*, 1896.
c Since 1879.
d Before 1879.
e *Washington Observations* for 1892, Appendix I, pp XXI and XXXII.
f *Transactions of the New Zealand Institute*, Vol. XLVII, 1914.
g Old observatory 9″ N., 1ˢ.2 E.
h And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

Tables of lunar distances are no longer given in the Ephemeris, in accordance with the decision of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, February 28, 1923, at 10 P. M., Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$
Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

α	$4^h\ 31^m\ 30^s.5$	M	29° 35′ 23″
α'	$8^h\ 42^m\ 15^s.0$	δ	+16° 21′ 11″
$\alpha - \alpha'$	$19^h\ 49^m\ 15^s.5$	$M - \delta$	13° 14′ 12″
$\alpha - \alpha'$	297° 18′ 52″	sin δ'	9.401658
δ'	+ 14° 36′ 17″	cos $(M - \delta)$	9.988306
		cosec M	0.306461
tan δ'	9.415922		
sec $(\alpha - \alpha')$	0.338307	cos D	9.696425
tan M	9.754229	D	60° 11′ 35″

EXAMPLE 2.

Find the lunar distance of Jupiter, March 8, 1923, at noon, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$
Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$

Sin N and sin $\frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

α	$15^h\ 7^m\ 19^s.1$	tan $\frac{1}{2} (\alpha - \alpha')$	$9.043745\,n$
α'	$15^h\ 57^m\ 48^s.5$	cos $\frac{1}{2} (\delta + \delta')$	9.983230
$\alpha - \alpha'$	$23^h\ 9^m\ 30^s.6$	cosec $\frac{1}{2} (\delta - \delta')$	$2.130022\,n$
$\alpha - \alpha'$	347° 22′ 39″	tan N	1.156997
δ	− 16° 14′ 42″	N	86° 0′ 54″
δ'	− 15° 23′ 44″		
$\delta + \delta'$	− 31° 38′ 26″	sin $\frac{1}{2} (\alpha - \alpha')$	9.041105
$\delta - \delta'$	− 0° 50′ 58″	cos $\frac{1}{2} (\delta + \delta')$	9.983230
		cosec N	0.001051
$\frac{1}{2} (\alpha - \alpha')$	173° 41′ 20″	sin $\frac{1}{2}$ D	9.025386
$\frac{1}{2} (\delta + \delta')$	− 15° 49′ 13″	$\frac{1}{2}$ D	6° 5′ 9″
$\frac{1}{2} (\delta - \delta')$	− 0° 25′ 29″	D	12° 10′ 18″

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the apparent right ascension and declination of Polaris for the time of observation.

Subtract the apparent right ascension from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the apparent declination of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For altitudes other than 45°, corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—August 5, 1923, at $10^h\ 40^m\ 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be 33° 20′ 0″, required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reduction from Table III for $10^h\ 40^m\ 30^s$		+ 1	45
Greenwich sidereal time of mean noon, August 5, page 10	8	52	3
Reduction from Table III for longitude ($=3^h\ 56^m$ west, or plus)		+ 0	39
Sum (having regard to signs) is equal to local sidereal time	19	34	57
R. A. of Polaris (page 281) for time of observation	1	34	15
Remainder is equal to hour-angle of Polaris	18	0	42
Decl. of Polaris (page 281) for time of observation, 88° 53′ 21″			
	°	′	″
True altitude	+33	20	0
Correction from Table I		+ 0	27
Correction from Table Ia			−13
Latitude of the place	+33	20	14

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

Decl. / H.A.	88° 53′ 20″		88° 53′ 30″		88° 53′ 40″		88° 53′ 50″		88° 54′ 0″		88° 54′ 10″		Decl. / H.A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
0 0	−66 40	0	−66 30	0	−66 20	0	−66 10	0	−66 0	0	−65 50	0	24 0
3	66 40	1	66 30	1	66 20	1	66 10	1	66 0	1	65 50	1	23 57
6	66 39	2	66 29	2	66 19	2	66 9	2	65 59	2	65 49	2	54
9	66 37	3	66 27	3	66 17	3	66 7	3	65 57	3	65 47	3	51
12	66 34	3	66 24	3	66 14	3	66 4	3	65 54	3	65 44	3	48
0 15	−66 31	4	−66 21	4	−66 11	4	−66 1	4	−65 51	4	−65 41	3	23 45
18	66 27	4	66 17	4	66 7	4	65 57	4	65 47	4	65 38	5	42
21	66 23	5	66 13	5	66 3	4	65 53	5	65 43	5	65 33	5	39
24	66 18	6	66 8	6	65 58	5	65 48	5	65 38	6	65 28	6	36
27	66 12	7	66 2	7	65 52	6	65 42	7	65 32	7	65 22	6	33
0 30	−66 5	7	−65 55	7	−65 45	7	−65 35	7	−65 25	7	−65 16	8	23 30
33	65 58	8	65 48	8	65 38	8	65 28	8	65 18	8	65 8	8	27
36	65 50	9	65 40	9	65 30	9	65 20	9	65 10	8	65 0	8	24
39	65 41	9	65 31	9	65 21	9	65 11	9	65 2	10	64 52	9	21
42	65 32	10	65 22	10	65 12	9	65 2	10	64 52	10	64 43	10	18
0 45	−65 22	11	−65 12	11	−65 2	11	−64 52	10	−64 42	10	−64 33	11	23 15
48	65 11	11	65 1	11	64 51	11	64 42	12	64 32	11	64 22	11	12
51	65 0	13	64 50	12	64 40	12	64 30	12	64 21	12	64 11	12	9
54	64 47	12	64 38	13	64 28	13	64 18	12	64 9	13	63 59	13	6
0 57	64 35	14	64 25	14	64 15	13	64 6	14	63 56	13	63 46	13	3
1 0	−64 21	14	−64 11	14	−64 2	14	−63 52	14	−63 43	14	−63 33	14	23 0
3	64 7	15	63 57	14	63 48	15	63 38	15	63 29	15	63 19	15	22 57
6	63 52	15	63 43	16	63 33	15	63 23	15	63 14	15	63 4	15	54
9	63 37	16	63 27	16	63 18	16	63 8	16	62 59	16	62 49	16	51
1 12	−63 21		−63 11		−63 2		−62 52		−62 43		−62 33		22 48

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Decl. / H.A.	88° 53′ 20″		88° 53′ 30″		88° 53′ 40″		88° 53′ 50″		88° 54′ 0″		88° 54′ 10″		Decl. / H.A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
1 12	−63 21	17	−63 11	17	−63 2	17	−62 52	17	−62 43	17	−62 33	17	22 48
15	63 4	18	62 54	17	62 45	17	62 35	17	62 26	17	62 16	17	45
18	62 46	18	62 37	18	62 28	18	62 18	18	62 9	18	61 59	18	42
21	62 28	19	62 19	19	62 10	19	62 0	19	61 51	19	61 41	18	39
24	62 9	19	62 0	19	61 51	20	61 41	19	61 32	19	61 23	19	36
1 27	−61 50	20	−61 41	20	−61 31	20	−61 22	20	−61 13	20	−61 4	20	22 33
30	61 30	21	61 21	21	61 11	20	61 2	20	60 53	21	60 44	21	30
33	61 9	21	61 0	21	60 51	21	60 42	21	60 32	21	60 23	21	27
36	60 48	22	60 39	22	60 30	22	60 21	22	60 11	21	60 2	21	24
39	60 26	23	60 17	23	60 8	23	59 59	23	59 50	23	59 41	23	21
1 42	−60 3	23	−59 54	23	−59 45	23	−59 36	23	−59 27	23	−59 18	23	22 18
45	59 40	24	59 31	24	59 22	24	59 13	24	59 4	23	58 55	23	15
48	59 16	24	59 7	24	58 58	24	58 49	24	58 41	25	58 32	24	12
51	58 52	25	58 43	25	58 34	25	58 25	25	58 16	24	58 8	25	9
54	58 27	26	58 18	26	58 9	26	58 0	25	57 52	26	57 43	26	6
1 57	−58 1	26	−57 52	26	−57 43	26	−57 35	26	−57 26	26	−57 17	26	22 3
2 0	57 35	27	57 26	27	57 17	27	57 9	27	57 0	27	56 51	26	22 0
3	57 8	28	56 59	27	56 50	27	56 42	27	56 33	27	56 25	27	21 57
6	56 40	28	56 32	28	56 23	28	56 15	28	56 6	28	55 58	28	54
9	56 12	29	56 4	29	55 55	28	55 47	29	55 38	28	55 30	28	51
2 12	−55 43	29	−55 35	29	−55 27	29	−55 18	29	−55 10	29	−55 2	29	21 48
15	55 14	30	55 6	30	54 58	30	54 49	29	54 41	30	54 33	30	45
18	54 44	30	54 36	30	54 28	30	54 20	30	54 11	30	54 3	30	42
21	54 14	31	54 6	31	53 58	31	53 50	30	53 41	30	53 33	30	39
24	53 43	32	53 35	32	53 27	32	53 19	31	53 11	31	53 3	31	36
2 27	−53 11	32	−53 3	32	−52 55	32	−52 48	32	−52 40	32	−52 32	32	21 33
30	52 39	32	52 31	32	52 23	32	52 16	33	52 8	33	52 0	32	30
33	52 7	34	51 59	33	51 51	33	51 43	33	51 35	32	51 28	33	27
36	51 33	33	51 26	34	51 18	34	51 10	33	51 3	34	50 55	33	24
39	51 0	35	50 52	34	50 44	34	50 37	34	50 29	34	50 22	34	21
2 42	−50 25	34	−50 18	35	−50 10	34	−50 3	35	−49 55	34	−49 48	34	21 18
45	49 51	36	49 43	35	49 36	35	49 28	35	49 21	35	49 14	35	15
48	49 15	35	49 8	36	49 1	36	48 53	35	48 46	35	48 39	36	12
51	48 40	37	48 32	36	48 25	36	48 18	36	48 11	36	48 3	36	9
54	48 3	37	47 56	37	47 49	37	47 42	37	47 35	37	47 27	36	6
2 57	−47 26	37	−47 19	37	−47 12	37	−47 5	37	−46 58	37	−46 51	37	21 3
3 0	46 49	38	46 42	38	46 35	37	46 28	37	46 21	37	46 14	37	21 0
3	46 11	38	46 4	38	45 58	38	45 51	38	45 44	38	45 37	38	20 57
6	45 33	39	45 26	38	45 20	39	45 13	38	45 6	38	44 59	38	54
9	44 54	39	44 48	39	44 41	39	44 34	39	44 28	39	44 21	39	51
3 12	−44 15	39	−44 9	40	−44 2	39	−43 55	39	−43 49	39	−43 42	39	20 48
15	43 36	40	43 29	40	43 23	40	43 16	40	43 10	40	43 3	39	45
18	42 56	41	42 49	40	42 43	41	42 36	40	42 30	40	42 24	40	42
21	42 15	41	42 9	41	42 2	40	41 56	41	41 50	41	41 44	41	39
24	41 34	41	41 28	41	41 22	41	41 15	41	41 9	41	41 3	41	36
3 27	−40 53	42	−40 47	42	−40 41	42	−40 34	41	−40 28	41	−40 22	41	20 33
30	40 11	42	40 5	42	39 59	42	39 53	42	39 47	42	39 41	42	30
33	39 29	43	39 23	43	39 17	43	39 11	42	39 5	42	38 59	42	27
36	38 46	43	38 40	43	38 34	43	38 29	43	38 23	42	38 17	42	24
39	38 3	43	37 57	43	37 51	43	37 46	43	37 40	43	37 35	43	21
3 42	−37 20	44	−37 14	44	−37 8	43	−37 3	44	−36 57	43	−36 52	43	20 18
45	36 36	44	36 30	44	36 25	44	36 19	44	36 14	44	36 9	44	15
48	35 52	44	35 46	44	35 41	44	35 35	44	35 30	44	35 25	44	12
51	35 7	45	35 2	44	34 57	45	34 51	44	34 46	44	34 41	44	9
54	34 22	45	34 17	45	34 12	45	34 7	45	34 2	45	33 57	45	6
3 57	−33 37	46	−33 32	46	−33 27	46	−33 22	45	−33 17	45	−33 12	45	20 3
4 0	32 51	46	32 46	46	32 41	45	32 37	46	32 32	46	32 27	46	20 0
3	32 5	46	32 0	46	31 56	46	31 51	46	31 46	46	31 41	45	19 57
6	31 19	47	31 14	46	31 10	47	31 5	46	31 0	46	30 56	46	54
4 9	−30 32		−30 28		−30 23		−30 19		−30 14		−30 10		19 51

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

H.A. \ Decl.	88° 53′ 20″	88° 53′ 30″	88° 53′ 40″	88° 53′ 50″	88° 54′ 0″	88° 54′ 10″	Decl. \ H.A.
h m	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	h m
4 9	−30 32 47	−30 28 47	−30 23 46	−30 19 47	−30 14 46	−30 10 47	19 51
12	29 45 47	29 41 47	29 37 47	29 32 47	29 28 47	29 23 46	48
15	28 58 47	28 54 48	28 50 48	28 45 47	28 41 47	28 37 47	45
18	28 11 48	28 6 47	28 2 47	27 58 47	27 54 47	27 50 47	42
21	27 23 48	27 19 48	27 15 48	27 11 48	27 7 48	27 3 48	39
4 24	−26 35 49	−26 31 48	−26 27 48	−26 23 48	−26 19 48	−26 15 48	19 36
27	25 46 48	25 43 49	25 39 48	25 35 48	25 31 48	25 27 48	33
30	24 58 49	24 54 49	24 51 49	24 47 49	24 43 48	24 39 48	30
33	24 9 49	24 5 49	24 2 49	23 58 48	23 55 48	23 51 48	27
36	23 20 49	23 16 49	23 13 49	23 10 49	23 6 49	23 3 49	24
4 39	−22 31 50	−22 27 49	−22 24 49	−22 21 50	−22 17 49	−22 14 49	19 21
42	21 41 50	21 38 50	21 35 50	21 31 49	21 28 49	21 25 49	18
45	20 51 50	20 48 50	20 45 50	20 42 50	20 39 49	20 36 49	15
48	20 1 50	19 58 50	19 55 50	19 52 50	19 50 50	19 47 50	12
51	19 11 50	19 8 50	19 5 50	19 2 50	19 0 50	18 57 50	9
4 54	−18 21 51	−18 18 51	−18 15 50	−18 12 50	−18 10 50	−18 7 50	19 6
4 57	17 30 51	17 27 50	17 25 50	17 22 50	17 20 50	17 17 50	3
5 0	16 39 51	16 37 51	16 35 51	16 32 51	16 30 51	16 27 50	19 0
3	15 48 51	15 46 51	15 44 51	15 41 50	15 39 50	15 37 51	18 57
6	14 57 51	14 55 51	14 53 51	14 51 51	14 49 51	14 46 50	54
5 9	−14 6 51	−14 4 51	−14 2 51	−14 0 51	−13 58 51	−13 56 51	18 51
12	13 15 52	13 13 52	13 11 51	13 9 51	13 7 51	13 5 51	48
15	12 23 51	12 21 51	12 20 52	12 18 51	12 16 51	12 14 51	45
18	11 32 52	11 30 52	11 28 52	11 27 52	11 25 51	11 23 51	42
21	10 40 52	10 38 51	10 37 52	10 35 51	10 34 52	10 32 51	39
5 24	− 9 48 52	− 9 47 52	− 9 45 51	− 9 44 52	− 9 42 51	− 9 41 51	18 36
27	8 56 52	8 55 52	8 54 52	8 52 51	8 51 51	8 50 52	33
30	8 4 52	8 3 52	8 2 52	8 1 52	8 0 52	7 58 51	30
33	7 12 52	7 11 52	7 10 52	7 9 52	7 8 52	7 7 51	27
36	6 20 52	6 19 52	6 18 52	6 17 52	6 16 51	6 16 52	24
5 39	− 5 28 53	− 5 27 52	− 5 26 52	− 5 25 52	− 5 25 52	− 5 24 52	18 21
42	4 35 52	4 35 52	4 34 52	4 33 51	4 33 52	4 32 51	18
45	3 43 52	3 43 53	3 42 52	3 42 52	3 41 52	3 41 52	15
48	2 51 53	2 50 52	2 50 52	2 50 52	2 49 51	2 49 52	12
51	1 58 52	1 58 52	1 58 52	1 58 52	1 58 52	1 57 51	9
5 54	− 1 6 52	− 1 6 52	− 1 6 52	− 1 6 52	− 1 6 52	− 1 6 52	18 6
5 57	− 0 14 53	− 0 14 53	− 0 14 52	− 0 14 52	− 0 14 52	− 0 14 52	3
6 0	+ 0 39 52	+ 0 39 52	+ 0 38 53	+ 0 38 52	+ 0 38 52	+ 0 38 52	18 0
3	1 31 53	1 31 52	1 31 52	1 30 52	1 30 52	1 30 52	17 57
6	2 24 52	2 23 52	2 23 52	2 22 52	2 22 51	2 21 52	54
6 9	+ 3 16 52	+ 3 15 52	+ 3 15 52	+ 3 14 52	+ 3 13 52	+ 3 13 51	17 51
12	4 8 52	4 7 52	4 7 52	4 6 52	4 5 52	4 4 52	48
15	5 0 52	4 59 52	4 59 51	4 58 52	4 57 52	4 56 52	45
18	5 52 53	5 51 52	5 50 52	5 49 51	5 49 52	5 48 51	42
21	6 45 52	6 43 52	6 42 52	6 41 52	6 40 51	6 39 51	39
6 24	+ 7 37 51	+ 7 35 52	+ 7 34 52	+ 7 33 51	+ 7 32 51	+ 7 30 52	17 36
27	8 28 52	8 27 52	8 26 51	8 24 52	8 23 51	8 22 51	33
30	9 20 52	9 19 51	9 17 52	9 16 51	9 14 52	9 13 51	30
33	10 12 52	10 10 52	10 9 51	10 7 51	10 6 51	10 4 51	27
36	11 4 51	11 2 51	11 0 51	10 58 51	10 57 51	10 55 51	24
6 39	+11 55 52	+11 53 52	+11 51 52	+11 49 51	+11 48 51	+11 46 51	17 21
42	12 47 51	12 45 51	12 43 51	12 40 51	12 39 50	12 37 50	18
45	13 38 51	13 36 51	13 34 51	13 31 51	13 29 51	13 27 51	15
48	14 29 51	14 27 50	14 25 50	14 22 51	14 20 50	14 18 50	12
51	15 20 51	15 17 51	15 15 51	15 13 50	15 10 50	15 8 50	9
6 54	+16 11 50	+16 8 50	+16 6 50	+16 3 50	+16 0 51	+15 58 50	17 6
6 57	17 1 51	16 58 51	16 56 50	16 53 50	16 51 50	16 48 50	3
7 0	17 52 50	17 49 50	17 46 50	17 43 50	17 41 50	17 38 50	17 0
3	18 42 50	18 39 50	18 36 50	18 33 50	18 30 50	18 27 49	16 57
7 6	+19 32 50	+19 29	+19 26	+19 23	+19 20	+19 17 50	16 54

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Decl. / H.A.	88° 53′ 20″		88° 53′ 30″		88° 53′ 40″		88° 53′ 50″		88° 54′ 0″		88° 54′ 10″		Decl. / H.A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
7 6	+19 32	50	+19 29	50	+19 26	50	+19 23	49	+19 20	49	+19 17	49	16 54
9	20 22	49	20 19	49	20 16	49	20 12	49	20 9	49	20 6	49	51
12	21 11	50	21 8	49	21 5	49	21 1	49	20 58	49	20 55	49	48
15	22 1	49	21 57	49	21 54	49	21 50	49	21 47	49	21 44	48	45
18	22 50	49	22 46	49	22 43	49	22 39	49	22 36	48	22 32	49	42
7 21	+23 39	49	+23 35	49	+23 32	48	+23 28	48	+23 24	48	+23 21	48	16 39
24	24 28	48	24 24	48	24 20	48	24 16	48	24 12	48	24 9	48	36
27	25 16	48	25 12	48	25 8	48	25 4	48	25 0	48	24 57	47	33
30	26 4	48	26 0	48	25 56	48	25 52	48	25 48	47	25 44	47	30
33	26 52	48	26 48	47	26 44	47	26 40	47	26 35	47	26 31	47	27
7 36	+27 40	47	+27 35	47	+27 31	47	+27 27	47	+27 22	47	+27 18	47	16 24
39	28 27	47	28 22	47	28 18	47	28 14	46	28 9	47	28 5	47	21
42	29 14	47	29 9	47	29 5	46	29 0	47	28 56	46	28 52	46	18
45	30 1	46	29 56	46	29 51	46	29 47	46	29 42	46	29 38	46	15
48	30 47	46	30 42	46	30 37	46	30 33	46	30 28	46	30 24	45	12
7 51	+31 33	46	+31 28	46	+31 23	46	+31 19	45	+31 14	45	+31 9	45	16 9
54	32 19	45	32 14	45	32 9	45	32 4	45	31 59	45	31 54	45	6
7 57	33 4	45	32 59	45	32 54	45	32 49	45	32 44	45	32 39	45	3
8 0	33 49	45	33 44	45	33 39	45	33 34	44	33 29	44	33 24	44	16 0
3	34 34	44	34 29	44	34 24	44	34 18	44	34 13	44	34 8	44	15 57
8 6	+35 18	44	+35 13	44	+35 8	43	+35 2	44	+34 57	44	+34 52	43	15 54
9	36 2	44	35 57	43	35 51	44	35 46	43	35 41	43	35 35	43	51
12	36 46	43	36 40	43	36 35	43	36 29	43	36 24	43	36 18	43	48
15	37 29	43	37 23	43	37 18	43	37 12	43	37 7	42	37 1	42	45
18	38 12	43	38 6	43	38 1	42	37 55	42	37 49	42	37 43	42	42
8 21	+38 55	42	+38 49	42	+38 43	42	+38 37	42	+38 31	42	+38 25	42	15 39
24	39 37	41	39 31	41	39 25	41	39 19	41	39 13	41	39 7	41	36
27	40 18	42	40 12	41	40 6	41	40 0	41	39 54	41	39 48	41	33
30	41 0	41	40 53	41	40 47	41	40 41	41	40 35	41	40 29	40	30
33	41 41	40	41 34	40	41 28	40	41 22	40	41 15	40	41 9	40	27
8 36	+42 21	40	+42 14	40	+42 8	40	+42 2	39	+41 55	40	+41 49	39	15 24
39	43 1	39	42 54	40	42 48	39	42 41	40	42 35	39	42 28	39	21
42	43 40	39	43 34	39	43 27	39	43 21	39	43 14	39	43 7	39	18
45	44 19	39	44 13	38	44 6	39	44 0	38	43 53	38	43 46	38	15
48	44 58	38	44 51	38	44 45	38	44 38	38	44 31	38	44 24	38	12
8 51	+45 36	38	+45 29	38	+45 23	37	+45 16	37	+45 9	37	+45 2	37	15 9
54	46 14	37	46 7	37	46 0	37	45 53	37	45 46	37	45 39	37	6
8 57	46 51	37	46 44	37	46 37	37	46 30	36	46 23	36	46 16	36	3
9 0	47 28	36	47 21	36	47 14	36	47 6	36	46 59	36	46 52	36	15 0
3	48 4	36	47 57	36	47 50	35	47 42	36	47 35	36	47 28	35	14 57
9 6	+48 40	35	+48 33	35	+48 25	35	+48 18	35	+48 11	35	+48 3	35	14 54
9	49 15	35	49 8	35	49 0	35	48 53	34	48 46	34	48 38	34	51
12	49 50	34	49 43	34	49 35	34	49 27	34	49 20	34	49 12	34	48
15	50 24	34	50 17	34	50 9	34	50 1	34	49 54	33	49 46	34	45
18	50 58	33	50 51	33	50 43	33	50 35	33	50 27	33	50 20	33	42
9 21	+51 31	33	+51 24	32	+51 16	32	+51 8	33	+51 0	33	+50 53	32	14 39
24	52 4	32	51 56	32	51 48	32	51 41	32	51 33	32	51 25	32	36
27	52 36	32	52 28	32	52 20	32	52 13	32	52 5	31	51 57	31	33
30	53 8	31	53 0	31	52 52	31	52 44	31	52 36	31	52 28	31	30
33	53 39	31	53 31	30	53 23	30	53 15	30	53 7	30	52 59	31	27
9 36	+54 10	30	+54 1	30	+53 53	30	+53 45	30	+53 37	30	+53 29	30	14 24
39	54 40	29	54 31	30	54 23	29	54 15	29	54 7	29	53 59	29	21
42	55 9	29	55 1	29	54 52	29	54 44	29	54 36	29	54 28	28	18
45	55 38	28	55 30	29	55 21	28	55 13	28	55 5	28	54 56	28	15
48	56 6	28	55 58	28	55 49	28	55 41	28	55 33	27	55 24	27	12
9 51	+56 34	27	+56 26	27	+56 17	27	+56 9	27	+56 0	27	+55 51	27	14 9
54	57 1	27	56 53	26	56 44	27	56 36	26	56 27	26	56 18	27	6
9 57	57 28	26	57 19	26	57 11	26	57 2	26	56 53	26	56 45	25	3
10 0	57 54	25	57 45	26	57 37	26	57 28	25	57 19	25	57 10	25	14 0
10 3	+58 19		+58 11		+58 2		+57 53		+57 44		+57 35		13 57

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Decl. / H.A.	88° 53′ 20″		88° 53′ 30″		88° 53′ 40″		88° 53′ 50″		88° 54′ 0″		88° 54′ 10″		Decl. / H.A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
10 3	+58 19	25	+58 11	25	+58 2	25	+57 53	25	+57 44	25	+57 35	25	13 57
6	58 44	24	58 36	24	58 27	24	58 18	24	58 9	24	58 0	24	54
9	59 8	24	59 0	23	58 51	23	58 42	23	58 33	23	58 24	23	51
12	59 32	23	59 23	23	59 14	23	59 5	23	58 56	23	58 47	23	48
15	59 55	23	59 46	22	59 37	22	59 28	22	59 19	22	59 10	22	45
10 18	+60 18	22	+60 8	22	+59 59	22	+59 50	22	+59 41	22	+59 32	22	13 42
21	60 40	21	60 30	21	60 21	21	60 12	21	60 3	21	59 54	21	39
24	61 1	20	60 51	21	60 42	21	60 33	21	60 24	20	60 15	20	36
27	61 21	20	61 12	20	61 3	20	60 54	20	60 44	20	60 35	20	33
30	61 41	20	61 32	19	61 23	19	61 14	19	61 4	19	60 55	19	30
10 33	+62 1	18	+61 51	19	+61 42	19	+61 33	18	+61 23	19	+61 14	19	13 27
36	62 19	18	62 10	18	62 1	18	61 51	18	61 42	18	61 33	18	24
39	62 37	18	62 28	17	62 19	17	62 9	18	62 0	17	61 51	17	21
42	62 55	17	62 45	17	62 36	17	62 27	16	62 17	17	62 8	16	18
45	63 12	16	63 2	16	62 53	16	62 43	16	62 34	16	62 24	16	15
10 48	+63 28	15	+63 18	16	+63 9	15	+62 59	16	+62 50	15	+62 40	16	13 12
51	63 43	15	63 34	15	63 24	15	63 15	15	63 5	15	62 56	14	9
54	63 58	15	63 49	14	63 39	14	63 30	14	63 20	14	63 10	14	6
10 57	64 13	13	64 3	14	63 53	14	63 44	13	63 34	14	63 24	14	3
11 0	64 26	13	64 17	13	64 7	13	63 57	13	63 48	13	63 38	13	13 0
11 3	+64 39	13	+64 30	12	+64 20	12	+64 10	12	+64 1	12	+63 51	12	12 57
6	64 52	11	64 42	12	64 32	12	64 22	12	64 13	11	64 3	11	54
9	65 3	11	64 54	11	64 44	11	64 34	11	64 24	11	64 14	11	51
12	65 14	11	65 5	10	64 55	10	64 45	10	64 35	10	64 25	11	48
15	65 25	9	65 15	9	65 5	10	64 55	10	64 45	10	64 36	9	45
11 18	+65 34	9	+65 24	9	+65 15	9	+65 5	9	+64 55	9	+64 45	9	12 42
21	65 43	9	65 33	9	65 24	8	65 14	8	65 4	8	64 54	8	39
24	65 52	7	65 42	8	65 32	8	65 22	8	65 12	8	65 2	8	36
27	65 59	7	65 50	7	65 40	7	65 30	7	65 20	7	65 10	7	33
30	66 6	7	65 57	6	65 47	6	65 37	6	65 27	6	65 17	6	30
11 33	+66 13	6	+66 3	6	+65 53	6	+65 43	6	+65 33	6	+65 23	6	12 27
36	66 19	5	66 9	5	65 59	5	65 49	5	65 39	5	65 29	5	24
39	66 24	4	66 14	4	66 4	4	65 54	4	65 44	4	65 34	4	21
42	66 28	4	66 18	4	66 8	4	65 58	4	65 48	4	65 38	4	18
45	66 32	3	66 22	3	66 12	3	66 2	3	65 52	3	65 42	3	15
11 48	+66 35	2	+66 25	2	+66 15	2	+66 5	2	+65 55	2	+65 45	2	12 12
51	66 37	2	66 27	2	66 17	2	66 7	2	65 57	2	65 47	2	9
54	66 39	1	66 29	1	66 19	1	66 9	1	65 59	1	65 49	1	6
11 57	66 40	0	66 30	0	66 20	0	66 10	0	66 0	0	65 50	0	3
12 0	+66 40		+66 30		+66 20		+66 10		+66 0		+65 50		12 0

TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken from the following table may be applied when the desired degree of accuracy requires it.

Altitude. / H.A.	10°	20°	30°	40°	50°	60°	70°	Altitude. / H.A.
h h	″	″	″	″	″	″	″	h h
0 12	0	0	0	0	0	0	0	12 24
1 11	− 2	− 2	− 1	0	0	+ 2	+ 4	13 23
2 10	− 8	6	4	−2	+2	7	17	14 22
3 9	16	12	8	3	4	14	34	15 21
4 8	24	18	12	5	6	21	50	16 20
5 7	30	23	15	6	7	26	63	17 19
6 6	−32	−24	−16	−6	+7	+28	+67	18 18

152737°—1923——44

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0h	1h	2h	3h	4h	5h	6h	7h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32 438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4 587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14 908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15 072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33 545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16h	17h	18h	19h	20h	21h	22h	23h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12 649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52 239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45 340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h	17h	18h	19h	20h	21h	22h	23h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A. \ Lat.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 3.0	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.5	23 50
20	0 5.9	0 6.0	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.8	0 6.9	40
0 30	0 8.8	0 9.0	0 9.3	0 9.4	0 9.6	0 9.7	0 9.9	0 10.1	0 10.3	23 30
40	0 11.7	0 12.0	0 12.3	0 12.5	0 12.7	0 12.9	0 13.2	0 13.4	0 13.8	20
50	0 14.6	0 14.9	0 15.4	0 15.6	0 15.8	0 16.1	0 16.4	0 16.8	0 17.1	10
1 0	0 17.5	0 17.9	0 18.4	0 18.7	0 19.0	0 19.3	0 19.6	0 20.0	0 20.5	23 0
10	0 20.3	0 20.8	0 21.4	0 21.7	0 22.0	0 22.4	0 22.8	0 23.3	0 23.8	22 50
20	0 23.1	0 23.6	0 24.5	0 24.7	0 25.0	0 25.5	0 26.0	0 26.5	0 27.1	40
1 30	0 25.9	0 26.4	0 27.3	0 27.6	0 28.0	0 28.5	0 29.0	0 29.6	0 30.3	22 30
40	0 28.6	0 29.2	0 30.0	0 30.5	0 30.9	0 31.5	0 32.1	0 32.7	0 33.4	20
50	0 31.2	0 31.9	0 32.8	0 33.3	0 33.8	0 34.4	0 35.0	0 35.7	0 36.5	10
2 0	0 33.8	0 34.5	0 35.5	0 36.0	0 36.6	0 37.2	0 37.9	0 38.7	0 39.5	22 0
10	0 36.3	0 37.1	0 38.2	0 38.7	0 39.3	0 40.0	0 40.7	0 41.6	0 42.5	21 50
20	0 38.7	0 39.6	0 40.7	0 41.3	0 42.0	0 42.7	0 43.4	0 44.4	0 45.3	40
2 30	0 41.1	0 42.0	0 43.2	0 43.8	0 44.5	0 45.3	0 46.1	0 47.0	0 48.1	21 30
40	0 43.4	0 44.3	0 45.6	0 46.3	0 47.0	0 47.8	0 48.7	0 49.7	0 50.8	20
50	0 45.6	0 46.6	0 48.0	0 48.6	0 49.4	0 50.2	0 51.2	0 52.2	0 53.3	10
3 0	0 47.8	0 48.8	0 50.2	0 50.9	0 51.7	0 52.5	0 53.5	0 54.6	0 55.8	21 0
10	0 49.8	0 50.8	0 52.3	0 53.0	0 53.8	0 54.8	0 55.8	0 56.9	0 58.1	20 50
20	0 51.7	0 52.8	0 54.3	0 55.1	0 55.9	0 56.8	0 57.9	0 59.1	1 0.4	40
3 30	0 53.6	0 54.7	0 56.2	0 57.0	0 57.9	0 58.9	1 0.0	1 1.2	1 2.5	20 30
40	0 55.3	0 56.4	0 58.1	0 58.9	0 59.8	1 0.8	1 1.9	1 3.1	1 4.5	20
50	0 56.9	0 58.1	0 59.8	1 0.6	1 1.5	1 2.6	1 3.7	1 5.0	1 6.4	10
4 0	0 58.4	0 59.6	1 1.3	1 2.2	1 3.2	1 4.2	1 5.4	1 6.7	1 8.2	20 0
10	0 59.8	1 1.1	1 2.8	1 3.7	1 4.7	1 5.8	1 7.0	1 8.3	1 9.8	19 50
20	1 1.1	1 2.4	1 4.2	1 5.0	1 6.0	1 7.2	1 8.4	1 9.7	1 11.2	40
4 30	1 2.3	1 3.6	1 5.4	1 6.3	1 7.3	1 8.4	1 9.7	1 11.1	1 12.6	19 30
40	1 3.4	1 4.6	1 6.5	1 7.4	1 8.4	1 9.6	1 10.8	1 12.3	1 13.8	20
50	1 4.3	1 5.6	1 7.5	1 8.4	1 9.4	1 10.6	1 11.9	1 13.3	1 14.9	10
5 0	1 5.1	1 6.4	1 8.3	1 9.2	1 10.3	1 11.5	1 12.8	1 14.2	1 15.8	19 0
10	1 5.8	1 7.1	1 9.0	1 10.0	1 11.0	1 12.2	1 13.5	1 15.0	1 16.6	18 50
20	1 6.4	1 7.7	1 9.6	1 10.6	1 11.6	1 12.8	1 14.1	1 15.6	1 17.2	40
5 30	1 6.8	1 8.1	1 10.0	1 11.0	1 12.1	1 13.3	1 14.6	1 16.0	1 17.7	18 30
40	1 7.1	1 8.4	1 10.4	1 11.3	1 12.4	1 13.6	1 14.9	1 16.4	1 18.0	20
50	1 7.3	1 8.6	1 10.5	1 11.5	1 12.6	1 13.8	1 15.1	1 16.6	1 18.2	10
6 0	1 7.4	1 8.7	1 10.6	1 11.5	1 12.6	1 13.8	1 15.1	1 16.6	1 18.2	18 0
10	1 7.3	1 8.6	1 10.5	1 11.4	1 12.5	1 13.7	1 15.0	1 16.5	1 18.1	17 50
20	1 7.1	1 8.4	1 10.3	1 11.2	1 12.3	1 13.5	1 14.8	1 16.2	1 17.8	40
6 30	1 6.8	1 8.0	1 9.9	1 10.9	1 11.9	1 13.1	1 14.4	1 15.8	1 17.4	17 30
40	1 6.3	1 7.6	1 9.4	1 10.4	1 11.4	1 12.6	1 13.8	1 15.3	1 16.9	20
50	1 5.7	1 7.0	1 8.8	1 9.7	1 10.8	1 11.9	1 13.2	1 14.6	1 16.2	10
7 0	1 5.0	1 6.2	1 8.1	1 9.0	1 10.0	1 11.1	1 12.4	1 13.8	1 15.3	17 0
10	1 4.2	1 5.4	1 7.2	1 8.1	1 9.1	1 10.2	1 11.4	1 12.8	1 14.4	16 50
20	1 3.2	1 4.4	1 6.2	1 7.0	1 8.1	1 9.1	1 10.4	1 11.7	1 13.2	40
7 30	1 2.1	1 3.3	1 5.0	1 5.9	1 6.9	1 8.0	1 9.1	1 10.5	1 11.9	16 30
40	1 0.9	1 2.1	1 3.7	1 4.6	1 5.6	1 6.6	1 7.8	1 9.1	1 10.5	20
50	0 59.6	1 0.8	1 2.4	1 3.2	1 4.2	1 5.2	1 6.3	1 7.6	1 9.0	10
8 0	0 58.2	0 59.3	1 0.9	1 1.7	1 2.6	1 3.6	1 4.7	1 6.0	1 7.3	16 0
10	0 56.7	0 57.8	0 59.3	1 0.1	1 1.0	1 1.9	1 3.0	1 4.2	1 5.5	15 50
20	0 55.1	0 56.1	0 57.6	0 58.4	0 59.2	1 0.1	1 1.2	1 2.4	1 3.6	40
8 30	0 53.3	0 54.3	0 55.8	0 56.5	0 57.4	0 58.2	0 59.2	1 0.4	1 1.6	15 30
40	0 51.5	0 52.4	0 53.8	0 54.5	0 55.3	0 56.2	0 57.2	0 58.3	0 59.5	20
50	0 49.6	0 50.5	0 51.8	0 52.5	0 53.2	0 54.1	0 55.0	0 56.1	0 57.2	10
9 0	0 47.5	0 48.4	0 49.7	0 50.3	0 51.0	0 51.8	0 52.7	0 53.8	0 54.8	15 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A. \ Lat.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
9 0	0 47.5	0 48.4	0 49.7	0 50.3	0 51.0	0 51.8	0 52.7	0 53.8	0 54.8	15 0
10	0 45.4	0 46.2	0 47.4	0 48.1	0 48.8	0 49.5	0 50.4	0 51.3	0 52.4	14 50
20	0 43.2	0 44.0	0 45.1	0 45.7	0 46.4	0 47.1	0 47.9	0 48.8	0 49.8	40
9 30	0 40.9	0 41.6	0 42.7	0 43.3	0 43.9	0 44.6	0 45.3	0 46.2	0 47.2	14 30
40	0 38.5	0 39.2	0 40.3	0 40.8	0 41.4	0 42.0	0 42.7	0 43.5	0 44.4	20
50	0 36.1	0 36.7	0 37.7	0 38.2	0 38.8	0 39.3	0 40.0	0 40.8	0 41.6	10
10 0	0 33.6	0 34.2	0 35.1	0 35.5	0 36.0	0 36.6	0 37.2	0 37.9	0 38.7	14 0
10	0 31.0	0 31.6	0 32.4	0 32.8	0 33.3	0 33.8	0 34.4	0 35.0	0 35.7	13 50
20	0 28.4	0 28.9	0 29.6	0 30.0	0 30.5	0 30.9	0 31.5	0 32.0	0 32.7	40
10 30	0 25.7	0 26.2	0 26.8	0 27.2	0 27.6	0 28.0	0 28.5	0 29.0	0 29.6	13 30
40	0 23.0	0 23.4	0 24.0	0 24.3	0 24.6	0 25.0	0 25.5	0 25.9	0 26.5	20
50	0 20.2	0 20.6	0 21.1	0 21.4	0 21.7	0 22.0	0 22.4	0 22.8	0 23.3	10
11 0	0 17.4	0 17.7	0 18.2	0 18.4	0 18.6	0 18.9	0 19.2	0 19.6	0 20.0	13 0
10	0 14.5	0 14.8	0 15.2	0 15.4	0 15.6	0 15.8	0 16.1	0 16.4	0 16.7	12 50
20	0 11.7	0 11.9	0 12.2	0 12.3	0 12.5	0 12.7	0 12.9	0 13.2	0 13.4	40
11 30	0 8.8	0 8.9	0 9.1	0 9.3	0 9.4	0 9.5	0 9.7	0 9.9	0 10.1	12 30
40	0 5.9	0 6.0	0 6.1	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.7	20
50	0 2.9	0 3.0	0 3.1	0 3.1	0 3.1	0 3.2	0 3.2	0 3.3	0 3.4	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

H. A. \ Lat.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 3.5	0 3.5	0 3.6	0 3.7	0 3.8	0 4.0	0 4.1	0 4.3	0 4.4	23 50
20	0 6.9	0 7.1	0 7.2	0 7.4	0 7.7	0 7.9	0 8.2	0 8.5	0 8.8	40
0 30	0 10.3	0 10.6	0 10.9	0 11.2	0 11.5	0 11.8	0 12.3	0 12.7	0 13.2	23 30
40	0 13.8	0 14.1	0 14.4	0 14.8	0 15.3	0 15.8	0 16.3	0 16.9	0 17.6	20
50	0 17.1	0 17.5	0 18.0	0 18.5	0 19.0	0 19.6	0 20.3	0 21.2	0 21.9	10
1 0	0 20.5	0 21.0	0 21.5	0 22.1	0 22.8	0 23.5	0 24.3	0 25.2	0 26.2	23 0
10	0 23.8	0 24.4	0 25.0	0 25.7	0 26.4	0 27.3	0 28.2	0 29.3	0 30.4	22 50
20	0 27.1	0 27.7	0 28.4	0 29.2	0 30.1	0 31.0	0 32.1	0 33.3	0 34.6	40
1 30	0 30.3	0 31.0	0 31.8	0 32.7	0 33.6	0 34.7	0 35.9	0 37.2	0 38.7	22 30
40	0 33.4	0 34.2	0 35.1	0 36.1	0 37.1	0 38.3	0 39.6	0 41.1	0 42.7	20
50	0 36.5	0 37.4	0 38.3	0 39.4	0 40.6	0 41.9	0 43.3	0 44.9	0 46.7	10
2 0	0 39.5	0 40.5	0 41.5	0 42.6	0 43.9	0 45.3	0 46.9	0 48.6	0 50.5	22 0
10	0 42.5	0 43.5	0 44.6	0 45.8	0 47.2	0 48.7	0 50.4	0 52.2	0 54.2	21 50
20	0 45.3	0 46.4	0 47.6	0 48.9	0 50.3	0 51.9	0 53.7	0 55.7	0 57.9	40
2 30	0 48.1	0 49.2	0 50.5	0 51.9	0 53.4	0 55.1	0 57.0	0 59.1	1 1.4	21 30
40	0 50.8	0 52.0	0 53.3	0 54.8	0 56.4	0 58.2	1 0.1	1 2.3	1 4.8	20
50	0 53.3	0 54.6	0 56.0	0 57.5	0 59.2	1 1.1	1 3.2	1 5.5	1 8.0	10
3 0	0 55.8	0 57.1	0 58.6	1 0.2	1 1.9	1 3.9	1 6.1	1 8.5	1 11.2	21 0
10	0 58.1	0 59.5	1 1.0	1 2.7	1 4.5	1 6.6	1 8.8	1 11.4	1 14.2	20 50
20	1 0.4	1 1.8	1 3.4	1 5.1	1 7.0	1 9.1	1 11.5	1 14.1	1 17.0	40
3 30	1 2.5	1 4.0	1 5.6	1 7.4	1 9.4	1 11.6	1 14.0	1 16.7	1 19.7	20 30
40	1 4.5	1 6.0	1 7.7	1 9.6	1 11.6	1 13.8	1 16.4	1 19.1	1 22.2	20
50	1 6.4	1 8.0	1 9.7	1 11.6	1 13.6	1 16.0	1 18.5	1 21.4	1 24.6	10
4 0	1 8.2	1 9.8	1 11.5	1 13.4	1 15.6	1 18.0	1 20.6	1 23.5	1 26.8	20 0
10	1 9.8	1 11.4	1 13.2	1 15.2	1 17.4	1 19.8	1 22.5	1 25.5	1 28.8	19 50
20	1 11.2	1 12.9	1 14.7	1 16.8	1 19.0	1 21.5	1 24.2	1 27.3	1 30.7	40
4 30	1 12.6	1 14.3	1 16.2	1 18.2	1 20.5	1 23.0	1 25.8	1 28.9	1 32.3	19 30
40	1 13.8	1 15.5	1 17.4	1 19.5	1 21.8	1 24.4	1 27.2	1 30.3	1 33.8	20
50	1 14.9	1 16.6	1 18.5	1 20.6	1 23.0	1 25.6	1 28.4	1 31.6	1 35.2	10
5 0	1 15.8	1 17.5	1 19.5	1 21.6	1 24.0	1 26.6	1 29.5	1 32.7	1 36.3	19 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A. \ Lat.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
5 0	1 15.8	1 17.5	1 19.5	1 21.6	1 24.0	1 26.6	1 29.5	1 32.7	1 36.3	19 0
10	1 16.6	1 18.3	1 20.3	1 22.4	1 24.8	1 27.5	1 30.4	1 33.6	1 37.2	18 50
20	1 17.2	1 19.0	1 21.0	1 23.1	1 25.5	1 28.2	1 31.1	1 34.4	1 38.0	40
5 30	1 17.7	1 19.5	1 21.4	1 23.6	1 26.0	1 28.7	1 31.6	1 34.9	1 38.5	18 30
40	1 18.0	1 19.8	1 21.8	1 24.0	1 26.4	1 29.0	1 32.0	1 35.3	1 38.9	20
50	1 18.2	1 20.0	1 22.0	1 24.1	1 26.6	1 29.2	1 32.2	1 35.5	1 39.1	10
6 0	1 18.2	1 20.0	1 22.0	1 24.2	1 26.6	1 29.3	1 32.2	1 35.5	1 39.1	18 0
10	1 18.1	1 19.9	1 21.8	1 24.0	1 26.4	1 29.1	1 32.0	1 35.3	1 38.9	17 50
20	1 17.8	1 19.6	1 21.6	1 23.7	1 26.1	1 28.8	1 31.7	1 35.0	1 38.5	40
6 30	1 17.4	1 19.2	1 21.1	1 23.3	1 25.7	1 28.3	1 31.2	1 34.4	1 38.0	17 30
40	1 16.9	1 18.6	1 20.6	1 22.7	1 25.0	1 27.6	1 30.5	1 33.7	1 37.2	20
50	1 16.2	1 17.9	1 19.8	1 21.9	1 24.2	1 26.8	1 29.7	1 32.8	1 36.3	10
7 0	1 15.3	1 17.0	1 18.9	1 21.0	1 23.3	1 25.8	1 28.6	1 31.8	1 35.2	17 0
10	1 14.4	1 16.0	1 17.9	1 19.9	1 22.2	1 24.7	1 27.4	1 30.5	1 33.9	16 50
20	1 13.2	1 14.8	1 16.7	1 18.6	1 20.9	1 23.4	1 26.1	1 29.1	1 32.5	40
7 30	1 11.9	1 13.6	1 15.4	1 17.3	1 19.5	1 21.9	1 24.6	1 27.5	1 30.8	16 30
40	1 10.5	1 12.1	1 13.9	1 15.8	1 17.9	1 20.3	1 22.9	1 25.8	1 29.0	20
50	1 9.0	1 10.5	1 12.3	1 14.2	1 16.2	1 18.5	1 21.1	1 23.9	1 27.0	10
8 0	1 7.3	1 8.8	1 10.5	1 12.4	1 14.4	1 16.6	1 19.1	1 21.9	1 24.9	16 0
10	1 5.5	1 7.0	1 8.6	1 10.4	1 12.4	1 14.6	1 17.0	1 19.7	1 22.6	15 50
20	1 3.6	1 5.1	1 6.6	1 8.4	1 10.3	1 12.4	1 14.7	1 17.3	1 20.2	40
8 30	1 1.6	1 3.0	1 4.5	1 6.2	1 8.0	1 10.1	1 12.3	1 14.8	1 17.6	15 30
40	0 59.5	1 0.8	1 2.2	1 3.9	1 5.6	1 7.6	1 9.8	1 12.2	1 14.9	20
50	0 57.2	0 58.5	0 59.9	1 1.4	1 3.2	1 5.1	1 7.2	1 9.5	1 12.0	10
9 0	0 54.8	0 56.1	0 57.4	0 58.9	1 0.5	1 2.4	1 4.4	1 6.6	1 9.0	15 0
10	0 52.4	0 53.6	0 54.8	0 56.2	0 57.8	0 59.5	1 1.5	1 3.6	1 5.9	14 50
20	0 49.8	0 51.0	0 52.1	0 53.5	0 55.0	0 56.6	0 58.4	1 0.5	1 2.7	40
9 30	0 47.2	0 48.2	0 49.4	0 50.6	0 52.0	0 53.6	0 55.3	0 57.2	0 59.3	14 30
40	0 44.4	0 45.4	0 46.5	0 47.7	0 49.0	0 50.5	0 52.1	0 53.9	0 55.9	20
50	0 41.6	0 42.5	0 43.6	0 44.7	0 45.9	0 47.3	0 48.8	0 50.4	0 52.3	10
10 0	0 38.7	0 39.6	0 40.5	0 41.6	0 42.7	0 44.0	0 45.4	0 46.9	0 48.7	14 0
10	0 35.7	0 36.5	0 37.4	0 38.4	0 39.4	0 40.6	0 41.9	0 43.3	0 44.9	13 50
20	0 32.7	0 33.4	0 34.2	0 35.1	0 36.1	0 37.2	0 38.3	0 39.6	0 41.1	40
10 30	0 29.6	0 30.3	0 31.0	0 31.8	0 32.6	0 33.6	0 34.7	0 35.9	0 37.2	13 30
40	0 26.5	0 27.0	0 27.7	0 28.4	0 29.2	0 30.0	0 31.0	0 32.0	0 33.2	20
50	0 23.3	0 23.8	0 24.3	0 25.0	0 25.6	0 26.4	0 27.2	0 28.2	0 29.2	10
11 0	0 20.0	0 20.4	0 20.9	0 21.5	0 22.1	0 22.7	0 23.4	0 24.2	0 25.1	13 0
10	0 16.7	0 17.1	0 17.5	0 18.0	0 18.4	0 19.0	0 19.6	0 20.3	0 21.0	12 50
20	0 13.4	0 13.7	0 14.0	0 14.4	0 14.8	0 15.2	0 15.7	0 16.3	0 16.9	40
11 30	0 10.1	0 10.3	0 10.6	0 10.8	0 11.1	0 11.5	0 11.8	0 12.2	0 12.7	12 30
40	0 6.7	0 6.9	0 7.0	0 7.2	0 7.4	0 7.6	0 7.9	0 8.2	0 8.5	20
50	0 3.4	0 3.4	0 3.5	0 3.6	0 3.7	0 3.8	0 4.0	0 4.1	0 4.2	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

H. A. \ Lat.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 4.4	0 4.6	0 4.8	0 5.1	0 5.3	0 5.6	0 6.0	0 6.2	0 6.4	23 50
20	0 8.8	0 9.2	0 9.6	0 10.1	0 10.6	0 11.3	0 12.0	0 12.4	0 12.8	40
0 30	0 13.2	0 13.8	0 14.4	0 15.1	0 15.9	0 16.9	0 17.9	0 18.5	0 19.1	23 30
40	0 17.6	0 18.3	0 19.2	0 20.1	0 21.2	0 22.4	0 23.8	0 24.6	0 25.4	20
50	0 21.9	0 22.8	0 23.9	0 25.1	0 26.4	0 27.9	0 29.7	0 30.6	0 31.7	10
1 0	0 26.2	0 27.3	0 28.6	0 30.0	0 31.6	0 33.4	0 35.5	0 36.6	0 37.9	23 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of north.]

