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FACSIMILE

FACSIMILE

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FIRST EDITION

NEW YORK TORONTO LONDON
McGRAW-HILL BOOK COMPANY, INC.
1949

FACSIMILE

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PREFACE

Facsimile, a potentially great industry, has been launched on a commercial basis, and this book traces it through more than a century of development. Students, newspapermen, radiomen, and average readers who just want to know what facsimile is all about are the persons for whom this is written. Emphasis is on facsimile as a whole rather than on any single phase of the process. Our objective is a faithful portrayal of a fascinating business, not a highly detailed technical handbook.

We sought such an outline of facsimile when we entered the facsimile field late in 1946, but there was none. Fragments of information about facsimile's growth were available, conspicuous for the gaps they left in the record. Piecing together the history of facsimile and then learning how to use it for mass communications proved to be a major undertaking. Many blind paths were explored. Much time was wasted because there was no general reference book on facsimile. Although we recognize that there is much still to be learned, we resolved to digest our experiences and studies so that a comprehensive explanation would be available to others entering the field.

Armed with a liberal record of our mistakes and a voluminous, if not complete, file of facsimile's background, we have thoroughly enjoyed preparing the manuscript. When word spread that a facsimile book was being written, encouragement came from the radio-receiver manufacturing industry, radio broadcasters, newspaper publishers, and our business associates. We trust that their enthusiasm for the idea is justified by the book itself.

Appreciation is due John S. Knight and James L. Knight, of the Knight Newspapers, whose pioneering

efforts in facsimile made this book possible, and to John V. L. Hogan, president of Radio Inventions, Inc., and Marion Gulick, WQAM-FM facsimile engineer, for their constructive criticisms of the manuscript.

Lee Hills
Timothy J. Sullivan

Miami, Fla.
July, 1949

CONTENTS

PREFACE v

FOREWORD xi

I. THIS IS FACSIMILE 1
Information Delivered---Appearance---Range---Speed---Uses---Training Required---Outlook.

II. THE BIRTH AND GROWTH OF FACSIMILE 5
Early Experiments---Radio Phase---False Start---War Research---New Interest.

III. THE MANY USES OF FACSIMILE . . . 15
Mass Communications---Military Applications---Facsimile Newspapers---Facsimile Telegrams---Air Lines, Police, Schools, Railroads, Banks, Industries, Utilities, Recording Instruments, and Other Uses.

IV. COLORFAX AND ULTRAFAX. 31
Facsimile Colored Pictures---1,000,000 Words per Minute.

V. FACSIMILE VERSUS TELEVISION. . . 43
Facsimile Is Permanent---Economic Competition--TV Is Old Acquaintance---Radio's Ugly Duckling---Different Lures.

VI. FREQUENCY MODULATION AND FACSIMILE (FM-FX) 49
FM Music Is Superior---Broader Tone Range---FM Grew Slowly---FCC En-

courages FM---A New Sales Point for FM---Facsimile Needs FM's Broad Highway---FM Range Is Limited---Stretching the Horizon---Ultrahigh Frequency Radio Relay---Coaxial Cable.

VII. THE RULES AND STANDARDS FOR FACSIMILE BROADCASTING 57
Green Light from Federal Communications Commission---Setting Standards ---What Rules Cover---Text of FCC Rules.

VIII. HOW TO APPLY TO FCC FOR FACSIMILE LICENSE 73
Letter Request---Multiplex Permit---New Precedents---Facsimile-only Station---AM Experimental Facsimile---Special HF Experimental Facsimile---Permit for Demonstration.

IX. FREEDOM OF THE PRESS ON THE AIR . 79
Radio's Bout with Regulation---Controversial Decisions---Facsimile's Editorial Freedom.

X. FACSIMILE STAFF. 85
Newspaper-affiliated, Daily Editions ---Staff Duties---Facsimile Editor--Scanner Operator---Staff Announcer---Recorder---Maintenance Engineer---Facsimile Engineer---Writers---Typists---Make-up Man---Photographer ---Smaller Staffs.

XI. FACSIMILE PROGRAMMING. 95
General Facsimile Newspaper---Hourly Programming---Programming for Independent Facsimilist---Public Services---Sponsored Editions---School, Club, Church, Suburb and Other Editions---Illustrating Sound Radio Programs---Country Weeklies by

Facsimile---New Publications---Farm Facsimile Newspaper---Tips on Programming.

XII. STYLE FOR FACSIMILE WRITING AND EDITING 123
Easy Reading---Editing Procedure---Writing Techniques---Rewrites---Stories in Cut Lines---Features.

XIII. PHOTOGRAPHY 143
Selecting Paper---Tone Values---Electronic Retouching---Separate Dark Room---Fast Cameras---Cropping---Manual Retouching---Wire Photos---Cut Lines---Samples of Good Photographic Practice.

XIV. MAKE-UP STYLE 163
Top Side First---Photography Overlines---Column Widths---First Page ---Samples of News Page Make-up---Preprinted Forms ---Fashions and Features.

XV. PRODUCTION AND MAKE-UP WITHOUT A COMPOSING ROOM 205
One Original Copy Is Needed---Copy Setting---IBM Electric Typewriter---Varityper---The Multigraph---Flexible Tape Printer---Justowriter---Headlines---Showcard Machine---Nonmechanical Heads---Artype---Fototype---Template Headlining---Hand Lettering---Make-up Practice and Materials---Department Layout---Minimum Equipment.

XVI. FACSIMILE ADVERTISING. 227
Display Ads or Sponsored Programs---Elastic Form---Advantages---Eye and Ear Appeal Combined---Format---Size of Ads.

XVII. OTHER WAYS TO MAKE MONEY WITH FACSIMILE. 243
Leased Service---Selling Air Space---Manufacturers Have New Opportunity---Sale for Retailers.

XVIII. HOW FACSIMILE EQUIPMENT FUNCTIONS. 247
Scanner Drum---Scanning Head---Electric Eye---Scanner Simplifier---Photograph Emphasis Control---Line Amplifier---Pulse Generator---Recording---Monitor Recorder Amplifier---Test Recorder---Unattended, Automatic Operation---Voice Announcements.

XIX. MULTIPLEXING. 273
Why Multiplexing Is Needed---What It Is---First Commercial Multiplex---How It Functions.

XX. MOBILE UNIT 279
Equipment---Transportation---Assembly---Connecting Lines---Radio Link.

XXI. LAUNCHING A FACSIMILE NEWSPAPER . 283
Advance Stories---Selecting Sites, Audiences---Sample Pages---Promotion Booklet, Chart---Demonstration Programming---FM Station Promotion---Preview for Radio Men.

XXII. TEACHING FACSIMILE. 287
Editing---Make-up---Equipment Operation---Campus Editions---Lecturers' Observations.

XXIII. A NEW ERA. 293
Ability to Serve---Favorable Factors---Investments---World Market.

GLOSSARY. 295

INDEX. 313

FOREWORD

Since the end of the Second World War, the problems of applying facsimile to civil and industrial communication services, including radio broadcasting, have been largely solved. Striking improvements in speed, fidelity of photographic reproduction, clarity and contrast of recorded copy, and simplicity and utility of equipment have been made. The progress of facsimile service, with its unique advantages of inherent accuracy and the ability to transmit any kind of graphic material that can be put on paper, is no longer fettered by the limitations that were recognized eight or ten years ago.

A book such as this one should be of immense interest and utility to those who wish to use modern facsimile equipment. What goes on inside the apparatus can be learned elsewhere; the present authors are concerned with what can be accomplished in the way of rendering a facsimile service and particularly by the publication of a radio facsimile newspaper. The Miami Herald, of which the authors are, respectively, the Managing Editor and the Facsimile Editor, is a pioneer in the use of modern facsimile for broadcasting a newspaper by radio. Out of their long and continuing experience in this field the authors have learned at first hand what so many others need to know. Their knowledge, derived from that experience, is the basis of the present volume.

Facsimile has become an expanding industry. Its techniques are threading into many branches of the communication field, including broadcasting, point-to-point, mobile, military, naval, air, and even amateur transmission of text and pictures.

For communication, facsimile terminals are connected by wire or by radio—indeed, it has even been proposed to send facsimile messages over a beam of light. Beyond the field of communications, the new facsimile

developments are finding application in duplicating processes for office and library use and in high-speed recording devices for making charts of temperature, pressure, and quantities in general. Even the provision of toy facsimile models for children has not been overlooked.

One of the most fascinating uses of facsimile is, however, the publication and distribution of a newspaper by radio. The owner of any FM broadcasting station needs only to install a facsimile scanner at his studio in order to print a newspaper over the air. He can use his FM station alternately for sound programs and for the facsimile newspaper, or, by using the "multiplex" system, he can broadcast speech and music along with the simultaneous and independent distribution of his radio newspaper. Thus the FM station becomes the carrier for two separate radio services, one aural and the other visual and both reaching out as far as the radio waves travel. Any listener who equips his FM receiving set with a facsimile recorder can then either listen to the broadcast sound programs or print the facsimile newspaper in his home, or he can do both at the same time. Neither service interferes with the other, and both are available from the same FM broadcasting station.

The greater part of the present volume relates to the facsimile newspaper. The authors outline for you how simply and quickly such a newspaper can be produced and how the composing room, photoengraving department, and high-speed presses of the conventional newspaper are left out of the facsimile picture. From the readers' point of view, they show you how facsimile meets the ever-increasing demand for more speed and greater completeness in the delivery of news to the public and why the fact that the radio newspaper is a printed permanent page (that can be held in the reader's hand) means that confusion, so common when one merely listens to radio news, is avoided.

Not only does the radio-printed newspaper bring more complete news stories, but it illustrates them with photographs, drawings, maps, and charts. Moreover,

and perhaps best of all, it releases you from your radio set; you do not have to be within hearing or sight of your receiver while the news is coming in. Because it is printed in your home and will stay there in recorded form for you to pick up and read at your convenience, you will not "miss the program" in case you are not at the radio.

The potentialities of the facsimile newspaper are so great that they should be studied by all who are concerned with modern radio and journalism. This book gives not merely an introduction to these improved tools for the dissemination of intelligence but the solutions for many of the problems that have arisen. It is stimulating reading that challenges the imagination, and the vistas that it opens relate not only to the future of the daily newspaper but also to weekly and monthly periodicals and even to the publication and distribution of books. To foresee and to catalogue all the implications of having a radio-controlled miniature printing press in every home of the nation would indeed require a bolder and better mind than mine.

John V. L. Hogan
President, Radio Inventions, Inc.

NOTE

The text for this book is set in Varitype, one of the methods used for facsimile publication. See Chap. XV, Production and Make-up without a Composing Room.

I

THIS IS FACSIMILE

Facsimile delivers exact duplicates of anything that is printed, drawn, written, photographed, or otherwise marked on paper. The duplicate is black and white on a paper page, which may range in size from a pocket magazine to a full newspaper page.

It can go anyplace in the world by radio or wire.

Fingerprints, X-ray photographs, or mathematical formulas are delivered without error. It can't misspell a word or drop a decimal point.

This page can be printed by a facsimile receiver, line by line, about as fast as you can read the type.

After facsimile arrives, it is permanent. The message is clearly printed on the paper, ready to read. It cannot smudge, rub off, or be erased. The message will not blur if left under water for a month. Filed in an archive, the message will remain clear until the paper turns to dust.

The ability to deliver quickly, accurately, and permanently any kind of written or printed intelligence that can be seen by the human eye means that all mankind can use facsimile.

To a newspaperman, it can mean printing the photo finish of a Kentucky Derby in the living room of a Californian's home before the jockeys have dismounted. Or the report of a United States Supreme Court decision can be printed in your home before the judges have left the bench.

A banker can set up centralized bookkeeping with a facsimile network reaching each branch office. Or signatures on checks can be compared with originals in the master file.

Steel companies with many divisions, from ore mines in Minnesota to rolling mills in Alabama, can send production statistics, or metallurgical formulas without fear of error in transmission.

Railroads can write orders to the engineer of a streamliner traveling 100 miles per hour.

Air lines can speed passenger reservations or send

a new weather map to a pilot hundreds of miles away and thousands of feet in the air.

Any place on earth or any plane in the sky can be facsimile's destination.

The equipment required is simple to use. An office boy has been trained to operate the transmitter in 1 week. An executive's wife learned not only to adjust a home receiver but also to replace paper and the printer blade that serves as ink *in 1 hour*.

Although facsimile is ready now to serve the nation, many persons have never seen it and are only vaguely familiar with what it can do. Recognition of facsimile's talents comes quickly with association, if the broadcaster provides a facsimile service that gains and holds attention.

Facsimile equipment, produced in relatively small quantities, is still expensive, but some major radio manufacturers have assigned key technical and sales personnel to facsimile-manufacturing projects, and their work points to progressively lower costs necessary to wider use of the process.

Like any new industry, facsimile has had and will have growing pains. No process or product has ever matured without groping to find the best path to travel. One good proof of a newcomer's worth is the ability to progress despite obstacles, and, where facsimile has been introduced on a practical basis, good progress has been made.

People enjoy facsimile because it keeps them informed and entertains them. An engineer may view the process in terms of microvolts; the average facsimile reader knows it is an electronic town crier, bringing the funny and the sad, the serious and the ridiculous reports of human behavior all over the world.

Sometimes it isn't the news but facsimile itself that does the entertaining. One afternoon a facsimile broadcaster transmitted a page which included a photograph of a famous Hollywood actress clad in a flimsy negligee. The studio operator made a mistake in setting the controls, and the star's photograph came out of the receivers with the negligee printed

so faintly that at first glance it wasn't there at all.

Remote control, by radio, of receivers in public places is a clever accomplishment, and it, too, has lighter moments. By push buttons at the studio, the facsimile publisher can switch the public receivers on and off. One of these push-button-controlled receivers was installed in the sedate lobby of the Florida Power & Light Co., in Miami. It worked fine until the receiver mechanism got mixed up during a 4:30 p.m. news edition. Instead of printed news coming out of the receiver, it switched to the regular radio program, and the rhythm of a rhumba band blared across the utility company's office. Two Cuban visitors accepted the unexpected invitation and started a fast rhumba on the marble floor.

Facsimile is rarely dull—even without such incidents—because it holds a mirror to world events and their reflection can come into your living room. No other method of delivering printed news, ready to read, is so fast. A permanent record of history, minutes fresh, appears while you look on.

Proponents of facsimile are confident that such ability can win a place for itself on the list of major American industries. They are rather impatient as they watch facsimile grow slowly. At the same time, they are mindful that many years may intervene between introduction and full growth as a public service. Perhaps facsimile publishers and readers should use as their motto the sign which hangs over a tiny store on Grand Bahama island: "A Lion is Born Small."



Fig. 1

II

THE BIRTH AND GROWTH OF FACSIMILE

Facsimile is not a new idea. In 1842, Alexander Bain, an English physicist, used a wire circuit to mark paper. He can be accurately identified as the father of facsimile because his electrochemical recording telegraph established the basic elements of present facsimile equipment.

Bain's wire facsimile was widely used in the United States. It was superseded by electromechanical "tickers," or printers, which developed into the modern teletype.

His facsimile work was a crude start, but it cracked open the door that a century later was to swing wide.

Other physicists conducted similar facsimile experiments—marking paper with an electric signal. However, their pioneering was principally laboratory work rather than an organized, objective research program seeking a commercially practical facsimile system. There was little demand for a recording telegraph, and before Bain's system was refined, the automatic wire loop printer was on the scene.

None of the early wire-facsimile systems achieved gradations of black. They were exclusively solid black marks on paper. If any of the nineteenth century experimenters conceived of facsimile color gradations, which would make facsimile recording of photographs possible, they were stymied by the inadequacies of equipment then available.

Facsimile was stunted by the glamorous shadows of Morse code telegraphy introduced in 1844, when Bain's development was a toddling two-year-old, and later by Marconi's wireless telegraphy, launched in 1895.

The Morse and Marconi systems were fast, simple to operate, and adequate for most telegraphic communication requirements.

As demand grew for recorded telegraph information in the 1890's, electromechanical tickers met the need satisfactorily. A broker who wanted stock quotations got them printed clearly and promptly. Likewise,

newspaper editors got current news in clear and legible printed form.

The demand was for transmission of printed intelligence, not an exact copy of an original, so facsimile withered on the vine.

Men were stimulated by the prospect of someday getting exact duplicates, or facsimiles, by wires or wireless. But that could wait for the future. It was not an immediate, imperative need. The stock tickers and rudimentary teletypes were novel enough for early 1900 customers.

However, as recorded telegraph became commonplace, research on graphic communications generally shifted into a faster gear. Meantime, wireless telegraph mushroomed into radio broadcasting.

The three-legged stool which supports facsimile, (1) the transmitting equipment, (2) the transmitting medium, and (3) the recorder, became a reality. The basic equipment of modern facsimile was at hand. Even so, development was slow.

Copy transmitted experimentally was almost exclusively type matter because photographs did not reproduce satisfactorily. The equipment could send black and white, but intermediate gray tones, vital to good photographic reproduction, were lacking.

The Radio Phase of Facsimile

Active experiments with the radio phase of facsimile date from the early 1920's. All the early efforts used amplitude-modulation (AM) radio. Whether the service is by wire or radio, the basic elements of a facsimile system are the same.

For two decades the work with facsimile broadcasting stirred high hopes over new developments and just as often saw those hopes dashed by one obstacle or another. Facsimile was hailed on the one hand as heralding a revolution in the dissemination of news and pictures. It was damned on the other hand as being "the fanciest way yet devised to do bad printing."

In 1924, The American Telephone and Telegraph Company made an important stride in the facsimile field,

but it was by wire. Photographs were transmitted between London and New York, employing the facsimile principle and establishing the first commercial facsimile system. The transmission was received as a photographic negative rather than a direct print on paper. This negative had to be developed and prints made. The photographs obtained were a far cry from today's well-defined and delicately shaded prints, but it was a major stride nevertheless.

The Radio Corporation of America experimented with AM radio facsimile broadcasting in the early 1920's, but the endeavor was shunted aside to concentrate on commercial short-wave facsimile. On May 1, 1926, RCA inaugurated such a service between New York and London. In 1936 this type of transmission was ended and an adaptation of wire photo employed for radio transmission of photographs.

In 1926, Austin G. Cooley unveiled a radio photograph system he called "ray photo," which used a corona discharge to create an image at the recorder. He introduced ray photo to radio stations, and 27 broadcasters ultimately experimented with this elementary facsimile system and demonstrated it to the public. This phase of facsimile's development was sidetracked because the varying tone signal was too disagreeable for the air waves. Persons unfamiliar with the ray-photo system would tune in the signal on their radio sets and be greeted by an ear-wracking garble of sound.

This was not the basic reason, however, that the Cooley system was unsatisfactory for general use. The recording speed of 20 square inches in 3 minutes was too slow. Modern facsimile is more than four times as fast.

However, Cooley's ability to transmit the negatives of photographs by radio involved the basic procedure of today's facsimile newspaper, and his developments gave important impetus to facsimile generally. Cooley later became chief of Times Facsimile, Inc., New York manufacturers of wire-photo equipment. They also manufacture equipment which uses Teledeltos paper. This type of equipment is used in Desk-Fax (see Chap. III).

The indirect facsimile systems of wire photo and radio photo were perfected. Latent images were transmitted by wire or radio impulses to create a photographic negative. These systems came into widespread use for news-photo transmission. Yet this did not answer the facsimilist's dream of a radio receiver in the home which would do direct printing of text and pictures on paper. The dream actually was realized when the wire-facsimile systems were converted into radio-facsimile systems, but the results remained crude and slow.

John V. L. Hogan, another pioneer in facsimile, did much development work and successfully demonstrated his system in New York and Milwaukee during the 1930's. Radio Corporation of America and Finch Telecommunications, Inc., also made important progress. (RCA noted Hogan's progress with considerable interest and was about to change over to manufacture of equipment based on his system when the Second World War intervened in 1941.)

In their research work in 1935 and 1936, RCA engineers developed an ultrahigh-frequency receiver, a carbon-paper recorder, and a device for cutting off the facsimile pages as received and stacking them in a tray. The receiver was pretuned and wholly automatic —a push-button affair which was turned on and off from the transmitter.

Since the recording paper was costly, a dual recorder was built which would print on both sides of the paper. The saving on paper was more than offset by the increased cost of the recorder. The design was changed back, and a method was sought to preprint advertising on the back of the pages. This proved most difficult, however, for the rolls then used contained about 3,700 feet of paper.

Charles J. Young, who was active in RCA's early facsimile efforts, said it was not until after the project was abandoned that a means was found for building a recorder that would feed from a stack of cut sheets instead of a roll.

A Second False Start

Having had one false start in the 1920's, facsimile

embarked upon another in the 1930's.

Improved recorders of the carbon-paper type had been designed by RCA. Scanners also were improved. A workable facsimile-broadcasting service seemed so near that new interest was stimulated by the activities of several standard radio stations. They got Federal permits for experimental facsimile operation during the early morning hours when their AM broadcasts were off the air.

Late in 1937, station WOR in New York bought the new Finch and RCA scanners and 25 recorders of each type. Ultimately, four stations bought RCA equipment for operation in the standard broadcast band and four others for use in higher frequency bands. About 12 scanners and 300 receivers, in all, were sold by RCA.

WOR aired facsimile nightly, dividing the time about equally between the Finch and RCA systems. The Finch system recorded approximately 3 square inches of copy a minute on a sheet 4 inches wide. The RCA equipment reproduced about 5 square inches per minute on a sheet 8½ inches wide.

At that time, the Finch recorders used an electric signal to etch a waxed paper, in effect burning the reproduction into the paper. The varying electric signal would melt the paper's coating and uncover a black background. The RCA recorder used carbon paper on the recorder to make a carbon duplicate of the original on the scanner.

Neither system reproduced type or pictures with high fidelity. They were considered too slow for general acceptance, but over-all performance was far ahead of their predecessors.

In 1938, WOR teamed with WGN in Chicago and WLW in Cincinnati and formed a rudimentary facsimile network. WOR transmitted programs one night, WLW the next, and WGN the third night, in continuous rotation, which provided the experimenters with varied data on facsimile. Observers, who received the programs on the 50 sets, had ample opportunity to test facsimile's ability to operate over long distances, using AM channels.

At that time, facsimile broadcasting was confined

to the relatively narrow bands of the regular broadcasting channels. It was not transmitted during normal listening hours because the signal was high objectionable on home-set loudspeakers—one of the faults of Cooley's system.

The unsolved problems that marked this prewar burst of activity as another false start for facsimile broadcasting included the following:

The systems were too slow. It was clear that the transmission of only three pages of copy an hour was not fast enough for a usable home facsimile service.

Size. Some of the early recorders were as small as 3 inches in width, limiting the kind of material that could be sent as well as the amount.

The quality of reproduction was poor. There were definite weaknesses of the carbon-paper or pencil types of recording. Some of the recorders were 60 per cent below current standards for recording accuracy. Even those which did a fair job of producing straight black-and-white text or line drawings did a smudgy, unattractive job with photographs.

The cost of building recorders was too high to hope for a mass market in view of the type of service then possible.

Programming was crude and uninteresting. This was not an inherent weakness in the facsimile systems, but it proved a handicap in winning acceptance.

There was a definite limitation in some areas where electrical power was supplied by more than one source. Transmitters and receivers have to be operated from the same power source to establish synchronization. The receiver scanning drum will rotate in exact step with transmitter scanning drum if both are powered by synchronous motors supplied with power from the same generating station or stations which are connected together.

If a receiver scanning drum is not kept in step with the transmitter at all times, the printed copy will be badly distorted.

No effort was made to offer facsimile as a regularly scheduled feature. The hours within which facsimile could be broadcast was one deterrent; the inadequacies

of the equipment another. Some experimenters placed recorders on public view, but in most instances the recorders were in homes of engineers and others connected with the experiment.

Added to the experimenter's troubles was the fact that the signal rode AM channels with the hazard of static interference, which sometimes made copy totally illegible when it came out of the recorder. Also, the narrow channels imposed technical restrictions on the original facsimile signal itself. As a result, reproduction of photographs was not outstanding.

Experimentation spread until it included 22 high-frequency stations and approximately 15 regular broadcasting stations.

One by one the experimenters fell by the wayside. They were discouraged primarily by equipment breakdowns. Facsimile scanners and recorders combine intricate mechanical synchronization with all the facets of radio. There were still too many "bugs" and shortcomings in the equipment.

The hurdle of static interference on AM broadcast channels was obvious.

With all these shortcomings, interest lagged again. When the Japs struck Pearl Harbor there were only four stations broadcasting facsimile. Even if war had not put commercial facsimile on the shelf for the time being, the lessons learned in those experiments would have. The public was apathetic to what it had seen.

And still the research went on. It was obvious what had to be done. The process had to be stepped up in speed and down in price. A better method of printing than carbon paper or pencils had to be devised. The tests with erratic transmission pointed to use of FM channels for fidelity of recording. Better programming on a sheet big enough to carry pictures as well as type would help sell facsimile.

War Research Revives Facsimile

Part of these indicated solutions came out of war research—because facsimile went to war. The public became conscious for the first time of electronics,

and very (ultra) high-frequency radio. Sharply accelerated research and production of VHF equipment was a prime instigator of the postwar improved commercial facsimile.

The armed forces discovered that facsimile could be an extremely valuable tool and used it over both wire and radio channels. Military facsimile was first used within the United States, but later overseas circuits were opened and units for field operations were dedeloped. Maps, orders, plans, photographs, weather charts, and other graphic material was transmitted, most of it by short wave.

Military facsimile equipment was not suitable for home recording, but the technical lessons learned in developing it, together with the war's amazing advances in electronics generally, gave facsimile new impetus.

Bolstering these accomplishments was the development of FM broadcasting. FM, like all high-frequency bands, is essentially static-free. Equally important, the broad frequency response, or ability to deliver a wide range of tones, from very low to very high, can handle the tones needed for good facsimile recording.

Hogan Faximile and BFA

The next phase of facsimile broadcasting began before the end of the Second World War. FM radio provided one answer. And the war-born improvements in facsimile equipment were marked enough to excite new interest.

Theodore C. Streibert, president of WOR, surveyed the field again late in 1944. RCA and Finch apparently had no extensive plans at the time.

He found that Hogan did have plans and some important new inventions. Hogan had been concentrating on facsimile since the early 1930's, having dropped his research on television in order to do so. Hogan was the inventor of single-dial radio tuning and founder and president of WQXR, New York's classical-music station.

Hogan had developed a facsimile process which transmitted type and photographs with remarkable fidelity and at a speed much faster than anything seen before.

Hogan's Radio Inventions, Inc., had been conducting intensive research in facsimile for the government, and many refinements had emerged from the laboratory.

The key to Hogan's process was the electrolytic system of recording. A varying electric signal caused infinitesimal particles of metal to pass from a printing blade to a chemically treated paper. The electrolytic process reproduced deep charcoal blacks or fine gradations of blacks and grays in photographs.

Hogan told Streibert that "improvements so marked as to be almost revolutionary were wholly practicable." However, no coordinated effort was under way to adapt the military improvements into home equipment. Out of this grew Broadcasters Faximile Analysis (a trade-name spelling of facsimile by Radio Inventions).

A group of about 25 newspapers and broadcasters banded together in BFA to help finance the development of an acceptable facsimile-broadcast service in its new form. Some of these broadcasters had conducted prewar facsimile experiments and had the experience to judge what was needed to make it succeed. Others had publication experience, and still others had been in developmental work, so that a combined opinion could be formed based on past performance as to what would be required.

The cooperative effort proceeded as man power and materials became available without conflicting with war work. Fundamentally, this effort concentrated on increased speed of recording, larger page size, noiseless operation, automatic synchronization, static-free transmission, and the establishment of over-all standards.

The key decision as to what would satisfy the public was made at a meeting of the BFA group in September, 1945. Recorder models were displayed which produced three sizes of copy and operated at five different speeds.

Pages 5, 8, and 11 inches in width were tried. The smallest size was unanimously tossed out as inadequate for a public service. The 8-inch size, permitting a four-column newspaper format, was finally agreed upon, although a few favored the larger width. Development, therefore, was centered on a sheet 9.5 inches wide with a useful line width of 8.2 inches.

Speeds as slow as 8 square inches a minute and as high as 48 square inches a minute were investigated. It was agreed that the speed should correspond to the normal reading speed of the average person. It actually was set at a faster pace than this—or 28 square inches a minute—to allow for the fact that pages would contain illustrations which didn't take so much time to absorb as text matter.

There was another underlying factor in this compromise. Broadcasters then wanted a recording speed which would fit pages into the standard 15-minute broadcast period, with allowance for station breaks. The 8.2-inch useful line and recording speed of 28 square inches a minute permitted four facsimile pages 11.5 inches deep to be transmitted in a 15-minute period.

Equipment was built to these standards, and in April, 1946, it was air tested and considered adequate. General Electric Company was given the production job of building transmitters and receivers exclusively for BFA participants according to the Hogan specifications.

John S. Knight, editor and publisher of the Knight Newspapers, had kept close touch with facsimile's development. Using prototypes of the Hogan-General Electric equipment, he introduced facsimile to the public in Miami, Fla., where the Miami Herald and WQAM-FM transmitted a series of editions in March, 1947. Other public demonstrations followed in New York and Philadelphia. By the end of the year General Electric began delivering equipment to the BFA members and some stations went on the air.

The standards decided upon in this intensive period of development were the ones later accepted by the Federal Communications Commission when it made facsimile operations uniform and authorized commercial facsimile broadcasting.

III

THE MANY USES OF FACSIMILE

Anything that can be drawn, written, printed, or pictured on paper can be broadcast by facsimile or sent from point-to-point by wire.

Facsimile was used for so many different purposes during and after the Second World War that some enthusiasts believed its future lay more in these directions than in the printing of a newspaper in the home. In the immediate postwar period, facsimile grew faster in some of these fields than it did in the publishing of electronic newspapers.

The world was entering a new era of electronic mass communication. Facsimile played a spectacular part —little known, at first, to the public—because it has the power to do some things which other facilities can't duplicate.

For one thing, facsimile doesn't know how to make a mistake. It will transmit a typographical error if there is one in the original copy, but it doesn't have the ability to make one. It will send twice as many words per minute as a radio announcer can read and eight times as many as a high-speed teletype can deliver.

Or, by the innovation of Ultrafax, it can be stepped up in speed to deliver the entire text of this book across the continent in less than a minute (see Chap. IV). Facsimile not only leaves a written, printed, or pictured message in permanent form but also does so faster than any other method. It can transmit Greek letters or Chinese ideographs as easily as it can the words on this page.

This chapter will tell how these facsimile talents have been put to military, public, and commercial use in recent years (see Fig. 2). It will discuss other exciting possibilities which may seem almost incredible but are already practicable.

The greatest attention has been focused on facsimile newspapers because of the promise, or threat, that your newspaper of the future will materialize in your home

printed by radio. This would revolutionize the press as we know it today. The authors do not believe the printing press will become obsolete, but, in the fields of publishing and advertising, facsimile does speed up the movement of copy to an unprecedented degree.

The potential uses of facsimile in other fields are almost unlimited. The Army, Navy, and Air Forces employ facsimile on a world-wide scale. By 1949 Western Union was busy setting up a nation-wide system for sending and receiving telegrams automatically by facsimile (see Fig. 3).

Tests proved that radio facsimile fills a vital need in ground-to-air and air-to-ground communication. It provides a new type of service to, from, and between ships at sea and to railroad trains in transit. Police can use facsimile to transmit fingerprints and photos; hospitals to send an X-ray print to a distant clinic and get a speedy diagnosis. The science of weather forecasting is being improved by up-to-the-minute facsimile maps showing the weather conditions in distant areas.

Facsimile is the one service that guarantees infallible accuracy, instantaneous delivery, and permanency —the prime needs of modern communications. These assets are the compelling reasons why facsimile has become the infant giant of electronics and why it would continue to grow even without air newspapers.

Military Applications of Facsimile

The military uses of facsimile are obvious and constantly increasing. Orders, requisitions, weather and terrain maps, personnel data, and the endless stream of red tape which pours from central and regional headquarters can be handled swiftly and with unerring accuracy.

Coded messages can be sent with a major problem eliminated—transmission error which garbles the context. Facsimile is so flexible that it can exchange information between land, sea, and air points or any combination of the three—including submarines. The Second World War gave the great impetus to the per-

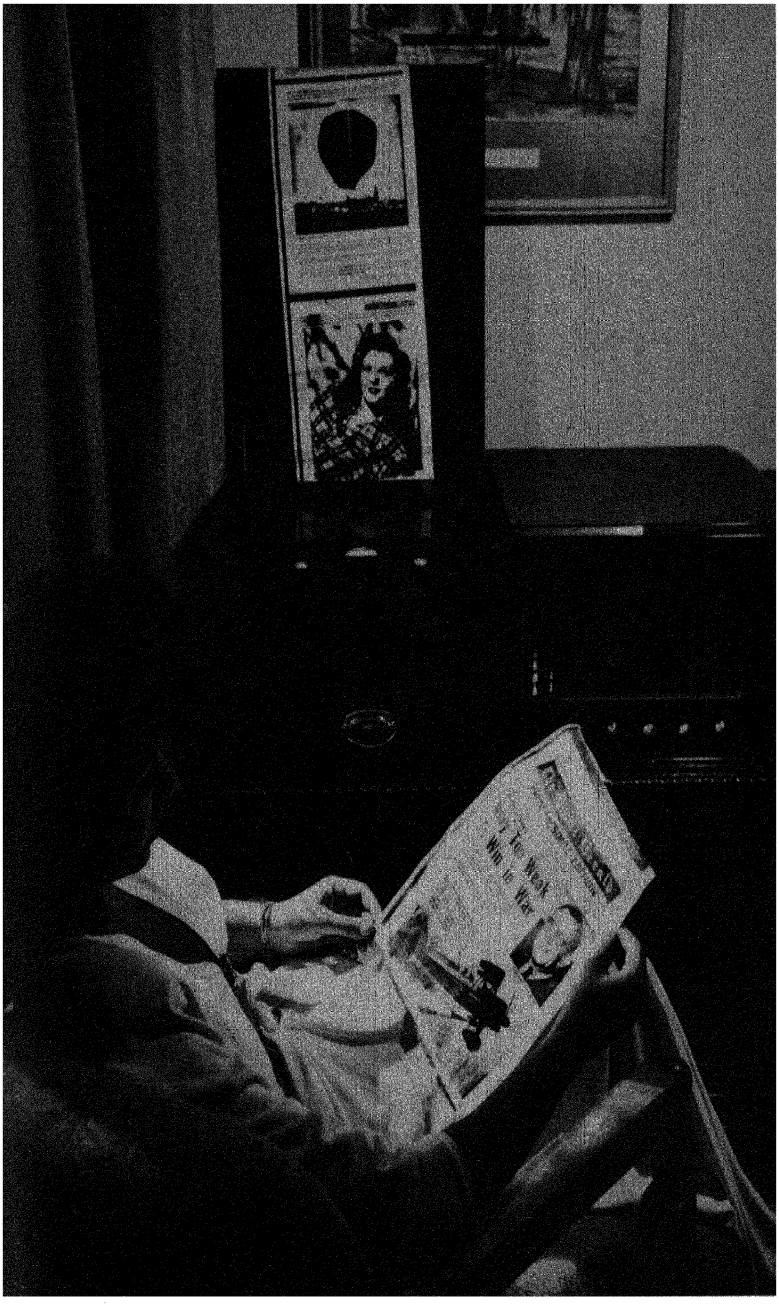


Fig. 2. Facsimile brings news of the world to a vacationer in her suite at a Miami Beach ocean-front hotel.

fection of facsimile described in the chapter entitled The Birth and Growth of Facsimile. With the "bugs" out of the equipment, the military after the war went steadily ahead developing a wider use of facsimile.

New warplanes and weapons called for a foolproof means of communication. The faster aircraft traveled, the less time there was for sending and receiving messages and the greater the risk of getting them garbled. In telling a science forum why the U.S. Army Air Forces planned to use facsimile equipment, Brig. Gen. F. L. Ankenbrandt, chief air communications officer of the AAF, said:

> We are doing everything possible to make our communications equipment and systems more reliable. This is especially important when we consider the requirements in aircraft of the future, which we expect to travel at velocities exceeding that of sound. Every word spoken into the microphone of the aircraft transmitter should be instantly understood at the other end of the system — there's no time for repeats. And every communication intended for the aircraft must be reliably received immediately upon transmission.

The goal of the Air Forces was a lightweight, rugged facsimile machine with high operating speeds. Tests showed that facsimile could minimize or do away with the effects of noise and interference on the aircraft communications system. It also came closer than any other system to providing a fully automatic operation in airborne equipment.

> Said General Ankenbrandt, The problem of airborne equipment design is complicated by the fact that it must operate under a very wide variety of climatic conditions. It must provide reliable operation both in the polar regions and at the equator. It must not falter whether the climate is very dry or very humid. Also, it must provide continuous communications whether the aircraft is flying at 50,000 feet where the atmosphere is very rare or near the earth where it is much denser.

While it was developing airborne facsimile, the Air

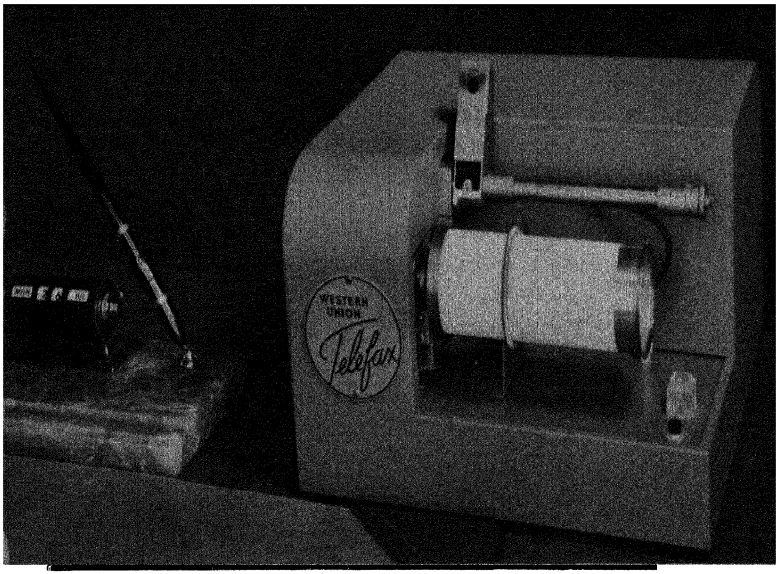


Fig. 3. Western Union's miniature facsimile transmitter and recorder, which puts world-wide telegraph and cable service within arm's reach of the user.

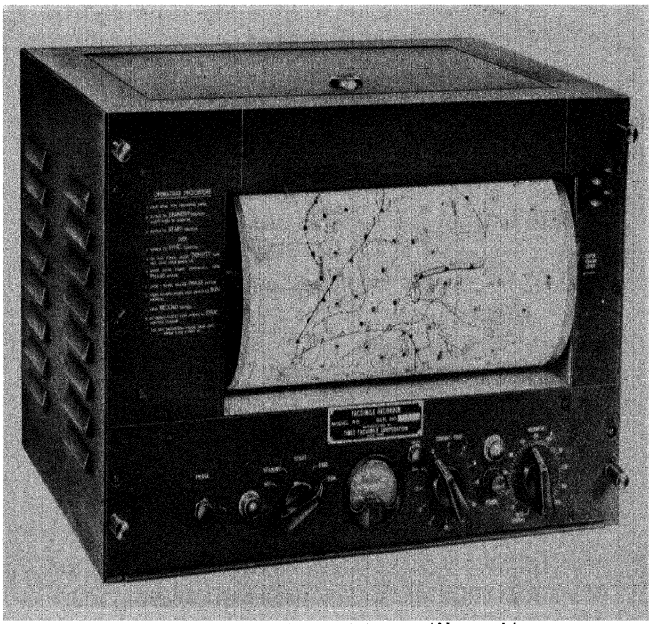


Fig. 4. Air lines and the armed forces will use this Times Facsimile Corp. direct facsimile recording equipment. Without the relay rack it weighs only 40 pounds.

Forces in 1947-1948 also began setting up a facsimile network linking the principal airfields along the Atlantic seaboard and through the Southeastern and Gulf states. Complete weather maps and reports, gathered from AAF information collection points, were sent by facsimile to personnel at airfields for forecasting purposes.

This facsimile weather-information service proved invaluable for the long flights of the Air Transport Command, whose facsimile operations soon extended to Frankfurt, Germany.

The Navy, meanwhile, spread a radio facsimile network across the Pacific which supplied it with up-to-the-minute pictures showing weather conditions all the way from Washington to the China coast. Pilots about to make the long hop from California to Guam or Manila could see at a glance what kind of weather they could expect 5,000 to 6,000 miles away.

Facsimile machines for the Navy service are manufactured by Times Facsimile Corporation, a subsidiary of The New York Times Company, which was established in August, 1942, to build equipment for the Signal Corps (see Fig. 4).

In announcing its network, the Navy said it was putting to peacetime use facilities that were developed during the war when the Naval Communications service transmitted war pictures by radio directly from Guam to Washington, a distance of 8,500 miles.

The new process provides "a real map complete in every respect," compared with the partial charts previously compiled from coded reports of weather conditions in far-off places.

The collecting centers for the weather data are Navy stations at Guam, Pearl Harbor, San Francisco, and Anacostia, D.C. They compile area maps and transit them to each other. Each station receives a full set of the local charts and puts them together to make the big map charting weather conditions halfway around the world. The whole sending process takes about 30 minutes.

Some of the dramatic ways in which facsimile was employed during the Second World War provide the tip-

off on why the armed forces are intensely interested in facsimile. In addition to the normal uses for high-speed communications, facsimile was called into play in actual battles and invasions.

One notable instance was during the Normandy invasion. Reconnaissance planes took photographs over the enemy front lines. The pictures were flown back to England, developed, analyzed, and then transmitted by facsimile to the Allied front lines, all within 1 hour from the time the pictures were taken. With present-day equipment, the pictures could be developed aloft and transmitted directly from the plane to the troops below in a matter of minutes after the photographs were taken. A little imagination indicates facsimile can be an invaluable instrument in modern warfare.

Telegrams by Facsimile

The Western Union Telegraph Company took a leading role in advancing the commercial use of facsimile. It launched a "desk model telegraph office" in the summer of 1948—starting in New York City, Atlanta, Chicago, and San Francisco—and rapidly began spreading an amazing new facsimile service over the country.

These Desk-Fax machines send and receive telegrams through central Western Union Offices by facsimile. They are faster, more convenient, and less costly than teleprinters and make the old Morse wire sluggish indeed. The machine is smaller than a portable phonograph and weighs only 18 pounds. It measures 10 by 11 by 7 inches.

With the new device, a message sent from New York is in San Francisco in 10 minutes. The innovation eliminates call boxes and messenger boys, cuts operating costs, and increases the speed of telegrams. It is part of the Western Union program for mechanizing telegram operations.

With Desk-Fax, you simply type or write a wire or cable on a special blank provided with the machine. Then you wrap the message around a cylinder in the machine and press a switch. Facsimile goes to work,

and the rest is automatic. The machine even cuts itself off after transmitting an exact duplicate of the telegram into the nearest Western Union central office, where a meter registers the charges. The message goes from there to its destination.

A buzzer sounds when there is an incoming telegram for your Desk-Fax. You switch it on; the gadget records the message on a special sensitized paper and then shuts off automatically. The buzzer sounds again until you push a button to acknowledge receipt of the telegram. Facsimile can transmit a telegram in the sender's own handwriting.

Western Union said its machine is no "electronic miracle." F. E. d'Humy, vice-president in charge of research and development, said the first prewar models built, using electronic equipment, cost $135 to make. When this cost soared to $400 a few years later, Western Union threw that model out and developed a "revolutionary" machine that used principles nearly 75 years old.

Costing less than one-fourth the expense of the other system, it was developed in less than a year by Garvice H. Ridings, an engineer who worked under Raleigh J. Wise, chief of Western Union's facsimile department. Most of Western Union's facsimile developments have been in wire transmission rather than radio, and its Desk-Fax does not use the same processes as the radio-facsimile system developed by John V. L. Hogan.

The main difference is in Western Union's use of its Teledeltos paper. This is a dry recording paper, containing a light-gray carbon pigment which turns black wherever electric current passes through it. Amplified tone signals are applied directly to the paper by means of a wire stylus, which rides continuously on the surface. It "prints" a clear and permanent record directly on the paper. The paper is sensitive only to electrical impulses. Light and moisture do not change its color more than they do that of ordinary writing paper.

The sender-receiver in the telegraph central bureau is equipped with a photoelectric cell common to most

facsimile transmitters, but the customer's device relies on the sensitized paper and stylus.

The machines are built by the Teleregister Corporation, a subsidiary of the telegraph company. As installations spread, Western Union said Desk-Fax would be placed in transportation terminals, hotels, and similar places for the convenience of the public.

Facsimile for Air Lines

The air lines began using facsimile in the late 1940's, when several small weather-service networks were set up. Coupled with the established weather services and the far-flung facsimile networks of the Army and Navy for weather information, there was gradually emerging a complete weather picture for all air transportation needs.

Next came facsimile message machines to transmit airplane reservation data, swiftly and accurately, between airport and city offices. A message, either typed or penciled on an ordinary size telegraph blank, is placed on the machine's cylinder. As a beam of light scans the message at the downtown reservation office, an identical cylinder rotates on the airport device, printing a duplicate of the message on dry recording paper. Electrical impulses actuate a stylus that traces a path on chemically treated paper. The machine both sends and receives.

American Airlines, which started using facsimile in Baltimore, Oklahoma City, Rochester, and Syracuse and then made it a system-wide service, found that four reservation requests could be sent from a city office to airport in 2½ minutes. Other air lines also are commercial users of facsimile. These services use wire instead of radio for transmission.

A more spectacular use is the radio facsimile news service for airplane passengers, which has been successfully demonstrated in flight. Radioed press dispatches were printed on speeding air liners at the rate of 500 words a minute. Some air lines announced they would consider installing the service when air facsimile newspaper became more commonplace.

Facsimile for Police, Hospitals, Schools, Railroads, Banks, Industries, Utilities, Recording Instruments

In many other fields, facsimile either has been put into operation or has been proved to be a practicable instrument for swift and infallible communication. It has the advantage of economies in equipment and operating costs. It provides a faster service at less cost than the teletype and one with unfailing accuracy. Facsimile will look at checks, forms, orders, letters, documents, drawings, photographs, or any written or pictured message, and it will deliver authentic copies of what it sees to any point which can be reached by wire or radio.

Banks. As an example, the Bankers Trust Company in New York uses facsimile to eliminate the need for a second set of cumbersome files in branch offices.

When a signature is questioned in the branch bank in Radio City, the check is transmitted by facsimile to the main office in Wall Street, where the signature is quickly matched against the one on permanent file.

Facsimile makes central bookkeeping possible for banks with several branches.

Two-way transmitters and receivers, called "transceivers," have been used in banks and hotels with great success. Messages are written on a narrow, continuous strip of paper which transmits information from the teller's cage to the inner record office of the bank, or from the hotel phone to the information and mail desk.

Railroads. The Pennsylvania Railroad has used facsimile to dispatch trains in more than a dozen locations for several years. An order is prepared, placed in the machine, and the desired recorder in the yard is dialed. The selected recorder then reproduces the message, and it is picked up by the trainman. The danger of error that might come from a signal or telephoned message is eliminated. Facsimile can place written orders in the hands of engineer and conductor of moving trains. A message in Margaret Truman's

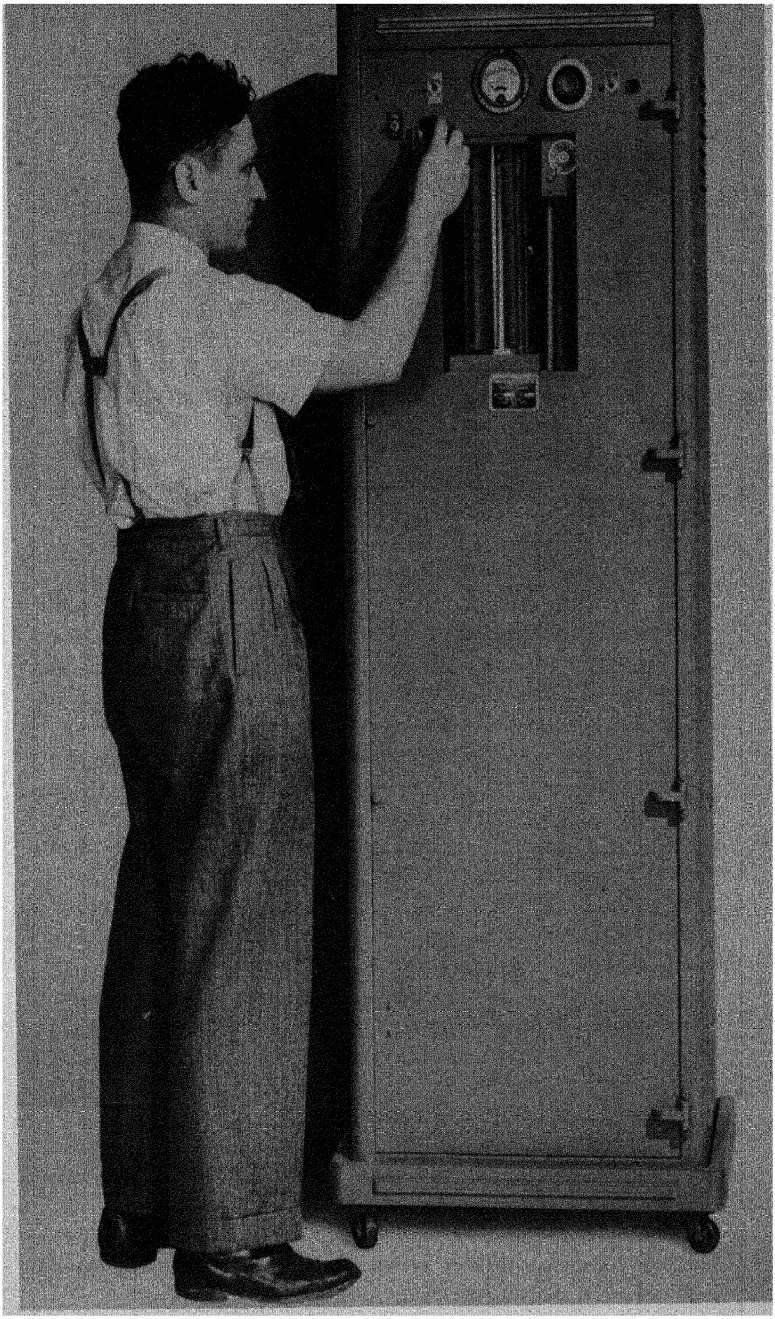


Fig. 5. Transmission of X-ray films by facsimile has been demonstrated to the American Medical Association by Times Facsimile Corp. using this equipment.

handwriting was sent to the Capitol Limited as it sped toward Washington.

Shipping. Steamship lines can communicate with ships at sea, sending weather data, pertinent business information as ships approach port, or general news for passengers. The ships can advise shore stations of happenings aboard, transmitting anything from photographs of prominent passengers to accounting forms or cargo lists. Ships or airplanes can transmit the customs declarations of incoming international travelers before they reach port.

Police, Hospitals. Hospitals can noiselessly, instantly, transmit instructions from the superintendent's office to floor stations throughout the building. An X-ray of an auto-crash victim's skull can be sent from a distant point to John Hopkins for study, and the diagnosis flashed back in the specialist's handwriting (see Fig. 5).

Fingerprints of a suspect held in El Paso can be flashed to FBI headquarters in Washington and the desired information received in return. Police departments can circulate orders or photos of suspects and of missing persons and retransmit them to mobile units in their own areas.

License numbers of stolen automobiles can be sent to precinct headquarters as fast as they are received, or complete lists can be sent to patrol cars equipped with miniature recorders.

Industries. Written orders can be delivered through a vast steel or auto plant with facsimile as the courier. Official announcements can be posted on bulletin boards a few minutes after the plant manager has signed the originals (see Fig. 6).

Production statistics, inventory figures, and personnel information can be whisked to the general offices of an industrial empire for study at the end of each business day.

Orders can go out to plants from the general offices exactly as they appear on the originals, with no chance of costly transmission errors.

Public utilities can flash information to branch offices or substations, using charts and specific

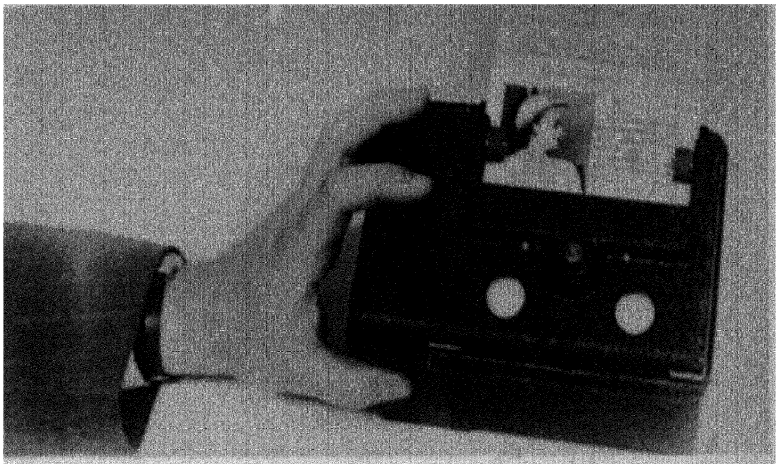


Fig. 6. The Alden Products Co. 4-inch recorder, used in office and interplant facsimile communication systems. The recorder takes 4 by 7 by 7 inches of cabinet space.

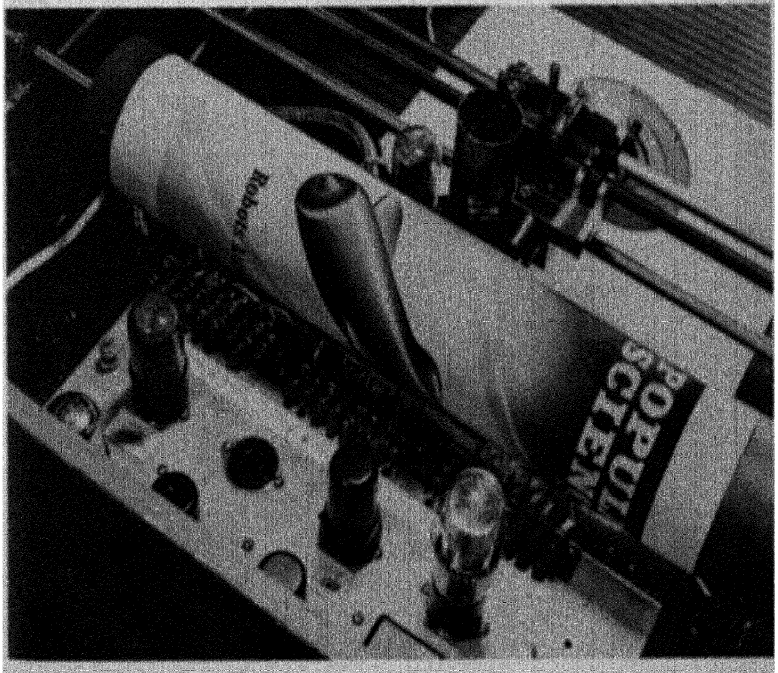


Fig. 7. Colortax scanning drum, with a page of full-color copy, ready for transmission. *(Popular Science photo)*.

data when line trouble develops or distributing operation orders and statistics in the course of normal business.

Educating by Facsimile. Facsimile can be used for administrative purposes in schools and colleges or for actual teaching. Radio education specialists of the U.S. Office of Education have said that widespread use of facsimile in education awaits only the general distribution of sets to homes.

For administrative work, facsimile can be as valuable in schools as in any other large organization. It can transmit study outlines, assignment sheets, reference lists, tests, pictures, maps, and other material.

The greatest use, however, has been visualized for adult education. Many publicly owned FM stations have engaged in radio education. They see a possibility of bolstering radio teaching by educational programming over facsimile. Unlike compulsory education, which *should* be interesting, the voluntary education of mail and radio extension courses *must* be interesting to get and hold attention. This is a job facsimile can do if the proper care is given to building programs and especially if they are broadcast in connection with FM sound programs.

Office Machines, Instruments, Publishing, Other Uses. Facsimile machines have been built that will cut a mimeograph stencil automatically from prepared copy and make good offset printing plates. Another adaptation is an office duplicator that will deliver a sheet a minute. It provides all the accuracy, permanency, and authenticity of a photostat but is faster, cheaper, and easier to operate.

EBASCO Services, Inc., in a survey on facsimile, declared that recording instruments or meters in powerhouses, industrial plants, laboratories, petroleum exploration stations, etc., "may advantageously be supplemented or replaced by facsimile." This great public utility organization cited long-distance transmission of meter readings by facsimile as a distinct possibility.

Stock and commodity prices, together with trade news, charts, graphs, buy and sell orders, can be transmitted between cities without fear of transmission error.

High-speed teletypes transmit hundreds of thousands of words of news copy every day over the world's news networks. The same quantity of news, in the same usable, printed page form, can be delivered by facsimile in a fraction of the time that it takes the teletype to do it.

Sports writers' copy can be radioed exactly as they write it from the Rose Bowl to a Boston copy desk, many times faster than by telegraphy and without any chance of typographical error in transmission.

Editorial offices divorced geographically from printing plants can receive proofs by facsimile, edit and return them.

Many magazines are edited in New York and printed in Chicago. With facsimile, printer's proofs can materialize in the editorial offices as fast as the type is set. An exact reproduction of the editor's corrected proof can be sent back to the printer the instant the editor has finished with each galley. Costly delay and all danger of transmission errors are eliminated.

Master copies of newspapers, government agency instructions, or any material which requires mass distribution over a wide area can be flashed to key points where the text can be set in type, printed, and distributed regionally, saving time and shipping expenses involved in a centralized operation.

The Federal Communications Commission, in a summary of the possible applications of facsimile, said that it "may someday be used as an adjunct to the telephone, so that, failing to get an answer, the caller may leave a message which will be found at the phone when the person returns."

Regardless of the field of enterprise, wherever the transmission of a permanent printed record is desired, facsimile can be used, saving time and ensuring unerring accuracy.

The employment of facsimile in some of these other fields—such as for rural publications, farm bulletin services, church and other organizational broadcasts—is discussed in other chapters. As the public sees facsimile in its various applications, the process probably will become an accepted commonplace.

IV

COLORFAX AND ULTRAFAX

The sending of colored pictures by radio facsimile and the direct reproduction of the colored image on ordinary paper were demonstrated experimentally late in 1947.

The process, called "Colorfax," was developed jointly by Capt. W.G.H. Finch and Dr. LaVerne R. Philpott, director of research, of Finch Telecommunications, Inc., of Passaic, N.J. Philpott is known as a designer of Navy radar equipment, and Finch was a pioneer in facsimile.

Color facsimile is the glamour girl of the air newspaper.

It can send, in full color, the picture of a pin-up girl, a new gown, or a roast turkey. The enthusiasts talk about "tuning in a painting." Yet the system has some limitation in so far as growing into large-scale use is concerned.

The scanning and transmitting operations are essentially the same as in other facsimile processes. When the Federal Communications standardized radio facsimile with definite rules, Finch and Philpott said their color equipment was built to operate under those rules.

The main difference is in the recording equipment. From a practical standpoint, if you want to receive both color and the black-and-white facsimile of the other systems, you need two different recorders.

Colorfax employs the earlier process of marking lines on paper with a mechanical pencil. Plain, ordinary paper can therefore be used. It doesn't have to be chemically treated or kept moist in a special humidor as in the electrolytic method, which Finch himself, Hogan, and Alden all use in their black-and-white recorders.

The saving in paper cost, however, is offset by other disadvantages. The pencil-marking process was abandoned by most facsimile developers years ago because it was too slow and its reproductions were not clear

and sharp enough. Colorfax records at one-fourth the speed of the electrolytic systems. Color facsimile is intended for pictures, not type, and the average reader absorbs pictures much faster than he does textual matter. Hence, the slow speed (it takes about 15 minutes to produce an 8- by 10-inch color picture) is even more obvious to the viewer.

The quality of the color reproductions, however, is much better than the early pencil recordings. The blending of the colors is improved by the fact that more than 100 lines are marked on each linear inch of paper.

Color pictures have been sent by radio before, using the photographic process. With that method, the picture is broken down into its primary colors and the colors separated. Each color is then transmitted separately, reproduced at the receiving end as in the wire-photo system, engraved separately, and printed as in ordinary color printing. Naturally, this is a slow procedure. The Finch Colorfax system doesn't give the quality of a fine color photograph, but it does directly print (or, more precisely, draw) the picture on paper.

Here is how it works: The color picture to be sent is wrapped on the scanner drum just as it is in other facsimile processes (see Fig. 7). The copy also is scanned, line by line, by a photoelectric cell, or "electric eye," transforming the variations in the intensity of the reflected light into electrical impulses.

In color facsimile, however, the reflected light passes through a geared, rotating filter disk, which separates the colors from each other. The only colors this mechanical painter worries about are the primary colors—red, blue, and yellow—because these, in proper combination, produce the other shades.

Each tiny slice of copy in the color picture is scanned four times by the spot of light. The color of the light is changed once for each revolution of the scanning drum which holds the copy.

First it is scanned with blue, then with yellow, next with red, and, finally, the fourth time, with black through an amber filter to give depth and contrast to

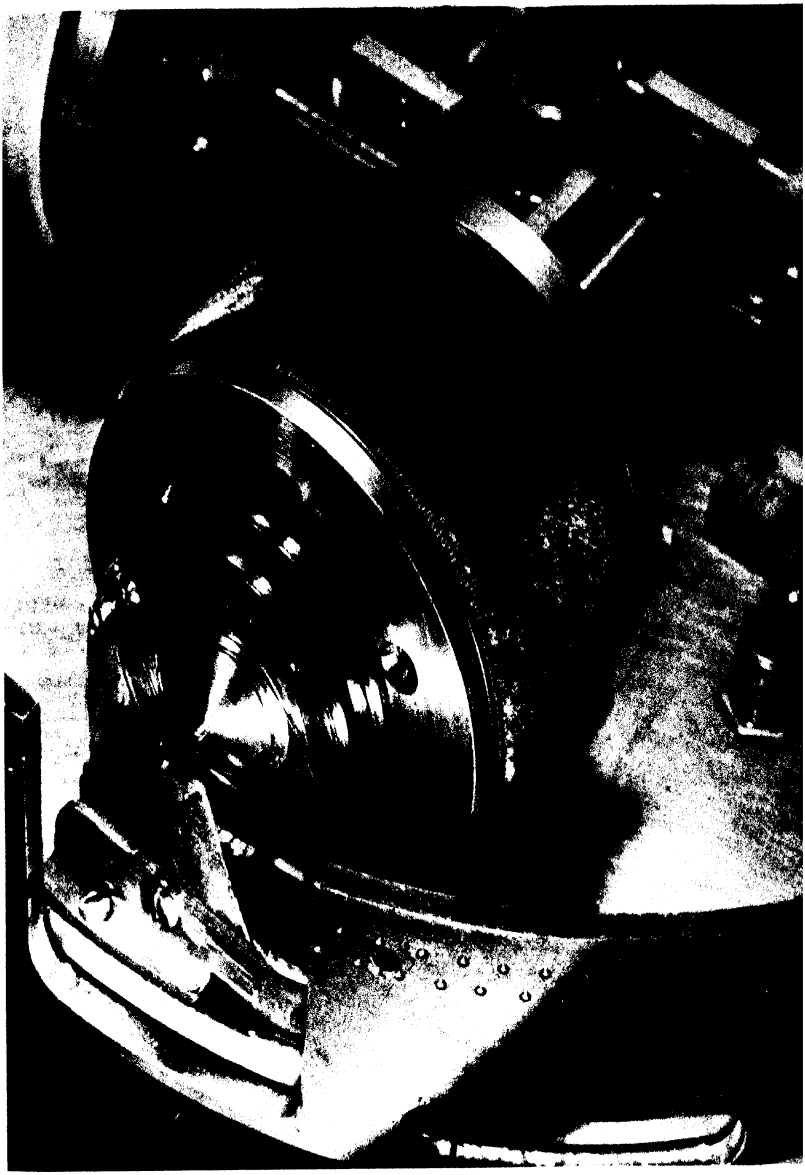


Fig. 8. Colored pencil, actuated by a voice coil, marks the paper when its turn comes if the incoming signal tells it to. The pencil is inclined slightly against the surface of the paper, and the entire unit rotates. This keeps pencils sharp and ensures fine lines.

the colors. All these light variations then are turned into electrical energy and broadcast over the air waves.

At the receiver, the process is inverted, and the varying impulses actuate pencils with colored pigment leads, which literally retrace the picture on paper (see Fig. 8).

The receiver takes orders from the facsimile transmitter. When the photocell at the scanner is looking at red, the transmitted signal tells the receiver to draw a red mark on the paper. If the signal says yellow, the electronic brain pushes out a different pencil and marks a yellow line on the paper. If the sliver of copy being scanned contains secondary colors, the receiver blends them by putting one primary color on top of another and may add black to deepen the dark areas.

The four different pigment pencils are mounted in a revolving turntable. As one line stroke at the scanner is finished and another starts, the turntable is rotated to the next position and the next colored pencil makes its mark. Each of the four colors is applied line by line (see Fig. 9).

This tracing of each line four times with a partial overlapping is what slows up the copy reproduction to about one-fourth the speed of standard black-and-white facsimile. The inventors hope to double this pace in later models.

The Colorfax receiver can be converted into a standard black-and-white recorder. The color machine has four printing heads, or pencils—one for each of the colored pigments. By replacing the color with black leads in each position, the color receiver can record black and white on regular paper but at the one-quarter speed. This would be a tracing of the paper, however, and not the electrolytic reproduction of pictures and type.

By changing to black and white at both ends, the machine can do the pencil-marking kind of facsimile recording at standard speed. Unless the right adjustments are made, however, the attempt to pick up black-and-white pictures from a color transmission will result in a distortion of the object pictured. It is a vertical distortion, being either compressed four times or elongated four times vertically.

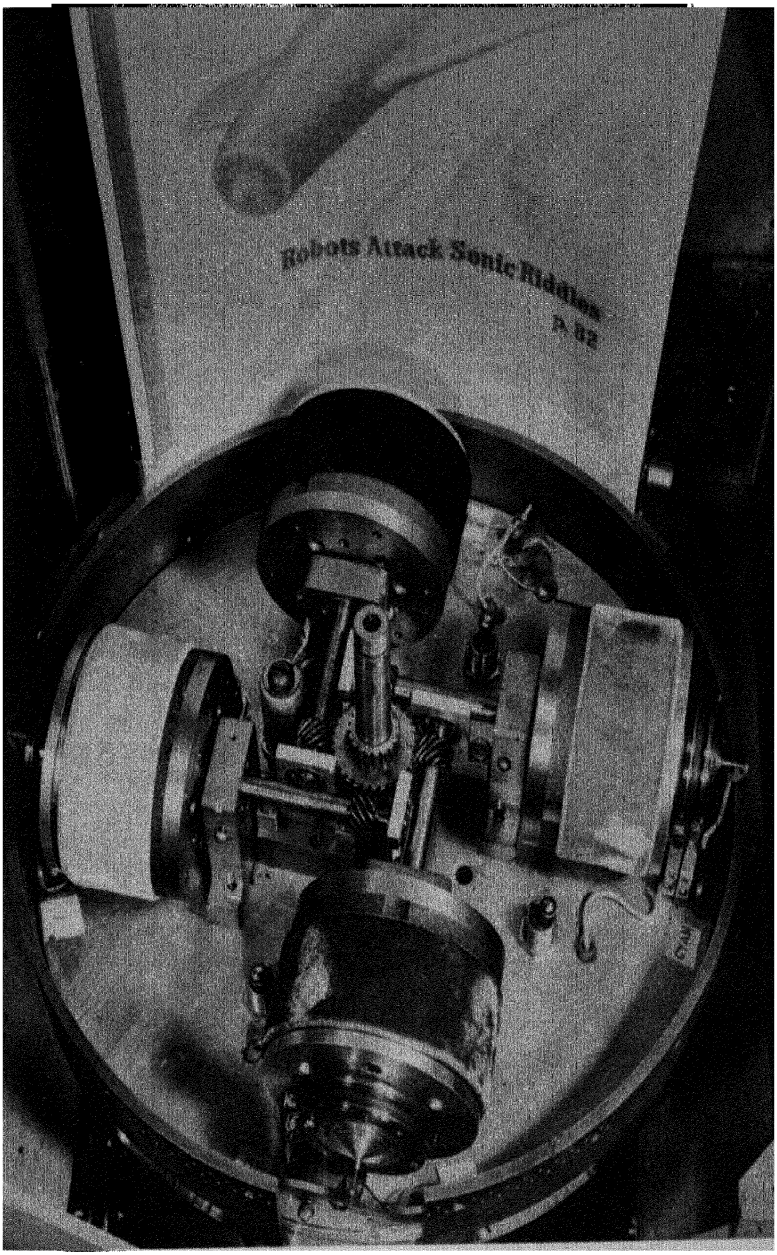


Fig. 9. Mechanical pencils in the recording unit are the primary colors—red, blue, and yellow—plus black to improve contrast and strengthen dark areas. Mixed colors are produced by blending the three primary colors.

The radio sending and direct printing of color pictures is one of the more glamorous phases of the miracle of facsimile. Yet the early response to it, based on the kind and quality of service it could render, did not presage any immediate or widespread public use of the facility.

Publishers of daily facsimile editions have reacted cooly to Colorfax. They are not particularly concerned with the slow recording speed. That can be improved through technical improvements. The factor that makes them indifferent is the tremendous cost of preparing colored original copy compared with black-and-white copy. Until facsimile is a major money maker, it is unlikely that color will be used in daily editions.

Ultrafax

In October, 1948, a means of delivering printed messages with the speed of light was unveiled at the Library of Congress (see Fig. 10). The process, called "Ultrafax," was created by the Radio Corporation of America in cooperation with the Eastman Kodak Co. and the National Broadcasting Co. Messages are recorded on a reel of motion-picture film, which is then transmitted by television. At the receiving end, a television receiver records the messages on another reel of film, which must be developed for further processing.

The speed and capacity of Ultrafax can be pointed up by one illustration: The 60 to 70 plays that reach Broadway in an ordinary year average about 12,000 words in length. Thus the entire yearly output of all authors whose plays are produced there does not total more than 1,000,000 words. NBC president Niles Trammell says Ultrafax can take a million words of text and send it across the country by microwave relays in 1 minute.

Yet there is nothing startlingly new in the design or concept of Ultrafax, according to Dr. E.W. Engstrom, vice-president in charge of research at the RCA Laboratories, Princeton, N.J. The chief innovation, he said, was the application of television principles to message transmission. Otherwise, Ultrafax is a refinement and a combination of existing communication processes.

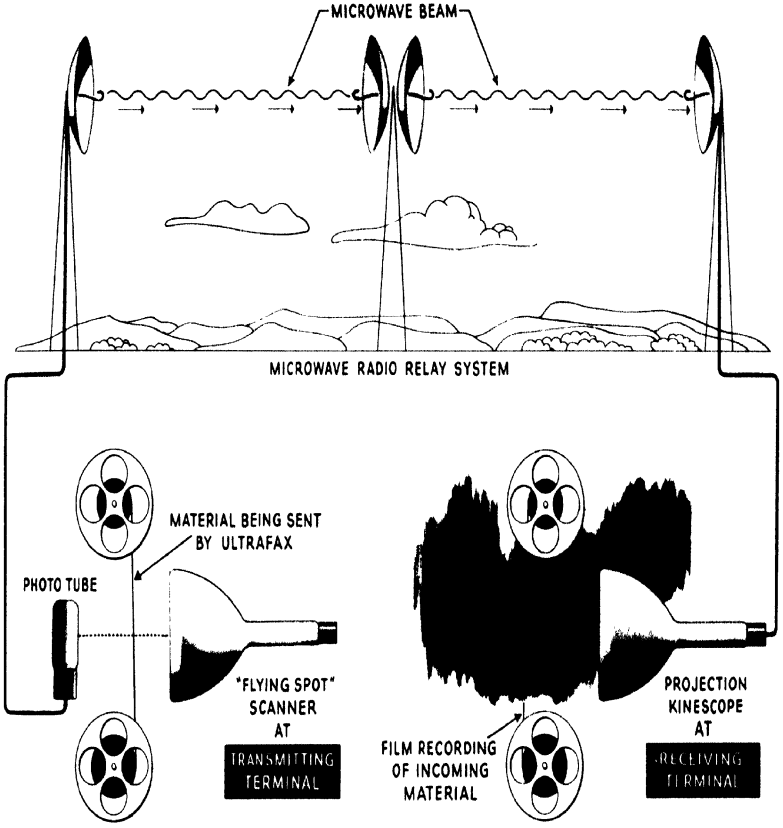

MICROWAVE BEAM
MICROWAVE RADIO RELAY SYSTEM
MATERIAL BEING SENT BY ULTRAFAX
PHOTO TUBE
"FLYING SPOT" SCANNER AT TRANSMITTING TERMINAL
FILM RECORDING OF INCOMING MATERIAL
PROJECTION KINESCOPE AT RECEIVING TERMINAL
RCA ULTRAFAX SYSTEM

Fig. 10.

RCA officials have said they would leave the uses and adaptations of Ultrafax to the broadcasting, publishing, and communications industries. Dr. Engstrom said that, ultimately, it probably will replace those forms of communication handled in mail volume. He questioned that Ultrafax would ever be used for "newspapers by radio," although it is theoretically possible.

RCA engineers explain that Ultrafax's remarkable speed is possible because full pages of information are transmitted as television pictures at the rate of 15 to 30 pages a second.[1]

The principal steps in transmitting and receiving by Ultrafax are

1. Preparation of data to be transmitted to assure a continuous flow at high speed
2. Scanning of this data by what is known as a flying-spot television scanner at the sending terminal (see Fig. 11)
3. Transmission of the television image as ultrahigh radio-frequency signals over a microwave relay system
4. Reception on a projection-type television kinescope, or "picture tube," from which incoming messages are recorded on motion-picture film (see Fig. 12)

After the message is transmitted, the exposed motion-picture film can be put in a special processing unit, where it is passed through a miniature developing tank, rinsed and fixed in about 15 seconds, and dried in 25 seconds more. Pictures from Ultrafax film can be enlarged to full-size copy by a highspeed continuous processing machine similar to that used during the Second World War for V-mail enlarging.

Obviously, this fabulous process is primarily suited for commercial communications, and not home installations, because of the need for varied, expensive pro-

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[1]Television channels and the band widths of video are needed for Ultrafax. It is based on the same line-of-sight relay systems as facsimile, TV, or FM broadcasting and has the same limitations inherent in the use of that principle.



Fig. 11. A strip of film containing messages is placed in the scanning unit of the RCA Ultrafax system. As the film runs at a constant speed through this unit, a pin point of light generated in the television "flying spot" scanner (lower left) is focused on the film and sweeps across it thousands of times a second. The resulting light impulses are converted into corresponding electrical impulses, which are then sent out over the air through the Ultrafax transmitter.

cessing equipment to enlarge the film message for reading.

Brigadier General David Sarnoff, president and chairman of the board of RCA, presided at the public demonstration of Ultrafax and said the process "is as significant a milestone in communications as was the splitting of the atom in the world of energy."

Reviewing the possible uses of Ultrafax, some day in the future, he forecast

1. The exchange of international television programs.

2. A combination of television and Ultrafax by which the same receiving set would bring various types of publications into a home without interrupting the program being viewed.

3. A system of world-wide military communications. These would be "scrambled" for secrecy. Ten transmitters, he said, could carry in 60 seconds the peak load of messages sent from the Pentagon in a 24-hour period during the height of the Second World War.

4. Possible establishment of newspapers as national institutions by the delivery of complete editions into every home equipped with a television set.

5. Transmission of a full-length motion picture from a single negative in the production studio simultaneously to the screens of thousands of motion-picture theaters throughout the country.

6. The possibility of a new radio-mail system with the vast pickup and delivery services of the Post Office Department.

Doctor Engstrom pointed out to the preview audience the significance of Ultrafax with respect to nationwide radio relay networks which are capable of transmitting, interchangeably, both television and Ultrafax signals. He said, "We have succeeded in obtaining results which show that Ultrafax can now promise practical commercial use at a time when demands are greater than ever for speed, speed, and more speed in communications."

The Library of Congress demonstration underscored the commercial and military uses of Ultrafax by transmitting a battle map, contour map, four pages of Naval specifications, a transportation schedule, bank draft,

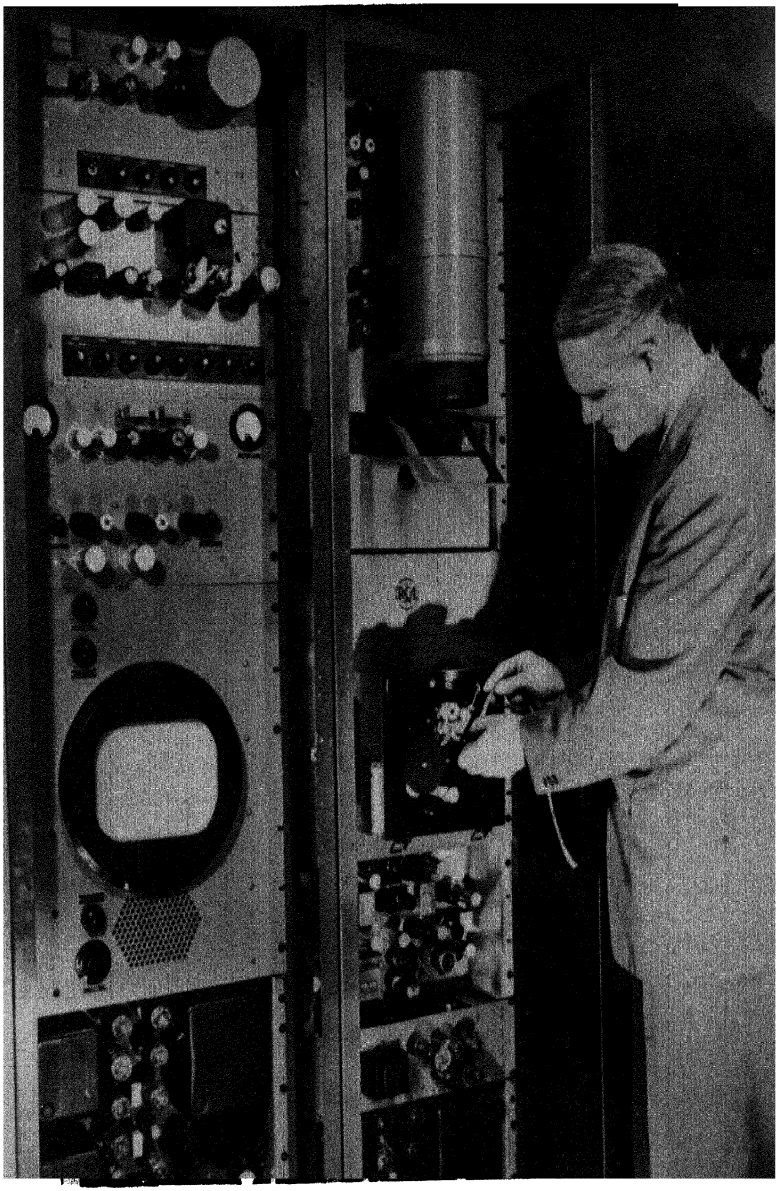


Fig. 12. Messages transmitted through the air in the form of radio waves by RCA Ultrafax are reconverted to their original form at this receiving terminal. The messages are reproduced as television images on a kinescope tube in the cylinder at upper right and are copied The exposed film can then be processed in 45 seconds.

financial report, technical drawing, money order, personal letter, description and fingerprints of a criminal, Civil Service job application, consumer price-index chart, newspaper masthead, cartoons, and writings in Latin, Hebrew, Russian, and Japanese.

The 1,047-page novel, "Gone With the Wind" was transmitted, word for word, from the Wardman Park Hotel to the Library of Congress, 3 miles away, in 2 minutes 21 seconds. This was done on a 5-mc channel in the 7,000-mc (microwave) region with only 1/10-watt power. If it had been operating on a 10-mc channel, for which Ultrafax is intended, the transmission would have been completed in 1 minute 10½ seconds.

Observers of Ultrafax are awed by its performance, but none can do more than guess about its future. The concensus is that, where tremendous speed and a huge volume of transmission are required at the same time, Ultrafax will find its place. RCA has delivered the method, and its use now becomes a stimulating challenge to the communications industry.

V

FACSIMILE VERSUS TELEVISION

Start a discussion of facsimile, and you can be sure television will be brought up. Many persons jump to the conclusion that the two are directly competitive, with the edge going to TV. Actually, they serve different purposes. They offer entirely different services. Each is preeminent in its own field.

Television is radio business—show business. Facsimile is the newspaper or publishing business. Radio is a minor element in facsimile, a means of transmission and nothing more.

Television is a personalized delivery of motion pictures. Facsimile is a personalized delivery of a combined newspaper and magazine or any other printed material.

Television delivers an instantaneous motion picture of an event to an audience or into the home. It requires careful planning and programming in advance of the event. It is ideal for picturing scheduled "live" action events, such as sports or plays. Or it may be motion pictures fresh from the scene of the action. But you have to be watching the television set at the time the event is shown. Once a scene is flashed on a television screen, it is gone.

By contrast, facsimile delivers a *permanent* record into your home. Facsimile publishers believe that the permanency of their product is a significant factor in estimating the long-range future of the industry.

Facsimile needs no preevent planning. It handles unexpected spot news and picture breaks and covers a wide range of subjects. Through press association wires, the entire world becomes facsimile's program.

News reading remains the most universal public habit in the United States. Facsimilists do not believe that TV will change this habit any more than motion pictures hurt the circulation of newspapers. They are confident that FX will capture its share of the news readers.

Television competes with the routine of living; facsimile does not. You have to be there to see TV. You

must make concessions about bright lights in the room. You can't wander around the house without removing yourself from the viewing area. TV is dramatic; it is also confining and demands constant attention. Facsimile publishers feel that, after the novelty of a television set wears off, it has merely a share of the set owner's attention, not a monopoly. And they believe facsimile can earn its share of the home reader's time too.

Facsimile lacks action, but it can deliver a long list of material which does not lend itself to television, such as dramatic news pictures, stock reports, race results, box scores, major news breaks, puzzles, comics and stories for the children, and dress patterns, to mention a few. The parade of news events—local and world-wide—can be covered quickly and permanently.

Television has action which facsimile lacks. The facsimile publisher cannot hope to compete for attention when there is a choice of watching a televised world series or a printed report of it by facsimile. But if a transatlantic plane crashes in the middle of the second inning, facsimile can grab the headline and steal the thunder from the series game while the TV program is anchored to the ball park.

A broad field for popular programs is within TV's grasp. Sports, plays, special public events, and motion pictures themselves ensure TV a cordial public acceptance. But TV will seldom be on hand when a plane crashes, when a bomb is dropped and a war starts, when a king is assassinated. Most of the world's biggest news isn't planned in advance on the timetables needed for TV.

That is where facsimile steps in. The news event that is on everyone's lips can be carried in detail, complete with photographs, while television cameras are stymied by the distance that may separate the nearest TV camera from the scene of the news.

Competition Is Mainly Economic

Assuming that facsimile programming is attractive and carefully designed to create and hold mass audiences,

the competition between television and facsimile is mainly economic. Unless the prospective receiver buyer can afford both or a combination, he must make his choice. Until costs come down, not many will buy both. Thus far television is the choice; it has higher entertainment value, lower cost, wider use.

Aside from the economic factor, we believe the set shopper will find that the two services compare as follows.

Television offers more in visual entertainment, especially in sports events. Facsimile offers more in world-wide news and photographs as well as local features. Its accent is on the type of material you find in newspapers and magazines, covering many events at the same time. Television gives you the kind of material found in movies, covering one event at a time.

There is a potential appetite for both services in homes. It is understandable that, as long as receivers are expensive, the shopper will turn to television and more home entertainment. He may appreciate facsimile, but human nature being what it is, television recreation has a greater lure if he can't buy both.

The research director of a large appliance company observed, "I want both. Actually, they are complementary."

We agree, and we believe TV-FX combinations will be commonplace in living rooms when set costs go low enough through mass-production economies. Such cost reductions have characterized every other phase of American manufacturing, and we have no reason to believe that TV-FX will prove an exception.

TV Is an Old Acquaintance

A television screen gives the same impression that people are accustomed to from a motion-picture screen. It is synonymous with action entertainment and subconsciously stirs up memories of outstanding motion pictures.

This conscious and subconscious reaction is a major part of TV's lure. And a TV producer can copy Hollywood techniques with assurance that they will be acceptable.

Facsimile has a more radical job to do in tailoring its product, even though it can draw on the newspaper- and magazine-reading habits of its readers. This puts a special responsibility on the facsimile editor. He must seek new techniques. He must try to improve on conventional publications. Whenever possible, he must try to capture and give the reader a major event in a state of "frozen" action which, in effect, makes permanent what might be a fleeting high light on television. He has a medium which is fast and permanent at the same time. It is stimulating, but it is also a major challenge to his ingenuity.

Radio's Ugly Duckling

After the Second World War, radio went heavily into television but did little about facsimile. Radio at first saw little in facsimile *for radio.* Facsimile was primarily newspapering, not radio. Nevertheless, alert broadcasters found it was easy to get into the field.

Realization that facsimile offered radio stations an opportunity to become news publishers as well as news broadcasters was slow in taking shape. Many broadcasters who were natural candidates for entry into facsimile were already deeply involved with television. They were committed to wet-nursing TV through its infancy and hesitated to adopt another radio stepchild, however promising. So, they stayed on the sidelines.

When facsimile had its third major start in life in the late 1940's, these broadcasters watched conflicting results of facsimile publishers carefully. Those who saw several facsimile publications suffer growing pains gained solace from the travail. Others privately conceded that additional refinements to facsimile, particularly successful multiplex operation, are "the handwriting on the wall."

Whatever the economic or technical problems that remained ahead for facsimile, they publicly said that facsimile is here to stay this time.

Newspaper publishers, meantime, watched facsimile and television with equal interest, and their conclusions were the same as those of the broadcasters.

Early public reaction to regular facsimile editions, competing with television programs, confirmed the opinion of facsimile enthusiasts: Newspapers and magazines, movies and radio have lived side by side and prospered; facsimile and television can do likewise.

Television and facsimile each seek an audience and get it by delivering something different. Their lures are markedly different. Neither can do the other's job.

Survival and expansion depend on the ability to deliver a public service. Each has a specialized service to offer. Facsimilists are confident that their service has a broad ultimate appeal after the novelty periods have passed and believe that facsimile will be the cheaper. Most important, in their opinion, is permanent delivery.

VI

FREQUENCY MODULATION AND FACSIMILE (FM-FX)

Home-service radio facsimile and frequency-modulation (FM) broadcasting are natural partners. Radio-borne facsimile can grow only as fast as FM because home facsimile travels on FM channels. In turn, facsimile helps FM grow.

This imposes a mutual responsibility, and facsimile is carrying its share of the load. In some areas facsimile is giving an important boost to FM which is particularly welcome during the current transition period from standard amplitude-modulation broadcasting (AM) to FM.

There is a sound reason for basing facsimile plans on the assumption that the swing to FM will continue to gain momentum and that FM eventually may largely replace AM. The length of this switch-over period can be only a guess. Estimates by radio authorities differ. But they seem agreed that the bulk of listening areas will be served by FM within a decade. In terms of a new industry, that is a short growing-up period.

FM, now, is comparable to a new automobile which performs with technical superiority over existing cars but otherwise gives about the same service. Stations with combined AM-FM facilities are duplicating AM network or local programs over FM.