Lat. / H. A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
1 0	0 26.2	0 27.3	0 28.6	0 30.0	0 31.6	0 33.4	0 35.5	0 36.6	0 37.9	23 0
10	0 30.4	0 31.7	0 33.2	0 34.8	0 36.7	0 38.8	0 41.2	0 42.6	0 44.0	22 50
20	0 34.6	0 36.1	0 37.7	0 39.6	0 41.7	0 44.1	0 46.8	0 48.4	0 50.0	40
1 30	0 38.7	0 40.4	0 42.2	0 44.3	0 46.6	0 49.3	0 52.4	0 54.1	0 56.0	22 30
40	0 42.7	0 44.5	0 46.6	0 48.9	0 51.5	0 54.4	0 57.8	0 59.7	1 1.8	20
50	0 46.7	0 48.6	0 50.9	0 53.4	0 56.2	0 59.4	1 3.1	1 5.2	1 7.4	10
2 0	0 50.5	0 52.6	0 55.0	0 57.8	1 0.8	1 4.3	1 8.3	1 10.5	1 12.9	22 0
10	0 54.2	0 56.6	0 59.1	1 2.0	1 5.3	1 9.0	1 13.3	1 15.7	1 18.3	21 50
20	0 57.9	1 0.3	1 3.1	1 6.2	1 9.7	1 13.6	1 18.2	1 20.8	1 23.5	40
2 30	1 1.4	1 4.0	1 6.9	1 10.1	1 13.9	1 18.1	1 23.0	1 25.6	1 28.6	21 30
40	1 4.8	1 7.5	1 10.6	1 14.1	1 18.0	1 22.4	1 27.5	1 30.3	1 33.4	20
50	1 8.0	1 10.9	1 14.1	1 17.8	1 21.8	1 26.5	1 31.9	1 34.8	1 38.1	10
3 0	1 11.2	1 14.2	1 17.5	1 21.3	1 25.6	1 30.5	1 36.1	1 39.2	1 42.5	21 0
10	1 14.2	1 17.3	1 20.8	1 24.7	1 29.2	1 34.2	1 40.1	1 43.3	1 46.8	20 50
20	1 17.0	1 20.2	1 23.9	1 27.9	1 32.6	1 37.8	1 43.8	1 47.2	1 50.8	40
3 30	1 19.7	1 23.0	1 26.8	1 31.0	1 35.8	1 41.2	1 47.4	1 50.9	1 54.6	20 30
40	1 22.2	1 25.6	1 29.5	1 33.9	1 38.8	1 44.4	1 50.8	1 54.3	1 58.2	20
50	1 24.6	1 28.1	1 32.1	1 36.5	1 41.6	1 47.3	1 53.9	1 57.6	2 1.5	10
4 0	1 26.8	1 30.4	1 34.5	1 39.1	1 44.2	1 50.1	1 56.8	2 0.6	2 4.6	20 0
10	1 28.8	1 32.5	1 36.6	1 41.3	1 46.6	1 52.6	1 59.5	2 3.3	2 7.4	19 50
20	1 30.7	1 34.4	1 38.6	1 43.4	1 48.8	1 54.9	2 1.9	2 5.8	2 10.0	40
4 30	1 32.3	1 36.2	1 40.5	1 45.3	1 50.8	1 57.0	2 4.1	2 8.1	2 12.3	19 30
40	1 33.8	1 37.7	1 42.1	1 47.0	1 52.6	1 58.8	2 6.1	2 10.1	2 14.4	20
50	1 35.2	1 39.1	1 43.5	1 48.5	1 54.1	2 0.5	2 7.8	2 11.8	2 16.2	10
5 0	1 36.3	1 40.3	1 44.7	1 49.8	1 55.4	2 1.8	2 9.2	2 13.3	2 17.7	19 0
10	1 37.2	1 41.2	1 45.7	1 50.8	1 56.5	2 3.0	2 10.4	2 14.5	2 19.0	18 50
20	1 38.0	1 42.0	1 46.6	1 51.6	1 57.4	2 3.9	2 11.4	2 15.5	2 20.0	40
5 30	1 38.5	1 42.6	1 47.2	1 52.2	1 58.0	2 4.6	2 12.1	2 16.2	2 20.7	18 30
40	1 38.9	1 43.0	1 47.6	1 52.6	1 58.4	2 5.0	2 12.5	2 16.7	2 21.1	20
50	1 39.1	1 43.2	1 47.7	1 52.8	1 58.6	2 5.2	2 12.7	2 16.8	2 21.3	10
6 0	1 39.1	1 43.2	1 47.7	1 52.8	1 58.6	2 5.1	2 12.6	2 16.8	2 21.2	18 0
10	1 38.9	1 43.0	1 47.5	1 52.6	1 58.3	2 4.9	2 12.3	2 16.4	2 20.9	17 50
20	1 38.5	1 42.6	1 47.1	1 52.1	1 57.8	2 4.3	2 11.7	2 15.8	2 20.2	40
6 30	1 38.0	1 42.0	1 46.5	1 51.5	1 57.2	2 3.6	2 10.9	2 15.0	2 19.4	17 30
40	1 37.2	1 41.2	1 45.6	1 50.6	1 56.2	2 2.6	2 9.8	2 13.9	2 18.2	20
50	1 36.3	1 40.2	1 44.6	1 49.5	1 55.1	2 1.4	2 8.5	2 12.5	2 16.8	10
7 0	1 35.2	1 39.1	1 43.4	1 48.2	1 53.7	1 59.9	2 7.0	2 10.9	2 15.2	17 0
10	1 33.9	1 37.7	1 42.0	1 46.8	1 52.2	1 58.2	2 5.2	2 9.1	2 13.2	16 50
20	1 32.5	1 36.2	1 40.4	1 45.1	1 50.4	1 56.4	2 3.2	2 7.0	2 11.1	40
7 30	1 30.8	1 34.5	1 38.6	1 43.2	1 48.4	1 54.3	2 1.0	2 4.7	2 8.7	16 30
40	1 29.0	1 32.6	1 36.6	1 41.1	1 46.2	1 52.0	1 58.5	2 2.2	2 6.1	20
50	1 27.0	1 30.6	1 34.5	1 38.9	1 43.8	1 49.4	1 55.9	1 59.4	2 3.2	10
8 0	1 24.9	1 28.3	1 32.2	1 36.4	1 41.3	1 46.7	1 53.0	1 56.4	2 0.1	16 0
10	1 22.6	1 26.0	1 29.7	1 33.8	1 38.5	1 43.8	1 49.9	1 53.2	1 56.8	15 50
20	1 20.2	1 23.4	1 27.0	1 31.0	1 35.6	1 40.7	1 46.6	1 49.9	1 53.4	40
8 30	1 17.6	1 20.7	1 24.2	1 28.1	1 32.5	1 37.5	1 43.1	1 46.3	1 49.6	15 30
40	1 14.9	1 17.9	1 21.2	1 25.0	1 29.2	1 34.0	1 39.5	1 42.5	1 45.8	20
50	1 12.0	1 14.9	1 18.1	1 21.7	1 25.8	1 30.4	1 35.7	1 38.5	1 41.7	10
9 0	1 9.0	1 11.8	1 14.9	1 18.3	1 22.2	1 26.6	1 31.6	1 34.4	1 37.4	15 0
10	1 5.9	1 8.6	1 11.5	1 14.8	1 18.5	1 22.7	1 27.4	1 30.1	1 33.0	14 50
20	1 2.7	1 5.2	1 8.0	1 11.1	1 14.6	1 18.6	1 23.2	1 25.7	1 28.4	40
9 30	0 59.3	1 1.7	1 4.3	1 7.3	1 10.6	1 14.4	1 18.7	1 21.0	1 23.6	14 30
40	0 55.9	0 58.1	1 0.6	1 3.3	1 6.5	1 10.0	1 14.1	1 16.3	1 18.7	20
50	0 52.3	0 54.4	0 56.7	0 59.3	1 2.2	1 5.6	1 9.3	1 11.4	1 13.7	10
10 0	0 48.7	0 50.6	0 52.8	0 55.2	0 57.9	1 1.0	1 4.5	1 6.4	1 8.5	14 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A. \ Lat.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
10 0	0 48.7	0 50.6	0 52.8	0 55.2	0 57.9	1 1.0	1 4.5	1 6.4	1 8.5	14 0
10	0 44.9	0 46.7	0 48.7	0 50.9	0 53.4	0 56.3	0 59.5	1 1.3	1 3.2	13 50
20	0 41.1	0 42.7	0 44.6	0 46.6	0 48.9	0 51.5	0 54.4	0 56.1	0 57.8	40
10 30	0 37.2	0 38.7	0 40.3	0 42.2	0 44.2	0 46.6	0 49.2	0 50.7	0 52.3	13 30
40	0 33.2	0 34.6	0 36.0	0 37.6	0 39.5	0 41.6	0 44.0	0 45.3	0 46.7	20
50	0 29.2	0 30.4	0 31.7	0 33.1	0 34.7	0 36.6	0 38.7	0 39.8	0 41.1	10
11 0	0 25.1	0 26.1	0 27.2	0 28.5	0 29.9	0 31.5	0 33.3	0 34.2	0 35.3	13 0
10	0 21.0	0 21.8	0 22.8	0 23.8	0 25.0	0 26.3	0 27.8	0 28.6	0 29.5	12 50
20	0 16.9	0 17.5	0 18.3	0 19.1	0 20.0	0 21.1	0 22.3	0 23.0	0 23.7	40
11 30	0 12.7	0 13.2	0 13.7	0 14.4	0 15.0	0 15.9	0 16.8	0 17.3	0 17.8	12 30
40	0 8.5	0 8.8	0 9.2	0 9.6	0 10.0	0 10.6	0 11.2	0 11.5	0 11.9	20
50	0 4.2	0 4.4	0 4.6	0 4.8	0 5.0	0 5.3	0 5.6	0 5.8	0 6.0	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

H. A. \ Lat.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 6.4	0 6.6	0 6.9	0 7.2	0 7.4	0 7.8	0 8.1	0 8.5	0 8.9	23 50
20	0 12.8	0 13.2	0 13.7	0 14.3	0 14.9	0 15.5	0 16.2	0 17.0	0 17.8	40
0 30	0 19.1	0 19.8	0 20.6	0 21.4	0 22.2	0 23.2	0 24.3	0 25.4	0 26.7	23 30
40	0 25.4	0 26.4	0 27.4	0 28.4	0 29.6	0 30.9	0 32.3	0 33.8	0 35.5	20
50	0 31.7	0 32.8	0 34.1	0 35.4	0 36.9	0 38.5	0 40.2	0 42.1	0 44.3	10
1 0	0 37.9	0 39.2	0 40.7	0 42.3	0 44.1	0 46.0	0 48.0	0 50.4	0 52.9	23 0
10	0 44.0	0 45.6	0 47.3	0 49.1	0 51.2	0 53.4	0 55.8	0 58.5	1 1.4	22 50
20	0 50.0	0 51.8	0 53.8	0 55.8	0 58.2	1 0.7	1 3.4	1 6.4	1 9.8	40
1 30	0 56.0	0 57.9	1 0.1	1 2.4	1 5.0	1 7.8	1 10.9	1 14.3	1 18.0	22 30
40	1 1.8	1 3.9	1 6.3	1 8.9	1 11.7	1 14.8	1 18.2	1 22.0	1 26.1	20
50	1 7.4	1 9.8	1 12.4	1 15.2	1 18.3	1 21.7	1 25.4	1 29.4	1 34.0	10
2 0	1 12.9	1 15.5	1 18.3	1 21.5	1 24.7	1 28.3	1 32.3	1 36.8	1 41.6	22 0
10	1 18.3	1 21.1	1 24.1	1 27.4	1 30.9	1 34.8	1 39.1	1 43.8	1 49.1	21 50
20	1 23.5	1 26.5	1 29.7	1 33.2	1 37.0	1 41.1	1 45.7	1 50.7	1 56.3	40
2 30	1 28.6	1 31.7	1 35.1	1 38.8	1 42.8	1 47.2	1 52.0	1 57.3	2 3.2	21 30
40	1 33.4	1 36.7	1 40.3	1 44.2	1 48.4	1 53.0	1 58.1	2 3.7	2 9.9	20
50	1 38.1	1 41.5	1 45.3	1 49.4	1 53.8	1 58.6	2 4.0	2 9.8	2 16.3	10
3 0	1 42.5	1 46.1	1 50.0	1 54.3	1 58.9	2 4.0	2 9.5	2 15.7	2 22.4	21 0
10	1 46.8	1 50.5	1 54.6	1 59.0	2 3.8	2 9.1	2 14.9	2 21.2	2 28.2	20 50
20	1 50.8	1 54.7	1 58.9	2 3.5	2 8.5	2 13.9	2 19.9	2 26.5	2 33.7	40
3 30	1 54.6	1 58.6	2 3.0	2 7.7	2 12.8	2 18.5	2 24.6	2 31.4	2 38.9	20 30
40	1 58.2	2 2.3	2 6.8	2 11.6	2 16.9	2 22.7	2 29.1	2 36.0	2 43.8	20
50	2 1.5	2 5.8	2 10.3	2 15.3	2 20.8	2 26.7	2 33.2	2 40.4	2 48.3	10
4 0	2 4.6	2 8.9	2 13.6	2 18.7	2 24.3	2 30.4	2 37.0	2 44.3	2 52.4	20 0
10	2 7.4	2 11.9	2 16.7	2 21.9	2 27.6	2 33.7	2 40.5	2 48.0	2 56.2	19 50
20	2 10.0	2 14.5	2 19.4	2 24.7	2 30.5	2 36.8	2 43.7	2 51.3	2 59.7	40
4 30	2 12.3	2 16.9	2 21.9	2 27.3	2 33.1	2 39.5	2 46.5	2 54.2	3 2.8	19 30
40	2 14.4	2 19.0	2 24.1	2 29.5	2 35.5	2 41.9	2 49.0	2 56.8	3 5.5	20
50	2 16.2	2 20.9	2 26.0	2 31.5	2 37.5	2 44.0	2 51.2	2 59.1	3 7.8	10
5 0	2 17.7	2 22.5	2 27.6	2 33.2	2 39.2	2 45.8	2 53.1	3 1.0	3 9.8	19 0
10	2 19.0	2 23.7	2 28.9	2 34.5	2 40.6	2 47.3	2 54.6	3 2.5	3 11.4	18 50
20	2 20.0	2 24.8	2 30.0	2 35.6	2 41.7	2 48.4	2 55.7	3 3.7	3 12.6	40
5 30	2 20.7	2 25.5	2 30.7	2 36.4	2 42.5	2 49.2	2 56.5	3 4.6	3 13.4	18 30
40	2 21.1	2 26.0	2 31.2	2 36.8	2 43.0	2 49.7	2 57.0	3 5.0	3 13.9	20
50	2 21.3	2 26.1	2 31.4	2 37.0	2 43.1	2 49.8	2 57.1	3 5.2	3 14.0	10
6 0	2 21.2	2 26.0	2 31.2	2 36.9	2 43.0	2 49.6	2 56.9	3 4.9	3 13.8	18 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of north.]

H. A. \ Lat.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. \ H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
6 0	2 21.2	2 26.0	2 31.2	2 36.9	2 43.0	2 49.6	2 56.9	3 4.9	3 13.8	18 0
10	2 20.9	2 25.7	2 30.8	2 36.4	2 42.5	2 49.1	2 56.4	3 4.4	3 13.1	17 50
20	2 20.2	2 25.0	2 30.2	2 35.7	2 41.8	2 48.3	2 55.5	3 3.4	3 12.2	40
6 30	2 19.4	2 24.1	2 29.2	2 34.7	2 40.7	2 47.2	2 54.3	3 2.2	3 10.8	17 30
40	2 18.2	2 22.9	2 27.9	2 33.4	2 39.3	2 45.8	2 52.8	3 0.6	3 9.1	20
50	2 16.8	2 21.4	2 26.4	2 31.8	2 37.6	2 44.0	2 51.0	2 58.6	3 7.0	10
7 0	2 15.2	2 19.7	2 24.6	2 29.9	2 35.7	2 42.0	2 48.8	2 56.4	3 4.6	17 0
10	2 13.2	2 17.7	2 22.6	2 27.8	2 33.5	2 39.6	2 46.4	2 53.8	3 1.9	16 50
20	2 11.1	2 15.5	2 20.2	2 25.4	2 31.0	2 37.0	2 43.6	2 50.9	2 58.9	40
7 30	2 8.7	2 13.0	2 17.7	2 22.7	2 28.1	2 34.1	2 40.6	2 47.7	2 55.5	16 30
40	2 6.1	2 10.3	2 14.8	2 19.8	2 25.1	2 30.9	2 37.2	2 44.2	2 51.8	20
50	2 3.2	2 7.3	2 11.8	2 16.6	2 21.8	2 27.4	2 33.6	2 40.4	2 47.8	10
8 0	2 0.1	2 4.1	2 8.4	2 13.1	2 18.2	2 23.7	2 29.7	2 36.3	2 43.5	16 0
10	1 56.8	2 0.7	2 4.9	2 9.4	2 14.4	2 19.7	2 25.5	2 31.9	2 39.0	15 50
20	1 53.4	1 57.1	2 1.2	2 5.5	2 10.3	2 15.5	2 21.1	2 27.3	2 34.1	40
8 30	1 49.6	1 53.3	1 57.2	2 1.4	2 6.0	2 11.0	2 16.5	2 22.4	2 29.0	15 30
40	1 45.8	1 49.2	1 53.0	1 57.1	2 1.5	2 6.3	2 11.6	2 17.3	2 23.6	20
50	1 41.7	1 45.0	1 48.6	1 52.6	1 56.8	2 1.4	2 6.4	2 11.9	2 18.0	10
9 0	1 37.4	1 40.6	1 44.1	1 47.8	1 51.9	1 56.2	2 1.1	2 6.3	2 12.1	15 0
10	1 33.0	1 36.0	1 39.3	1 42.9	1 46.8	1 50.9	1 55.5	2 0.5	2 6.1	14 50
20	1 28.4	1 31.3	1 34.4	1 37.8	1 41.4	1 45.4	1 49.8	1 54.5	1 59.8	40
9 30	1 23.6	1 26.3	1 29.3	1 32.5	1 36.0	1 39.7	1 43.8	1 48.3	1 53.3	14 30
40	1 18.7	1 21.3	1 24.1	1 27.0	1 30.3	1 33.9	1 37.7	1 41.9	1 46.6	20
50	1 13.7	1 16.1	1 18.7	1 21.4	1 24.5	1 27.8	1 31.4	1 35.4	1 39.7	10
10 0	1 8.5	1 10.7	1 13.1	1 15.7	1 18.6	1 21.6	1 25.0	1 28.7	1 32.7	14 0
10	1 3.2	1 5.3	1 7.5	1 9.9	1 12.5	1 15.3	1 18.4	1 21.8	1 25.5	13 50
20	0 57.8	0 59.7	1 1.7	1 3.9	1 6.3	1 8.9	1 11.7	1 14.8	1 18.2	40
10 30	0 52.3	0 54.0	0 55.9	0 57.8	1 0.0	1 2.3	1 4.9	1 7.7	1 10.8	13 30
40	0 46.7	0 48.3	0 49.9	0 51.6	0 53.6	0 55.7	0 58.0	1 0.4	1 3.2	20
50	0 41.1	0 42.4	0 43.8	0 45.4	0 47.1	0 48.9	0 50.9	0 53.1	0 55.5	10
11 0	0 35.3	0 36.5	0 37.7	0 39.0	0 40.5	0 42.1	0 43.8	0 45.7	0 47.8	13 0
10	0 29.5	0 30.5	0 31.5	0 32.6	0 33.9	0 35.2	0 36.6	0 38.2	0 39.9	12 50
20	0 23.7	0 24.5	0 25.3	0 26.2	0 27.2	0 28.2	0 29.4	0 30.6	0 32.0	40
11 30	0 17.8	0 18.4	0 19.0	0 19.7	0 20.4	0 21.2	0 22.1	0 23.0	0 24.0	12 30
40	0 11.9	0 12.3	0 12.7	0 13.1	0 13.6	0 14.2	0 14.7	0 15.4	0 16.1	20
50	0 6.0	0 6.2	0 6.4	0 6.6	0 6.8	0 7.1	0 7.4	0 7.7	0 8.0	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

TABLE IVa.

Table IV has been computed for a declination of 88° 53′ 40″. For other declinations of Polaris the corrections given below should be applied to the Azimuth taken from Table IV.

Decl. \ Azimuth.	0′	20′	40′	60′	80′	100′	120′	140′	160′	180′	200′	Azimuth. \ Decl.
° ′ ″	′	′	′	′	′	′	′	′	′	′	′	° ′ ″
88 53 15	0.0	+0.1	+0.3	+0.4	+0.5	+0.6	+0.8	+0.9	+1.0	+1.1	+1.3	88 53 15
88 53 20	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 53 20
88 53 25	0.0	+0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	88 53 25
88 53 30	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	88 53 30
88 53 35	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.3	88 53 35
88 53 40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88 53 40
88 53 45	0.0	0.0	−0.1	−0.1	−0.1	−0.1	−0.2	−0.2	−0.2	−0.2	−0.3	88 53 45
88 53 50	0.0	0.0	−0.1	−0.2	−0.2	−0.3	−0.3	−0.4	−0.4	−0.5	−0.5	88 53 50
88 53 55	0.0	−0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	88 53 55
88 54 0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 54 0
88 54 5	0.0	−0.1	−0.3	−0.4	−0.5	−0.6	−0.8	−0.9	−1.0	−1.1	−1.3	88 54 5

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Lat. \ Decl.	88° 53′ 20″	88° 53′ 30″	88° 53′ 40″	88° 53′ 50″	88° 54′ 0″	88° 54′ 10″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
10 0	1 7 41.7	1 7 31.6	1 7 21.4	1 7 11.3	1 7 1.1	1 6 50.9	+0.20	−1.02
10 20	1 7 45.9	1 7 35.8	1 7 25.6	1 7 15.4	1 7 5.3	1 6 55.1	0.21	1.02
10 40	1 7 50.3	1 7 40.2	1 7 30.0	1 7 19.8	1 7 9.6	1 6 59.5	0.22	1.02
11 0	1 7 54.9	1 7 44.7	1 7 34.5	1 7 24.3	1 7 14.1	1 7 4.0	0.23	1.02
11 20	1 7 59.6	1 7 49.4	1 7 39.2	1 7 29.0	1 7 18.8	1 7 8.6	0.24	1.02
11 40	1 8 4.4	1 7 54.2	1 7 44.0	1 7 33.8	1 7 23.6	1 7 13.3	+0.24	−1.02
12 0	1 8 9.4	1 7 59.2	1 7 48.9	1 7 38.7	1 7 28.5	1 7 18.2	0.25	1.02
12 20	1 8 14.5	1 8 4.3	1 7 54.0	1 7 43.8	1 7 33.6	1 7 23.3	0.26	1.02
12 40	1 8 19.8	1 8 9.6	1 7 59.3	1 7 49.0	1 7 38.8	1 7 28.5	0.27	1.03
13 0	1 8 25.2	1 8 15.0	1 8 4.7	1 7 54.4	1 7 44.2	1 7 33.9	0.28	1.03
13 20	1 8 30.8	1 8 20.6	1 8 10.3	1 8 0.0	1 7 49.7	1 7 39.4	+0.28	−1.03
13 40	1 8 36.6	1 8 26.3	1 8 16.0	1 8 5.7	1 7 55.4	1 7 45.1	0.29	1.03
14 0	1 8 42.5	1 8 32.2	1 8 21.9	1 8 11.6	1 8 1.2	1 7 50.9	0.30	1.03
14 20	1 8 48.5	1 8 38.2	1 8 27.9	1 8 17.6	1 8 7.2	1 7 56.9	0.30	1.03
14 40	1 8 54.7	1 8 44.4	1 8 34.1	1 8 23.7	1 8 13.4	1 8 3.1	0.31	1.03
15 0	1 9 1.1	1 8 50.8	1 8 40.4	1 8 30.1	1 8 19.7	1 8 9.4	+0.32	−1.03
15 20	1 9 7.7	1 8 57.3	1 8 46.9	1 8 36.6	1 8 26.2	1 8 15.8	0.33	1.04
15 40	1 9 14.4	1 9 4.0	1 8 53.6	1 8 43.2	1 8 32.8	1 8 22.4	0.34	1.04
16 0	1 9 21.2	1 9 10.8	1 9 0.4	1 8 50.0	1 8 39.6	1 8 29.2	0.34	1.04
16 20	1 9 28.2	1 9 17.8	1 9 7.4	1 8 57.0	1 8 46.6	1 8 36.1	0.35	1.04
16 40	1 9 35.4	1 9 25.0	1 9 14.6	1 9 4.1	1 8 53.7	1 8 43.2	+0.36	−1.04
17 0	1 9 42.8	1 9 32.3	1 9 21.9	1 9 11.4	1 9 1.0	1 8 50.5	0.37	1.05
17 20	1 9 50.3	1 9 39.8	1 9 29.4	1 9 18.9	1 9 8.4	1 8 57.9	0.38	1.05
17 40	1 9 58.0	1 9 47.5	1 9 37.0	1 9 26.5	1 9 16.0	1 9 5.5	0.38	1.05
18 0	1 10 5.9	1 9 55.4	1 9 44.8	1 9 34.3	1 9 23.8	1 9 13.3	0.39	1.05
18 20	1 10 13.9	1 10 3.4	1 9 52.8	1 9 42.3	1 9 31.8	1 9 21.2	+0.40	−1.05
18 40	1 10 22.1	1 10 11.6	1 10 1.0	1 9 50.5	1 9 39.9	1 9 29.3	0.41	1.06
19 0	1 10 30.5	1 10 19.9	1 10 9.4	1 9 58.8	1 9 48.2	1 9 37.6	0.42	1.06
19 20	1 10 39.1	1 10 28.5	1 10 17.9	1 10 7.3	1 9 56.7	1 9 46.1	0.43	1.06
19 40	1 10 47.8	1 10 37.2	1 10 26.6	1 10 16.0	1 10 5.4	1 9 54.7	0.44	1.06
20 0	1 10 56.7	1 10 46.1	1 10 35.5	1 10 24.8	1 10 14.2	1 10 3.5	+0.45	−1.06
20 20	1 11 5.8	1 10 55.2	1 10 44.5	1 10 33.8	1 10 23.2	1 10 12.5	0.46	1.07
20 40	1 11 15.1	1 11 4.5	1 10 53.8	1 10 43.1	1 10 32.4	1 10 21.7	0.47	1.07
21 0	1 11 24.6	1 11 13.9	1 11 3.2	1 10 52.5	1 10 41.8	1 10 31.1	0.48	1.07
21 20	1 11 34.3	1 11 23.5	1 11 12.8	1 11 2.1	1 10 51.3	1 10 40.6	0.48	1.07
21 40	1 11 44.1	1 11 33.4	1 11 22.6	1 11 11.9	1 11 1.1	1 10 50.3	+0.49	−1.08
22 0	1 11 54.2	1 11 43.4	1 11 32.6	1 11 21.8	1 11 11.0	1 11 0.2	0.50	1.08
22 20	1 12 4.4	1 11 53.6	1 11 42.8	1 11 32.0	1 11 21.2	1 11 10.4	0.51	1.08
22 40	1 12 14.9	1 12 4.0	1 11 53.2	1 11 42.3	1 11 31.5	1 11 20.7	0.52	1.08
23 0	1 12 25.5	1 12 14.6	1 12 3.8	1 11 52.9	1 11 42.0	1 11 31.2	0.53	1.09
23 20	1 12 36.3	1 12 25.4	1 12 14.6	1 12 3.7	1 11 52.8	1 11 41.9	+0.54	−1.09
23 40	1 12 47.4	1 12 36.4	1 12 25.5	1 12 14.6	1 12 3.7	1 11 52.8	0.55	1.09
24 0	1 12 58.6	1 12 47.6	1 12 36.7	1 12 25.8	1 12 14.8	1 12 3.9	0.56	1.09
24 20	1 13 10.0	1 12 59.1	1 12 48.1	1 12 37.1	1 12 26.1	1 12 15.2	0.57	1.10
24 40	1 13 21.7	1 13 10.7	1 12 59.7	1 12 48.7	1 12 37.7	1 12 26.7	0.58	1.10
25 0	1 13 33.6	1 13 22.5	1 13 11.5	1 13 0.5	1 12 49.4	1 12 38.4	+0.59	−1.10
25 20	1 13 45.7	1 13 34.6	1 13 23.5	1 13 12.5	1 13 1.4	1 12 50.3	0.61	1.11
25 40	1 13 58.0	1 13 46.9	1 13 35.8	1 13 24.7	1 13 13.6	1 13 2.5	0.62	1.11
26 0	1 14 10.5	1 13 59.4	1 13 48.2	1 13 37.1	1 13 26.0	1 13 14.8	0.63	1.11
26 20	1 14 23.2	1 14 12.1	1 14 0.9	1 13 49.7	1 13 38.6	1 13 27.4	0.64	1.12
26 40	1 14 36.2	1 14 25.0	1 14 13.8	1 14 2.6	1 13 51.4	1 13 40.2	+0.65	−1.12
27 0	1 14 49.4	1 14 38.2	1 14 26.9	1 14 15.7	1 14 4.5	1 13 53.3	0.66	1.12
27 20	1 15 2.8	1 14 51.6	1 14 40.3	1 14 29.0	1 14 17.8	1 14 6.5	0.67	1.13
27 40	1 15 16.5	1 15 5.2	1 14 53.9	1 14 42.6	1 14 31.3	1 14 20.0	0.68	1.13
28 0	1 15 30.4	1 15 19.0	1 15 7.7	1 14 56.4	1 14 45.0	1 14 33.7	0.70	1.13
28 20	1 15 44.5	1 15 33.1	1 15 21.8	1 15 10.4	1 14 59.0	1 14 47.7	+0.71	−1.14
28 40	1 15 58.9	1 15 47.5	1 15 36.1	1 15 24.7	1 15 13.3	1 15 1.9	0.72	1.14
29 0	1 16 13.5	1 16 2.1	1 15 50.6	1 15 39.2	1 15 27.8	1 15 16.3	0.73	1.14
29 20	1 16 28.4	1 16 16.9	1 16 5.4	1 15 54.0	1 15 42.5	1 15 31.0	0.75	1.15
29 40	1 16 43.5	1 16 32.0	1 16 20.5	1 16 9.0	1 15 57.5	1 15 46.0	0.76	1.15
30 0	1 16 58.9	1 16 47.3	1 16 35.8	1 16 24.3	1 16 12.7	1 16 1.2	+0.77	−1.15

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Lat. \ Decl.	88° 53′ 20″	88° 53′ 30″	88° 53′ 40″	88° 53′ 50″	88° 54′ 0″	88° 54′ 10″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
30 0	1 16 58.9	1 16 47.3	1 16 35.8	1 16 24.3	1 16 12.7	1 16 1.2	+0.77	−1.15
30 10	1 17 6.7	1 16 55.1	1 16 43.6	1 16 32.0	1 16 20.4	1 16 8.9	0.78	1.16
30 20	1 17 14.6	1 17 3.0	1 16 51.4	1 16 39.8	1 16 28.2	1 16 16.6	0.78	1.16
30 30	1 17 22.5	1 17 10.9	1 16 59.3	1 16 47.7	1 16 36.0	1 16 24.4	0.79	1.16
30 40	1 17 30.5	1 17 18.8	1 17 7.2	1 16 55.6	1 16 43.9	1 16 32.3	0.80	1.16
30 50	1 17 38.5	1 17 26.9	1 17 15.2	1 17 3.6	1 16 51.9	1 16 40.3	+0.80	−1.16
31 0	1 17 46.6	1 17 35.0	1 17 23.3	1 17 11.6	1 17 0.0	1 16 48.3	0.81	1.17
31 10	1 17 54.8	1 17 43.1	1 17 31.5	1 17 19.8	1 17 8.1	1 16 56.4	0.82	1.17
31 20	1 18 3.1	1 17 51.4	1 17 39.7	1 17 28.0	1 17 16.3	1 17 4.6	0.82	1.17
31 30	1 18 11.4	1 17 59.7	1 17 48.0	1 17 36.2	1 17 24.5	1 17 12.8	0.83	1.17
31 40	1 18 19.8	1 18 8.1	1 17 56.3	1 17 44.6	1 17 32.8	1 17 21.1	+0.84	−1.17
31 50	1 18 28.3	1 18 16.5	1 18 4.7	1 17 53.0	1 17 41.2	1 17 29.4	0.85	1.18
32 0	1 18 36.8	1 18 25.0	1 18 13.2	1 18 1.5	1 17 49.7	1 17 37.9	0.85	1.18
32 10	1 18 45.4	1 18 33.6	1 18 21.8	1 18 10.0	1 17 58.2	1 17 46.4	0.86	1.18
32 20	1 18 54.1	1 18 42.3	1 18 30.5	1 18 18.6	1 18 6.8	1 17 54.9	0.87	1.18
32 30	1 19 2.9	1 18 51.0	1 18 39.2	1 18 27.3	1 18 15.5	1 18 3.6	+0.88	−1.19
32 40	1 19 11.7	1 18 59.8	1 18 48.0	1 18 36.1	1 18 24.2	1 18 12.3	0.88	1.19
32 50	1 19 20.6	1 19 8.7	1 18 56.8	1 18 44.9	1 18 33.0	1 18 21.1	0.89	1.19
33 0	1 19 29.6	1 19 17.7	1 19 5.7	1 18 53.8	1 18 41.9	1 18 30.0	0.89	1.19
33 10	1 19 38.6	1 19 26.7	1 19 14.7	1 19 2.8	1 18 50.8	1 18 38.9	0.90	1.19
33 20	1 19 47.8	1 19 35.8	1 19 23.8	1 19 11.8	1 18 59.9	1 18 47.9	+0.91	−1.20
33 30	1 19 57.0	1 19 45.0	1 19 33.0	1 19 21.0	1 19 9.0	1 18 57.0	0.92	1.20
33 40	1 20 6.2	1 19 54.2	1 19 42.2	1 19 30.2	1 19 18.2	1 19 6.2	0.92	1.20
33 50	1 20 15.6	1 20 3.5	1 19 51.5	1 19 39.5	1 19 27.4	1 19 15.4	0.93	1.20
34 0	1 20 25.0	1 20 12.9	1 20 0.9	1 19 48.8	1 19 36.8	1 19 24.7	0.94	1.21
34 10	1 20 34.5	1 20 22.4	1 20 10.3	1 19 58.3	1 19 46.2	1 19 34.1	+0.95	−1.21
34 20	1 20 44.1	1 20 32.0	1 20 19.9	1 20 7.8	1 19 55.7	1 19 43.6	0.96	1.21
34 30	1 20 53.8	1 20 41.6	1 20 29.5	1 20 17.4	1 20 5.2	1 19 53.1	0.96	1.21
34 40	1 21 3.5	1 20 51.4	1 20 39.2	1 20 27.0	1 20 14.9	1 20 2.7	0.97	1.22
34 50	1 21 13.3	1 21 1.2	1 20 49.0	1 20 36.8	1 20 24.6	1 20 12.4	0.98	1.22
35 0	1 21 23.2	1 21 11.0	1 20 58.8	1 20 46.6	1 20 34.4	1 20 22.2	+0.99	−1.22
35 10	1 21 33.2	1 21 21.0	1 21 8.8	1 20 56.5	1 20 44.3	1 20 32.1	1.00	1.22
35 20	1 21 43.3	1 21 31.1	1 21 18.8	1 21 6.5	1 20 54.3	1 20 42.0	1.01	1.23
35 30	1 21 53.5	1 21 41.2	1 21 28.9	1 21 16.6	1 21 4.3	1 20 52.0	1.02	1.23
35 40	1 22 3.7	1 21 51.4	1 21 39.1	1 21 26.8	1 21 14.5	1 21 2.2	1.02	1.23
35 50	1 22 14.0	1 22 1.7	1 21 49.4	1 21 37.0	1 21 24.7	1 21 12.4	+1.03	−1.23
36 0	1 22 24.4	1 22 12.1	1 21 59.7	1 21 47.3	1 21 35.0	1 21 22.6	1.04	1.24
36 10	1 22 34.9	1 22 22.5	1 22 10.2	1 21 57.8	1 21 45.4	1 21 33.0	1.05	1.24
36 20	1 22 45.5	1 22 33.1	1 22 20.7	1 22 8.3	1 21 55.8	1 21 43.4	1.06	1.24
36 30	1 22 56.2	1 22 43.7	1 22 31.3	1 22 18.9	1 22 6.4	1 21 54.0	1.06	1.24
36 40	1 23 6.9	1 22 54.5	1 22 42.0	1 22 29.5	1 22 17.1	1 22 4.6	+1.07	−1.25
36 50	1 23 17.8	1 23 5.3	1 22 52.8	1 22 40.3	1 22 27.8	1 22 15.3	1.08	1.25
37 0	1 23 28.7	1 23 16.2	1 23 3.7	1 22 51.2	1 22 38.6	1 22 26.1	1.09	1.25
37 10	1 23 39.7	1 23 27.2	1 23 14.6	1 23 2.1	1 22 49.5	1 22 37.0	1.10	1.25
37 20	1 23 50.9	1 23 38.3	1 23 25.7	1 23 13.1	1 23 0.5	1 22 48.0	1.11	1.26
37 30	1 24 2.1	1 23 49.5	1 23 36.9	1 23 24.3	1 23 11.6	1 22 59.0	+1.12	−1.26
37 40	1 24 13.4	1 24 0.7	1 23 48.1	1 23 35.5	1 23 22.8	1 23 10.2	1.13	1.26
37 50	1 24 24.8	1 24 12.1	1 23 59.4	1 23 46.8	1 23 34.1	1 23 21.5	1.14	1.27
38 0	1 24 36.3	1 24 23.6	1 24 10.9	1 23 58.2	1 23 45.5	1 23 32.8	1.15	1.27
38 10	1 24 47.9	1 24 35.1	1 24 22.4	1 24 9.7	1 23 57.0	1 23 44.2	1.16	1.27
38 20	1 24 59.5	1 24 46.8	1 24 34.0	1 24 21.3	1 24 8.6	1 23 55.8	+1.17	−1.27
38 30	1 25 11.3	1 24 58.5	1 24 45.8	1 24 33.0	1 24 20.2	1 24 7.4	1.18	1.28
38 40	1 25 23.2	1 25 10.4	1 24 57.6	1 24 44.8	1 24 32.0	1 24 19.2	1.19	1.28
38 50	1 25 35.2	1 25 22.3	1 25 9.5	1 24 56.7	1 24 43.8	1 24 31.0	1.20	1.28
39 0	1 25 47.2	1 25 34.4	1 25 21.5	1 25 8.6	1 24 55.8	1 24 42.9	1.21	1.29
39 10	1 25 59.4	1 25 46.5	1 25 33.6	1 25 20.7	1 25 7.8	1 24 54.9	+1.22	−1.29
39 20	1 26 11.7	1 25 58.8	1 25 45.8	1 25 32.9	1 25 20.0	1 25 7.0	1.23	1.29
39 30	1 26 24.1	1 26 11.1	1 25 58.2	1 25 45.2	1 25 32.3	1 25 19.3	1.24	1.30
39 40	1 26 36.6	1 26 23.6	1 26 10.6	1 25 57.6	1 25 44.6	1 25 31.6	1.25	1.30
39 50	1 26 49.2	1 26 36.1	1 26 23.1	1 26 10.1	1 25 57.1	1 25 44.1	1.26	1.30
40 0	1 27 1.9	1 26 48.8	1 26 35.8	1 26 22.7	1 26 9.6	1 25 56.6	+1.27	−1.31