The margin of difference is in fidelity of reception. Because nature equips human beings with hearing equipment of variable efficiency, some people cannot tell the difference between AM and FM. Others can hear the superior tones of FM, but the contrast isn't enough to make them dissatisfied with their existing AM sets. Still another group is relatively indifferent to fidelity of music.

Those who develop an appreciation of good music and FM fidelity gradually lose sensitive hearing as they grow older and can't enjoy fully what they have learned to like.

The growth of FM, therefore, has not been a triumphal, unimpeded march. Gradually, the advantages of FM are becoming apparent, but important inroads on AM have been slow and principally in metropolitan areas.

However, the relatively small FM audience at present cannot be considered an accurate barometer. The underlying factors of FM are worth examining closely because they are the true indicators of future growth.

FM Music Is Superior

Technically, FM is superior to AM as a sound carrier. The very high frequency of FM conveys a sound signal which is closer to the original tone than with AM. Lilting notes of a violin on FM can be almost a precise duplicate of the violin music heard in the studio. On AM the notes are readily recognizable as having come from a violin, but only part of the music's full beauty is transmitted and received.

Association with FM gradually educates radio listeners to this fact, whether their preference is night club orchestras or the Boston Symphony.

Broader Tone Range

The range of tone which can be transmitted on FM is wider than on AM. It can include all sounds which can be accurately distinguished by the human ear. The deepest boom of a bass drum and the highest note of a clarinet in the hands of master musicians can be faithfully carried on FM. Completely covering the human ear tone range (20 to 20,000 cycles, maximum), FM brings the listener all the tone and overtones of a symphony orchestra, each note almost precisely in the form with which it left the instrument. The relationship between an FM listener and an orchestra is practically the same, soundwise, as if the listener had a front-row seat at the concert.

At the same time, FM sound signals suffer less atmospheric static and electrical interference than AM. The background of FM is almost complete silence rather than fuzzy with noise.

These points of technical superiority are more readily recognized and appreciated by radio technicians than by laymen. In areas where AM signals are strong and the atmosphere relatively free from static, the difference is not so marked and conversion of AM set owners is slower. But the consistent performance of FM, in clarity and fidelity of music, is a persistent selling point, and most die-hard AM fans ultimately will succumb.

Of course, the FM receiver plays an important part in "selling" the process. The music heard by a radio listener is no better than his receiver. If the audio-frequency response, or tone response, of his receiver is limited, he cannot hear and therefore cannot appreciate the full breadth of FM broadcasting. In such a case, an FM transmitter is delivering superb music, but the receiver is incapable of reproducing all the tones.

FM Grew Slowly

FM was almost left at the post after the Second World War for reasons completely divorced from performance. Radio-set manufacturers found it good business to concentrate on AM models for which they were tooled and for which there was a big market. As a result, sales of FM sets were mostly confined to higher price brackets of FM-AM sets.

FM, however promising as an ultimate market, was in embryo and treated as such.

Programming did little to influence set buyers. Until 1948, the American Federation of Musicians placed prohibitive restrictions on FM programs. Although it was a simple technical accomplishment to broadcast simultaneously a program over AM and FM, radio stations had to be content with playing records on FM or airing voice programs without live music. This fare appealed greatly to some music lovers, but they scarcely constituted a major audience.

When this ban was lifted, FM listeners could get all their favorite programs and interest increased.

FCC Encourages FM

Meantime, the Federal Communications Commission encouraged entry into the FM field. The commission has issued or is processing hundreds of licenses for new FM stations all over the country.

An incongruity looms when it is considered that the FCC is also licensing many new AM stations. Actually, the effect of the FCC's practice is to provide radio listeners with a greater choice of programs, whether AM or FM, and in so doing to encourage what appears to be a more democratic base for the broadcasting industry and far more diversified programming.

With the FCC encouraging entry into FM, radio-set manufacturers had new incentive to study the FM market potential, and it has very interesting aspects. More than 90 per cent of the families in the United States already own AM receivers. Near saturation is a reality, and sales resistance is a cumulative problem. Anything that opens a new sales field within their manufacturing scope, as FM does, is important.

Aside from technical advantages, which do not seem enough to create listeners, FM sets are not "hot" sales items. In contrast to television, which any set shopper can see offers something new and different, FM is drab.

A New Sales Point

Something new might well be added to FM to break this log jam and provide set makers with an additional active sales line.

Facsimile can be that something new. It offers FM a realm in which its technical superiority is unchallengeable and listener appeal is available without possible competition from AM and only partial competition from radio's glamour girl—television.

FM and facsimile together offer a lure which truly does make an AM set obsolete. In the vast rural listening areas not reached by television or not likely to be reached for some years, FM-FX has no competition as a radio innovation.

FM-FX creates an entirely new home use of radio, not a refinement of an existing one. And unless the home-receiver owner has FM, he cannot get facsimile. This facility not only encourages the swing from AM to FM but creates a new competitive factor within FM itself. In either case facsimile can only benefit.

Facsimile Needs FM's Broad Highway

The technical virtues of FM, which permit high-fidelity broadcasting and reception of music, also provide the broad channel for transmission of facsimile.

As has been noted, early experimenters learned that AM channels, which can carry a tone impulse up to 5,000 cycles, are too narrow for good home recording.

FM multiplex facsimile uses a broader highway starting at 10,000 cycles and ranging upward to 20,000 cycles (approximate). This is readily taken care of on FM channels, which are 200,000 cycles wide.

If facsimile had been irrevocably tied to the AM band, the relatively narrow impulse channel would have limited the speed of recording and clarity to an extent that widespread acceptance would have been unlikely. Satisfactory facsimile home service requires that facsimile's electric impulses must be converted into sound waves at the scanning rate of 105 lines per inch, 8.2 inches wide, and that calls for a band width exceeding AM's.

FM, in addition, is virtually free of the atmospheric static and electrical interference which seriously affected the quality of early facsimile on the AM band.

A supporting reason behind using FM for transmitting facsimile is the tone impulse itself. On AM this signal rides the center of the sound band, which both human ears and ordinary AM radio sets receive most clearly. The AM facsimile signal has a high-pitched sound which is thoroughly disagreeable to listeners. The FCC recognized the complaints of various persons about the disconcerting AM facsimile tone impulses and in the late 1920's limited their broadcast to early morning hours.

FM has circumvented this objection through multiplex, which puts the FM tone impulse so high on the FM channels (above 10,000 cycles) that it is usually not heard at all.

FM Range is Limited

Although FM has solved most of facsimile's transmission problems, it has limited facsimile's "circulation" geographically.

The FM transmitting antenna activates a signal at approximately 100,000,000 impulses each second, and this very high-frequency carrier follows a straight line, or line-of-sight course. Hence, the horizon seen from the top of an FM antenna is the theoretical maximum distance which an FM signal will carry, and the facsimile reception area is identical.

The majority of FM stations consider approximately 70 miles as their radius for satisfactory reception. FM range varies, of course, with antenna height and transmitter power strength. Your engineer can supply specific figures for your station.

There is some bend, or ability to follow the curve of the earth's surface. A good FM set with proper antenna may receive signals 100 miles or more from a transmitter. However, this is an erratic quality and cannot be counted on for continuous reception.

After an FM impulse reaches the horizon in a straight line, it continues on out into space. It does not bounce off the ionosphere and back to earth as an AM signal can do. The FM impulse's high-frequency nature causes it to knife through the atmospheric envelope of the earth and shoot into infinity.

Assuming a constant signal saturation of the area within 70 miles of an FM antenna as a conservative average, facsimile publishers will usually find within that area their principal reader potential. Radio stations are ordinarily located in the center of a concentrated population. Beyond 70 miles the population will be either sparse or served by another broadcaster.

Stretching the Horizon

A variety of tools are at hand for the facsimile publisher who wishes to reach out beyond the range of his original antenna impulse.

He can use regular wire network facilities of The Bell Telephone System or a radio-relay system.

There are more than 130,000 miles of wire "program transmission" circuits connecting radio stations in state, regional, and coast-to-coast networks. Most of these can handle up to 8,000-cycle frequencies. Some short-haul circuits offer 15,000-cycle links. The latter are usually studio-to-transmitter circuits. The Federal Communications Commission standards for FM broadcasting specify that a 15,000-cycle frequency band must connect the stations' main studio with the transmitter.

The Bell System has said it will be able to furnish the broadcasting industry with 15,000-cycle intercity program transmission channels if they are desired.

Broadcasters generally use the regular 8,000-cycle network circuits for relaying FM programs over long distances. On such a line, facsimile can be transmitted with a 4,000-cycle subcarrier. At the FM transmitter the subcarrier is changed from 4,000 to 17,000 cycles in order to successfully multiplex the facsimile material.

Arrangements usually can be made with the telephone company to provide special, equalized 8,000-cycle lines for short relays needed with special-events coverage. Such local lines have been used with complete success to carry facsimile from athletic stadiums and public buildings.[1]

Ultrahigh-frequency Radio Relay

An alternate method of relaying facsimile is ultrahigh-frequency radio relay. Like the original FM signal, UHF relay has line-of-sight limitations but can be used in series to create a network of any desired

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[1]See chapter on Mobile Unit.

length. This is aided by the fact that UHF relay beams can be very accurately directed, so that the signal can follow a bullet-accurate path and not trespass on neighboring channels.

The number of radio relay links which may be used within assigned frequency bands is astronomical and for all forseeable needs completely adequate. The relays can be mounted readily on poles about 30 miles apart and operated without attendance. Maintenance is a minor consideration.

A relay unit picks up an FM signal at its farthest range and sends the signal to the next relay link. These relays, which can operate simultaneously in both directions, can go on indefinitely, creating a state-wide or national FM-FX grid if there is sufficient reader interest to merit the construction cost.

Ordinarily, the original signal strength will be sufficient, but network circuits and microwaves are on tap for the facsimile publisher who wants to reach remote areas. Either medium can serve as an extension ladder for facsimile transmission, tying together other FM-FX stations for program interchange or used in connection with on-the-spot coverage of special events.

Coaxial Cable

For all practical purposes the frequency response of a coaxial cable is unlimited, and it can be used to relay facsimile between a mobile-unit scanner and the transmitter or between FM stations. However, present and indicated future costs of this service per mile make it seem unlikely that the cable soon will be used for these purposes.

VII

THE RULES AND STANDARDS FOR FACSIMILE BROADCASTING

The move that took facsimile out of the dream world of miracle gadgets and made it a practical service for the general public was the setting of standards by the government. The decision was made by the Federal Communications Commission June 9, 1948, and became fully effective a few weeks later on July 15. This gave the green light for facsimile to become a means of mass communication.

An infinite amount of research went into the technical development of the facsimile art to bring it to the stage of standardization.

By the time the government acted, virtually everyone manufacturing facsimile equipment and those who had helped perfect it had agreed on what the rules and standards should be.

In a nutshell, the adoption of standards means that any facsimile receiver can pick up the broadcast of any facsimile station, just as in radio, regardless of who made the set or who is broadcasting the program. The public thus gets maximum use of the limited number of frequencies available for facsimile broadcasting.

Arriving at the standards was no haphazard matter. It was a methodical, painstaking task. It involved a fantastic number of technical questions that had to be settled and disputes over methods that had to be resolved. Before it was over, almost every individual, group, or interest in America that had any possible stake in facsimile was given some say in the decision. When it came time for the FCC to act, it was largely a matter of confirming discoveries and recommendations already made.

Even so, it was, in many ways, a bold step by the Commission to set standards and permit commercial facsimile. Very little equipment existed. There was no production-line manufacture of sets. Only a small fraction of the population had ever seen facsimile. It was no sure thing that facsimile would grow into

a mass medium supported by advertising in the pattern of free American radio. Yet most of these same limitations faced commercial radio more than a quarter of a century before when it was given the go-ahead.

Advice from Experts

Work toward standardizing actually started years before it came about. Before the Second World War, there was much concern about the future development of the radio art. Television and FM broadcasting captured the imagination of many radiomen. The whole field of electronics was advancing at a phenomenal pace, and this was accelerated by the war.

The National Television Systems Committee proved invaluable in advising the Commission on TV problems. It was then decided--largely at the instance of the FCC and with the cooperation of the Radio Manufacturers Association and the Institute of Radio Engineers—to form a similar group to advise the Commission on the engineering aspects of all phases of radio over which it had jurisdiction. This was called the Radio Technical Planning Board. It was divided into more than a dozen panels, and to each panel was assigned a particular branch of the radio art, such as FM broadcasting, standard broadcasting, facsimile, and emergency services.

Panel 7 of the RTPB was assigned the problems of facsimile. Its job was to work up engineering and other data on facsimile for the Commission. Dr. John V. L. Hogan, who probably did more than any other one man to advance modern facsimile, was named chairman of Panel 7.

Hogan invited broadcasters, manufacturers, development organizations, the military, users of facsimile in communication, educators, and others interested in the growth of facsimile to take part. His only competitors in facsimile, the Finch and Alden companies, were included. Some of the nation's top radio engineers, as well as laymen with practical experience in operating facsimile, participated. Each panel member had an alternate, observers were freely invited, and

the meetings were open to the public (see list of panel members at end of chapter).

With this broad field of interests represented, the panel explored every aspect of facsimile broadcasting. Meantime, the Radio Manufacturers Association had been delving into facsimile standards. It came up with a set of proposals which closely paralleled the final recommendations of the RTPB. In each case, the standards decided upon were largely the same as those determined by the Broadcasters Faximile Analysis group. All manufacturers known to be active in facsimile were represented on the RMA committee. The committee's approval of tentative standards led to the RTPB's acting for a broad segment of the entire radio industry and the final submission of the proposals to the FCC as a Standard of Good Engineering Practice.

What the Rules Cover

The whole scope of the standards—and how and why they were arrived at—is set forth in the text of the Commission order at the end of this chapter. They range all the way from the speed at which the paper can advance from a facsimile recorder to the segment of the FM band that shall be used for facsimile broadcasting. They permit both simplex and multiplex facsimile and specify the hours that may be used for each.

Some of the principal decisions involved were to agree upon a 360-rpm drum speed, an 8.2 inch width for copy reproduction, 105 lines per inch vertical definition (meaning that the photoelectric cell in the scanner views the circumference of the drum 105 times as it advances across 1 inch of copy), and a 45-degree blanking interval for synchronization purposes. What these technical requirements mean in the operation of facsimile is explained in other chapters and in the glossary of facsimile terms at the end of the book.

The final controversy over standards centered on the page size and the definition value, or number of scanning lines per inch.

Finch and Hogan favored an 8.2-inch width and a single value for the lines' advance, namely, 105 lines per inch. This produced an "index of cooperation" of 984, which is the product of the lines per inch (105) times the length of the scanning line (8.2) times 8/7 (since one-eighth of the total line length is used for margins and the synchronizing pulse). Alden Products Company, which specialized in the small recorder, urged the 4.1-inch size.

Largely at Alden's urgent request the RMA Committee asked that the standards provide for both widths. Panel 7 of RTPB (with Alden dissenting) recommended standards providing only one index of cooperation, namely, 984, for 8.2-inch recorders operating at 105 lines per inch or 4.1-inch recorders operating at 210 lines per inch. Hogan pointed out that a single index value would create a situation comparable to the reception of small, medium, or large television pictures on TV receivers of various sizes. He said that, while he favored 8.2, there was no reason to standardize on a given size of page any more than on one size of television screen as long as the index value was uniform to assure interchangeability.

The Commission ruled that a full interchangeability of equipment is necessary so that buyers of all types of receivers can pick up programs from all available facsimile stations, and it made a choice in favor of the 8.2 size. But the FCC found the 4.1 size might be useful for bulletin facsimile services and said it had no objection to continued use of that recorder width if the standards of facsimile broadcasting were followed.

The drawback to recording an 8.2 program on a 4.1 receiver is that the type might be so small as to require a magnifying glass or, in the reverse case, so large that it would be wasteful. And, unless the 105 lines per inch of an 8.2 transmitter were stepped up to 210 lines in the recorder, and vice versa, the picture received would be distorted. Type would be readable, but the transmission of pictures would be out of the question because of distortion. A circle would become an oval, and a square a rectangle.

Greatest value of the standards adopted by the FCC is that they represent a performance standard and not a system standard. They do not require that any particular type of equipment be used, and the facsimile scanners and recorders made by different manufacturers can be used interchangeably.

A knowledge of these standards is essential to anyone who wants to understand facsimile, for they are the basis of all commercial facsimile broadcasting in the United States since 1948.

The full text of the Commission's order follows:

Before the FCC 48-1655

FEDERAL COMMUNICATIONS COMMISSION 21960

Washington 25, D.C.

In the Matter of Promulgation of Rules and Transmission Standards Concerning Facsimile Broadcasting	))))	Docket No. 8751

REPORT AND ORDER

By the Commission (Chairman Coy and Commissioners Walker and Webster not participating) (Commissioner Jones dissenting in part.)

This proceeding was held pursuant to a notice adopted Jan. 30, 1948, and released Feb. 2, 1948, giving notice that a hearing would be held before the Commission en banc. Such a hearing was held on March 15, 16, and 17, 1948.

The issues in the hearing were designed to obtain information concerning the development and status of facsimile broadcasting (including both simplex and multiplex facsimile), to determine public demand for the service, to determine whether facsimile broadcasting should be authorized on a commercial basis at this time and, if so, to determine the transmission standards to be employed. Although the hearing was not limited to facsimile

operation on channels in the FM band, the evidence showed that practically all operation and development work has been in this portion of the spectrum. Accordingly, the discussion that follows will be confined to facsimile in the FM band.[1]

Experimental facsimile broadcasting carried on before the war was not considered satisfactory for public acceptance on a widespread basis, principally for the reason that equipment was not adequately developed and the speed of transmission was relatively slow. Facsimile equipment and techniques developed during and after the war, however, are greatly improved, providing good facsimile transmission at a speed considered sufficient and appropriate for a broadcast service to the public. During the postwar period, representatives of the facsimile industry have been considering facsimile-transmission standards to be proposed for commercial facsimile broadcasting.

Transmission standards are, of course, necessary so that any facsimile recorder may operate from any facsimile broadcast station. In discussing proposed standards, the industry groups reached agreement on all important issues with the exception of the standard that would govern the paper width to be employed.[2] Finch Telecommunications, Inc., Radio Inventions, Inc., and Fax-

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[1]While there was no testimony during the hearing concerning facsimile operation by noncommercial educational FM broadcast stations, the Commission is considering this matter and the rule (Section 3.566) under which such stations may transmit facsimile. No action on this rule is being proposed at this time.

[2]This standard, called the "index of cooperation," is the product of the number of lines per inch times the total line length in inches; this term is a measure of the definition of the facsimile image. For example, an index of cooperation of 984 = 105 (lines per inch) x 8.2 (useful line length) x 8/7 (one-eighth of the total line length is employed for margins and the synchronizing pulse). Similarly, a 4.1-inch recorder using the same number of lines per inch would have an index of cooperation of 492.

imile, Inc. (the latter two companies represent the John V. L. Hogan interests) prefer the 8.2-inch width. The only other principal facsimile manufacturer, Alden Products Company, prefers the 4.1-inch width. A committee of the Radio Manufacturers' Association proposed standards which provide for both widths. These recommendations were then considered by Panel 7 (Facsimile) of the Radio Technical Planning Board, which recommended standards providing only one index of cooperation; the recommended index, 984, would provide for 8.2-inch recorders operating at 105 lines per inch. This proposal would also provide for other size recorders operating under the same standards; for example, a 4.1-inch recorder would operate at 210 lines per inch, and other sizes would be in proportion. This proposal of the RTPB, however, was adopted with a dissenting vote by the Alden representative. In considering this proposal in 1947, the Commission noted that little experimentation had been conducted to determine public preferences and suggested that further experimental operation and demonstrations be made in order to obtain more data on this subject.

While some further experimentation was conducted, it appears that little, if any, was of a character which would give direct comparisons of facsimile paper widths from a public-acceptance standpoint. Subsequently, however, the manufacturers listed above requested that standards be adopted which would provide for both the 8.2- and 4.1-inch recorders. It was stated that in their opinion extensive use and experience would be necessary in order to determine which paper width is preferable or whether both should be employed to render a complete service. The same viewpoint was also expressed at the hearing.

At the hearing, proponents of the 8.2-inch recorder size pointed out that a study of paper widths was made by a group of facsimile broadcasters and others interested in facsimile and that this group was in favor of the 8.2-inch width.

They indicated that this width is the least necessary for proper programming and make-up of facsimile and that a narrower width would not be satisfactory. Further, this size provides copy somewhat faster than average reading speed and makes better use of the 200-kilocycle channels assigned to FM broadcasting. It was also indicated that these present and potential facsimile broadcasters would not be interested in this service if equipment were limited to the 4.1-inch size. On the other hand, Mr. Alden was in favor of the 4.1-inch size, and additional testimony supported his view. He testified that facsimile will develop short, terse programs that can be adequately handled by 4.1-inch recorders. It appears that the narrower size recorder has been used to a considerable extent for furnishing a bulletin service, and there was testimony that abbreviated news reports, weather information, and farm prices would likely be a major field for facsimile in which the narrower recorder would be preferred.

Other factors involved in the choice of recorder width include the cost of paper and the possibility that both recorders may be used interchangeably from stations operating with either index of cooperation. While facsimile paper would, of course, be cheaper per foot for the narrower recorder, it appears that the cost on a unit area basis will likely be about the same. With respect to the use of both recorders with stations using either index of cooperation, a 4.1-inch recorder could be used, for example, in receiving material designed for 8.2-inch recorders but the reproduced material would be distorted by a ratio of 1:2. Conversely, 8.2-inch recorders operating from transmissions designed for 4.1-inch recorders would distort the transmitted material in the opposite fashion. This distortion could be remedied by changing gears in the recorder so that the proper aspect ratio would be maintained. It appears, however, that this remedy would not be fully satisfactory because, for example, the copy reproduced on a 4.1-inch machine

may be too small to be legible unless large type were used in transmitting; this would be wasteful of paper for all 8.2-inch recorders tuned to that particular station. It appears, therefore, that this solution has only a limited application from a practical viewpoint.

In the Commission's opinion a broadcast service should provide for full interchangeability of equipment, so that purchasers of all types of receivers are able to receive programs from all available stations. This is the only way maximum utilization of frequencies is possible. Where there is no such standardization, the result is that fewer people are served by a given number of stations than is the case where there is standardization or a greater number of stations is required to serve the same number of people. In either event a waste of frequency potentiality exists. Accordingly, the Commission concludes that only one standard should be authorized for facsimile.

A choice must therefore be made between the 8.2- and 4.1-inch paper widths. In the Commission's opinion the 8.2-inch paper width appears to be preferable for a broadcast service. This paper width will permit a greater flexibility in programming than in the case of the narrower paper. By and large an 8.2-inch paper should be capable of handling practically any program material that is carried by a newspaper. On the other hand the 4.1-inch paper appears to be more suitable for a bulletin type of service than an over-all type of service. Some of the radio services may find such a bulletin service desirable, and as is pointed out in the Commission's Allocation Report (Jan. 15, 1945 Report, page 148), there is no objection to such other services utilizing facsimile provided that the emissions are confined to the band authorized for the service.

The Commission also concludes that it would be in the public interest to permit facsimile broadcasting to be authorized on a commercial basis at the present time. The record shows that sufficient

interest has been shown to indicate public acceptance and support of this service, that limited quantities of facsimile transmitting and receiving equipment are in production, that additional equipment will be available as the service develops, and that the standards proposed for facsimile broadcasting, particularly with reference to the 8.2-inch recorders, are satisfactory for the development and utilization of facsimile as a broadcast service.

Since facsimile broadcasting takes place on channels also authorized for FM broadcasting, it is apparent that some conflict may develop between the two services. Facsimile broadcasting can be done in one of two ways. One way is the so-called "simplex method;" i.e., when there is facsimile broadcasting, the FM broadcast operation on that channel is stopped. The other method is multiplexing, i.e., simultaneous broadcasting of facsimile and FM programs on the same channels. Each method has some problems. As to the simplex method, no technical difficulties exist, but since under this method FM must be silent while a facsimile program is being broadcast, it is apparent that FM listening audiences will turn away from the station when a facsimile program is being broadcast. Broadcasters who testified at the hearing agreed that this would be a factor in the building of audiences. Moreover, as FM broadcasting develops, the problem will undoubtedly become more serious.

So far as multiplexing is concerned, the difficulties are technical in nature. Since under this method FM and facsimile programs are broadcast simultaneously, a method must be devised to prevent mutual interference. Under present rules (Section 3.266) the test that must be met is that multiplexing should not reduce the quality of the aural program and that a filter or other additional equipment is not required for receivers not equipped to receive facsimile. This means that the facsimile transmissions to be permissible on a multiplex basis should not cause any degradation

in the aural programs below 15,000 cycles. The witnesses agreed that this is a desirable objective, but there was also agreement that the objective has not yet been attained. There was some evidence that multiplexing had been achieved which resulted in no degradation below 10,000 or 12,000 cycles. The facsimile material has, in general, been carried on in the range between 12,000 and 15,000 cycles. Experiments, using 4.1-inch recorders, have indicated that the background noise is slight and not objectionable. It appears that this system would be applicable to systems employing 8.2-inch recorders and that a higher subcarrier frequency could be employed so that the modulating frequencies for facsimile would generally be beyond the audible range. It is apparent that such a system of multiplexing could be carried on during part of the broadcast day without adverse effect on FM broadcasting, since a well-rounded FM broadcast service will inevitably have some time devoted to programs which do not require the full tonal response of which FM is capable, e.g., talks, plays, discussions, etc.

The Commission is of the opinion that ultimately a suitable multiplex system must be developed if FM and facsimile are to operate in the same band. The Commission expects that extensive research will be undertaken looking toward the development of a multiplex facsimile system, particularly one which will not cause any degradation to the full tone range of which FM is capable. However, the Commission believes that facsimile broadcasting should be permitted to proceed in the meantime.

In order to accomplish this purpose, the Commission intends to permit facsimile broadcasting on both a simplex and multiplex basis under certain conditions. This is being done by dividing the broadcast day into two segments. The first segment is the hours between midnight and 7 a.m., and the second is the hours from 7 a.m. to midnight. In the first segment, the licensee may broadcast facsimile on a simplex basis or on a

multiplex basis provided that no degradation results to the aural programs below 10,000 cycles on a receiver employing no filter.

In the second period—7 a.m. to midnight—licensees may broadcast a total of 1 hour of facsimile programs on a simplex basis. The licensee may also broadcast during such period an additional 3 hours of facsimile programs on a multiplex basis provided that no degradation results to the aural program below 10,000 cycles on a receiver employing no filter. Commercial operations will be permitted for both types of facsimile transmissions during both segments.

In order that the system should work out well, the Commission expects that during multiplex operation FM licensees will so arrange their schedules that aural programs broadcast during such periods will be of a type that do not require frequency response above 10,000 cycles. Moreover, all interested persons are strongly urged to continue multiplex experimentation so that a system can be developed at an early date which involves no degradation of the aural program below 15,000 cycles. In this way, simplex operation can be eliminated entirely and multiplexing will be possible during all hours.

IT IS THEREFORE ORDERED, This 9th day of June, 1948, that the following amendments to Section 3.266 of the Commission's Rules and Regulations and Parts 1 and 8 of the Standards of Good Engineering Practice Concerning FM Broadcast Stations be adopted, effective July 15th, 1948:

Section 3.266 is amended to read as follows:

S 3.266 *Facsimile broadcasting and multiplex transmission*

(a) FM broadcast stations may transmit simplex facsimile in accordance with transmission standards set forth in the Standards of Good Engineering Practice Concerning FM Broadcast Stations during periods not devoted to FM aural broadcasting. However, such transmissions may not exceed 1 hour during the period between

7 a.m. and midnight (no limit for the hours between midnight and 7 a.m.) and may not be counted toward the minimum operation required by Section 3.261.

(b) FM broadcast stations may, upon securing authorization from the Commission, transmit multiplex facsimile and aural broadcast programs for a maximum of 3 hours between the hours of 7 a.m. and midnight (no limit for the hours between midnight and 7 a.m.) in accordance with transmission standards set forth in the Standards of Good Engineering Practice Concerning FM Broadcast Stations provided that the transmission of facsimile does not impair the quality of the aural program below 10,000 cycles per second and that a filter or other additional equipment is not required for receivers not equipped to receive facsimile.

Section 1 and 8 of the Standards of Good Engineering Practice Concerning FM Broadcast Stations are amended by adding the following:

1. DEFINITIONS

O. Index of Cooperation. The index of cooperation as applied to facsimile broadcasting is the product of the number of lines per inch, the available line length in inches and the reciprocal of the line-use ratio (e.g., $105 \times 8.2 \times 8/7 = 984$).

P. Line-use Ratio. The term "line-use ratio" as applied to facsimile broadcasting is the ratio of the available line to the total length of scanning line.

Q. Available Line. The term "available line" means the portion of the total length of scanning line that can be used specifically for picture signals.

R. Rectilinear scanning. The term "rectilinear scanning" means the process of scanning an area in a predetermined sequence of narrow straight parallel strips.

S. Optical Density. The term "optical density" means the logarithm (to the base 10) of the ratio of incident to transmitted or reflected light.

H. Facsimile-engineering Standards. The following standards apply to facsimile broadcasting under Section 3.266 of the Rules and Regulations.

1. Rectilinear scanning shall be employed, with scanning spot progressing from left to right and scanned lines progressing from top to bottom of subject copy.
2. The standard index of cooperation shall be 984.
3. The number of scanning lines per minute shall be 360.
4. The line-use ratio shall be 7/8, or 315 degrees of the full scanning cycle.
5. The 1/8 cycle or 45 degrees not included in the available scanning line shall be divided into three equal parts, the first 15 degrees being used for transmission at approximately white level, the second 15 degrees for transmission at approximately black level, and the third 15 degrees for transmission at approximately white level.
6. An interval of not more than 12 seconds shall be available between two pages of subject copy, for the transmission of a page-separation signal and/or other services.
7. Amplitude modulation of subcarrier shall be used.
8. Subcarrier modulation shall normally vary approximately linearly with the optical density of the subject copy.
9. Negative modulation shall be used, i. e., maximum subcarrier amplitude and maximum radio frequency swing on black.
10. Subcarrier noise level shall be maintained at least 30 decibels below maximum (black) picture modulation level, at the radio transmitter input.

FEDERAL COMMUNICATIONS COMMISSION
T.J.Slowie
Secretary

Commissioner Jones believes that facsimile broadcasting ought to be permitted on a commercial basis; however, he believes the licensee should be allowed to broadcast multiplex or simplex from 12 midnight to 6 a.m. and to broadcast simplex only from 6 a.m. to 12 midnight. In the period 6 a.m. to 12 midnight simplex broadcasting should not exceed one-fourth of the aural broadcasting time.

Adopted: June 9, 1948.
Released: June 10, 1948.

Membership of Radio Technical Planning Board Panel included

F. P. Andrews, Press Wireless, Inc.
Ben Adler, Transmitter Equipment Mfg. Co.
Milton Alden, Alden Products Co.
R. L. Beard, Acme Newspictures, Inc.
F. R. Bridges, International Municipal Signal Engineers
H. F. Burhard, Coles Signal Laboratory
J. L. Callahan, RCA Laboratories
R. W. Carlisle, Consulting Engineer
J. O. Carr, Teletype Corporation
R. D. Chipp, American Broadcasting System
Robin D. Compton, Philadelphia Evening Bulletin
James Corey, WOKO, Inc.
E. D. Cross, Alden Products Co.
R. C. Curtis, Radio Inventions, Inc.
Clifford E. Denton, New York Daily News
Dr. Franklin Dunham, Federal Security Agency
W. M. Faulkerson, Press Wireless, Inc.
Capt. W.G.H. Finch, Finch Telecommunications, Inc.
C. S. Fitch, International Business Machines Corp.
W. A. Hemrick, Press Wireless, Inc.
J. A. Herbst, Federal Telegraph & Radio Corp.
Frank Hester, Radio Inventions, Inc.
Lee Hills, The Miami Herald
John V. L. Hogan, Radio Inventions, Inc., chairman
A. C. Holt, Globe Wireless, Ltd.
Royal V. Howard, National Association of Broadcasters

L. H. Junken, General Electric Co.
H. C. Leuteritz, Pan American World Airways
W. Lodge, Columbia Broadcasting System
Dr. Lowdermilk, Federal Security Agency
H. B. Marvin, General Electric Co.
R. E. Mathes, Finch Telecommunications, Inc.
C. M. McClellan, Westinghouse Electric & Manufacturing Co.
Pierre Mertz, Bell Telephone Laboratories, Inc.
George Milne, Blue Network, Inc.
G. M. Nixon, National Broadcasting Company
C. E. Nobles, Westinghouse Electric & Manufacturing Co.
F. B. Philbrick, The Gamewell Company
C. W. Rhein, Mackay Radio & Telegraph Co.
Cyrus D. Samuelson, Bamberger Broadcasting Service, Inc.
S. H. Simpson, RCA Communications, Inc.
Charles H. Singer, Bamberger Broadcasting Service, Inc.
W. E. Stewart, Radio Corporation of America
Timothy J. Sullivan, The Miami Herald
D. C. Summerford, Broadcasting Station WHAS
L. A. Thompson, Acme Telephoto
E. F. Watson, Bell Telephone Laboratories
C. W. Winter, Pan American Airways, Inc.
R. J. Wise, Western Union Telegraph Co.
C. J. Young, RCA Laboratories

VIII

HOW TO APPLY TO FCC FOR FACSIMILE LICENSE

Under the standards for facsimile broadcasting set up by the Federal Communications Commission (preceding chapter), the first need of the facsimile broadcaster is to have an FM license. The application for permission to radiate facsimile thus becomes a problem of the radio counsel of the FM station which proposes to do the facsimile broadcasting.

If the future facsimilist is not an FM-station owner but merely has an arrangement with an FM broadcaster to air his editions, the FM station must itself make the application and must take full responsibility for its broadcasts. Time, money, and mistakes will usually be saved if the application is handled by competent counsel for the broadcasting station.

The application can be an informal request in letter form. It should specify what the FM broadcasting station proposes to do with facsimile in accordance with the standards established by the FCC. The letter should be addressed to the secretary of the Federal Communications Commission.

Unlike other forms of broadcasting, there is no long series of precedents dictating the form and content of the request. Eventually, we assume, there will be a formal procedure for facsimile applications.

The FCC standards permit multiplex facsimile if certain conditions are met. If the FM licensee wants to engage in this, he should set forth how he proposes to multiplex, with details on how his multiplex system operates so as to meet the FCC standards concerning degradation of aural FM programs (see chapter on standards). This also is done by informal letter request.

Special periodical reports to the engineering division of the FCC are required, describing how multiplex broadcasts are conducted and presenting data to confirm that the standards of good engineering practice are being met.

The subject of applications and licenses for facsimile touches the whole undeveloped field of the rights and obligations of facsimile broadcasters. Even after the FCC in 1948 gave the green light to facsimile as a regular commercial public service, the degree of regulation of facsimile broadcasts remained in doubt. Does an application for permission to transmit commercial facsimile imply or concede FCC jurisdiction over the content of the facsimile publication? Would the FCC confine itself to the technical aspects, or would it decide that the type of programs proposed are a determining factor in deciding "public interest, convenience, and necessity"? Actually, this issue didn't come up when commercial facsimile was launched. The applicants didn't raise the question, nor did the Commission.

It is conceivable that the question may not arise so long as applications are confined to *existing* FM broadcasting stations. But what if two competing facsimilists seek FM licenses *on the same wave length* to broadcast facsimile only? In other branches of radio, to decide between two applicants for the same facility, the FCC requires a detailed showing as to the proposed program service in order that it may compare and judge the relative public interest, convenience, and necessity. Will the same procedure be applied in facsimile? Will the FCC ask about facsimile content and editorial policy? If not, how would the Commission make its evaluation? Some possible implications of this are discussed in the chapter Freedom of the Press on the Air.

Facsimile seems likely to establish new precedents in the reporting of its broadcasting performance. Most radio sound broadcasters feel that they are handicapped in their statistical position by having to count as advertising time all entertainment time paid for by sponsors. They contend this places newspapers at an advantage. Only space given directly to advertising is listed in newspaper advertising statistics. Since a facsimile broadcast emerges in the form of a printed page, facsimilists feel confident they will not have to count editorial time as

sponsored or advertising time simply because it adjoins a printed facsimile ad.

Newspaper Publishers' Faximile Service, which supplied its members with a series of useful, practical reports on facsimile, took the position that

> There is no reason why the unfortunate precedents in established AM sound broadcasting should be carried over to facsimile broadcasting. The rate structure developed by the newspaper and magazine publisher is far more satisfactory than that of the broadcaster, because it leaves the publisher in direct control over editorial content. The AM broadcaster sells his "editorial" space to specific advertisers.
>
> The newspaper and magazine publisher sells only the sponsor's advertising message. He, himself, elects just where he is going to place the advertiser's message with respect to his editorial or entertainment copy . . . . Radio sells its editorial or entertainment "space" to individual advertisers, surrendering a large part of its control over both entertainment and advertising to the advertising agency which provides both elements. The disadvantage to the broadcaster not only is statistical (his entertainment and public service features supported by sponsors are statistically charged off as advertising time) but also affects the way in which his entire operation is managed, since the principal programs are presented by the advertiser rather than the station management.
>
> NPFS urged facsimilists to avoid sponsored programs.

Unlike the experimental and demonstration broadcasts of facsimile in the past, the type of application made possible by the setting of FCC standards is for a permanent commercial service on a regular basis. The application, therefore, must be based upon accepted standards of equipment performance just as in commercial radio. These requirements are set forth in the preceding chapter.

The Facsimile-only Station

In addition to commercial operation, another possible category of facsimile application is for an FM broadcasting station devoted *exclusively* to radiating a general public facsimile service.

When the FCC decided on the high-frequency FM band after the Second World War, part of the band was set aside for FM stations proposing to give a service consisting exclusively of facsimile programs. Then came a flood of applications for FM sound broadcasting, especially in the so-called Area 1, or Northeastern states. The great activity in this field and the lack of activity in facsimile caused the FCC to abandon the channels reserved for facsimile in Area 1 in order to take care of the rush of FM sound broadcasters. Eventually, the reservations for facsimile channels in the FM band was eliminated for the rest of the country.

There have been indications, however, that the FCC will entertain a request for an FM channel to be used exclusively for facsimile. The Commission's rules and regulations do not now provide for the licensing of such stations, nor is any proposal for the establishment of such a service now under consideration. It would appear that an applicant for a facsimile-only station in the FM broadcast band would be required first to petition for an appropriate amendment of the rules and regulations to provide for such a service.

AM Experimental Facsimile

There has been so little activity in this field in recent years that the exact status of this category is not clear. In the past, standard AM broadcasting of facsimile has been limited to the period 1 to 6 a.m., the so-called "experimental hours."

Over the years, a large number of AM stations have experimented with early morning broadcasts using many systems of facsimile. These ranged from high-fidelity photographic systems to direct-printing carbon paper and burning methods.

At one time, a station was required to have at least 50 recorders (to get user reaction) in order to qualify for such experimental transmissions. No commercial sponsorship of facsimile was allowed, because the broadcasts were for "experimental" purposes. Regular reports of the work done and results are required by the FCC under these experimental grants.

Actually, it was the extensive work and experience of these AM experimental facsimilists that inspired the development of modern facsimile equipment and the launching of FM facsimile broadcasting.

Special HF Experimental Facsimile Stations

In high-frequency facsimile experimentation there is little current activity. A small number of experimenters in the past, however, have applied for special high-frequency transmitter licenses for the express purpose of conducting specific experiments with facsimile.

This is not the same case as the existing station which wants to use its frequency in a special way, such as for facsimile. It means an application to build and operate a *new* radio station on a specially assigned high-frequency. The FCC requires a complete presentation as to the nature of the proposed development program. It also insists on periodical reports to the FCC engineering division describing the kind of work being done and the results.

Permit for Demonstration Facsimile

As a preliminary to launching regular commercial facsimile, many broadcasters want to stage special demonstrations to acquaint the public with facsimile broadcasting. The application in this category also is made by informal letter to the Commission. The FCC has issued these special permits for limited and specified periods.

The application should give the essential information about the FM station, the dates desired for the demonstration, the approximate daily schedule for day

and night hours, and what kind of demonstration facsimile service is proposed. The proposal should meet the FCC Standards for facsimile broadcasting. The same approach should be made in an application to demonstrate multiplex facsimile.

IX

FREEDOM OF THE PRESS ON THE AIR

Facsimile is credited with putting a new argument into radio's fight for freedom. As facsimile journalism developed, broadcasters saw at once that here was a radio service which reached the public in the same physical printed form as the press. The press, under the First Amendment, enjoys full freedom. Radio, under Federal regulation, has not been permitted freedom of speech in the same sense. But how, the broadcasters asked, could the Federal Communications Commission put the same restrictions on air newspapers that it has on aural broadcasting without violating the Bill of Rights? Some even went as far as to predict that facsimile, if tested in court, might be the instrument that would emancipate radio.

The history of radio's bout with regulation is long and involved. It is not a one-sided story. We shall touch here only on the high lights to show how the course of restraint might be influenced by facsimile.

The controversy over radio freedom has centered on the FCC's interest in, if not control over, program service and content.

Congress in the Radio Act of 1927 set up the Federal Radio Commission as a government licensing body. One of its tasks was to regulate use of the air waves. The Communications Act of 1934 continued this authority in the Federal Communications Commission.

The problem of control stems from the fact that there is a limited number of radio channels. There aren't enough frequencies to go around. If a frequency is granted to one applicant, it often must be withheld from another. Therefore, Congress directed the Commission to grant licenses and renew licenses only if "public interest, convenience, and necessity will be served thereby."

What is the "public interest" in the case of radio?

The Communications Act is not specific. There have been arguments that it was the intent of Congress merely to create an agency for the regulation of radio

frequencies, that Congress did not intend to establish a commission with power to regulate the content of radio broadcasts.

From the outset, however, the FCC worked on the theory that program service, or content, was a prime factor to be taken into consideration in deciding if the "public interest" would be served by renewing a particular license.

The inquiry into program policy reached a dramatic climax in the famous Mayflower ruling of 1941. It hit its controversial peak in the widely publicized Blue Book of Mar. 7, 1946, which further asserted the government's interest in programs. On several other occasions—including the confusing Port Huron political censorship case of 1948—the Commission linked a station's programming with its right to stay in business.

In the Mayflower case, station WAAB in Boston had asked to renew its license. The Mayflower Broadcasting Corp. at the same time sought to establish a new station and asked for a license to use the frequency then assigned to WAAB. The Mayflower plea was rejected. On the question of whether to renew the WAAB license, the commission said:

> The record shows without contradiction that, beginning early in 1937 and continuing through September 1938, it was the policy of station WAAB to broadcast so-called editorials from time to time urging the election of various candidates for political office or supporting one side or another of various questions in public controversy. In these editorials . . . . no pretense was made at objective, impartial reporting. It is clear—indeed the station seems to have taken pride in the fact—that the purpose of these editorials was to win public support for some person or view favored by those in control of the station . . . . [The record] compels the conclusion that this licensee during the period in question has revealed a serious misconception of its duties and functions under the law.
>
> Under the American system of broadcasting, it is clear that the responsibility for the conduct

of a broadcast station must rest initially with the broadcaster. It is equally clear that, with the limitations in frequencies inherent in the nature of radio, the public interest can never be served by a dedication of any broadcast facility to the support of his partisan ends....

A truly free radio cannot be used to advocate the causes of the licensee. It cannot be used to support the candidacies of his friends. It cannot be devoted to the support of principles he happens to regard most favorably. In brief, the broadcaster cannot be an advocate.

Freedom of speech on the radio must be broad enough to provide full and equal opportunity for the presentation to the public of all sides of public issues. Indeed, as one licensed to operate in a public domain, the licensee has assumed the obligation of presenting all sides of important public questions fairly, objectively, and without bias. The public interest——not the private——is paramount.

The WAAB license was renewed, however, when it showed that "no editorials have been broadcast over station WAAB since September 1938, and that it is not intended to depart from this uninterrupted policy . . . . The station has no editorial policies."

Stations generally complied with the ban on editorials. Their ability to stay on the air depended on it. The ruling made it clear that any licensee who used his station to air his own particular point of view was abusing the privilege of his license. No editorial pages on the radio.

Eight years later, on June 2, 1949, the FCC modified the Mayflower doctrine in a decision that left the fight for freedom far from won. It did permit radio stations to editorialize on the air in their own name, under certain restrictions.

The opinion established *fairness* and *balance* as the vague yardsticks for stations airing the views of ownership on public issues. It said:

Licensee editorialization is but one aspect of freedom of expression by means of radio. Only

> insofar as it is exercised in conformity with the paramount right of the public to hear a reasonably balanced presentation of all responsible viewpoints on particular issues can such editorialization be considered to be consistent with the licensee's duty to operate in the public interest....
>
> Assurance of fairness must in the final analysis be achieved, not by the exclusion of particular views because of the source of the views, or the forcefulness with which the view is expressed, but by making the microphone available for the presentation of contrary views without deliberate restrictions designed to impede equally forceful presentation.

The new limited right was hailed by some either as a "victory for radio" or a "wobbly, clumsy first step." Others charged the FCC had officially reaffirmed the imposition of "thought control" by the government upon radio. *Broadcasting Magazine* said the ruling "can become a Frankenstein monster to turn against those who toiled so diligently for its arrival." It said radio must fight for the "right to be wrong or unfair" if it is to establish its right to speak under the guaranties of the First Amendment. Under the 1949 edict, this meant radio must "live dangerously" if it spoke freely and still run the risk of being put out of business if a government bureau decided that it also spoke unfairly.

The whole question of controversy on the air is difficult and complex. The issue of restraint popped up again in the Robert Harold Scott case of 1946. The FCC held that a station which broadcast church programs must also make time available for arguments in support of the atheist point of view. This ruling later drew fire from members of Congress.

In the Port Huron case, the Commission ruled that stations may not edit or reject political speeches because they contain libelous matter. If a broadcaster refused to air such a speech, he would violate the FCC rule and might lose his license. However, in actual practice, if he did permit a libelous political broadcast, he would be violating state laws and could be sued for libel.

About the time facsimile showed signs of reviving in 1945, broadcasters began taking a firmer stand on "freedom on the air." They went on complying with the restrictions but became more outspoken against them.

The issue got a pointed public airing when the National Association of Broadcasters met in 1946. The NAB executive vice-president, Arthur D. Willard, Jr., told the convention that it was impossible to divide "freedom of expression" into separate categories—freedom of speech, freedom of the press, freedom of radio, and freedom of motion pictures.

Facsimile was then receiving wide attention, and Willard declared that the technological advances of facsimile journalism "may well make freedom of the press and freedom of radio synonymous."

> Willard asked: Where would the vaunted freedom of the press be if the ruling of the FCC depriving radio of the right to editorialize were imposed upon the transmission of newspapers by facsimile?
>
> Where, indeed, would freedom of the press stand if . . . . a newspaper's editorial policy were to be required as evidence in the determination of a facsimile application which might involve an issue of economic life or death for the paper? Will newspapers in the future, in applying for facsimile facilities, be required to provide sustaining pages, discussion pages, and so on?

Willard urged American editors to "examine the rules and regulations and reports of the FCC in the light of the miracle of facsimile and . . . . then determine whether in this electronic age there can be any division of the freedoms of communication."

A newspaper publisher backed up this view. John S. Knight, whose Miami Herald was getting ready to start a facsimile edition, told the meeting that he would "fight for the right to express ourselves freely" but that "if we reach the point at any stage where the editorial page of that facsimile newspaper could not speak its mind with the same freedom we do in the editorial columns of our newspapers, I would abandon the venture."

The principal fear of the 1949 "limited-freedom" doctrine is that stations more than ever might have to

submit their thoughts and past expressions to a political administration for review to get a license renewed. Unions, on the other hand, expressed fear that moneyed interests would now use radio as a powerful propoganda weapon. The courts or Congress may eventually have to define clearly radio's freedom of expression.

Officially, the Commission has side-stepped the issue of editorializing in radio newspapers. It may be significant that, when hearings were held in 1948 on radio's right to editorialize, the question of facsimile editorials did not arise and that, in the hearings which preceded the decision to make facsimile a full commercial radio service, the commission did not once bring up the matter of editorials. This was in the face of the fact that facsimile stations operating under experimental licenses had been broadcasting editorial pages and that these pages had been submitted to the commission.

Freedom of expression thus had become divided on the air, with restrictions on editorializing in aural broadcasts and the practice of editorializing freely in facsimile.

Many broadcasters and radio lawyers were convinced that, if a facsimile test case based on the issues of free speech were carried to the Supreme Court of the United States, the decision would uphold their view that FCC control over programming is a violation of the First Amendment in the Bill of Rights. Only an extremist would argue that there should be no government licensing and regulation of radio. The air is limited. Its use must be regulated in the public interest. But radiomen generally contend that the government should no more control the content of programs than it does the content of newspapers.

Radio's hopes for a showdown on air freedom through facsimile may be doomed to disappointment however. The FCC has never objected to editorials in facsimile newspapers. The pioneers in facsimile broadcasting, by asserting and using the right of "freedom of the press on the air," apparently achieved that freedom for one segment of radio and may help assure it for other radio services.

X

FACSIMILE STAFF

Facsimile staffs may vary as much in size and quality as do the staffs of different newspapers or different radio stations. The number of people needed depends upon the kind of job the publisher is trying to do. But there are certain minimum requirements, and the qualifications of the personnel can be definitely set forth.

The best way to visualize the staff problem is to consider what happens in newspapers and radio.

A single newspaperman-printer, with one linotype, a flat-bed press, and a supply of boiler plate, can get out a small country weekly. But to produce one of our great metropolitan dailies requires the work of hundreds of trained specialists.

A 250-watt radio station, playing records and reading news off a ticker but run on a shoestring and with no other programming, can come close to being a one- or two-man operation. Yet a large station, producing its own shows and originating first-rate programs, employs scores of highly skilled artists, technicians, and other staff members.

It is the same with facsimile. How many editions a day will be published? How many pages per edition? What is the span of working hours? How many days a week? Is a great deal of original material desirable? Would you like nearly every page to have the finished appearance of text matter that is retyped and justified? Are all the news stores and pictures of a daily newspaper available so that the task is merely one of processing that flow of material? Is your facsimile part of an independent station which must dig up its own news and pictures? Or are you a facsimilist with neither radio nor newspaper connection who wants to buy facsimile time to broadcast a page or edition of your own?

These and many other questions will determine the kind and size of staff that is needed.

This chapter will outline the staff setups of the

two newspaper-affiliated stations which started regular facsimile broadcasts in December, 1947. It also will explain the minimum staff requirements for the smallest of facsimile operations and will tell what should be added as these are expanded. It will describe the qualifications needed by those who perform the various jobs. With this framework, it should be possible to plan a staff for any type or size of facsimile publication, no matter how large or small the scale of operation may be.

Staffs for Newspaper-affilitated Daily Facsimile Editions

The staff for a newspaper-connected station putting out four or five editions a day can range in number from 5 or 6 up to 10, 15, or many more (see Fig. 13). Obviously, if a 5-man staff can produce regular editions within an 8-hour period, 5 days a week, it will take twice that number to keep the editions going 16 hours a day, assuming an 8-hour work day. And if you broadcast facsimile 7 days a week, it will take almost another full shift in order to stagger hours and fill out the work schedule.

The two stations which pioneered in the broadcasting of modern facsimile newspapers were The Miami Herald - WQAM-FM and The Philadelphia Inquirer - WFIL-FM. Each set up staffs to produce several editions daily within an average workday, 5 days a week. An examination of their staff organizations will give some practical insight into the whole problem of staffing for facsimile. It must be remembered, however, that these facsimilists attempted to produce editions of a quality that would come up to their metropolitan newspapers.

The Herald-WQAM-FM started with a seven-man staff plus an expert radio engineer who did nothing but work on research and development in a facsimile laboratory built for that purpose. The Inquirer-WFIL-FM started with a ten-man team. After a period of training, The Miami Herald found it could do its job with six persons. Functions of employes and their general qualifications were about the same in each city.



Fig. 13. General view of a facsimile department.

The Herald staff included
The facsimile editor
Scanner operator
Maintenance engineer (whose chief job was to tour the city, checking and keeping recorders in proper running order. In Miami, the station leased recorders, supplied the paper and printer blade replacements, and assumed all maintenance responsibility).
Writer-typist
Second typist
Artist-make-up
Copy boy and general assistant

The Inquirer staff included the facsimile editor, two engineers (including scanner operator), an artist, two writers, three IBM typists, and a copy boy. Backing up both of these facsimile staffs were the scores of reporters, writers, editors, photographers, and cartoonists of the newspapers. Facsimile became a by-product of the newspapers, processing the same raw material into a new form.

In addition to the huge output of local news and pictures, the staff of the newspaper-affiliated facsimile edition can draw on the many other resources of its parent publication. Most important of these are the world-wide news agencies and wire-photo services. The facsimile staff in such an arrangement has little or no original copy to produce. It does need high skill and imagination to take full advantage of these facilities.

Cost figures on their first months of operation showed that The Inquirer spent about $4,600 a month for program, engineering, administrative, and advertising expenses——mostly in salaries——while The Herald's operating cost averaged less than half that amount.

Staff Duties

The duties of various staff members are roughly the same in all facsimile newspaper operations. The larger the staff the more specialized will be the tasks of

the individual members. In a small staff, one person might combine duties handled by two or more employes in a large organization. The principal staff positions, the job each person is called upon to perform, and the skills required are

The Facsimile Editor. He is in complete charge and is responsible to the owner, the station's general manager, or the newspaper's publisher or editor. He must be thoroughly familiar with the entire operation —editing, copy preparation, make-up, and transmission. He must know what the equipment can do, or he will not be able to judge whether he is getting the best possible results. If the recording is inferior, he should be able to recognize the fault and the probable source of trouble.

The editor should have a broad newspaper background. He must be able to write, judge news, and, above all, make quick decisions. Copy editing, headline writing, layout, photography, and cropping of pictures are under his direction. On a small staff, he may have to do some or all of these things himself. If possible, select a man with some newspaper executive experience.

The Scanner Operator. In certain situations, the scanner operator need have only limited technical ability. This is true, for example, if the scanner is operated in conjunction with the radio transmitter and a radio engineer is standing by to make frequent checks and help if trouble arises.

In ordinary circumstances, however, the man who operates the scanner should be a person of mature judgment who is familiar with the fundamentals of radio and even photography. The more versatile he is the better, for he will have time between the airing of editions to help with other work in the facsimile studio.

His radio background can be in the amateur field if he knows enough about it to build simple radio equipment. This implies that he can read schematic drawings, use test equipment, and make minor repairs in an emergency.

Photographic background is not a "must," but it is

invaluable to the operator who wants to get the finest results from the scanner. If the operator doesn't know the essentials of good photography, he should learn them, including standard darkroom practices. He can then look at a picture and know just how to adjust the scanner to make the photo produce best.

A photographic background can be extremely helpful. As we explain in the chapter on Photography, some poor pictures can be made acceptable and good photographs made better by manipulating the controls at the scanner. The more the operator knows about photographic tones the better chance he has of getting the highest fidelity in reproductions.

Everyone on the staff can learn to place copy on the scanner, make the necessary adjustments, and transmit the copy. The editor and at least one or two other persons should learn to do this. Every key man should have a stand-in. If the equipment never faltered, the choice of an operator would be simple. However, there are unpredictable ailments in the best of radio equipment, and unless the scanner operator is more than a pseudo-technician, your editions may not get on the air.

The operator should be able to trace down scanner trouble and make repairs short of major maintenance. If he has the potential for eventually handling all repairs and maintenance on the scanner, so much the better.

Operator Also Is Staff Announcer. The scanner operator also is the staff member who announces editions and signs them off the air from a microphone at the studio scanner. He makes voice announcements during page breaks while the edition is being broadcast. This is an easy assignment and requires a minimum of training. The opening and closing announcements as well as the information given by voice between pages are written out for the operator to read.

Recorder Maintenance Engineer. If the station owns and keeps control of recorders, through lease or other arrangement, it must service the recorders in homes and public places to make sure of giving customer satisfaction. The extent of this work will depend on the number of sets in use.

Some facsimile publishers may decide to offer maintenance service to those who buy their receivers outright, because this can be a source of revenue and good will. However, most stations probably will want to get out of the maintenance business as soon as the lease phase of their facsimile publishing ends. The retail radio dealers and servicemen can then take care of repairs and the sale of paper and printer blades.

Facsimile Engineer. He can be a member of the FM-radio-station engineering staff who is especially trained in facsimile and capable of doing all types of major maintenance. Or he can be a full-time member of the facsimile staff. In some cases he might well be the scanner operator, providing he has the proper engineering background. In others he might be a full-time employee of the FM station who is summoned only in emergencies. The choice can be determined by the circumstances of each individual station. In any event, the engineer must have a sound, practical knowledge of radio engineering and supplement it with specialized training in facsimile equipment.

Writers. Only the larger staffs will include persons who do nothing but write. Usually, the writers also will be typists or editors or make-up men. The special art of writing for facsimile is covered in Chap. XII. Writers take copy from the teletype, reporters, or a newspaper city room and rewrite it to fit the space limitations of the facsimile page. The copy then goes to the typists.

Typists. The chief requirements are speed, accuracy, and ability to operate the electric typewriters used in the facsimile studio to get the approximate appearance of regular type. Most common are the IBM, Varityper, Flexowriter, and Justowriter, which can "justify" each line (make the margins come out even). On small staffs, the typist also should learn to write and set headlines, help on make-up of pages, and even operate the scanner in emergencies.

Artist. A fast, competent newspaper artist can dress up pages and give them a professional newspaper or magazine appearance. The facsimile artist actually functions as chief make-up man. It is his deft touch

in cropping and retouching photographs, arranging the material on the page, and sketching a quick chart or map or diagram that turns an ordinary-looking page into a layout having much greater impact on the reader. He is responsible for the technical perfection of all make-up.

However, if you start with a staff of fewer than six or seven persons, the professional artist can be eliminated. Other members of the staff can learn to crop pictures, use an airbrush for retouching, and make up pages. On small staffs, the other positions are more essential.

Photographer. An independent facsimile station trying to give local picture coverage needs a photographer. Such a station would have to develop into a sizable business to justify the extra expense, however. A newspaper-affiliated station has no need for its own photographers, since it has local pictures as a by-product and can call on the news-photo staff for special coverage.

Reporters and Rewrite Men. The same thing is true here as in the case of full-time facsimile photographers. A staff to report and write local news is expensive. Until commercial facsimile newspapers become widespread and profitable, it is doubtful if any independent will try such a luxury. And the facsimile publication which is run in connection with a newspaper doesn't need it.

Smaller Staffs

A one-man editorial staff can, theoretically, get out one or two facsimile editions a day. But it is a skin-of-the-teeth, risky business, and that one man has to double in brass all over the place.

The main snag is finding a good all-round newsman, with some photographic knowledge and with enough mechanical aptitude to operate the scanner and keep it "tuned." This is a rare combination.

However, such a versatile person can produce and transmit two four-page editions daily of limited quality. The Miami Herald did it in test runs to

determine the feasibility. Such a one-man staff needs a press teletype, a good news-photo service, and, if possible, syndicated facsimile pages ready for broadcast. He has little or no time to retype copy. The news, however, can be transmitted directly from the teletype copy. The "staff" is kept busy selecting and editing the news, writing and setting heads, choosing and cropping pictures, writing cut lines, pasting up pages, and then dashing to the scanner to send the edition on schedule.

To assure even minimum performance, the one-man staff must have all major scanner maintenance done by the FM station's engineers or a competent radio-repair company. Even then, a breakdown during a broadcast is likely to put the edition off the air.

Other handicaps also make the one-man operation undesirable. One of the greatest appeals of facsimile is its speed and flexibility. Once the editor-typist-make-up man reaches his broadcast deadline and becomes the scanner operator, he cannot leave the scanner to handle a spot-breaking story or picture and get it into the edition while it is still fresh. The greatest danger, however, is that some kind of mechanical trouble will keep the "staff" from performing his other duties.

The minimum practical staff starts with a competent scanner operator and a newsman. Even then the number of editions and the quality of the programming will be very limited. The newsman devotes his time exclusively to copy editing, preparation, and layout. The scanner operator keeps his equipment at maximum efficiency and has time between editions to help prepare pages.

The addition of a third person, a typist, steps up the quality and appearance of the pages. Much of the teletype copy can be retyped in regular column form with even margins. The number of editions can be increased if the typist is trained to help set headlines and assist in make-up. The next logical steps in expansion are to add a writer-typist, a utility man who can type, set heads and make-up, and an artist. As the size of the staff increases, the newsman or editor

can concentrate on selecting and editing the news, writing headlines, and directing make-up to get the best results.

In selecting the members of a facsimile staff, there are some general qualifications worth consideration by the publisher. It is a high-pressure job. He should choose men and women who "can take it."

Facsimile is as versatile as its operators; look for staffers with adaptability and initiative. Don't weaken or sabotage your new enterprise with workers who lack enthusiasm for it. Some newspaper old-timers don't adapt readily to the techniques of this new art. Facsimile needs men and women who can learn new routines and who will eagerly travel a new and promising road.

Advertising

The sale of advertising and servicing of customers' accounts should be a separate responsibility and delegated either to the publisher's regular advertising department or to the radio station's sales staff. The scope of your facsimile publishing will determine which method is most fruitful.

XI

FACSIMILE PROGRAMMING

Programming is the key to success in facsimile as it is in radio, newspapers, magazines, television, movies, or any other medium that gets and holds the public's attention. Equipment may be the best, studios ultramodern, and engineers may be technical wizards, but if facsimile programs are dull, ill-timed, and unimaginative, failure is almost certain.

Radio stations that fail to build an audience go out of business. Newspapers and magazines need circulation in order to sell advertising. A facsimile newspaper or special service, too, must win an audience if it is to be established as a sound, profitable enterprise.

This can be a wide, general audience or a small, specialized segment of the public, depending on the type of service you intend to give. If it is a full facsimile newspaper with several daily editions, the programs should appeal to the broadest possible mass of people. The character of this audience will shift from hour to hour during the day, and separate editions can be tailored to suit its changing needs. If it is a special facsimile service, beamed at a farm, school, church, club, or other limited audience, the programs should be slanted specifically toward that particular group interest.

First, determine the public you are trying to reach. Decide how much or how little facsimile broadcasting you are going to do. Survey the ability of your particular public to receive your programs. In facsimile just being introduced in your area? Are most of the available recorders in public places or in homes (see Fig. 14)? What is your potential audience? All these factors will help determine the type of programming you should do.

This chapter will outline program ideas for all types of facsimile broadcasts, from the multiple editions of a daily air newspaper to the weekly or once-a-day edition or page that is aimed at specialized

interests. In the latter field, it will be seen that facsimile has an unprecedented advantage over radio or newspapers. Programs created for these limited groups also can be instrumental in building a large general audience.

Regardless of the target, there is one fundamental to keep in mind in all kinds of programming: The chief appeal of radio facsimile is that it can instantly deliver news and pictures into the home, office, factory, or wherever a recorder is installed *and leave them there* to be viewed at the reader's convenience.

The General Facsimile Newspaper

The programs obviously can vary as widely as does the editing between a metropolitan daily and a country weekly. No formula will fit several different situations. This, then, is no effort to draft a program blueprint to fit any particular situation. Instead, we shall describe in detail some program schedules that have been successfully aired. We shall outline a wide range of practical program ideas. As facsimile grows, the scope of program plans will expand as it has in publishing and radio. The successful facsimilist will choose the ideas that best fit his own station and community needs.

The one sure-fire, interest-compelling facsimile program is spot news. It may be the general news of a fast-breaking foreign crisis. It may be the specialized news of baseball, reported after each inning, or a running account of the stock market given hour by hour. Whatever it is, the reader can get it faster in permanent form by facsimile than by any other means.

Take advantage of this speed element. Tell the progress of a new plane as it seeks to make a cross-continent record, not just in one splash story from the terminal airport. Handling news in this manner puts the reader virtually in the editor's chair. watching with him as the story unfolds and sharing the thrill that comes from being close to the news.



Fig. 14. Home facsimile receiver manufactured by the General Electric Company.

If facsimile editorial workers strive constantly to give the reader the same ringside seat that they enjoy, programs will be vibrant and will hold interest.

Follow the same technique on spot news pictures. Wire photo will deliver many photographs of train wrecks, fires, sports, and other events in less than an hour after the pictures are taken. You can make these dramatic, news-telling pictures materialize by facsimile in the homes of readers in a matter of minutes——usually hours before they can be seen in newspapers.

The program operation, therefore, should be fast and flexible. In a newspaper-allied facsimile setup, a wide variety of news and photos will pour into the program hopper. Even the lone news teletype in a small independent station will supply more live copy than can be placed on the scanner during a few editions. The problem is one of selecting and editing.

Much of this material is predictable. The timing is known in advance on White House conferences, major speeches, weather reports, stock and commodity prices and averages, ship arrivals, sports events, and a wide range of other reports. Press and picture agencies and city desks schedule in advance many stories and photos which they know are coming up. The pattern for editions can be planned around these known "regulars" plus the certain flow of live material.

The problem, then, is to build editions so that some stories and pictures or even whole pages can be dropped out at the last minute to make way for fast-breaking headline news or a spectacular news picture. If the facsimile staff is geared for fast action, this can be done even after a broadcast starts. A cabinet may fall in Europe at 3:05 p.m. your time. If you are always ready for such breaks, you can get a bulletin on the scanner before your edition finishes at 3:15. The impact on the reader is tremendous, for it gives him the feeling of being right on top of the news.

Pages can be dressed up easily. Therefore it is a great temptation to lean not only toward magazine appearance but also toward magazine-type content. Guard against this inclination. Facsimile can present

a program spectacularly from both speed and typographical viewpoints, but keep the accent on news.

Yet there is a definite place for features angled toward special reader interests. These can form a major part of editions at certain hours. Feature pages can be prepared in advance and provide a backlog of programming for any emergency. They can have all the eye appeal of a magazine. However, if a spot news story or picture comes along, sidetrack the feature and broadcast the live news. Speed in handling such up-to-the-minute news is your greatest asset.

Radio has capitalized on the public's appetite for news. Special-events coverage and regular newscasts rank high in Hooper ratings. Facsimile has the great advantage over radio in that it can deliver the same news in permanent form as fast or faster and moreover illustrate it with pictures.

Programming for Hourly Editions

Few stations in facsimile's early years will broadcast hourly editions from early morning until late at night. Mass distribution of low-cost sets is needed to make such a heavy program feasible. However, the best way to describe program needs and opportunities for the different periods of the day is to outline a virtual round-the-clock operation. *Each edition should be tailored for the kind of audience available when it is broadcast.* Naturally, this will vary from city to city. The summary that follows describes in general the different types of audience that may be on hand at different times and suggests the content of programs to best satisfy those changing audience groups. However, since facsimile leaves a permanent record, every program broadcast has a high potential readership even if some viewers are not present when a particular edition is sent.

7 a.m. Edition. All members of the family are together. On the doorstep is the morning newspaper displaying news events up to about the preceding midnight. Facsimile has the benefit of overnight news coverage which can make many top series in the morning

newspaper obsolete. It's already midday in Europe, and much has happened. The first edition can emphasize the antiquity of the morning paper. You can't do this by rewriting the news from your standard-size contemporary. There must be fresh stories, new headlines, new leads on stories that were developing the night before. Suggested content:

The newest headline story of the day

One-paragraph bulletins on live news

Spot news photos that came too late for the morning paper

The day's weather forecast

Schedule of facsimile editions for the day, with advance "plugs" for special features or coverage you have planned

The lighter side: An exclusive cartoon panel or strip. Brief humorous items from the overnight wire.

8 a.m. Edition. Most families are still together, but it's a busy period. Some workers going to their jobs see recorders in public places. Pedestrian traffic mounts, and these public outlets start getting their first audience.

This revised audience and living routine illustrate how all program plans must be directly keyed to the local situation. If facsimile is just being introduced in a community and there are few, if any, home recorders, there is no point in starting broadcasts before 9 or even 10 a.m. The audience won't be large enough.

At 8 a.m., those persons not already en route to work are busy with breakfast, getting ready for school or for work. They have little time to look. Suggested program content:

Brief summaries or bulletins of the latest important news. Your hit-and-run audience can't wade through long stories. Yet, by now, your top stories will be 7 or 8 hours later and fresher than the headlines in the conventional morning paper.

Drop the light features and cartoons.

Never repeat anything you carried in earlier editions. It is common in radio to repeat newscasts with little or no new material. The 8 o'clock listener

was asleep during the 7 a.m. newscast. Any such repetition in facsimile is wasteful and unnecessary. Previous programs can be waiting, in permanent form, whenever the reader is ready to look. He may resent the paper waste caused by repetition of pictures and even of big news unless it has new angles.

9 a.m. Edition. The community is settled into the day's routine. Most workers are en route to or at their jobs. Housewives are recovering from the chore of getting the family off to offices, plants, or schools. Shoppers are beginning to make the rounds of stores. Facsimile's audience has shifted not only in composition but in inclination.

The edition needs a fresh pattern of news and photographs plus information useful to everyone not moored to a desk or machine routine. Suggested content:

Spot news and pictures with latest developments in any earlier stories

List of sports events, public entertainments and meetings

List of FM station's sound programs

Stories on scheduled events and conventions

Menus and recipes as hints to housewives about to do their shopping for luncheon and dinner

Other information useful to those with leisure time and special interests

10 a.m. Edition. By now, the audience has shifted and flow of news has accelerated.

Programs for a home-recorder audience should be aimed at the housewife; for public recorders, at the businessman. In most situations, you will need a mixture of the two. A practical method is to design one edition for the home group and the next for the public group, announcing them in advance so that persons can tune in only the program they want. Suggested content:

For the homemaker, features on cooking and fashions, home decorations, baby care, movie programs, popular psychology (see section in this chapter on Syndicated Facsimile Pages). On some of these, facsimile has a marked advantage over radio. There is no chance of misunderstanding a complicated recipe or fashion tip.

Facsimile prints the full details, right in the home, with no possibility of error. And at the same time, it can deliver a picture to heighten the interest in the appetizing dish the recipe will make or a photo of the new styles described.

For the businessman and other viewers of public recorders, there will be late information on the day's sports events, the developing local and world-wide news situation, market information, etc. The opening trend on the stock market is available now (or on whatever edition coincides with 10 a.m. New York time). A local brokerage firm can supply a summary if you do not get it on a press wire. Local market and business news also can be developed through brokerage companies, the chamber of commerce, and other sources.

11 a.m. Edition. This coincides closely with the appearance of the first editions of afternoon newspapers in larger cities. If your air newspaper is an adjunct to a morning paper, you will strive to "beat" the afternoon daily's coverage. Suggested content:

Highlight the very latest stories from the news wires or city desk so that the afternoon paper's coverage is obviously "old." If the facsimile sponsor publishes an afternoon newspaper, he may want to hold back exclusive local stories from facsimile until he gets on the street with his regular editions. There is no need to hold back wire copy, however, for radio has it anyway. Facsimile's time advantage continues through the day. The top Washington news is beginning to break, and you can handle it fast.

Noon Edition. Composition of the audience shifts again. Shopping crowds will be augmented by workers at their lunch hour. There is a lull in homes for the midday meal. Suggested content:

Concise stories giving the reader a fill-in on every major news happening since breakfast. These should be rewritten and not merely "repeats."

The pick of the morning's news photos not previously aired.

For racing fans, track conditions and a list of scratches if these haven't been carried earlier.

Weather in major league cities in the baseball season, the weather on game days for important football games. Throughout the day keep the reader abreast of changing weather conditions, especially if unusual climatic changes are brewing.

Stock-market noon summary.

Skip the features. Offer a diversified fare of news tightly edited. It will be one of the day's best read editions. Make it a showpiece with attractive make-up. Send readers back to afternoon routines well informed about events in general.

1 p.m. Edition. The facsimile readership has shifted again, predominantly to housewives, shoppers, and those with time on their hands. Programming plans change with the audience. Prepare special-interest editions.

The 1 through 4 p.m. editions can accent a wide range of feature material. They also can give spot coverage of sports events while they are in progress. This is especially true of baseball, football, golf tournaments, horse racing, and other events which avid fans follow closely. Continue giving spot news high lights.

Interest is kept high when facsimile delivers inning-by-inning, play-by-play, and race-by-race statistics, including pari-mutuel prices from racetracks.

The afternoon is the only time when feature material should dominate the total space. The homemaker's interest can be whetted by dress patterns, household hints, beauty tips, illustrated hair-do suggestions, neighborhood events, and other special pages. Use pictures liberally. They brighten pages, and there is no engraving cost. Sources for feature pictures are plentiful. Fashions alone provide an endless flow of material. Designers, manufacturers, and retailers can deluge a facsimile department with stories and photos on every phase of the industry. Hollywood publicity offices will do the same with material on movie stars and films.

Reader interest in these editions can be checked by offering give-away booklets, diets, coupons to be filled in and mailed, and dress, knitting, and crocheting designs to be sent in for the complete patterns.

Afternoon editions can deliver program notes and even musical scores on concerts to be given that evening.

5 p.m. Edition. Children are home from school. Workers are leaving their jobs and may take a hurried look at fresh headlines on public recorders. Activity in the home steps up. Many sporting events are over. Stock, bond, and commodity markets have closed, and their statistics have been reported. The 5 o'clock or even the 6 o'clock facsimile will be the first one the man of the house may have seen since noon. Suggested content:

Up-to-date reports on the day's events which broke too late for the afternoon papers. Stress spot news and news photos.

Feature content, while secondary in volume, should appeal to children: comics, panels, school news, puzzles, feature pictures, and stories of animals, etc.

Cleanup of sports results to 5 p.m.

6 p.m. Edition. This can be largely an extension of the programming in the 5 o'clock edition. Women are in one of their busiest periods of the day. A heavy flood of varied and important news breaks just ahead of this deadline. Late afternoon papers either treat these stories lightly or miss them entirely.

It is a good time to present a thorough roundup of local, national, and foreign news. Edit this edition for men.

7 p.m. Edition. This is relaxation time in the home. The family is ready to be entertained. There is more leisure time for reading. Suggested content:

Fuller treatment of major news stories. Some of these will be as complete as readers see on page one of their morning newspaper 12 hours later. Top stories treated tersely in the two preceding editions can be expanded.

Human-interest photographs and articles.

Schedules of plays, motion pictures, sports, and meetings, with reference to earlier related stories which dealt with the events in detail.

If you also publish a conventional morning newspaper,

give the high lights of exclusive local stories you have for next morning and refer the reader to the regular newspaper for details.

8 and 9 p.m. Editions. Revise the play according to the run of news. Major political speeches given at night are now released. By this time you can skim the cream off the headline news that will appear in next morning's regular newspapers.

Scheduled items such as day sports, markets, and entertainment features are out of the way. There is room to resume a liberal use of photographs. If you are carrying by-line columns or news articles in a series, this is a good time for them.

Later Editions. Sports come back into the spotlight for results of night games and final roundups. Make-up should follow a bulletinized form to cover the maximum number of stories. Use art sparingly unless it is of an unusual character. The number of readers drops steadily.

The Two- or Three-a-day Operation

The program pattern for most stations will follow a much briefer and less elaborate schedule than hourly broadcasts. In inaugurating facsimile in a new area, it would be wasteful and extravagant to program more than 8 hours a day or 5 days a week until the audience reaches sizable proportions. Broadcasting during a long day or for a full 7-day week will double or treble the size of the staff.

A schedule of two to six editions, spanning an 8-hour period such as 10 a.m. to 6 p.m. or 11 to 7, is workable and efficient from the man-power standpoint. The size of the staff will determine the number and quality of editions that can be produced.

A typical three-a-day schedule might provide editions at 10 a.m., noon, and 5 p.m. Two programs a day might be at noon and 5 o'clock. One schedule for five-a-day starts at 10 a.m., with other editions at 12:30, 2:30, 5, and 6 p.m.

Whatever your program schedule, study the facsimile audience in your community for the time of day you will

be broadcasting. In general, it will shift from hour to hour along the lines mentioned in the foregoing pages. The preceding section gives specific program suggestions for these different periods of the day. Every facsimilist will develop other ideas to fit his own requirements better. Some of the detailed suggestions can be combined, and others discarded. Choose the ones that fit your station, your community, your program resources.

Programming for the Independent Facsimilist

The independent facsimile publisher may be an FM-radio-station operator or a person or group who merely buys time from an FM station to broadcast facsimile. The independent faces a different problem of programming from the facsimilist with a newspaper affiliation. He has fewer copy resources, but he can still get all he needs.

The independent will probably not find it practicable to hire a large editorial staff to cover local news. It is an expensive undertaking. One good man, however, can hit enough high spots of home-town news events to give the independent facsimile edition a local flavor.

The chief program need for the independent is a press-association news or radio wire. If he wants to put out attractive, illustrated pages, he also should have a news picture service, by either wire or air mail. An enterprising editor also can develop a flow of free and suitable material from the fashion, movie, and other industries that have elaborate publicity setups. On spot wire news, the independent operator can be on a par with a newspaper-allied competitor. If his staff is too limited to permit retyping of news copy, he can take sheets directly from the teletype, trim stories to fit, and place them directly on the scanner.

A small operator can follow the line of some small radio independents and stick to a specialized type of programming, such as late news bulletins at regular intervals or a full afternoon service on sports results. Others may make tie-ups with newspapers,

providing the newspaper with a dramatic promotional service in exchange for the use of news and pictures.

The smaller his operation the more the independent should build programs aimed at special interests. In this way he can win an audience regardless of the competition, just as small radio independents can get a share of the listeners from big network stations. The specialty might be a bulletin market service for farmers, straight news summaries, a running broadcast of sports results, detailed calendars of all events scheduled in the community, etc.

On the other hand, the independent with a news wire and picture service can provide a comprehensive facsimile service along the program lines discussed earlier in this chapter. The same rules of program appeal and types of audience will apply.

Special-interest and Sponsored Editions

Limited-interest editions fall into two categories, but programming follows the same general course in both. One type is the public service kind of broadcast which a station does even though the content may not appeal to all readers. This might be for schools, garden clubs, or women's organizations. The other is the sponsored edition paid for by a firm or group that wants to get its message to the public in a more elaborate form than in straight display advertising. This is similar to the program package so familiar in radio. The sponsored edition is actually a facsimile commercial, but to attract readers it must be interesting, informative, and/or entertaining.

The chapter entitled Other Ways to Make Money with Facsimile lists and describes a wide variety of companies and organizations that might be solicited for special-interest editions. To avoid repetition, we shall take up here a few selected examples and tell how programming for them can be developed.

Daily newspapers can give only limited coverage to school, suburban, garden, club, farm, and other specialty news. They have so many fields to cover that most school news, for example, doesn't have wide enough

general interest to compete for available space. A school section in a newspaper has to be printed for the entire circulation, including many subscribers who aren't interested. Any newspaper that tried to give thorough coverage for every specialized interest would produce a paper (1) too costly to publish, (2) too bulky to carry, and (3) dull and uninteresting to the vast majority of its readers. Newspapers, therefore, touch these special interests briefly with features and stories having the widest possible general interest.

Facsimile can step into these special fields with one big advantage: It can serve them without boring or penalizing large numbers of other readers who have different interests. Only those who want to get the announced special pages will turn them on. This controls the distribution and limits the cost to the actual user only. It changes the economics and gives special facsimile editions an edge over enforced mass publication or mass broadcasting. Some examples are as follows:

School Editions. This is a fertile field for special pages and editions. The schools themselves can supply a wealth of material and, through instructors and journalism classes, actually prepare and make up pages ready for the scanner. Some of this will be of general interest, such as changes in principals and teachers, outstanding individual or class achievements, visiting speakers, sports events, organization meetings, and schedules of plays. It is a physical impossibility to publish the names of all honor-roll students in a city of 500,000, but in a small town such a list makes a good feature.

Special facsimile editions can, in effect, provide students with a school newspaper. Many school events not only are newsworthy but are good sources for local photographs. Even the general classification of schools can be broken down, with pages designed for primary, grammar, high, parochial, normal, commercial schools or colleges.

Put on demonstrations in the schools. Arrange for classes to visit the facsimile studios and watch

editions take shape. You will be making friends with the students, the faculty, and, indirectly, the families of your community.

PTA Editions. Organizations such as Parent-teacher Associations, garden clubs, and farmer groups receive limited attention in the mass-circulation media. Facsimile, however, can deliver a service directly for their benefit without wasting "circulation" on people having dissimilar interests.

For example, the PTA groups in a community can work out a cooperative facsimile edition to promote their programs, exchange ideas, introduce new officers and new teachers, tell of outstanding work being done by certain units, and otherwise tie the group interests together through an air newspaper especially edited for them.

Copy for the service can be prepared largely by members of the association. If most of the groups meet regularly at about the same time, the edition can be made to coincide with meetings. Until facsimile recorders become commonplace, the station can lend demonstration models to the PTA for such meetings.

The cost of these special facsimile pages is comparatively low. Moreover, each page can be radiated in less than 3½ minutes, several times faster than a radio announcer could read the same words.

Church Editions. Church news should provide one or more good editions each week. You will find that gathering news for this special is simple; in fact, you may be overwhelmed by the volume. Try to establish a clearinghouse. Perhaps the Council of Churches or Ministerial Alliance will take over the job of screening and preparing copy. In any event, place the responsibility for gathering church news on the ministers and make them adhere to deadlines.

If you have many churches to cover, the volume of copy may become unwieldy. Confine items, then, to special announcements and real news. Eliminate the trivial items that appear in church bulletins. Newsworthy church photos are not plentiful, but pictures of new ministers, mortgage-burning ceremonies, the construction of new churches and additions, guest

soloists, and visiting church dignitaries will prove popular.

Club Editions. Unless a particular club buys air time for its own edition, great discretion should be used in selecting special editions of this type. There are countless clubs of all kinds. If you open the door to one, you may bring an avalanche of requests from others. Define clearly what type of clubs and activities constitute worth-while news, and stick to some definite rules.

The safest approach is to concentrate on those with community-wide memberships. Do not build programs around routine meetings. Insist that the material be of some general interest. A federation of women's clubs may take in a broad cross section of community life. Interesting programs can be based on the major activities of such groups.

Suburban Editions. Many American cities now consist of residential suburbs clustered around a central business district. Each suburb is virtually a city with a city, with independent shopping and recreation facilities. Residents often think in terms of their suburban residence rather than the city of which it is a part.

Facsimile can deliver suburban editions with news aimed at that specific area. Evidence that there is a market for such publications is the growth of weekly newspapers which concentrate on suburban happenings, despite competition from the city's daily newspapers. Facsimile can do this same community job on a daily basis—faster and cheaper.

The emphasis is on "neighborly" news, familiar names, familiar places. It is one of the strongest reader appeals you have. Remember the South Carolina lady who refused to read a copy of a New York newspaper, commenting, "I don't know anyone in New York." Many readers consider a street paving in their neighborhood more important than an earthquake in Peru.

Sponsored Editions. The chapter on Other Ways to Make Money with Facsimile suggests the great variety of commercial and other organizations that might become supporters of facsimile through this method. A natural would be a travel edition sponsored by air

lines, railroads, automobile clubs, busses, shipping lines, travel agencies, and oil companies. Not only do these firms have something to sell the public, but they also have a glamorous story to tell.

A travel edition can have very striking eye appeal. It can carry pictures of resorts in the Rockies, Europe, the Caribbean, and elsewhere. It can include maps of selected week-end drives within easy range of your city. It can describe guided tours to fascinating, far-off lands and give up-to-date information on changes in fares and timetables. With prices, time schedules, maps, pictures, and graphic descriptions of the comforts and facilities available, the travel edition can tell the prospective tourist everything he needs to know.

Special-interest editions should be transmitted between regular news editions. They can be spaced out through the publishing day and, if possible, should not immediately precede or follow your regular news service.

Illustrating Sound Radio Programs

A spectacular type of programming still being developed is the facsimile page which illustrates aural radio broadcasts. Multiplexing cleared the way for new possibilities in this field. A radio operator with facsimile broadcasts can transmit a striking service unlike anything that heretofore has been possible by radio or publications.

While a commentator in London is giving a play-by-play account of a crisis involving the countries of central Europe, the facsimile station can send maps and photographs to illustrate the areas and personalities involved.

A radio program on household hints includes a talk on tasty dishes and how to make them. At the same time, facsimile can print the recipes in the home. There is no frantic dashing for pencil and paper, no chance of making an error in the ingredients, no waste time while the recipe is being repeated.

A style commentator is giving a running description

of a fashion show. Just imagine how the interest is heightened while this is going on if the listener can look at a facsimile recorder and see unfolding pictures of the models wearing the hats, dresses, and accessories that are being described.

The President of the United States is delivering his message to Congress. As you listen to him speak, facsimile can print in your home the full text of what he says as fast or faster than he can say it. The texts are available in advance on press-association wires.

A network is airing a concert by the New York Philharmonic. Simultaneously, facsimile can transmit complete notes on the program, a picture of the orchestra, background on the composers, etc.

Popular quiz shows would be even more popular if the questions were printed in the home by facsimile as they are porpounded.

The possibilities in this field are innumerable. Talks, lectures, round-table programs, musical shows, and other sound radio programs can be accompanied—simultaneously, through the magic of facsimile—by maps, charts, texts, photographs, and other printed material that illustrates those programs.

Even commercials can be presented as advertisements on the facsimile page.

Country Weeklies by Facsimile: the Rural Radio Newspaper

Part of this chapter is devoted to telling how metropolitan newspapers can employ facsimile for supplementary editions and how independent FM stations can get into the publishing business via radio. The new medium also makes it possible for small dailies and weeklies to expand their services steadily at relatively low expense. Facsimile also opens the possibility of a general expansion in the number of new publications, for the cost of doing so is small compared with the outlay needed to launch a newspaper or magazine.

In the small-town field, the weekly can use facsimile for a different purpose from what it serves

in cities. As we have pointed out, a metropolitan daily can intensify and specialize its local coverage by facsimile editions. The weekly, however, and to some extent the small daily depend largely on news of strictly local happenings, including personals. A weekly can continue to stress this local coverage and use daily facsimile editions primarily for spot wire news. In this way, even though its regular edition comes out but once a week, the small-town paper can take the edge off the top news of the metropolitan papers coming into its area.

The average newspaper in a small community, whether daily or weekly, publishes but one edition. The backbone of its news coverage is local. It can afford to give little space to news of the outside world. With a supplementary facsimile service, however, it can deliver state, national, and foreign news as swiftly as readers get it in New York or Chicago.

Facsimile gives the small-town publisher many advantages he hasn't enjoyed before. For one thing, his newspaper has always been starved for good pictures. Engravings are so costly that he ordinarily can't afford many. The pictures in many weeklies are confined to syndicated mats several days old.

A facsimile edition brings his picture coverage up to date. Facsimile skips the expensive photoengraving process. All the local publisher needs is a newspicture service and a camera. His pictures can go directly from the darkroom to scanner to home recorders with speed, clarity, low cost, and a simplicity of handling unmatched by the conventional newspaper processes.

He can offer other invaluable services. The small town usually is the center of a rural area. The population is vitally interested in weather reports, farm-produce prices, and other information that directly concerns its welfare.

These facts can be delivered by facsimile faster than by newspaper and in a more satisfactory form than by radio. Have you ever tried to copy down commodity prices from a radio broadcast? With fewer pages and less editorial and advertising space than

his metropolitan competitor, the local publisher also can use facsimile editions to deliver additional news, features, and advertising by radio. If he doesn't own, he must, of course, have access to an FM station for transmission. Many small newspapers, however, do have FM licenses.

New Publications. Facsimile also offers an opportunity for new publishers to get into the small-town field. The cost is equipment, staff, and operation of launching a new conventional newspaper is almost prohibitive, even in a small community. Few new newspapers are started, and many old ones are either combined or discontinued, and this has been going on for many years. The number of papers, large and small, has steadily declined over a long period.