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Lat. \ Decl.	88° 53′ 20″	88° 53′ 30″	88° 53′ 40″	88° 53′ 50″	88° 54′ 0″	88° 54′ 10″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
40 0	1 27 1.9	1 26 48.8	1 26 35.8	1 26 22.7	1 26 9.6	1 25 56.6	+1.27	−1.31
40 10	1 27 14.7	1 27 1.6	1 26 48.5	1 26 35.4	1 26 22.3	1 26 9.2	1.28	1.31
40 20	1 27 27.6	1 27 14.5	1 27 1.3	1 26 48.2	1 26 35.1	1 26 22.0	1.29	1.31
40 30	1 27 40.6	1 27 27.4	1 27 14.3	1 27 1.1	1 26 48.0	1 26 34.8	1.30	1.32
40 40	1 27 53.7	1 27 40.5	1 27 27.4	1 27 14.2	1 27 1.0	1 26 47.8	1.31	1.32
40 50	1 28 7.0	1 27 53.7	1 27 40.5	1 27 27.3	1 27 14.1	1 27 0.9	+1.32	−1.32
41 0	1 28 20.3	1 28 7.0	1 27 53.8	1 27 40.5	1 27 27.3	1 27 14.0	1.33	1.33
41 10	1 28 33.8	1 28 20.5	1 28 7.2	1 27 53.9	1 27 40.6	1 27 27.3	1.34	1.33
41 20	1 28 47.3	1 28 34.0	1 28 20.7	1 28 7.4	1 27 54.1	1 27 40.8	1.35	1.33
41 30	1 29 1.0	1 28 47.7	1 28 34.3	1 28 21.0	1 28 7.6	1 27 54.3	1.37	1.33
41 40	1 29 14.8	1 29 1.5	1 28 48.1	1 28 34.7	1 28 21.3	1 28 7.9	+1.38	−1.34
41 50	1 29 28.8	1 29 15.3	1 29 1.9	1 28 48.5	1 28 35.1	1 28 21.6	1.39	1.34
42 0	1 29 42.8	1 29 29.3	1 29 15.9	1 29 2.4	1 28 49.0	1 28 35.5	1.40	1.35
42 10	1 29 57.0	1 29 43.5	1 29 30.0	1 29 16.5	1 29 3.0	1 28 49.5	1.41	1.35
42 20	1 30 11.3	1 29 57.7	1 29 44.2	1 29 30.7	1 29 17.1	1 29 3.6	1.42	1.35
42 30	1 30 25.7	1 30 12.1	1 29 58.5	1 29 45.0	1 29 31.4	1 29 17.8	+1.44	−1.36
42 40	1 30 40.2	1 30 26.6	1 30 13.0	1 29 59.4	1 29 45.8	1 29 32.2	1.45	1.36
42 50	1 30 54.8	1 30 41.2	1 30 27.6	1 30 13.9	1 30 0.3	1 29 46.6	1.46	1.36
43 0	1 31 9.6	1 30 55.9	1 30 42.3	1 30 28.6	1 30 14.9	1 30 1.2	1.47	1.37
43 10	1 31 24.5	1 31 10.8	1 30 57.1	1 30 43.4	1 30 29.7	1 30 15.9	1.48	1.37
43 20	1 31 39.6	1 31 25.8	1 31 12.0	1 30 58.3	1 30 44.6	1 30 30.8	+1.50	−1.38
43 30	1 31 54.7	1 31 40.9	1 31 27.1	1 31 13.3	1 30 59.6	1 30 45.8	1.51	1.38
43 40	1 32 10.0	1 31 56.2	1 31 42.3	1 31 28.5	1 31 14.7	1 31 0.9	1.53	1.38
43 50	1 32 25.4	1 32 11.6	1 31 57.7	1 31 43.8	1 31 30.0	1 31 16.1	1.54	1.39
44 0	1 32 41.0	1 32 27.1	1 32 13.2	1 31 59.3	1 31 45.4	1 31 31.5	1.55	1.39
44 10	1 32 56.7	1 32 42.7	1 32 28.8	1 32 14.8	1 32 0.9	1 31 47.0	+1.56	−1.39
44 20	1 33 12.5	1 32 58.5	1 32 44.5	1 32 30.5	1 32 16.6	1 32 2.6	1.58	1.40
44 30	1 33 28.5	1 33 14.4	1 33 0.4	1 32 46.4	1 32 32.4	1 32 18.4	1.59	1.40
44 40	1 33 44.6	1 33 30.5	1 33 16.4	1 33 2.4	1 32 48.3	1 32 34.3	1.61	1.41
44 50	1 34 0.8	1 33 46.7	1 33 32.6	1 33 18.5	1 33 4.4	1 32 50.3	1.62	1.41
45 0	1 34 17.2	1 34 3.1	1 33 48.9	1 33 34.8	1 33 20.6	1 33 6.5	+1.64	−1.41
45 10	1 34 33.7	1 34 19.6	1 34 5.4	1 33 51.2	1 33 37.0	1 33 22.8	1.65	1.42
45 20	1 34 50.4	1 34 36.2	1 34 22.0	1 34 7.7	1 33 53.5	1 33 39.3	1.66	1.42
45 30	1 35 7.2	1 34 53.0	1 34 38.7	1 34 24.4	1 34 10.2	1 33 55.9	1.68	1.43
45 40	1 35 24.2	1 35 9.9	1 34 55.6	1 34 41.3	1 34 27.0	1 34 12.7	1.69	1.43
45 50	1 35 41.3	1 35 27.0	1 35 12.6	1 34 58.3	1 34 43.9	1 34 29.6	+1.71	−1.43
46 0	1 35 58.6	1 35 44.2	1 35 29.8	1 35 15.4	1 35 1.0	1 34 46.6	1.72	1.44
46 10	1 36 16.0	1 36 1.6	1 35 47.2	1 35 32.7	1 35 18.3	1 35 3.8	1.74	1.44
46 20	1 36 33.6	1 36 19.1	1 36 4.7	1 35 50.2	1 35 35.7	1 35 21.2	1.75	1.45
46 30	1 36 51.4	1 36 36.8	1 36 22.3	1 36 7.8	1 35 53.3	1 35 38.7	1.77	1.45
46 40	1 37 9.3	1 36 54.7	1 36 40.1	1 36 25.5	1 36 11.0	1 35 56.4	+1.78	−1.46
46 50	1 37 27.3	1 37 12.7	1 36 58.1	1 36 43.4	1 36 28.8	1 36 14.2	1.80	1.46
47 0	1 37 45.5	1 37 30.9	1 37 16.2	1 37 1.5	1 36 46.9	1 36 32.2	1.82	1.47
47 10	1 38 3.9	1 37 49.2	1 37 34.5	1 37 19.8	1 37 5.1	1 36 50.4	1.84	1.47
47 20	1 38 22.5	1 38 7.7	1 37 53.0	1 37 38.2	1 37 23.5	1 37 8.7	1.85	1.48
47 30	1 38 41.2	1 38 26.4	1 38 11.6	1 37 56.8	1 37 42.0	1 37 27.2	+1.87	−1.48
47 40	1 39 0.1	1 38 45.2	1 38 30.4	1 38 15.5	1 38 0.7	1 37 45.8	1.88	1.49
47 50	1 39 19.1	1 39 4.2	1 38 49.3	1 38 34.4	1 38 19.5	1 38 4.6	1.90	1.49
48 0	1 39 38.4	1 39 23.4	1 39 8.5	1 38 53.5	1 38 38.6	1 38 23.6	1.92	1.50
48 10	1 39 57.8	1 39 42.8	1 39 27.8	1 39 12.8	1 38 57.9	1 38 42.8	1.94	1.50
48 20	1 40 17.4	1 40 2.3	1 39 47.3	1 39 32.2	1 39 17.2	1 39 2.1	+1.95	−1.51
48 30	1 40 37.1	1 40 22.0	1 40 6.9	1 39 51.8	1 39 36.7	1 39 21.6	1.97	1.51
48 40	1 40 57.1	1 40 41.9	1 40 26.8	1 40 11.6	1 39 56.5	1 39 41.3	1.99	1.52
48 50	1 41 17.2	1 41 2.0	1 40 46.8	1 40 31.6	1 40 16.4	1 40 1.2	2.01	1.52
49 0	1 41 37.5	1 41 22.3	1 41 7.0	1 40 51.8	1 40 36.5	1 40 21.3	2.03	1.52
49 10	1 41 58.0	1 41 42.7	1 41 27.4	1 41 12.1	1 40 56.8	1 40 41.5	+2.05	−1.53
49 20	1 42 18.7	1 42 3.4	1 41 48.0	1 41 32.7	1 41 17.3	1 41 2.0	2.07	1.53
49 30	1 42 39.6	1 42 24.2	1 42 8.8	1 41 53.4	1 41 38.0	1 41 22.6	2.09	1.54
49 40	1 43 0.7	1 42 45.2	1 42 29.8	1 42 14.3	1 41 58.9	1 41 43.4	2.11	1.55
49 50	1 43 22.0	1 43 6.5	1 42 51.0	1 42 35.4	1 42 19.9	1 42 4.4	2.13	1.55
50 0	1 43 43.4	1 43 27.9	1 43 12.3	1 42 56.8	1 42 41.2	1 42 25.6	+2.15	−1.56

AZIMUTH OF POLARIS AT ELONGATION. 1923.

Lat. \ Decl.	88° 53′ 20″	88° 53′ 30″	88° 53′ 40″	88° 53′ 50″	88° 54′ 0″	88° 54′ 10″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
50 0	1 43 43.4	1 43 27.9	1 43 12.3	1 42 56.8	1 42 41.2	1 42 25.6	+2.15	−1.56
50 10	1 44 5.1	1 43 49.5	1 43 33.9	1 43 18.3	1 43 2.7	1 42 47.1	2.17	1.56
50 20	1 44 27.0	1 44 11.3	1 43 55.7	1 43 40.0	1 43 24.3	1 43 8.7	2.19	1.57
50 30	1 44 49.1	1 44 33.4	1 44 17.7	1 44 1.9	1 43 46.2	1 43 30.5	2.21	1.57
50 40	1 45 11.4	1 44 55.6	1 44 39.9	1 44 24.1	1 44 8.3	1 43 52.5	2.23	1.58
50 50	1 45 33.9	1 45 18.1	1 45 2.3	1 44 46.4	1 44 30.6	1 44 14.7	+2.25	−1.58
51 0	1 45 56.7	1 45 40.8	1 45 24.9	1 45 9.0	1 44 53.1	1 44 37.2	2.27	1.59
51 10	1 46 19.6	1 46 3.7	1 45 47.7	1 45 31.8	1 45 15.8	1 44 59.9	2.29	1.59
51 20	1 46 42.8	1 46 26.8	1 46 10.8	1 45 54.8	1 45 38.7	1 45 22.7	2.31	1.60
51 30	1 47 6.2	1 46 50.1	1 46 34.1	1 46 18.0	1 46 1.9	1 45 45.8	2.33	1.61
51 40	1 47 29.8	1 47 13.7	1 47 57.6	1 46 41.4	1 46 25.3	1 46 9.2	+2.36	−1.61
51 50	1 47 53.7	1 47 37.5	1 47 21.3	1 47 5.1	1 46 48.9	1 46 32.7	2.38	1.62
52 0	1 48 17.8	1 48 1.5	1 47 45.2	1 47 29.0	1 47 12.7	1 46 56.5	2.40	1.63
52 10	1 48 42.1	1 48 25.8	1 48 9.4	1 47 53.1	1 47 36.8	1 47 20.5	2.43	1.63
52 20	1 49 6.6	1 48 50.3	1 48 33.9	1 48 17.5	1 48 1.1	1 47 44.8	2.46	1.64
52 30	1 49 31.4	1 49 15.0	1 48 58.6	1 48 42.1	1 48 25.7	1 48 9.3	+2.48	−1.64
52 40	1 49 56.5	1 49 40.0	1 49 23.5	1 49 7.0	1 48 50.5	1 48 34.0	2.50	1.65
52 50	1 50 21.8	1 50 5.2	1 49 48.6	1 49 32.1	1 49 15.5	1 48 59.0	2.52	1.66
53 0	1 50 47.3	1 50 30.7	1 50 14.0	1 49 57.4	1 49 40.8	1 49 24.2	2.55	1.66
53 10	1 51 13.1	1 50 56.4	1 50 39.7	1 50 23.0	1 50 6.3	1 49 49.7	2.57	1.67
53 20	1 51 39.2	1 51 22.4	1 51 5.6	1 50 48.9	1 50 32.1	1 50 15.4	+2.60	−1.68
53 30	1 52 5.5	1 51 48.7	1 51 31.8	1 51 15.0	1 50 58.2	1 50 41.4	2.63	1.68
53 40	1 52 32.0	1 52 15.2	1 51 58.3	1 51 41.4	1 51 24.5	1 51 7.6	2.66	1.69
53 50	1 52 58.9	1 52 41.9	1 52 25.0	1 52 8.0	1 51 51.1	1 51 34.1	2.68	1.70
54 0	1 53 26.0	1 53 9.0	1 52 52.0	1 52 35.0	1 52 18.0	1 52 0.9	2.71	1.70
54 10	1 53 53.4	1 53 36.3	1 53 19.3	1 53 2.2	1 52 45.1	1 52 28.0	+2.74	−1.71
54 20	1 54 21.1	1 54 3.9	1 53 46.8	1 53 29.6	1 53 12.5	1 52 55.3	2.76	1.72
54 30	1 54 49.1	1 54 31.8	1 54 14.6	1 53 57.4	1 53 40.1	1 53 22.9	2.79	1.72
54 40	1 55 17.3	1 55 0.0	1 54 42.7	1 54 25.4	1 54 8.1	1 53 50.8	2.82	1.73
54 50	1 55 45.8	1 55 28.5	1 55 11.1	1 54 53.7	1 54 36.4	1 54 19.0	2.85	1.74
55 0	1 56 14.7	1 55 57.2	1 55 39.8	1 55 22.4	1 55 4.9	1 54 47.5	+2.88	−1.74
55 10	1 56 43.8	1 56 26.3	1 56 8.8	1 55 51.3	1 55 33.8	1 55 16.3	2.91	1.75
55 20	1 57 13.3	1 56 55.7	1 56 38.1	1 56 20.5	1 56 2.9	1 55 45.3	2.94	1.76
55 30	1 57 43.0	1 57 25.4	1 57 7.7	1 56 50.0	1 56 32.3	1 56 14.7	2.97	1.77
55 40	1 58 13.1	1 57 55.3	1 57 37.6	1 57 19.8	1 57 2.1	1 56 44.4	3.00	1.77
55 50	1 58 43.5	1 58 25.6	1 58 7.8	1 57 50.0	1 57 32.2	1 57 14.4	+3.04	−1.78
56 0	1 59 14.2	1 58 56.3	1 58 38.4	1 58 20.5	1 58 2.6	1 57 44.7	3.07	1.79
56 10	1 59 45.2	1 59 27.2	1 59 9.2	1 58 51.3	1 58 33.3	1 58 15.3	3.10	1.80
56 20	2 0 16.5	1 59 58.5	1 59 40.4	1 59 22.4	1 59 4.4	1 58 46.3	3.14	1.80
56 30	2 0 48.2	2 0 30.1	2 0 12.0	1 59 53.9	1 59 35.8	1 59 17.6	3.17	1.81
56 40	2 1 20.3	2 1 2.1	2 0 43.9	2 0 25.7	2 0 7.5	1 59 49.2	+3.20	−1.82
56 50	2 1 52.7	2 1 34.4	2 1 16.1	2 0 57.8	2 0 39.5	2 0 21.2	3.24	1.83
57 0	2 2 25.4	2 2 7.0	2 1 48.7	2 1 30.3	2 1 11.9	2 0 53.6	3.27	1.84
57 10	2 2 58.5	2 2 40.0	2 2 21.6	2 2 3.2	2 1 44.7	2 1 26.3	3.31	1.84
57 20	2 3 32.0	2 3 13.4	2 2 54.9	2 2 36.4	2 2 17.8	2 1 59.3	3.34	1.85
57 30	2 4 5.8	2 3 47.2	2 3 28.6	2 3 9.9	2 2 51.3	2 2 32.7	+3.38	−1.86
57 40	2 4 40.0	2 4 21.3	2 4 2.6	2 3 43.9	2 3 25.2	2 3 6.5	3.42	1.87
57 50	2 5 14.6	2 4 55.8	2 4 37.0	2 4 18.2	2 3 59.4	2 3 40.6	3.46	1.88
58 0	2 5 49.5	2 5 30.6	2 5 11.8	2 4 52.9	2 4 34.0	2 4 15.1	3.49	1.89
58 10	2 6 24.9	2 6 5.9	2 5 46.9	2 5 28.0	2 5 9.0	2 4 50.0	3.53	1.90
58 20	2 7 0.6	2 6 41.6	2 6 22.5	2 6 3.5	2 5 44.4	2 5 25.4	+3.57	−1.90
58 30	2 7 36.8	2 7 17.6	2 6 58.5	2 6 39.4	2 6 20.2	2 6 1.1	3.62	1.91
58 40	2 8 13.4	2 7 54.1	2 7 34.9	2 7 15.7	2 6 56.4	2 6 37.2	3.66	1.92
58 50	2 8 50.4	2 8 31.0	2 8 11.7	2 7 52.4	2 7 33.0	2 7 13.7	3.70	1.93
59 0	2 9 27.8	2 9 8.3	2 8 48.9	2 8 29.5	2 8 10.1	2 7 50.6	3.74	1.94
59 10	2 10 5.6	2 9 46.1	2 9 26.6	2 9 7.0	2 8 47.5	2 8 28.0	+3.78	−1.95
59 20	2 10 43.9	2 10 24.3	2 10 4.7	2 9 45.0	2 9 25.4	2 9 5.8	3.83	1.96
59 30	2 11 22.6	2 11 2.9	2 10 43.2	2 10 23.5	2 10 3.7	2 9 44.0	3.87	1.97
59 40	2 12 1.8	2 11 42.0	2 11 22.2	2 11 2.4	2 10 42.5	2 10 22.7	3.92	1.98
59 50	2 12 41.4	2 12 21.5	2 12 1.6	2 11 41.7	2 11 21.8	2 11 1.8	3.96	1.99
60 0	2 13 21.5	2 13 1.5	2 12 41.5	2 12 21.5	2 12 1.5	2 11 41.4	+4.01	−2.00

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Lat. \ Decl.	88° 53′ 20″	88° 53′ 30″	88° 53′ 40″	88° 53′ 50″	88° 54′ 0″	88° 54′ 10″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
60 0	2 13 21.5	2 13 1.5	2 12 41.5	2 12 21.5	2 12 1.5	2 11 41.4	+4.01	−2.00
60 10	2 14 2.1	2 13 42.0	2 13 21.8	2 13 1.7	2 12 41.6	2 12 21.5	4.05	2.01
60 20	2 14 43.1	2 14 22.9	2 14 2.7	2 13 42.5	2 13 22.3	2 13 2.1	4.10	2.02
60 30	2 15 24.7	2 15 4.4	2 14 44.0	2 14 23.7	2 14 3.4	2 13 43.1	4.15	2.03
60 40	2 16 6.7	2 15 46.3	2 15 25.9	2 15 5.4	2 14 45.0	2 14 24.6	4.20	2.04
60 50	2 16 49.3	2 16 28.7	2 16 8.2	2 15 47.7	2 15 27.2	2 15 6.6	+4.26	−2.05
61 0	2 17 32.4	2 17 11.7	2 16 51.1	2 16 30.4	2 16 9.8	2 15 49.1	4.31	2.07
61 10	2 18 16.0	2 17 55.2	2 17 34.5	2 17 13.7	2 16 52.9	2 16 32.2	4.36	2.08
61 20	2 19 0.1	2 18 39.2	2 18 18.4	2 17 57.5	2 17 36.6	2 17 15.8	4.41	2.09
61 30	2 19 44.7	2 19 23.8	2 19 2.8	2 18 41.8	2 18 20.8	2 17 59.9	4.46	2.10
61 40	2 20 30.0	2 20 8.9	2 19 47.8	2 19 26.7	2 19 5.6	2 18 44.6	+4.52	−2.11
61 50	2 21 15.8	2 20 54.6	2 20 33.4	2 20 12.2	2 19 51.0	2 19 29.8	4.58	2.12
62 0	2 22 2.1	2 21 40.8	2 21 19.5	2 20 58.2	2 20 36.8	2 20 15.5	4.63	2.13
62 10	2 22 49.1	2 22 27.6	2 22 6.2	2 21 44.8	2 21 23.3	2 21 1.9	4.69	2.14
62 20	2 23 36.6	2 23 15.0	2 22 53.5	2 22 31.9	2 22 10.4	2 21 48.8	4.75	2.16
62 30	2 24 24.7	2 24 3.0	2 23 41.4	2 23 19.7	2 22 58.0	2 22 36.4	+4.82	−2.17
62 40	2 25 13.5	2 24 51.7	2 24 29.9	2 24 8.1	2 23 46.3	2 23 24.5	4.88	2.18
62 50	2 26 2.9	2 25 40.9	2 25 19.0	2 24 57.1	2 24 35.2	2 24 13.3	4.94	2.19
63 0	2 26 52.9	2 26 30.8	2 26 8.8	2 25 46.8	2 25 24.7	2 25 2.7	5.00	2.20
63 10	2 27 43.6	2 27 21.4	2 26 59.2	2 26 37.1	2 26 14.9	2 25 52.7	5.07	2.22
63 20	2 28 34.9	2 28 12.6	2 27 50.3	2 27 28.0	2 27 5.7	2 26 43.4	+5.13	−2.23
63 30	2 29 26.9	2 29 4.5	2 28 42.0	2 28 19.6	2 27 57.2	2 27 34.8	5.20	2.24
63 40	2 30 19.6	2 29 57.0	2 29 34.5	2 29 11.9	2 28 49.4	2 28 26.8	5.27	2.26
63 50	2 31 13.0	2 30 50.3	2 30 27.6	2 30 4.9	2 29 42.2	2 29 19.5	5.34	2.27
64 0	2 32 7.1	2 31 44.3	2 31 21.4	2 30 58.6	2 30 35.8	2 30 13.0	5.41	2.28
64 10	2 33 1.9	2 32 39.0	2 32 16.0	2 31 53.0	2 31 30.1	2 31 7.1	+5.49	−2.30
64 20	2 33 57.5	2 33 34.4	2 33 11.3	2 32 48.2	2 32 25.1	2 32 2.0	5.56	2.31
64 30	2 34 53.8	2 34 30.6	2 34 7.3	2 33 44.1	2 33 20.9	2 32 57.6	5.64	2.32
64 40	2 35 50.9	2 35 27.6	2 35 4.2	2 34 40.8	2 34 17.4	2 33 54.0	5.71	2.34
64 50	2 36 48.8	2 36 25.3	2 36 1.8	2 35 38.2	2 35 14.7	2 34 51.2	5.79	2.35
65 0	2 37 47.5	2 37 23.8	2 37 0.2	2 36 36.5	2 36 12.8	2 35 49.1	+5.87	−2.37
65 10	2 38 47.1	2 38 23.2	2 37 59.4	2 37 35.6	2 37 11.7	2 36 47.9	5.96	2.38
65 20	2 39 47.4	2 39 23.4	2 38 59.4	2 38 35.5	2 38 11.5	2 37 47.5	6.04	2.40
65 30	2 40 48.6	2 40 24.5	2 40 0.3	2 39 36.2	2 39 12.1	2 38 47.9	6.13	2.41
65 40	2 41 50.7	2 41 26.4	2 41 2.1	2 40 37.8	2 40 13.5	2 39 49.2	6.21	2.43
65 50	2 42 53.6	2 42 29.2	2 42 4.7	2 41 40.3	2 41 15.8	2 40 51.4	+6.30	−2.45
66 0	2 43 57.5	2 43 32.9	2 43 8.3	2 42 43.7	2 42 19.0	2 41 54.4	6.39	2.46
66 10	2 45 2.3	2 44 37.5	2 44 12.7	2 43 48.0	2 43 23.2	2 42 58.4	6.48	2.48
66 20	2 46 8.0	2 45 43.1	2 45 18.1	2 44 53.2	2 44 28.3	2 44 3.3	6.58	2.49
66 30	2 47 14.7	2 46 49.6	2 46 24.5	2 45 59.4	2 45 34.3	2 45 9.2	6.68	2.51
66 40	2 48 22.4	2 47 57.1	2 47 31.8	2 47 6.6	2 46 41.3	2 46 16.0	+6.78	−2.53
66 50	2 49 31.1	2 49 5.6	2 48 40.2	2 48 14.7	2 47 49.3	2 47 23.8	6.88	2.55
67 0	2 50 40.8	2 50 15.2	2 49 49.6	2 49 23.9	2 48 58.3	2 48 32.7	6.98	2.56
67 10	2 51 51.6	2 51 25.8	2 51 0.0	2 50 34.2	2 50 8.4	2 49 42.6	7.08	2.58
67 20	2 53 3.4	2 52 37.4	2 52 11.4	2 51 45.5	2 51 19.5	2 50 53.5	7.19	2.60
67 30	2 54 16.3	2 53 50.2	2 53 24.0	2 52 57.9	2 52 31.7	2 52 5.5	+7.30	−2.62
67 40	2 55 30.4	2 55 4.1	2 54 37.7	2 54 11.4	2 53 45.0	2 53 18.7	7.42	2.63
67 50	2 56 45.6	2 56 19.1	2 55 52.5	2 55 26.0	2 54 59.5	2 54 32.9	7.53	2.65
68 0	2 58 2.0	2 57 35.3	2 57 8.5	2 56 41.8	2 56 15.1	2 55 48.3	7.65	2.67
68 10	2 59 19.6	2 58 52.6	2 58 25.7	2 57 58.8	2 57 31.9	2 57 4.9	7.77	2.69
68 20	3 0 38.4	3 0 11.2	2 59 44.1	2 59 17.0	2 58 49.9	2 58 22.8	+7.90	−2.71
68 30	3 1 58.4	3 1 31.1	3 1 3.8	3 0 36.5	3 0 9.2	2 59 41.9	8.02	2.73
68 40	3 3 19.8	3 2 52.3	3 2 24.7	3 1 57.2	3 1 29.7	3 1 2.2	8.15	2.75
68 50	3 4 42.5	3 4 14.7	3 3 47.0	3 3 19.3	3 2 51.5	3 2 23.8	8.28	2.77
69 0	3 6 6.5	3 5 38.5	3 5 10.6	3 4 42.7	3 4 14.7	3 3 46.8	8.42	2.79
69 10	3 7 31.9	3 7 3.7	3 6 35.5	3 6 7.4	3 5 39.2	3 5 11.1	+8.56	−2.82
69 20	3 8 58.7	3 8 30.3	3 8 1.9	3 7 33.5	3 7 5.2	3 6 36.8	8.70	2.84
69 30	3 10 26.9	3 9 58.3	3 9 29.7	3 9 1.1	3 8 32.6	3 8 4.0	8.84	2.86
69 40	3 11 56.7	3 11 27.8	3 10 59.0	3 10 30.2	3 10 1.4	3 9 32.6	8.99	2.88
69 50	3 13 27.9	3 12 58.9	3 12 29.8	3 12 0.8	3 11 31.7	3 11 2.7	9.15	2.90
70 0	3 15 0.8	3 14 31.5	3 14 2.2	3 13 32.9	3 13 3.6	3 12 34.4	+9.31	−2.93

FOR REDUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

Azimuth at Elong. / * Time.	1° 0′	1° 10′	1° 20′	1° 30′	1° 40′	1° 50′	2° 0′	2° 10′	Azimuth at Elong. / Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
5	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
6	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
7	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
9	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
10	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
11	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
12	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
13	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
14	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
15	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
16	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
17	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
18	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
19	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
20	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
21	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
22	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
23	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
24	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
25	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

Azimuth at Elong. / * Time.	2° 10′	2° 20′	2° 30′	2° 40′	2° 50′	3° 0′	3° 10′	3° 20′	Azimuth at Elong. / Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
3	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
4	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
5	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
7	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
8	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
9	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
10	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
11	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
12	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
13	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
14	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
15	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
16	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
17	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
18	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
19	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
20	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
21	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
22	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
23	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
24	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
25	+46.4	+49.9	+53.5	+57.1	+60.7	+64.2	+67.8	+71.4	25

* Sidereal time from elongation.

TABLE VI.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS, 1923, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1923, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between either of the observed times above mentioned and upper or lower culmination, as the case may be, is given at ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

ζ URSÆ MAJORIS (MIZAR). (Upper culmination of Polaris.)							δ CASSIOPEIÆ. (Lower culmination of Polaris.)						
Date.		Lat. 40°	45°	50°	55°	60°	Date.		Lat. 35°	40°	45°	50°	55°
		m s	m s	m s	m s	m s			m s	m s	m s	m s	m s
Jan.	1	12 35	12 32	12 30	12 26	12 22	Jan.	1	13 47	13 49	13 52	13 55	13 59
	11	12 24	12 22	12 20	12 15	12 11		11	13 36	13 38	13 41	13 44	13 47
	21	12 13	12 10	12 8	12 4	12 0		21	13 25	13 27	13 29	13 32	13 36
	31	12 2	11 59	11 57	11 53	11 49		31	13 13	13 15	13 18	13 21	13 24
Feb.	10	11 51	11 49	11 46	11 43	11 38	Feb.	10	13 2	13 4	13 7	13 10	13 13
	20	11 41	11 39	11 36	11 33	11 29		20	12 52	12 54	12 57	13 0	13 3
Mar.	2	11 32	11 30	11 28	11 24	11 20	Mar.	2	12 44	12 46	12 48	12 51	12 54
								12	12 37	12 39	12 41	12 44	12 47
June	30	12 10	12 8	12 5	12 2	11 57		22	12 31	12 33	12 36	12 39	12 42
July	10	12 21	12 19	12 16	12 12	12 8	Apr.	1	12 28	12 30	12 33	12 35	12 39
	20	12 32	12 30	12 27	12 23	12 19		11	12 27	12 29	12 32	12 34	12 38
	30	12 43	12 41	12 38	12 34	12 30		21	12 28	12 30	12 33	12 36	12 39
Aug.	9	12 53	12 51	12 48	12 44	12 40	May	1	12 32	12 34	12 36	12 39	12 42
	19	13 3	13 0	12 58	12 54	12 49		11	12 37	12 39	12 41	12 44	12 47
	29	13 12	13 9	13 6	13 3	12 58		21	12 43	12 45	12 48	12 51	12 54
Sept.	8	13 20	13 17	13 14	13 10	13 6		31	12 52	12 54	12 56	12 59	13 2
	18	13 26	13 24	13 20	13 17	13 12	June	10	13 1	13 3	13 5	13 8	13 12
	28	13 31	13 29	13 25	13 22	13 17		20	13 11	13 13	13 16	13 19	13 22
Oct.	8	13 35	13 32	13 29	13 25	13 20		30	13 22	13 24	13 27	13 30	13 33
	18	13 37	13 34	13 31	13 27	13 22	July	10	13 33	13 35	13 38	13 41	13 45
	28	13 37	13 34	13 31	13 27	13 23		20	13 45	13 47	13 49	13 52	13 56
Nov.	7	13 35	13 33	13 30	13 26	13 21		30	13 56	13 58	14 0	14 3	14 7
	17	13 32	13 30	13 26	13 23	13 18							
	27	13 27	13 24	13 21	13 18	13 13	Nov.	27	14 40	14 43	14 46	14 49	14 53
Dec.	7	13 20	13 17	13 14	13 11	13 6	Dec.	7	14 33	14 36	14 38	14 42	14 46
	17	13 12	13 9	13 6	13 3	12 58		17	14 25	14 27	14 30	14 33	14 37
	27	13 2	13 0	12 57	12 53	12 48		27	14 15	14 17	14 20	14 23	14 27
	31	12 58	12 56	12 53	12 49	12 44		31	14 11	14 13	14 16	14 19	14 23

APPARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1923.

The local mean time of culmination on any meridian for a given date is found by taking from the following table the *Mean Time* of the nearest Greenwich culmination, and applying to it the product of the *Var. per Day* by the integral number of intervening days, this product being numerically additive for an earlier date and subtractive for a later date than that given in the table; and by applying also the product of the *Var. per Hour* by the longitude from Greenwich expressed in hours and fractions of an hour, this product being numerically additive for East longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12^h diminished by one-half the numerical value of the *Var. per Day*.

The last column below applies to all meridians.

Date.	Upper Culmination, Meridian of Greenwich.					Latitude.	Mean Time Interval, Elongation *minus* Upper Culm.
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.		
	h m 1 32 s	° ′ +88 53 ″	h m s	m s	W. E. s	°	W. E. h m
Jan. 1	119	49.8	6 52 24	−3 57.0	−9.87+	10	+5 58.2−
11	108	50.8	6 12 54	3 57.0	9.88	12	5 58.1
21	97	51.1	5 33 24	3 57.0	9.88	14	5 57.9
31	86	50.8	4 53 53	3 57.0	9.88	16	5 57.7
Feb. 10	75	49.9	4 14 24	3 56.9	9.87	18	5 57.6
20	65	48.3	3 34 55	−3 56.8	−9.87+	20	+5 57.4−
Mar. 2	56	46.2	2 55 27	3 56.7	9.86	22	5 57.2
12	49	43.7	2 16 1	3 56.5	9.85	24	5 57.1
22	44	40.8	1 36 36	3 56.3	9.85	26	5 56.9
Apr. 1	41	37.8	0 57 14	3 56.1	9.84	28	5 56.7
11	40	34.6	0 17 54	−3 55.9	−9.83+	30	+5 56.5−
20	41	31.5	23 38 36	3 55.7	9.82	32	5 56.3
30	44	28.5	22 59 20	3 55.5	9.81	34	5 56.0
May 10	49	25.8	22 20 6	3 55.3	9.80	36	5 55.8
20	56	23.4	21 40 54	3 55.2	9.80	38	5 55.6
30	64	21.4	21 1 43	−3 55.0	−9.79+	40	+5 55.3−
June 9	73	19.9	20 22 33	3 54.9	9.79	42	5 55.0
19	84	18.9	19 43 24	3 54.9	9.79	44	5 54.8
29	94	18.5	19 4 16	3 54.8	9.78	46	5 54.4
July 9	106	18.6	18 25 8	3 54.8	9.78	48	5 54.1
19	117	19.2	17 46 0	−3 54.8	−9.78+	50	+5 53.8−
29	128	20.4	17 6 52	3 54.8	9.78	52	5 53.4
Aug. 8	139	22.0	16 27 44	3 54.9	9.79	54	5 52.9
18	149	24.1	15 48 34	3 55.0	9.79	56	5 52.5
28	158	26.7	15 9 24	3 55.0	9.79	58	5 52.0
Sept. 7	166	29.6	14 30 13	−3 55.2	−9.80+	60	+5 51.4−
17	172	32.8	13 51 1	3 55.3	9.80	62	5 50.7
27	178	36.3	13 11 47	3 55.4	9.81	64	5 50.0
Oct. 7	182	39.9	12 32 32	3 55.6	9.82	66	5 49.1
17	184	43.7	11 53 15	3 55.8	9.82	68	5 48.1
27	184	47.4	11 13 57	−3 56.0	−9.83+	70	+5 46.9−
Nov. 6	183	51.1	10 34 36	3 56.1	9.84		
16	180	54.7	9 55 14	3 56.3	9.85		
26	175	58.0	9 15 50	3 56.5	9.85		
Dec. 6	168	60.9	8 36 24	3 56.7	9.86		
16	160	63.5	7 56 57	−3 56.8	−9.87+		
26	150	65.5	7 17 28	−3 56.9	−9.87+		

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 0	17 59	18 17	18 35	18 56	19 8	19 22	19 38	19 59	20 8	20 19	20 32	20 46	21 3
1	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 19	20 32	20 46	21 3
2	18 0	18 18	18 36	18 56	19 8	19 22	19 39	19 59	20 8	20 19	20 31	20 46	21 2
3	18 1	18 18	18 36	18 57	19 9	19 22	19 39	19 59	20 8	20 19	20 31	20 45	21 2
4	18 1	18 18	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 18	20 30	20 44	21 1
5	18 2	18 19	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 18	20 30	20 44	21 0
6	18 2	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 18	20 30	20 43	20 59
7	18 3	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 17	20 29	29 42	20 58
8	18 3	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 16	20 28	29 42	20 57
9	18 4	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 16	20 28	20 41	20 56
10	18 4	18 20	18 38	18 57	19 9	19 22	19 37	19 56	20 5	20 15	20 27	20 40	20 55
11	18 4	18 20	18 38	18 57	19 9	19 22	19 37	19 56	20 5	20 14	20 26	20 39	20 54
12	18 5	18 21	18 38	18 57	19 8	19 21	19 36	19 55	20 4	20 14	20 25	20 38	20 52
13	18 5	18 21	18 38	18 57	19 8	19 21	19 36	19 54	20 3	20 13	20 24	20 36	20 51
14	18 6	18 21	18 38	18 57	19 8	19 21	19 36	19 54	20 2	20 12	20 23	20 35	20 50
15	18 6	18 21	18 38	18 57	19 8	19 20	19 35	19 53	20 2	20 11	20 22	20 34	20 48
16	18 6	18 22	18 38	18 57	19 8	19 20	19 34	19 52	20 1	20 10	20 21	20 33	20 47
17	18 7	18 22	18 38	18 56	19 7	19 19	19 34	19 51	20 0	20 9	20 19	20 31	20 45
18	18 7	18 22	18 38	18 56	19 7	19 19	19 33	19 50	19 59	20 8	20 18	20 30	20 43
19	18 7	18 22	18 38	18 56	19 6	19 18	19 32	19 49	19 58	20 6	20 17	20 28	20 42
20	18 8	18 22	18 38	18 56	19 6	19 18	19 32	19 48	19 57	20 5	20 15	20 27	20 40
21	18 8	18 22	18 38	18 56	19 6	19 17	19 31	19 47	19 56	20 4	20 14	20 25	20 38
22	18 8	18 23	18 38	18 55	19 5	19 17	19 30	19 46	19 54	20 3	20 12	20 23	20 36
23	18 8	18 23	18 38	18 55	19 5	19 16	19 29	19 45	19 53	20 1	20 11	20 22	20 34
24	18 9	18 23	18 38	18 54	19 4	19 15	19 28	19 44	19 52	20 0	20 9	20 20	20 32
25	18 9	18 23	18 37	18 54	19 4	19 15	19 28	19 43	19 50	19 59	20 8	20 18	20 30
26	18 9	18 23	18 37	18 54	19 3	19 14	19 27	19 42	19 49	19 57	20 6	20 16	20 28
27	18 9	18 23	18 37	18 53	19 2	19 13	19 26	19 41	19 48	19 56	20 4	20 14	20 26
28	18 10	18 23	18 37	18 53	19 2	19 12	19 25	19 40	19 46	19 54	20 3	20 12	20 24
29	18 10	18 23	18 36	18 52	19 1	19 12	19 24	19 38	19 45	19 52	20 1	20 10	20 21
30	18 10	18 23	18 36	18 52	19 0	19 11	19 22	19 37	19 43	19 51	19 59	20 8	20 19
31	18 10	18 23	18 36	18 51	19 0	19 10	19 21	19 35	19 42	19 49	19 57	20 6	20 17
Feb. 1	18 10	18 22	18 36	18 50	18 59	19 9	19 20	19 34	19 40	19 47	19 55	20 4	20 14
2	18 10	18 22	18 35	18 50	18 58	19 8	19 19	19 32	19 39	19 46	19 53	20 2	20 12
3	18 10	18 22	18 35	18 49	18 58	19 7	19 18	19 31	19 37	19 44	19 51	20 0	20 10
4	18 10	18 22	18 35	18 49	18 57	19 6	19 17	19 30	19 36	19 42	19 49	19 58	20 7
5	18 10	18 22	18 34	18 48	18 56	19 5	19 15	19 28	19 34	19 40	19 47	19 56	20 5
6	18 11	18 22	18 34	18 47	18 55	19 4	19 14	19 26	19 32	19 38	19 45	19 53	20 2
7	18 11	18 22	18 33	18 47	18 54	19 3	19 13	19 25	19 30	19 36	19 43	19 51	20 0
8	18 11	18 22	18 33	18 46	18 53	19 2	19 11	19 23	19 28	19 34	19 41	19 49	19 57
9	18 11	18 21	18 32	18 45	18 52	19 0	19 10	19 22	19 27	19 33	19 39	19 46	19 55
10	18 11	18 21	18 32	18 44	18 51	18 59	19 9	19 20	19 25	19 31	19 37	19 44	19 52
11	18 11	18 21	18 32	18 44	18 50	18 58	19 7	19 18	19 23	19 28	19 35	19 42	19 49
12	18 11	18 21	18 31	18 43	18 49	18 57	19 6	19 16	19 21	19 26	19 32	19 39	19 47
13	18 11	18 20	18 30	18 42	18 48	18 56	19 4	19 15	19 19	19 24	19 30	19 37	19 44
14	18 11	18 20	18 30	18 41	18 47	18 54	19 3	19 13	19 17	19 22	19 28	19 34	19 41
15	18 11	18 20	18 29	18 40	18 46	18 53	19 1	19 11	19 15	19 20	19 26	19 32	19 39

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 1	6 7	5 50	5 32	5 11	4 59	4 45	4 28	4 8	3 58	3 48	3 35	3 21	3 4
2	6 8	5 51	5 32	5 12	5 0	4 46	4 29	4 9	3 59	3 49	3 36	3 22	3 5
3	6 8	5 51	5 33	5 12	5 0	4 46	4 30	4 10	4 0	3 50	3 38	3 24	3 7
4	6 8	5 51	5 34	5 13	5 1	4 47	4 31	4 11	4 2	3 51	3 39	3 25	3 8
5	6 9	5 52	5 34	5 14	5 2	4 48	4 32	4 12	4 3	3 52	3 40	3 26	3 10
6	6 9	5 53	5 35	5 14	5 3	4 49	4 33	4 13	4 4	3 54	3 42	3 28	3 12
7	6 10	5 53	5 36	5 15	5 4	4 50	4 34	4 14	4 5	3 55	3 43	3 30	3 14
8	6 10	5 54	5 36	5 16	5 4	4 51	4 35	4 16	4 7	3 56	3 45	3 31	3 15
9	6 11	5 54	5 37	5 17	5 5	4 52	4 36	4 17	4 8	3 58	3 46	3 33	3 17
10	6 11	5 55	5 38	5 18	5 6	4 53	4 38	4 18	4 9	3 59	3 48	3 35	3 19
11	6 12	5 55	5 38	5 18	5 7	4 54	4 39	4 20	4 11	4 1	3 50	3 36	3 21
12	6 12	5 56	5 39	5 19	5 8	4 55	4 40	4 21	4 12	4 2	3 51	3 38	3 23
13	6 12	5 56	5 39	5 20	5 9	4 56	4 41	4 22	4 14	4 4	3 53	3 40	3 26
14	6 13	5 57	5 40	5 21	5 10	4 57	4 42	4 24	4 15	4 6	3 55	3 42	3 28
15	6 13	5 57	5 41	5 22	5 11	4 58	4 43	4 25	4 17	4 7	3 56	3 44	3 30
16	6 13	5 58	5 41	5 23	5 12	4 59	4 45	4 27	4 18	4 9	3 58	3 46	3 32
17	6 14	5 58	5 42	5 24	5 13	5 0	4 46	4 28	4 20	4 11	4 0	3 48	3 34
18	6 14	5 59	5 43	5 24	5 14	5 2	4 47	4 30	4 22	4 12	4 2	3 50	3 37
19	6 14	5 59	5 43	5 25	5 15	5 3	4 49	4 31	4 23	4 14	4 4	3 52	3 39
20	6 14	6 0	5 44	5 26	5 16	5 4	4 50	4 33	4 25	4 16	4 6	3 55	3 41
21	6 15	6 0	5 45	5 27	5 17	5 5	4 51	4 34	4 26	4 18	4 8	3 57	3 44
22	6 15	6 1	5 45	5 28	5 18	5 6	4 52	4 36	4 28	4 20	4 10	3 59	3 46
23	6 16	6 1	5 46	5 29	5 19	5 7	4 54	4 38	4 30	4 22	4 12	4 1	3 49
24	6 16	6 2	5 47	5 30	5 20	5 8	4 55	4 39	4 32	4 24	4 14	4 4	3 51
25	6 16	6 2	5 47	5 30	5 21	5 10	4 57	4 41	4 34	4 25	4 16	4 6	3 54
26	6 16	6 2	5 48	5 31	5 22	5 11	4 58	4 43	4 35	4 27	4 18	4 8	3 56
27	6 16	6 3	5 48	5 32	5 23	5 12	4 59	4 44	4 37	4 29	4 20	4 10	3 59
28	6 17	6 3	5 49	5 33	5 24	5 13	5 1	4 46	4 39	4 31	4 22	4 13	4 1
29	6 17	6 4	5 50	5 34	5 25	5 14	5 2	4 48	4 41	4 33	4 24	4 15	4 4
30	6 17	6 4	5 50	5 35	5 26	5 16	5 4	4 49	4 42	4 35	4 27	4 17	4 6
31	6 17	6 4	5 51	5 36	5 27	5 17	5 5	4 51	4 44	4 37	4 29	4 20	4 9
Feb. 1	6 17	6 5	5 52	5 36	5 28	5 18	5 6	4 53	4 46	4 39	4 31	4 22	4 12
2	6 17	6 5	5 52	5 37	5 29	5 19	5 8	4 54	4 48	4 41	4 33	4 24	4 14
3	6 18	6 5	5 53	5 38	5 30	5 20	5 9	4 56	4 50	4 43	4 35	4 27	4 17
4	6 18	6 6	5 53	5 39	5 31	5 22	5 11	4 58	4 52	4 45	4 38	4 29	4 20
5	6 18	6 6	5 54	5 40	5 32	5 23	5 12	5 0	4 54	4 47	4 40	4 32	4 22
6	6 18	6 6	5 54	5 41	5 33	5 24	5 14	5 1	4 55	4 49	4 42	4 34	4 25
7	6 18	6 7	5 55	5 42	5 34	5 25	5 15	5 3	4 57	4 51	4 44	4 36	4 28
8	6 18	6 7	5 55	5 42	5 35	5 26	5 16	5 5	4 59	4 53	4 46	4 39	4 30
9	6 18	6 7	5 56	5 43	5 36	5 28	5 18	5 6	5 1	4 55	4 49	4 41	4 33
10	6 18	6 8	5 56	5 44	5 37	5 29	5 19	5 8	5 3	4 57	4 51	4 44	4 35
11	6 18	6 8	5 57	5 45	5 38	5 30	5 21	5 10	5 5	4 59	4 53	4 46	4 38
12	6 18	6 8	5 58	5 46	5 39	5 31	5 22	5 12	5 7	5 1	4 55	4 48	4 41
13	6 18	6 8	5 58	5 46	5 40	5 32	5 24	5 13	5 8	5 3	4 57	4 51	4 43
14	6 18	6 8	5 58	5 47	5 41	5 34	5 25	5 15	5 10	5 5	5 0	4 53	4 46
15	6 18	6 8	5 59	5 48	5 42	5 35	5 26	5 17	5 12	5 7	5 2	4 56	4 49
16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 4	4 58	4 51