The capital investment needed to launch a facsimile newspaper, however, is small in comparison. It is a safe prediction that, if facsimile recorders ever become as common in the home as radio receivers, the number of local newspapers, delivered by air, will expand rapidly. In program content, they can offer a local product that doesn't duplicate their big-city competitors.

The Farm Facsimile Newspaper. Rural radio publishing is one of the most obvious fields for facsimile programs. Here is a specialized audience that facsimile can serve well and profitably. As far back as 1946, The Philadelphia Bulletin began regular broadcasts to 4-inch recorders of a farm-market-weather bulletin facsimile service.

The programming for farm editions should be built around three major rural interests: (1) the weather, (2) produce and market prices of all kinds, and (3) government announcements and farm aids. These items all have compelling interest for the farmer. By newspaper and trade journal, he gets them more slowly than he often would like. By radio, they may be incomplete or they may come at a time and in such form that he cannot always depend on getting the information he wants.

The Weather. Farmers and aviators are the weatherman's best fans. What is the forecast today, tonight,

tomorrow, and long range? Are there any fronts moving this way? Use weather maps. Most farmers know how to read them. Run an explanation for those who don't. Do a good detailed job on weather, including rainfall and temperature statistics, water tables, the data from neighboring states.

Prices: Farmers will read all the commodity prices they can get their hands on, especially if they are up to the minute. What are hogs and cattle and wheat selling for today in Chicago? What is the other fellow getting for the products I raise? What is the local market price, and what is it elsewhere? Make your reports as comprehensive as possible.

Design your list of quotations to cover the commodities that are produced locally. Write and get on the mailing lists for commodity letters of brokerage firms. The Chicago Board of Trade can recommend lists. The Wall Street Journal and a few other specialized publications give good commodity coverage. Watch these to get the over-all picture.

Government Announcements, etc. Uncle Sam calls the turn on many trends of vital importance to the agricultural population. What is the situation on subsidies? How is new farm legislation likely to affect crops? What deals are under way with foreign governments on food supplies? How about world-wide crop conditions and statistics? Crop estimates often mean a drop or increase in farm prices. Every bit of information the farmer can get helps him decide when to sell, store, and ship to market. Farming is big business. The farmer often is his own producer, employer, purchasing agent, and marketing agent. Anything that helps him do those jobs better is valuable to him.

Sources of farm program material are numerous. The U.S. Department of Agriculture mailing list is a must. The county agent can help. Ask him to write special articles. He can give warnings on bugs and blight and what to do about them. The state university extension service issues a wealth of useful material. Get on its mailing list. State departments of agriculture and state and Federal experiment stations offer still other services. Take advantage of them all.

Let the rural audience know about fairs, entertainments, church socials, school parties, 4-H Club activities, and the like. Roads are the farmers' business too. Stay in touch with the State Highway Department, and keep the farmer posted about new roads, detours, repairs, bridges, and washouts. It will save him money.

Many of the farm information services which you can get at no cost give valuable hints and suggestions for better crops, diversified farming, more efficient planning of buildings, etc. Use these. Keep abreast of current literature in agriculture and allied fields. Get reprint permission if an article especially suits your local situation. Your main job in such facsimile programming is to keep the farmer posted.

There are many potential sponsors for the farm edition, including implement, feed, and fertilizer dealers. Build an edition that offers a useful service and develops a wide audience, and you should have no difficulty getting advertisers.

Tips on Programming

Since speed and flexibility are the great appeals of facsimile, the programming machinery should be geared to take full advantage of these assets. Stories and pictures must be handled fast. Editing and make-up processes frequently overlap, so the routine must be clearly defined.

The editor should keep before him a copy record chart which shows edition times, news and illustrations being processed, the editions for which this material is intended, and other pages which have been made up, tested, and ready for transmission.

All routine sports, financial, and other reports should be timed for broadcast in the next edition after they are received. These "regulars" make a foundation for many pages. The schedules of wire services or city desk should be checked as each story is received. Compare wire-photo schedules with the wire stories so that related pictures are used on the same page with the story whenever possible. Watch release times carefully, and schedule any such hold-

for-release stories for the proper editions. Frequently, a major announcement can thus start rolling on the scanner the second it is released. Wire and local advance lists of forthcoming stories will give you a tip-off on the personalities or issues involved. Check these against the photographic morgue, and have pictures ready to use with the stories when they arrive. The whole process of programming is so fast with facsimile pages that you'll be surprised at how easy it is to dress up editions.

But decisions must be made swiftly. Edition deadlines are as inexorable as the ticking clock. The time for making up pages is limited. There should be no room for doubt in the instructions and procedures between editor and typist on production or between editor and make-up man on headline and make-up style. Each member of the staff must know his job and do it without delay.

The use of dummies for all pages will eliminate confusion, simplify make-up, and assure an orderly flow of copy. It also prevents the sudden, last-minute appearance of improper copy sizes when the artist starts to assemble the final layout. Don't guess or try to remember or try to handle too many things with oral instructions. Write down all program material on the copy chart as it comes in and on dummies as it is scheduled for specific pages.

The copy record chart tells you what material has been selected and is being processed—pictures and stories and their sizes and lengths. As these are assigned to pages, the fact is noted on the dummy sheet, which serves as an accurate guide for the make-up man. Edited news copy goes to the copysetter; heads to the artist-make-up man. The make-up man takes all cropped photos, cut lines, headlines, and text scheduled for a page and follows the dummy in pasting it up. Each finished page should be checked again by the editor before it goes to the scanner.

The pages should follow with an even flow as an edition begins to roll on the scanner. With proper organization, most pages can be delivered far enough ahead of the deadline to permit preair testing. Any

technical faults can then be caught on the test recorder and corrected before the copy is transmitted to the public.

As soon as one edition is broadcast, editors should review the fresh material on hand and move it into the processing channels promptly. Set aside prospective material for the first page or the opening page of the next edition. The latest top news stories should go on this page. Wait for any later developments. Meantime, start working on the other pages and especially feature material. Plan each one for individual display. They are equally prominent on the recorders.

There is no set rule for determining the proportion of text and picture copy. If photo coverage is outstanding, it may frequently comprise 50 per cent of the total space.

Conceivably, news photographs that describe some dramatic event better than a textual account might occupy all the space in a four-page edition except for explanatory cut lines. Pictures often have more reader appeal than any combination of type and headlines. Sometimes an entire page can be one photograph and caption, followed by a second page with additional details if the story warrants. Avoid giving the reader the impression, however, that you are simply using pictures of secondary interest to fill the space. Expediency is a poor substitute for brilliant planning and editing.

The material you hold back for the last page before the deadline can be revised constantly before processing and make-up. The flow of material will bring a diversified choice. As more important and interesting copy arrives, drop out material tentatively selected or reschedule it for another page in smaller space.

Post a list of copy deadlines as well as actual edition broadcast schedules. This will tell you how much time you have for processing material for each page and when you must release finished copy for material for each page and when you must release finished copy for make-up in order to have the completed page ready for the scanner in time. Even then, there is great elasticity in putting the edition together.

Frequently, an important news story breaks when the final page is being assembled. Use a bulletin head, and substitute the story on the page for another item that is the same size. If the page is already made up and due to go on the scanner in a minute or two, let the page go as it stands. Don't risk delaying the edition or spoiling the page with a rush job. Let the new story become the lead on page two, which you have more time to revise.

If the news break is so sensational that any delay in handling is out of the question, it is worth while taking the chance that rushed copy may record imperfectly. The prepared page can be made over hurriedly, or a page actually being transmitted can be interrupted to send a bulletin by itself. The reader will not object if the news is really important.

Press-association wire copy can be used directly on the scanner without retyping when speed is paramount. Longer stories of great news value can be trimmed to make a complete facsimile page. If the item is a flash or bulletin one paragraph long, the wire copy can be stripped across a facsimile page, under a standing "Bulletin" headline. Dramatize the speed of a news bulletin by leaving on the copy the time which is marked at the bottom of wire stories.

Later, when the more complete first lead of the story moves on the wire, the editor can insert a bracketed note calling attention to the time the original bulletin was transmitted. This calling attention to speed is more promotion than reporting, but readers like it because it gives them the feeling of being among the first to know what's going on in the world.

Other hints on how to improve programs and to stress the speed of facsimile will be found in the chapter entitled Style for Facsimile Writing and Editing.

Syndicated and Exchange Pages

Almost as soon as regular air newspapers began, organizations were set up to provide syndicated feature pages for facsimile stations. The first of these was

Newspaper Publishers' Faximile Service, organized by John V. L. Hogan's Radio Inventions, Inc. (see Fig. 15). The extent of syndicate services depend on the growth of facsimile newspapers and the demand for ready-made pages. Some of the large newspaper syndicates have indicated they would enter the field as soon as the demand for service became large enough. These syndicates already have all the source material and facilities for quickly turning out suitable pages for all types of facsimile editions.

The early facsimilists also found it possible to exchange certain types of feature pages having no time element. They thereby share the cost of production, improve the quality, and expand their backlog of attractive pages ready for broadcasting.

A healthy growth of syndication for facsimile would expand a station's programming scope immeasurably. Even a tiny station could deliver editions having a professional appearance. The small operator could rely on syndicated material for two or three out of every four pages he transmitted. These would be almost entirely feature pages of the kind discussed earlier in this chapter and picture pages of human-interest photos. The remaining space could be filled with spot news from the press teletype and spot news pictures. This would cut the staff requirements of a small station to a bare minimum. On a larger radio newspaper, syndicated pages could be used to supplement the production of the local staff. It would save in man power and make more frequent editions possible.

N.P.F.S. FEATURE PAGE ..... supplied ready for broadcast





By JACK SHARP, Sports Editor

The lowly baseball umpire wasn't always the underdog. Around the turn of the century colorful Tim Hurst proved that point. It all began when a famous outfielder had a close decision at the plate called against him by Tim. The fly chaser yelled, "You're a dirty crook!" And an exchange of sarcastic words followed. As was inevitable, Tim ordered the player to the showers.

When the hefty fly chaser was slow in leaving, Tim Hurst promptly flattened him with a left to the jaw that left the batter unconscious. Hmmm, wonder what "Happy" Chandler would have ruled in a case like that?

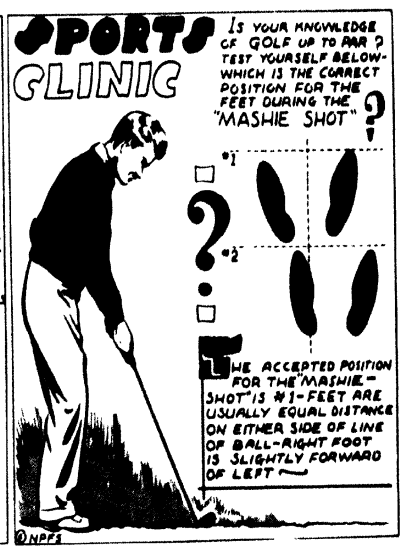


Fig. 15. Syndicated page prepared by Newspaper Publishers' Faximile Service.

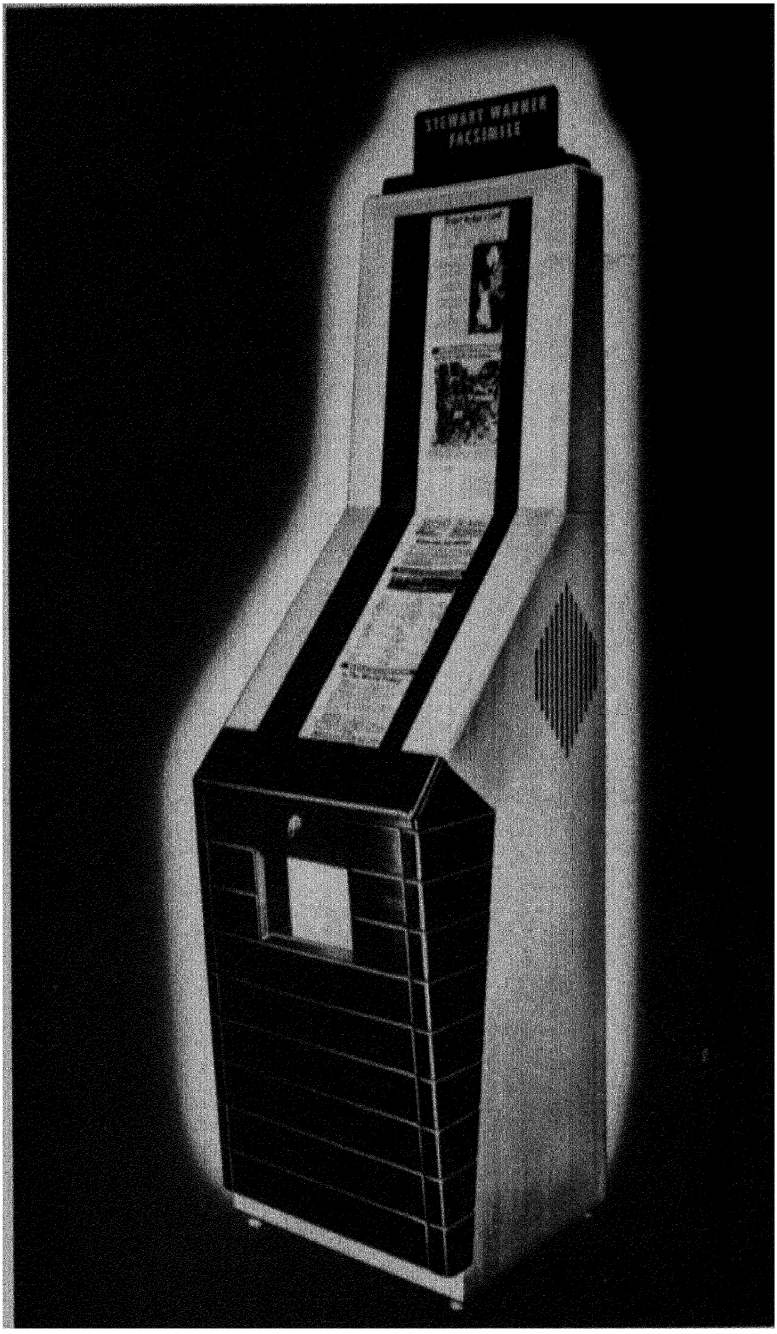


Fig. 16. Facsimile receiver for public places manufactured by the Stewart-Warner Corporation.

XII

STYLE FOR FACSIMILE WRITING AND EDITING

The 1940's may prove an important decade in the history of news writing. A general shortage of newsprint during and after the Second World War made "keep it short" a must. Then came readability studies. They emphasized that readers understand simple writing best.

Terse, direct writing replaced long-winded, vague copy. The change was neither immediate nor complete. But the trend was definite. Even the "old guard" realized newspapers had developed bad habits. They often were using words like shotgun pellets instead of rifle bullets. It was a waste of precious paper. Even worse, it was confusing and losing readers.

The growth of weekly news magazines may have been the initial spark. In them, a week of world-wide news was neatly packaged. Sentences were short. Words were familiar.

Magazines which printed short versions of long stories earned a healthy place on newsstands. A good demand remained for the original versions, but circulation trends showed that more prople were reached by concise, well-written, easy-to-read copy. Some sociologists deplored encouraging "lazy" readers. Editors, however, must be realists. The public wanted the news brief, readable, and understandable.

Facsimile has no choice but to side with the "keep it short" school. Time is precious. So is space.

Newspapermen and radiomen face time and space limitations, too. However, the techniques which solve their problems are not the complete answers for facsimile.

Radio news writing is fundamentally conversational. Scripts do not always "read" as well to the eye as they sound coming out of a loudspeaker.

Newspaper writing aims at brevity, but the larger size of regular newspapers permit longer stories than you can use on facsimile.

Although a newspaper or radio news-writing background is an excellent foundation, the facsimile writer must develop new techniques for the new art. His copy must

be more tightly edited than for any other form of publishing.

Editing Procedure

Facsimile editorial workers will do far more editing of copy than they will original writing. The nature of the business is condensing and rewriting the output of other writers. This does not mean that there is no room for creative writing in facsimile. We merely wish to stress that being able to edit copy well is a prime requirement for success.

The first step is to assemble copy without wasted motion. Be sure the press-association printers are operating properly, are loaded with paper, and have a fresh ribbon (you may want to snatch a bulletin from the teletype and use it directly on the scanner). You cannot indulge in the luxury of a mechanical fault. Minutes can count.

If you have a newspaper connection, establish a practical routine for getting carbons from the city desk promptly and for handling stories phoned directly to the facsimile department.

Organize your copy. Use spikes or clips to keep all pieces of a single story together, with latest developments on top.

Keep Copy Moving. Watch the clock. Speed is an important part of your technique. Setting copy and heads and making up pages take time. If you delay decisions, you may miss your deadline. Or you may rush pages to the scanner too fast to be sure they are right.

The continuing flow of news may change your mind about the lead story. But in the meantime set aside what you think will be the top story and get the rest of the copy moving.

Dummy Pages Accurately. Use page dummies, with carbons. As you release stories to the copy setters, mark the dummy. When a page is completely dummied, give the original to the make-up man. Keep the carbon for reference.

Scale copy and art so that they exactly fill the space. It can be done. You know a facsimile page is

four newspaper columns wide and 11½ inches deep. Edit your copy and dummy the pages to fit. Actually, facsimile stories should be so tightly written or edited that it is virtually impossible to cut them.

Tailoring the Copy. Assuming an orderly handling of copy, this chapter will concentrate on what happens to the copy before it leaves the editors. How skillfully they melt down the news to the crispest form possible will largely determine the success or failure of your publication. Slipshod editing is glaringly apparent on facsimile.

Be accurate, be fair, and be interesting. Being interesting on facsimile means being brief. A long story on a small facsimile page has all the appeal of a telephone directory. To earn eye appeal the stories must be short. That means pruning everything you write and every piece of local or press-association copy that passes through your hands. Leave the essential trunk and limbs of the news. Cut off extra foliage. The tighter you wrap up each story the more stories you can deliver.

Round up the Briefs. The first copy you will move are the secondary stories. Select those which fall in the same category, and rewrite them into a roundup. Departmentalize as much copy as possible, and run the stories under a label head.

For example, when Congress is in session, two or three Washington stories may come in between editions. They should be evaluated carefully. If the stories are related, they can be written into one. If they are unrelated, e.g., a Supreme Court decision, an Agriculture Department report on the corn crop, and a House committee statement on Communists, write them in bulletinized style and use under a Washington head on the same page.

Of course, if a story is headline material, you give it individual treatment and display it on the page according to its news worth.

Facsimile copy moves so fast you do not have many stories in the same general classification that accumulate between editions. But whatever is on hand should always be considered as a roundup possibility. It

simplifies your make-up and gives the reader a quick picture of what is happening.

Sports, society, markets, education, art, books, and politics all are on the list of roundup possibilities.

Writing Techniques

What Time Is It? In all rewrites or original writing, the time element is important. Facsimile is delivering the news hours before the regular newspaper. Standard newspaper practice may call for "today," but facsimile can better say, "at 10:15 a.m."

Keeping the exact time in a story, whenever it points up your speed in broadcasting, lends an atmosphere of immediacy to copy which is important. The reader constantly is aware of the rapidity with which he is getting the information, and that is one of the main reasons he reads facsimile.

Whenever time is mentioned in a story, relate it to the hour the edition is published. If the singles championship at a tennis club is scheduled for 3 p.m. and the story is on the 2 p.m. edition, refer to the match as "in 1 hour." If the contest is in progress, say "now being played." And when you report the winner, it might include, "½ hour ago" or the exact time "3:45 p.m."

Never use "this morning," "this afternoon," or "tonight" if you know the exact hour. Peg events by the clock, not the calendar.

Briefing Wire Copy. Press-association copy may or may not be tightly edited when you get it. It is primarily intended for regular newspapers, where the writers have some elbow room as far as length is concerned.

Knock out nonessential statements. They may be well-rounded newspaper writing, but they are not absolutely necessary for facsimile. If you accurately convey the idea of the story, the reader will be satisfied.

Names and quotations are not always needed. If a spokesman for a nation-wide organization makes the news, see if you can attribute the story to the organization and save space.

The original:

CHICAGO, DEC.15—(AP)—THE NATIONAL WOMAN'S CHRISTIAN TEMPERANCE UNION URGED TODAY THAT THE SPECIAL SESSION OF CONGRESS DECLARE A "HOLIDAY FROM HANGOVERS" TO SAVE GRAIN FOR EUROPE.

MRS. D. LEIGH COLVIN, WCTU PRESIDENT, ADVOCATED LEGISLATION TO "CLOSE DISTILLERIES AND BREWERIES INDEFINITELY PLUS VOLUNTARY PUBLIC ABSTINENCE TO CONSERVE GRAIN."

"THE CURRENT 60-DAY SHUTDOWN OF DISTILLERIES AND DOUBTFUL CURTAILMENT OF GRAIN BY BREWERS ARE OF NEGATIVE VALUE, BECAUSE DISTILLERIES HAD ALREADY DESTROYED A GREAT EXCESS OF GRAIN BY OVERPRODUCTION AND THE BREWERS HAVE BOASTED THAT THE TEMPORARY RESTRICTIONS WILL NOT RESULT IN 'THE LOSS OF A SINGLE BARREL,'" SHE SAID IN A STATEMENT.

The facsimile rewrite:

Chicago—(AP)—A "Hangover Holiday" to save grain for Europe was proposed today by the Women's Christian Temperance Union. It recommended closing distilleries and breweries indefinitely, plus voluntary public abstinence.

Specific names can be left out of many rewrites. For example, "The Army announced today a new long-distance record for a jet-propelled aircraft. An FJ-91 flew nonstop from Burbank, Calif., to Miami, Fla., a distance of 2,340 miles at an average speed of 481 miles per hour."

The name of the general making the announcement or the city in which he was interviewed is not necessarily a vital element of the story.

Similarly, such organizations as The American Legion, Boy Scouts of America, New York Yankees, etc., can be credited with news without the name of a spokesman.

It will be obvious to you when the name of a spokesman is essential to the story itself. Generally, you can skip many details, and your facsimile account will be that much crisper and more readable.

Here is a story about moving troops. The main idea was that they were to get out of Italy. See how the less important information has been omitted in the facsimile rewrite:

LEGHORN, ITALY, NOV. 15—(UP)—MAJ. GEN. L. C. JAYNES, COMMANDER OF U.S. FORCES IN THE MEDITERRANEAN, ANNOUNCED TODAY THAT ALL AMERICAN TROOPS WILL BE OUT OF ITALY BY DEC. 3, TWO WEEKS AHEAD OF THE DEADLINE SET BY THE ITALIAN PEACE TREATY.

JAYNES SAID THAT 10,500 TROOPS HAD BEEN REDEPLOYED TO GERMANY SINCE SEPT. 15 AND ANOTHER 3,500 WOULD GO THERE BY TRAIN WITHIN THE NEXT 18 DAYS. ALL EXTRA AMERICAN SUPPLIES AND EQUIPMENT WILL BE TURNED OVER TO THE ITALIAN GOVERNMENT, HE ADDED.

That item appeared under a "Europe" head in facsimile as follows:

Leghorn, Italy—(UP)—All U.S. Army troops will be out of Italy by Dec. 3, Maj. Gen. L.C. Jaynes announced. 3,500 troops will go to Germany where 10,500 have been deployed from Italy since Sept. 15. Surplus supplies will be given to the Italian government.

The major elements of the following story are food and money. The rest is window dressing, from facsimile's viewpoint. Here is the original version:

CLEVELAND, NOV. 15—(AP)—YARD WORKERS COMPLETED STUFFING SOME 7,000 CASES OF FOOD INTO EIGHT BOXCARS TONIGHT TO THE EVER-LONGATING FRIENDSHIP TRAIN'S CARGO OF FOOD FOR HUNGRY EUROPEANS.

THE CONTENTS OF THE EIGHT CARS, SAID CLARENCE T. MORRIS, CHAIRMAN OF THE TRAIN COMMITTEE, AMOUNTS TO ABOUT 200,000 POUNDS OF FOOD AND A CASH FUND OF $9,000 WAS ALSO RECEIVED AS CLEVELANDERS WENT ONE BOXCAR OVER THEIR PLEDGE.

BISECTED AT CHICAGO TODAY INTO TRAINS OF FIFTY-TWO CARS EACH, THE CLEVELAND SECTION IS DUE TO ARRIVE AT ABOUT 3 A.M. (EST) TOMORROW. AT 9:30 A.M. AT THE OLD NOTTINGHAM STATION OF THE NEW YORK CENTRAL RAILROAD THERE WILL BE MUSIC BY A 40-PIECE CLEVELAND FEDERATION OF MUSICIANS' BAND, A GREETING BY MAYOR THOMAS A. BURKE AND A TALK BY HENRY J. KAISER, A MEMBER OF THE PRESIDENT'S FOOD COMMITTEE.

FROM CLEVELAND, THE TRAIN WILL MOVE ALONG THE LAKE SHORE TO ASHTABULA, BUFFALO, SYRACUSE, UTICA AND ALBANY BEFORE THE FINAL STOP AT NEW YORK CITY.

THE OTHER SECTION OF THE TRAIN, HEADED BY COLUMNIST DREW PEARSON, ORIGINATOR OF THE IDEA, STOPPED AT MANSFIELD, O., TODAY TO ADD FOUR CARLOADS CARRYING 190,000 POUNDS OF FOOD AND TO RECEIVE CASH GIFTS OF $1,000.

The facsimile rewrite:

Cleveland, Nov. 15—(AP)—Yard workers here and at Mansfield, O., stuffed 12 boxcars with almost 400,000 pounds of food for hungry Europeans today as the Freedom Train moved east. In addition, $10,000 in cash was received. The train has grown to two sections of 52 cars each. Columnist Drew Pearson, originator of the idea, is aboard the Mansfield section.

Four or five paragraphs can tell almost any story for facsimile.

The following dispatch from London had general interest, but in its original form would have occupied more than a full page. Rewritten, it was a quarter-page facsimile story. The two versions follow:

LONDON, NOV. 15—(UP)—PRINCESS ELIZABETH AND LT. PHILIP MOUNTBATTEN HAVE AGREED PROVISIONALLY TO VISIT CANADA AND PROBABLY THE UNITED STATES NEXT SPRING, A SOURCE CLOSE TO BUCKINGHAM PALACE DISCLOSED TONIGHT.

THE ROYAL COUPLE, TO BE MARRIED NEXT THURSDAY AT WESTMINISTER ABBEY, WOULD POSTPONE A NORTH AMERICAN VISIT ONLY IN THE CASE OF PROSPECTIVE MOTHERHOOD FOR THE PRINCESS WHEN IT CAME TIME TO START THE TRIP, THESE SOURCES INDICATED.

FOR THIS REASON ALL PLANS FOR THE TRIP ARE ON A PROVISIONAL BASIS AND NO OFFICIAL ANNOUNCEMENT FROM BUCKINGHAM PALACE IS EXPECTED UNTIL SHORTLY BEFORE THE INTENDED DATE OF DEPARTURE, IT WAS INDICATED.

ARRANGEMENTS FOR THE ROYAL VISIT TO CANADA WERE COMPLETED LAST WEEK BY CANADIAN PRIME MINISTER WILLIAM L. MACKENZIE KING WHEN HE ARRIVED HERE TO ATTEND THE WEDDING AND MAKE A TOUR OF WESTERN EUROPE. IT IS EXPECTED THAT MACKENZIE KING WILL HOLD FURTHER DISCUSSIONS AT BUCKINGHAM PALACE WHEN HE RETURNS FROM THE CONTINENT.

INFORMANTS ACQUAINTED IN PALACE CIRCLES SAID IT WAS TAKEN FOR GRANTED THAT THE PRINCESS AND HER PRINCE CONSORT WOULD ALSO VISIT THE UNITED STATES IF THEY WENT TO CANADA.

PRESIDENT TRUMAN INVITED PRINCESS ELIZABETH AND HER BRIDEGROOM TO VISIT THE UNITED STATES SHORTLY AFTER THEIR ENGAGEMENT WAS ANNOUNCED LAST SPRING. AN INVITATION TO VISIT CANADA WAS RECEIVED

AT THE SAME TIME. AT THAT TIME THERE WAS NO OFFICIAL COMMENT ON EITHER.

ELIZABETH'S VISIT TO NORTH AMERICA WILL BE HER FIRST. SHE AND HER SISTER, PRINCESS MARGARET ROSE, DID NOT ACCOMPANY KING GEORGE AND QUEEN ELIZABETH WHEN THEY VISITED CANADA AND THE UNITED STATES IN 1939. ELIZABETH WAS ONLY 13 YEARS OLD THEN.

THE PRINCESS TRAVELED ABROAD FOR THE FIRST TIME LAST SPRING WHEN SHE TOURED SOUTH AFRICA FOR 10 WEEKS WITH THE ROYAL FAMILY. IN HER 21ST BIRTHDAY BROADCAST FROM CAPETOWN WHEN SHE SAID SHE HOPED IN THE FUTURE TO VISIT OTHER NATIONS IN THE BRITISH COMMONWEALTH.

ANNOUNCEMENT OF THE PROPOSED VISIT WAS MADE AS THE ROYAL COUPLE UNVEILED THEIR OFFICIAL WEDDING CAKE--A SNOW-WHITE BEAUTY NINE FEET TALL AND 500 POUNDS IN WEIGHT THAT WAS THREE MONTHS IN THE MAKING.

THE FOUR TIERS OF THE MASTERPIECE, SEASONED WITH FIVE AND ONE-HALF PINTS OF RUM, BRANDY AND CURACAO, WERE ASSEMBLED AT A PREVIEW SANCTIONED BY THE PRINCESS WHILE POLICEMEN STOOD GUARD TO MAKE SURE THAT NO ONE DIPPED A FINGER IN THE FROSTING.

THE PREVIEW WAS STAGED IN THE RCYAL BAKING FACTORY WHERE THE CAKE WAS MIXED 12 WEEKS AGO BY F.E. SCHUR, ONE OF THE FIVE BEST KNOWN MASTER BAKERS IN THE WORLD. NEXT WEDNESDAY IT WILL BE TAKEN DOWN AGAIN AND TRANSPORTED BY TRUCK—AGAIN UNDER GUARD—TO BUCKINGHAM PALACE.

PHILIP WILL SLICE THE CAKE FOR GUESTS AT BUCKINGHAM PALACE FOLLOWING THE WESTMINISTER ABBEY CEREMONIES NEXT THURSDAY. ONE SLICE, HOWEVER, WILL BE CUT OUT BEFORE PHILIP CARVES. THIS SLICE CONTAINS SEVEN LUCKY SILVER CHARMS BAKED INTO THE CAKE—A BACHELOR BUTTON, WEDDING RING,

THIMBLE, DONKEY, THREE-PENNY BIT, WISHBONE AND HORSESHOE.

SCHUR SAID THE CAKE WAS THE MASTER-PIECE OF HIS BAKING CAREER. HE MIXED IT 12 WEEKS AGO, BAKED IT FOR 10 HOURS AND THEN LEFT IT FIVE WEEKS TO MATURE. DECORATIONS TOOK FIVE MORE WEEKS OF HIS TIME. THE SECRET MIXTURE USED IN THE CAKE, HE SAID, MAKES IT IMPROVE WITH AGE FOR SIX MONTHS.

THE OFFICIAL CAKE IS ONLY ONE OF THE 12 ACCEPTED BY ELIZABETH. THE OTHER 11 WILL BE DISTRIBUTED TO CHARITY ORGAN-IZATIONS ON THE DAY OF THE WEDDING. BUCKINGHAM PALACE, STILL WORRYING THAT FOLKS MIGHT THINK KING GEORGE VI WAS GIVING A PRETENTIOUS WEDDING FOR HIS OLDEST DAUGHTER, STRESSED THAT ALL IN-GREDIENTS FOR THE CAKE WERE GIFTS FROM THE GIRL GUIDES OF AUSTRALIA AND THUS NO DRAIN ON BRITAIN'S OWN THIN FOOD SUPPLIES.

IT ALSO WAS EXPLAINED THAT THE PRINCESS DID NOT HAVE TO GIVE UP BREAD COUPONS FOR THE CAKE BECAUSE IT WAS A GIFT.

THE FOUR TIERS OF THE CAKE STAND ON A SILVER BASE SOME 40 INCHES ACROSS. THE TIERS ARE SEPARATED BY SILVER PIL-LARS AND THE ENTIRE NINE-FOOT MASTER-PIECE IS SURMOUNTED BY A SILVER BOWL WHICH WILL HOLD CAMELIAS AND WHITE ROSES. THE SILVER FRAMEWORK AND BOWL ARE VET-ERANS OF THE SEVERAL PREVIOUS ROYAL WEDDINGS.

THE ONLY BREAK IN THE CAKE'S CRISP WHITENESS ARE PANELS HAND-PAINTED ON SILK, EACH ONE SPECIFICALLY REQUESTED BY THE PRINCESS.

ON THE BOTTOM TIER ARE ELIZABETH'S ARMORIAL BEARINGS WITH PLAQUES SHOWING BUCKINGHAM PALACE, WINDSOR CASTLE AND BALMORAL CASTLE.

ON THE SECOND TIER ARE THE ARMS OF LT. MOUNTBATTEN SUPPORTED BY MODELED SCENES SHOWING HIS FAVORITE SPORTS—CRICKET, SAILING, TRACK AND FIELD.

THE THIRD TIER SHOWS THE CREST OF THE ROYAL NAVY, PHILIP'S SERVICE ARM; THE GRENADIER GUARDS, OF WHICH ELIZABETH IS COLONEL IN CHIEF; AND THE AUXILIARY TERRITORIAL SERVICE IN WHICH SHE SERVED DURING THE WAR. THIS TIER ALSO HOLDS PLAQUES SHOWING SOME OF HER ACTIVITIES—TENNIS, RIDING, MUSIC.

ON THE TOP TIER IS THE CREST OF THE ROYAL NAVY, BADGES OF THE GIRL GUIDES AND SEA RANGERS, AND SAILORS BEARING THE MONOGRAM OF THE BRIDE AND BRIDEGROOM.

THE GENERAL DESIGN OF THE CAKE IS CLASSICAL GREEK. OFFICIALS SAID IT IS SOMEWHAT LESS ORNATE THAN CAKES FOR PREVIOUS ROYAL WEDDINGS, ESPECIALLY FOR ELIZABETH'S GREAT-GREAT-GRANDMOTHER, QUEEN VICTORIA, WHOSE WEDDING WAS CELEBRATED WITH 101 CAKES.

The facsimile rewrite:

Princess Elizabeth and Lt. Philip Mountbatten, who will be married Thursday, may visit Canada and the United States next spring. Only prospective motherhood would postpone the trip, a Buckingham Palace source disclosed tonight.

In 1939, when King George and Queen Elizabeth visited Canada and the United States, 13-year-old Elizabeth was left at home. Her first trip abroad, this year, was to South Africa.

Announcement of the proposed visit came as the royal couple unveiled their official wedding cake, one of twelve given to Elizabeth. The other 11 will go to charity.

The four-tier cake is snow-white, nine feet tall and weighs 500 pounds. It was mixed 12 weeks

ago, baked for 10 hours and then left five weeks to mature. Decorations took five more weeks. The secret mixture in the cake, Master Baker F. E. Schur reported, makes it improve with age for six months.

The masterpiece includes panels hand-painted on silk depicting castles, coats of arms, crests and the couples' favorite sports. Officials said it is less ornate than some previous royal wedding cakes.

Stories from the city desk may be tightened in a similar manner. Notice how the time element has been inserted in the facsimile rewrite of the following story and the impact it adds to it.

The original story from The Miami Herald:

Doll-like Bernice Henry, 17-months-old kidnaping victim in a family mystery, is going home to her anxious parents.

The blonde, blue-eyed tot was located in Miami Saturday after a five-month search which started when she disappeared from her home near Houston, Tex., in the company of an aunt.

A warrant charging kidnaping was issued in Houston for the aunt, Mrs. Mitchell Ashline, about 23, the FBI said. She has not been apprehended.

In a foster home here, little "Bunny" Henry smiled readily, oblivious of the strange events which made her a pawn in what the FBI called a "kidnaping within a family."

The story started June 10 when the baby disappeared from the family vacation camp which her parents, Mr. and Mrs. Leonard Henry of Westfield, Mass., had established on West beach at Galveston, Tex.

While Henry and an uncle of the child went to California to get an automobile, Mrs. Henry said that Mrs. Ashline took Bernice on a shopping tour in Galveston.

When neither reappeared at the camp, police were

notified and later the FBI joined in the hunt.

At one time a woman with a child fitting the description of the missing two was reported seen in New Orleans. From there the FBI traced the trail to Florida.

Shortly after, the baby was found abandoned in a rooming house in Key West, where the aunt reportedly had been working as a waitress.

Juvenile authorities turned the child over to the Children's Home Society of Florida on July 11, and then began a search to establish her identity.

A wallet left behind in the Key West rooming house provided clues which pointed to Westfield. There, a Massachusetts children's agency took up the elusive thread and made tentative identification.

Bunny was positively identified as the missing baby when the FBI produced a picture which Society officials here quickly recognized.

Saturday the anxious father put in a long-distance telephone call from Westfield to Mrs. Helen Squires, case-worker supervisor of the Children's Home Society.

The father wanted to come here immediately to claim his baby, but the intricacies of official channels are not that simple. He was told to arrange for Bunny's return through the Massachusetts agency.

But the months of heart-rending waiting and wondering were over for the distraught parents.

Baby Bunny was safe—and happy in the foster home where the Children's Home Society, a Community Chest agency, had placed her.

Within a few days, society officials said, baby and parents will be reunited.

"She's a wonderful baby," said Mrs. Squires "Her ready smile shows a grand disposition...except when she doesn't get her way."

For little Bernice, it is a happy ending to a strange odyssey.

But still to be written is the story of the aunt who the FBI says kidnaped the child only to abandon her in a far-away rooming house.

Therein lies the mystery, which both FBI and

Children's Home Society investigators were at a loss to explain.

The facsimile rewrite:

Bernice Henry, 17-months-old, of Houston, was found safe in a Miami foster home two hours ago, ending a five-month search.

Mrs. Mitchell Ashline, aunt of the child, is alleged to have kidnaped Bernice while her parents were vacationing. Police traced the missing two to New Orleans, then to Florida.

The girl was abandoned in Key West and an intensive search to identify her ended when a photograph supplied the FBI by her father was identified by Children's Home Society officials here.

The baby and her parents will be reunited in a few days. The search for Mrs. Ashline continues.

For make-up purposes many short items with independent heads may be necessary. They will be conspicuous, so make them good. The lighter side of the news frequently can be handled in these shorts. Get to the point fast, and quit. Hold the short item to one paragraph. You will need many of these for make-up purposes.

Tell It in Cut Lines. Carry the "keep-it-short" policy over to stories with related photographs. If possible, tell the story in the cut lines rather than run both the photograph and the story.

Here is a story from the Washington Post about the opening of an underpass. It ran with a three-column engraving of a parade opening the new project.

Silver Spring, which now ranks as Maryland's second largest city, became a main-line community again yesterday.

Its residents and neighbors, 70,000 strong, made the occasion a ringing one as the new $1,400,000 Georgia Ave. underpass was opened.

Gov. William Preston Lane, Jr., snipped a tape spread across the entrance to the gleaming white

concrete underpass at 2 p.m. and a few minutes later his car was the first vehicle to pass through.

This ceremony was followed by a parade, a long one with a cortege of official cars, four bands and more than 60 floats. The parade wound through a mile of Silver Spring's business section and residential area to the new Montgomery Blair High School stadium.

At the stadium, there was a 90-minute program highlighted by an address by Governor Lane.

The Governor outlined the history of the construction of the new underpass and told his audience.

"I believe you'll agree that what we have here now was worth waiting for, and worth all the trouble and inconveniences the achievement of it required."

The new underpass which Silver Spring celebrated so thoroughly yesterday goes under the Baltimore and Ohio tracks.

The B. & O,'s president, Roy B. White, said at the ceremonies that the railroad was pleased to have had a part in the project.

As part of the project, a new highway was built on Georgia Ave. from the East-West hwy. to the Colesville rd.

The celebration also gave Silver Spring an opportunity to dedicate Montgomery Blair's new stadium. Yesterday was the first time that the new stadium had been used for an official gathering.

The story was handed to a facsimile staff writer for rewrite into three-column cut lines. Here is what he wrote:

70,000 SILVER SPRING residents and neighbors celebrated the opening of the new $1,400,000 underpass at the Baltimore & Ohio tracks and Georgia Ave. yesterday. This aerial view shows a parade which marched through the underpass after Gov. William Preston Lane, Jr., dedicated

it at 2 p.m. The parade ended at the new Montgomery Blair High School stadium where Gov. Lane and Roy B. White, B. & O. president, featured a 90-minute program that also served to dedicate the stadium.

An airplane-crash story with a photograph may or may not squeeze down to cut lines only. It would be unwieldy and comparatively unreadable to include a long list of victims. Give the names in the accompanying story. If a photograph is a head shot of a prominent citizen, his report on the Community Chest campaign could hardly be summarized in a few lines under the art. Common sense will tell you when cut lines can tell the story.

Features Can Be Tight Too. It would be foolish to apply one set of rules to editing straight news copy and another to feature material. Both must be tightly written.

Syndicated material for newspapers usually runs about the same length for each day's feature. The editors allot space and assume that the copy is written to fit with minor editing. Facsimile editors using such material should put it through the same process as city desk or wire copy.

The very nature of the copy indicates that the writer is going to give his subject more liberal treatment than straight news, but you can edit him down without ruining the feature.

Adjectives and qualifying phrases overpopulate most features, particularly fashion and sports copy. You can usually edit out three-fourths of the adjectives without losing a reader or making the copy flat. A good active verb can often take the place of an adjective.

Here is a story from the Miami Herald about the British West Indian Island of St. Lucia, written in feature style for a Sunday edition:

> Home of catastrophes--that is what historians may someday call the Caribbean islands which somehow survive earthquake, hurricane, fire and pestilence.

Latest of these sunny isles to renew an acquaintance with tragedy is St. Lucia, whose capital city of Castries is trying to make a comeback after a devastating fire that left 24,000 homeless two months ago.

To aid its people and those of other West Indian islands like Barbados, Jamaica, Antigua and Granada, $250,000 is being asked from American citizens of West Indian origin.

The Institute of Caribbean Affairs, of New York City, recently called together representatives of 10 West Indian beneficial organizations and asked $150,000 in food and $100,000 in cash to tide the Caribbean residents over.

At Castries, frame buildings went up like matchwood on the morning of June 20. All day buildings burned while fire fighters struggled against odds. Water pressure dropped to a trickle.

Looters roamed the town while bluejackets posted guard around pitiful piles of the citizens' belongings. Property damage was later estimated at more than $10,000,000.

A bank, the town newspaper, stores, warehouses, electrical and communication facilities were swept up in the holocaust fanned by sea breezes.

The town's inhabitants were served meals from the jail by Boy Scouts. Neighboring islands rushed in clothing and supplies. British and American air lines carried in food, bedding, badly needed telephone wire and oxygen to the stricken populace.

Warehouses went up in flames taking with them much of the island's means of livelihood, its export products, sugar, mace, nutmeg, lime juice and lime oil, coconuts and copra.

In the face of adversity the natives--predominantly Negro--recall the earlier days which have seen hurricanes, tidal waves, earthquakes and volcanic eruptions, a St. Lucia specialty. (One 4,000-ft. volcano, Soufriere, stands at the southeast corner of the island, as a reminder to the populace.)

The fire which destroyed Castries was probably

the most electrifying event in St. Lucia since a night in early 1942.

Through its narrow needlelike harbor approaches, a German submarine slid in, running near the surface. Past harbor defenses and between dangerous rocks the U-boat sailed to within a few hundred yards of the SS Lady Hawkins and the SS Umtata, two large ships tied up to Castries' concrete wharf.

The sub fired a "spread" of torpedoes which caught both ships. As they settled in the shallow harbor they carried part of the docks with them.

Castries, built almost entirely of wood, has been burned out before. Another holocaust swept the place in 1927, and neighboring islands like St. Vincent to the south then, too, came to the rescue with cash, potatoes, flour and clothing.