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 15	18 11	18 20	18 29	18 40	18 46	18 53	19 1	19 11	19 15	19 20	19 26	19 32	19 39
16	18 11	18 20	18 29	18 39	18 45	18 52	19 0	19 9	19 14	19 18	19 23	19 29	19 36
17	18 11	18 19	18 28	18 38	18 44	18 51	18 58	19 7	19 12	19 16	19 21	19 27	19 33
18	18 11	18 19	18 28	18 37	18 43	18 49	18 57	19 5	19 10	19 14	19 19	19 24	19 30
19	18 10	18 19	18 27	18 36	18 42	18 48	18 55	19 4	19 7	19 12	19 16	19 22	19 28
20	18 10	18 18	18 26	18 36	18 41	18 47	18 54	19 2	19 5	19 10	19 14	19 19	19 25
21	18 10	18 18	18 26	18 35	18 40	18 45	18 52	19 0	19 3	19 7	19 12	19 17	19 22
22	18 10	18 17	18 25	18 34	18 38	18 44	18 50	18 58	19 1	19 5	19 9	19 14	19 19
23	18 10	18 17	18 24	18 33	18 37	18 42	18 48	18 56	18 59	19 3	19 7	19 11	19 16
24	18 10	18 17	18 24	18 32	18 36	18 41	18 47	18 54	18 57	19 0	19 4	19 9	19 14
25	18 10	18 16	18 23	18 30	18 35	18 40	18 45	18 52	18 55	18 58	19 2	19 6	19 11
26	18 10	18 16	18 22	18 29	18 34	18 38	18 44	18 50	18 53	18 56	18 59	19 3	19 8
27	18 9	18 15	18 22	18 28	18 32	18 37	18 42	18 48	18 51	18 54	18 57	19 1	19 5
28	18 9	18 15	18 21	18 27	18 31	18 35	18 40	18 46	18 48	18 51	18 54	18 58	19 2
Mar. 1	18 9	18 14	18 20	18 26	18 30	18 34	18 38	18 44	18 46	18 49	18 52	18 55	18 59
2	18 9	18 14	18 19	18 25	18 28	18 32	18 37	18 42	18 44	18 47	18 49	18 53	18 56
3	18 9	18 14	18 18	18 24	18 27	18 31	18 35	18 40	18 42	18 44	18 47	18 50	18 53
4	18 8	18 13	18 18	18 23	18 26	18 29	18 33	18 38	18 40	18 42	18 44	18 47	18 50
5	18 8	18 12	18 17	18 22	18 25	18 28	18 31	18 36	18 37	18 40	18 42	18 44	18 47
6	18 8	18 12	18 16	18 21	18 23	18 26	18 30	18 33	18 35	18 37	18 39	18 42	18 44
7	18 8	18 12	18 15	18 20	18 22	18 25	18 28	18 31	18 33	18 35	18 37	18 39	18 41
8	18 8	18 11	18 14	18 18	18 20	18 23	18 26	18 29	18 30	18 32	18 34	18 36	18 38
9	18 7	18 10	18 14	18 17	18 19	18 21	18 24	18 27	18 28	18 30	18 31	18 33	18 35
10	18 7	18 10	18 13	18 16	18 18	18 20	18 22	18 25	18 26	18 27	18 29	18 30	18 32
11	18 7	18 9	18 12	18 15	18 16	18 18	18 20	18 23	18 24	18 25	18 26	18 28	18 29
12	18 6	18 9	18 11	18 14	18 15	18 17	18 18	18 20	18 21	18 22	18 24	18 25	18 26
13	18 6	18 8	18 10	18 13	18 14	18 15	18 17	18 18	18 19	18 20	18 21	18 22	18 23
14	18 6	18 8	18 9	18 11	18 12	18 14	18 15	18 16	18 17	18 18	18 18	18 19	18 20
15	18 6	18 7	18 9	18 10	18 11	18 12	18 13	18 14	18 15	18 15	18 16	18 16	18 17
16	18 5	18 6	18 8	18 9	18 10	18 10	18 11	18 12	18 12	18 13	18 13	18 14	18 14
17	18 5	18 6	18 7	18 8	18 8	18 9	18 9	18 10	18 10	18 10	18 11	18 11	18 11
18	18 5	18 5	18 6	18 7	18 7	18 7	18 7	18 8	18 8	18 8	18 8	18 8	18 8
19	18 4	18 5	18 5	18 5	18 5	18 6	18 5	18 5	18 5	18 5	18 5	18 5	18 5
20	18 4	18 4	18 4	18 4	18 4	18 4	18 4	18 3	18 3	18 3	18 3	18 2	18 2
21	18 4	18 4	18 3	18 3	18 3	18 2	18 2	18 1	18 1	18 0	18 0	18 0	17 59
22	18 4	18 3	18 2	18 2	18 1	18 1	18 0	17 59	17 58	17 58	17 57	17 57	17 56
23	18 3	18 2	18 2	18 0	18 0	17 59	17 58	17 57	17 56	17 55	17 55	17 54	17 53
24	18 3	18 2	18 1	17 59	17 58	17 57	17 56	17 54	17 54	17 53	17 52	17 51	17 50
25	18 3	18 1	18 0	17 58	17 57	17 56	17 54	17 52	17 52	17 50	17 50	17 48	17 47
26	18 2	18 1	17 59	17 57	17 56	17 54	17 52	17 50	17 49	17 48	17 47	17 46	17 44
27	18 2	18 0	17 58	17 56	17 54	17 52	17 50	17 48	17 47	17 46	17 44	17 43	17 41
28	18 2	18 0	17 57	17 54	17 53	17 51	17 48	17 46	17 44	17 43	17 41	17 40	17 38
29	18 2	17 59	17 56	17 53	17 51	17 49	17 47	17 44	17 42	17 41	17 39	17 37	17 35
30	18 1	17 58	17 56	17 52	17 50	17 48	17 45	17 41	17 40	17 38	17 36	17 34	17 32
31	18 1	17 58	17 55	17 51	17 48	17 46	17 43	17 39	17 38	17 36	17 34	17 31	17 29
Apr. 1	18 1	17 57	17 54	17 50	17 47	17 44	17 41	17 37	17 35	17 33	17 31	17 28	17 26
2	18 0	17 57	17 53	17 48	17 46	17 43	17 39	17 35	17 33	17 31	17 28	17 26	17 23

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

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For sunset in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 4	4 58	4 51
17	6 18	6 9	6 0	5 50	5 44	5 37	5 29	5 20	5 16	5 11	5 6	5 0	4 54
18	6 18	6 9	6 0	5 50	5 45	5 38	5 31	5 22	5 18	5 13	5 8	5 3	4 56
19	6 18	6 9	6 1	5 51	5 46	5 40	5 32	5 24	5 20	5 15	5 10	5 5	4 59
20	6 17	6 10	6 1	5 52	5 47	5 41	5 34	5 25	5 22	5 17	5 13	5 7	5 2
21	6 17	6 10	6 2	5 53	5 48	5 42	5 35	5 27	5 23	5 19	5 15	5 10	5 4
22	6 17	6 10	6 2	5 53	5 48	5 43	5 36	5 29	5 25	5 21	5 17	5 12	5 7
23	6 17	6 10	6 3	5 54	5 49	5 44	5 38	5 30	5 27	5 23	5 19	5 14	5 9
24	6 17	6 10	6 3	5 55	5 50	5 45	5 39	5 32	5 29	5 25	5 21	5 17	5 12
25	6 17	6 10	6 3	5 56	5 51	5 46	5 40	5 34	5 31	5 27	5 23	5 19	5 14
26	6 17	6 10	6 4	5 56	5 52	5 47	5 42	5 35	5 32	5 29	5 26	5 22	5 17
27	6 16	6 10	6 4	5 57	5 53	5 49	5 43	5 37	5 34	5 31	5 28	5 24	5 20
28	6 16	6 10	6 4	5 58	5 54	5 50	5 44	5 39	5 36	5 33	5 30	5 26	5 22
Mar. 1	6 16	6 10	6 5	5 58	5 55	5 51	5 46	5 40	5 38	5 35	5 32	5 28	5 25
2	6 16	6 10	6 5	5 59	5 56	5 52	5 47	5 42	5 40	5 37	5 34	5 31	5 27
3	6 16	6 11	6 6	6 0	5 56	5 53	5 49	5 44	5 42	5 39	5 36	5 33	5 30
4	6 15	6 11	6 6	6 0	5 57	5 54	5 50	5 45	5 43	5 41	5 38	5 35	5 32
5	6 15	6 11	6 6	6 1	5 58	5 55	5 51	5 47	5 45	5 43	5 40	5 38	5 35
6	6 15	6 11	6 7	6 2	5 59	5 56	5 53	5 49	5 47	5 45	5 43	5 40	5 37
7	6 15	6 11	6 7	6 3	6 0	5 57	5 54	5 50	5 49	5 47	5 45	5 42	5 40
8	6 14	6 11	6 7	6 3	6 1	5 58	5 55	5 52	5 50	5 49	5 47	5 45	5 42
9	6 14	6 11	6 8	6 4	6 2	5 59	5 57	5 54	5 52	5 51	5 49	5 47	5 45
10	6 14	6 11	6 8	6 4	6 2	6 0	5 58	5 55	5 54	5 52	5 51	5 49	5 47
11	6 14	6 11	6 8	6 5	6 3	6 1	5 59	5 57	5 56	5 54	5 53	5 51	5 50
12	6 13	6 11	6 8	6 6	6 4	6 2	6 1	5 58	5 57	5 56	5 55	5 54	5 52
13	6 13	6 11	6 9	6 6	6 5	6 4	6 2	6 0	5 59	5 58	5 57	5 56	5 55
14	6 13	6 11	6 9	6 7	6 6	6 5	6 3	6 2	6 1	6 0	5 59	5 58	5 57
15	6 13	6 11	6 10	6 8	6 7	6 6	6 5	6 3	6 3	6 2	6 1	6 1	6 0
16	6 12	6 11	6 10	6 8	6 8	6 7	6 6	6 5	6 4	6 4	6 3	6 3	6 2
17	6 12	6 11	6 10	6 9	6 8	6 8	6 7	6 6	6 6	6 6	6 5	6 5	6 4
18	6 12	6 11	6 10	6 10	6 9	6 9	6 8	6 8	6 8	6 8	6 8	6 7	6 7
19	6 12	6 11	6 11	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 9
20	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 12	6 12	6 12	6 12
21	6 11	6 11	6 11	6 11	6 12	6 12	6 12	6 13	6 13	6 13	6 14	6 14	6 14
22	6 10	6 11	6 11	6 12	6 12	6 13	6 14	6 14	6 15	6 15	6 16	6 16	6 17
23	6 10	6 11	6 12	6 13	6 13	6 14	6 15	6 16	6 16	6 17	6 18	6 18	6 19
24	6 10	6 11	6 12	6 13	6 14	6 15	6 16	6 18	6 18	6 19	6 20	6 21	6 22
25	6 10	6 11	6 12	6 14	6 15	6 16	6 17	6 19	6 20	6 21	6 22	6 23	6 24
26	6 9	6 11	6 12	6 14	6 16	6 17	6 19	6 21	6 22	6 23	6 24	6 25	6 26
27	6 9	6 11	6 13	6 15	6 16	6 18	6 20	6 22	6 23	6 25	6 26	6 27	6 29
28	6 9	6 11	6 13	6 16	6 17	6 19	6 21	6 24	6 25	6 26	6 28	6 30	6 31
29	6 8	6 11	6 13	6 16	6 18	6 20	6 22	6 25	6 27	6 28	6 30	6 32	6 34
30	6 8	6 11	6 14	6 17	6 19	6 21	6 24	6 27	6 28	6 30	6 32	6 34	6 36
31	6 8	6 11	6 14	6 18	6 20	6 22	6 25	6 28	6 30	6 32	6 34	6 36	6 39
Apr. 1	6 8	6 11	6 14	6 18	6 20	6 23	6 26	6 30	6 32	6 34	6 36	6 38	6 41
2	6 7	6 10	6 14	6 19	6 21	6 24	6 28	6 32	6 34	6 36	6 38	6 41	6 44
3	6 7	6 10	6 15	6 19	6 22	6 25	6 29	6 33	6 35	6 38	6 40	6 43	6 46

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	18 1	17 57	17 54	17 50	17 47	17 44	17 41	17 37	17 35	17 33	17 31	17 28	17 26
2	18 0	17 57	17 53	17 48	17 46	17 43	17 39	17 35	17 33	17 31	17 28	17 26	17 23
3	18 0	17 56	17 52	17 47	17 44	17 41	17 37	17 33	17 31	17 28	17 26	17 23	17 20
4	18 0	17 56	17 51	17 46	17 43	17 40	17 35	17 30	17 28	17 26	17 23	17 20	17 17
5	17 59	17 55	17 50	17 45	17 42	17 38	17 34	17 28	17 26	17 23	17 20	17 17	17 14
6	17 59	17 54	17 50	17 44	17 40	17 36	17 32	17 26	17 24	17 21	17 18	17 14	17 10
7	17 59	17 54	17 49	17 42	17 39	17 35	17 30	17 24	17 22	17 18	17 15	17 12	17 7
8	17 58	17 53	17 48	17 41	17 38	17 33	17 28	17 22	17 19	17 16	17 13	17 9	17 4
9	17 58	17 53	17 47	17 41	17 36	17 32	17 26	17 20	17 17	17 14	17 10	17 6	17 2
10	17 58	17 52	17 46	17 39	17 35	17 30	17 24	17 18	17 15	17 11	17 8	17 3	16 59
11	17 58	17 52	17 45	17 38	17 34	17 29	17 23	17 16	17 12	17 9	17 5	17 1	16 56
12	17 57	17 51	17 45	17 37	17 32	17 27	17 21	17 14	17 10	17 7	17 2	16 58	16 53
13	17 57	17 51	17 44	17 36	17 31	17 26	17 19	17 12	17 8	17 4	17 0	16 55	16 50
14	17 57	17 50	17 43	17 34	17 30	17 24	17 17	17 10	17 6	17 2	16 57	16 52	16 47
15	17 57	17 50	17 42	17 33	17 28	17 22	17 16	17 8	17 4	17 0	16 55	16 50	16 44
16	17 56	17 49	17 41	17 32	17 27	17 21	17 14	17 5	17 1	16 57	16 52	16 47	16 41
17	17 56	17 49	17 41	17 31	17 26	17 20	17 12	17 3	16 59	16 55	16 50	16 44	16 38
18	17 56	17 48	17 40	17 30	17 24	17 18	17 10	17 1	16 57	16 52	16 47	16 42	16 35
19	17 56	17 48	17 39	17 29	17 23	17 16	17 9	16 59	16 55	16 50	16 45	16 39	16 32
20	17 55	17 47	17 38	17 28	17 22	17 15	17 7	16 57	16 53	16 48	16 42	16 36	16 29
21	17 55	17 47	17 38	17 27	17 21	17 14	17 5	16 55	16 51	16 46	16 40	16 34	16 26
22	17 55	17 46	17 37	17 26	17 20	17 12	17 4	16 53	16 49	16 43	16 37	16 31	16 23
23	17 55	17 46	17 36	17 25	17 18	17 11	17 2	16 51	16 46	16 41	16 35	16 28	16 20
24	17 55	17 45	17 35	17 24	17 17	17 10	17 0	16 50	16 44	16 39	16 33	16 26	16 18
25	17 54	17 45	17 35	17 23	17 16	17 8	16 59	16 48	16 42	16 37	16 30	16 23	16 15
26	17 54	17 45	17 34	17 22	17 15	17 7	16 57	16 46	16 40	16 34	16 28	16 20	16 12
27	17 54	17 44	17 33	17 21	17 14	17 5	16 56	16 44	16 38	16 32	16 25	16 18	16 9
28	17 54	17 44	17 33	17 20	17 13	17 4	16 54	16 42	16 36	16 30	16 23	16 15	16 6
29	17 54	17 43	17 32	17 19	17 11	17 3	16 52	16 40	16 34	16 28	16 21	16 13	16 4
30	17 54	17 43	17 32	17 18	17 10	17 2	16 51	16 38	16 32	16 26	16 18	16 10	16 1
May 1	17 54	17 43	17 31	17 17	17 9	17 0	16 50	16 37	16 30	16 24	16 16	16 8	15 58
2	17 54	17 42	17 30	17 16	17 8	16 59	16 48	16 35	16 29	16 22	16 14	16 5	15 55
3	17 53	17 42	17 30	17 16	17 7	16 58	16 46	16 33	16 27	16 20	16 12	16 3	15 53
4	17 53	17 42	17 29	17 15	17 6	16 57	16 45	16 31	16 25	16 18	16 10	16 0	15 50
5	17 53	17 41	17 28	17 14	17 5	16 55	16 44	16 30	16 23	16 16	16 7	15 58	15 47
6	17 53	17 41	17 28	17 13	17 4	16 54	16 42	16 28	16 21	16 14	16 5	15 56	15 45
7	17 53	17 41	17 28	17 12	17 3	16 53	16 41	16 26	16 19	16 12	16 3	15 53	15 42
8	17 53	17 40	17 27	17 11	17 2	16 52	16 40	16 25	16 18	16 10	16 1	15 51	15 40
9	17 53	17 40	17 26	17 11	17 1	16 51	16 38	16 23	16 16	16 8	15 59	15 49	15 37
10	17 53	17 40	17 26	17 10	17 0	16 50	16 37	16 22	16 14	16 6	15 57	15 46	15 34
11	17 53	17 40	17 26	17 9	17 0	16 49	16 36	16 20	16 12	16 4	15 55	15 44	15 32
12	17 53	17 40	17 26	17 9	16 59	16 48	16 34	16 18	16 11	16 2	15 53	15 42	15 29
13	17 53	17 39	17 25	17 8	16 58	16 47	16 33	16 17	16 9	16 1	15 51	15 40	15 27
14	17 53	17 39	17 24	17 7	16 57	16 46	16 32	16 16	16 8	15 59	15 49	15 38	15 25
15	17 53	17 39	17 24	17 7	16 56	16 45	16 31	16 14	16 6	15 57	15 47	15 36	15 22
16	17 53	17 39	17 24	17 6	16 56	16 44	16 30	16 13	16 5	15 56	15 45	15 34	15 20
17	17 53	17 38	17 23	17 5	16 55	16 43	16 29	16 11	16 3	15 54	15 44	15 32	15 18

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 2	6 7	6 10	6 14	6 19	6 21	6 24	6 28	6 32	6 34	6 36	6 38	6 41	6 44
3	6 7	6 10	6 15	6 19	6 22	6 25	6 29	6 33	6 35	6 38	6 40	6 43	6 46
4	6 7	6 10	6 15	6 20	6 23	6 26	6 30	6 35	6 37	6 40	6 42	6 45	6 48
5	6 6	6 10	6 15	6 20	6 24	6 27	6 31	6 36	6 39	6 41	6 44	6 47	6 51
6	6 6	6 10	6 15	6 21	6 24	6 28	6 33	6 38	6 40	6 43	6 46	6 50	6 53
7	6 6	6 10	6 16	6 22	6 25	6 29	6 34	6 39	6 42	6 45	6 48	6 52	6 56
8	6 6	6 10	6 16	6 22	6 26	6 30	6 35	6 41	6 44	6 47	6 50	6 54	6 58
9	6 5	6 10	6 16	6 23	6 27	6 31	6 36	6 43	6 46	6 49	6 52	6 56	7 1
10	6 5	6 10	6 16	6 24	6 28	6 32	6 38	6 44	6 47	6 50	6 54	6 58	7 3
11	6 5	6 10	6 17	6 24	6 28	6 33	6 39	6 46	6 49	6 52	6 56	7 1	7 6
12	6 4	6 10	6 17	6 25	6 29	6 34	6 40	6 47	6 51	6 54	6 58	7 3	7 8
13	6 4	6 10	6 17	6 25	6 30	6 35	6 42	6 49	6 52	6 56	7 0	7 5	7 10
14	6 4	6 10	6 18	6 26	6 31	6 36	6 43	6 50	6 54	6 58	7 2	7 7	7 13
15	6 4	6 10	6 18	6 26	6 32	6 37	6 44	6 52	6 56	7 0	7 4	7 9	7 15
16	6 3	6 10	6 18	6 27	6 32	6 38	6 45	6 54	6 58	7 2	7 6	7 12	7 18
17	6 3	6 10	6 18	6 28	6 33	6 39	6 46	6 55	6 59	7 4	7 8	7 14	7 20
18	6 3	6 10	6 19	6 28	6 34	6 40	6 48	6 57	7 1	7 5	7 10	7 16	7 23
19	6 3	6 11	6 19	6 29	6 35	6 41	6 49	6 58	7 3	7 7	7 12	7 18	7 25
20	6 2	6 11	6 19	6 30	6 36	6 42	6 50	7 0	7 4	7 9	7 14	7 21	7 28
21	6 2	6 11	6 20	6 30	6 36	6 43	6 52	7 1	7 6	7 11	7 17	7 23	7 30
22	6 2	6 11	6 20	6 31	6 37	6 44	6 53	7 3	7 8	7 13	7 19	7 25	7 33
23	6 2	6 11	6 20	6 31	6 38	6 45	6 54	7 4	7 9	7 15	7 21	7 27	7 35
24	6 2	6 11	6 21	6 32	6 39	6 46	6 55	7 6	7 11	7 17	7 23	7 30	7 38
25	6 2	6 11	6 21	6 33	6 40	6 47	6 57	7 8	7 13	7 18	7 25	7 32	7 40
26	6 1	6 11	6 21	6 33	6 40	6 48	6 58	7 9	7 14	7 20	7 27	7 34	7 42
27	6 1	6 11	6 22	6 34	6 41	6 49	6 59	7 11	7 16	7 22	7 29	7 36	7 45
28	6 1	6 11	6 22	6 35	6 42	6 50	7 0	7 12	7 18	7 24	7 31	7 39	7 47
29	6 1	6 11	6 22	6 35	6 43	6 51	7 2	7 14	7 19	7 26	7 33	7 41	7 50
30	6 1	6 11	6 23	6 36	6 44	6 52	7 3	7 15	7 21	7 28	7 35	7 43	7 52
May 1	6 1	6 12	6 23	6 37	6 44	6 53	7 4	7 17	7 23	7 30	7 37	7 45	7 55
2	6 0	6 12	6 23	6 37	6 45	6 54	7 5	7 18	7 24	7 31	7 39	7 48	7 57
3	6 0	6 12	6 24	6 38	6 46	6 55	7 7	7 20	7 26	7 33	7 41	7 50	8 0
4	6 0	6 12	6 24	6 38	6 47	6 56	7 8	7 21	7 28	7 35	7 43	7 52	8 2
5	6 0	6 12	6 25	6 39	6 48	6 57	7 9	7 23	7 30	7 37	7 45	7 54	8 5
6	6 0	6 12	6 25	6 40	6 49	6 58	7 10	7 24	7 31	7 39	7 47	7 56	8 7
7	6 0	6 12	6 25	6 40	6 49	6 59	7 12	7 26	7 33	7 40	7 49	7 58	8 10
8	6 0	6 12	6 26	6 41	6 50	7 0	7 13	7 28	7 34	7 42	7 51	8 1	8 12
9	6 0	6 12	6 26	6 42	6 51	7 1	7 14	7 29	7 36	7 44	7 53	8 3	8 15
10	6 0	6 13	6 26	6 42	6 52	7 2	7 15	7 30	7 38	7 46	7 55	8 5	8 17
11	6 0	6 13	6 27	6 43	6 53	7 3	7 16	7 32	7 39	7 48	7 57	8 7	8 20
12	6 0	6 13	6 27	6 44	6 53	7 4	7 17	7 33	7 41	7 49	7 59	8 9	8 22
13	6 0	6 13	6 28	6 44	6 54	7 5	7 19	7 35	7 42	7 51	8 1	8 12	8 24
14	6 0	6 13	6 28	6 45	6 55	7 6	7 20	7 36	7 44	7 53	8 2	8 14	8 27
15	6 0	6 14	6 28	6 46	6 56	7 7	7 21	7 38	7 46	7 54	8 4	8 16	8 29
16	6 0	6 14	6 29	6 46	6 56	7 8	7 22	7 39	7 47	7 56	8 6	8 18	8 31
17	6 0	6 14	6 29	6 47	6 57	7 9	7 23	7 40	7 49	7 58	8 8	8 20	8 34
18	6 0	6 14	6 30	6 48	6 58	7 10	7 24	7 42	7 50	7 59	8 10	8 22	8 36

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 17	17 53	17 38	17 23	17 5	16 55	16 43	16 29	16 11	16 3	15 54	15 44	15 32	15 18
18	17 53	17 38	17 23	17 5	16 54	16 42	16 28	16 10	16 2	15 52	15 42	15 30	15 16
19	17 53	17 38	17 22	17 4	16 54	16.41	16 27	16 9	16 0	15 51	15 40	15 28	15 13
20	17 53	17 38	17 22	17 4	16 53	16 40	16 26	16 8	15 59	15 49	15 38	15 26	15 11
21	17 53	17 38	17 22	17 3	16 52	16 40	16 25	16 6	15 58	15 48	15 37	15 24	15 9
22	17 53	17 38	17 22	17 3	16 52	16 39	16 24	16 5	15 56	15 46	15 35	15 22	15 7
23	17 53	17 38	17 21	17 2	16 51	16 38	16 23	16 4	15 55	15 45	15 34	15 20	15 5
24	17 53	17 38	17 21	17 2	16 50	16 38	16 22	16 3	15 54	15 44	15 32	15 19	15 3
25	17 53	17 38	17 21	17 1	16 50	16 37	16 21	16 2	15 53	15 42	15 31	15 17	15 1
26	17 53	17 38	17 21	17 1	16 50	16 36	16 20	16 1	15 52	15 41	15 29	15 15	14 59
27	17 53	17 38	17 20	17 1	16 49	16 36	16 20	16 0	15 51	15 40	15 28	15 14	14 57
28	17 54	17 38	17 20	17 0	16 49	16 35	16 19	15 59	15 50	15 39	15 27	15 12	14 56
29	17 54	17 38	17 20	17 0	16 48	16 35	16 18	15 58	15 49	15 38	15 25	15 11	14 54
30	17 54	17 38	17 20	17 0	16 48	16 34	16 18	15 57	15 48	15 37	15 24	15 10	14 52
31	17 54	17 38	17 20	16 59	16 47	16 34	16 17	15 56	15 47	15 36	15 23	15 8	14 50
June 1	17 54	17 38	17 20	16 59	16 47	16 33	16 16	15 56	15 46	15 35	15 22	15 7	14 49
2	17 54	17 38	17 20	16 59	16 47	16 33	16 16	15 55	15 45	15 34	15 21	15 6	14 48
3	17 54	17 38	17 20	16 59	16 46	16 32	16 16	15 54	15 44	15 33	15 20	15 5	14 46
4	17 54	17 38	17 20	16 59	16 46	16 32	16 15	15 54	15 44	15 32	15 19	15 4	14 45
5	17 55	17 38	17 20	16 58	16 46	16 32	16 15	15 53	15 43	15 31	15 18	15 3	14 44
6	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 53	15 42	15 31	15 17	15 2	14 43
7	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 42	15 30	15 16	15 1	14 42
8	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 41	15 30	15 16	15 0	14 41
9	17 55	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 41	15 29	15 15	14 59	14 40
10	17 56	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 40	15 28	15 15	14 58	14 39
11	17 56	17 38	17 20	16 58	16 45	16 30	16 13	15 51	15 40	15.28	15 14	14 58	14 38
12	17 56	17 39	17 20	16 58	16 45	16 30	16 13	15 50	15 40	15 28	15 14	14 57	14 37
13	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15.40	15.27	15 13	14 57	14 37
14	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
15	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
16	17 57	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
17	17 57	17 40	17 20	16 59	16 45	16 30	16 12	15 50	15 39	15 27	15 12	14 56	14 35
18	17 57	17 40	17 21	16 59	16 46	16 30	16 13	15 50	15 39	15 27	15 12	14 56	14 35
19	17 57	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 12	14 56	14 35
20	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
21	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
22	17 58	17 40	17 22	16 59	16 46	16 31	16 13	15 51	15 40	15 27	15 13	14 56	14 36
23	17 58	17 41	17 22	17 0	16 46	16 31	16 13	15 51	15 40	15 28	15 13	14 56	14 36
24	17 58	17 41	17 22	17 0	16 47	16 32	16 14	15 51	15 40	15 28	15 14	14 57	14 36
25	17 59	17 41	17 22	17 0	16 47	16 32	16 14	15 52	15 41	15 28	15 14	14 57	14 37
26	17 59	17 41	17 22	17 0	16 48	16 32	16 14	15 52	15 41	15 29	15 15	14 58	14 38
27	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 52	15 42	15 29	15 15	14 58	14 38
28	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 53	15 42	15 30	15 16	14 59	14 39
29	18 0	17 42	17 23	17 1	16 48	16 34	16 16	15 53	15 43	15 30	15 16	15 0	14 40
30	18 0	17 42	17 24	17 2	16 49	16 34	16 16	15 54	15 43	15 31	15 17	15 1	14 41
July 1	18 0	17 43	17 24	17 2	16 49	16 34	16 17	15 55	15 44	15 32	15 18	15 2	14 42
2	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 45	15 33	15 19	15 3	14 43

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 18	6 0	6 14	6 30	6 48	6 58	7 10	7 24	7 42	7 50	7 59	8 10	8 22	8 36
19	6 0	6 14	6 30	6 48	6 59	7 11	7 25	7 43	7 52	8 1	8 12	8 24	8 38
20	6 0	6 15	6 30	6 49	7 0	7 12	7 26	7 44	7 53	8 3	8 14	8 26	8 40
21	6 0	6 15	6 31	6 49	7 0	7 13	7 28	7 46	7 55	8 4	8 15	8 28	8 43
22	6 0	6 15	6 31	6 50	7 1	7 14	7 29	7 47	7 56	8 6	8 17	8 30	8 45
23	6 0	6 15	6 32	6 51	7 2	7 15	7 30	7 48	7 57	8 7	8 19	8 32	8 47
24	6 0	6 16	6 32	6 51	7 2	7 15	7 31	7 50	7 59	8 9	8 20	8 34	8 49
25	6 0	6 16	6 32	6 52	7 3	7 16	7 32	7 51	8 0	8 10	8 22	8 36	8 52
26	6 0	6 16	6 33	6 52	7 4	7 17	7 33	7 52	8 2	8 12	8 24	8 37	8 54
27	6 0	6 16	6 33	6 53	7 5	7 18	7 34	7 53	8 3	8 13	8 25	8 39	8 56
28	6 1	6 17	6 34	6 54	7 5	7 19	7 35	7 55	8 4	8 15	8 27	8 41	8 58
29	6 1	6 17	6 34	6 54	7 6	7 20	7 36	7 56	8 5	8 16	8 28	8 43	9 0
30	6 1	6 17	6 34	6 55	7 7	7 20	7 36	7 57	8 6	8 17	8 30	8 44	9 2
31	6 1	6 17	6 35	6 55	7 7	7 21	7 37	7 58	8 8	8 19	8 31	8 46	9 4
June 1	6 1	6 18	6 35	6 56	7 8	7 22	7 38	7 59	8 9	8 20	8 33	8 48	9 5
2	6 1	6 18	6 36	6 56	7 8	7 22	7 39	8 0	8 10	8 21	8 34	8 49	9 7
3	6 1	6 18	6 36	6 56	7 9	7 23	7 40	8 1	8 11	8 22	8 35	8 50	9 9
4	6 2	6 18	6 36	6 57	7 10	7 24	7 41	8 2	8 12	8 24	8 37	8 52	9 10
5	6 2	6 18	6 37	6 58	7 10	7 24	7 42	8 3	8 13	8 25	8 38	8 53	9 12
6	6 2	6 19	6 37	6 58	7 11	7 25	7 42	8 4	8 14	8 26	8 39	8 55	9 14
7	6 2	6 19	6 38	6 59	7 11	7 26	7 43	8 5	8 15	8 27	8 40	8 56	9 15
8	6 2	6 20	6 38	6 59	7 12	7 26	7 44	8 6	8 16	8 28	8 41	8 57	9 16
9	6 2	6 20	6 38	7 0	7 12	7 27	7 44	8 6	8 17	8 29	8 42	8 58	9 18
10	6 3	6 20	6 38	7 0	7 13	7 28	7 45	8 7	8 18	8 30	8 43	8 59	9 19
11	6 3	6 20	6 39	7 1	7 13	7 28	7 46	8 8	8 18	8 30	8 44	9 1	9 20
12	6 3	6 20	6 39	7 1	7 14	7 29	7 46	8 8	8 19	8 31	8 45	9 2	9 21
13	6 3	6 21	6 40	7 1	7 14	7 29	7 47	8 9	8 20	8 32	8 46	9 2	9 22
14	6 4	6 21	6 40	7 2	7 15	7 30	7 47	8 10	8 20	8 33	8 47	9 3	9 23
15	6 4	6 21	6 40	7 2	7 15	7 30	7 48	8 10	8 21	8 33	8 47	9 4	9 24
16	6 4	6 22	6 40	7 2	7 15	7 30	7 48	8 11	8 22	8 34	8 48	9 5	9 25
17	6 4	6 22	6 41	7 3	7 16	7 31	7 49	8 11	8 22	8 34	8 49	9 5	9 26
18	6 4	6 22	6 41	7 3	7 16	7 31	7 49	8 12	8 22	8 35	8 49	9 6	9 26
19	6 5	6 22	6 41	7 3	7 16	7 31	7 49	8 12	8 23	8 35	8 50	9 6	9 27
20	6 5	6 22	6 41	7 4	7 17	7 32	7 50	8 12	8 23	8 36	8 50	9 7	9 27
21	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 12	8 24	8 36	8 50	9 7	9 28
22	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 50	9 7	9 28
23	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 50	9 7	9 28
24	6 6	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
25	6 6	6 24	6 42	7 4	7 18	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
26	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 51	9 7	9 28
27	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 28
28	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 27
29	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 24	8 36	8 50	9 7	9 27
30	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 24	8 36	8 50	9 6	9 26
July 1	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 23	8 35	8 49	9 6	9 26
2	6 7	6 25	6 43	7 5	7 18	7 33	7 50	8 12	8 23	8 35	8 49	9 5	9 25
3	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 23	8 35	8 48	9 5	9 24

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 1	18 0	17 43	17 24	17 2	16 49	16 34	16 17	15 55	15 44	15 32	15 18	15 2	14 42
2	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 45	15 33	15 19	15 3	14 43
3	18 0	17 43	17 25	17 3	16 50	16 36	16 18	15 56	15 45	15 34	15 20	15 4	14 44
4	18 0	17 43	17 25	17 3	16 51	16 36	16 19	15 57	15 46	15 34	15 21	15 5	14 45
5	18 1	17 44	17 25	17 4	16 51	16 37	16 19	15 58	15 47	15 35	15 22	15 6	14 46
6	18 1	17 44	17 26	17 4	16 52	16 37	16 20	15 58	15 48	15 36	15 23	15 7	14 48
7	18 1	17 44	17 26	17 5	16 52	16 38	16 21	15 59	15 49	15 37	15 24	15 8	14 49
8	18 1	17 44	17 26	17 5	16 53	16 38	16 21	16 0	15 50	15 38	15 25	15 10	14 51
9	18 1	17 45	17 27	17 6	16 53	16 39	16 22	16 1	15 51	15 39	15 26	15 11	14 52
10	18 2	17 45	17 27	17 6	16 54	16 40	16 23	16 2	15 52	15 40	15 27	15 12	14 54
11	18 2	17 45	17 27	17 7	16 54	16 40	16 24	16 3	15 53	15 42	15 29	15 14	14 56
12	18 2	17 45	17 28	17 7	16 55	16 41	16 24	16 4	15 54	15 43	15 30	15 15	14 57
13	18 2	17 46	17 28	17 8	16 56	16 42	16 25	16 5	15 55	15 44	15 32	15 17	14 59
14	18 2	17 46	17 28	17 8	16 56	16 43	16 26	16 6	15 56	15 45	15 33	15 18	15 1
15	18 2	17 46	17 29	17 9	16 57	16 43	16 27	16 7	15 58	15 47	15 34	15 20	15 3
16	18 2	17 46	17 29	17 9	16 58	16 44	16 28	16 8	15 59	15 48	15 36	15 22	15 5
17	18 2	17 47	17 30	17 10	16 58	16 45	16 29	16 9	16 0	15 49	15 37	15 24	15 7
18	18 2	17 47	17 30	17 10	16 59	16 46	16 30	16 10	16 1	15 51	15 39	15 25	15 9
19	18 2	17 47	17 30	17 11	17 0	16 46	16 31	16 12	16 2	15 52	15 41	15 27	15 11
20	18 3	17 47	17 31	17 12	17 0	16 47	16 32	16 13	16 4	15 54	15 42	15 29	15 13
21	18 3	17 48	17 31	17 12	17 1	16 48	16 33	16 14	16 5	15 55	15 44	15 31	15 15
22	18 3	17 48	17 32	17 13	17 2	16 49	16 34	16 15	16 7	15 57	15 45	15 33	15 17
23	18 3	17 48	17 32	17 13	17 2	16 50	16 35	16 17	16 8	15 58	15 47	15 34	15 20
24	18 3	17 48	17 32	17 14	17 3	16 51	16 36	16 18	16 9	16 0	15 49	15 36	15 22
25	18 3	17 48	17 33	17 14	17 4	16 52	16 37	16 19	16 11	16 1	15 51	15 38	15 24
26	18 3	17 48	17 33	17 15	17 5	16 52	16 38	16 20	16 12	16 3	15 52	15 40	15 26
27	18 3	17 49	17 33	17 16	17 5	16 53	16 39	16 22	16 14	16 5	15 54	15 42	15 28
28	18 3	17 49	17 34	17 16	17 6	16 54	16 40	16 23	16 15	16 6	15 56	15 44	15 31
29	18 3	17 49	17 34	17 17	17 7	16 55	16 42	16 25	16 17	16 8	15 58	15 46	15 33
30	18 3	17 49	17 34	17 18	17 8	16 56	16 43	16 26	16 18	16 10	16 0	15 48	15 35
31	18 3	17 49	17 35	17 18	17 8	16 57	16 44	16 27	16 20	16 11	16 1	15 51	15 38
Aug. 1	18 3	17 50	17 35	17 19	17 9	16 58	16 45	16 29	16 21	16 13	16 3	15 53	15 40
2	18 3	17 50	17 36	17 19	17 10	16 59	16 46	16 30	16 23	16 15	16 5	15 55	15 42
3	18 3	17 50	17 36	17 20	17 10	17 0	16 47	16 32	16 24	16 16	16 7	15 57	15 45
4	18 2	17 50	17 36	17 20	17 11	17 1	16 48	16 33	16 26	16 18	16 9	15 59	15 47
5	18 2	17 50	17 36	17 21	17 12	17 2	16 50	16 34	16 28	16 20	16 11	16 1	15 50
6	18 2	17 50	17 37	17 22	17 13	17 3	16 51	16 36	16 29	16 21	16 13	16 3	15 52
7	18 2	17 50	17 37	17 22	17 14	17 4	16 52	16 37	16 31	16 23	16 15	16 5	15 54
8	18 2	17 50	17 38	17 23	17 14	17 5	16 53	16 39	16 32	16 25	16 17	16 8	15 57
9	18 2	17 50	17 38	17 24	17 15	17 6	16 54	16 40	16 34	16 27	16 19	16 10	15 59
10	18 2	17 50	17 38	17 24	17 16	17 6	16 55	16 42	16 36	16 28	16 21	16 12	16 2
11	18 2	17 51	17 38	17 25	17 17	17 7	16 57	16 43	16 37	16 30	16 23	16 14	16 4
12	18 2	17 51	17 39	17 25	17 17	17 8	16 58	16 45	16 39	16 32	16 24	16 16	16 6
13	18 1	17 51	17 39	17 26	17 18	17 9	16 59	16 46	16 40	16 34	16 26	16 18	16 9
14	18 1	17 51	17 40	17 26	17 19	17 10	17 0	16 48	16 42	16 36	16 28	16 20	16 11
15	18 1	17 51	17 40	17 27	17 20	17 11	17 1	16 49	16 44	16 37	16 30	16 22	16 14
16	18 1	17 51	17 40	17 28	17 20	17 12	17 2	16 51	16 45	16 39	16 32	16 25	16 16

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 2	6 7	6 25	6 43	7 5	7 18	7 33	7 50	8 12	8 23	8 35	8 49	9 5	9 25
3	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 23	8 35	8 48	9 5	9 24
4	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 22	8 34	8 48	9 4	9 24
5	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 11	8 22	8 34	8 47	9 3	9 23
6	6 8	6 25	6 43	7 5	7 17	7 32	7 49	8 11	8 21	8 33	8 47	9 2	9 22
7	6 8	6 25	6 43	7 5	7 17	7 32	7 49	8 10	8 21	8 32	8 46	9 1	9 20
8	6 8	6 25	6 43	7 4	7 17	7 31	7 48	8 10	8 20	8 32	8 45	9 0	9 19
9	6 8	6 25	6 43	7 4	7 17	7 31	7 48	8 9	8 19	8 31	8 44	8 59	9 18
10	6 9	6 25	6 43	7 4	7 16	7 31	7 48	8 9	8 19	8 30	8 43	8 58	9 17
11	6 9	6 25	6 43	7 4	7 16	7 30	7 47	8 8	8 18	8 29	8 42	8 57	9 16
12	6 9	6 25	6 43	7 4	7 16	7 30	7 46	8 7	8 17	8 28	8 41	8 56	9 14
13	6 9	6 25	6 43	7 3	7 16	7 29	7 46	8 6	8 16	8 27	8 40	8 55	9 12
14	6 9	6 25	6 43	7 3	7 15	7 29	7 45	8 6	8 15	8 26	8 39	8 53	9 11
15	6 9	6 25	6 43	7 3	7 15	7 28	7 45	8 5	8 14	8 25	8 38	8 52	9 9
16	6 9	6 25	6 42	7 2	7 14	7 28	7 44	8 4	8 13	8 24	8 36	8 51	9 8
17	6 9	6 25	6 42	7 2	7 14	7 27	7 43	8 3	8 12	8 23	8 35	8 49	9 6
18	6 9	6 25	6 42	7 2	7 13	7 27	7 42	8 2	8 11	8 22	8 34	8 47	9 4
19	6 10	6 25	6 42	7 1	7 13	7 26	7 42	8 1	8 10	8 20	8 32	8 46	9 2
20	6 10	6 25	6 42	7 1	7 12	7 25	7 41	8 0	8 9	8 19	8 31	8 44	9 0
21	6 10	6 25	6 41	7 0	7 12	7 25	7 40	7 59	8 8	8 18	8 29	8 42	8 58
22	6 10	6 25	6 41	7 0	7 11	7 24	7 39	7 58	8 6	8 16	8 28	8 41	8 56
23	6 10	6 25	6 41	6 59	7 10	7 23	7 38	7 56	8 5	8 15	8 26	8 39	8 54
24	6 10	6 24	6 40	6 59	7 10	7 22	7 37	7 55	8 4	8 13	8 24	8 37	8 52
25	6 10	6 24	6 40	6 58	7 9	7 21	7 36	7 54	8 2	8 12	8 23	8 35	8 50
26	6 10	6 24	6 40	6 58	7 8	7 21	7 35	7 53	8 1	8 10	8 21	8 33	8 48
27	6 10	6 24	6 39	6 57	7 8	7 20	7 34	7 51	8 0	8 9	8 19	8 31	8 45
28	6 10	6 24	6 39	6 56	7 7	7 19	7 33	7 50	7 58	8 7	8 18	8 29	8 43
29	6 10	6 24	6 39	6 56	7 6	7 18	7 32	7 49	7 56	8 5	8 16	8 27	8 40
30	6 10	6 23	6 38	6 55	7 5	7 17	7 30	7 47	7 55	8 4	8 14	8 25	8 38
31	6 10	6 23	6 38	6 55	7 4	7 16	7 29	7 46	7 54	8 2	8 12	8 23	8 36
Aug. 1	6 10	6 23	6 37	6 54	7 4	7 15	7 28	7 44	7 52	8 0	8 10	8 21	8 33
2	6 9	6 23	6 37	6 53	7 3	7 14	7 27	7 43	7 50	7 58	8 8	8 18	8 31
3	6 9	6 22	6 36	6 52	7 2	7 13	7 26	7 41	7 48	7 57	8 6	8 16	8 28
4	6 9	6 22	6 36	6 52	7 1	7 12	7 24	7 40	7 47	7 55	8 4	8 14	8 26
5	6 9	6 22	6 35	6 51	7 0	7 10	7 23	7 38	7 45	7 53	8 2	8 12	8 23
6	6 9	6 22	6 35	6 50	6 59	7 9	7 21	7 36	7 43	7 51	8 0	8 9	8 21
7	6 9	6 21	6 34	6 49	6 58	7 8	7 20	7 35	7 41	7 49	7 58	8 7	8 18
8	6 9	6 21	6 34	6 48	6 57	7 7	7 19	7 33	7 40	7 47	7 55	8 5	8 15
9	6 9	6 20	6 33	6 48	6 56	7 6	7 17	7 31	7 38	7 45	7 53	8 2	8 13
10	6 9	6 20	6 32	6 47	6 55	7 5	7 16	7 29	7 36	7 43	7 51	8 0	8 10
11	6 8	6 20	6 32	6 46	6 54	7 3	7 14	7 28	7 34	7 41	7 49	7 57	8 7
12	6 8	6 19	6 31	6 45	6 53	7 2	7 13	7 26	7 32	7 39	7 46	7 55	8 5
13	6 8	6 19	6 30	6 44	6 52	7 1	7 11	7 24	7 30	7 37	7 44	7 52	8 2
14	6 8	6 18	6 30	6 43	6 51	7 0	7 10	7 22	7 28	7 35	7 42	7 50	7 59
15	6 8	6 18	6 29	6 42	6 50	6 58	7 8	7 20	7 26	7 32	7 40	7 47	7 56
16	6 8	6 18	6 28	6 41	6 48	6 57	7 6	7 18	7 24	7 30	7 37	7 45	7 54
17	6 7	6 17	6 28	6 40	6 47	6 56	7 5	7 17	7 22	7 28	7 35	7 42	7 51