Castries, though not a favorite haunt of Americans, was a tourist's stopover on cruises through the Caribbean. Natives sold trinkets, woven baskets and wooden novelties to visitors bent more on buying rum. From a hotel high above the port Americans dined and looked at the scenery.

In 1941 the United States built air defenses near Castries as one of the features of the "50-destroyer deal" with Great Britain.

An American contractor brought in hundreds of engineers and scores of women office workers to get the airfields and roads built. Many Miamians were in that group as well as the military garrisons that went to St. Lucia when the bases were finished. They learned about malaria and about snakes.

Ironically, the ugly barracks they built were untouched by the June 20 fire. But the neat Barclay's bank, the historic newspaper, Voice of St. Lucia, and buildings dating from Lord Nelson's day went up in smoke.

At the meeting in New York one spokesman for the St. Lucia colony accused the island's British colonial government of "angling to keep out American aid...." The American colony supported

several small schools in the islands before the fire, he said.

But whatever the political implications, Castries will build again. Hammers already ring where only piles of ashes and charred timbers lay weeks ago. The town will rise again. It always has.

The same story rewritten for facsimile:

Caribbean islands deserve being called the home of catastrophes. Tidal waves and volcanic eruptions, earthquakes, hurricane, fire, pestilence batter them regularly. Somehow, they survive.

Most recent victim is St. Lucia island, whose capital city, Castries, was swept by fire that left 24,000 homeless and $10,000,000 in property charred wreckage, two months ago.

Food warehouses, a bank, the town newspaper, electrical and communication facilities were destroyed. Sea breezes and low water pressure defeated the fire fighters. Looters followed in the wake of the flames. Bluejackets finally restored order.

The jail became a cafeteria, with Boy Scouts in charge. Neighboring islands rushed clothes and supplies. British and American air lines carried in food, bedding, telephone wire, and oxygen.

When dawn came, the natives, predominantly Negro, started cleaning up. They are hard to discourage. The Germans discovered that when a sub blasted two large ships and part of Castries' wharf to the bottom in 1942. Quick rebuilding is routine on St. Lucia.

Bolstering the native effort is the Institute of Caribbean Affairs, of New York, which called representatives of 10 West Indian beneficial organizations and asked for $150,000 in food and $100,000 in cash aid.

The few cruise tourists who stop at Castries can dine in a hotel high above the port. They

can see installations built by the United States during the war, patches of virtual jungle and an awesome stretch of blue water. And rising from the ashes they can see a new Castries, too, as the natives renew their battle against a nature that knows no mercy.

Does It Ruin Copy? Some writers balk when they move into facsimile and are told to "write it still tighter." One newsman flared, "Who are we writing for, fifth graders?"

The answer was, "If fifth graders can understand it, the rest of your readers will. It can still be good writing."

Of course it can be overdone. Acute paragraphitis and the overuse of one-syllable words *are* boring. You don't want a staccato, telegraphic effect. Your writing rhythm should have a change of pace. Mix long and short sentences so that the over-all result is copy that is easy to read and understand.

It is not proposed that simple writing for facsimile be carried to an absurd end. Elimination of all words which clutter up a sentence, the substitution of short words for long ones, and removal of all sentences which clutter up a paragraph—this is an entirely different goal.

Keeping it short does not mean jumpy sentences or distortion of ideas. It means reaching more readers with a precise thought quickly. In actual practice, facsimile writers and editors learn to like the super-short style. This is not because it means less work. Brevity actually requires more concentration and skill than does the writing of loose copy. Facsimilists like the style because it is lucid. And saying what he means, without wasted motion, is a prime satisfaction for any good newsman. It is probably even a greater satisfaction to the reader who, as a result, understands what he reads.

XIII
PHOTOGRAPHY

The ability to reproduce photographs with a soft, lithographic appearance is one of facsimile's greatest appeals. Because the recording does not have a screen such as is used in photoengraving, the photographs can record with greater detail than those printed in newspapers.

No unusual skill is required to deliver good facsimile pictures. You need only observe a few basic rules. Previous experience in handling photographs for publication is helpful but not essential. Naturally, the more you know about photography the easier your job will be. But you can start from scratch.

Foundation stone of good photograph recording is the use of photographs made on single-weight paper. It wraps around the scanner drum without wrinkles, and the thin edges will not cause border shadow. If photographic paper is too heavy, you will have difficulty anchoring the plastic blanket on the drum. Even if you succeed in forcing the blanket mooring into place, the stretching process creates tension which may backfire. When the scanning drum revolves, the added tug of centrifugal force may make the blanket pull loose. It will flap against the console 360 times a minute and probably toss off the photograph. Your transmission will be interrupted.

One of your troubles if you use excessively thick paper is likely to be wrinkles or buckled areas. The photoelectric cell has a fixed focus, and a wrinkle or buckle in copy on the scanning drum may be out of focus and record as a smudge or shadow. Similarly, the edge of a thick photograph may record as a long thin shadow.

Occasionally, you will receive photographs on heavyweight paper which cannot be copied or reprinted in time for an edition. In that case spring clamps can be used on the holder of the plastic blanket, and if test recording is satisfactory, you can transmit the photograph. However, you are actually forcing the

photograph to fit on the drum and risking an interrupted page. This is poor facsimile practice and a recording gamble at best.

It is not enough that single-weight paper be used. The photographic print must have a wrinkle-free surface, or shadows will result. Most photo driers produce a satisfactorily flat surface if care is taken. Speed is important, and fast drying of a print is best done by a pressureroller over a hot ferrotype tin. This will make the print acceptably flat and free from excess moisture.

When top speed in handling news events is desired, photographic prints may be placed on the scanner while still damp. Take the prints directly from the wash, and blot them enough to remove free water. Then put them on the scanning drum damp. After scanning, it probably will be necessary to wipe moisture off the plastic scanning drum blanket. Otherwise the equipment is not affected. Dry, glossy prints are more easily handled, but there is no measurable improvement in recorded results.

Assuming you get single-weight prints, wrinkle-free, your next concern is with tone values. Whenever possible, use photographs with soft intermediate shadings. Areas which are too dark tend to "fill in" and give the recorded photograph a heavy, unattractive appearance. This is particularly noticeable in photographs taken outdoors at night with one flash bulb. The background usually will be dark. Crop as much of the dark area as possible, and retouch the remaining background with an airbrush, or the recording is likely to look like a coal-mine scene.

You can "electronically retouch" photographs with the contrast or emphasis control of the line amplifier (see Chap. XVIII,) and your artist can do his part, but actually you get out of a print essentially what is in it to start with.

Photographers trained to deliver contrasty prints for newspaper engravings must learn that "flat-tone" prints are best for facsimile. They quickly recognize the qualities in a print which promote good recordings, without necessarily knowing the technicalities of

facsimile transmitting or recording equipment. At first the idea of deliberately making "flat" prints rubs against previous photographic training, but the change-over in thinking is quickly done by letting photographers see how much can be obtained from a "flat" print on the scanner.

There is some danger that, when photographers learn about "electronic retouching," they will become indifferent about the quality of prints they deliver to facsimile. If you take the time to demonstrate the limitations of the contrast control, they see that following the flat-print principle is desirable.

The authors do not wish to be arbitrary about suggesting the need for light tones in photographs for facsimile. They have found it is easy to add good contrast to a print that is too light. Attempts to lighten a print that is too dark have not resulted in attractive recordings. The dark areas remain muddy. However, experiment for yourself. Refinements in facsimile scanners ultimately may make the tone quality of original photographs immaterial.

Obviously, if a photograph has even tones except for a small black area, such as a man's hat, or some relatively small background object, it is acceptable without retouching. Also, insistence upon flat prints should not be carried to the extreme that photographers are asked to defy the laws of nature's coloring. Dark areas must be held to a minimum in news photographs, and usually the photographer can do it.

There is one circumstance under which sharp contrasts in a print are not only permissible but desirable. That is an advertisement or women's page feature when a dress or fabric is pictured. Many fashion photographs are almost black-whites. In such cases, you want to deliver a contrasty recording because the detail of styling, print design of fabrics, or even the texture of the fabrics are recorded best and the thing you want to emphasize. The model's features may suffer, but that is secondary. Other categories in which contrast is an advantage include jewelry, automobiles, furniture, and appliances.

Wire photos pose different problems from photographs

of local origin. Then the lighting conditions of the original picture cannot be dictated, and the facsimile staff must salvage what they can from the wire product. Wire photos are primarily suitable for newspaper engravings and not technically composed for facsimile. Electronic retouching or retouching by your artist can correct most overcontrast common in wire photos. Occasionally, the extent of retouching required is so great that only a photograph of unusual news merit deserves the time involved. However, most wire photos will be usable with minor retouching. And they comprise an important part of your programming.

Let the operators of the wire photo machines know what you want in photographic tones. They will not always be able to deliver ideal prints but often can correct part of the faults. Wire photos also should be properly sized when prints for facsimile are being made.

Over all, there is no radical departure in taking photographs or printing them for facsimile, as far as techniques or equipment are concerned.

Separate Darkroom

News photographers appreciate having a darkroom set apart from the regular news photographic work for handling facsimile prints. Because of the time pressure caused by frequent facsimile deadlines, it is helpful to have all necessary equipment, developing tanks, trays, enlarger, chemicals, drier, and other darkroom items on tap for speedy and efficient operation. If your programming consists only of two or three daily editions, conflict with regular news photographic work will be minor. Facsimile editions every hour or 2 hours can create a traffic jam in the photographic department.

Here are some suggestions for speeding the darkroom work.

1. Use a fast-developing solution, with as limited a contrast reaction as possible, and make a quick-hardening bath standard practice.

2. Printing should be done always with the horizontal spread of facsimile recording in mind.

3. Whenever possible, the facsimile photographer should shoot his picture across the negative and cancel out depth.

4. Prepare a set of masks corresponding to the columns widths you use for facsimile photographs. It will speed up the photographer's job if he can print within that mask and save the facsimile editorial staff cropping time.

"Fast" Cameras

Fast cameras, which deliver a print directly from the camera without development of a negative and printing, have limited facsimile applications. Because there is no negative, tone control is essentially limited to the original lighting and focus. If the tones in a print from a so-called "fast" camera are right for facsimile, the print will be useful, provided retouching can compensate for the discrepancies.

Facsimilists have not had much experience with fast cameras. However, the difficulty of controlling tones indicates they are more useful for amateur photographers than for facsimile news work.

Ordinary speed graphics can provide all the tones a facsimile editor desires.

Cropping

The scanner cannot enlarge or reduce, so cropping must be a physical alteration of the photographic print and is done simply with a razor blade or art knife.

If your local photographers and wire-photo operators have printing masks sized for facsimile, part of your cropping work will be done before the print is delivered.

However, there are photographs from outside sources which require cropping, and editors will want to use only a part of mask-cropped prints produced exclusively for facsimile.

As a general practice, crop photographs "tight." Reduce nonessential space at the top of photographs

to a minimum. Because a photograph comes out of a recorder top side first, it is both boring and confusing to the reader if an inch or two of sky or wallpaper background is visible before the remainder of the picture comes into view. Leave only enough top area to offer a reasonable balance with the remainder of the picture when it is viewed as a whole.

Frequently a photograph will have an inanimate object at the top. Chop it off.

If you lower the ceiling as much as possible and still have a large patch of neutral space, such as sky on each side of a building or a golfer, put that space to work. You can overlay a headline, for example, "New Theater Planned" or "Hogan Leads Field," and put the detailed caption at the bottom of the photograph.

Crop from the top of the print down, and then crop the sides. If the action in a picture is moving from left to right, crop tightest against the left side, leaving extra room for the reader's eye to move to the right, along the line of action. It contributes to the illusion of motion.

Head shots of men and women which are profile or three-quarter profile should have more space in front of their features than between the back of their heads and the edge of the picture. Cropping too close to a nose has a tendency to blunt all the person's features. Sometimes you can be kind to a face with a pug nose by allowing a little more space than usual between the features and the print margin.

The same principle applies to cropping the upper half of any photo. You want to eliminate nonessential space, but if there is a contour you wish to retain or accentuate, whether it be the top of a person's head or the sweep of a discus thrower's arm, don't overcrop. Keep the path of action in mind.

Crop only to the extent that you do not create an unwanted optical illusion. A top hairline which is flat can be made flatter by cropping too close. The rounded curls of a woman's hair are not so vulnerable. Don't lop off part of a woman's hair-do unless you know enough about such beauty aids to be sure the

effect is not ruined. If in doubt, ask a woman.

The closer a crop is to a flat plane in a photograph, the more you accentuate the flatness. The closer a crop is to the point of action the more action you usually take out of the photograph. An exception to this is when the action in a photograph is coming straight at you rather than to the right or left, up or down. For example, a photograph of a pitcher throwing a ball at the camera or a moving object (race horse, automobile) in a head-on view. In such photographs, you don't have to worry about the path of action. Then you simply crop in relation to the size and shape of the moving object.

Cropping does not have to be in terms of a square or rectangle. If the photograph lends itself to angles, arcs, or even a circle and you can fit it in with adjacent copy or photographs, pleasing effects may be created.

Examine all photographs carefully. Often there will be a small part of a generally listless print which has special merit. If so, crop that part out and use by itself with proper editing of outlines. The interesting area may be too small for practical use. Have the photographer mask out the remainder and give you an enlargement of the desired part of the negative.

Retouching

If the photographs you receive are too contrasty and amplifier controls cannot compensate for the undesirable tones, your last resource is having the print retouched *discreetly*. The scanner eye is supersensitive, and a heavy hand with brush or airbrush can ruin the effect.

A commercial artist, accustomed to retouching photographs for engravings, must discard some old practices, just as the photographer must use a new set of tone values.

Not only is the degree of photographic retouching for facsimile different from engraving, but materials differ. The scanner eye sees a lot more than the

engraver's camera as far as retouching paints are concerned. An artist will learn through experimentation the proper dilution of retouching materials so that subtle rather than abrupt shadings are interpreted by the eye.

Generally, an engraver's camera will see retouching as a human eye does. The scanner eye distinguishes not only color but also surface smoothness and opacity because of the intense concentration of light from the scanner light source.

Keeping that precision in mind, artists must guard against overretouching, which can wash out the retouched area or bring it into disproportionate prominence.

It is easy to overretouch, particularly faces. Shadows on faces of good color (not black) should not be lightened, or valuable shadows in the recording will be destroyed.

Skin tones on legs and arms can be lightened to conform with face color. The lightest color in most photographs will be found in the face and shoulders. Use that portion as your lightest tone, and scale all others accordingly.

Specially produced fashion and movie stills require little, if any, retouching.

Eyelashes can be lengthened with good effect, but never give blondes black eyebrows; gray suffices.

Use an airbrush for retouching wherever possible. The film of color dries quickly, allows for fast handling of copy, and produces attractive recordings.

All ink lines should be thin for quick drying. If a broad line is needed and time is short, use a China marking pencil. Don't make a habit of such a pencil, however, because it can smudge off on the plastic blanket.

Keep it simple. An overretouched face will look like a cadaver on a recorder, or backgrounds will look like ink blots. The equipment can do a perfect job only if good copy goes on the scanner.

Cut Lines

Cut lines usually go *above* photographs. The reader

will then know what is coming and not have to wait until the entire photograph is recorded. Once a photograph has been transmitted in its entirety, the human eye will scan all of it simultaneously. While it is coming out of the recorder, there is no way for the reader to know what to expect unless you tell him.

If the picture lends itself to an overline "flat," or a headline overlayed on the print itself, the cut lines can be placed at the bottom.

When a neutral area in a photograph is sufficiently large, complete cut lines may be set odd measure and overlaid directly on the print. If you use a photograph less than four columns wide, the cut line may run beside the print with an arrow keying the type to the illustration.

Whatever variation of cut-line placement you use, keep in mind how the photograph will look *as it comes out of the recorder*. Let the reader know what the photograph is that he sees taking shape. You can do this successfully and still have a combination of photograph and cut line that will be attractive to later facsimile readers who see the whole page at one time.

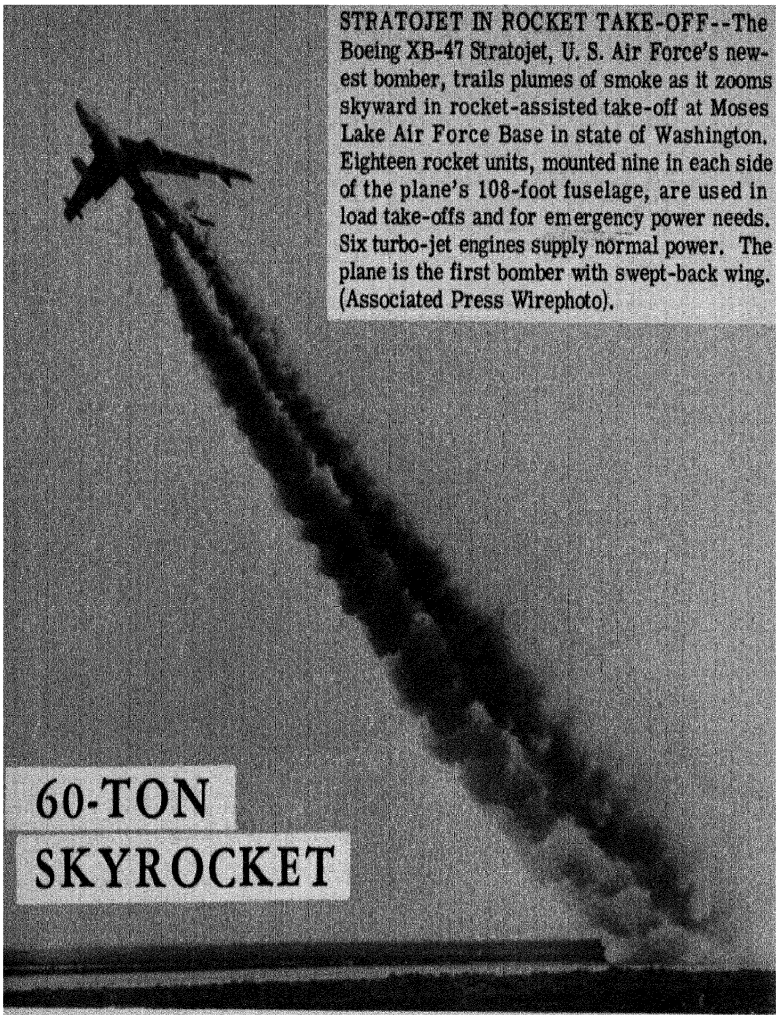


Fig. 17. The caption inserted in a nonessential space. Catering to the readers who saw the page after it was transmitted, the head "60-ton Skyrocket" was put in the lower left-hand corner, occupying what was also nonessential space. Scanner contrast setting: No. 1 black, to accentuate smoke. (Scanner contrast settings listed are for Hogan-General Electric scanner. Other facsimile scanners have similar contrast control.)

FOR SALE: PRICE $10,000



"SITUATION WANTED"--Mrs. Dorothy Lawlor (above), 28-year-old divorcee offered a "Situation Wanted, Female" classified ad to Newsday in which she offered herself "for sale" as a wife to a man with $10,000 and willing to support her and her two children.

Fig. 18. The print has been cropped maximum tight top and bottom. Mrs. Lawlor then dominates the picture and the background impression is almost completely eliminated. Scanner contrast setting: 0.



HAPPY DAYS OVER

Los Angeles, (AP)--Film Actress Lois Andrews (left) has filed a separate maintenance suit against her third husband, Actor Steve Brodie (right). She alleges extreme cruelty.

The 24-year-old actress was married to Brodie in Ti Juana, Mex., in 1946, shortly after her divorce from Singer David Street. Her first husband was George Jessel, comedian turned Hollywood producer.

Fig. 19. A story often can be edited into cut lines and, if the photograph permits, used as a combination strip. This treatment is particularly effective across the extreme top or bottom of a page. *Both faces have been retouched with an airbrush.* If it is properly done, you should not be able to tell at a glance where the retouching has been applied. Scanner contrast setting: No. 2 white, to compensate for almost solid black tones in hair

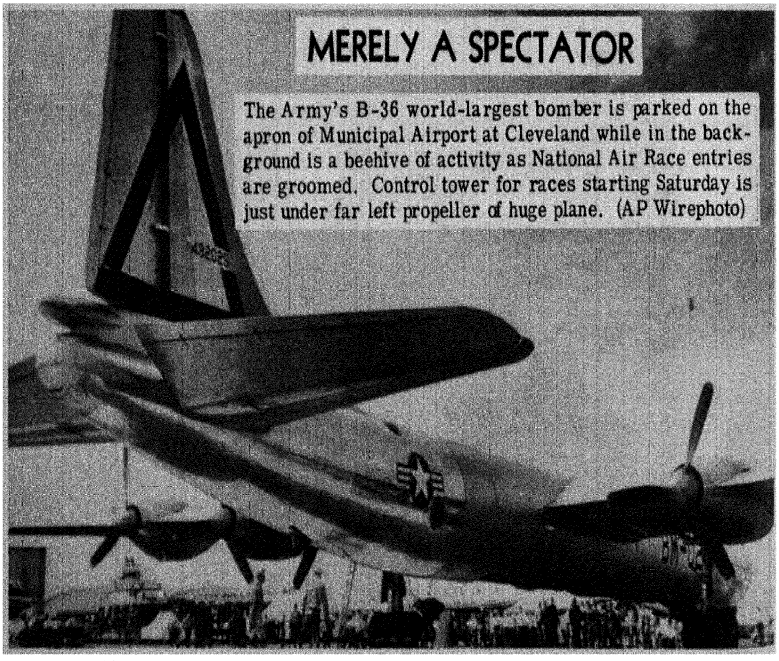
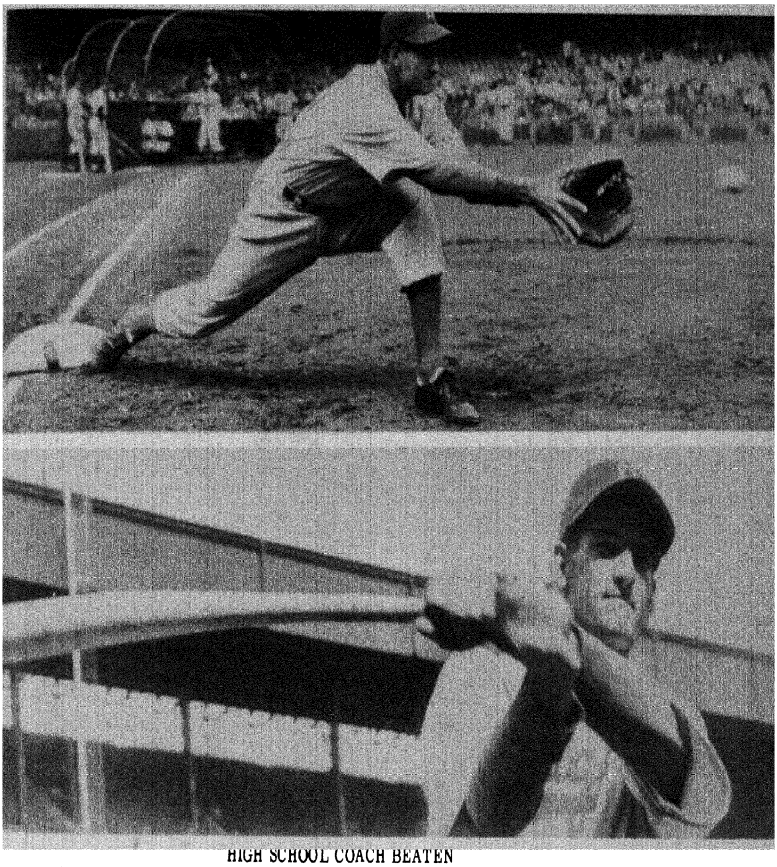


Fig. 20. The dark area around the right engine and bottom of the right wing could have been retouched with an airbrush, but the photograph was transmitted as received from the Associated Press. The print otherwise has good tones and was acceptable.

DODGERS ROOKIE FIRST BASEMAN--Rookie Preston Ward exhibits the fielding and batting techniques which won him starting assignment at first base for Brooklyn Dodgers on opening day of season. Ward, 6-feet 2½-inches tall, weighs 187 lbs. and never played higher than Class A ball until this year. He batted .325 with Pueblo of the Western League in 1947, leading the league in runs batted in. He was slated to return to the minors for more seasoning until Manager Leo Durocher decided to give him a chance to make good. This Associated Press Wirephoto was taken at New York.



HIGH SCHOOL COACH BEATEN

Newark, O., (AP)--Donald L. Dimick, 45-year-old woodworker, was charged with assault and battery tonight in the firewood beating of the high school coach at nearby Granville, O., Sheriff Roe Francis said. Coach Larry Petersen, 39, was reported in fair condition at Newark hospital.

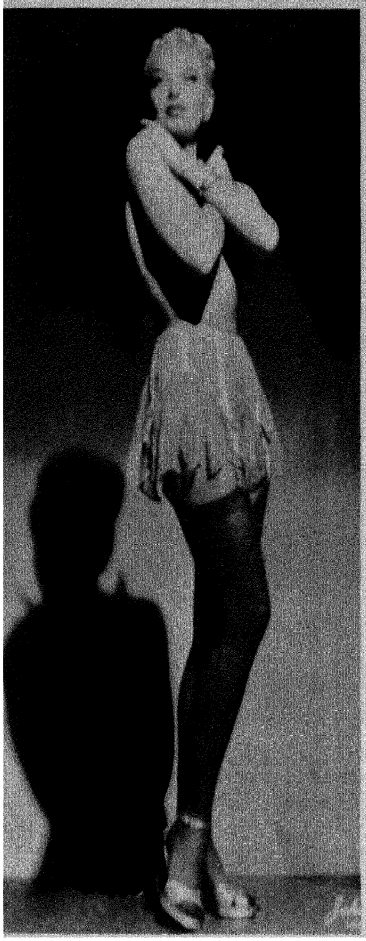
Deputy Sheriff Clarence Miller, who arrested Dimick, said Mrs. Donna Petersen, the coach's wife, told him her husband had been beaten with a stick of firewood by the father of a high school student. Coach Petersen, his wife said, had disciplined the youth yesterday.

Fig. 21. Two wire photos so large that each would have made almost a page were cropped to fit on one page with enough space left for other sports news. Scanner contrast setting: 0.

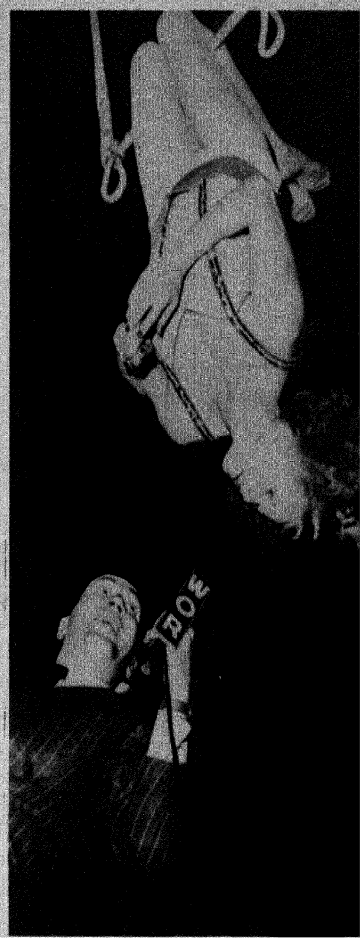


Fig. 22. A tightly cropped print with overlines and caption used within the borders to make a compact illustration. Scanner contrast setting: No. 1 black, to deepen shadows on sweater and heighten contrast of print design.

WOMEN IN THE NEWS



STRIPTEASER FINED--Stripteaser Lili St. Cyr tried to convince a judge her dance at a burlesque theater in Los Angeles was art and an interpretive dance of love, but he ruled it was lewd and fined her $350. A young vice squad officer, Cletus O. Smith, testified she "shed practically everything," and then when she faced the audience "only her hands kept her from being nude and she quickly dropped them."



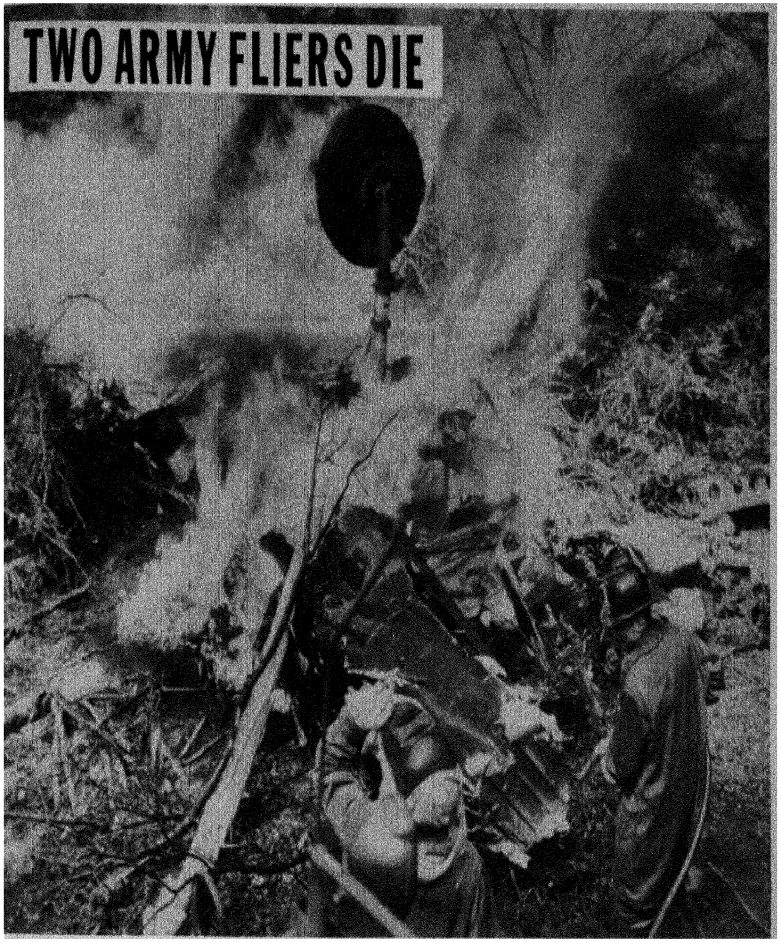
INTERVIEW ON A HIGH PLANE--Rose Behee, a daring young gal on a flying trapeze, is interviewed by Dick Kollmar, high above the floor of Madison Square Garden, where Miss Behee is thrilling the customers at the Ringling Bros. Barnum & Bailey Circus. Kollmar interviewed Miss Behee for his "Sounds of the City" radio program. (International News Photo).

Fig. 23. Overcontrasty photographs occasionally are effective. If you can use them in pairs side by side or one directly above the other, the dark areas will not be so objectionable. It is obvious that, if a flat or normal-toned photo had been substituted for one of these, the page would appear unbalanced. Scanner contrast setting: No. 2 white, to soften the impact of the dark backgrounds.



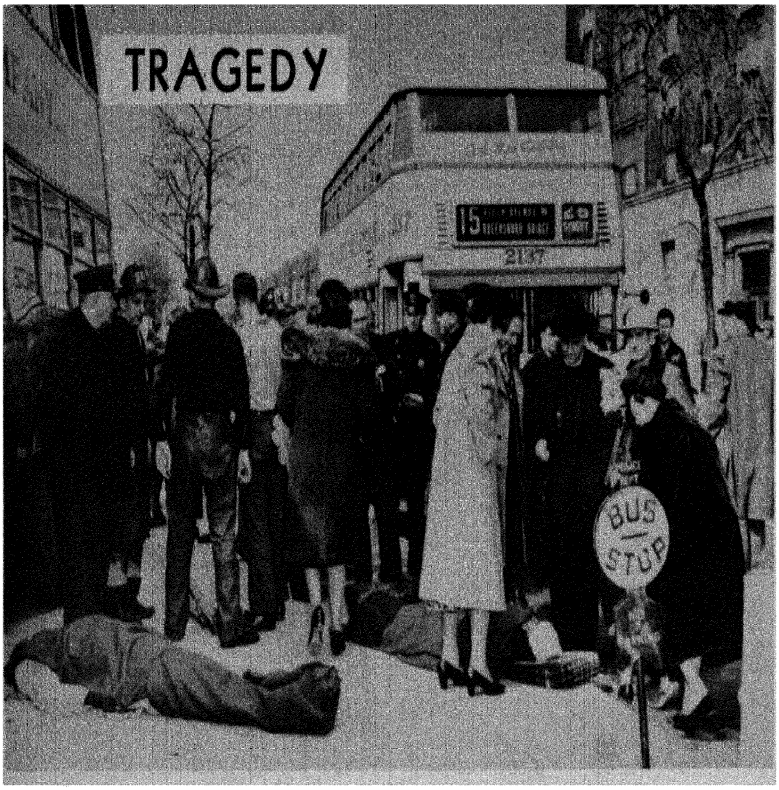
FROM ONE CHAMP TO ANOTHER--Gretchen Merrill of Boston (left) and Dick Button, Englewood, N. J., kiss immediately after the successful defense of their national figure-skating titles at the Broadmoor Ice Palace in Colorado Springs. (Associated Press Wirephoto).

Fig. 24. The only area of this photograph not well occupied is over Button's shoulder. The overline put any other place would have detracted from the print. The center trophy could have been retouched, but the center of attraction is the kiss and not the silverware. Scanner contrast setting: 0.



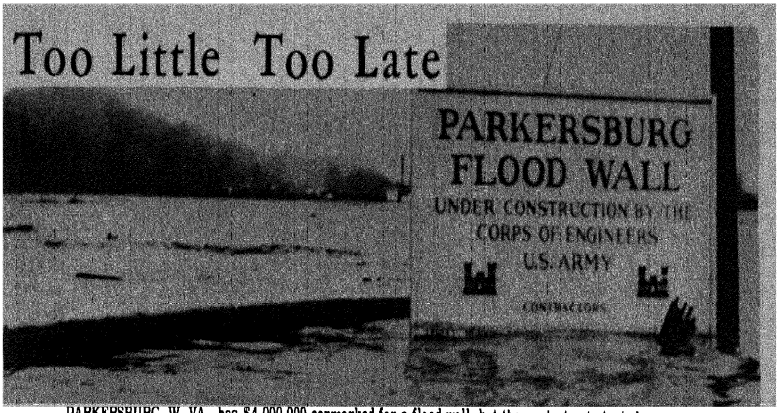
FLAMES ENGULF CRASHED PLANE--Flames lick at remains of an Air Force P-61 Black Widow fighter plane from Mitchell Field, Long Island, which crashed in a wooded area near the field. Two reserve officers on active duty, Lt. Alan Belmarsh of Brockton, Mass., and Lt. Ray E. Fritsche of San Augustine, Tex., died in the crash. (Associated Press Wirephoto).

Fig. 25. The editors debated whether to use this print two or four columns wide. They selected four because the wind is fanning the flames from left to right, and by leaving the open spaces on the right-hand side of the print—in the direction of the action—the entire scene became more vivid. If the center of the print had been used two columns wide, part of the illusion of the swirling flames would have been destroyed. Scanner contrast setting: 0.



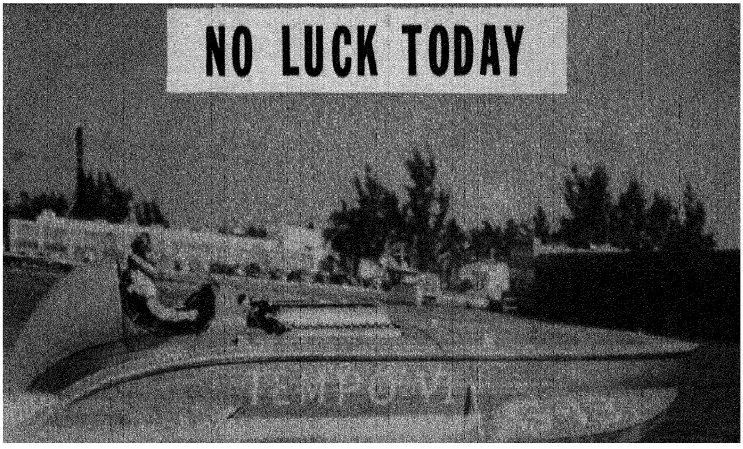
OUT OF CONTROL AS IT ROUNDED A CORNER in Jackson Heights, this Fifth Avenue bus climbed a curb and crashed into a group of pedestrians on the sidewalk, killing one woman, and injuring three other persons, including a baby. Mrs. Dorothy Staver, of 33-21 85th st., Jackson Heights, lies dead at left. With a priest standing by, Grace McGlade, of 33-17 82d st., lies injured at right. (Photo by Leonard Victor for International News.)

Fig. 26. The clothing of many of the spectators recorded as near blacks. The tones could have been lightened by airbrush retouching, but it was unnecessary. The centers of eye attraction were the accident victims, and the blanket tones were light enough to set them apart. Scanner contrast setting: No. 2 white, to keep what detail there is in the clothing of the spectators.



PARKERSBURG, W. VA., has $4,000,000 earmarked for a flood wall, but the project got started too late to keep old Man River out of its door. This is the junction of the Ohio and Little Kanawha rivers when the stage was 42.8 feet, 6.8 feet above flood level. In background is Belpre, Ohio. (Associated Press Wirephoto).

Fig. 27. When a photograph requires considerable background to make it effective, be careful about tight cropping. The impression of flood was retained in this print by deliberately using ordinarily nonessential space at the bottom. Scanner contrast setting: No. 1 black, for contrast in the lettering on the sign.



MOTOR TROUBLE HALTS LOMBARDO--Guy Lombardo, on Indian Creek today, drove his Tempo VI speed boat 114 miles per hour, bettering yesterday's mark by one mile per hour, but motor trouble forced him to abandon an attempt to set a new world's record. This is presently held by Gar Wood of Miami Beach.

Fig. 28. Remember your line of action in cropping. The speedboat is moving from left to right. It has been cropped just short of the stern, but extra space has been left in front of the bow. Scanner contrast setting: No. 1 black, to add contrast to the hull details.



POLITICS WITH FEATHERS--Chief William Spotted Crow, 77-year-old Sioux Indian who is an alternate delegate from South Dakota, was among the first arrivals at Convention Hall in Philadelphia. He hails from Pine Ridge. (Associated Press Wirephoto).

Fig. 29. Wire photos sometimes have tone values divided by a vertical or horizontal line. This is caused by fluctuations in wire-photo equipment. The change in values may or may not make a print unusable. You can see the line where the tones change, running down through the center of the print. Blending the two entirely different sets of tones by airbrush retouching is possible but tedious. Scanner contrast setting: No. 2 white, to minimize the two sets of tones.

XIV

MAKE-UP STYLE

The small size of a facsimile page would seem to impose crippling restrictions on make-up techniques. Actually, it offers an opportunity for attractive make-up which a conventional newspaper doesn't have.

The facsimile reader's interest is concentrated on a small area. Therefore, stories and photographs can grab attention quickly if they are properly tailored. Instead of a wide range of headlines, stories, and photographs, there are but a few. It is a small show window, and the stories and photographs you exhibit are very prominent.

In making up a facsimile page, the editors bear in mind that they have two objectives. The copy should make sense *as it comes out of the recorder.* And a completely recorded page should be attractive when all the copy is scanned simultaneously by the human eye.

This requires some changes from newspaper and magazine make-up practice, but it is not awkward or a difficult skill to acquire.

You simply make sure that every piece of copy, whether it be a typed story or a photograph, has a headline or overline which lets the reader know what is coming. Otherwise, it might be necessary for the reader to wait until 5 or 6 inches of paper has been recorded before the copy makes complete sense.

A newspaper or magazine can run a photograph with all the identification at the bottom. In facsimile, the photograph comes out of the recorder *top side first.* A photograph of a willowy blonde would have to be transmitted in its entirety before the reader knew whether she was a beauty contest winner or a murderess *if the only identification was at the bottom of the photograph.*

It takes only a few words to let the reader know what is taking shape: "Wins Divorce," "New Ambassador," "Jailed." At the end of this chapter are reproductions of facsimile pages which show this technique.

Omission of overlines may produce embarrassing

moments. A broadcaster's facsimile edition once had a gorilla's picture beside a baseball story. The headline on the ball game was "Blank Homers to Defeat Tigers." As the page unfolded, the gorilla's face came into view beside the headline, and a reader phoned to ask if the game was played inside a zoo. Captions or tag lines used beside a photograph should have an arrow leading the reader's eye to the related illustrations. Sometimes you can overlay the caption or tag line directly on the photograph or overlapping it, and there can be no confusion.

Headlines over stories automatically take care of identifying what typed copy is coming up. However, if possible, avoid make-up which winds the text of a story from one column to an adjoining column. When you do that, the reader gets the lead of the story and perhaps the fifth paragraph before he has seen the middle of the story.

Each page can and should be complete. It is seldom that copy cannot be edited to one column on one page. If you have a long story, don't start it on a page unless there is room for all of it. Switch your stories, and fill small open space with a short story. Move the longer article to a separate page, where it can run unbroken.

Column Widths

The facsimile page is four 2-inch newspaper columns wide, and you can use four columns of copy. It is unlikely you will do this, because facsimile's large body type is hard to set and hard to read in short lines. A four-column page is less attractive, over all, than copy broken into two or three columns.

Most effective facsimile make-up leans toward magazine style. Vary the widths of copy and illustrations for maximum eye appeal when possible. There are no rigid rules or inherited patterns. Make-up imagination is your only limitation. Odd-measure copy and headlines are used successfully by magazines to provide change of pace, and you can do the same thing on pages without advertisements.

Think of these open pages as being 8 inches wide and 11½ inches deep, *without column rules*. Spread your copy over that area to best advantage, in any shape or pattern that best displays your news. Advertisements will probably be in standard column widths. Odd-measure editorial copy can still be used as long as it wraps around the advertisements smoothly. For example, a pyramid which has a one-column advertisement on top leaves you with 6 inches of editorial space at the side of the ad. You can, if you wish, set editorial copy one and a half columns wide and using two columns of this copy, fill the space.

The First Page

All facsimile pages are actually "front" pages on the recorders. For the sake of orderly reference, it is customary to identify them in the sequence in which they are transmitted.

The first page carries your masthead, including call letters of the FM station, day of the week, date and hour of the day the edition is sent.

Use preprinted mastheads with the date line filled in on your copy- or head-setting machine. After designing a masthead, have a line cut made of it and proofs pulled on the same paper as that you use for copy and headlines.

The first page is the last page made up. You want it to include the latest news and photographs. When the deadline for the page arrives, be sure the last piece of copy is on its way through the processing end of the department. If the first page is late, your edition will be late getting on the air.

Don't worry about a major news story's arriving just before air time and upsetting your page one plans. Let the original page one stand. You can still give the late story top play by a neat trick in operating the scanner.

Here is how you do it.

Suppose the first page is made up and on the No. 1 scanner (remember you have a dual scanner, with two scanning eyes, drums, etc.). The city desk or press-

association wire delivers a story of importance. You would like to get that story out to the customers in a hurry.

Leave the first page on scanner No. 1. Look at the clock. If you have time to set a headline and justify the copy, get it moving. If time is too short for that, trim the copy from the press wire or have the copy setter set one or two graphs of the city desk copy. Put a preprinted bulletin head on the story, and then put it on scanner No. 2.

When your edition goes on the air, send the masthead and date line from the original first page. Before scanner No. 1 reaches the top of the headline on the original first page, switch to scanner No. 2. Send the bulletin. You now have the masthead, date line, and bulletin on the recorders. Switch back to scanner No. 1, and resume where you left off, sending the original top headline and the remainder of the page. The recorders will then display *a complete page without a break*, and you have taken the late news story in stride.

Newcomers to facsimile are sometimes confused by the fact that the maximum length of copy that can be scanned on a single drum is 11.5 inches, but they occasionally see pages on recorders which are longer than that. It is done by this switching from one scanner to another, which is called "stretching the page."