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	18 1	17 51	17 40	17 28	17 20	17 12	17 2	16 51	16 45	16 39	16 32	16 25	16 16
17	18 1	17 51	17 40	17 28	17 21	17 13	17 4	16 52	16 47	16 41	16 34	16 27	16 18
18	18 0	17 51	17 41	17 29	17 22	17 14	17 5	16 54	16 48	16 43	16 36	16 29	16 21
19	18 0	17 51	17 41	17 29	17 23	17 15	17 6	16 55	16 50	16 44	16 38	16 31	16 23
20	18 0	17 51	17 41	17 30	17 23	17 16	17 7	16 57	16 52	16 46	16 40	16 33	16 26
21	18 0	17 51	17 42	17 31	17 24	17 17	17 8	16 58	16 53	16 48	16 42	16 36	16 28
22	17 59	17 51	17 42	17 31	17 25	17 18	17 10	17 0	16 55	16 50	16 44	16 38	16 30
23	17 59	17 51	17 42	17 32	17 26	17 19	17 11	17 1	16 57	16 52	16 46	16 40	16 33
24	17 59	17 51	17 42	17 32	17 26	17 20	17 12	17 3	16 58	16 53	16 48	16 42	16 35
25	17 59	17 51	17 42	17 33	17 27	17 21	17 13	17 4	17 0	16 55	16 50	16 44	16 38
26	17 58	17 51	17 43	17 33	17 28	17 22	17 14	17 6	17 2	16 57	16 52	16 46	16 40
27	17 58	17 51	17 43	17 34	17 29	17 23	17 16	17 7	17 3	16 59	16 54	16 48	16 42
28	17 58	17 51	17 43	17 34	17 29	17 24	17 17	17 8	17 5	17 0	16 56	16 51	16 45
29	17 58	17 51	17 44	17 35	17 30	17 24	17 18	17 10	17 6	17 2	16 58	16 53	16 47
30	17 57	17 51	17 44	17 36	17 31	17 25	17 19	17 12	17 8	17 4	17 0	16 55	16 50
31	17 57	17 51	17 44	17 36	17 32	17 26	17 20	17 13	17 10	17 6	17 2	16 57	16 52
Sept. 1	17 57	17 51	17 44	17 37	17 32	17 27	17 22	17 14	17 11	17 8	17 4	16 59	16 54
2	17 56	17 51	17 44	17 37	17 33	17 28	17 23	17 16	17 13	17 9	17 6	17 1	16 57
3	17 56	17 51	17 45	17 38	17 34	17 29	17 24	17 18	17 14	17 11	17 8	17 4	16 59
4	17 56	17 50	17 45	17 38	17 34	17 30	17 25	17 19	17 16	17 13	17 10	17 6	17 2
5	17 55	17 50	17 45	17 39	17 35	17 31	17 26	17 20	17 18	17 15	17 12	17 8	17 4
6	17 55	17 50	17 45	17 40	17 36	17 32	17 28	17 22	17 19	17 17	17 14	17 10	17 6
7	17 55	17 50	17 46	17 40	17 37	17 33	17 29	17 24	17 21	17 18	17 15	17 12	17 8
8	17 54	17 50	17 46	17 41	17 38	17 34	17 30	17 25	17 23	17 20	17 17	17 14	17 11
9	17 54	17 50	17 46	17 41	17 38	17 35	17 31	17 26	17 24	17 22	17 19	17 16	17 13
10	17 54	17 50	17 46	17 42	17 39	17 36	17 32	17 28	17 26	17 24	17 21	17 19	17 16
11	17 53	17 50	17 46	17 42	17 40	17 37	17 34	17 29	17 28	17 26	17 23	17 21	17 18
12	17 53	17 50	17 47	17 43	17 40	17 38	17 35	17 31	17 29	17 27	17 25	17 23	17 20
13	17 53	17 50	17 47	17 43	17 41	17 39	17 36	17 32	17 31	17 29	17 27	17 25	17 23
14	17 52	17 50	17 47	17 44	17 42	17 40	17 37	17 34	17 32	17 31	17 29	17 27	17 25
15	17 52	17 50	17 47	17 44	17 43	17 41	17 38	17 35	17 34	17 33	17 31	17 29	17 27
16	17 52	17 50	17 48	17 45	17 43	17 42	17 40	17 37	17 36	17 34	17 33	17 31	17 30
17	17 51	17 50	17 48	17 46	17 44	17 43	17 41	17 38	17 38	17 36	17 35	17 34	17 32
18	17 51	17 50	17 48	17 46	17 45	17 44	17 42	17 40	17 39	17 38	17 37	17 36	17 34
19	17 50	17 49	17 48	17 46	17 46	17 44	17 43	17 41	17 41	17 40	17 39	17 38	17 37
20	17 50	17 49	17 48	17 47	17 46	17 45	17 44	17 43	17 42	17 42	17 41	17 40	17 39
21	17 50	17 49	17 49	17 48	17 47	17 46	17 46	17 44	17 44	17 43	17 43	17 42	17 41
22	17 50	17 49	17 49	17 48	17 48	17 47	17 47	17 46	17 46	17 45	17 45	17 44	17 44
23	17 49	17 49	17 49	17 49	17 48	17 48	17 48	17 47	17 47	17 47	17 47	17 46	17 46
24	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 48	17 48
25	17 48	17 49	17 49	17 50	17 50	17 50	17 50	17 50	17 50	17 51	17 51	17 51	17 51
26	17 48	17 49	17 50	17 50	17 51	17 51	17 52	17 52	17 52	17 52	17 53	17 53	17 53
27	17 48	17 49	17 50	17 51	17 52	17 52	17 53	17 54	17 54	17 54	17 55	17 55	17 56
28	17 47	17 49	17 50	17 52	17 52	17 53	17 54	17 55	17 56	17 56	17 57	17 57	17 58
29	17 47	17 49	17 50	17 52	17 53	17 54	17 55	17 57	17 57	17 58	17 59	17 59	18 0
30	17 47	17 49	17 51	17 53	17 54	17 55	17 56	17 58	17 59	18 0	18 1	18 2	18 3
Oct. 1	17 46	17 49	17 51	17 53	17 55	17 56	17 58	18 0	18 0	18 2	18 3	18 4	18 5

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 17	6 7	6 17	6 28	6 40	6 47	6 56	7 5	7 17	7 22	7 28	7 35	7 42	7 51
18	6 7	6 17	6 27	6 39	6 46	6 54	7 3	7 15	7 20	7 26	7 32	7 40	7 48
19	6 7	6 16	6 26	6 38	6 45	6 53	7 2	7 13	7 18	7 24	7 30	7 37	7 45
20	6 7	6 16	6 26	6 37	6 44	6 51	7 0	7 11	7 16	7 21	7 28	7 34	7 42
21	6 6	6 15	6 25	6 36	6 42	6 50	6 58	7 9	7 14	7 19	7 25	7 32	7 39
22	6 6	6 15	6 24	6 35	6 41	6 48	6 57	7 7	7 12	7 17	7 23	7 29	7 36
23	6 6	6 14	6 23	6 34	6 40	6 47	6 55	7 5	7 10	7 15	7 20	7 27	7 34
24	6 6	6 14	6 23	6 33	6 39	6 46	6 53	7 3	7 8	7 12	7 18	7 24	7 31
25	6 6	6 13	6 22	6 32	6 38	6 44	6 52	7 1	7 5	7 10	7 15	7 21	7 28
26	6 5	6 13	6 21	6 31	6 36	6 43	6 50	6 59	7 3	7 8	7 13	7 18	7 25
27	6 5	6 12	6 20	6 29	6 35	6 41	6 48	6 57	7 1	7 5	7 10	7 16	7 22
28	6 5	6 12	6 19	6 28	6 34	6 40	6 46	6 55	6 59	7 3	7 8	7 13	7 19
29	6 4	6 11	6 18	6 27	6 32	6 38	6 45	6 53	6 56	7 0	7 5	7 10	7 16
30	6 4	6 10	6 18	6 26	6 31	6 36	6 43	6 51	6 54	6 58	7 2	7 8	7 13
31	6 4	6 10	6 17	6 25	6 30	6 35	6 41	6 48	6 52	6 56	7 0	7 5	7 10
Sept. 1	6 3	6 9	6 16	6 24	6 28	6 33	6 39	6 46	6 50	6 53	6 57	7 2	7 7
2	6 3	6 9	6 15	6 22	6 27	6 32	6 37	6 44	6 48	6 51	6 55	6 59	7 4
3	6 3	6 8	6 14	6 21	6 26	6 30	6 36	6 42	6 45	6 49	6 52	6 56	7 1
4	6 2	6 8	6 13	6 20	6 24	6 28	6 34	6 40	6 43	6 46	6 50	6 54	6 58
5	6 2	6 7	6 13	6 19	6 23	6 27	6 32	6 38	6 41	6 44	6 47	6 51	6 55
6	6 2	6 6	6 12	6 18	6 21	6 25	6 30	6 36	6 38	6 41	6 44	6 48	6 52
7	6 2	6 6	6 11	6 16	6 20	6 24	6 28	6 34	6 36	6 39	6 42	6 45	6 49
8	6 1	6 5	6 10	6 15	6 18	6 22	6 26	6 31	6 34	6 36	6 39	6 42	6 46
9	6 1	6 5	6 9	6 14	6 17	6 20	6 24	6 29	6 31	6 34	6 36	6 40	6 43
10	6 0	6 4	6 8	6 13	6 16	6 19	6 22	6 27	6 29	6 31	6 34	6 37	6 40
11	6 0	6 3	6 7	6 12	6 14	6 17	6 21	6 25	6 27	6 29	6 31	6 34	6 37
12	6 0	6 3	6 6	6 10	6 13	6 16	6 19	6 23	6 24	6 26	6 29	6 31	6 34
13	5 59	6 2	6 5	6 9	6 11	6 14	6 17	6 21	6 22	6 24	6 26	6 28	6 31
14	5 59	6 2	6 4	6 8	6 10	6 12	6 15	6 18	6 20	6 22	6 23	6 26	6 28
15	5 59	6 1	6 4	6 7	6 9	6 11	6 13	6 16	6 18	6 19	6 21	6 23	6 25
16	5 58	6 0	6 3	6 5	6 7	6 9	6 11	6 14	6 15	6 16	6 18	6 20	6 22
17	5 58	6 0	6 2	6 4	6 6	6 7	6 9	6 12	6 13	6 14	6 15	6 17	6 18
18	5 58	5 59	6 1	6 3	6 4	6 6	6 7	6 10	6 10	6 11	6 13	6 14	6 15
19	5 57	5 58	6 0	6 2	6 3	6 4	6 5	6 7	6 8	6 9	6 10	6 11	6 12
20	5 57	5 58	5 59	6 0	6 1	6 2	6 4	6 5	6 6	6 6	6 7	6 8	6 9
21	5 56	5 57	5 58	5 59	6 0	6 1	6 2	6 3	6 3	6 4	6 4	6 6	6 6
22	5 56	5 57	5 57	5 58	5 58	5 59	6 0	6 1	6 1	6 2	6 2	6 3	6 3
23	5 56	5 56	5 56	5 57	5 57	5 57	5 58	5 58	5 59	5 59	5 59	6 0	6 0
24	5 55	5 55	5 56	5 56	5 56	5 56	5 56	5 56	5 56	5 56	5 57	5 57	5 57
25	5 55	5 55	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54
26	5 55	5 54	5 54	5 53	5 53	5 52	5 52	5 52	5 52	5 52	5 51	5 51	5 51
27	5 54	5 54	5 53	5 52	5 51	5 51	5 50	5 50	5 49	5 49	5 49	5 48	5 48
28	5 54	5 53	5 52	5 50	5 50	5 49	5 48	5 47	5 47	5 46	5 46	5 46	5 45
29	5 54	5 52	5 51	5 49	5 48	5 48	5 46	5 45	5 45	5 44	5 43	5 43	5 42
30	5 54	5 52	5 50	5 48	5 47	5 46	5 44	5 43	5 42	5 42	5 41	5 40	5 39
Oct. 1	5 53	5 51	5 49	5 47	5 46	5 44	5 43	5 41	5 40	5 39	5 38	5 37	5 36
2	5 53	5 50	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 36	5 34	5 33

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	17 46	17 49	17 51	17 53	17 55	17 56	17 58	18 0	18 0	18 2	18 3	18 4	18 5
2	17 46	17 49	17 51	17 54	17 55	17 57	17 59	18 1	18 2	18 3	18 5	18 6	18 8
3	17 46	17 49	17 51	17 54	17 56	17 58	18 0	18 3	18 4	18 5	18 7	18 8	18 10
4	17 46	17 48	17 52	17 55	17 57	17 59	18 1	18 4	18 6	18 7	18 9	18 10	18 12
5	17 45	17 48	17 52	17 56	17 58	18 0	18 3	18 6	18 7	18 9	18 11	18 12	18 15
6	17 45	17 48	17 52	17 56	17 58	18 1	18 4	18 7	18 9	18 11	18 13	18 15	18 17
7	17 45	17 48	17 52	17 57	17 59	18 2	18 5	18 9	18 11	18 13	18 15	18 17	18 19
8	17 44	17 48	17 53	17 57	18 0	18 3	18 6	18 11	18 12	18 14	18 17	18 19	18 22
9	17 44	17 48	17 53	17 58	18 1	18 4	18 8	18 12	18 14	18 16	18 19	18 21	18 24
10	17 44	17 48	17 53	17 58	18 2	18 5	18 9	18 14	18 16	18 18	18 21	18 24	18 27
11	17 44	17 48	17 54	17 59	18 2	18 6	18 10	18 15	18 18	18 20	18 23	18 26	18 29
12	17 43	17 48	17 54	18 0	18 3	18 7	18 12	18 17	18 19	18 22	18 25	18 28	18 32
13	17 43	17 48	17 54	18 0	18 4	18 8	18 13	18 18	18 21	18 24	18 27	18 30	18 34
14	17 43	17 48	17 54	18 1	18 5	18 9	18 14	18 20	18 23	18 26	18 29	18 32	18 36
15	17 43	17 49	17 55	18 2	18 6	18 10	18 16	18 22	18 24	18 28	18 31	18 35	18 39
16	17 42	17 49	17 55	18 2	18 7	18 11	18 17	18 23	18 26	18 29	18 33	18 37	18 41
17	17 42	17 49	17 56	18 3	18 8	18 12	18 18	18 25	18 28	18 31	18 35	18 39	18 44
18	17 42	17 49	17 56	18 4	18 8	18 13	18 19	18 26	18 30	18 33	18 37	18 42	18 46
19	17 42	17 49	17 56	18 4	18 9	18 14	18 21	18 28	18 31	18 35	18 39	18 44	18 49
20	17 42	17 49	17 57	18 5	18 10	18 16	18 22	18 30	18 33	18 37	18 41	18 46	18 51
21	17 41	17 49	17 57	18 6	18 11	18 17	18 23	18 31	18 35	18 39	18 43	18 48	18 54
22	17 41	17 49	17 57	18 6	18 12	18 18	18 25	18 33	18 37	18 41	18 45	18 51	18 56
23	17 41	17 49	17 58	18 7	18 13	18 19	18 26	18 35	18 38	18 43	18 48	18 53	18 59
24	17 41	17 49	17 58	18 8	18 14	18 20	18 28	18 36	18 40	18 45	18 50	18 55	19 2
25	17 41	17 50	17 59	18 9	18 14	18 21	18 29	18 38	18 42	18 47	18 52	18 58	19 4
26	17 41	17 50	17 59	18 10	18 15	18 22	18 30	18 40	18 44	18 49	18 54	19 0	19 6
27	17 41	17 50	17 59	18 10	18 16	18 23	18 32	18 41	18 46	18 51	18 56	19 2	19 9
28	17 40	17 50	18 0	18 11	18 17	18 24	18 33	18 43	18 47	18 53	18 58	19 4	19 12
29	17 40	17 50	18 0	18 12	18 18	18 26	18 34	18 44	18 49	18 55	19 0	19 7	19 14
30	17 40	17 50	18 1	18 12	18 19	18 27	18 36	18 46	18 51	18 56	19 2	19 9	19 17
31	17 40	17 50	18 1	18 13	18 20	18 28	18 37	18 48	18 53	18 58	19 5	19 12	19 19
Nov. 1	17 40	17 51	18 2	18 14	18 21	18 29	18 38	18 50	18 55	19 0	19 7	19 14	19 22
2	17 40	17 51	18 2	18 15	18 22	18 30	18 40	18 51	18 56	19 2	19 9	19 16	19 24
3	17 40	17 51	18 2	18 16	18 23	18 31	18 41	18 53	18 58	19 4	19 11	19 18	19 27
4	17 40	17 51	18 3	18 16	18 24	18 32	18 42	18 54	19 0	19 6	19 13	19 21	19 30
5	17 40	17 52	18 4	18 17	18 25	18 34	18 44	18 56	19 2	19 8	19 15	19 23	19 32
6	17 40	17 52	18 4	18 18	18 26	18 35	18 45	18 58	19 4	19 10	19 17	19 26	19 35
7	17 40	17 52	18 4	18 19	18 27	18 36	18 47	19 0	19 6	19 12	19 20	19 28	19 37
8	17 40	17 52	18 5	18 19	18 28	18 37	18 48	19 1	19 7	19 14	19 22	19 30	19 40
9	17 40	17 53	18 6	18 20	18 29	18 38	18 49	19 3	19 9	19 16	19 24	19 32	19 42
10	17 41	17 53	18 6	18 21	18 30	18 39	18 51	19 4	19 11	19 18	19 26	19 35	19 45
11	17 41	17 53	18 6	18 22	18 31	18 40	18 52	19 6	19 13	19 20	19 28	19 37	19 48
12	17 41	17 54	18 7	18 23	18 32	18 42	18 53	19 8	19 14	19 22	19 30	19 39	19 50
13	17 41	17 54	18 8	18 24	18 33	18 43	18 55	19 9	19 16	19 24	19 32	19 42	19 53
14	17 41	17 54	18 8	18 24	18 34	18 44	18 56	19 11	19 18	19 26	19 34	19 44	19 55
15	17 41	17 55	18 9	18 25	18 34	18 45	18 58	19 13	19 20	19 28	19 36	19 46	19 58
16	17 41	17 55	18 10	18 26	18 35	18 46	18 59	19 14	19 22	19 29	19 38	19 48	20 0

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 2	5 53	5 50	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 36	5 34	5 33
3	5 52	5 50	5 47	5 44	5 43	5 41	5 39	5 36	5 35	5 34	5 33	5 32	5 30
4	5 52	5 49	5 46	5 43	5 42	5 39	5 37	5 34	5 33	5 32	5 30	5 29	5 27
5	5 52	5 49	5 46	5 42	5 40	5 38	5 35	5 32	5 31	5 29	5 28	5 26	5 24
6	5 52	5 48	5 45	5 41	5 39	5 36	5 33	5 30	5 28	5 27	5 25	5 23	5 21
7	5 51	5 48	5 44	5 40	5 37	5 35	5 32	5 28	5 26	5 24	5 22	5 20	5 18
8	5 51	5 47	5 43	5 38	5 36	5 33	5 30	5 26	5 24	5 22	5 20	5 18	5 15
9	5 51	5 46	5 42	5 37	5 34	5 31	5 28	5 24	5 22	5 20	5 17	5 15	5 12
10	5 50	5 46	5 41	5 36	5 33	5 30	5 26	5 22	5 20	5 17	5 15	5 12	5 9
11	5 50	5 45	5 40	5 35	5 32	5 28	5 24	5 19	5 17	5 15	5 12	5 9	5 6
12	5 50	5 45	5 40	5 34	5 30	5 27	5 22	5 17	5 15	5 12	5 10	5 6	5 3
13	5 50	5 44	5 39	5 33	5 29	5 25	5 21	5 15	5 13	5 10	5 7	5 4	5 0
14	5 50	5 44	5 38	5 32	5 28	5 24	5 19	5 13	5 11	5 8	5 5	5 1	4 57
15	5 49	5 43	5 37	5 30	5 27	5 22	5 17	5 11	5 8	5 5	5 2	4 58	4 54
16	5 49	5 43	5 37	5 29	5 25	5 21	5 15	5 9	5 6	5 3	5 0	4 56	4 51
17	5 49	5 42	5 36	5 28	5 24	5 19	5 14	5 7	5 4	5 1	4 57	4 53	4 48
18	5 49	5 42	5 35	5 27	5 23	5 18	5 12	5 5	5 2	4 58	4 55	4 50	4 46
19	5 48	5 42	5 34	5 26	5 22	5 16	5 10	5 3	5 0	4 56	4 52	4 48	4 43
20	5 48	5 41	5 34	5 25	5 20	5 15	5 8	5 1	4 58	4 54	4 50	4 45	4 40
21	5 48	5 41	5 33	5 24	5 19	5 13	5 7	4 59	4 56	4 52	4 47	4 42	4 37
22	5 48	5 40	5 32	5 23	5 18	5 12	5 5	4 57	4 53	4 49	4 45	4 40	4 34
23	5 48	5 40	5 32	5 22	5 17	5 11	5 4	4 55	4 51	4 47	4 42	4 37	4 31
24	5 48	5 39	5 31	5 21	5 16	5 9	5 2	4 53	4 49	4 45	4 40	4 35	4 28
25	5 48	5 39	5 30	5 20	5 14	5 8	5 0	4 51	4 47	4 43	4 38	4 32	4 26
26	5 47	5 39	5 30	5 19	5 13	5 7	4 59	4 50	4 45	4 40	4 35	4 30	4 23
27	5 47	5 38	5 29	5 18	5 12	5 5	4 57	4 48	4 43	4 38	4 33	4 27	4 20
28	5 47	5 38	5 28	5 17	5 11	5 4	4 56	4 46	4 41	4 36	4 31	4 24	4 18
29	5 47	5 38	5 28	5 16	5 10	5 3	4 54	4 44	4 39	4 34	4 28	4 22	4 15
30	5 47	5 37	5 27	5 16	5 9	5 2	4 53	4 42	4 38	4 32	4 26	4 20	4 12
31	5 47	5 37	5 27	5 15	5 8	5 0	4 51	4 40	4 36	4 30	4 24	4 17	4 10
Nov. 1	5 47	5 37	5 26	5 14	5 7	4 59	4 50	4 39	4 34	4 28	4 22	4 15	4 7
2	5 47	5 37	5 26	5 13	5 6	4 58	4 48	4 37	4 32	4 26	4 20	4 12	4 4
3	5 47	5 36	5 25	5 12	5 5	4 57	4 47	4 35	4 30	4 24	4 18	4 10	4 2
4	5 47	5 36	5 25	5 12	5 4	4 56	4 46	4 34	4 28	4 22	4 15	4 8	3 59
5	5 47	5 36	5 24	5 11	5 3	4 54	4 44	4 32	4 26	4 20	4 13	4 5	3 56
6	5 47	5 36	5 24	5 10	5 2	4 53	4 43	4 30	4 25	4 18	4 11	4 3	3 54
7	5 47	5 36	5 23	5 9	5 1	4 52	4 42	4 29	4 23	4 16	4 9	4 1	3 52
8	5 47	5 35	5 23	5 9	5 0	4 51	4 40	4 27	4 21	4 15	4 7	3 59	3 49
9	5 47	5 35	5 22	5 8	5 0	4 50	4 39	4 26	4 20	4 13	4 5	3 56	3 47
10	5 48	5 35	5 22	5 7	4 59	4 49	4 38	4 24	4 18	4 11	4 3	3 54	3 44
11	5 48	5 35	5 22	5 7	4 58	4 48	4 37	4 23	4 16	4 9	4 1	3 52	3 42
12	5 48	5 35	5 21	5 6	4 57	4 47	4 36	4 21	4 15	4 8	3 59	3 50	3 40
13	5 48	5 35	5 21	5 6	4 57	4 46	4 34	4 20	4 13	4 6	3 58	3 48	3 37
14	5 48	5 35	5 21	5 5	4 56	4 46	4 33	4 19	4 12	4 4	3 56	3 46	3 35
15	5 48	5 35	5 20	5 4	4 55	4 45	4 32	4 17	4 10	4 3	3 54	3 44	3 33
16	5 48	5 35	5 20	5 4	4 55	4 44	4 31	4 16	4 9	4 1	3 52	3 42	3 31
17	5 48	5 35	5 20	5 4	4 54	4 43	4 30	4 15	4 8	4 0	3 51	3 40	3 28

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	17 41	17 55	18 10	18 26	18 35	18 46	18 59	19 14	19 22	19 29	19 38	19 48	20 0
17	17 42	17 56	18 10	18 27	18 36	18 47	19 0	19 16	19 23	19 31	19 40	19 51	20 3
18	17 42	17 56	18 11	18 28	18 37	18 48	19 2	19 18	19 25	19 33	19 42	19 53	20 5
19	17 42	17 56	18 11	18 28	18 38	18 50	19 3	19 19	19 27	19 35	19 44	19 55	20 8
20	17 42	17 57	18 12	18 29	18 39	18 51	19 4	19 21	19 28	19 37	19 46	19 57	20 10
21	17 42	17 57	18 13	18 30	18 40	18 52	19 6	19 22	19 30	19 39	19 48	20 0	20 12
22	17 43	17 58	18 13	18 31	18 41	18 53	19 7	19 24	19 32	19 40	19 50	20 2	20 15
23	17 43	17 58	18 14	18 32	18 42	18 54	19 8	19 25	19 33	19 42	19 52	20 4	20 17
24	17 43	17 58	18 14	18 33	18 43	18 55	19 9	19 27	19 35	19 44	19 54	20 6	20 20
25	17 44	17 59	18 15	18 34	18 44	18 56	19 11	19 28	19 37	19 46	19 56	20 8	20 22
26	17 44	17 59	18 16	18 34	18 45	18 57	19 12	19 30	19 38	19 47	19 58	20 10	20 24
27	17 44	18 0	18 16	18 35	18 46	18 58	19 13	19 31	19 40	19 49	20 0	20 12	20 26
28	17 44	18 0	18 17	18 36	18 47	19 0	19 14	19 33	19 41	19 51	20 2	20 14	20 29
29	17 45	18 1	18 18	18 37	18 48	19 1	19 16	19 34	19 43	19 52	20 3	20 16	20 31
30	17 45	18 1	18 18	18 38	18 49	19 2	19 17	19 35	19 44	19 54	20 5	20 18	20 33
Dec. 1	17 46	18 2	18 19	18 38	18 50	19 3	19 18	19 37	19 46	19 56	20 7	20 20	20 35
2	17 46	18 2	18 20	18 39	18 51	19 4	19 19	19 38	19 47	19 57	20 8	20 22	20 37
3	17 46	18 3	18 20	18 40	18 51	19 5	19 20	19 39	19 48	19 58	20 10	20 23	20 39
4	17 47	18 3	18 21	18 41	18 52	19 6	19 21	19 41	19 50	20 0	20 12	20 25	20 41
5	17 47	18 4	18 21	18 42	18 53	19 7	19 22	19 42	19 51	20 1	20 13	20 27	20 43
6	17 48	18 4	18 22	18 42	18 54	19 8	19 24	19 43	19 52	20 3	20 14	20 28	20 44
7	17 48	18 5	18 23	18 43	18 55	19 8	19 25	19 44	19 54	20 4	20 16	20 30	20 46
8	17 48	18 5	18 23	18 44	18 56	19 9	19 26	19 45	19 55	20 5	20 17	20 31	20 48
9	17 49	18 6	18 24	18 44	18 56	19 10	19 27	19 46	19 56	20 7	20 19	20 33	20 49
10	17 49	18 6	18 24	18 45	18 57	19 11	19 27	19 47	19 57	20 8	20 20	20 34	20 51
11	17 50	18 7	18 25	18 46	18 58	19 12	19 28	19 48	19 58	20 9	20 21	20 35	20 52
12	17 50	18 7	18 26	18 46	18 59	19 13	19 29	19 49	19 59	20 10	20 22	20 37	20 54
13	17 51	18 8	18 26	18 47	18 59	19 13	19 30	19 50	20 0	20 11	20 23	20 38	20 55
14	17 51	18 8	18 27	18 48	19 0	19 14	19 31	19 51	20 1	20 12	20 24	20 39	20 56
15	17 52	18 9	18 27	18 48	19 1	19 15	19 32	19 52	20 2	20 13	20 25	20 40	20 57
16	17 52	18 10	18 28	18 49	19 1	19 16	19 32	19 53	20 3	20 14	20 26	20 41	20 58
17	17 53	18 10	18 28	18 50	19 2	19 16	19 33	19 54	20 4	20 14	20 27	20 42	20 59
18	17 53	18 10	18 29	18 50	19 3	19 17	19 34	19 54	20 4	20 15	20 28	20 43	21 0
19	17 54	18 11	18 30	18 51	19 3	19 17	19 34	19 55	20 5	20 16	20 29	20 43	21 1
20	17 54	18 12	18 30	18 51	19 4	19 18	19 35	19 56	20 6	20 17	20 29	20 44	21 2
21	17 55	18 12	18 31	18 52	19 4	19 18	19 35	19 56	20 6	20 17	20 30	20 45	21 2
22	17 55	18 12	18 31	18 52	19 5	19 19	19 36	19 57	20 7	20 18	20 30	20 45	21 3
23	17 56	18 13	18 32	18 53	19 5	19 19	19 36	19 57	20 7	20 18	20 31	20 46	21 3
24	17 56	18 13	18 32	18 53	19 6	19 20	19 37	19 57	20 7	20 18	20 31	20 46	21 4
25	17 57	18 14	18 32	18 54	19 6	19 20	19 37	19 58	20 8	20 19	20 32	20 46	21 4
26	17 57	18 14	18 33	18 54	19 6	19 21	19 37	19 58	20 8	20 19	20 32	20 46	21 4
27	17 58	18 15	18 33	18 55	19 7	19 21	19 38	19 58	20 8	20 19	20 32	20 47	21 4
28	17 58	18 15	18 34	18 55	19 7	19 21	19 38	19 59	20 8	20 20	20 32	20 47	21 4
29	17 58	18 16	18 34	18 55	19 8	19 22	19 38	19 59	20 8	20 20	20 32	20 47	21 4
30	17 59	18 16	18 35	18 56	19 8	19 22	19 38	19 59	20 8	20 20	20 32	20 46	21 4
31	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 20	20 32	20 46	21 3

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 17	5 48	5 35	5 20	5 4	4 54	4 43	4 30	4 15	4 8	4 0	3 51	3 40	3 28
18	5 49	5 35	5 20	5 3	4 53	4 42	4 29	4 14	4 6	3 58	3 49	3 38	3 26
19	5 49	5 35	5 20	5 3	4 53	4 42	4 28	4 12	4 5	3 57	3 47	3 37	3 24
20	5 49	5 35	5 20	5 2	4 52	4 41	4 28	4 11	4 4	3 55	3 46	3 35	3 22
21	5 49	5 35	5 20	5 2	4 52	4 40	4 27	4 10	4 2	3 54	3 44	3 33	3 20
22	5 50	5 35	5 19	5 2	4 51	4 40	4 26	4 9	4 1	3 53	3 43	3 32	3 19
23	5 50	5 35	5 19	5 1	4 51	4 39	4 25	4 8	4 0	3 51	3 41	3 30	3 17
24	5 50	5 35	5 19	5 1	4 50	4 39	4 24	4 7	3 59	3 50	3 40	3 28	3 15
25	5 51	5 35	5 19	5 1	4 50	4 38	4 24	4 6	3 58	3 49	3 39	3 27	3 13
26	5 51	5 35	5 19	5 1	4 50	4 38	4 23	4 6	3 57	3 48	3 38	3 26	3 12
27	5 51	5 36	5 19	5 0	4 50	4 37	4 22	4 5	3 56	3 47	3 36	3 24	3 10
28	5 51	5 36	5 19	5 0	4 49	4 37	4 22	4 4	3 55	3 46	3 35	3 23	3 8
29	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 3	3 54	3 45	3 34	3 22	3 7
30	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 2	3 54	3 44	3 33	3 20	3 5
Dec. 1	5 52	5 36	5 19	5 0	4 49	4 36	4 20	4 2	3 53	3 43	3 32	3 19	3 4
2	5 53	5 37	5 20	5 0	4 48	4 36	4 20	4 1	3 52	3 42	3 31	3 18	3 3
3	5 53	5 37	5 20	5 0	4 48	4 35	4 20	4 1	3 52	3 42	3 30	3 17	3 2
4	5 54	5 37	5 20	5 0	4 48	4 35	4 19	4 0	3 51	3 41	3 30	3 16	3 0
5	5 54	5 38	5 20	5 0	4 48	4 35	4 19	4 0	3 51	3 40	3 29	3 15	2 59
6	5 54	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 40	3 28	3 14	2 58
7	5 55	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 39	3 27	3 14	2 57
8	5 55	5 38	5 21	5 0	4 48	4 35	4 18	3 59	3 49	3 39	3 27	3 13	2 57
9	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 56
10	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 55
11	5 57	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 49	3 38	3 26	3 11	2 55
12	5 57	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 48	3 38	3 25	3 11	2 54
13	5 58	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 48	3 38	3 25	3 11	2 54
14	5 58	5 41	5 22	5 2	4 49	4 35	4 19	3 58	3 48	3 38	3 25	3 11	2 54
15	5 58	5 41	5 23	5 2	4 50	4 36	4 19	3 58	3 48	3 38	3 25	3 10	2 53
16	5 59	5 42	5 23	5 2	4 50	4 36	4 19	3 58	3 49	3 38	3 25	3 10	2 53
17	6 0	5 42	5 24	5 2	4 50	4 36	4 19	3 59	3 49	3 38	3 25	3 10	2 53
18	6 0	5 42	5 24	5 3	4 50	4 36	4 20	3 59	3 49	3 38	3 25	3 10	2 53
19	6 0	5 43	5 25	5 3	4 51	4 37	4 20	3 59	3 49	3 38	3 25	3 11	2 53
20	6 1	5 44	5 25	5 4	4 51	4 37	4 20	4 0	3 50	3 38	3 26	3 11	2 53
21	6 2	5 44	5 26	5 4	4 52	4 38	4 21	4 0	3 50	3 39	3 26	3 11	2 54
22	6 2	5 44	5 26	5 5	4 52	4 38	4 21	4 0	3 50	3 39	3 27	3 12	2 54
23	6 2	5 45	5 26	5 5	4 53	4 39	4 22	4 1	3 51	3 40	3 27	3 12	2 55
24	6 3	5 46	5 27	5 6	4 53	4 39	4 22	4 2	3 52	3 40	3 28	3 13	2 55
25	6 3	5 46	5 28	5 6	4 54	4 40	4 23	4 2	3 52	3 41	3 28	3 14	2 56
26	6 4	5 47	5 28	5 7	4 54	4 40	4 24	4 3	3 53	3 42	3 29	3 14	2 57
27	6 4	5 47	5 29	5 7	4 55	4 41	4 24	4 4	3 54	3 43	3 30	3 15	2 58
28	6 5	5 48	5 29	5 8	4 56	4 42	4 25	4 4	3 54	3 43	3 31	3 16	2 59
29	6 6	5 48	5 30	5 9	4 56	4 42	4 26	4 5	3 55	3 44	3 32	3 17	3 0
30	6 6	5 49	5 30	5 9	4 57	4 43	4 26	4 6	3 56	3 45	3 33	3 18	3 1
31	6 6	5 49	5 31	5 10	4 58	4 44	4 27	4 7	3 57	3 46	3 34	3 19	3 2
32	6 7	5 50	5 32	5 11	4 59	4 45	4 28	4 8	3 58	3 47	3 35	3 21	3 4

TABLE IX.

SUNRISE AND SUNSET FOR SOUTHERN LATITUDES, 1923.

In the case of a southern latitude the time of sunrise or sunset is taken from Table VIII, with the corresponding northern latitude, not for the given date but for a date about six months earlier or later, which is to be found in the following table. The time taken from Table VIII, whether of sunrise or of sunset, must be corrected by the quantity given in Table IX on the same line with the given date.

Example.—May 10, 1923, civil date, in latitude −38°, required the time of sunrise and sunset.

The astronomical date is May 9 for sunrise and May 10 for sunset; Table IX gives November 11 and 12 as the corresponding dates, northern latitude, while the correction is +12^m in each case.

	Sunrise. d h m		Sunset. d h m	
Table VIII, Lat. +38° . . .	Nov. 11 18 36		Nov. 12 4 51	
Table IX	May 9 + 12		May 10 + 12	
Local astronomical mean time . .	May 9 18 48		May 10 5 3	
Civil time	May 10 6 48	A.M.	May 10 5 3	P.M.

Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.
		m			m			m			m
Jan. 0	July 2	−1	Feb. 5	Aug. 9	+ 9	Mar. 13	Sept. 15	+14	Apr. 18	Oct. 21	+15
1	3	0	6	10	9	14	16	14	19	22	15
2	4	0	7	11	9	15	17	14	20	23	14
3	5	0	8	12	9	16	18	15	21	24	14
4	6	0	9	13	10	17	19	15	22	25	14
5	7	+1	10	14	+10	18	20	+15	23	26	+14
6	8	1	11	15	10	19	21	15	24	27	14
7	9	1	12	16	10	20	22	15	25	28	14
8	10	2	13	17	10	21	23	15	26	29	14
9	11	2	14	18	11	22	24	15	27	30	14
10	12	+2	15	19	+11	23	25	+15	28	31	+14
11	13	2	16	20	11	24	26	15	29	Nov. 1	14
12	14	3	17	21	11	25	27	15	30	2	14
13	15	3	18	23	11	26	28	15	May 1	3	13
14	16	3	19	24	12	27	29	15	2	4	13
15	18	+4	20	25	+12	28	30	+15	3	5	+13
16	19	4	21	26	12	29	Oct. 2	15	4	6	13
17	20	4	22	27	12	30	3	16	5	7	13
18	21	4	23	28	12	31	4	16	6	8	13
19	22	5	24	29	12	Apr. 1	5	16	7	9	13
20	23	+5	25	30	+13	2	6	+16	8	10	+12
21	24	5	26	31	13	3	7	16	9	11	12
22	25	5	27	Sept. 1	13	4	8	15	10	12	12
23	26	6	28	2	13	5	9	15	11	13	12
24	27	6	Mar. 1	3	13	6	10	15	12	14	12
25	28	+6	2	4	+13	7	10	+15	13	15	+12
26	29	6	3	5	13	8	11	15	14	16	11
27	30	7	4	6	13	9	12	15	15	16	11
28	31	7	5	7	14	10	13	15	16	17	11
29	Aug. 1	7	6	8	14	11	14	15	17	18	11
30	2	+7	7	9	+14	12	15	+15	18	19	+11
31	4	8	8	10	14	13	16	15	19	20	11
Feb. 1	5	8	9	11	14	14	17	15	20	21	10
2	6	8	10	12	14	15	18	15	21	22	10
3	7	8	11	13	14	16	19	15	22	23	10
4	8	+9	12	14	+14	17	20	+15	23	24	+10

SUNRISE AND SUNSET FOR SOUTHERN LATITUDES, 1923.

Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.
		m			m			m			m
May 24	Nov. 25	+10	July 19	Jan. 16	− 4	Sept. 13	Mar. 11	−14	Nov. 8	May 6	−13
25	26	9	20	17	4	14	12	14	9	7	13
26	27	9	21	18	4	15	13	14	10	8	12
27	28	9	22	19	5	16	14	14	11	9	12
28	29	9	23	20	5	17	15	14	12	10	12
29	30	+ 8	24	21	− 5	18	16	−15	13	11	−12
30	Dec. 1	8	25	22	5	19	17	15	14	12	12
31	2	8	26	23	6	20	18	15	15	13	12
June 1	3	8	27	24	6	21	19	15	16	15	11
2	4	8	28	25	6	22	20	15	17	16	11
3	5	+ 7	29	26	− 6	23	21	−15	18	17	−11
4	5	7	30	27	7	24	22	15	19	18	11
5	6	7	31	28	7	25	23	15	20	19	11
6	7	7	Aug. 1	29	7	26	24	15	21	20	10
7	8	7	2	30	7	27	25	15	22	21	10
8	9	+ 6	3	30	− 7	28	26	−15	23	22	−10
9	10	6	4	31	8	29	27	15	24	23	10
10	11	6	5	Feb. 1	8	30	28	15	25	24	10
11	12	6	6	2	8	Oct. 1	29	15	26	25	9
12	13	5	7	3	8	2	29	15	27	26	9
13	14	+ 5	8	4	− 9	3	30	−16	28	27	− 9
14	15	5	9	5	9	4	31	16	29	28	9
15	16	4	10	6	9	5	Apr. 1	16	30	29	8
16	17	4	11	7	9	6	2	16	Dec. 1	30	8
17	18	4	12	8	9	7	3	16	2	31	8
18	19	+ 4	13	9	−10	8	4	−15	3	June 1	− 8
19	20	4	14	10	10	9	5	15	4	2	8
20	20	4	15	11	10	10	7	15	5	4	7
21	21	3	16	12	10	11	8	15	6	5	7
22	22	3	17	13	10	12	9	15	7	6	7
23	23	+ 3	18	14	−11	13	10	−15	8	7	− 7
24	24	2	19	15	11	14	11	15	9	8	6
25	25	2	20	16	11	15	12	15	10	9	6
26	26	2	21	17	11	16	13	15	11	10	6
27	27	2	22	18	11	17	14	15	12	11	6
28	28	+ 1	23	18	−11	18	15	−15	13	12	− 5
29	29	1	24	19	12	19	16	15	14	13	5
30	30	1	25	20	12	20	17	15	15	14	5
July 1	Dec. 31	1	26	21	12	21	18	15	16	15	4
2	Jan. 0	+ 1	27	22	12	22	19	15	17	16	4
3	1	0	28	23	−12	23	20	−14	18	17	− 4
4	2	0	29	24	12	24	21	14	19	18	4
5	3	0	30	25	13	25	22	14	20	19	4
6	4	0	31	26	13	26	23	14	21	21	3
7	5	− 1	Sept. 1	27	13	27	24	14	22	22	3
8	6	− 1	2	28	−13	28	25	−14	23	23	− 3
9	7	1	3	Mar. 1	13	29	26	14	24	24	2
10	8	2	4	2	13	30	27	14	25	25	2
11	9	2	5	3	13	31	28	14	26	26	2
12	10	2	6	4	13	Nov. 1	29	14	27	27	2
13	11	− 2	7	5	−14	2	30	−14	28	28	− 1
14	12	3	8	6	14	3	May 1	13	29	29	1
15	13	3	9	7	14	4	2	13	30	30	1
16	14	3	10	8	14	5	3	13	31	July 1	− 1
17	15	4	11	9	14	6	4	13	32	2	0
18	15	− 4	12	10	−14	7	5	−13			

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 1	4 50	4 36	4 21	4 4	3 54	3 43	3 30	3 14	3 7	2 58	2 49	2 39	2 27
2	5 43	5 30	5 15	4 58	4 48	4 36	4 23	4 7	3 59	3 51	3 41	3 30	3 18
3	6 38	6 25	6 11	5 55	5 46	5 35	5 22	5 7	5 0	4 52	4 43	4 33	4 21
4	7 34	7 22	7 10	6 56	6 47	6 38	6 27	6 14	6 8	6 1	5 53	5 45	5 35
5	8 28	8 19	8 9	7 58	7 52	7 44	7 36	7 25	7 20	7 15	7 9	7 3	6 55
6	9 21	9 15	9 8	9 1	8 57	8 52	8 46	8 39	8 36	8 32	8 29	8 24	8 20
7	10 14	10 11	10 8	10 4	10 2	10 0	9 57	9 54	9 52	9 50	9 49	9 47	9 44
8	11 6	11 6	11 6	11 7	11 7	11 8	11 8	11 8	11 9	11 9	11 9	11 10	11 10
9	11 57	12 1	12 5	12 10	12 12	12 15	12 19	12 23	12 25	12 27	12 30	12 33	12 36
10	12 49	12 56	13 4	13 12	13 17	13 23	13 30	13 37	13 41	13 45	13 50	13 55	14 0
11	13 43	13 52	14 3	14 15	14 22	14 30	14 39	14 50	14 56	15 1	15 8	15 15	15 23
12	14 37	14 49	15 2	15 16	15 25	15 35	15 46	16 0	16 7	16 14	16 22	16 32	16 42
13	15 32	15 46	16 0	16 16	16 26	16 37	16 50	17 6	17 13	17 22	17 31	17 41	17 54
14	16 27	16 41	16 56	17 13	17 24	17 35	17 48	18 5	18 13	18 21	18 31	18 42	18 55
15	17 22	17 35	17 50	18 6	18 16	18 27	18 40	18 56	19 4	19 12	19 21	19 32	19 44
16	18 14	18 27	18 40	18 55	19 4	19 14	19 26	19 40	19 47	19 54	20 2	20 12	20 22
17	19 5	19 15	19 27	19 40	19 47	19 55	20 5	20 17	20 22	20 28	20 35	20 43	20 51
18	19 53	20 1	20 10	20 20	20 26	20 32	20 40	20 49	20 53	20 58	21 3	21 8	21 15
19	20 38	20 44	20 50	20 57	21 1	21 5	21 10	21 17	21 20	21 22	21 26	21 30	21 34
20	21 22	21 25	21 28	21 32	21 34	21 36	21 39	21 42	21 43	21 45	21 47	21 49	21 51
21	22 5	22 5	22 5	22 6	22 6	22 6	22 6	22 6	22 6	22 6	22 6	22 6	22 6
22	22 47	22 45	22 42	22 39	22 37	22 35	22 32	22 30	22 28	22 27	22 26	22 24	22 22
23	23 30	23 25	23 19	23 12	23 9	23 5	23 0	22 54	22 52	22 49	22 46	22 42	22 38
24	....	....	23 58	23 48	23 43	23 36	23 29	23 21	23 17	23 12	23 8	23 2	22 57
25	0 14	0 6	....	....	....	....	....	23 51	23 45	23 40	23 33	23 26	23 18
26	0 59	0 49	0 38	0 26	0 19	0 11	0 2	....	....	....	....	23 55	23 45
27	1 47	1 35	1 22	1 7	0 59	0 49	0 38	0 25	0 18	0 12	0 4	....	....
28	2 37	2 24	2 9	1 53	1 44	1 33	1 20	1 5	0 58	0 50	0 41	0 32	0 20
29	3 30	3 16	3 1	2 44	2 34	2 23	2 9	1 54	1 46	1 38	1 28	1 17	1 5
30	4 24	4 10	3 56	3 39	3 30	3 18	3 5	2 50	2 42	2 34	2 25	2 14	2 2
31	5 20	5 7	4 54	4 39	4 30	4 20	4 8	3 54	3 47	3 40	3 32	3 22	3 11
Feb. 1	6 16	6 5	5 54	5 42	5 34	5 26	5 16	5 5	4 59	4 53	4 46	4 39	4 30
2	7 11	7 4	6 56	6 46	6 41	6 35	6 28	6 20	6 16	6 11	6 6	6 1	5 55
3	8 6	8 2	7 57	7 52	7 49	7 45	7 41	7 37	7 34	7 32	7 29	7 26	7 23
4	9 0	8 59	8 58	8 57	8 56	8 56	8 55	8 54	8 54	8 53	8 53	8 52	8 51
5	9 53	9 56	9 58	10 2	10 3	10 5	10 8	10 11	10 12	10 14	10 15	10 17	10 19
6	10 46	10 52	10 58	11 6	11 10	11 14	11 20	11 27	11 30	11 33	11 37	11 41	11 46
7	11 40	11 48	11 58	12 9	12 15	12 22	12 31	12 41	12 46	12 51	12 56	13 3	13 10
8	12 33	12 45	12 57	13 10	13 18	13 28	13 38	13 51	13 58	14 4	14 12	14 20	14 30
9	13 28	13 41	13 54	14 10	14 20	14 30	14 42	14 58	15 5	15 13	15 22	15 32	15 44
10	14 22	14 36	14 50	15 8	15 17	15 29	15 42	15 58	16 6	16 14	16 24	16 35	16 47
11	15 16	15 29	15 44	16 1	16 11	16 22	16 35	16 51	16 59	17 7	17 16	17 27	17 39
12	16 8	16 21	16 34	16 50	17 0	17 10	17 22	17 37	17 44	17 51	18 0	18 10	18 21
13	16 58	17 10	17 22	17 35	17 43	17 52	18 3	18 16	18 22	18 28	18 35	18 43	18 53
14	17 46	17 56	18 6	18 17	18 23	18 30	18 39	18 49	18 54	18 59	19 5	19 11	19 18
15	18 33	18 40	18 47	18 55	19 0	19 5	19 11	19 18	19 22	19 25	19 29	19 34	19 39
16	19 17	19 21	19 26	19 31	19 34	19 37	19 40	19 45	19 47	19 49	19 51	19 54	19 57
17	20 1	20 2	20 3	20 5	20 6	20 7	20 8	20 9	20 10	20 11	20 12	20 12	20 13

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	0	16 22	16 36	16 50	17 6	17 16	17 27	17 40	17 56	18 3	18 11	18 20	18 30	18 42
	1	17 15	17 29	17 44	18 1	18 11	18 23	18 36	18 52	19 0	19 8	19 18	19 29	19 41
	2	18 10	18 23	18 38	18 54	19 4	19 15	19 28	19 44	19 51	19 59	20 9	20 19	20 31
	3	19 5	19 17	19 30	19 46	19 54	20 4	20 16	20 30	20 36	20 43	20 51	21 0	21 11
	4	20 0	20 10	20 21	20 34	20 41	20 49	20 58	21 10	21 15	21 21	21 27	21 34	21 42
	5	20 54	21 1	21 10	21 19	21 24	21 30	21 37	21 45	21 49	21 53	21 58	22 2	22 8
	6	21 46	21 51	21 56	22 1	22 4	22 8	22 12	22 17	22 19	22 21	22 24	22 27	22 30
	7	22 38	22 40	22 41	22 42	22 43	22 44	22 45	22 47	22 47	22 48	22 48	22 49	22 50
	8	23 30	23 28	23 26	23 23	23 22	23 20	23 18	23 16	23 15	23 14	23 12	23 11	23 9
	9	....	....	....	....	....	23 56	23 51	23 46	23 43	23 40	23 37	23 33	23 29
	10	0 22	0 17	0 11	0 4	0 1	....	....	....	....	....	....	23 58	23 52
	11	1 15	1 6	0 57	0 47	0 42	0 35	0 27	0 18	0 14	0 9	0 4	....	....
	12	2 8	1 58	1 46	1 33	1 25	1 16	1 6	0 54	0 48	0 42	0 35	0 27	0 18
	13	3 3	2 51	2 37	2 21	2 12	2 2	1 50	1 35	1 28	1 21	1 12	1 3	0 52
	14	3 59	3 45	3 30	3 13	3 3	2 52	2 39	2 23	2 15	2 7	1 57	1 46	1 34
	15	4 54	4 40	4 25	4 8	3 58	3 46	3 33	3 16	3 9	3 0	2 51	2 40	2 27
	16	5 47	5 34	5 20	5 4	4 55	4 44	4 31	4 16	4 8	4 0	3 51	3 41	3 29
	17	6 39	6 28	6 15	6 1	5 52	5 43	5 32	5 18	5 12	5 5	4 57	4 48	4 38
	18	7 28	7 19	7 9	6 57	6 50	6 42	6 33	6 23	6 17	6 12	6 6	5 59	5 50
	19	8 15	8 8	8 0	7 52	7 47	7 41	7 35	7 27	7 23	7 19	7 14	7 10	7 4
	20	9 0	8 56	8 51	8 46	8 42	8 39	8 35	8 30	8 28	8 26	8 23	8 20	8 16
	21	9 43	9 42	9 40	9 38	9 37	9 36	9 34	9 33	9 32	9 31	9 30	9 29	9 28
	22	10 26	10 27	10 28	10 30	10 31	10 32	10 33	10 34	10 35	10 36	10 36	10 37	10 38
	23	11 8	11 12	11 16	11 21	11 24	11 27	11 31	11 35	11 37	11 40	11 42	11 45	11 48
	24	11 51	11 58	12 5	12 13	12 18	12 23	12 29	12 36	12 40	12 44	12 48	12 53	12 58
	25	12 36	12 45	12 54	13 5	13 12	13 19	13 28	13 38	13 43	13 48	13 54	14 0	14 8
	26	13 22	13 33	13 45	13 58	14 6	14 15	14 26	14 39	14 45	14 51	14 59	15 7	15 17
	27	14 11	14 23	14 37	14 52	15 2	15 12	15 24	15 39	15 46	15 54	16 2	16 12	16 23
	28	15 2	15 16	15 30	15 47	15 57	16 8	16 21	16 37	16 45	16 53	17 2	17 13	17 25
	29	15 56	16 9	16 24	16 41	16 51	17 2	17 15	17 31	17 39	17 47	17 56	18 7	18 19
	30	16 51	17 4	17 18	17 34	17 43	17 53	18 6	18 21	18 28	18 35	18 44	18 54	19 5
	31	17 47	17 58	18 10	18 24	18 32	18 41	18 52	19 4	19 10	19 17	19 24	19 32	19 41
Feb.	1	18 42	18 51	19 1	19 12	19 18	19 25	19 33	19 43	19 47	19 52	19 58	20 4	20 10
	2	19 38	19 44	19 50	19 57	20 1	20 6	20 11	20 17	20 20	20 23	20 27	20 31	20 35
	3	20 32	20 34	20 37	20 40	20 42	20 44	20 46	20 49	20 50	20 52	20 53	20 55	20 57
	4	21 25	21 24	21 24	21 22	21 22	21 21	21 20	21 20	21 19	21 18	21 18	21 17	21 17
	5	22 18	22 14	22 10	22 4	22 2	21 58	21 54	21 50	21 48	21 45	21 43	21 40	21 37
	6	23 12	23 4	22 56	22 48	22 42	22 37	22 30	22 22	22 18	22 14	22 10	22 4	21 59
	7	....	23 55	23 44	23 32	23 25	23 17	23 8	22 57	22 51	22 46	22 40	22 32	22 24
	8	0 5	....	....	....	....	....	23 50	23 36	23 29	23 22	23 14	23 6	22 55
	9	0 59	0 47	0 34	0 19	0 11	0 1	....	....	....	....	23 56	23 46	23 34
	10	1 54	1 40	1 26	1 10	1 0	0 49	0 36	0 21	0 13	0 5	....	....	....
	11	2 48	2 34	2 19	2 2	1 52	1 41	1 27	1 11	1 3	0 55	0 45	0 34	0 22
	12	3 41	3 27	3 13	2 56	2 47	2 36	2 23	2 7	2 0	1 51	1 42	1 32	1 19
	13	4 32	4 20	4 7	3 52	3 43	3 33	3 22	3 7	3 0	2 53	2 45	2 36	2 25
	14	5 22	5 11	5 0	4 48	4 40	4 32	4 22	4 10	4 4	3 58	3 51	3 44	3 35
	15	6 9	6 1	5 52	5 43	5 37	5 30	5 23	5 14	5 9	5 5	4 59	4 54	4 47
	16	6 55	6 49	6 43	6 36	6 33	6 28	6 23	6 17	6 14	6 11	6 8	6 4	5 59

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

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For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	19 17	19 21	19 26	19 31	19 34	19 37	19 40	19 45	19 47	19 49	19 51	19 54	19 57
17	20 1	20 2	20 3	20 5	20 6	20 7	20 8	20 9	20 10	20 11	20 12	20 12	20 13
18	20 43	20 42	20 40	20 38	20 37	20 36	20 35	20 33	20 33	20 32	20 31	20 30	20 29
19	21 26	21 22	21 17	21 12	21 9	21 6	21 2	20 58	20 56	20 53	20 51	20 48	20 45
20	22 9	22 2	21 55	21 46	21 42	21 37	21 30	21 23	21 20	21 16	21 12	21 8	21 3
21	22 53	22 44	22 34	22 23	22 17	22 9	22 1	21 51	21 46	21 41	21 36	21 30	21 23
22	23 39	23 28	23 16	23 2	22 54	22 45	22 35	22 23	22 17	22 11	22 4	21 56	21 47
23	....	....	....	23 45	23 36	23 26	23 14	23 0	22 53	22 45	22 37	22 28	22 17
24	0 26	0 14	0 0	....	....	....	23 58	23 43	23 35	23 27	23 18	23 8	22 56
25	1 17	1 3	0 48	0 32	0 22	0 11	....	....	....	....	....	23 58	23 46
26	2 9	1 55	1 41	1 24	1 14	1 3	0 50	0 34	0 26	0 18	0 8	....	....
27	3 3	2 50	2 36	2 20	2 11	2 0	1 48	1 33	1 26	1 18	1 9	0 59	0 48
28	3 59	3 47	3 35	3 21	3 13	3 4	2 53	2 40	2 33	2 27	2 19	2 10	2 1
Mar. 1	4 54	4 46	4 36	4 25	4 18	4 11	4 3	3 52	3 48	3 42	3 36	3 30	3 22
2	5 50	5 44	5 38	5 31	5 26	5 22	5 16	5 9	5 6	5 3	4 59	4 55	4 50
3	6 46	6 44	6 41	6 38	6 36	6 34	6 31	6 28	6 27	6 26	6 24	6 22	6 20
4	7 41	7 42	7 43	7 45	7 45	7 46	7 47	7 48	7 49	7 49	7 50	7 51	7 52
5	8 37	8 41	8 46	8 52	8 55	8 58	9 3	9 8	9 10	9 13	9 16	9 19	9 22
6	9 32	9 40	9 48	9 58	10 3	10 9	10 17	10 26	10 30	10 34	10 39	10 45	10 51
7	10 28	10 38	10 49	11 2	11 9	11 18	11 28	11 40	11 46	11 52	11 59	12 6	12 16
8	11 23	11 36	11 49	12 4	12 13	12 23	12 35	12 50	12 56	13 4	13 13	13 22	13 33
9	12 18	12 32	12 46	13 3	13 13	13 24	13 37	13 53	14 0	14 9	14 18	14 29	14 41
10	13 12	13 26	13 41	13 58	14 8	14 19	14 32	14 48	14 56	15 4	15 14	15 25	15 37
11	14 5	14 18	14 32	14 48	14 57	15 8	15 20	15 36	15 43	15 51	16 0	16 10	16 21
12	14 55	15 7	15 19	15 34	15 42	15 52	16 3	16 16	16 22	16 30	16 37	16 46	16 56
13	15 43	15 53	16 4	16 16	16 23	16 31	16 40	16 51	16 56	17 2	17 8	17 15	17 23
14	16 30	16 37	16 46	16 55	17 0	17 6	17 13	17 21	17 25	17 29	17 34	17 39	17 45
15	17 14	17 20	17 25	17 31	17 34	17 38	17 43	17 48	17 51	17 54	17 56	18 0	18 4
16	17 58	18 0	18 2	18 5	18 7	18 9	18 11	18 13	18 14	18 16	18 17	18 18	18 20
17	18 40	18 40	18 40	18 39	18 39	18 38	18 38	18 37	18 37	18 37	18 36	18 36	18 36
18	19 23	19 20	19 16	19 12	19 10	19 8	19 5	19 1	19 0	18 58	18 56	18 54	18 52
19	20 6	20 0	19 54	19 47	19 42	19 38	19 33	19 26	19 23	19 20	19 17	19 13	19 9
20	20 49	20 41	20 32	20 22	20 16	20 10	20 2	19 53	19 49	19 44	19 39	19 34	19 27
21	21 34	21 24	21 13	21 0	20 53	20 44	20 35	20 23	20 18	20 12	20 5	19 58	19 50
22	22 21	22 8	21 55	21 41	21 32	21 22	21 11	20 58	20 51	20 44	20 36	20 27	20 17
23	23 9	22 56	22 42	22 25	22 16	22 5	21 52	21 37	21 30	21 22	21 13	21 3	20 52
24	23 59	23 45	23 31	23 14	23 4	22 53	22 40	22 24	22 16	22 8	21 58	21 48	21 36
25	....	....	....	....	23 57	23 46	23 33	23 17	23 10	23 2	22 53	22 42	22 30
26	0 51	0 37	0 23	0 6	....	....	....	....	....	....	23 56	23 47	23 36
27	1 44	1 32	1 18	1 4	0 55	0 45	0 33	0 19	0 12	0 5	....	....	....
28	2 38	2 28	2 16	2 4	1 57	1 48	1 38	1 27	1 21	1 15	1 8	1 1	0 52
29	3 33	3 25	3 17	3 7	3 2	2 56	2 49	2 40	2 36	2 32	2 27	2 21	2 15
30	4 28	4 23	4 18	4 13	4 10	4 6	4 2	3 57	3 55	3 52	3 50	3 47	3 43
31	5 23	5 22	5 21	5 20	5 20	5 19	5 18	5 17	5 16	5 16	5 15	5 15	5 14
Apr. 1	6 20	6 22	6 25	6 28	6 30	6 32	6 35	6 38	6 40	6 41	6 43	6 45	6 47
2	7 16	7 23	7 29	7 37	7 41	7 46	7 52	7 59	8 2	8 6	8 10	8 14	8 20
3	8 14	8 23	8 33	8 44	8 51	8 59	9 8	9 18	9 23	9 29	9 35	9 42	9 50

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	6 55	6 49	6 43	6 36	6 33	6 28	6 23	6 17	6 14	6 11	6 8	6 4	5 59
17	7 38	7 36	7 33	7 30	7 28	7 25	7 23	7 20	7 18	7 17	7 15	7 13	7 11
18	8 21	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22
19	9 4	9 7	9 10	9 13	9 15	9 18	9 20	9 23	9 25	9 26	9 28	9 30	9 32
20	9 46	9 52	9 58	10 5	10 9	10 13	10 18	10 24	10 27	10 30	10 34	10 38	10 42
21	10 30	10 38	10 46	10 56	11 2	11 8	11 16	11 25	11 29	11 34	11 39	11 45	11 51
22	11 15	11 25	11 36	11 48	11 56	12 4	12 14	12 25	12 30	12 36	12 43	12 51	12 59
23	12 2	12 14	12 26	12 41	12 50	12 59	13 11	13 25	13 31	13 38	13 46	13 55	14 6
24	12 50	13 4	13 18	13 34	13 44	13 54	14 7	14 22	14 30	14 38	14 47	14 57	15 8
25	13 42	13 55	14 10	14 27	14 37	14 48	15 1	15 17	15 25	15 33	15 42	15 53	16 5
26	14 35	14 48	15 3	15 19	15 29	15 40	15 52	16 8	16 15	16 23	16 32	16 42	16 54
27	15 30	15 42	15 55	16 10	16 19	16 28	16 40	16 54	17 0	17 8	17 16	17 24	17 35
28	16 25	16 36	16 46	16 59	17 6	17 14	17 24	17 35	17 40	17 46	17 52	18 0	18 7
Mar. 1	17 21	17 29	17 37	17 46	17 51	17 57	18 4	18 12	18 16	18 20	18 24	18 29	18 35
2	18 17	18 21	18 26	18 31	18 34	18 37	18 41	18 45	18 47	18 50	18 52	18 55	18 58
3	19 12	19 13	19 14	19 15	19 15	19 16	19 17	19 18	19 18	19 18	19 19	19 19	19 20
4	20 8	20 5	20 2	19 58	19 57	19 54	19 52	19 49	19 48	19 46	19 44	19 43	19 41
5	21 3	20 57	20 50	20 43	20 39	20 34	20 28	20 21	20 18	20 15	20 11	20 7	20 3
6	21 58	21 49	21 40	21 29	21 22	21 15	21 6	20 57	20 52	20 47	20 41	20 35	20 28
7	22 54	22 43	22 30	22 16	22 8	21 59	21 48	21 35	21 29	21 23	21 15	21 7	20 58
8	23 50	23 36	23 23	23 6	22 57	22 47	22 34	22 19	22 12	22 4	21 56	21 46	21 34
9	....	....	....	23 59	23 49	23 38	23 24	23 8	23 1	22 52	22 43	22 32	22 20
10	0 44	0 30	0 16	....	....	....	....	....	23 55	23 47	23 37	23 27	23 14
11	1 38	1 24	1 9	0 53	0 43	0 32	0 19	0 3	....	....	....	....	....
12	2 29	2 17	2 3	1 48	1 38	1 28	1 16	1 1	0 54	0 46	0 38	0 28	0 17
13	3 19	3 8	2 56	2 42	2 35	2 26	2 15	2 2	1 56	1 50	1 42	1 34	1 25
14	4 6	3 57	3 48	3 37	3 31	3 23	3 15	3 5	3 0	2 55	2 49	2 43	2 35
15	4 52	4 45	4 38	4 31	4 26	4 21	4 15	4 8	4 4	4 1	3 57	3 52	3 47
16	5 36	5 32	5 28	5 24	5 21	5 18	5 14	5 10	5 8	5 6	5 4	5 1	4 59
17	6 19	6 18	6 17	6 16	6 15	6 14	6 13	6 12	6 12	6 11	6 11	6 10	6 10
18	7 1	7 3	7 5	7 7	7 9	7 10	7 12	7 14	7 15	7 16	7 17	7 18	7 20
19	7 44	7 48	7 53	7 59	8 2	8 6	8 10	8 15	8 18	8 20	8 23	8 26	8 30
20	8 27	8 34	8 42	8 50	8 55	9 1	9 8	9 16	9 20	9 24	9 28	9 33	9 39
21	9 11	9 20	9 31	9 42	9 49	9 56	10 5	10 16	10 21	10 27	10 33	10 40	10 47
22	9 57	10 8	10 20	10 34	10 42	10 52	11 2	11 15	11 22	11 28	11 36	11 44	11 54
23	10 44	10 57	11 10	11 26	11 35	11 46	11 58	12 13	12 20	12 28	12 36	12 46	12 57
24	11 33	11 47	12 1	12 18	12 28	12 39	12 52	13 8	13 15	13 24	13 33	13 43	13 56
25	12 24	12 38	12 52	13 9	13 19	13 30	13 43	13 59	14 6	14 15	14 24	14 34	14 46
26	13 16	13 28	13 43	13 59	14 8	14 18	14 31	14 45	14 52	15 0	15 9	15 18	15 29
27	14 10	14 21	14 33	14 47	14 55	15 4	15 15	15 27	15 33	15 40	15 47	15 55	16 4
28	15 4	15 13	15 23	15 34	15 40	15 47	15 55	16 5	16 10	16 14	16 20	16 26	16 33
29	15 59	16 5	16 11	16 19	16 23	16 28	16 33	16 40	16 43	16 46	16 49	16 53	16 58
30	16 54	16 57	17 0	17 3	17 5	17 7	17 9	17.12	17 13	17 15	17 16	17 18	17 20
31	17 50	17 49	17 48	17 47	17 46	17 46	17 45	17 44	17 43	17 43	17 42	17 42	17 41
Apr. 1	18 46	18 42	18 37	18 32	18 29	18 25	18 21	18 16	18 14	18 12	18 9	18 6	18 3
2	19 43	19 36	19 28	19 18	19 13	19 6	18 59	18 51	18 47	18 43	18 38	18 32	18 27
3	20 41	20 31	20 20	20 7	20 0	19 51	19 41	19 29	19 24	19 18	19 11	19 4	18 55

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	6 20	6 22	6 25	6 28	6 30	6 32	6 35	6 38	6 40	6 41	6 43	6 45	6 47
2	7 16	7 23	7 29	7 37	7 41	7 46	7 52	7 59	8 2	8 6	8 10	8 14	8 20
3	8 14	8 23	8 33	8 44	8 51	8 59	9 8	9 18	9 23	9 29	9 35	9 42	9 50
4	9 12	9 24	9 36	9 50	9 59	10 8	10 20	10 33	10 40	10 47	10 55	11 4	11 14
5	10 9	10 22	10 37	10 53	11 3	11 14	11 26	11 42	11 49	11 57	12 7	12 17	12 29
6	11 6	11 20	11 34	11 51	12 1	12 13	12 26	12 42	12 50	12 59	13 8	13 19	13 32
7	12 0	12 14	12 28	12 45	12 54	13 5	13 17	13 34	13 41	13 50	13 59	14 9	14 21
8	12 52	13 4	13 18	13 33	13 42	13 52	14 3	14 17	14 24	14 31	14 39	14 49	14 59
9	13 41	13 52	14 3	14 16	14 24	14 32	14 42	14 54	14 59	15 5	15 12	15 20	15 28
10	14 28	14 37	14 46	14 56	15 2	15 8	15 16	15 25	15 29	15 34	15 39	15 45	15 52
11	15 13	15 19	15 25	15 32	15 37	15 41	15 46	15 53	15 56	15 59	16 2	16 6	16 11
12	15 57	16 0	16 3	16 7	16 9	16 12	16 15	16 18	16 20	16 21	16 23	16 25	16 28
13	16 39	16 40	16 40	16 40	16 41	16 41	16 42	16 42	16 42	16 43	16 43	16 43	16 43
14	17 22	17 19	17 17	17 14	17 12	17 11	17 8	17 6	17 5	17 3	17 2	17 0	16 59
15	18 4	17 59	17 54	17 47	17 44	17 40	17 36	17 30	17 28	17 25	17 22	17 19	17 15
16	18 47	18 40	18 32	18 23	18 17	18 12	18 5	17 56	17 52	17 48	17 44	17 39	17 33
17	19 32	19 22	19 12	19 0	18 53	18 45	18 36	18 25	18 20	18 15	18 8	18 2	17 54
18	20 18	20 6	19 54	19 39	19 31	19 22	19 11	18 58	18 52	18 45	18 37	18 29	18 19
19	21 5	20 52	20 38	20 22	20 13	20 3	19 50	19 35	19 28	19 20	19 12	19 2	18 51
20	21 54	21 41	21 26	21 9	20 59	20 48	20 35	20 19	20 11	20 3	19 54	19 43	19 31
21	22 45	22 31	22 16	22 0	21 50	21 38	21 25	21 9	21 2	20 53	20 44	20 33	20 21
22	23 36	23 23	23 10	22 54	22 44	22 34	22 22	22 6	21 59	21 52	21 43	21 33	21 22
23	....	....	....	23 51	23 43	23 34	23 23	23 10	23 4	22 57	22 50	22 41	22 31
24	0 28	0 17	0 5	....	....	....	....	....	....	....	....	23 56	23 49
25	1 21	1 12	1 2	0 51	0 45	0 37	0 29	0 19	0 14	0 9	0 3	....	....
26	2 14	2 8	2 1	1 53	1 49	1 44	1 38	1 32	1 28	1 25	1 21	1 17	1 12
27	3 7	3 4	3 1	2 58	2 56	2 54	2 51	2 48	2 47	2 45	2 43	2 41	2 39
28	4 2	4 2	4 3	4 4	4 4	4 5	4 6	4 7	4 7	4 8	4 8	4 9	4 9
29	4 57	5 2	5 6	5 12	5 15	5 18	5 22	5 27	5 30	5 32	5 35	5 38	5 42
30	5 55	6 2	6 11	6 20	6 26	6 32	6 39	6 48	6 52	6 57	7 2	7 8	7 14
May 1	6 53	7 4	7 15	7 28	7 36	7 45	7 55	8 7	8 13	8 19	8 26	8 34	8 44
2	7 53	8 5	8 19	8 35	8 44	8 54	9 7	9 22	9 29	9 37	9 45	9 55	10 7
3	8 52	9 6	9 20	9 38	9 48	9 59	10 12	10 29	10 36	10 45	10 54	11 6	11 18
4	9 49	10 3	10 18	10 35	10 45	10 57	11 10	11 26	11 34	11 43	11 52	12 3	12 16
5	10 44	10 57	11 11	11 28	11 37	11 47	12 0	12 15	12 22	12 30	12 38	12 48	13 0
6	11 36	11 48	12 0	12 14	12 22	12 31	12 42	12 55	13 1	13 8	13 15	13 23	13 33
7	12 25	12 34	12 44	12 56	13 2	13 10	13 18	13 28	13 33	13 39	13 44	13 51	13 58
8	13 11	13 18	13 25	13 34	13 38	13 44	13 50	13 58	14 1	14 5	14 9	14 14	14 19
9	13 55	13 59	14 4	14 9	14 12	14 15	14 19	14 23	14 26	14 28	14 30	14 33	14 36
10	14 38	14 39	14 41	14 43	14 44	14 45	14 46	14 48	14 48	14 49	14 50	14 51	14 52
11	15 20	15 19	15 17	15 16	15 15	15 14	15 13	15 11	15 10	15 10	15 9	15 8	15 7
12	16 3	15 58	15 54	15 49	15 46	15 43	15 39	15 35	15 33	15 31	15 28	15 26	15 23
13	16 46	16 39	16 32	16 24	16 19	16 14	16 7	16 0	15 57	15 53	15 49	15 45	15 40
14	17 30	17 21	17 11	17 0	16 53	16 46	16 38	16 28	16 23	16 18	16 12	16 6	15 59
15	18 15	18 4	17 52	17 39	17 31	17 22	17 11	16 59	16 53	16 47	16 40	16 32	16 22
16	19 3	18 50	18 36	18 21	18 12	18 1	17 49	17 35	17 28	17 21	17 12	17 3	16 52
17	19 52	19 38	19 23	19 6	18 57	18 46	18 32	18 16	18 9	18 1	17 52	17 41	17 29

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	18 46	18 42	18 37	18 32	18 29	18 25	18 21	18 16	18 14	18 12	18 9	18 6	18 3
2	19 43	19 36	19 28	19 18	19 13	19 6	18 59	18 51	18 47	18 43	18 38	18 32	18 27
3	20 41	20 31	20 20	20 7	20 0	19 51	19 41	19 29	19 24	19 18	19 11	19 4	18 55
4	21 39	21 27	21 13	20 58	20 49	20 39	20 27	20 12	20 6	19 58	19 50	19 41	19 30
5	22 36	22 23	22 8	21 51	21 42	21 30	21 17	21 1	20 54	20 46	20 36	20 26	20 13
6	23 32	23 18	23 3	22 46	22 36	22 25	22 12	21 56	21 48	21 39	21 30	21 19	21 6
7	....	....	23 58	23 42	23 33	23 22	23 9	22 54	22 47	22 39	22 30	22 20	22 8
8	0 25	0 12	....	....	....	....	....	23 55	23 49	23 42	23 34	23 25	23 15
9	1 16	1 4	0 52	0 38	0 29	0 20	0 9	....	....	....	....	....	....
10	2 4	1 55	1 44	1 33	1 26	1 18	1 9	0 58	0 53	0 47	0 41	0 34	0 26
11	2 50	2 43	2 35	2 27	2 21	2 16	2 9	2 1	1 57	1 53	1 48	1 43	1 37
12	3 34	3 30	3 25	3 19	3 16	3 12	3 8	3 3	3 1	2 58	2 55	2 52	2 48
13	4 17	4 16	4 14	4 11	4 10	4 8	4 7	4 5	4 4	4 3	4 2	4 0	3 59
14	5 0	5 1	5 2	5 3	5 4	5 4	5 5	5 6	5 7	5 7	5 8	5 8	5 9
15	5 42	5 46	5 50	5 54	5 57	6 0	6 3	6 7	6 9	6 12	6 14	6 16	6 19
16	6 25	6 31	6 38	6 46	6 50	6 55	7 2	7 9	7 12	7 16	7 20	7 24	7 29
17	7 9	7 18	7 27	7 38	7 44	7 51	7 59	8 9	8 14	8 19	8 25	8 31	8 38
18	7 54	8 5	8 17	8 30	8 38	8 46	8 57	9 9	9 15	9 21	9 29	9 37	9 46
19	8 41	8 53	9 7	9 22	9 31	9 41	9 53	10 8	10 14	10 22	10 30	10 40	10 51
20	9 29	9 43	9 57	10 14	10 23	10 34	10 47	11 3	11 11	11 19	11 28	11 39	11 51
21	10 19	10 33	10 48	11 4	11 14	11 26	11 39	11 55	12 3	12 11	12 21	12 31	12 44
22	11 10	11 23	11 37	11 54	12 3	12 14	12 27	12 42	12 50	12 58	13 6	13 17	13 28
23	12 1	12 13	12 26	12 41	12 50	13 0	13 11	13 25	13 31	13 38	13 46	13 55	14 5
24	12 53	13 3	13 14	13 27	13 34	13 42	13 51	14 2	14 8	14 13	14 20	14 27	14 35
25	13 46	13 54	14 2	14 11	14 16	14 22	14 29	14 37	14 41	14 45	14 49	14 54	15 0
26	14 39	14 43	14 48	14 54	14 57	15 0	15 4	15 9	15 11	15 13	15 16	15 19	15 22
27	15 33	15 34	15 35	15 36	15 37	15 38	15 39	15 40	15 40	15 41	15 41	15 42	15 42
28	16 28	16 25	16 23	16 19	16 18	16 16	16 13	16 11	16 9	16 8	16 6	16 5	16 3
29	17 24	17 18	17 12	17 4	17 0	16 56	16 50	16 44	16 41	16 37	16 34	16 30	16 25
30	18 22	18 13	18 3	17 52	17 46	17 38	17 30	17 20	17 15	17 10	17 4	16 58	16 51
May 1	19 22	19 10	18 57	18 43	18 35	18 25	18 14	18 1	17 55	17 48	17 40	17 32	17 22
2	20 21	20 8	19 53	19 37	19 27	19 16	19 4	18 48	18 41	18 33	18 24	18 14	18 2
3	21 20	21 6	20 51	20 33	20 23	20 12	19 58	19 42	19 34	19 26	19 16	19 5	18 52
4	22 16	22 2	21 48	21 31	21 21	21 10	20 57	20 41	20 33	20 25	20 15	20 4	19 52
5	23 10	22 57	22 44	22 28	22 20	22 10	21 58	21 43	21 36	21 29	21 20	21 11	21 0
6	....	23 50	23 38	23 25	23 18	23 9	22 59	22 47	22 42	22 35	22 28	22 20	22 11
7	0 0	....	....	....	....	....	....	23 51	23 47	23 42	23 37	23 31	23 24
8	0 48	0 39	0 31	0 21	0 15	0 8	0 0	....	....	....	....	....	....
9	1 33	1 27	1 21	1 14	1 10	1 6	1 1	0 55	0 52	0 48	0 45	0 41	0 36
10	2 16	2 13	2 10	2 7	2 5	2 2	2 0	1 57	1 56	1 54	1 52	1 50	1 48
11	2 59	2 59	2 59	2 58	2 58	2 58	2 58	2 58	2 58	2 58	2 58	2 58	2 58
12	3 41	3 44	3 46	3 50	3 52	3 54	3 57	4 0	4 1	4 3	4 4	4 6	4 8
13	4 23	4 29	4 35	4 41	4 45	4 49	4 55	5 1	5 4	5 7	5 10	5 14	5 18
14	5 7	5 15	5 24	5 33	5 39	5 45	5 53	6 2	6 6	6 11	6 16	6 22	6 28
15	5 52	6 2	6 13	6 26	6 33	6 41	6 51	7 3	7 8	7 14	7 21	7 28	7 37
16	6 38	6 50	7 3	7 18	7 27	7 37	7 48	8 2	8 9	8 16	8 24	8 33	8 44
17	7 26	7 40	7 54	8 10	8 20	8 31	8 44	8 59	9 7	9 15	9 24	9 34	9 46

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 17	19 52	19 38	19 23	19 6	18 57	18 46	18 32	18 16	18 9	18 1	17 52	17 41	17 29
18	20 42	20 28	20 13	19 56	19 46	19 35	19 21	19 5	18 57	18 49	18 39	18 28	18 16
19	21 33	21 20	21 5	20 49	20 39	20 28	20 15	20 0	19 52	19 44	19 35	19 24	19 13
20	22 24	22 12	21 59	21 44	21 36	21 26	21 14	21 0	20 54	20 47	20 39	20 29	20 19
21	23 16	23 6	22 55	22 43	22 35	22 27	22 18	22 6	22 1	21 55	21 49	21 41	21 33
22	....	....	23 52	23 43	23 37	23 31	23 24	23 16	23 12	23 8	23 3	22 58	22 52
23	0 7	0 0	....	....	....	....	....	....	....	....	....	....	....
24	0 58	0 54	0 49	0 44	0 41	0 38	0 34	0 29	0 27	0 24	0 22	0 19	0 15
25	1 50	1 49	1 48	1 47	1 46	1 46	1 45	1 44	1 44	1 43	1 43	1 42	1 41
26	2 43	2 46	2 49	2 52	2 54	2 56	2 58	3 1	3 2	3 4	3 6	3 8	3 10
27	3 38	3 44	3 51	3 58	4 2	4 7	4 13	4 20	4 23	4 26	4 30	4 35	4 40
28	4 35	4 44	4 54	5 5	5 12	5 19	5 28	5 39	5 44	5 49	5 55	6 2	6 10
29	5 34	5 46	5 58	6 13	6 21	6 31	6 42	6 56	7 2	7 10	7 18	7 27	7 37
30	6 33	6 47	7 1	7 18	7 28	7 39	7 52	8 8	8 15	8 24	8 33	8 44	8 56
31	7 33	7 47	8 2	8 20	8 30	8 41	8 55	9 12	9 20	9 28	9 38	9 50	10 2
June 1	8 31	8 44	8 59	9 16	9 26	9 37	9 50	10 6	10 14	10 22	10 31	10 42	10 54
2	9 26	9 38	9 51	10 7	10 15	10 25	10 37	10 51	10 58	11 5	11 14	11 23	11 33
3	10 17	10 28	10 39	10 52	10 59	11 7	11 17	11 29	11 34	11 40	11 47	11 54	12 3
4	11 6	11 14	11 22	11 32	11 38	11 44	11 51	12 1	12 4	12 9	12 14	12 19	12 26
5	11 52	11 57	12 3	12 9	12 13	12 17	12 22	12 28	12 31	12 34	12 37	12 40	12 44
6	12 35	12 38	12 41	12 44	12 46	12 48	12 50	12 53	12 54	12 55	12 57	12 59	13 0
7	13 18	13 18	13 18	13 17	13 17	13 17	13 17	13 16	13 16	13 16	13 16	13 16	13 16
8	14 0	13 57	13 54	13 50	13 48	13 46	13 43	13 40	13 38	13 37	13 35	13 33	13 31
9	14 43	14 37	14 31	14 24	14 20	14 16	14 11	14 4	14 2	13 58	13 55	13 51	13 47
10	15 26	15 18	15 10	15 0	14 54	14 47	14 40	14 31	14 27	14 22	14 17	14 11	14 5
11	16 12	16 1	15 50	15 37	15 30	15 22	15 12	15 0	14 55	14 49	14 42	14 35	14 27
12	16 59	16 46	16 33	16 18	16 10	16 0	15 48	15 34	15 28	15 21	15 13	15 4	14 54
13	17 48	17 34	17 20	17 3	16 53	16 42	16 30	16 14	16 6	15 59	15 50	15 39	15 27
14	18 38	18 24	18 9	17 52	17 42	17 30	17 17	17 0	16 52	16 44	16 34	16 23	16 11
15	19 29	19 16	19 1	18 44	18 34	18 23	18 9	17 53	17 46	17 37	17 28	17 17	17 5
16	20 21	20 9	19 55	19 39	19 30	19 20	19 8	18 53	18 46	18 38	18 30	18 20	18 9
17	21 13	21 2	20 51	20 37	20 30	20 21	20 10	19 58	19 52	19 46	19 39	19 31	19 21
18	22 4	21 56	21 47	21 37	21 31	21 24	21 16	21 7	21 2	20 57	20 52	20 46	20 39
19	22 55	22 50	22 44	22 37	22 33	22 29	22 24	22 18	22 15	22 12	22 8	22 5	22 0
20	23 46	23 44	23 41	23 39	23 37	23 35	23 33	23 31	23 30	23 28	23 27	23 26	23 24
21	....	....	....	....	....	....	....	....	....	....	....	....	....
22	0 37	0 38	0 40	0 41	0 42	0 43	0 44	0 45	0 46	0 47	0 48	0 48	0 49
23	1 30	1 34	1 39	1 45	1 48	1 52	1 56	2 1	2 3	2 6	2 9	2 12	2 16
24	2 24	2 31	2 40	2 49	2 55	3 1	3 9	3 18	3 22	3 26	3 31	3 37	3 43
25	3 20	3 30	3 41	3 54	4 2	4 11	4 21	4 33	4 39	4 46	4 53	5 1	5 10
26	4 17	4 30	4 44	4 59	5 9	5 19	5 31	5 46	5 54	6 2	6 10	6 20	6 32
27	5 16	5 30	5 45	6 2	6 12	6 24	6 37	6 54	7 2	7 10	7 20	7 31	7 44
28	6 15	6 29	6 44	7 1	7 11	7 23	7 37	7 53	8 1	8 10	8 20	8 31	8 44
29	7 12	7 25	7 39	7 55	8 5	8 15	8 28	8 43	8 51	8 59	9 8	9 18	9 29
30	8 6	8 17	8 30	8 44	8 52	9 1	9 12	9 25	9 32	9 38	9 46	9 54	10 4
July 1	8 57	9 6	9 16	9 27	9 34	9 41	9 50	10 0	10 5	10 10	10 16	10 22	10 30
2	9 44	9 51	9 58	10 7	10 11	10 16	10 23	10 30	10 33	10 37	10 41	10 46	10 51

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 17	7 26	7 40	7 54	8 10	8 20	8 31	8 44	8 59	9 7	9 15	9 24	9 34	9 46
18	8 16	8 30	8 45	9 2	9 12	9 24	9 37	9 53	10 1	10 9	10 19	10 30	10 42
19	9 7	9 20	9 35	9 52	10 2	10 13	10 26	10 42	10 50	10 58	11 7	11 18	11 30
20	9 58	10 10	10 24	10 40	10 49	10 59	11 11	11 26	11 33	11 40	11 48	11 58	12 9
21	10 49	11 0	11 12	11 25	11 33	11 42	11 52	12 5	12 10	12 17	12 24	12 31	12 40
22	11 40	11 49	11 58	12 9	12 15	12 22	12 30	12 39	12 43	12 48	12 54	12 59	13 6
23	12 31	12 38	12 44	12 50	12 55	12 59	13 4	13 11	13 14	13 17	13 20	13 24	13 29
24	13 23	13 26	13 28	13 32	13 33	13 35	13 38	13 40	13 42	13 43	13 44	13 46	13 48
25	14 15	14 14	14 14	14 13	14 12	14 11	14 11	14 10	14 9	14 9	14 8	14 8	14 7
26	15 9	15 5	15 0	14 54	14 52	14 48	14 44	14 40	14 37	14 35	14 33	14 30	14 27
27	16 5	15 57	15 49	15 40	15 35	15 29	15 22	15 13	15 10	15 5	15 1	14 56	14 50
28	17 3	16 52	16 41	16 28	16 21	16 12	16 2	15 51	15 45	15 39	15 33	15 25	15 17
29	18 2	17 50	17 36	17 20	17 11	17 1	16 49	16 34	16 28	16 20	16 12	16 2	15 51
30	19 2	18 48	18 33	18 16	18 6	17 54	17 41	17 25	17 17	17 9	16 59	16 48	16 36
31	20 1	19 47	19 32	19 14	19 4	18 52	18 39	18 22	18 14	18 6	17 56	17 45	17 32
June 1	20 57	20 44	20 30	20 14	20 4	19 53	19 40	19 25	19 18	19 9	19 0	18 50	18 38
2	21 51	21 39	21 27	21 13	21 4	20 55	20 44	20 30	20 24	20 17	20 9	20 0	19 50
3	22 41	22 32	22 22	22 10	22 4	21 56	21 47	21 36	21 31	21 26	21 20	21 13	21 5
4	23 28	23 22	23 14	23 6	23 1	22 56	22 49	22 42	22 38	22 34	22 30	22 25	22 19
5	....	....	....	....	23 57	23 54	23 50	23 45	23 43	23 41	23 39	23 36	23 32
6	0 13	0 9	0 5	0 0	....	....	....	....	....	....	....	....	....
7	0 56	0 55	0 54	0 52	0 52	0 50	0 49	0 48	0 47	0 47	0 46	0 45	0 44
8	1 38	1 40	1 42	1 44	1 45	1 46	1 48	1 50	1 50	1 51	1 52	1 54	1 55
9	2 21	2 25	2 30	2 36	2 39	2 42	2 46	2 51	2 53	2 56	2 59	3 2	3 5
10	3 4	3 11	3 18	3 27	3 32	3 38	3 44	3 52	3 56	4 0	4 5	4 9	4 15
11	3 48	3 58	4 8	4 19	4 26	4 34	4 43	4 53	4 58	5 4	5 10	5 17	5 25
12	4 34	4 46	4 58	5 12	5 20	5 30	5 41	5 54	6 0	6 7	6 15	6 23	6 33
13	5 22	5 35	5 49	6 5	6 14	6 25	6 38	6 53	7 0	7 8	7 17	7 26	7 38
14	6 12	6 26	6 41	6 58	7 8	7 19	7 32	7 49	7 56	8 5	8 14	8 25	8 38
15	7 3	7 17	7 32	7 49	7 59	8 10	8 24	8 40	8 48	8 56	9 6	9 17	9 29
16	7 54	8 8	8 23	8 38	8 48	8 59	9 11	9 26	9 34	9 42	9 50	10 0	10 12
17	8 46	8 58	9 11	9 25	9 33	9 43	9 54	10 7	10 14	10 20	10 28	10 36	10 46
18	9 38	9 48	9 58	10 10	10 16	10 24	10 33	10 43	10 48	10 54	11 0	11 6	11 14
19	10 29	10 36	10 43	10 52	10 56	11 2	11 8	11 15	11 19	11 22	11 27	11 31	11 36
20	11 20	11 23	11 27	11 32	11 35	11 38	11 41	11 45	11 47	11 49	11 51	11 54	11 56
21	12 10	12 11	12 12	12 12	12 12	12 13	12 13	12 14	12 14	12 14	12 14	12 15	12 15
22	13 2	12 59	12 56	12 52	12 51	12 48	12 46	12 43	12 41	12 40	12 38	12 36	12 34
23	13 55	13 49	13 42	13 35	13 30	13 26	13 20	13 13	13 10	13 7	13 3	12 59	12 54
24	14 50	14 41	14 31	14 20	14 13	14 6	13 57	13 47	13 42	13 38	13 32	13 25	13 18
25	15 47	15 35	15 22	15 8	15 0	14 51	14 40	14 26	14 20	14 14	14 6	13 57	13 48
26	16 45	16 32	16 18	16 1	15 51	15 40	15 28	15 12	15 5	14 57	14 48	14 37	14 26
27	17 44	17 30	17 15	16 57	16 47	16 36	16 22	16 5	15 57	15 49	15 39	15 28	15 15
28	18 42	18 28	18 13	17 56	17 46	17 35	17 22	17 5	16 58	16 49	16 39	16 28	16 16
29	19 38	19 25	19 12	18 56	18 47	18 37	18 25	18 10	18 3	17 56	17 47	17 37	17 26
30	20 30	20 20	20 8	19 56	19 48	19 39	19 29	19 17	19 11	19 5	18 58	18 50	18 41
July 1	21 20	21 12	21 3	20 53	20 48	20 41	20 33	20 24	20 20	20 15	20 10	20 4	19 57
2	22 7	22 1	21 56	21 49	21 45	21 41	21 36	21 30	21 27	21 24	21 21	21 17	21 13