Two or three pieces of copy that add up to more than 11.5 inches may be recorded as one page with this operation. The recording paper is in a continuous roll, not in cut sheets. Naturally, you will try to make up your pages in even lengths of 11.5 inches each. That way you achieve uniform recorded pages, and the entire editing and make-up procedure is orderly. If for any reason you are long or short of 11.5 inches, the dual scanner system can take care of the discrepancy.

This patching back and forth between scanners requires skillful operation. If the timing isn't perfect, there will be a blank space between the pieces of copy and the page will look sloppy. Consider "page

stretching" an emergency resource rather than standard practice.

Strive for Variety

Use any variety of art, headlines, and type on the first page that is needed to cover the top stories. With frequent editions, you will find that handling three or four stories on the first page covers the top of the news. This gives you an opportunity to display them attractively.

The facsimile first pages reproduced in this chapter are from editions designed particularly for recorders in public places. Pages for a predominantly home audience can use smaller headline type (see Figs. 30 to 32).

To avoid hitting the reader with a solid mass of type, use at least one illustration on the first page. Don't dig down in your pile of photographs and select one purely for the sake of eye relief. It should be newsworthy. Filler copy is very conspicuous on facsimile.

Don't forget identification on top or in the upper part of the photograph. This can be varied, as illustrated in the typical first pages (see Figs. 33 to 40).

Notice how both photographs and captions have been used in odd widths on some of the pages. Some stories have been set four columns wide, which ordinarily would give the page a flat appearance. However, the odd-width photographs and captions, with a staggered pattern and liberal use of white space around overlines, make them attractive.

Don't be stingy with your white space. It is true that space is precious, but if you are miserly to the extent of stodgy make-up, you will fail to hold readers.

When a page is made up in two even columns and a story is split across the top of the page above the masthead, be careful that such make-up does not push the masthead too far down or the entire page will be top-heavy.

You may consider the white space between the Moscow and New Orleans stories in Fig. 34 to be excessive. Lay your hand over the space, and see how the page would have turned into a solid, unattractive mass of

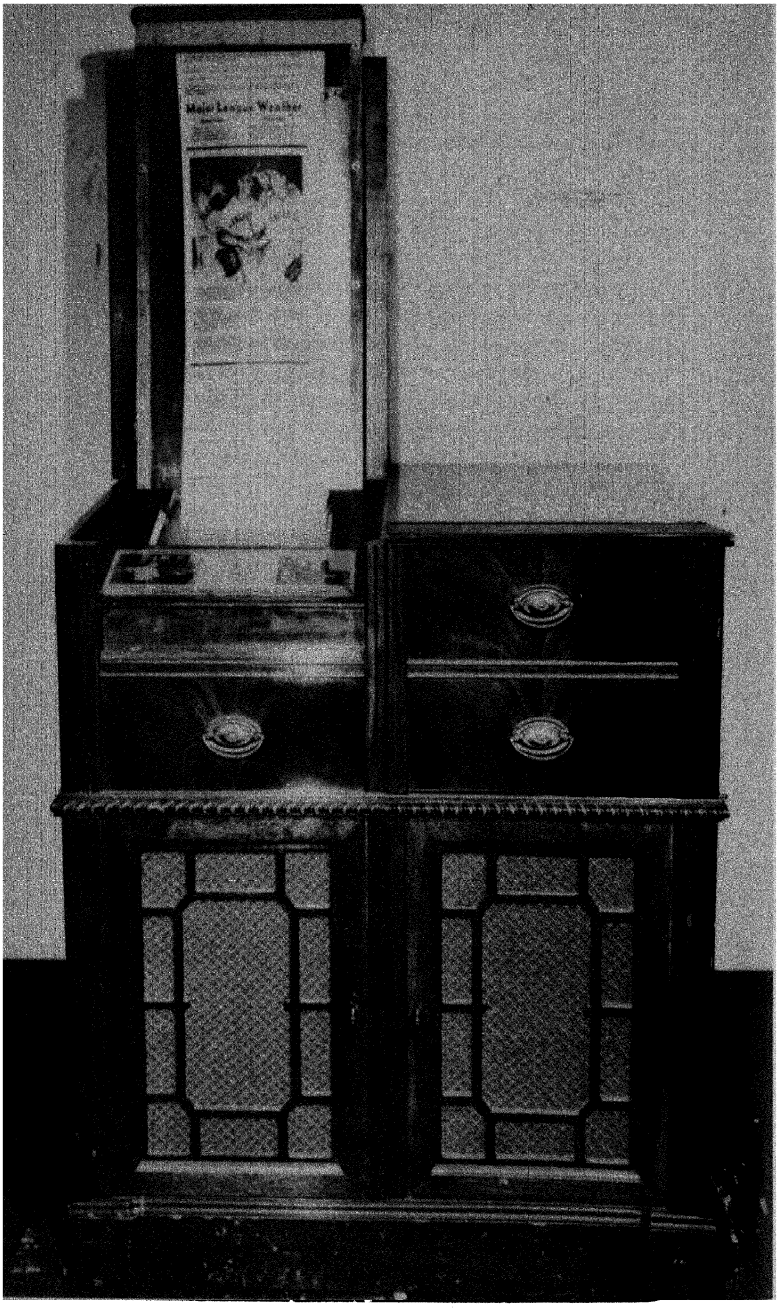


Fig. 30. General Electric facsimile receiver with plexiglass-covered display column and synchronized paper drive wheel which lifts pages into a vertical column.



Fig. 31. Stewart-Warner Corp. facsimile receiver.

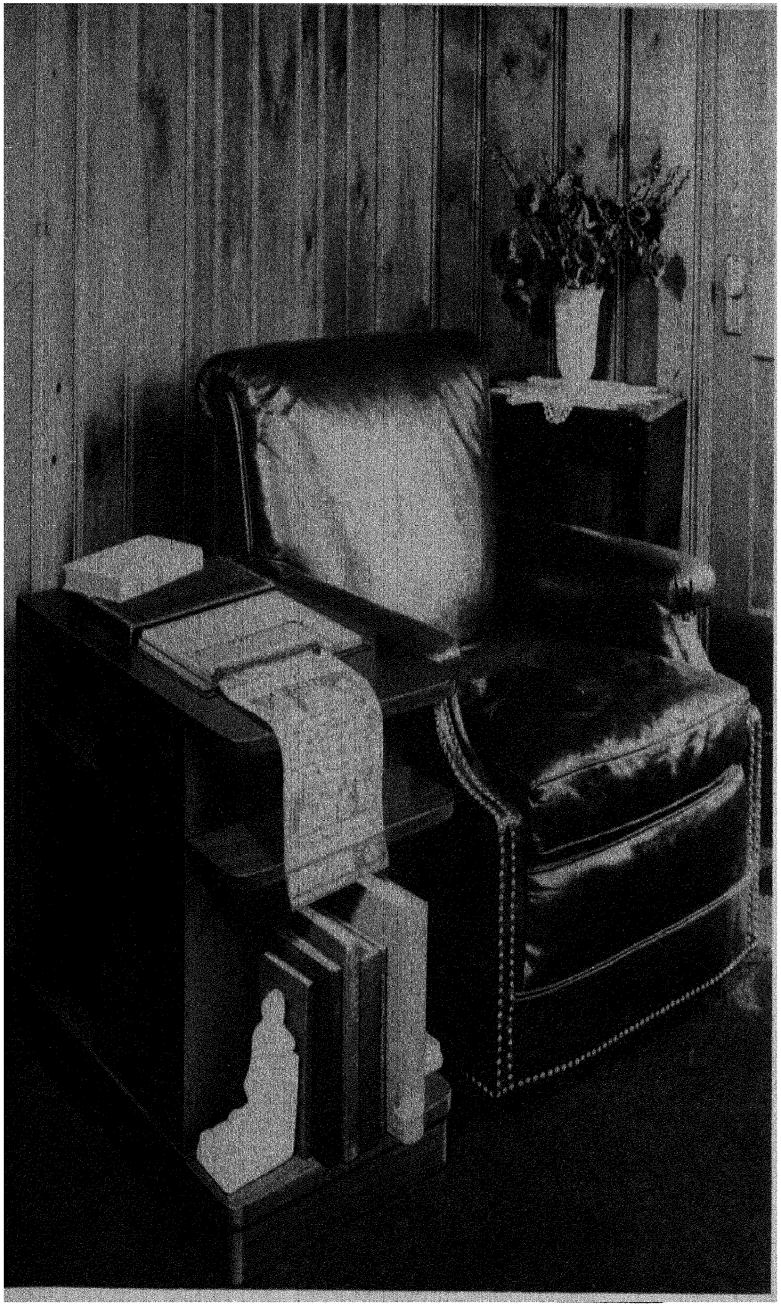


Fig. 32. Chair-side facsimile receiver manufactured by Alden Products Co.

The Miami Herald FACSIMILE EDITION

via WQAM-FM WEDNESDAY, SEPT. 1, 1948 10 a.m.

Truck Driver Strike Tying Up N.Y. Traffic

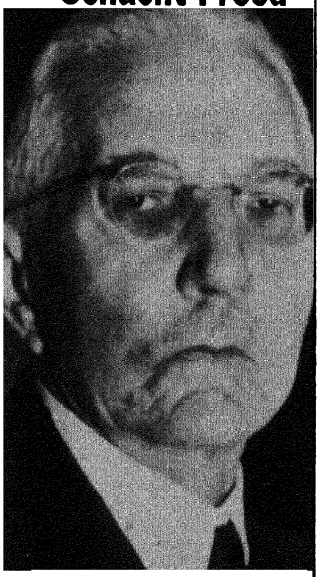
New York, (AP)--Start of a city-wide stoppage in New York city's huge trucking industry was reported at 6:45 a. m. today by the police department.

AFL drivers and helpers for several trucking firms--which normally begin operations at an early hour--failed to show up for work, police said.

The stoppage, stemming from union rejection of a proposed agreement with workers, is expected to tie up a major part of the city's trucking business.

Plans for the stoppage began taking shape early today after members of the city's largest AFL teamster's local voted to turn down a tentative wage settlement approved last week by union and employer negotiators.

Schacht Freed



Stuttgart, Germany, (AP)--A German appeals court today acquitted Hjalmar Schacht, former German financial wizard, of charges that he was a major Nazi offender. He was ordered freed.

He had been serving an eight-year term after conviction on the charge by a Stuttgart de-Nazification court last year.

China Bars All Planes, But Reds, In Provinces

Nanking, (AP)--All foreign airplanes except Russian have been barred by China from the air over its western border provinces.

The step was taken secretly and became known here when U. S. Minister Lewis Clark's plane was grounded and turned back at Lanchow.

In 1939, China, then yearning for Russian support, gave the Soviets exclusive foreign rights to fly over the western provinces for 10 years.

A Nanking source today said formal notice that the pact will be terminated Sept. 9 next year has been served Russia.

The order barring all foreign planes, except Russian, from the border provinces was confirmed by the foreign office.

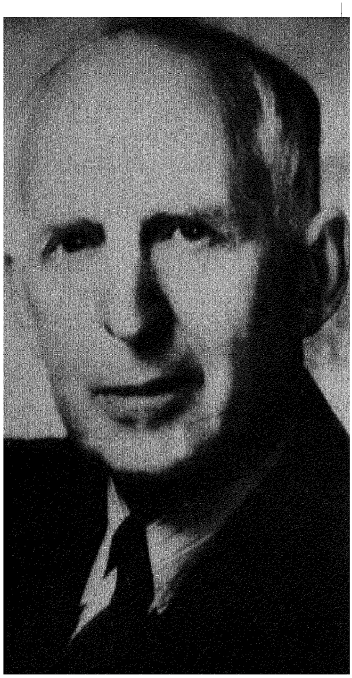
FOR THE FINEST IN RADIO - WQAM-FM

Fig. 33.

The Miami Herald FACSIMILE EDITION

via WQAM-FM WEDNESDAY, SEPT. 1, 1948 2:30 p.m.

HISTORIAN DIES



New Haven, (AP)--Charles A. Beard, the noted historian who several months ago accused President Roosevelt of secretly instigating the war between the United States and the German-Japanese Axis, died today. He was 73.

Author of some 30 books on American history, it was in his last book, published last April, that the historian criticized President Roosevelt's handling of foreign affairs prior to America's entrance into World War II.

Zhdanov's Death Delaying Parley On Berlin Issues

Moscow, (AP)--The death of Andrei A. Zhdanov is almost certain to interrupt at least for a few days the four-power Moscow talks on Berlin and Germany.

Both Prime Minister Stalin and Foreign Minister V. M. Molotov will be extremely busy during the next few days taking a personal part in the funeral for the deceased member of the 14-man politburo.

Stalin himself probably will be one of the pallbearers when the casket is carried to Red Square for the funeral services Thursday evening.

Zhdanov's death Tuesday was regarded here as the greatest loss to the Communist party since the death of Sergei Kirov in December, 1934, and observers believed as many as 1,000,000 people are likely to view the remains.

HUEY'S SON GAINS LATE LEAD

New Orleans, (AP)--Russell Long, 29-year-old son of the late Huey P. Long, today pulled 1,500 votes ahead of Judge Robert F. Kennon in the race for the United States Senate.

Long gained steadily as rural returns from yesterday's Democratic primary election were completed. Unofficial returns from 1686 of 1883 precincts gave Long 240,232; Kennon 238,732. Most of the missing boxes are in rural areas.

FOR THE FINEST IN RADIO - WQAM-FM

Fig. 34.

The Miami Herald FACSIMILE EDITION

VIA WQAM-FM Thursday, September 2, 1948 12:30 p.m.

N.Y., Western Strikes Facing Truman

By the Associated Press

Two major work stoppages on the east and west coasts today threatened to cut off supplies to a large segment of the nation's population.

Freight shipments into New York City and Pacific coast ports from Seattle to San Diego were halted by rail embargoes as the work stoppages went into effect.

WASHINGTON, (AP)--THE WHITE HOUSE SAID TODAY THAT PRESIDENT TRUMAN HAS THE NEW YORK TRUCK STRIKE AND THE WEST COAST MARITIME WALKOUT "UNDER STUDY." AS TO WHETHER ANY GOVERNMENT ACTION IS CONTEMPLATED, PRESS SECRETARY CHARLES G. ROSS REPLIED: "THAT, I CANNOT SAY."

Involved in the New York dispute are some 10,000 AFL truck drivers who quit work yesterday after rejecting a proposed wage agreement.

On the west coast, 16,000 CIO longshoremen and seafarers stayed away from their jobs and prepared to set up picket lines in a dispute over wages and a hiring hall issue.

In New York, huge cargoes of freight, which normally moved into the metropolis daily by rail, were halted by the rail embargo. It was placed in effect by the railroads to prevent piling up of merchandise in rail yards.

Spokesmen said some 30,000 members of two other major New York city locals, and nine teamster locals in New Jersey and Westchester county, N. Y., may join the walkout.

Fearing that the strike might grow to the proportions of the 1946 trucking strike which seriously curtailed the city's food and other supplies, city, state and federal officials combined efforts to get a quick settlement.

The longshoremen's strike also resulted in a rail embargo on most freight destined for Pacific coast ports. The railroads said, however, that military freight would continue to move.

Observers said that if the longshoremen's walkout continues it will soon be felt across the nation.

Boys Town Head



The Rt. Rev. Msgr. Nicholas H. Wegner, above, Wednesday was announced as the new director of Boys Town, Neb. The community for underprivileged boys was founded by the late Msgr. Edward J. Flanagan. (Associated Press Wirephoto).

Fig. 35.

FACSIMILE EDITION DELIVERED BY WQAM-FM

The Miami Herald

Miami, Fla., August 23, 1948

2:30 p.m.

Kremlin Talks Resumed

Moscow, (AP)--The three Western envoys went to the Kremlin tonight for another four power conference.

An American embassy spokesman would not say with whom the envoys of the U. S., Britain and France were talking.

Bulletin

NEW YORK, (AP)--The Coast Guard said today it had dispatched two planes from Floyd Bennett field after receiving reports that a plane had exploded in the air four miles south of Quoque, Long Island, N. Y.

Russian Consul, Aide To Leave

New York, (AP)--Zot I. Chepurnykh, Soviet vice-consul here, said today that he is planning to return to Russia but will not accompany Consul General Jacob M. Lomakin who is scheduled to sail Saturday.

Lomakin was ordered expelled by the State Department last week after it accused him of "improper conduct" in connection with the case of Mrs. Oksana Kasenkina, injured Aug. 12 in a three-story leap from the Russian consulate.

Chepurnykh declined to tell newsmen why he was returning home or when he planned to leave. "Are you going with Mr. Lomakin?" he was asked.

"No, later on," the vice consul replied, adding that he was in "no particular hurry."

Earlier today, a Swedish-American line official disclosed that Lomakin's passage, aboard the liner Stockholm next Saturday, had been booked about six weeks ago.

Some sources earlier expressed belief Prime Minister Stalin might be interviewed tonight. (Paris and London dispatches also suggested the talks might be with Stalin.)

It was freely predicted that the meeting tonight will be the last in the series of four power conferences which started late in July.

The western diplomats are believed seeking a lifting of the Berlin blockade and exploring a basis for four power talks on Germany and other European problems.

News In Brief

U. S. MAY PASS PARLEY

Washington, (AP)--The United States government may pass up the inter-American conference on foreign colonies at Havana Sept. 1, diplomatic officials said today.

RED TRIAL DATE SET

New York, (AP)--Federal Judge Harold R. Medina today fixed Oct. 15, as the trial date for 12 top American Communists charged with conspiracy to overthrow the government by force.

RAF CRASH KILLS 8

Kinross, Morayshire, Scotland, (AP)--A Royal Air Force Lancaster crashed on landing at this RAF station today and eight airmen were killed.

Fig. 36.

FACSIMILE EDITION DELIVERED BY WQAM-FM

The Miami Herald

Tuesday, August 24, 1948

5 p.m.

HIGH COST NO SECRET

Washington, (AP)--The cost of living index kept by the Bureau of Labor Statistics hit an all time record July 15.

As a result 333,000 General Motors Corp. employes will get a wage increase of three cents an hour.

Tension Eases In Berlin Sector

Berlin, (AP)--Tension eased today in blockaded Berlin as the Russians appeared to have given up, at least temporarily, their series of kidnap raids into the Western sectors.

Berliners turned their attention to Moscow reports which told of new hope for a settlement of the 61-day-old crisis brought on by the Russian blockade.

On the internal political front, Marshal Sokolovsky, Soviet zone commander, announced that elections in the Russian zone have been postponed for one year. It was the first time an occupying power has postponed elections.

Along the city's powder keg Potsdamer Square, where the American, British and Soviet sectors meet, Red army patrols were quiet after days of border-crossing raids ostensibly aimed at black marketers.

The British said they had abandoned plans to string up barbed wire between their part of the square and the Russian side. Some wire was strung Saturday.

Teacher Exhausted



MRS. OKSANA KASENKINA was scheduled to receive reporters in her New York hospital room today but was forced to cancel the engagement when doctors said she became exhausted by visits of cameramen and television technicians. This is one of the photos taken prior to the press cancellation. (Associated Press Wirephoto).

Fig. 37.

FACSIMILE EDITION

The Miami Herald

10 a.m.

iami, Fla., August 24, 1948



PLATINUM blonde-haired Jean Wallace of the movies has been granted a divorce from Actor Franchot Tone at Santa Monica, Cal.

Collision Kills 4 U.S. Fliers In Corridor

Ravotzhausen, Germany, (AP)--Two American planes on the supply run to blockaded Berlin collided outside this American zone town today, killing four U. S. fliers.

Five American fliers were killed in two previous accidents on the air run since the Russians blockaded Berlin late in June.

The planes were two-engined C-47s. They plunged into cornfields around this village which is 14 miles northeast of Frankfurt. The planes were returning to Wiesbaden from Berlin, where they had delivered supplies.

Nation Sweltering

Chicago, (AP)--Another sweltering day was in prospect for a wide section of the country today.

Summer's first sustained heat wave continued from the Rockies to the Appalachians. Temperatures ranging from the 90s to above 100 were forecast, a repeat of yesterday's readings. No immediate break in the hot spell was indicated.

Only upper Michigan and northeastern Minnesota, in the Central States, escaped the blistering heat.

MIAMI WEATHER FORECAST---

Partly cloudy through Wednesday with widely scattered thunder showers mostly in afternoons. Gentle to moderate variable winds mostly easterly. Temperature at 8:20 a.m. 84 degrees.

REDS BAN BERLIN ELECTION

Berlin, (AP)--Marshal Vassily D. Sokolovsky announced today that Germans in the Russian zone will not be allowed to hold community elections this fall. The Russian commander said the voting will be put off for one year.

Fig. 38.

FACSIMILE EDITION DELIVERED BY WQAM-FM

The Miami Herald

Wednesday, August 25, 1948

2:30 p.m.

B-29 Crashes Studied



72 DIE IN 5 WRECKS

Washington, (AP)--A recent series of B-29 crashes was described by an air force official today as a matter of "grave concern."

He added: "The crashes follow no particular pattern and apparently all had different causes. No connection between them is believed to exist."

None of the B-29s which figured in the crashes had been taken from reserve stocks where undetected deterioration might have occurred. All were flown by experienced pilots.

The safety division of the Air Force is making a careful investigation of the crashes, he added.

Here is a list of recent B-29 crashes:

July 15, Salina, Kans., 9 killed.
July 27, Aden, 17 killed.
Aug. 12, Rosewell Field, N.M., 13 killed.
Aug. 20, Rapid City, S.D., 17 killed.
Aug. 24, Hickam Field, Hawaii, 16 killed.

Fig. 39

FACSIMILE EDITION DELIVERED BY WQAM-FM

The Miami Herald

Wednesday, August 25, 1948

Miami, Fla.,

5 p.m.

Jumped To Escape,



MRS. OKSANA KASENKINA

Red Teacher Says

New York, (AP)--Mrs. Oksana Kasenkina said today she jumped from a third floor window of the Russian consulate because she wanted to escape.

She said in an interview from her bed in Roosevelt hospital "I jumped to escape, not to kill myself."

The 42-year-old Russian schoolteacher added she did not want to go back to Russia.

Mrs. Kasenkina said, "I don't agree with the policies of Josef Stalin. I love my people and my country. But I cannot agree with the regime in the Soviets."

Mrs. Kasenkina told reporters that when she was returned to the Soviet consulate here from the White Russian refugee farm at Valley Cottage, N. Y.:

"I knew that since they did not permit me to leave the consulate, I would not be able to escape in Russia either.

"Therefore I jumped out of the window to escape. I didn't want to kill myself. I wanted to escape."

She said that Soviet Ambassador Alexander Panyushkin and Consul General Yakov M. Lomakin "both told me what to say to reporters" at a press conference held in the Russian consulate on the day she was

(Continued on next page)

Fig. 40.

type if the two stories had been closer together. Note that the short story at the bottom of the right-hand column is set with IBM head, underscored.

This method of accentuating copy may also be seen in Fig. 35, where it is used to make a paragraph in the middle of the copy stand out and give the same sort of eye relief that a boldface paragraph would offer. This page also demonstrates use of odd-width copy and a photograph and headline sharing top play. The rule which separates the copy has been drawn with a soft lead pencil.

Bulletinized treatment of stories worth front-page mention can be brightened up by putting a one-line label head on top of the bulletins and using small, typed heads on each item. Figure 36 shows examples of this.

Winding copy of various widths around first-page art and putting a boxed story beside the banner headline are demonstrated in Fig. 37. The lead story is unusually long for facsimile, but the importance of the news merited the space.

Be careful about selecting first-page photographs. Be sure they are worthy of the play.

Occasionally you can take advantage of the topside-comes-first recorder operation by writing a headline which will "unreel" one word at a time. When you do that, get the caption with complete details high enough on the page so that the reader doesn't feel you are teasing him too much. Don't make a facsimile page a guessing game.

Notice that the two-column stories at the bottom of the page have small heads. They are about as large as you can use without making the bottom of the page "too heavy."

An example of a late news flash being worked into the make-up of the first page is shown in Fig. 36. The bulletin about the plane exploding in the air arrived just as the page was being made up. As originally laid out, the Russian consul story was directly under the four-column lead of the top story. At the bottom was a short story with a small head. The bulletin was hurriedly typed and placed on top

of the consul story, and the short at the bottom of the page was dropped.

Figure 37 is a good example of a first page with all copy and art used odd measure. The photograph of Mrs. Kasenkina could have been smaller and still effective, but there was no time for ordering a smaller reprint.

Although the authors have stressed putting identification of photographs on top, there are times when to do so would detract from the appearance of a page.

In Fig. 38, the photograph of the beautiful movie actress had been cropped as tight as possible, and there was no room for an overline on top. The editors tried putting the caption on top, but it seemed ridiculous in the company of the masthead and headline. So the caption was put at the bottom.

The overline of a photograph can be a banner head (Fig. 39). This page also shows a liberal use of white space. The editors had decided to tell just one story on the first page, and copy was laid out accordingly. It is a good example of facsimile's individual style of make-up, which uses a magazine sort of format to tell a live news story.

The banner story will sometimes identify the subject of a companion photograph and eliminate the need for a separate overline on the photograph (Fig. 40). The subhead mentions "Red Teacher," so the reader doesn't have to do much wondering about who the woman is as the photograph takes form down the page.

Frequently a shallow, three-column photograph is available, and sufficient story or caption material is on hand to run down beside it. The two can then be stripped across the page effectively. Often, if the story is sufficiently newsworthy and the photograph good, the combination can be stripped across the top of the first page under the masthead and above the banner headline.

These suggestions and illustrations just scratch the surface of what can be done with facsimile first pages. They serve primarily to demonstrate that spot news can be dressed up far more than in regular newspaper treatment and that it can be done routinely with

the simple equipment of a facsimile department.

Follow Pages

The make-up of pages that follow the first page depends, of course, on what type of edition you are transmitting. It can be four or eight pages of news, with little emphasis on features, or the first page may be the only complete news page of the edition.

Use pages which are all type matter sparingly. Work an illustration into each page if possible. When you do use a page which is mostly type, break it up with enough headlines, subheads, or white space to make it readable. Set copy different widths. The solid-type page in Fig. 41 is included as an example of how flat a page can appear if copy is used full-page width and without an illustration.

The main advantage of all-type pages is speed of processing and make-up. There are times when copy may pile up and you want to clear the decks. However, much of this advantage is offset by the dull appearance of the pages.

Pages on which photographs are used liberally have greatest reader interest. The typical follow pages shown in Figs. 42 to 47 combine spot news with wire photo, local or file photographs. All of these pages were made by the Miami Herald facsimile staff. They are presented as suggestions of what can be done to package facsimile news attractively and still meet fixed deadlines. The authors do not offer these as perfect examples of facsimile make-up. They are merely typical of pages made up in the rush of getting out hourly facsimile editions.

You will notice in Fig. 42 that the arrow leads out of the top words of the headline "Film Actress," keying the photograph to the story and identifying it at the very beginning of the page. Miss Johnson's face has been outlined by cutting away the photograph's background. Her hair has been cropped as little as possible to maintain the soft effect, and there is enough white space between her cheek and the type to prevent an illusion of flatness, which might be caused

STASSEN HITS WAR TALK

Hiram, O., (AP)--Harold E. Stassen told a mock Republican convention at Hiram College today "We must never surrender to the insidious whisper that war is inevitable."

Making his second trip into Ohio in quest of 23 of its 53 presidential delegates following triumphs in Wisconsin and Nebraska, Stassen concentrated on the possibilities of keeping the peace in his talk for some 700 students.

"Clearly there is a world menace to liberalism," he said, "manifesting itself in Russian communism and in the face of that threat there are two extremes of action." Rejecting both, Stassen said they were "appeasement" and the assumption that war is inevitable.

"You cannot pave the road to peace with jelly-like blocks of appeasement," he continued. "On the other hand, if we once conclude in America World War II is inevitable then it becomes inevitable. We must never surrender to the insidious whisper that war is inevitable."

He said the United States should go on an "offensive of ideas," entailing: outlawing the communist party and strengthening the United Nations "by calling a convention to end the veto and establishing an international police force."

From here, Stassen plans to move to Youngstown for noon, afternoon and evening speeches.

Jews Claim Decisive Victory Over Arabs

By the Associated Press

Jewish sources said today Haganah fighters won a decisive victory in northern Palestine over Fawzi Bey Al Kaukji's Arab volunteer army.

The informants said 12,000 Jewish militia fighters inflicted 200 casualties, routed the Arabs and were pursuing them northward from embattled Mishmar Haemak toward Jenin. Some Jews cut over the hills lining Megiddo Plain, ancient Armageddon battleground, in an attempt to encircle the Arabs, they said.

The military situation in the Mishmar Haemak area, where Haganah and part of Fawzi Bey's army have been fighting for more than a week, was clouded by conflicting reports. Arab League headquarters in Cairo said it had reports that the Arabs were surrounded by 12,000 Jewish fighters, but an Arab spokesman in Jerusalem said the Jews themselves had been surrounded.

Russians Refuse To Lift Embargo

Berlin, (AP)--Western allied authorities today accused the Russians of reneging on a promise to remove their embargo on German parcel post service with Western Germany.

More than 130 railroad carloads of packages have piled up.

The British military government announced Maj. Gen. Alexander Kotikov, Soviet commandant of Berlin, notified them yesterday that he would take immediate steps to clear the packages.

Despite this promise, American postal officials said today, the Russians still refused to let German railroads haul this cargo.

The official Soviet news bureau declared today that parcel post had to be checked because Berliners were sending "great wealth" out to the western occupation zone by this method. It asserted "diamonds, gold, platinum and much food" were being shipped out.

Fig. 41.

FILM ACTRESS SUFFERS FROM HEAD INJURY

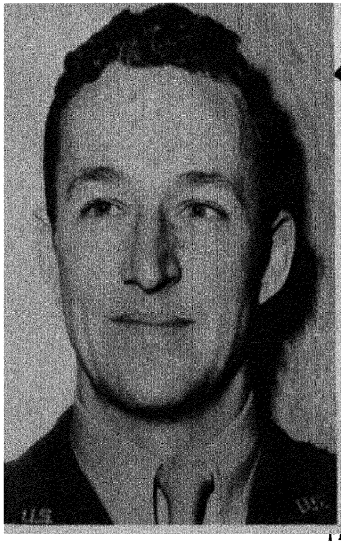


Hollywood. (AP)--Blond Rita Johnson, once considered as a successor to the late Jean Harlow, is in critical condition today with a brain injury suffered mysteriously four days ago.

The 35-year-old film actress underwent delicate surgery in which three specialists removed a blood clot pressing on her brain last night at St. Vincent's Hospital in Los Angeles. Thereafter her condition was reported slightly improved.

Hollywood Detectives Knox Weaver and Al Goossen began an investigation to determine what it was that might have struck Miss Johnson's head in her apartment, apparently between the hours of 4:30 and 6 P.M. Monday.

A maid offered a possible clue to the mystery, saying a hair dryer in Miss Johnson's apartment had slipped before and might have again, striking the actress on the head. Dr. Siegel reported finding the dryer resting on a chair behind which it stood.



Famous Speed Pilot Injured In Crackup

Van Nuys, Cal. (AP)--Capt. James T. Fitzgerald, Jr., 28, one of the nation's fastest fliers, lay critically injured today after a jet plane crackup.

His TF-80C jet fighter-trainer Shooting Star crashed in a field of rose bushes yesterday 300 yards north of Metropolitan airport here.

He had flown alone from Muroc air force base, where he was stationed. Witnesses said he was making an approach to the runway here when the plane dipped, dug its left wing into the ground and somersaulted.

Norman Pultz, a Lockheed Aircraft test engineer said that when he reached the scene Capt. Fitzgerald was unconscious.

Capt. Fitzgerald, from South Pittsburgh, Tenn., has flown the X-1 rocket plane faster than the speed of sound in research work at Muroc.

Fig. 42.

Suspect Sabotage In Brazilian Blaze

Rio De Janeiro, (AP)--Fire which police suspect was sabotage broke out today at the Rio De Janeiro navy yard near the arsenal. It was put out before it reached explosives.

Police said the circumstances were similar to those of the recent army arsenal explosion, blamed on Communists.

The navy yard fire began in a wooden warehouse where workers keep clothes. Only a plot of dry grass separates the building from a deposit of TNT and other explosives. The warehouse and a tool shed burned.

Free 12 Communists Held In Bogota Riot

Bogota, Colombia, (AP)--Twelve Communists held in the investigation of Colombia's April 9 uprising have been freed unconditionally.

Judge Rafael Latorre Fonseca said in a newspaper statement yesterday he released the Communists because he could find no proof that they took part in the rioting which took a death toll in the nation estimated by the Red Cross at 1,500.

The 12 had been held since April 12. They included Gilberto Viera, secretary of Colombia's Communist party.

Chinese Red Radio Forecasts Doom' For Chiang Kai-Shek

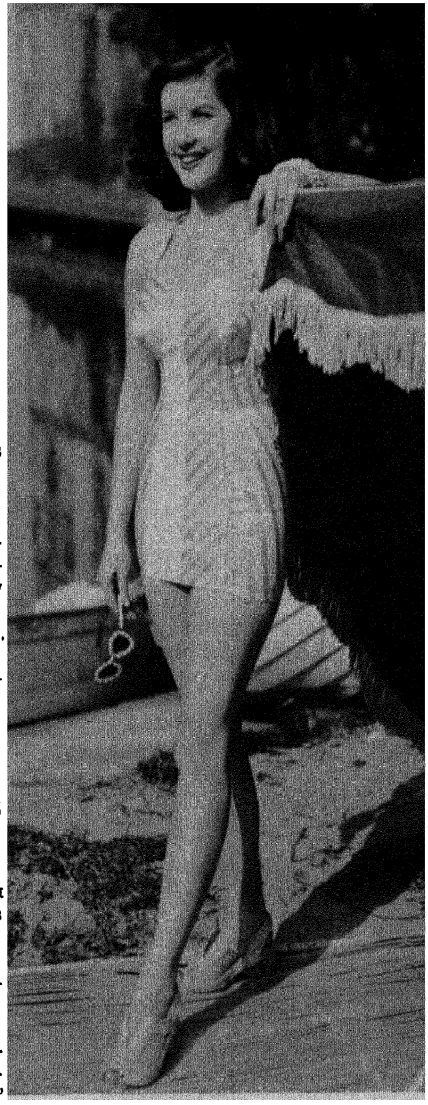
San Francisco, (AP)--The Chinese Communist radio said today that May Day this year marks the beginning of Chiang Kai-Shek's "doom."

Broadcasting from its hideout in Shensi Province, the radio said:

"Chiang Kai-Shek's phony (election) as president portends his imminent ascent to the guillotine. Fight to take the phony president alive."

The broadcast was heard in San Francisco by the Associated Press.

ONE-PIECE CLASSIC swim suit of elasticized fabric is in yellow on yellow stripe. Made to fit the tiny waistline, the suit has a seamless zipperless back and shoulder straps that may be either crossed and buttoned or tied in halter fashion. Rose Marie Reid designed it; Actress Barbara Bates models it.



The Miami Herald
RADIO FACSIMILE EDITION

Fig. 43.

ITU Cited To Reply To Contempt Action

Indianapolis, (AP)--Federal Judge Luther M. Swygert today ordered officials of the International Typographical Union to appear at 10 a.m. Sept. 15 to show cause why the union should not be held in contempt of court.

The National Labor Relations Board's attorney petitioned the court yesterday to cite the ITU for contempt, charging that the ITU had violated an injunction issued last March 27 by Judge Swygert.

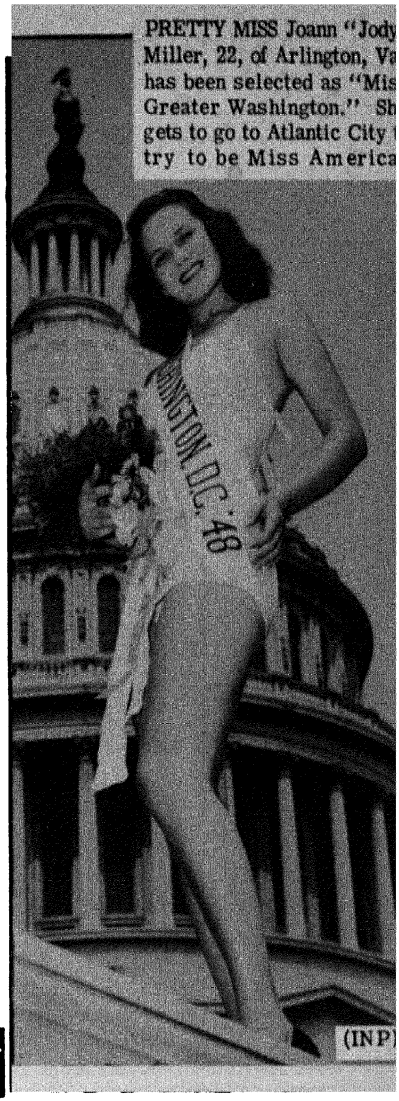
The NLRB attorney charged the union had continued to insist on what he said amounted to closed shop conditions in negotiations with newspaper publishers.

In his order, sent to the clerk of the Southern Indiana District court, Judge Swygert also gave the union until Sept. 7 to file an answer to the NLRB petition.

Arabs Charge Truce Violated

Jerusalem, (AP)--The Jews made new charges of truce violations by Arab forces in Jerusalem yesterday.

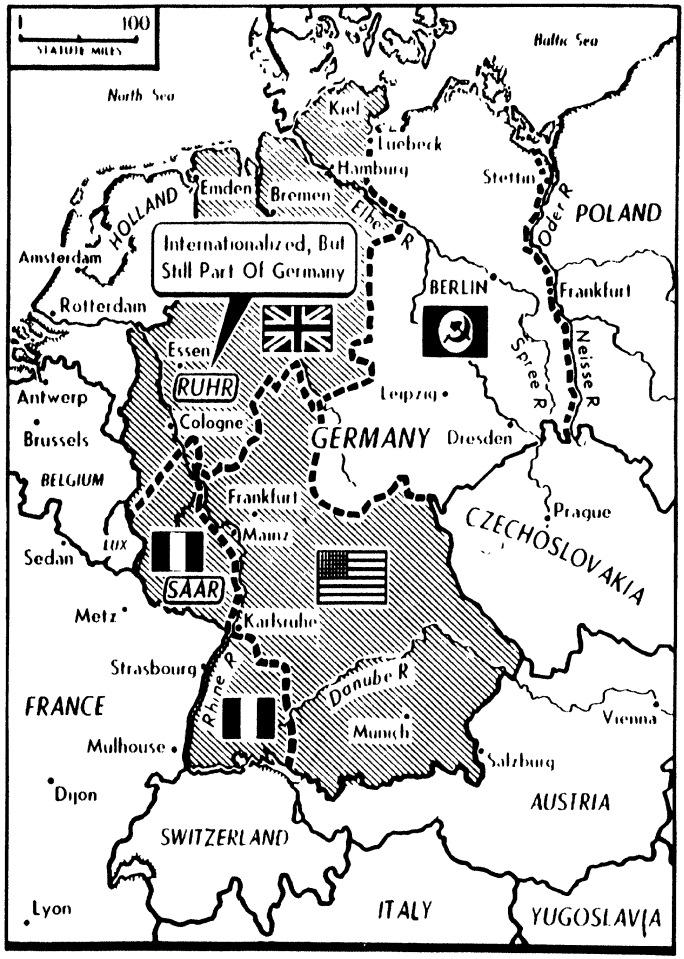
An Israeli army bulletin said Egyptian troops tried to advance across no-man's land toward a Jewish suburb. Israeli troops drove them back, the bulletin added.



FACSIMILE EDITION

Fig. 44.

PROPOSED WEST GERMAN STATE



A SIX-POWER WESTERN NATION CONFERENCE has proposed that Western zone of Germany (shaded) form a separate federal government. Territory of proposed state includes occupation zones of Britain, United States and France. Way was left open for Russian-occupied Germany to join proposed federation. Ruhr would be internationalized, but left a part of new German state. (Associated Press Wirephoto).

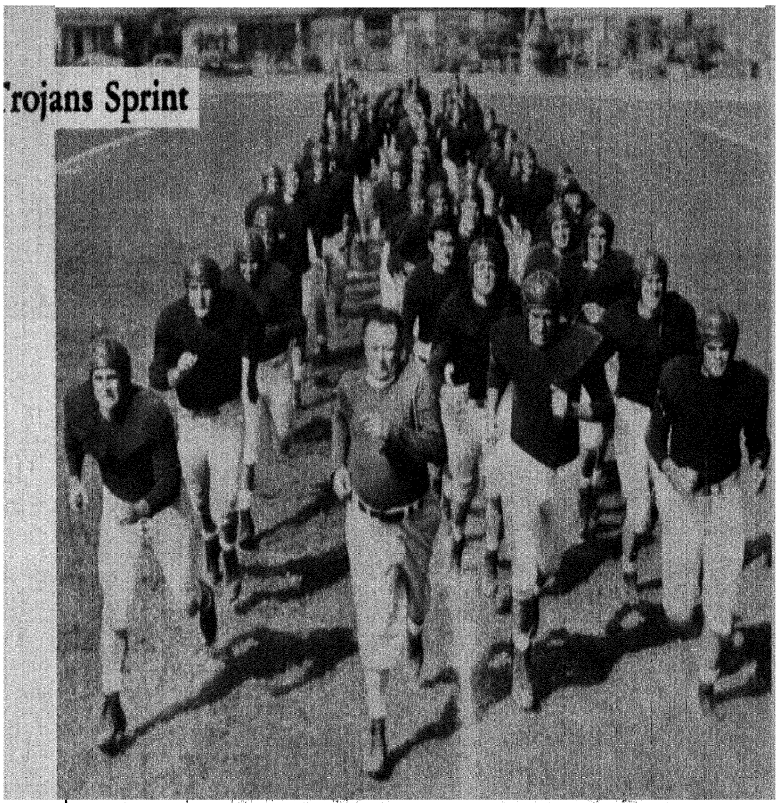
Fig. 45.

Soviet Seized 10 U.S. Planes In War

Washington, (AP)--At least 10 United States bombers were seized by the Russians during this country's war with Japan, including one B-29 shot down by Soviet fighter planes.

The Air Force disclosed this today and gave the detailed story of each incident in answer to a reporter's questions.

Five of the planes were B-29s, which the Russians later used as patterns for their own bombers now appearing in numbers over eastern Europe. The others included smaller Air Force bombers and two Navy patrol planes.



Led by Head Coach Jeff Cravath, the University of Southern California's Trojan football players gallop onto the field to open their 1948 practice program. The Trojans were the west's representatives against Michigan in the last Rose Bowl game--of sorrowful memory to California. (Associated Press Wirephoto).

Miami Weather Forecast ---

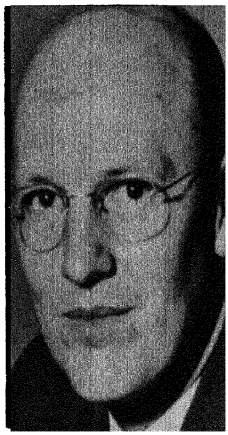
MIAMI AND VICINITY: Partly cloudy through Friday with scattered thundershowers in afternoons. Gentle, occasionally moderate, southeast to south winds. Temperature at 9:30 a. m., was 85 degrees.

Fig. 46.

STASSEN CHARGES BRANNAN TRIED TO STOP PRICE DROP



STASSEN



BRANNAN

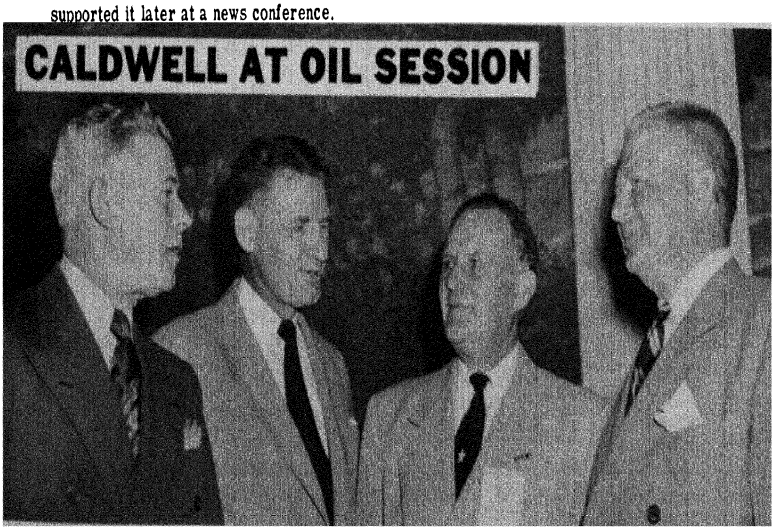
Albany, N. Y., (AP)--Harold E. Stassen today accused Secretary of Agriculture Charles F. Brannan of a "deliberate attempt to stop the downward trend of food prices."