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 1	8 57	9 6	9 16	9 27	9 34	9 41	9 50	10 0	10 5	10 10	10 16	10 22	10 30
2	9 44	9 51	9 58	10 7	10 11	10 16	10 23	10 30	10 33	10 37	10 41	10 46	10 51
3	10 30	10 34	10 38	10 43	10 46	10 49	10 52	10 56	10 58	11 0	11 3	11 6	11 8
4	11 14	11 15	11 16	11 17	11 18	11 19	11 20	11 21	11 21	11 22	11 23	11 23	11 24
5	11 56	11 55	11 53	11 51	11 49	11 48	11 46	11 44	11 43	11 43	11 42	11 40	11 39
6	12 39	12 34	12 30	12 24	12 21	12 18	12 13	12 8	12 6	12 4	12 1	11 58	11 55
7	13 22	13 15	13 7	12 59	12 54	12 48	12 42	12 34	12 30	12 26	12 22	12 17	12 12
8	14 6	13 57	13 47	13 35	13 29	13 21	13 12	13 2	12 57	12 52	12 46	12 39	12 32
9	14 52	14 41	14 29	14 15	14 7	13 57	13 47	13 34	13 28	13 21	13 14	13 5	12 56
10	15 41	15 28	15 14	14 58	14 48	14 38	14 26	14 11	14 4	13 56	13 47	13 38	13 26
11	16 31	16 17	16 2	15 45	15 35	15 24	15 10	14 54	14 46	14 38	14 28	14 18	14 6
12	17 22	17 8	16 53	16 36	16 26	16 15	16 1	15 45	15 37	15 29	15 19	15 8	14 56
13	18 15	18 2	17 48	17 31	17 22	17 11	16 58	16 43	16 36	16 28	16 19	16 8	15 56
14	19 8	18 56	18 44	18 30	18 21	18 12	18 1	17 47	17 41	17 34	17 26	17 17	17 7
15	20 1	19 51	19 41	19 30	19 23	19 15	19 6	18 56	18 51	18 46	18 39	18 32	18 25
16	20 52	20 46	20 39	20 31	20 26	20 21	20 15	20 8	20 4	20 0	19 56	19 52	19 47
17	21 44	21 40	21 37	21 33	21 30	21 28	21 25	21 21	21 19	21 17	21 15	21 13	21 10
18	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35
19	23 26	23 30	23 33	23 38	23 40	23 43	23 46	23 50	23 52	23 54	23 56	23 58	. . . .
20	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . .	. . . .	0 1
21	0 19	0 26	0 33	0 41	0 45	0 51	0 57	1 5	1 8	1 12	1 16	1 21	1 27
22	1 13	1 22	1 33	1 44	1 51	1 59	2 8	2 19	2 24	2 30	2 36	2 43	2 51
23	2 8	2 20	2 33	2 48	2 56	3 6	3 17	3 31	3 38	3 45	3 53	4 3	4 13
24	3 5	3 18	3 33	3 50	3 59	4 10	4 24	4 40	4 47	4 55	5 5	5 16	5 28
25	4 2	4 16	4 31	4 49	4 59	5 11	5 25	5 41	5 49	5 58	6 8	6 19	6 32
26	4 59	5 13	5 27	5 44	5 54	6 5	6 18	6 34	6 42	6 50	7 0	7 10	7 23
27	5 54	6 6	6 19	6 35	6 44	6 54	7 6	7 20	7 26	7 34	7 42	7 51	8 2
28	6 46	6 57	7 8	7 21	7 28	7 36	7 46	7 58	8 3	8 9	8 16	8 23	8 32
29	7 36	7 44	7 52	8 2	8 8	8 14	8 21	8 30	8 34	8 39	8 43	8 49	8 55
30	8 23	8 28	8 34	8 40	8 44	8 48	8 52	8 58	9 1	9 4	9 7	9 10	9 14
31	9 8	9 10	9 13	9 15	9 17	9 19	9 21	9 24	9 25	9 26	9 28	9 29	9 31
Aug. 1	9 51	9 51	9 50	9 50	9 49	9 49	9 48	9 48	9 48	9 48	9 47	9 47	9 47
2	10 34	10 31	10 27	10 23	10 21	10 19	10 16	10 12	10 10	10 9	10 7	10 5	10 2
3	11 17	11 11	11 4	10 57	10 53	10 49	10 43	10 37	10 34	10 30	10 27	10 23	10 18
4	12 1	11 52	11 43	11 33	11 27	11 20	11 13	11 3	10 59	10 54	10 49	10 44	10 37
5	12 46	12 35	12 24	12 11	12 3	11 55	11 45	11 33	11 28	11 22	11 15	11 7	10 59
6	13 32	13 20	13 7	12 52	12 43	12 33	12 22	12 8	12 1	11 54	11 46	11 36	11 26
7	14 21	14 8	13 53	13 37	13 27	13 16	13 3	12 48	12 40	12 32	12 23	12 13	12 1
8	15 12	14 58	14 43	14 26	14 16	14 4	13 51	13 35	13 27	13 18	13 9	12 58	12 46
9	16 4	15 51	15 36	15 19	15 10	14 58	14 45	14 30	14 22	14 14	14 4	13 54	13 42
10	16 58	16 45	16 32	16 17	16 8	15 58	15 46	15 32	15 25	15 17	15 9	14 59	14 48
11	17 51	17 41	17 30	17 17	17 10	17 1	16 51	16 39	16 34	16 28	16 21	16 13	16 4
12	18 45	18 37	18 28	18 19	18 14	18 7	18 0	17 51	17 47	17 43	17 38	17 32	17 26
13	19 38	19 33	19 28	19 22	19 19	19 16	19 11	19 6	19 4	19 1	18 58	18 55	18 52
14	20 30	20 29	20 28	20 26	20 25	20 24	20 23	20 22	20 21	20 21	20 20	20 19	20 18
15	21 23	21 25	21 27	21 30	21 32	21 34	21 36	21 38	21 39	21 41	21 42	21 44	21 45
16	22 16	22 21	22 27	22 34	22 38	22 43	22 48	22 54	22 57	23 0	23 4	23 8	23 13

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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Date. \ Lat.		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	1	21 20	21 12	21 3	20 53	20 48	20 41	20 33	20 24	20 20	20 15	20 10	20 4	19 57
	2	22 7	22 1	21 56	21 49	21 45	21 41	21 36	21 30	21 27	21 24	21 21	21 17	21 13
	3	22 51	22 49	22 46	22 43	22 41	22 39	22 37	22 34	22 33	22 32	22 30	22 28	22 26
	4	23 34	23 35	23 35	23 36	23 36	23 36	23 37	23 37	23 37	23 37	23 37	23 38	23 38
	5	....	....	....	....	....	....	....	....	....	....	....	....	....
	6	0 17	0 20	0 24	0 28	0 30	0 32	0 35	0 39	0 41	0 42	0 44	0 46	0 49
	7	1 0	1 6	1 12	1 19	1 24	1 28	1 34	1 40	1 43	1 47	1 50	1 55	1 59
	8	1 44	1 52	2 1	2 11	2 17	2 24	2 32	2 41	2 46	2 51	2 56	3 2	3 9
	9	2 29	2 39	2 51	3 4	3 11	3 20	3 30	3 42	3 48	3 54	4 1	4 9	4 18
	10	3 16	3 28	3 42	3 57	4 6	4 16	4 27	4 42	4 49	4 56	5 4	5 14	5 25
	11	4 5	4 18	4 33	4 50	4 59	5 11	5 24	5 39	5 47	5 55	6 4	6 15	6 27
	12	4 56	5 10	5 25	5 42	5 52	6 3	6 17	6 34	6 41	6 50	6 59	7 10	7 23
	13	5 48	6 2	6 16	6 33	6 43	6 54	7 7	7 23	7 30	7 38	7 48	7 58	8 10
	14	6 41	6 53	7 6	7 22	7 31	7 41	7 52	8 6	8 13	8 20	8 28	8 38	8 48
	15	7 33	7 44	7 55	8 8	8 15	8 24	8 33	8 45	8 50	8 56	9 3	9 10	9 19
	16	8 25	8 34	8 42	8 52	8 57	9 3	9 10	9 19	9 23	9 27	9 32	9 38	9 44
	17	9 17	9 22	9 27	9 33	9 37	9 40	9 45	9 50	9 53	9 55	9 58	10 1	10 5
	18	10 8	10 10	10 12	10 14	10 15	10 16	10 18	10 19	10 20	10 21	10 22	10 23	10 24
	19	10 59	10 58	10 56	10 54	10 53	10 51	10 50	10 48	10 47	10 46	10 45	10 44	10 43
	20	11 51	11 46	11 41	11 35	11 31	11 27	11 23	11 17	11 16	11 12	11 9	11 6	11 2
	21	12 44	12 36	12 28	12 18	12 12	12 6	11 58	11 50	11 45	11 41	11 36	11 30	11 24
	22	13 39	13 28	13 17	13 4	12 56	12 48	12 37	12 25	12 20	12 14	12 7	11 59	11 50
	23	14 35	14 23	14 9	13 53	13 44	13 34	13 22	13 7	13 0	12 53	12 44	12 34	12 24
	24	15 32	15 18	15 4	14 46	14 36	14 25	14 12	13 55	13 48	13 39	13 30	13 19	13 6
	25	16 30	16 15	16 0	15 43	15 33	15 21	15 8	14 51	14 43	14 34	14 25	14 14	14 1
	26	17 25	17 12	16 58	16 42	16 32	16 21	16 8	15 53	15 45	15 37	15 28	15 18	15 6
	27	18 19	18 8	17 55	17 41	17 32	17 23	17 12	16 58	16 52	16 45	16 37	16 28	16 18
	28	19 10	19 1	18 51	18 40	18 33	18 25	18 16	18 6	18 1	17 55	17 49	17 42	17 34
	29	19 59	19 52	19 45	19 37	19 32	19 27	19 20	19 12	19 9	19 5	19 1	18 56	18 51
	30	20 45	20 41	20 37	20 32	20 29	20 26	20 22	20 18	20 16	20 14	20 12	20 9	20 6
	31	21 29	21 28	21 27	21 26	21 25	21 24	21 23	21 22	21 22	21 21	21 20	21 20	21 19
Aug.	1	22 12	22 14	22 16	22 18	22 20	22 21	22 23	22 25	22 26	22 27	22 28	22 30	22 31
	2	22 55	23 0	23 5	23 10	23 14	23 17	23 22	23 27	23 29	23 32	23 35	23 38	23 42
	3	23 38	23 45	23 53	....	....	....	....	....	....	....	....	....	....
	4	....	....	....	0 2	0 7	0 13	0 20	0 28	0 32	0 36	0 41	0 46	0 52
	5	0 22	0 32	0 42	0 54	1 1	1 9	1 18	1 29	1 34	1 40	1 46	1 53	2 1
	6	1 8	1 20	1 32	1 46	1 55	2 4	2 15	2 29	2 35	2 42	2 50	2 58	3 8
	7	1 56	2 9	2 23	2 39	2 48	2 59	3 12	3 27	3 34	3 42	3 51	4 1	4 12
	8	2 46	3 0	3 14	3 31	3 41	3 53	4 6	4 22	4 30	4 38	4 48	4 59	5 11
	9	3 37	3 51	4 6	4 23	4 33	4 44	4 58	5 14	5 21	5 30	5 39	5 50	6 2
	10	4 30	4 43	4 57	5 13	5 22	5 33	5 45	6 0	6 7	6 15	6 24	6 34	6 45
	11	5 23	5 35	5 47	6 1	6 9	6 18	6 29	6 42	6 48	6 54	7 2	7 10	7 19
	12	6 17	6 26	6 36	6 47	6 53	7 0	7 8	7 18	7 23	7 28	7 34	7 40	7 47
	13	7 10	7 16	7 23	7 30	7 34	7 39	7 45	7 51	7 54	7 58	8 1	8 5	8 10
	14	8 3	8 6	8 9	8 12	8 14	8 16	8 19	8 22	8 24	8 25	8 26	8 28	8 31
	15	8 55	8 55	8 54	8 53	8 53	8 53	8 52	8 52	8 51	8 51	8 50	8 50	8 50
	16	9 48	9 44	9 40	9 35	9 32	9 29	9 26	9 21	9 19	9 17	9 15	9 12	9 9

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	22 16	22 21	22 27	22 34	22 38	22 43	22 48	22 54	22 57	23 0	23 4	23 8	23 13
17	23 9	23 18	23 27	23 38	23 44	23 51	23 59	....	....	....	....	....	....
18	....	....	....	....	....	....	....	0 9	0 14	0 19	0 25	0 31	0 38
19	0 4	0 15	0 27	0 41	0 49	0 58	1 9	1 22	1 28	1 35	1 42	1 51	2 1
20	1 0	1 13	1 27	1 43	1 52	2 3	2 15	2 31	2 38	2 46	2 55	3 5	3 17
21	1 56	2 10	2 25	2 42	2 52	3 3	3 17	3 33	3 41	3 50	4 0	4 10	4 23
22	2 51	3 5	3 20	3 37	3 47	3 59	4 12	4 28	4 36	4 45	4 55	5 5	5 18
23	3 46	3 59	4 13	4 29	4 38	4 48	5 0	5 16	5 23	5 30	5 39	5 49	6 0
24	4 38	4 49	5 1	5 15	5 23	5 32	5 43	5 56	6 2	6 8	6 16	6 24	6 33
25	5 28	5 37	5 47	5 58	6 4	6 11	6 20	6 30	6 34	6 39	6 45	6 51	6 58
26	6 16	6 22	6 29	6 37	6 41	6 47	6 52	6 59	7 3	7 6	7 10	7 14	7 19
27	7 2	7 5	7 9	7 13	7 16	7 19	7 22	7 26	7 28	7 30	7 32	7 34	7 37
28	7 46	7 46	7 47	7 48	7 49	7 49	7 50	7 51	7 51	7 52	7 52	7 53	7 53
29	8 29	8 27	8 25	8 22	8 21	8 19	8 17	8 15	8 14	8 13	8 12	8 10	8 8
30	9 12	9 7	9 2	8 56	8 53	8 49	8 45	8 40	8 37	8 34	8 31	8 28	8 24
31	9 55	9 48	9 40	9 31	9 26	9 20	9 13	9 5	9 1	8 57	8 53	8 48	8 42
Sept. 1	10 40	10 30	10 20	10 8	10 1	9 53	9 44	9 33	9 28	9 23	9 17	9 10	9 2
2	11 25	11 13	11 1	10 47	10 39	10 29	10 18	10 5	9 59	9 52	9 45	9 36	9 27
3	12 12	11 59	11 45	11 29	11 20	11 10	10 57	10 42	10 35	10 27	10 19	10 9	9 58
4	13 2	12 48	12 33	12 16	12 6	11 55	11 41	11 26	11 18	11 10	11 0	10 50	10 37
5	13 52	13 38	13 23	13 6	12 57	12 45	12 32	12 16	12 8	12 0	11 50	11 39	11 27
6	14 44	14 31	14 17	14 1	13 52	13 41	13 29	13 14	13 6	12 58	12 50	12 40	12 28
7	15 38	15 26	15 14	15 0	14 52	14 42	14 32	14 18	14 12	14 5	13 58	13 49	13 39
8	16 31	16 22	16 12	16 1	15 55	15 48	15 39	15 29	15 24	15 19	15 13	15 6	14 59
9	17 25	17 19	17 12	17 5	17 1	16 56	16 50	16 43	16 40	16 37	16 33	16 28	16 24
10	18 19	18 16	18 13	18 10	18 8	18 6	18 3	18 0	17 59	17 57	17 56	17 54	17 52
11	19 13	19 14	19 14	19 15	19 16	19 17	19 18	19 18	19 19	19 19	19 20	19 21	19 21
12	20 8	20 12	20 17	20 22	20 25	20 29	20 33	20 38	20 40	20 42	20 45	20 48	20 52
13	21 3	21 10	21 18	21 28	21 33	21 39	21 47	21 55	21 59	22 4	22 9	22 14	22 21
14	21 59	22 9	22 20	22 33	22 40	22 49	22 59	23 11	23 17	23 23	23 30	23 38	23 47
15	22 55	23 8	23 21	23 36	23 46	23 56	....	....	....	....	....	....	....
16	23 52	....	....	....	....	....	0 8	0 22	0 29	0 37	0 46	0 56	1 7
17	....	0 5	0 20	0 37	0 47	0 58	1 11	1 28	1 35	1 44	1 53	2 4	2 17
18	0 47	1 1	1 16	1 34	1 44	1 55	2 9	2 25	2 33	2 42	2 51	3 2	3 15
19	1 42	1 55	2 9	2 26	2 35	2 46	2 59	3 14	3 22	3 30	3 39	3 49	4 1
20	2 34	2 46	2 59	3 13	3 22	3 31	3 42	3 56	4 2	4 9	4 17	4 26	4 36
21	3 24	3 34	3 44	3 56	4 3	4 11	4 20	4 31	4 36	4 42	4 48	4 55	5 3
22	4 12	4 19	4 27	4 36	4 41	4 47	4 54	5 2	5 5	5 10	5 14	5 19	5 25
23	4 58	5 2	5 7	5 13	5 16	5 20	5 24	5 29	5 31	5 34	5 36	5 39	5 43
24	5 42	5 44	5 46	5 48	5 49	5 50	5 52	5 54	5 55	5 56	5 57	5 58	5 59
25	6 25	6 24	6 23	6 22	6 21	6 20	6 19	6 18	6 18	6 17	6 16	6 16	6 15
26	7 8	7 4	7 0	6 55	6 53	6 50	6 46	6 42	6 40	6 38	6 36	6 33	6 31
27	7 52	7 45	7 38	7 30	7 25	7 20	7 14	7 7	7 4	7 0	6 57	6 52	6 47
28	8 35	8 26	8 17	8 6	8 0	7 53	7 44	7 34	7 30	7 25	7 19	7 13	7 6
29	9 20	9 9	8 57	8 44	8 36	8 27	8 17	8 5	7 59	7 53	7 46	7 38	7 29
30	10 6	9 54	9 40	9 25	9 16	9 6	8 54	8 39	8 33	8 25	8 17	8 8	7 57
Oct. 1	10 54	10 40	10 26	10 9	9 59	9 48	9 35	9 19	9 12	9 4	8 54	8 44	8 32
2	11 43	11 29	11 14	10 57	10 47	10 35	10 22	10 6	9 58	9 49	9 40	9 29	9 16

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

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For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	9 48	9 44	9 40	9 35	9 32	9 29	9 26	9 21	9 19	9 17	9 15	9 12	9 9
17	10 41	10 34	10 26	10 18	10 13	10 7	10 0	9 53	9 49	9 45	9 41	9 36	9 31
18	11 35	11 25	11 15	11 3	10 56	10 48	10 39	10 28	10 22	10 17	10 11	10 4	9 56
19	12 31	12 18	12 5	11 51	11 42	11 32	11 21	11 7	11 0	10 53	10 46	10 36	10 26
20	13 26	13 13	12 58	12 42	12 32	12 21	12 8	11 52	11 45	11 37	11 28	11 17	11 5
21	14 22	14 8	13 53	13 36	13 26	13 14	13 1	12 44	12 36	12 28	12 18	12 7	11 54
22	15 18	15 4	14 50	14 33	14 23	14 12	13 59	13 42	13 35	13 26	13 17	13 7	12 54
23	16 11	15 59	15 46	15 31	15 22	15 12	15 0	14 45	14 39	14 31	14 23	14 13	14 3
24	17 2	16 52	16 41	16 29	16 21	16 13	16 3	15 51	15 46	15 40	15 33	15 25	15 16
25	17 51	17 44	17 35	17 26	17 20	17 14	17 6	16 57	16 53	16 49	16 42	16 38	16 31
26	18 38	18 33	18 28	18 22	18 18	18 14	18 9	18 3	18 1	17 58	17 54	17 51	17 47
27	19 23	19 21	19 19	19 16	19 14	19 13	19 10	19 8	19. 7	19 6	19 4	19 3	19 1
28	20 7	20 8	20 8	20 9	20 10	20 10	20 11	20 12	20 12	20 12	20 13	20 13	20 14
29	20 50	20 54	20 57	21 2	21 4	21 7	21 10	21 14	21 16	21 18	21 20	21 23	21 25
30	21 33	21 39	21 46	21 54	21 58	22 3	22 9	22 16	22 19	22 23	22 27	22 31	22 36
31	22 17	22 26	22 35	22 45	22 52	22 58	23 7	23 16	23 21	23 26	23 32	23 38	23 45
Sept. 1	23 2	23 12	23 24	23 37	23 45	23 54	....	....	....	....	....	....	....
2	23 48	....	....	....	....	....	0 4	0 16	0 22	0 28	0 36	0 44	0 53
3	....	0 0	0 14	0 29	0 38	0 48	1 0	1 14	1 21	1 29	1 37	1 47	1 58
4	0 36	0 49	1 4	1 21	1 30	1 41	1 54	2 10	2 18	2 26	2 36	2 46	2 58
5	1 26	1 40	1 55	2 12	2 22	2 33	2 46	3 3	3 10	3 19	3 29	3 39	3 52
6	2 17	2 31	2 45	3 2	3 12	3 23	3 35	3 51	3 58	4 7	4 16	4 26	4 38
7	3 10	3 22	3 35	3 50	3 59	4 9	4 20	4 34	4 41	4 48	4 56	5 5	5 15
8	4 3	4 14	4 25	4 37	4 44	4 52	5 2	5 13	5 18	5 24	5 31	5 38	5 46
9	4 57	5 5	5 13	5 22	5 27	5 33	5 40	5 48	5 52	5 56	6 1	6 5	6 11
10	5 51	5 55	6 0	6 5	6 8	6 12	6 16	6 20	6 22	6 25	6 27	6 30	6 33
11	6 45	6 46	6 47	6 48	6 48	6 49	6 50	6 51	6 52	6 52	6 53	6 53	6 54
12	7 39	7 36	7 34	7 30	7 29	7 27	7 24	7 22	7 20	7 19	7 17	7 16	7 14
13	8 34	8 28	8 21	8 14	8 10	8 5	8 0	7 53	7 50	7 47	7 44	7 39	7 35
14	9 29	9 20	9 10	9 0	8 53	8 46	8 38	8 28	8 23	8 18	8 12	8 6	7 59
15	10 25	10 14	10 2	9 48	9 39	9 30	9 19	9 6	9 0	8 54	8 46	8 38	8 28
16	11 22	11 9	10 55	10 38	10 29	10 18	10 6	9 50	9 43	9 35	9 26	9 16	9 5
17	12 18	12 4	11 49	11 32	11 22	11 11	10 57	10 41	10 33	10 24	10 15	10 4	9 51
18	13 14	13 0	12 45	12 28	12 18	12 7	11 53	11 37	11 29	11 21	11 11	11 0	10 48
19	14 7	13 54	13 41	13 25	13 16	13 5	12 53	12 38	12 31	12 23	12 14	12 4	11 53
20	14 58	14 47	14 36	14 22	14 14	14 5	13 55	13 42	13 36	13 29	13 22	13 14	13 4
21	15 47	15 38	15 29	15 18	15 12	15 5	14 57	14 47	14 42	14 37	14 32	14 26	14 18
22	16 34	16 28	16 22	16 14	16 10	16 5	15 59	15 52	15 49	15 46	15 42	15 37	15 33
23	17 19	17 16	17 12	17 8	17 6	17 4	17 0	16 57	16 55	16 53	16 51	16 49	16 46
24	18 3	18 3	18 2	18 2	18 2	18 1	18 1	18 0	18 0	18 0	18 0	18 0	17 59
25	18 46	18 49	18 51	18 54	18 56	18 58	19 0	19 3	19 4	19 6	19 8	19 9	19 11
26	19 29	19 34	19 40	19 47	19 50	19 54	19 59	20 5	20 8	20 11	20 14	20 18	20 22
27	20 13	20 20	20 29	20 39	20 44	20 50	20 58	21 7	21 11	21 15	21 20	21 26	21 32
28	20 57	21 7	21 18	21 30	21 37	21 46	21 55	22 6	22 12	22 18	22 25	22 32	22 40
29	21 42	21 54	22 7	22 22	22 30	22 40	22 52	23 5	23 12	23 19	23 27	23 36	23 46
30	22 29	22 43	22 57	23 13	23 22	23 33	23 46	....	....	....	....	....	....
Oct. 1	23 18	23 32	23 46	....	....	....	....	0 1	0 9	0 17	0 26	0 36	0 48
2	....	....	....	0 4	0 14	0 25	0 38	0 54	1 2	1 11	1 20	1 31	1 44

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	10 54	10 40	10 26	10 9	9 59	9 48	9 35	9 19	9 12	9 4	8 54	8 44	8 32
2	11 43	11 29	11 14	10 57	10 47	10 35	10 22	10 6	9 58	9 49	9 40	9 29	9 16
3	12 33	12 20	12 5	11 49	11 39	11 28	11 15	10 59	10 51	10 43	10 34	10 23	10 11
4	13 25	13 12	12 59	12 44	12 35	12 25	12 13	11 59	11 52	11 45	11 36	11 27	11 16
5	14 17	14 6	13 55	13 43	13 35	13 27	13 17	13 5	13 0	12 54	12 47	12 39	12 30
6	15 10	15 2	14 54	14 44	14 39	14 32	14 25	14 16	14 12	14 8	14 3	13 58	13 51
7	16 3	15 58	15 54	15 48	15 45	15 41	15 37	15 32	15 30	15 27	15 24	15 21	15 18
8	16 57	16 56	16 55	16 54	16 53	16 52	16 51	16 50	16 50	16 49	16 48	16 47	16 47
9	17 52	17 55	17 58	18 1	18 3	18 5	18 7	18 10	18 11	18 13	18 15	18 17	18 19
10	18 48	18 54	19 1	19 9	19 13	19 18	19 24	19 31	19 34	19 38	19 42	19 46	19 51
11	19 46	19 55	20 5	20 17	20 23	20 31	20 40	20 51	20 56	21 1	21 8	21 14	21 22
12	20 44	20 56	21 9	21 24	21 32	21 42	21 53	22 7	22 14	22 21	22 29	22 38	22 49
13	21 43	21 57	22 11	22 28	22 38	22 49	23 2	23 18	23 25	23 34	23 43	23 54	....
14	22 41	22 55	23 10	23 28	23 38	23 50	....	....	....	....	....	....	0 6
15	23 37	23 51	....	....	....	....	0 4	0 20	0 28	0 37	0 47	0 58	1 11
16	....	....	0 6	0 23	0 33	0 44	0 57	1 13	1 21	1 29	1 38	1 49	2 1
17	0 31	0 44	0 57	1 12	1 21	1 31	1 43	1 57	2 4	2 11	2 20	2 29	2 40
18	1 22	1 32	1 44	1 57	2 4	2 13	2 22	2 34	2 40	2 46	2 53	3 0	3 9
19	2 10	2 18	2 27	2 37	2 43	2 49	2 57	3 6	3 10	3 15	3 20	3 25	3 32
20	2 56	3 2	3 8	3 14	3 18	3 22	3 27	3 33	3 36	3 39	3 43	3 46	3 50
21	3 40	3 43	3 46	3 49	3 51	3 53	3 56	3 59	4 0	4 2	4 3	4 5	4 7
22	4 23	4 23	4 23	4 23	4 23	4 23	4 23	4 23	4 23	4 22	4 22	4 22	4 22
23	5 6	5 3	5 0	4 56	4 54	4 52	4 49	4 46	4 45	4 43	4 41	4 39	4 37
24	5 49	5 43	5 37	5 30	5 27	5 22	5 17	5 11	5 8	5 5	5 2	4 58	4 54
25	6 33	6 24	6 16	6 6	6 0	5 54	5 46	5 37	5 33	5 28	5 23	5 18	5 11
26	7 17	7 7	6 56	6 43	6 35	6 27	6 17	6 6	6 1	5 55	5 48	5 41	5 32
27	8 2	7 51	7 37	7 22	7 14	7 4	6 52	6 39	6 32	6 25	6 17	6 8	5 58
28	8 50	8 36	8 22	8 5	7 56	7 45	7 32	7 16	7 9	7 1	6 52	6 42	6 30
29	9 38	9 24	9 9	8 51	8 41	8 30	8 16	8 0	7 52	7 44	7 34	7 23	7 10
30	10 27	10 13	9 58	9 41	9 31	9 20	9 6	8 50	8 42	8 33	8 24	8 13	8 0
31	11 17	11 4	10 50	10 34	10 24	10 14	10 1	9 46	9 39	9 31	9 22	9 12	9 0
Nov. 1	12 7	11 56	11 44	11 30	11 21	11 12	11 1	10 48	10 42	10 35	10 28	10 19	10 9
2	12 58	12 49	12 39	12 28	12 22	12 14	12 6	11 55	11 50	11 45	11 39	11 33	11 25
3	13 49	13 43	13 36	13 28	13 24	13 19	13 13	13 6	13 3	13 0	12 56	12 51	12 46
4	14 41	14 38	14 35	14 32	14 29	14 27	14 24	14 21	14 20	14 18	14 16	14 14	14 12
5	15 34	15 35	15 36	15 36	15 37	15 37	15 38	15 38	15 39	15 39	15 40	15 40	15 41
6	16 30	16 34	16 38	16 43	16 46	16 50	16 54	16 59	17 1	17 3	17 6	17 9	17 12
7	17 27	17 34	17 42	17 52	17 58	18 4	18 11	18 20	18 24	18 29	18 34	18 39	18 46
8	18 26	18 36	18 48	19 1	19 9	19 18	19 28	19 40	19 46	19 53	20 0	20 8	20 17
9	19 26	19 39	19 53	20 9	20 18	20 29	20 42	20 57	21 4	21 12	21 21	21 31	21 43
10	20 27	20 41	20 56	21 14	21 24	21 36	21 50	22 6	22 14	22 23	22 33	22 44	22 57
11	21 26	21 41	21 56	22 14	22 24	22 35	22 49	23 6	23 14	23 23	23 33	23 44	23 57
12	22 23	22 37	22 51	23 7	23 17	23 27	23 40	23 55	....	....	....	....	....
13	23 17	23 28	23 41	23 55	....	....	....	....	0 2	0 11	0 19	0 30	0 41
14	....	....	....	....	0 3	0 12	0 23	0 36	0 42	0 49	0 56	1 5	1 14
15	0 7	0 16	0 26	0 37	0 44	0 51	1 0	1 10	1 15	1 20	1 26	1 32	1 39
16	0 54	1 1	1 8	1 16	1 20	1 26	1 32	1 39	1 42	1 46	1 50	1 54	1 59

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	23 18	23 32	23 46	....	....	....	....	0 1	0 9	0 17	0 26	0 36	0 48
2	....	....	....	0 4	0 14	0 25	0 38	0 54	1 2	1 11	1 20	1 31	1 44
3	0 7	0 21	0 36	0 53	1 3	1 14	1 27	1 43	1 51	2 0	2 9	2 20	2 32
4	0 58	1 11	1 25	1 41	1 50	2 0	2 13	2 28	2 35	2 42	2 51	3 1	3 12
5	1 50	2 1	2 13	2 27	2 35	2 44	2 55	3 8	3 13	3 20	3 27	3 35	3 44
6	2 42	2 51	3 1	3 12	3 18	3 25	3 33	3 43	3 48	3 53	3 58	4 4	4 11
7	3 35	3 41	3 48	3 55	3 59	4 4	4 10	4 16	4 19	4 22	4 26	4 30	4 34
8	4 28	4 31	4 34	4 38	4 40	4 42	4 44	4 47	4 48	4 50	4 52	4 53	4 55
9	5 23	5 22	5 21	5 20	5 20	5 19	5 18	5 18	5 17	5 17	5 16	5 16	5 15
10	6 18	6 14	6 10	6 4	6 1	5 58	5 54	5 49	5 47	5 44	5 42	5 39	5 36
11	7 16	7 8	7 0	6 50	6 45	6 39	6 32	6 23	6 19	6 15	6 10	6 5	5 59
12	8 14	8 3	7 52	7 39	7 31	7 23	7 13	7 1	6 55	6 49	6 43	6 35	6 26
13	9 12	9 0	8 46	8 30	8 21	8 11	7 59	7 44	7 38	7 30	7 21	7 12	7 1
14	10 11	9 57	9 42	9 25	9 15	9 4	8 50	8 34	8 26	8 18	8 8	7 57	7 45
15	11 8	10 54	10 39	10 22	10 11	10 0	9 46	9 30	9 22	9 13	9 3	8 52	8 39
16	12 3	11 50	11 36	11 19	11 10	10 59	10 46	10 30	10 23	10 15	10 6	9 55	9 43
17	12 56	12 44	12 32	12 17	12 9	11 59	11 48	11 34	11 28	11 21	11 13	11 4	10 54
18	13 45	13 36	13 26	13 14	13 7	12 59	12 50	12 39	12 34	12 29	12 22	12 15	12 7
19	14 32	14 25	14 18	14 10	14 4	13 59	13 52	13 44	13 41	13 36	13 32	13 27	13 21
20	15 18	15 13	15 9	15 4	15 1	14 57	14 53	14 48	14 46	14 44	14 41	14 38	14 35
21	16 1	16 0	15 58	15 57	15 56	15 55	15 54	15 52	15 51	15 51	15 50	15 49	15 48
22	16 44	16 46	16 47	16 49	16 50	16 52	16 53	16 55	16 55	16 56	16 58	16 58	17 0
23	17 27	17 31	17 36	17 41	17 44	17 48	17 52	17 57	17 59	18 2	18 4	18 7	18 11
24	18 10	18 17	18 25	18 33	18 38	18 44	18 50	18 58	19 2	19 6	19 10	19 15	19 21
25	18 54	19 4	19 14	19 25	19 32	19 39	19 48	19 59	20 4	20 10	20 16	20 22	20 30
26	19 39	19 51	20 3	20 17	20 25	20 34	20 45	20 58	21 5	21 12	21 19	21 28	21 38
27	20 26	20 39	20 52	21 8	21 18	21 28	21 41	21 56	22 3	22 11	22 20	22 30	22 41
28	21 13	21 27	21 42	21 59	22 9	22 20	22 34	22 50	22 58	23 6	23 16	23 27	23 39
29	22 2	22 16	22 31	22 48	22 58	23 10	23 23	23 40	23 48	23 56	....	....	....
30	22 51	23 5	23 19	23 36	23 45	23 56	....	....	....	....	0 6	0 17	0 30
31	23 41	23 53	....	....	....	....	0 9	0 25	0 32	0 41	0 50	1 0	1 12
Nov. 1	....	....	0 6	0 22	0 30	0 40	0 52	1 5	1 12	1 19	1 27	1 36	1 46
2	0 32	0 42	0 53	1 5	1 12	1 21	1 30	1 41	1 46	1 52	1 59	2 6	2 14
3	1 22	1 30	1 38	1 47	1 53	1 59	2 6	2 14	2 18	2 22	2 27	2 32	2 38
4	2 14	2 18	2 23	2 29	2 32	2 36	2 40	2 44	2 47	2 49	2 52	2 55	2 58
5	3 6	3 7	3 9	3 10	3 11	3 12	3 13	3 14	3 15	3 15	3 16	3 16	3 17
6	4 0	3 58	3 55	3 52	3 51	3 49	3 47	3 44	3 43	3 42	3 40	3 38	3 37
7	4 56	4 50	4 44	4 37	4 33	4 28	4 22	4 16	4 13	4 10	4 6	4 2	3 58
8	5 54	5 45	5 35	5 24	5 18	5 10	5 2	4 52	4 47	4 42	4 36	4 30	4 22
9	6 54	6 43	6 30	6 15	6 7	5 57	5 46	5 32	5 26	5 19	5 11	5 3	4 53
10	7 55	7 42	7 27	7 10	7 0	6 49	6 36	6 20	6 13	6 4	5 55	5 45	5 33
11	8 56	8 41	8 26	8 8	7 57	7 46	7 32	7 15	7 7	6 58	6 48	6 37	6 24
12	9 54	9 40	9 25	9 8	8 58	8 46	8 33	8 16	8 9	8 0	7 50	7 39	7 26
13	10 49	10 37	10 23	10 8	9 59	9 49	9 36	9 22	9 15	9 7	8 58	8 49	8 37
14	11 41	11 31	11 20	11 7	10 59	10 51	10 40	10 28	10 23	10 16	10 9	10 2	9 52
15	12 30	12 22	12 14	12 4	11 58	11 52	11 44	11 35	11 30	11 26	11 21	11 15	11 8
16	13 16	13 11	13 5	12 59	12 55	12 51	12 46	12 40	12 37	12 34	12 31	12 27	12 23

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	0 54	1 1	1 8	1 16	1 20	1 26	1 32	1 39	1 42	1 46	1 50	1 54	1 59
17	1 39	1 43	1 47	1 52	1 54	1 57	2 0	2 5	2 6	2 8	2 11	2 13	2 16
18	2 22	2 23	2 24	2 26	2 26	2 27	2 28	2 29	2 29	2 30	2 30	2 31	2 31
19	3 5	3 3	3 1	2 58	2 57	2 56	2 54	2 52	2 51	2 50	2 49	2 48	2 46
20	3 48	3 43	3 38	3 32	3 29	3 25	3 21	3 16	3 13	3 11	3 8	3 5	3 1
21	4 31	4 23	4 16	4 6	4 1	3 56	3 49	3 41	3 37	3 33	3 29	3 24	3 18
22	5 15	5 5	4 55	4 43	4 36	4 28	4 19	4 8	4 3	3 58	3 52	3 45	3 37
23	6 0	5 48	5 36	5 21	5 13	5 4	4 53	4 40	4 33	4 27	4 19	4 10	4 1
24	6 47	6 34	6 20	6 3	5 54	5 43	5 31	5 15	5 8	5 0	4 52	4 42	4 30
25	7 35	7 21	7 6	6 49	6 38	6 27	6 13	5 57	5 49	5 41	5 31	5 20	5 8
26	8 24	8 10	7 54	7 37	7 27	7 15	7 1	6 45	6 37	6 28	6 18	6 7	5 54
27	9 14	9 0	8 45	8 28	8 19	8 8	7 55	7 38	7 31	7 23	7 14	7 3	6 50
28	10 3	9 51	9 38	9 23	9 14	9 4	8 52	8 38	8 32	8 24	8 16	8 7	7 56
29	10 53	10 42	10 32	10 19	10 12	10 4	9 54	9 42	9 37	9 31	9 24	9 17	9 8
30	11 42	11 35	11 26	11 17	11 12	11 6	10 59	10 50	10 46	10 42	10 37	10 32	10 26
Dec. 1	12 32	12 28	12 23	12 17	12 14	12 10	12 6	12 1	11 59	11 56	11 53	11 50	11 47
2	13 22	13 21	13 20	13 19	13 18	13 17	13 16	13 14	13 14	13 13	13 13	13 12	13 11
3	14 14	14 17	14 19	14 22	14 24	14 26	14 28	14 30	14 32	14 33	14 35	14 36	14 38
4	15 9	15 14	15 21	15 28	15 32	15 37	15 42	15 49	15 52	15 56	15 59	16 3	16 8
5	16 5	16 14	16 24	16 35	16 42	16 49	16 58	17 9	17 14	17 19	17 25	17 32	17 40
6	17 5	17 16	17 29	17 44	17 52	18 2	18 14	18 27	18 34	18 41	18 49	18 59	19 9
7	18 6	18 20	18 34	18 51	19 1	19 12	19 26	19 42	19 50	19 58	20 8	20 19	20 32
8	19 7	19 22	19 37	19 55	20 6	20 18	20 32	20 49	20 57	21 6	21 16	21 28	21 41
9	20 8	20 22	20 37	20 54	21 4	21 15	21 29	21 46	21 53	22 2	22 12	22 23	22 35
10	21 5	21 17	21 31	21 46	21 55	22 6	22 18	22 32	22 39	22 46	22 55	23 4	23 15
11	21 58	22 9	22 20	22 33	22 40	22 49	22 58	23 10	23 16	23 22	23 28	23 36	23 44
12	22 48	22 56	23 5	23 14	23 20	23 26	23 33	23 42	23 46	23 50	23 55	....	....
13	23 35	23 40	23 46	23 52	23 55	....	....	....	....	....	....	0 1	0 7
14	....	....	....	....	....	0 0	0 4	0 9	0 12	0 15	0 18	0 21	0 25
15	0 20	0 22	0 24	0 27	0 28	0 30	0 32	0 34	0 35	0 36	0 38	0 39	0 41
16	1 3	1 2	1 1	1 0	1 0	0 59	0 59	0 58	0 57	0 57	0 56	0 56	0 55
17	1 46	1 42	1 38	1 34	1 31	1 28	1 25	1 21	1 19	1 17	1 15	1 13	1 10
18	2 28	2 22	2 15	2 8	2 3	1 58	1 52	1 46	1 42	1 39	1 35	1 31	1 26
19	3 12	3 3	2 54	2 43	2 37	2 30	2 22	2 12	2 7	2 2	1 57	1 51	1 44
20	3 57	3 46	3 34	3 20	3 13	3 4	2 54	2 41	2 36	2 29	2 22	2 14	2 5
21	4 43	4 30	4 17	4 1	3 52	3 42	3 30	3 15	3 8	3 1	2 52	2 43	2 32
22	5 31	5 17	5 2	4 45	4 35	4 24	4 11	3 55	3 47	3 38	3 29	3 18	3 6
23	6 20	6 6	5 51	5 33	5 23	5 11	4 57	4 40	4 33	4 24	4 14	4 2	3 49
24	7 10	6 56	6 41	6 24	6 14	6 3	5 49	5 33	5 25	5 16	5 7	4 56	4 43
25	8 1	7 48	7 34	7 18	7 9	6 58	6 46	6 31	6 24	6 16	6 8	5 58	5 46
26	8 51	8 40	8 28	8 14	8 6	7 57	7 47	7 34	7 28	7 22	7 14	7 6	6 57
27	9 40	9 32	9 22	9 12	9 6	8 59	8 51	8 41	8 36	8 31	8 26	8 20	8 13
28	10 29	10 23	10 17	10 10	10 6	10 2	9 56	9 50	9 47	9 44	9 40	9 36	9 32
29	11 18	11 16	11 13	11 10	11 8	11 6	11 4	11 1	11 0	10 59	10 57	10 55	10 53
30	12 8	12 9	12 10	12 11	12 12	12 12	12 13	12 14	12 15	12 15	12 16	12 16	12 17
31	12 59	13 4	13 8	13 13	13 16	13 20	13 24	13 29	13 31	13 33	13 36	13 39	13 43
32	13 52	14 0	14 8	14 18	14 23	14 29	14 36	14 45	14 49	14 54	14 59	15 4	15 10

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	13 16	13 11	13 5	12 59	12 55	12 51	12 46	12 40	12 37	12 34	12 31	12 27	12 23
17	14 0	13 58	13 55	13 52	13 51	13 49	13 47	13 44	13 43	13 41	13 40	13 38	13 36
18	14 43	14 44	14 44	14 45	14 45	14 46	14 46	14 47	14 47	14 47	14 48	14 48	14 48
19	15 26	15 29	15 33	15 37	15 39	15 42	15 45	15 49	15 51	15 53	15 55	15 57	16 0
20	16 8	16 15	16 21	16 29	16 33	16 38	16 44	16 51	16 53	16 57	17 1	17 6	17 10
21	16 52	17 1	17 10	17 21	17 27	17 34	17 42	17 52	17 56	18 1	18 7	18 13	18 20
22	17 37	17 48	17 59	18 13	18 20	18 29	18 40	18 52	18 58	19 4	19 12	19 20	19 29
23	18 23	18 36	18 49	19 5	19 14	19 24	19 36	19 51	19 58	20 5	20 14	20 24	20 35
24	19 10	19 24	19 39	19 56	20 6	20 17	20 30	20 47	20 54	21 3	21 12	21 23	21 36
25	19 59	20 13	20 28	20 46	20 56	21 8	21 22	21 38	21 46	21 55	22 5	22 16	22 29
26	20 48	21 2	21 17	21 34	21 44	21 56	22 9	22 25	22 33	22 41	22 51	23 2	23 14
27	21 38	21 51	22 4	22 20	22 29	22 40	22 52	23 7	23 14	23 22	23 30	23 40	23 51
28	22 27	22 38	22 50	23 4	23 12	23 21	23 31	23 44	23 50	23 56	....	....	....
29	23 16	23 25	23 35	23 45	23 52	23 59	....	....	....	....	0 3	0 11	0 20
30	....	....	....	....	....	....	0 7	0 17	0 21	0 26	0 31	0 38	0 44
Dec. 1	0 6	0 12	0 19	0 26	0 30	0 35	0 40	0 46	0 50	0 53	0 56	1 0	1 5
2	0 56	0 59	1 2	1 5	1 7	1 9	1 12	1 15	1 16	1 18	1 19	1 21	1 23
3	1 47	1 46	1 46	1 45	1 45	1 44	1 44	1 43	1 43	1 42	1 42	1 42	1 41
4	2 40	2 36	2 32	2 26	2 24	2 21	2 17	2 12	2 10	2 8	2 6	2 3	2 0
5	3 35	3 28	3 20	3 10	3 5	3 0	2 53	2 45	2 41	2 37	2 32	2 27	2 22
6	4 33	4 23	4 11	3 59	3 51	3 43	3 33	3 21	3 16	3 10	3 3	2 56	2 47
7	5 34	5 21	5 7	4 51	4 42	4 32	4 19	4 5	3 58	3 50	3 42	3 32	3 21
8	6 35	6 21	6 6	5 48	5 38	5 26	5 13	4 56	4 48	4 39	4 30	4 18	4 5
9	7 36	7 22	7 6	6 48	6 38	6 26	6 12	5 55	5 47	5 38	5 28	5 16	5 3
10	8 35	8 22	8 7	7 51	7 41	7 30	7 17	7 1	6 53	6 45	6 35	6 24	6 12
11	9 31	9 19	9 7	8 52	8 44	8 34	8 23	8 9	8 3	7 56	7 48	7 39	7 29
12	10 23	10 14	10 4	9 52	9 46	9 38	9 29	9 18	9 13	9 8	9 2	8 55	8 47
13	11 11	11 5	10 58	10 50	10 45	10 40	10 34	10 26	10 23	10 19	10 15	10 10	10 5
14	11 57	11 54	11 50	11 45	11 43	11 40	11 36	11 32	11 31	11 28	11 26	11 24	11 21
15	12 41	12 40	12 40	12 39	12 38	12 38	12 37	12 36	12 36	12 36	12 35	12 35	12 34
16	13 24	13 26	13 29	13 31	13 33	13 35	13 37	13 39	13 40	13 42	13 43	13 45	13 46
17	14 6	14 12	14 17	14 23	14 27	14 31	14 36	14 41	14 44	14 47	14 50	14 54	14 58
18	14 50	14 57	15 6	15 15	15 20	15 27	15 34	15 43	15 47	15 51	15 56	16 2	16 8
19	15 34	15 44	15 54	16 7	16 14	16 22	16 32	16 43	16 49	16 55	17 1	17 9	17 17
20	16 19	16 31	16 44	16 59	17 8	17 17	17 29	17 43	17 50	17 57	18 5	18 14	18 24
21	17 6	17 20	17 34	17 51	18 1	18 12	18 25	18 40	18 48	18 56	19 6	19 16	19 28
22	17 55	18 9	18 25	18 42	18 52	19 4	19 18	19 34	19 42	19 51	20 1	20 12	20 25
23	18 45	18 59	19 14	19 32	19 42	19 54	20 7	20 24	20 32	20 41	20 50	21 2	21 14
24	19 35	19 48	20 3	20 19	20 29	20 40	20 52	21 8	21 16	21 24	21 32	21 43	21 54
25	20 25	20 37	20 50	21 4	21 13	21 22	21 34	21 47	21 53	22 0	22 8	22 17	22 27
26	21 14	21 24	21 35	21 47	21 54	22 1	22 10	22 21	22 26	22 32	22 38	22 45	22 52
27	22 4	22 11	22 19	22 27	22 32	22 38	22 44	22 52	22 55	22 59	23 3	23 8	23 14
28	22 53	22 57	23 1	23 6	23 9	23 12	23 16	23 20	23 22	23 24	23 27	23 29	23 32
29	23 42	23 43	23 44	23 45	23 45	23 46	23 46	23 48	23 48	23 48	23 49	23 49	23 50
30	....	....	....	....	....	....	....	....	....	....	....	....	....
31	0 32	0 30	0 27	0 24	0 22	0 20	0 18	0 15	0 14	0 12	0 11	0 9	0 7
32	1 24	1 18	1 12	1 5	1 1	0 56	0 51	0 44	0 41	0 38	0 34	0 31	0 26

FOR NORTHERN STATIONS NOT ON THE MERIDIAN OF GREENWICH, AND FOR SOUTHERN STATIONS.

For northern stations not on the meridian of Greenwich.—For longitudes twelve hours or less west from Greenwich obtain the data for the given latitude from Table X for the given date and for the date following; for longitude twelve hours or less east from Greenwich obtain the data for the given latitude from Table X for the given date and for the date preceding. Subtract the time on the earlier date from the time on the later and multiply the difference by the twenty-fourth part of the longitude in hours and decimals of an hour, positive if west, negative if east. Apply the product as a correction to the time on the given date.

For southern stations.—The instant of moonrise or moonset for any station south of the equator is that of moonset or moonrise, respectively, at a place of the same latitude north of the equator whose longitude is twelve hours different from that at the southern station.

If the southern station is twelve hours or less west from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day will be the same at the southern and northern stations. If, however, the phenomenon at the southern station occurs between midnight and noon, the local astronomical day at the northern station will be one day later than at the southern.

If the southern station is twelve hours or less east from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day at the northern station will be one less than at the southern station. If, however, the phenomenon occurs between midnight and noon, the local astronomical day will be the same at the two stations.

Having thus determined the true astronomical day at the northern station, compute by the rule for northern latitudes. For the desired local time of moonrise at the southern station change the time of moonset at the northern station twelve hours. For the desired local time of moonset at the southern station change the time of moonrise at the northern station twelve hours.

Example.—January 31, 1923, civil date, find the the time of moonrise and moonset in longitude $9^h\ 40^m$ east from Greenwich and in latitude 37° 50′ south.

The longitude of the northern station is $2^h.3$ west from Greenwich and its latitude is 37°.8 N. Upon inspection of Table X it is seen that the astronomical day at the southern station is January 31 for moonrise and January 30 for moonset, the former phenomenon occurring between noon and midnight, the latter between midnight and noon. For the northern station in accordance with the precepts given above, both phenomena are to be computed for January 30.

	Moonrise.				Moonset.			
	d	h	m		d	h	m	
At northern station—								
Table X, Lat. +37°.8 . . . . . Jan.	30	3	23	Jan.	30	17	49	
Table X, Lat. +37°.8	31	4	24		31	18	37	
Difference			61				48	
Product of Diff. by $+\frac{2.3}{24}$ . . .			+6				+5	
Local astronomical mean time . .		3	29			17	54	
At southern station—	Moonset.				Moonrise.			
Local astronomical mean time . .		15	29			5	54	
Civil time . . . . . Jan.	31	3	29 A. M.	Jan.	31	5	54 P. M.	

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for Greenwich mean noon on pages 2–16 and for Washington apparent noon on pages 514–521.

The Mean Solar Day is the unit of mean solar time and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two successive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or $3^m\ 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing

366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean. Astronomical time only is used throughout this volume.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to the Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–17 contain for Greenwich mean noon of each day the *Sun's Apparent Right Ascension, Apparent Declination, Semidiameter, Horizontal Parallax, True Longitude*, and *Latitude*. They also contain the *Logarithm of the Radius Vector of the Earth*, the *Precession in Longitude*, the *Nutation in Longitude*, the *Aberration*, the *True Obliquity*, the *Equation of Time*, the *Sidereal Time or Right Ascension of Mean Sun*, and the *Mean Time of Sidereal Noon*. Adjoining columns contain, for each Greenwich mean noon, the *Variation per*

Hour for those of the quantities for which it seemed advisable to give a rate of motion. By multiplying any one of those variations by the hours and parts of an hour from Greenwich mean noon and adding the product algebraically to the corresponding quantity at noon, we obtain an approximate value of the quantity in question for any given Greenwich mean time. If great exactness is desired, the value of the hourly variation is found for the time halfway between Greenwich mean noon and the given Greenwich mean time before multiplying by the hours and parts of an hour from Greenwich mean noon.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations or latitudes indicates north and the negative sign south.

The Sun's *Apparent Right Ascension* and *Declination* are affected both by aberration and by nutation, and therefore denote the *apparent* position of the *true* Sun. The Sun's *True Longitude* is the true geometric longitude not corrected for aberration; it is referred to the true equinox.

The Sun's *Latitude* is referred to the ecliptic of the date.

The Sun's *Declination* is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude of the Sun referred to the mean equinox of the beginning of the Besselian fictitious year, i. e., the instant when the Sun's mean longitude is 280°, in order to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude of a body referred to the mean equinox of date in order to refer it to the true equinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude of the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, short-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, to take account of the short-period terms, may be found on pages 215–216.

The *Equation of Time* is the apparent time of Greenwich mean noon, or the hour angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude or to any Greenwich mean time by using the hourly variation, $+9^s.8565$; or by Table III, page 693 of this volume, for reducing intervals of mean time to sidereal time. It is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time,

and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time past noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 690 of this volume. If the sidereal interval is less than $3^m\ 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean-time interval between these two mean times being $23^h\ 56^m\ 4^s.09$. The mean time, approximately known, will always show which one is to be taken. Instead of using Table II the reduction of a sidereal to a mean-time interval may be found by multiplying $-9^s.8296$ by the hours and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich; it may be reduced to any other meridian by using the hourly variation, $-9^s.8296$, to effect the necessary interpolation, or the reduction may be taken directly from Table II. In the same way the reduction may be made to any Greenwich sidereal time, and the result will then represent 24^h– Right Ascension of the Mean Sun. This column may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

As examples of the use of pages 2–17:

1. Let the Sun's declination be required for April 14, 1923, $2^h\ 5^m\ 20^s$, P. M., at a place whose longitude is 58° 20′, or $3^h\ 53^m\ 20^s$ west from Greenwich:

		h m s
Local mean time	April 14,	2 5 20
Longitude from Greenwich (additive)		3 53 20
Greenwich mean time	April 14,	5 58 40

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich mean noon on April 14, or $18^h.022$ before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declination per hour is:

	″
At Greenwich mean noon, April 14	+54.30
At Greenwich mean noon, April 15	+53.91
Difference for one day	− 0.39

If great exactness is desired, we find the amount of this hourly variation for the time halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 hours. Three hours is 0.125 of a day; so the calculation is as follows:

Variation at Greenwich mean noon, April 14 . . .		+54.30
Change in 0.125 of a day . . .	−0″.39×0.125	− 0.05
Variation at 3 hours after noon		+54.25
		° ′ ″
Declination at Greenwich noon, April 14		+9 8 9.4
Change in 5.978 hours . . .	+54″.25×5.978	+ 5 24.3
Sun's declination at time of observation		+9 13 33.7

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is $18^h.022$ before Greenwich noon of April 15; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is +54″.06. Then we find:

		° ′ ″
Declination at Greenwich noon, April 15		+9 29 47.9
Change in −18.022 hours . . .	+54″.06×−18.022	− 16 14.3
Sun's declination at time of observation		+9 13 33.6

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly the one derived from the nearest noon should be regarded as the more accurate.

2. Let the Sun's right ascension and the equation of time be required for July 13, 1923, $10^h\ 3^m\ 30^s$, A. M., mean time, at a place whose longitude is 85° 15′, or $5^h\ 41^m$ west from Greenwich.

		h m s	
Local astronomical mean time	July 12,	22 3 30	
Longitude from Greenwich (additive)		5 41 0	
Greenwich mean time	July 13,	3 44 30	=3.7417

	Sun's Right Ascension.		*Equation of Time.*	
		h m s		m s
Greenwich noon, July 13		7 26 48.46		−5 26.10
Change in 3.7417 hours . .	$10^s.172\times3.7417$	+38.06	$-0^s.315\times3.7417$	− 1.18
		7 27 26.52		−5 27.28

In this case the hourly variations interpolated to half the interval, or $1^h.87$ after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

	h m s
Sidereal time at Greenwich mean noon, July 13	7 21 22.36
Reduction for $3^h\ 44^m\ 30^s$ from Table III, or $9^s.8565\times3.7417$.	+36.88
Add the local astronomical mean time	22 3 30.00
The required sidereal time (rejecting 24^h)	5 25 29.24

4. On July 13, 1923, A. M., at a place whose longitude is 85° 15′ W., suppose the sidereal time to be $5^h\ 25^m\ 29^s.24$ and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h\ 41^m\ 0^s$, or $+5^h.6833$.

First solution.

		h	m	s	
Sidereal time at Greenwich mean noon . .	July 12,	7	17	25.80	
Reduction for $5^h\ 41^m\ 0^s$ from Table III, or $9^s.8565 \times 5.6833$.				+56.02	
The sidereal time at local mean noon, July 12 . . .		7	18	21.82	
The given sidereal time ($+24^h$, if necessary for the following subtraction)		29	25	29.24	
Subtracting the first from the second gives the sidereal interval from noon		22	7	7.42	$=22^h.1187$
Reduction for $22^h\ 7^m\ 7^s.42$ from Table II, or $-9^s.8296 \times 22.1187$				−3 37.42	
The required astronomical mean time . . .	July 12,	22	3	30.00	

Second solution.

		h	m	s
Mean time at Greenwich sidereal noon . .	July 12,	16	39	49.95
Reduction for longitude from Table II, or $-9^s.8296 \times 5.6833$				−55.86
Mean time of *preceding* local sidereal noon . .	July 12,	16	38	54.09
Add the given sidereal time		5	25	29.24
Reduction for $5^h\ 25^m\ 29^s.24$ from Table II, or $-9^s.8296 \times 5.4248$				−53.32
The required astronomical mean time . . .	July 12,	22	3	30.01

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

Pages 18–25 contain the rectangular coordinates of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox as the plane and point of reference. Each coordinate is given for every Greenwich mean noon and midnight. The columns *Reduc. to Mean Eq'x of 1923.0* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and equinox of the beginning of the Besselian fictitious year.

Pages 26–117 contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time, referred to the true equator and equinox. They are accompanied by columns of *Variations per Minute*, by means of which interpolation may be conveniently made to any moment of Greenwich mean time. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Var. per Min.* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added numerically in case of the right ascension and algebraically in case of the declination.

Thus, suppose the Moon's right ascension and declination are required for January 25, 1923, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:

	Right Ascension.			*Declination.*		
	h	m	s	°	′	″
January 25, 10^h	2	47	46.60	+11	56	0.8
Change in 10.5 minutes . . $1^s.9876 \times 10.5$			20.87	$+7''.292 \times 10.5$	+1	16.6
January 25, $10^h\ 10^m\ 30^s$	2	48	7.47	+11	57	17.4

For the sake of precision the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page 117 contains also the *Phases of the Moon* and the dates of the *Moon's Apogee* and *Perigee*, or the greatest and least distances from the Earth.

Pages 118–133 contain for every Greenwich mean noon and midnight the *Moon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, its *Semidiameter*, and its *Equatorial Horizontal Parallax*. The column adjoining that of the horizontal parallax gives the variation of that quantity per hour, by means of which it can be reduced to any other Greenwich mean time in the manner shown in the preceding examples. When allowing for change in the variation itself, note must be taken of the fact that the tabular interval is here 12 hours instead of 24. The quantity thus obtained is the equatorial horizontal parallax; to obtain the horizontal parallax at any given place, the correction for the latitude of the place must be applied. The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see page xi), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for March 10, 1923, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is $5''.9$; then,

$$12^h : 7^h :: 5''.9 : 3''.4$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The Moon's semidiameter for March 10, 7^h, is therefore $15'\ 38''.9$.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since the preceding new Moon, given to tenths of a day; the mean time of the *Moon's Transit, Upper* and *Lower*, at Greenwich, given to tenths of a minute; and the *Variation per Hour* of the latter quantity, that is, the variation for one hour of longitude, by means of which the local time of an upper or lower transit of the Moon may be computed for any place whose longitude is known.

Pages 134–198 contain for each of the seven major planets the geocentric ephemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *Apparent Declination* with the respective *Variations per Hour* or *per Day*. The positions thus given are referred to the true equator and equinox, and are corrected for aberration. The geocentric ephemeris gives also the *Logarithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *Semidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time of *Transit Meridian of Greenwich*. All the data, except the last named, are given for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that already given for the Sun. The local mean time of meridian transit of any planet at any place can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric Longitude, Mean Equinox of Date;* the *Heliocentric Latitude;* and the *Logarithm of Radius Vector;* with

their respective *Variations per Day*. The heliocentric longitude may be referred to the true equinox by applying nutation. The variations are given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude measured along the orbit of the planet. This orbit longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is referred to the ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 200–201 contain formulæ for reducing mean positions of stars to apparent positions, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers*, A, B, C, D, for each Washington mean midnight, with the values of E appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at any of the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of A, C, and D are sometimes needed to five places of decimals. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of 2 Aquilæ, May 26, 1923, for the upper transit at Washington.

log a	0.5165	log b	7.2481 n	log c	8.0477	log d	8.8234 n
log A	9.1732	log B	0.9704	log C	0.8996 n	log D	1.2684 n
log a'	0.5203	log b'	9.9910	log c'	9.4343	log d'	8.4187 n
log Aa	9.9897	log Bb	8.2185 n	log Cc	8.9473 n	log Dd	0.0918
log Aa'	9.9935	log Bb'	0.9644	log Cc'	0.3339 n	log Dd'	9.6871

		h	m	s		°	′	″
Mean Place, 1923.0	α_0	18	38	3.536	δ_0	−9	7	38.89
	Aa			+0.977	Aa'			+0.99
	Bb			−0.017	Bb'			+9.21
	Cc			−0.089	Cc'			−2.16
	Dd			+1.235	Dd'			+0.49
	E			+0.001	$\tau\mu'$			0.00
	$\tau\mu$			+0.001				
Apparent Place, May 26,	α	18	38	5.644	δ	−9	7	30.36

Pages 206–213 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 200, which also contains the formulæ

and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants $a, b, c, d, a', b', c', d'$, while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of 2 Aquilæ, May 26, 1923, for the upper transit at Washington

$G=$	3 49.7			$\delta_0=$	− 9 7.6
$\alpha_0=$	18 38.1			$G+\alpha_0=$	$22^h\ 27^m.8$
$H=$	13 32.6			$H+\alpha_0=$	$8\ 10^m.7$

$\log \frac{1}{\Upsilon\delta}$	8.8239	$\log \frac{1}{\Upsilon\delta}$	8.8239	α_0	18 38 3.536
$\log g$	1.0446	$\log h$	1.3049	$f+f'$	+0.913
$\log \sin (G+\alpha_0)$	9.5928 n	$\log \sin (H+\alpha_0)$	9.9252	(g)	+0.046
$\log \tan \delta_0$	9.2059 n	$\log \sec \delta_0$	0.0055	(h)	+1.147
$\log (g)$	8.6672	$\log (h)$	0.0595	$\tau\mu$	+0.001
				α	18 38 5.643
$\log g$	1.0446	$\log h$	1.3049	δ_0	− 9 7 38.89
$\log \cos (G+\alpha_0)$	9.9639	$\log \cos (H+\alpha_0)$	9.7323 n	(g')	+10.20
$\log (g')$	1.0085	$\log \sin \delta_0$	9.2004 n	(h')	+1.73
		$\log (h')$	0.2376	(i)	−3.40
$\log i$	0.5368 n			$\tau\mu'$	0.00
$\log \cos \delta_0$	9.9945				
$\log (i)$	0.5313 n			δ	− 9 7 30.36

Page 214 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 316–513, for which data containing short-period terms should not be employed.

Pages 215–216 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 201, and the coefficients mentioned later, which are given for each star on pages 316–513.

Pages 217–230 contain the *Mean Places of Ten-day Stars* for the beginning of the Besselian fictitious year. These pages give also the magnitude, spectral type, annual variations, and proper motions for each star. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars*, the same data as the immediately preceding pages do for the ten-day stars.

Pages 232–315 contain for every upper transit at Washington the apparent positions of seventeen northern and eighteen southern circumpolar stars arranged in the order of their right ascensions. The mean solar time of transit is given in the column *Washington Mean Time*, in order that each transit above

and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 232 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit of July 1 precedes the upper one, which occurs July 1.8. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Washington Mean Time.*

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 316–513 contain, for every tenth upper transit at Washington, the apparent places of 790 stars, being all those given in the list of mean places of ten-day stars. The *Washington Mean Time* in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are given at the foot of the page (1) the seconds of the mean place in both right ascension and declination for the beginning of the year, (2) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 201.

Pages 514–521 contain, for Washington apparent noon, the *Apparent Right Ascension* and *Declination* of the Sun, the *Equation of Time*, and the *Variation per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian.* The last column on each page contains the *Sidereal Time of Mean Noon.*

The *Equation of Time, Mean–App.*, is the correction to be applied to apparent time in order to obtain mean time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington counted from the nearest noon.

Pages 522–537 contain the *Right Ascension of Center*, the *Geocentric Declination of Center*, the *Sidereal Time of Semidiameter Passing Meridian*, the *Geocentric Semidiameter*, and the *Equatorial Horizontal Parallax* of the Moon, and the *Washington Mean Time* at the moment of each upper and lower transit over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied in each case to the quantity in the preceding column to obtain its value for the time of transit over the meridian one hour west of Washington, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The quantities in the third column, when corrected for another longitude by the hourly variations, give the local mean time of transit for that longitude. By means of the variations per hour of longitude any one of the quantities under consideration can be computed with great exactness for the moment of transit over any meridian not more than one hour

distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Washington Mean Time*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let V represent the corresponding *Variation per Hour of Longitude.* Write down three successive values of F, together with the corresponding values of V, and difference the latter as in the following scheme, where the middle values, F_0 and V_0, belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ:—

Function.	Var. per Hour of Longitude.	Δ'	Δ''
F_{-1}	V_{-1}		
F_0	V_0	a'	b
F_{+1}	V_{+1}	a''	

Then, for the culmination at the meridian λ

$$F\lambda = F_0 + \lambda V_0 + \frac{\lambda^2}{48}(a'+a'') + \frac{\lambda^3 b}{864}$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within 1″ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a footnote.

Pages 538–553 contain for six of the major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semidiameter*, *Sidereal Time of Semidiameter Passing Meridian*, and the *Washington Mean Time*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The stellar magnitude at opposition for Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Greenwich mean time, except in the case of the occultations visible at Washington, where Washington time is used.

Pages 556–563 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse

remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51:50. The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane, together with the latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of Sept. 10, 1923, begins and ands at San Diego, Calif., whose latitude is $+32° 43'$ and whose longitude is $+117° 10'$.

For the beginning we compare the distance of the place from the curves of 7^h and 8^h and find it to correspond to about 30 minutes from the former, thus giving for the approximate time of beginning $7^h 30^m$; for the end we compare the distance of the place from the curves of 10^h and 11^h and find it to

correspond to about 20 minutes from the former, thus giving for the approximate time of ending $10^h\ 20^m$; and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning. d h m	Ending. d h m
Greenwich mean time	Sept.	10 7 30	10 10 20
Longitude west		7 49	7 49
Local mean time	Sept.	9 23 41	10 2 31

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relative to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit, the measurements being made upon a line drawn through the place perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements, which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy. We take the intersection of this plane with that of the Earth's equator as the axis of x, and the center of the Earth as the origin of coordinates. The axis of y is perpendicular to that of x, and directed toward the north; x and y are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2, the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x', y', and μ', which are the changes of x, y, and μ, in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that the distance of the observer from the axis of the shadow cones is equal to the radius of the penumbra at the point of observation for the beginning and ending of the eclipse, and is equal to the radius of the umbra at the

point of observation for the beginning and ending of totality or of the annular phase. To find this distance and radius in each case, we proceed as follows:

(1) The coordinates of the observer, ξ, η, and ζ, together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, 1/297, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000	1	0.00293	1
5	0.00001	3	0.00292	3
10	0.00004	6	0.00289	6
15	0.00010	7	0.00283	7
20	0.00017	9	0.00276	9
25	0.00026	11	0.00267	11
30	0.00037	11	0.00256	11
35	0.00048	12	0.00245	13
40	0.00060	13	0.00232	12
45	0.00073	13	0.00220	13
50	0.00086	12	0.00207	12
55	0.00098	12	0.00195	12
60	0.00110	10	0.00183	10
65	0.00120	9	0.00173	9
70	0.00129	8	0.00164	8
75	0.00137	5	0.00156	5
80	0.00142	3	0.00151	3
85	0.00145	1	0.00148	2
90	0.00146		0.00146	

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be--

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\xi' = [7.63986]\ \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63986]\ \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63986]\ \xi \sin d$$
ζ' is not needed.

(2) For the same assumed moment of Greenwich mean time, take from the table of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y', and their logarithms are given beneath the tables of x and y.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) Both for the umbra and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

l and f being taken from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation—

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle; the one for which cos ψ is negative must be taken for the beginning of the eclipse, for the beginning of the annular phase, or for the ending of the total phase, but the one for which cos ψ is positive must be taken for the ending of the eclipse, for the ending of the annular phase, or for the beginning of the total phase. The correction τ to the assumed time will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

However, only in case the value of τ does not exceed a few minutes can the time thus corrected be considered even fairly accurate. Therefore it is best to commence the computation by assuming times near the phenomena wanted. The times for the beginning and the ending of an eclipse may be

derived from the chart with sufficient exactness as previously explained; the time for the total or for the annular phase may then be assumed as midway between the times assumed for the beginning and the ending of the eclipse; or, in case of a partial eclipse, this time midway may be assumed as that of the maximum eclipse.

The more accurate times resulting from the computation as outlined above and as illustrated in the example below may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a value of τ in each case, which should be very small, and which should give a very accurate time of the phenomenon. Such a repetition of the computation will be advisable, moreover, for the reason that it will enable one to locate and eliminate any accidental numerical errors that may have occurred in the first computation.

As a result of this last approximation the computed times of contact will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P=N+\psi$$

where the results of the last approximation are used.

The position-angle V, of the point of contact, reckoned from the vertex of the Sun's limb toward the east, is found by the formula—

$$V=P-C$$

where C is obtained from

$$\tan C=\frac{\xi}{\eta}$$

sin C having the same algebraic sign as ξ, and the results of the last approximation again being used.

Time of Maximum Eclipse.—For a partial eclipse, or for a central eclipse at a point at which the eclipse is only partial indicated by sin ψ greater than unity for the umbra, the correction to the assumed time to obtain the time of maximum eclipse is given by the formula—

$$\tau=-\frac{m\cos(M-N)}{n}$$

For a central eclipse at a point at which the eclipse is total or annular, the above formula gives the correction to the assumed time to obtain the true time of mid-eclipse.

Magnitude of Maximum Partial Eclipse.—This is given by the formula—

$$D^*=\frac{L-\Delta}{2L-0.5459}$$

where $\Delta=\pm m\sin(M-N)$, always taken positive, and L is the radius of the penumbra. In a partial eclipse D is the fraction of the Sun's diameter covered

* The denominator of this expression, as given by CHAUVENET, is $2(L-k)$; the denominator here used is obtained from CHAUVENET's by substituting 0.272274 for k, and then diminishing the result by the 1/400 part in order to allow for the fact that in deriving his formula CHAUVENET assumes the angle of the umbral cone equal to that of the penumbral.

by the Moon; but in all cases D is the ratio to the Sun's diameter of the straight line passing through the centers of the two disks and having for its extremities the Sun's limb that is nearest to the Moon's center and the Moon's limb that is nearest to the Sun's center.

Magnitude during Annular Phase.—A, the ratio of the Moon's apparent diameter to the Sun's apparent diameter, or the fraction of the Sun's diameter covered by the Moon, is given by the formula—

$$A=\frac{0.5459}{2L-0.5459}$$

At mid-eclipse the portion of the Sun's diameter uncovered at the broadest part of the annulus is equal to $1-D$, and at the narrowest part, to $D-A$. D is computed by the formula already given.

Magnitude during Total Phase.—As in the preceding case, A, the ratio of the Moon's apparent diameter to the Sun's apparent diameter (in this case greater than unity) is given by the formula—

$$A=\frac{0.5459}{2L-0.5459}$$

At mid-eclipse, however, the least distance between the limb of the Sun and the limb of the Moon, the Sun's diameter being taken as unity, is equal to $D-1$, and the greatest, to $A-D$.

Computation of the Solar Eclipse of September 10, 1923, for San Diego, Calif.

The position of San Diego is—

	°	′	″
Latitude, $\phi=$	+ 32	43	0
Longitude, $\lambda=$	+117	10	0

and its geocentric coordinates are—

$$\rho \sin \phi' = [9.73028]$$
$$\rho \cos \phi' = [9.92541]$$

From the eclipse chart we find the approximate times of the phases to be—

	d	h	m	
Beginning	Sept. 10	7	30	Greenwich Mean Time.
Middle	10	9	0	
Ending	10	10	20	

T Sept. 10	Beginning $7^h\ 30^m$	Middle. $9^h\ 0^m$	Ending $10^h\ 20^m$
	° ′ ″	° ′ ″	° ′ ″
μ	113 13 6	135 43 30	155 43 54
λ	117 10 0	117 10 0	117 10 0
$\mu-\lambda$	356 3 6	18 33 30	38 33 54
$\log \rho \cos \phi'$	9.92541	9.92541	9.92541
$\log \sin (\mu-\lambda)$	8.83795n	9.50280	9.79476
$\log \xi$	8.76336n	9.42821	9.72017
$\log \cos d$	9.99827	9.99828	9.99829
$\log \rho \sin \phi'$	9.73028	9.73028	9.73028
$\log \sin d$	8.95016	8.94820	8.94645
$\log \eta_1$	9.72855	9.72856	9.72857
$\log \zeta_1$	8.68044	8.67848	8.67673
$\log \sin d$	8.95016	8.94820	8.94645
$\log \rho \cos \phi'$	9.92541	9.92541	9.92541
$\log \cos (\mu-\lambda)$	9.99897	9.97681	9.89315
$\log \cos d$	9.99827	9.99828	9.99829
$\log \eta_2$	8.87454	8.85042	8.76501
$\log \zeta_2$	9.92265	9.90050	9.81685

	Beginning.	Middle.	Ending.
η_1	+0.53524	+0.53525	+0.53526
$-\eta_2$	−0.07491	−0.07086	−0.05821
ζ_1	+0.04791	+0.04770	+0.04750
ζ_2	+0.83686	+0.79524	+0.65592
ζ	+0.88477	+0.84294	+0.70342
$\log \rho \cos \phi'$	9.92541	9.92541	9.92541
$\log \cos (\mu-\lambda)$	9.99897	9.97681	9.89315
log const.	7.63986	7.63986	7.63986
$\log \xi$	8.76336n	9.42821	9.72017
$\log \sin d$	8.95016	8.94820	8.94645
$\log \xi'$	7.56424	7.54208	7.45842
$\log \eta'$	5.35338n	6.01627	6.30648
x	−0.54475	+0.27033	+0.99482
ξ	−0.05799	+0.26805	+0.52501
$x-\xi$	−0.48676	+0.00228	+0.46981
y	+0.70872	+0.45496	+0.22918
η	+0.46033	+0.46439	+0.47705
$y-\eta$	+0.24839	−0.00943	−0.24787

	Beginning.	Middle.	Ending.
x'	+0.009056	+0.009057	+0.009055
ξ'	+0.003666	+0.003484	+0.002874
$x'-\xi'$	+0.005390	+0.005573	+0.006181
y'	−0.002818	−0.002821	−0.002824
η'	−0.000023	+0.000104	+0.000203
$y'-\eta'$	−0.002795	−0.002925	−0.003027
log m sin M	9.68731n	7.35793	9.67192
log sin or cos M	9.94974n	9.98766n	9.94667
log m cos M	9.39513	7.97451n	9.39423n
log tan M	0.29218n	9.38342n	0.27769n
log n sin N	7.73159	7.74609	7.79106
log sin or cos N	9.94829	9.94716	9.95332
log n cos N	7.44638n	7.46613n	7.48101n
log tan N	0.28521n	0.27996n	0.31005n
	° ′ ″	° ′ ″	° ′ ″
M	297 2 6	166 24 28	117 49 0
N	117 24 33	117 41 35	116 5 32
$M-N$	179 37 33	48 42 53	1 43 28
log m	9.73757	7.98685	9.72525
log n	7.78330	7.79893	7.83774
log ζ	9.94683	9.92580	9.84721
log tan f	7.66689	7.66473	7.66690
log ζ tan f	7.61372	7.59053	7.51411

	Beginning.	Middle.	Ending.
l	+0.53867	−0.00733	+0.53841
ζ tan f	+0.00411	+0.00390	+0.00327
L	+0.53456	−0.01123	+0.53514
log m	9.73757	7.98685	9.72525
log sin $(M-N)$	7.81494	9.87589	8.47846
colog L	0.27200	1.94962n	0.27153
log sin ψ	7.82451	9.81236n	8.47524
	° ′ ″	° ′ ″	° ′ ″
ψ	179 37 3	319 31 16 / 220 28 44	1 42 42
log m/n	1.95427	0.18792	1.88751
log cos $(M-N)$	9.99999n	9.81942	9.99981
log (1)	1.95426n	0.00734	1.88732
log L	9.72800	8.05038n	9.72847
log cos ψ	9.99999n	(±) 9.88118	9.99981
colog n	2.21670	2.20107	2.16226
log (2)	1.94469n	(∓) 0.13263	1.89054
−(1)	+90.004	− 1.017	−77.147
+(2)	−88.042	∓ 1.357	+77.722
	m	m	m
τ	+ 1.962	− 2.374 / + 0.340	+0.575
	d h m	d h m	d h m
T	10 7 30	10 9 0	10 10 20
	d h m	d h m	d h m
$T+\tau$	10 7 31.962	10 8 57.626 / 10 9 0.340	10 10 20.575

Taking the four times just found, a new computation is made in each case. The times resulting from the new computation are—

	Greenwich Mean Time.	Local Mean Time.
	d h m s	d h m s
Beginning of the eclipse . .	September 10 7 31 57.6	September 9 23 43 17.6
Beginning of total eclipse . .	8 57 37.2	10 1 8 57.2
Ending of total eclipse . .	9 0 20.2	1 11 40.2
Ending of the eclipse . . .	10 20 34.7	2 31 54.7

The values from the last approximation of the quantities needed in computing the position angles, and the computation of these position angles, are—

	1st Contact.	2d Contact.	3d Contact.	4th Contact.
log ξ	8.70582n	9.41457	9.43012	9.72155
log η	9.66304	9.66665	9.66692	9.67867
log tan C	9.04278n	9.74792	9.76320	0.04288
	°	°	°	°
N	117.44	117.72	117.68	116.07
ψ	179.58	319.64	220.52	1.73
P	297.02	77.36	338.20	117.80
C	353.70	29.23	30.10	47.82
V	303.3	48.1	308.1	70.0

The quantities needed in computing A, $A-D$, and $D-1$, and the computation of these three expressions, are—

	2d Contact.	3d Contact.
log ζ	9.92720	9.92558
log Δ=log m sin $(M-N)$	7.86209	7.86267

T	$8^h\ 59^m$	l_1	+0.5385	$2L-0.5459$	+0.5233
log ζ	9.9264	ζ tan f_1	+0.0039	D	1.008
log tan f_1	7.6669	L	+0.5346	A (Magnitude)	1.043
log ζ tan f_1	7.5933	Δ	+0.0073	$A-D$	0.035
		$L-\Delta$	+0.5273	$D-1$	0.008

Pages 564–567 contain the adopted mean places and annual proper motions of such stars, as bright as magnitude 6.5, as will be occulted during the year by the Moon.

Pages 568–607 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1923.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1923 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T, at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle*, H, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Greenwich—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the time of immersion and emersion of a star relative to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T=the instant of geocentric conjunction of Moon and star in right ascension, expressed in Greenwich mean time;
H=the Greenwich west hour-angle of the two bodies at that moment;
λ=the longitude west of Greenwich;
$h_0=H-\lambda$=the local hour-angle of the star at the instant T;
δ=the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 758.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction, which must be reckoned in mean solar hours, and will be designated by the symbol t. It will have the same sign as h_0. This correction may be computed from the formulæ—

$$\xi_0=\rho \cos \varphi' \sin h_0$$
$$\xi'=[9.4192]\ \rho \cos \varphi' \cos \tfrac{4}{3} h_0$$
$$t=\frac{\xi_0}{x'-\xi'}$$

By applying t to the Greenwich mean time of geocentric conjunction, as given with the elements, we shall have the Greenwich mean time of local conjunction within a few minutes.

(2) Compute for the instant $T+t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t:

$$\xi = \rho \cos \varphi' \sin (h_0+t_0)$$
$$\eta = \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0+t_0) = \eta_1-\eta_2$$
$$\xi' = [9.4192]\ \rho \cos \varphi' \cos (h_0+t_0)$$
$$\eta' = [9.4192]\ \rho \cos \varphi' \sin \delta \sin (h_0+t_0) = [9.4192]\ \xi \sin \delta$$
$$x = x't$$
$$y = Y+y't$$

Compute also m, M, n, N, and ψ from the equations—

$$m \sin M = x-\xi$$
$$m \cos M = y-\eta$$
$$n \sin N = x'-\xi'$$
$$n \cos N = y'-\eta'$$
$$\sin \psi = [0.5646]\ m \sin (M-N)$$

ψ being taken between the limits $\pm 90°$.

Finally compute,

$$\tau = -\frac{[1.7782]m}{n}\cos(M-N) \mp \frac{[1.2135]}{n}\cos\psi$$

$$\delta\tau = \frac{[6.7591]r^2}{n\cos\psi}[\eta_2\cos(N\mp\psi) - \xi\sin(N\mp\psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated, respectively, τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Greenwich mean times of the phases,

$$\text{Instant of immersion} = T+t+\tau'+\delta\tau'$$
$$\text{Instant of emersion} = T+t+\tau''+\delta\tau''$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results it will be advisable to compute ξ, η, x, and y for the times of immersion and emersion finally obtained. If these times are correct, the quantities in question will fulfill the condition,

$$\sqrt{(x-\xi)^2+(y-\eta)^2} = 0.2725$$

If $\log m \sin(M-N) > 9.4354$, $\sin\psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P. It is computed from the formulæ—

$$P = N-\psi+\delta P \quad \text{for immersion,}$$
$$\text{or} \quad P = N+\psi+\delta P \pm 180^\circ \quad \text{for emersion,}$$

where the angles $N-\psi$ and $N+\psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp\frac{[7.3038]r^2}{\cos\psi}[\eta_2\sin N + \xi\cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction from the north toward the east, and is found from the formula

$$V = P-C$$

where C is computed from the expression,

$$\tan C = \frac{\xi+[8.2218]r\xi'-[4.9810]r^2\xi}{\eta+[8.2218]r\eta'+[4.9810]r^2\eta_2}$$

C being taken less or greater than 180°, according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

As an example of an isolated occultation we will compute that of α Tauri on January 27, 1923, for Boston, Mass., whose position is—

$$\varphi = +42^\circ\ 20'\ 58''$$
$$\lambda = +\ 4^h\ 44^m\ 19^s$$

and whose geocentric coordinates are—

$$\rho \sin \varphi' = [9.8262]$$
$$\rho \cos \varphi' = [9.8693]$$

From the elements on page 570 we have—

	h	m
$T=$	11	58.4
$H=+$	3	51.9
$h_0 = H-\lambda = -$	0	52.4

From the formulæ on page 764 we find the correction, t, to the Greenwich mean time of geocentric conjunction, T, to be about $-0^h\ 27^m.0$; therefore the Greenwich mean time of apparent conjunction is—

$$T+t = \text{Jan. } 27,\ 11^h\ 31^m.4$$

α Tauri	Apparent Declination.	G. M. T. of ☌	Hour Angle.	Y	x'	y'
	° ′	d h m	h m			
	+16 21.2	Jan. 27 11 58.4	+3 51.9	+0.4799	0.5584	+0.0736

	h m
h_0	−0 52.4
t_0	−0 27.1
h_0+t_0	−1 19.5
log (ρ cos φ')	9.8693
log sin (h_0+t_0)	9.5315 n
log ξ	9.4008 n
log (ρ sin φ')	9.8262
log cos δ	9.9821
log η_1	9.8083
log (ρ cos φ')	9.8693
log sin δ	9.4496
log cos (h_0+t_0)	9.9733
log η_2	9.2922
η_1	+0.6432
$-\eta_2$	−0.1960
log (ρ cos φ')	9.8693
log cos (h_0+t_0)	9.9734
log const.	9.4192
log ξ	9.4008 n
log sin δ	9.4496
log ξ'	9.2619
log η'	8.2696 n
log x'	9.7469
log t	9.6530 n
log y'	8.8669
log x	9.3999 n
log $y't$	8.5199 n

$y't$	−0.0331
Y	+0.4799
x	−0.2512
ξ	−0.2516
$x-\xi$	+0.0004
y	+0.4468
η	+0.4472
$y-\eta$	−0.0004
x'	+0.5584
ξ'	+0.1828
$x'-\xi'$	+0.3756
y'	+0.0736
η'	−0.0186
$y'-\eta'$	+0.0922
log m sin M	6.6021
log cos M	9.8495 n
log m cos M	6.6021 n
log tan M	0.0000 n
log n sin N	9.5747
log sin N	9.9873
log n cos N	8.9647
log tan N	0.6100
	° ′
M	135 0
N	76 12
$M-N$	58 48

log m	6.7526
log n	9.5874
log const.	0.5646
log m	6.7526
log sin ($M-N$)	9.9322
log sin ψ	7.2494
ψ	+0° 6′
log const.	1.7782
log m/n	7.1652
log cos ($M-N$)	9.7144
log (1)	8.6578
log const.	1.2135
colog n	0.4126
log cos ψ	0.0000
log (2)	1.6261
	m
−(1)	− 0.05
∓(2)	∓42.28
τ for immersion	−42.33
τ for emersion	+42.23

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \psi$	76° 6′	76° 18′
log cos $(N \mp \psi)$	9.3806	9.3745
log η_2	9.2922	9.2922
log (1)	8.6728	8.6667
log sin $(N \mp \psi)$	9.9871	9.9875
log ξ	9.4008 n	9.4008 n
log (2)	9.3879 n	9.3883 n
(1)	+0.0471	+0.0464
(2)	−0.2443	−0.2445
(1)-(2)	+0.2914	+0.2909

	Immersion.	Emersion.
log [(1)-(2)]	9.4645	9.4637
log const.	6.7591	6.7591
log τ^2	3.2532	3.2512
colog (n cos ψ)	0.4126	0.4126
log $\delta\tau$	9.8894	9.8866
	d h m	h m
$T+t$	Jan. 27 11 31.4	11 31.4
τ	−42.33	+42.23
$\delta\tau$	+ 0.78	+ 0.77
Greenwich M. T.,	Jan. 27 10 49.8	12 14.4
λ	4 44.3	4 44.3
Boston M. T.,	Jan. 27 6 5.5	7 30.1

To find δP and P:

log η_2	9.2922	log ξ	9.4008 n	(3)	+0.1903
log sin N	9.9873	log cos N	9.3775	(4)	-0.0600
log (3)	9.2795	log (4)	8.7783 n	(3)+(4)	+0.1303

	Immersion.	Emersion.		Immersion.	Emersion.
log [(3)+(4)]	9.1149	9.1149		°	°
log const.	7.3038 n	7.3038	δP	− 0.5	+ 0.5
log τ^2	3.2532	3.2512	N	76.2	76.2
colog cos ψ	0.0000	0.0000	$\mp\psi$	− 0.1	+ 0.1
log δP	9.6719 n	9.6699	const.	0.0	180.0
			P	75.6	256.8

Pages 608–610 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 612 contains the *Ephemeris for Physical Observations of the Sun.*

Page 613 contains certain elements referring to the Moon, its equator, and its orbit.

i=the inclination of the Moon's mean equator to the Earth's true equator.

Δ=the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic of date.

Ω'=the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator.

Γ'=the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

Ω=the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

$\mathbb{C}$=the Moon's mean longitude, referred to the mean equinox of date.

Pages 614–621 contain the *Ephemeris for Physical Observations of the Moon.* The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xi, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° − longitude) and latitude and the position-angle of

the Moon's axis, C, in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A, at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β, are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by $l\odot$ and $b\odot$, respectively:

$$\sin A = \sin b_{\odot} \sin \beta + \cos b_{\odot} \cos \beta \cos (l_{\odot} - \lambda)$$

Pages 622–623 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360°. We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 624–625 contain the *Ephemeris for Physical Observations of Mars.* The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P=the position-angle of the axis of rotation measured eastward from the north point of the disk.

$A\oplus$, $A\odot$=the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

$D\oplus$, $D\odot$=the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

$\odot\sigma$=the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and the Earth as seen from the planet.

q=the angular value of the greatest defect of illumination as seen from the Earth.

Q=the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the Greenwich Mean Time of every transit of the zero meridian across the actual center of the disk.

Pages 626–629 contain the *Ephemeris for Physical Observations of Jupiter.*

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Greenwich Mean Time of every fifth transit of the zero meridian across the center of the illuminated disk.

The quantities in the remaining columns on these pages are the same as those defined under the *Ephemeris for Physical Observations of Mars.*

Pages 630–655 contain, concerning the *Satellites of Jupiter*, the diagram of the orbits of Satellites I–V, the times of conjunction of Satellites I–IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of Satellites I–IV together with their configurations.

Page 656 contains the *Magnitude of Saturn* and the *Elements of the Rings.*

a, b=the major axis and minor axis, respectively, of the outer ellipse of the outer ring.

P=the position-angle of the northern semi-minor axis of the rings, measured from the north, positive toward the east.

B=the Saturnicentric latitude of the Earth referred to the plane of the rings, positive toward the north.

$U+180°$=the Saturnicentric longitude of the Earth measured in the plane of the rings from their ascending node on the Earth's equator.

ω=the distance in the plane of the rings from their ascending node on the Earth's equator to their ascending node on the ecliptic.

B'=the Saturnicentric latitude of the Sun referred to the plane of the rings, positive toward the north.

$U'+180°$=the Saturnicentric longitude of the Sun measured in the plane of the rings from their ascending node on the ecliptic.

Pages 657–665 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phœbe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 666 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 667–668 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 669 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 670–671 contain the *Phenomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page xviii. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°. For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, ☉ ♂ ☾ . . . ♂ −4° 22′ would be read "Conjunction of Mars with the Moon, Mars, 4° 22′ to the South."

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These pages contain also the beginning of the seasons; the perihelia and aphelia of the planets, including the Earth; the passage of the planets through the nodes of their orbits upon the ecliptic; and the date of lunar and solar eclipses, with their aspect as seen from Washington.

Pages 672–683 contain the *Positions of Observatories*, together with a list of the authorities from which the positions are obtained. The tabular arrangement is self-explanatory.

Page 684 contains two examples in the computation of lunar distances, which are inserted because lunar distance tables are no longer published.

Pages 685–744 contain a series of tables numbered from I to X.

Table I—*For Finding the Latitude by an Observed Altitude of Polaris.*

Table II—For converting *Sidereal into Mean Solar Time.*

Table III—For converting *Mean Solar into Sidereal Time.*

Table IV—For finding the *Azimuth of Polaris at All Hour Angles.*

Table V—For finding the *Azimuth of Polaris at Elongation.*

Table VI—*For Finding the Times of Upper and Lower Culmination of Polaris.*

Table VII—For finding the *Apparent Place, Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation,* of Polaris.

Table VIII—For finding the time of *Sunrise* and *Sunset* at any place between the equator and 60° north latitude, assuming this to be the instant when the true zenith distance of the Sun's center is 90° 50′; i. e., when the apparent zenith distance of the Sun's upper limb is 90°, 34′ having been allowed for horizontal refraction and 16′ for semidiameter.

Table IX—*Sunrise and Sunset for Southern Latitudes.*

Table X—For finding the time of *Moonrise* and *Moonset* at any place between 60° north latitude and 60° south latitude, assuming this to be the instant when the true geocentric zenith distance of the Moon's center is 90° 50′ *minus* the Moon's parallax. Here, as in the case of the Sun, 34′ has been allowed for horizontal refraction and 16′ for semidiameter.

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