Stassen, former Minnesota governor, who was defeated for the Republican presidential nomination by Gov. Thomas E. Dewey, told a news conference that the Agriculture Department, with Brannan's approval, had issued statements intended to "raise food prices when they should be shaking down."

The Minnesotan talked to reporters after concluding a conference with Dewey about a speech opening the GOP campaign which Stassen will make in Detroit next Tuesday.

It will be a reply to President Truman's Labor Day address in the same city.

When a reporter asked Stassen whether Brannan himself had issued the food statement, Stassen said he believed it had been issued by the department but that the secretary had supported it later at a news conference.



Governors Roy J. Turner of Oklahoma, Millard Caldwell of Florida, Beauford Jester of Texas and James H. Duff (left to right) of Pennsylvania, get together in the Roosevelt hotel, New York City, to attend the summer meeting of the Interstate Oil Compact Commission. (Associated Press Photo).

Fig. 47.

if the justified right-hand margin of the copy was close to her face.

Three two-column stories of three and four paragraphs have been effectively strung down the page in Fig. 43 with a new-style bathing suit occupying the remainder of the page. A miniature masthead, preprinted, has been stripped under the photograph.

A deliberately short page is shown in Fig. 44. The space was reserved for baseball scores, which were stripped across the bottom of the page.

An Associated Press wire-photo map is shown in Fig. 45. It was used to illustrate a story on a preceding page. Maps add eye relief to pages, and often you can take a small part of the map and use it as a thumbnail insert into stories to show graphically an area mentioned in the copy.

Pages shown in Figs. 46 and 47 are samplings of various ways you can mix live photographs and live news. They do not begin to explore all the layouts that are possible but do point the way toward getting the most out of the space you have on a facsimile follow page.

Fashions and Features

The fidelity with which facsimile can reproduce good photographs makes illustrated fashion pages a natural program subject. You can broaden the range to include cosmetics, diet hints, how to get and keep a flat tummy, and all the other topics which women enjoy reading even if they don't follow the advice.

Some of the ways you can make up this category of programming are shown in Figs. 48 to 58.

If a hat is worth using, give it enough space so the woman can see all the details in close to actual size. In fact, be very liberal in your cropping throughout fashion feature material. Cropping too close sometimes hardens the lines of a dress or hat, and the more space there is around any subject the softer the general effect will be.

One of the pages (Fig. 53) has a script overline which was written with a pencil.

If proper treatment of a fashion subject or feature

OFF-FACE ROLLER OF COOL MOSSY GREEN boasts for trim a red-orange velvet rose caught high in the center front. Mauve veiling, used as streamers, can be tied under the chin and used as a shoulder drape. It's really a romantic Easter bonnet!



Fig. 48.

Silhouette Is Born-- Not Made, Says Designer Fira Benenson



Flying folds of fabric that look like long columns from hipbone to hemline is the new trend launched by Designer Fira Benenson.

"Fashion, a silhouette, is born--not made," contends this famous designer. Going on this premise that there is a feeling in the air before the emphasis shifts, Miss Benenson has attempted in her new collection "to introduce a new liveliness of shape and lightness of line to the mood for curves."

In every costume, whether created for daytime or evening wear, the motion is to the back even when there is front fullness.

The bodices are soft through the bosom above a low, taut waistline.

There is an upward sweep from back to front, sometimes the hemline of evening gowns, sometimes the bottom of suit jackets, sometimes the waistline.

Also particularly notable are tied-on skirts for day and evening; daringly bared bosoms and backs with narrowest of shoestring straps for evening.

Many of the jackets are shaped forward in a decided, faceted roundness at the hipbone. The padding--or lack of it--beneath this shaping depends on whether the wearer really needs it.

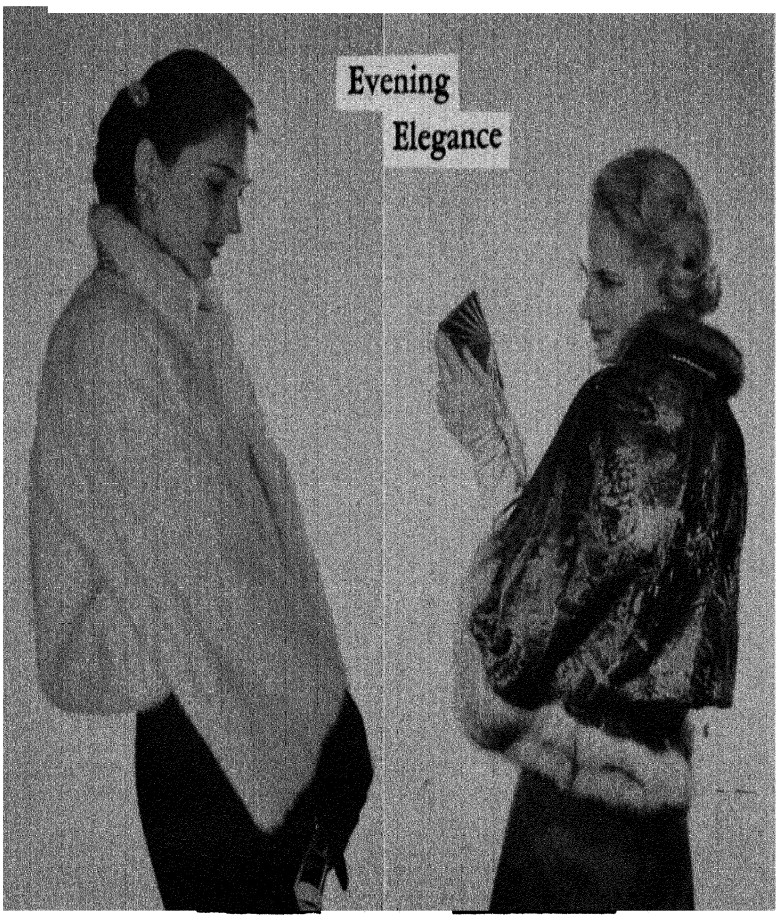
"I like the look of a small, very flexible torso set above a rather solid and shapely skirt," declares Miss Benenson.

WONDERFUL FOR DANCING is this navy blue taffeta gown from Fira Benenson's 1948 collection. The skirt is slim in front with Pilaster drapery in back. Soft folds over the bosom are embroidered in pink, green and silver with silver ball fringe. Shoestring shoulder straps are designer favorites.

The Miami Herald
RADIO FACSIMILE EDITION
May 24, 1948

Fig. 49.

The Miami Herald



NEW FLOWER SILHOUETTE IN FURS is introduced by Esther Dorothy. Her white mink version (left) has a very much bloused in back, drawn in to the waist with a drawstring. Shoulders are gently sloping, softly rounded. Same treatment is used in the jacket at right which combines black Russian broadtail and blond mink. In this, the sleeves blend right into the body of the jacket. Collar, characteristically in this collection, is up-standing. They make a perfect foil for ropes of pearls and form a frame for a pretty face.

Fig. 50.



PROFILE SILHOUETTE

In the new profile silhouette, there's a decided swing to the back or swing to the front of the skirts...A faceted, forward shaping over the hipbones in jackets and day clothes...An upward sweep from back to front in the hemlines of evening dresses, at the bottom of suit jackets, and in waistlines that dip to a low curve at the back (in profile, the dress is never straight around).....

'AREERISTS CHOOSE practical clothes ut keep a careful eye out for smartness. Radio Actress Ruth Ford (left) likes his navy faille suit with collar and cuffs f white organdy. A five-strand pearl racelet and white veiled pique Watteau onnet complete the gay ensemble. Anita Colby, Paramount Pictures executive and amed model (right) wears a fitted coat f thin, grey Julliard worsted mixture ool. Fitted top buttons to a high neck, hile the full circular skirt is pulled in t waist with matching belt. (INS Photos).

When On A Reducing Diet, Let Butter Be Luxury Item

Use butter as a luxury in your reducing diet--not as a general part of it, seems to be good advice even in these days of expensive foodstuffs. If you like your greens with vinegar and salt or with lemon and salt, then save your pat of butter for distribution on eggs, potatoes and bread. In other words do your own seasoning and use your allowable quota of butter in the way which gives you most gustatory pleasure.

Restriction of butter on the reducing diet is one reason for the wisdom of adding vitamin pills to the diet. The fact that the amount of food you consume is limited is another. You are not so likely to obtain sufficient vitamin content when you eat a smaller and more restricted amount of food.

Fig. 51.

LET EXERCISE COME TO YOUR RESCUE

By Josephine Lowman

Exercise can come to your rescue in many instances. For example, most of the forward and side bending exercises, especially when the exercise is done with the arms raised, are effective ways to combat fat across the back and under the arms.

Fat in these two particular spots is an ever present handicap for the overweight woman who wishes to wear the low-cut swim suits, evening gowns and play clothes.

Here's one exercise which will help overcome fat under the arms: Stand tall, arms hanging at your sides. Raise your arms overhead with stiff elbows, the backs of your hands turned toward each other so you touch the backs of your hands together high over your head. Pull and reach up as high as you can. Return arms to your sides and continue.

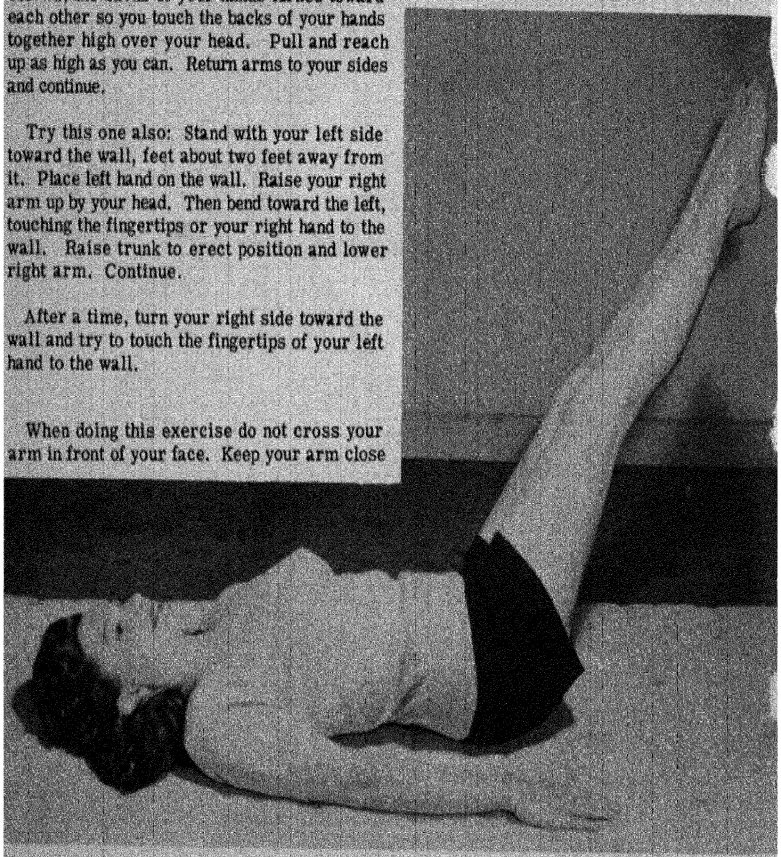
Try this one also: Stand with your left side toward the wall, feet about two feet away from it. Place left hand on the wall. Raise your right arm up by your head. Then bend toward the left, touching the fingertips or your right hand to the wall. Raise trunk to erect position and lower right arm. Continue.

After a time, turn your right side toward the wall and try to touch the fingertips of your left hand to the wall.

When doing this exercise do not cross your arm in front of your face. Keep your arm close to your ear and make your trunk bend for the wa touch.

MIDRIFF FLATTENER

To flatten that midriff area, lie on your back with your legs straight and your arms resting comfortably on the floor. Bend both knees up close to your tummy. Straighten your legs toward the ceiling, toes pointing toward the ceiling. Slowly lower your legs to the floor, with stiff knees. Do this ten times the first day and gradually work up to 30 times daily. Also, watch your diet a little by cutting out candy and rich desserts.



RECOMMENDED AS A GOOD EXERCISE to flatten your midriff is this exercise, demonstrated by Actress Patricia White and described for Herald facsimile readers by Josephine Lowman.

Fig. 52.



MAINTAINING that new look in the hat department, Arlene Dahl, MGM actress, wears deep-red carnations on a tiny pill box of navy blue straw. The wide mesh veiling of navy blue covers the crown and is worn scarflike around the neck. (International News Photo).

RADIO FACSIMILE EDITION

Why Grow Old Question Box

By Josephine Lowman

Q. "Does watermelon make one fat?"

A. A medium slice of watermelon has about 100 calories.

Q. "How can I reduce my legs?"

A. If it is the calf, do the following exercise: Lie on the floor on your back with your legs straight. Lift your left leg up and pull the toes back toward your head. Lower leg to floor. Do the same thing with your right leg. Continue, alternating.

Q. "Please give me what you consider to be the essentials in getting ready for bed, so far as skin and hair care are concerned. I lead a very busy life and by bedtime have the inclination to tumble in without doing anything at all. I have no time for beauty care during the day, except I do take my exercises."

A. The first "must" is a careful cleansing of the skin. The manner in which you do this depends on the type skin you have. If your complexion is oily, wash your face with soap and water and rinse well. Afterwards, apply an astringent. If you have pimples apply a drying antiseptic lotion to them and leave it on all night. If your skin is dry, cleanse it well with cleansing cream. Afterwards apply a lubricating cream and leave it on all night. If you do not like to sleep in cream, at least pat an eye cream about your eyes or use one of the disappearing night oils.

Hand lotion is indicated as a part of your bedroom routine. If your hands are very dry it is a good idea to apply cream and sleep in white cotton gloves once or twice a week.

This is also a splendid time to give your hair that one hundred strokes and to take facial exercises.

Fig. 55.

SOFTLY TAILORED FOR FALL



ADELE SIMPSON'S WIDE-BELTED two-piece tunic suit for Fall (left) in grey wool features a double row of buttons. Buttoned hip skirt pockets show through side slits in jacket peplum. There's a suggestion of the military in Jane Derby's brown and beige Glen plaid coat dress with tabbed shoulders (center). Skirt is opened down one side. Brown calf belt matches the bone buttons. Black velvet collar on the jacket of the black and white checked wool suit (right) is teamed with jet buttons. Both jacket and skirt of this suit dip slightly in back. (Photos courtesy New York Dress Institute.)

Fig. 56.

June Brings Story-Book Brides



Fig. 57.



LOOKING LIKE THEY STEPPED out of a nineteenth century portrait or the treasured family album, are this year's story-book brides. It's all thanks to the New York designers of wedding gowns, who are sending brides walking down the aisle in yards and yards of ruffling, lace bertha, leg o'mutton sleeves and long train. For striking simplicity, a sophisticated bride might choose the white jersey gown pictured for this supple material lends itself to a long princesse bodice and train. Heavy white lace in an off-shoulder band outlines the round yoke of white marquisette. Demurely charming for the sweet and girlish type is the white dotted nylon wedding dress with fluted ruffling forming a bustle and edging the skirt. Tiny, covered buttons march up to the Peter Pan collar and also are used on the leg o'mutton sleeves. Accompanying headdresses and veils are keyed to the New York-designed gowns.

Fig. 58

story requires more than one page, it is simple to make them up. Have the pages transmitted one immediately after the other without excess space in between. They will record as a continuous series of pictures or story. Figures 57 and 58 are examples of this.

Using Teletype Copy

Make-up of copy used directly from press-association teletype is simple. The copy is trimmed and mounted on a backing sheet the same color as the teletype paper.

If maximum handling speed is required, a preprinted "Bulletin" head is pasted above the teletype copy, and off it goes to the scanner (see Fig. 59).

Or several pieces of teletype copy about the same story can be pasted together on a page, and a head set and stripped on top (see Fig. 60).

A combination of teletype stories can go under a preprinted head.

You may wish to use several complete stories directly from the teletypes, and they each can have a set head (see Fig. 61).

Preprinted Forms

When running long tabulations, particularly in covering fast-moving election results, you can use preprinted forms and fill in the numbers on a typewriter (see Fig. 62).

BULLETIN

NEW YORK, APRIL 9(AP)-A BROADCAST FROM BOGOTA SIGNED BY THE "REVOLUTIONARY COMMITTEE OF THE LIBERAL PARTY" SAID TODAY THE LIBERAL PARTY HAD TAKEN CONTROL OF THE COLOMBIAN GOVERNMENT.

Fig. 59.

Philadelphia 5; Boston 4

BOSTON,APRIL 19-(AP)-PHILADELPHIA'S ATHLETICS SPOILED THE HOME DEBUT OF THE HIGHLY REGARDED RED SOX TODAY BY SHADING THE BOSTON CLUB 5-4 IN 11 INNINGS BEFORE A PATRIOT'S DAY MORNING CROWD OF 22,409.

THE SAME TEAMS WILL MEET AGAIN IN AN AFTERNOON CONTEST.

PHILADELPHIA	000	010	020	02--5	14	2
BOSTON	030	000	000	01--4	7	0

MARCHILDON AND ROSAR; DOBSON, JOHNSON (11) AND TEBBETTS.

HOME RUNS--SPENCE, STEPHENS, DOERR.

Kidnapped Farm Girl Found, Safe

CONCORD,VT.,MARCH 19-(AP)-THE ALLEGED KIDNAPER OF A 16-YEAR-OLD FARMER'S DAUGHTER WAS CAPTURED WITH HER THREE MILES FROM HER VILLAGE HOME TODAY. POLICE SAID NOTES DEMANDING FOOD LED THEM TO THE PAIR.

THE GIRL WAS REPORTED "O.K." BY STATE POLICE COMMISSIONER MERRITT EDSON. SHERIFF JOHN H.WILLSON SAID KENNETH A.INGALLS, 34, AND PRETTY CHARLOTTE O'BRIEN TOLD HIM:

"WE DIDN'T EAT IN FOUR DAYS AND WE HAD ONLY MELTED SNOW FOR DRINKING."

Five Killed In Explosion

CENTRALIA,ILL.,MARCH 19-(AP)-FIVE PERSONS WERE KILLED AND 25 WERE INJURED LAST NIGHT BY AN EXPLOSION THAT DESTROYED A TWO-STORY BRICK BUILDING.

TEN OF THE INJURED ARE IN CRITICAL CONDITION TODAY.

THE DEAD WERE:

MRS.FRANK NICHOLS, 60; JAMES ROLLA TELFORD, 61, AND PERCY ARCOUET, ABOUT 60, ALL OF CENTRALIA; ORAL LEEDS, JR., AND WAYNE SCOTT, 26, BOTH OF CHAMPAIGN.

LEEDS WAS A BRAKEMAN AND SCOTT A FIREMAN ON THE ILLINOIS CENTRAL RAILROAD.

POLICE AND FIREMEN CONTINUED THEIR SEARCH OF THE WRECKAGE FOR OTHER BODIES. HIGH WINDS AND HEAVY RAIN SLOWED THEIR WORK.

Wallace Skips Truman Visit

WASHINGTON,MARCH 19-(AP)-HENRY A.WALLACE PASSED UP AN OPPORTUNITY TO VISIT PRESIDENT TRUMAN AT THE WHITE HOUSE TODAY.

WALLACE, THIRD PARTY CANDIDATE FOR THE PRESIDENCY, COULD HAVE CALLED ON MR.TRUMAN ALONG WITH OTHER MEMBERS OF THE BOARD OF THE FRANKLIN D.ROOSEVELT MEMORIAL FOUNDATION.

Fig. 61.

Final
Dade Election Results

92 of 92 Precincts

County Commissioner

District 1

Bandy	2290	Spaulding	3604
Ellenburg	3585	Sweet	4663
Papy	10428	Yarborough	30933
Penman	2183		

District 2

Graham	16848	Robinson	6554
Peters	34909		

District 3

Butler	4577	Johnson	6267
Deer	5297	MacVicar	35292

District 4

Bird	23559	Turner	4401
Stockdale	18131	Wood	10632

District 5

Cleary	24535	Snedigar	27923

Governor

Akin	464	Pollitt	302
Cooper	608	Shands	10358
English	12456	Warren	18180
Macfadden	996	Watson	5149
McCarty	78707		

Attorney General

Burton	16957	Ervin	17378
Crews	9496	McArthur	6258

Comptroller

Fraser	18794	Lee	6746
Gay	31607		

Treasurer

Carlisle	9292	Larson	38501

State School Supt.

Bailey	21889	Marshall	8919
Dolley	20009		

Fig. 62.

XV

PRODUCTION AND MAKE-UP WITHOUT A COMPOSING ROOM

Facsimile make-up and production are radically different from that of standard newspapers, both in appearance and methods. Not only do pages have a new kind of eye appeal, but equipment and materials used to create the pages are unfamiliar to most newspapermen.

In regular newspaper production, there are separate departments, covering large areas. They specialize in editing; setting body type, advertisements, and headlines; processing illustrations and photographs; making layouts and retouching; putting pages together in orderly procedure; rolling them into plates in the stereotype department; putting the plates on the presses and printing the paper; and passing it through the mail room to the delivery trucks and newsboys.

Facsimile packages all these operations in one compact department.

There are three main reasons for this: (1) Speed is essential, (2) the end product consists of paper, not metal forms, and (3) only one copy of the edition has to be produced in the department, not thousands. Once an edition is assembled and scanned, each FM-FX receiver serves as a press, turning out precise copies of the page.

With careful preliminary layout planning, all the mechanical equipment required can be installed in a room 20 by 15 feet. An old-time editor walking into such a miniature department almost invariably exclaims, "Is this *it*?"

The mechanical equipment is different from the composing room because a proof, not metal, is desired. Therefore, machinery is small and relatively simple to operate. About the only previous skill required is familiarity with a typewriter. An apprenticeship of 1 month is sufficient for a person of average intelligence to learn how to run every machine in the department.

Copy Setting

Specially designed or adapted typewriters are the backbone of facsimile copy-setting equipment. Of course, the most versatile and attractive source of printed copy is a composing room which offers type faces and sizes with which readers are already familiar. However, if a composing room is used, speed of news delivery by facsimile is reduced. Copy must be edited, delivered to the compositors, set in type, corrected; proofs pulled on suitable paper and returned to the facsimile department for tailoring into pages. The time drag is obvious; the procedure expensive.

Instead of news having the immediacy of a few minutes, it becomes an involved, slow process curbing the editing of editions and diluting the speed appeal which is an integral part of facsimile. If a composing room is used exclusively, you can't handle a news break when only a few minutes of edition air time remain. It is simply too slow. The dramatic impact of a sudden event delivered fast by facsimile then becomes a standardized accounting of past history—a job newspapers can do better.

In order to make full use of facsimile's speed, copy must be set in the facsimile department itself. And the only machines now generally available to do the job are special typewriters. They reduce the cost and speed copy setting.

Copy produced is different from that ordinarily used in publication, but it is attractive enough to please readers. Perhaps they consider facsimile so completely different from other means of publication that they take the difference in body type appearance for granted. In any event, they do not complain.

IBM Electric Typewriter

One of the leaders in the special typewriter field is the IBM electric typewriter, with proportional letter spacing, which is manufactured by the International Business Machines Company.

This machine produces attractive copy closely

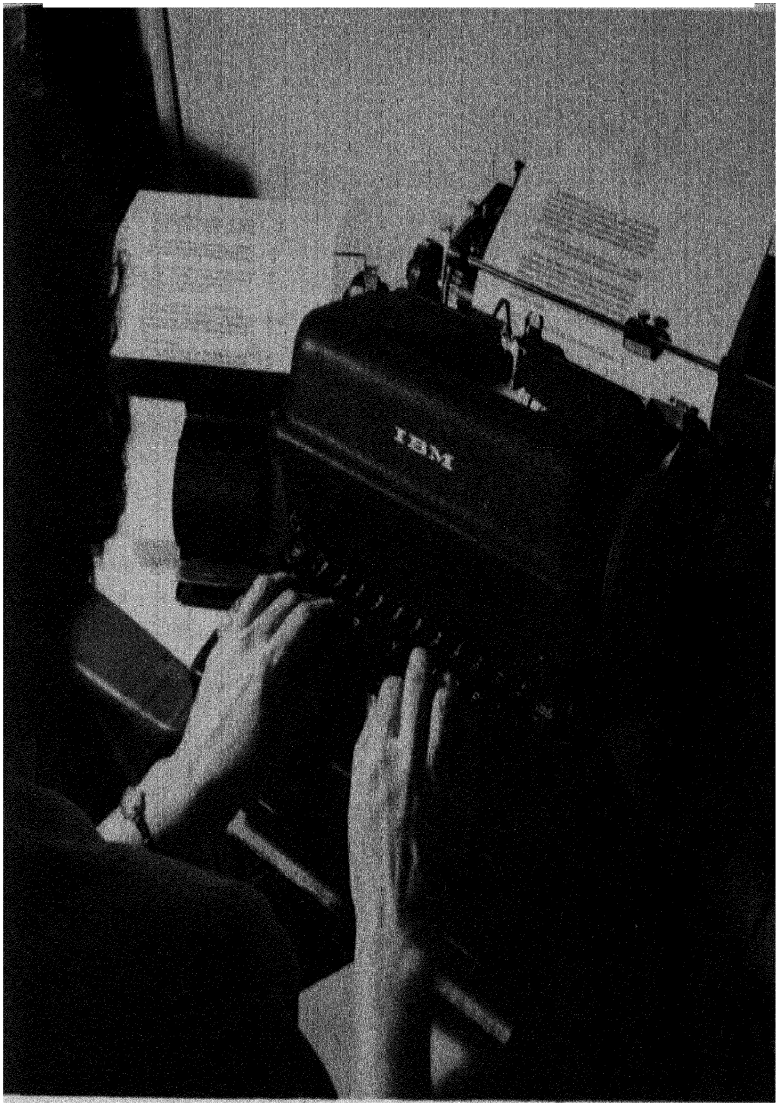


Fig. 63. Getting an even right-hand margin, with a second typing, using an International Business Machines electric typewriter with a Marginator. Copy at left is the first typing with marginal notes showing whether the line is long or short of the desired length. Copy in the typewriter has had space adjustments, and the consecutive lines have an even right-hand margin.

approximating regular printing. Copy may be single spaced or double spaced. One good method is to single space but use double space between paragraphs. Full double spacing usually is reserved for special emphasis. Standard equipment provides about two points of spacing between IBM lines when the copy is set single space. However, a special ratchet can be installed which cuts this to approximately one point and improves the readability.

Equipped with a Marginator (Edison Marginal Justifier, which also fits standard typewriters), right-hand margins are made to come out even by a second typing. Then the right side of the typed column is uniform—like the type on this type. Two adroit IBM operators can turn out justified copy with enough speed to handle a normal four-page edition hourly, together with any spot news that may break during edition time (see Fig. 63).

The editor marks copy for a specific width, e.g., 4 inches. The copy setter types the copy as close to that width as possible, and a scale on the typewriter paper bail shows how much the line is short or long of the mark. The copy setter makes a marginal note after each line, indicating the extent of expansion or contraction of the line that is needed. The Marginator will expand or contract lines four spaces plus or minus. During the second typing, the Marginator is reset once for each line, and by automatic adjustments in the typewriter's spacing mechanism, the line of copy is squeezed or expanded as desired. The space is evenly distributed throughout the line. This is repeated line after line until right-hand margin justification is achieved for the entire piece of copy.

The IBM machine has a standard typewriter keyboard of 88 characters, including symbols.

Four typefaces, not interchangeable, are available: 12-point Bold Book Face, 12-point Fine Line, 11-point Documentary, and 10-point Modern. The 12-point Book Face and 10-point Modern are best suited for facsimile because they have sturdy body construction and reproduce with good definition and density. These type

faces are permanent parts of each machine and cannot be changed at will.

Operation is entirely by electricity. Keys are activated by very light touch, and while attachment of a Marginator slows action somewhat, the operator can attain high speed once a smooth touch rhythm is developed. Keys cannot "pile up," because touching one key automatically locks all others until the key in action has returned to a neutral position.

Right-hand margin justification can be obtained on an IBM proportional spacing typewriter without a Marginator by using variable space keys during retyping. Words and sentences can be expanded or contracted 1/32, 2/32, or 3/32 inch as indicated by the length of original typing. Production speed is about the same, but finished copy sometimes has conspicuous stretching of spaces. The principal advantage of manual justification over the Marginator is reduced maintenance. The Marginator can cause difficulties in the spacing mechanism of the IBM. If you are in a city where an IBM serviceman is regularly available, the maintenance problem is worth enduring, because Marginator justified copy usually looks more like regular printing than manually justified copy.

Little training is needed to master the IBM machine, because it works almost exactly like a standard typewriter. Extra training, however, is required for the Marginator. Conversion of a good typist to satisfactory production and clean copy on an IBM-Marginator combination can be made in 1 month.

IBM's proportional spacing feature makes finished copy closely simulate regular type. Each letter is given the amount of space it requires, in contrast to a standard typewriter, which allows an equal amount of space between letters regardless of their width. Thus, the narrow letters "i" and "l" are given space proportionate to their width as are wide letters such as "w" and "m."

Twelve- and ten-point type faces will seem unnecessarily large body type to newspapermen. However, these sizes are used not merely because they happen to be the only ones available on the IBM machine but

also because facsimile body copy looks best in ten-point type or larger. Smaller body type is not yet recommended for facsimile because it usually records unsatisfactorily.

An important feature of the IBM machine is its automatically controlled impression strength. This ensures that each key will strike the ribbon with the same impact and provide uniform marking. The impression strength can be adjusted, which is useful for facsimile because a good black letter imprint is needed.

The machine uses a carbon ribbon which can be obtained in various degrees of black density. A No. 355 ribbon proves best for facsimile.

Although most IBM proportional spacing typewriters are now used in facsimile with a Marginator, manufactured by a separate company, it seems probable that new models will include IBM's own justifier as an optional, built-in feature.

Varityper

The Varityper, manufactured by the Ralph C. Coxhead Corp., of New York, is another outstanding typewriter adaptation which can achieve an even right-hand margin by a second typing. This may be done with an automatic, built-in justifying mechanism or, on standard models, with space-adjusting keys. Proportional letter spacing is an optional feature on the standard models.

For even right-hand margins, the copy is typed a line at a time as close to the desired length as possible. Then a tabulation key is struck, moving the carriage over for the second typing. This action sets in motion the automatic mechanism which injects the necessary spaces for justifying. When the operator retypes the first line, the machine automatically inserts the necessary spaces to make the line come out to the even margin. The operator does no calculating but merely sets the stops for the desired justified column width before starting to type.

Unlike the IBM electric typewriter, which was designed as a typewriter for executive correspondence,

the Varityper is expressly made to set copy for engraving or photo-offset printing, making it a natural facsimile tool.

It looks like a typewriter and has a modified standard-letter keyboard. There are only three rows of keys instead of four, and a few special keys have been added. A specialized typing touch is required, somewhat similar to that of a teletype, but training an operator is no more involved than for any other electric typewriter.

The Varityper has the advantage of interchangeable type fonts. In the proportional spacing model (which Varityper calls differential spacing) fonts are available from 5½ to 12 point, in light, medium, and bold faces.

The fonts are half-moon-shaped metal plates in special adaptations of standard faces. New fonts are loaded easily. Two fonts can be carried on the machine at the same time. They are interchangeable during typing merely by twisting a knob.

Impression strength is uniform and can be adjusted for light, medium, or dark copy. A carbon ribbon is used only once.

Operation is powered by electricity, except for the spacing adjustments and the carriage return. Production rate of a skilled Varityper operator is somewhat slower than a comparable operator of an IBM electric typewriter with a Marginator.

The authors have observed an IBM and Varityper, with expert operators, compete side by side in facsimile. The IBM is faster, but the two machines do essentially the same job. Varityper has the obvious advantage of two type fonts available at any one time and rapid interchangeability of others when wanted. Also, it has the built-in justifier feature.

A third advantage is the ability to vary the spacing between lines of copy, so that the finished typing can have line spacing comparable to that from Linotype machines.

Choice between IBM or Varityper, for facsimile use, is largely a matter of preference for their respective type appearances and cost. The Varityper, with

proportional spacing and automatic justification, is approximately three times as expensive as an IBM electric typewriter with proportional spacing and a Marginator. Either machine can do a good copy-setting job in facsimile.

The Multigraph

Multigraph hand-set type and printing offer facsimile a tool better suited for headlining than for body type, but satisfactory for either. The advantages of Multigraph for facsimile headlines are discussed later in this chapter (see Fig. 64).

For body type work, the process is considerably slower than either the IBM electric typewriter or the Varityper. Primarily, Multigraph is designed to fill the gap in business between typewriters and the print shop, so speed of assembling the type is not a paramount consideration. The equipment is designed for letterpress copy, such as menus, placards, posters, and form letters, which in the ordinary run of events do not require so much speed as preparing facsimile copy.

The type comes in individual characters from 6 point up. Each character slips into channels in a form that fits onto a small press. The type is assembled in a pickup fork, which extracts it from containers loaded with single letters of the alphabet.

When a line of type has been accumulated, it is justified by redistributing surplus spaces between the words. This, together with the fact that the letters are not proportionately spaced, detracts from the attempt to duplicate the appearance of machine-set body type.

Each line of type is transferred to the special channeled form and "locked" in place with metal clips. The press on which the form fits can be manually operated in a facsimile application, although power-driven presses are available for mass imprints.

Any person who has seen a printer assemble type on his stick will recognize the limitations of Multigraph for fast work. Because of the time involved, it is

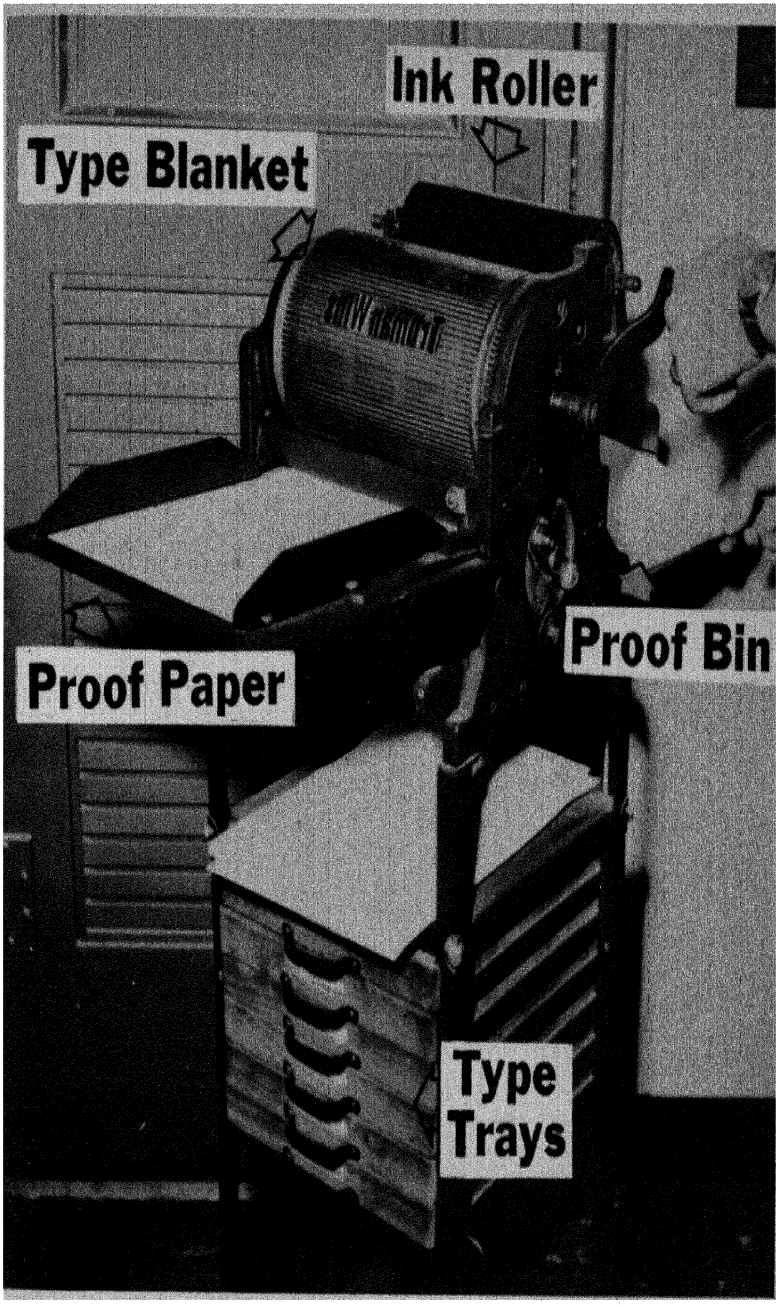


Fig. 64. Manually operated Multigraph machine, used for facsimile headlines.

not recommended for facsimile body type in connection with frequent editions.

Flexible Tape Printer

Joseph Spielvogel, a New Jersey inventor, has announced a method of producing typewritten copy with right-hand margins justified in the first typing by a flexible tape attachment to an IBM electric typewriter with proportional spacing.

This process has definite application to facsimile copysetting, although the danger of scanner shadow is inherent.

Spielvogel's process uses a reel of paper tape which can stretch. The tape is parallel to the carbon ribbon of the electric typewriter, and copy is typed on the tape. When no more words or characters will fit on the tape within the designated length for the copy, a special mechanism stretches the tape to the exact length desired and fastens it to a sheet of paper which has a special adhesive surface coat. The backup paper then feeds through the typewriter in the usual manner.

As the typist follows copy, line by line, the flexible tape is placed on the backup paper in succeeding lines as a telegram is pasted on a blank, and each line is precisely the same length.

There are obvious advantages to this flexible-tape method if it proves free from mechanical faults. Justified copy can be obtained in roughly half the time required with an IBM and justifier combination or with the Varityper.

Justowriter

The Justowriter Corporation, Rochester, N.Y., has developed copy-setting equipment expressly for engraving, photo-offset, or facsimile body text use.

This consists of a tape-perforating typewriter, similar to a teletype punch machine. Copy is typed and converted into perforated tape with compensations, according to the column width desired. The tape is then fed into another machine, which types precisely

justified lines, with proportional letter spacing.

Justowriter copy resembles IBM 12-point Bold Book Face type. It closely approximates regular printing and may prove to be one of the best answers to facsimile's copy-setting requirements.

Expansion and contraction of the justified line are evenly distributed in spaces between words. Key-impact strength is constant, and letters have uniform density, so facsimile copy records well.

Indentions for inset illustrations or heads are easily made. In fact, the Justowriter is so versatile that copy can be set in a perfect circle.

Original cost exceeds either IBM or Varityper installations, and a somewhat more specialized skill is required for operation.

Headlines

If the facsimile publisher has a newspaper composing room available and elects to use it, part of his headline-setting requirements may be met. Advance copy can be handled with ease, but he is still faced with the problem of getting proofs of headlines to the facsimile department in a hurry when a fast news break is being handled and minutes count.

This is not so important when one or two editions are being published daily. Then the extra head-setting load in the composing room is minor. But if his schedule calls for facsimile editions every hour or two hours, it isn't such a simple matter. He must either give facsimile headlines priority and invite disruption of production for his regular newspaper or set aside part of his composing-room equipment exclusively for facsimile work. The best arrangement he makes is slower and more expensive than setting the heads in the facsimile department itself.

This suggests duplicating composing-room equipment, an expensive undertaking. It isn't necessary.

There are two ways he can set heads in the facsimile department with maximum speed and attractive results, by-passing the composing room completely. One is mechanical, using office printing equipment; the other

is chiefly an art-department function.

The mechanical method calls for typewriters or hand-set heads, with type that is reusable, and a small, manually operated proof press. (One good proof is enough for facsimile.)

The art-department method involves hand lettering or preprinted paper letters which cannot be reused.

Both methods have their place in facsimile, although the bulk of the work will be done on the proof press.

Typewriters

Small heads are easily handled by typewriters. Either manual or electric models may be used. The latter are more satisfactory because they use a carbon ribbon which makes letters sharp and black. Ordinary manual typewriters with repeating fabric ribbons do not produce sufficiently uniform black copy for good recording.

The Varityper has 10- and 12-point type faces solely for headlining, which produce satisfactory small heads.

International Business Machines' electric typewriter has type which approximates 10- and 12-point. Both are suited for small heads.

Obviously, this is just a start toward facsimile's headline needs.

Multigraph

The Addressograph-Multigraph Corporation of Cleveland manufactures a head-setting machine with display type from 6 to 84 point in 30 styles and 57 faces.

This range gives enough variety for most facsimile heads, and the appearance is identical with composing-room work.

A type fork is used to pick up small letters from channels in a type holder. Type 30 point and larger can be set by hand without using the type fork. The lines are justified by hand. Accumulated type is transferred to a channel form on a small Multigraph press, which for facsimile headlining can be manually operated.

A proof is pulled (on the same paper as make-up backing sheet), trimmed, and pasted into the proper place on the facsimile page.

Multigraph inks dry rapidly, but sometimes you will want to use a head almost as fast as it comes from the proof machine. In that case, put the proof under a small infrared lamp and pat on ordinary talcum powder with a powder puff. The powder will absorb most of the surface ink and the lamp will solidify the remainder.

After this drying period (1 minute is usually sufficient if the Multigraph has not been "overinked"), surplus powder can be removed by brushing lightly with a wad of cotton.

An average office employe can set heads and operate a Multigraph after 1 week of training. The equipment is small, sturdy and requires only routine maintenance. Type is reusable indefinitely.

Showcard Machine

The Showcard Machine Company of Chicago manufactures a machine which is ordinarily used for store show cards but which can be used effectively for facsimile head setting.

Display type from 24 to 96 point is available in most standard faces, and the company will supply any other size or style of type that is desired on special order.

Operation of the Showcard machine is simple and requires no special skill. Type is slotted and locks on bars which stretch across a small flat-bed proof press. Changes and corrections are easily made. Type is set by hand, and the proof press is manually operated.

The Showcard machine sells for about the same price as the manually operated Multigraph.

Either machine is adequate for facsimile headlining. Multigraph has a built-in ink-distributing roll, whereas Showcard type must be inked with a hand roller. There is some advantage to the Multigraph in this respect, because distribution of ink is consistently uniform.

Nonmechanical Heads

A competent commercial artist, using standard art heading materials, can create attractive facsimile headlines.

Production is slower than with the Multigraph or Showcard machine. The artist is pushed to keep abreast of the flow of copy if editions are on an hourly or 2-hour schedule.

Artype

Probably the most satisfactory of all art headline methods now available is Artype. This consists of sheets of letters printed on a transparent background, in either white or black, with a wide choice of symbols and signs. It is available from 18 to 120 point.

Each letter or symbol is cut from the sheet and positioned individually. A temporary guide line under each letter assures that the type will be "on its feet." Letter spacing and word spacing depend upon the ability of the artist.

Since the letters can be attached to any surface in any desired pattern (a special paraffin compound backing provides adhesion), the artist has a wide range of opportunity for eye-appealing heads in black or reversed. The ability of the letters to bend and the fact that backgrounds are transparent make them very adaptable to facsimile. Properly handled, they do not cause scanner shadow.

Artype heads can be assembled about eight times faster than sending the same head through a composing room and getting proofs. However, it is best for feature pages or overlays on photographs rather than news heads. The letters are styled primarily for features, and the process is slow.

A combination of Multigraph, or Showcard machine, and Artype offers facsimile virtually every variety of headlines required.

Fototype

Fototype consists of individual pads of letters,

including reverses, printed on white cardboard or cellophane. The variety of type faces and sizes is greater than Artype and more closely resembles standard headline type.

Both the cardboard and cellophane types can be used, with limitations, in facsimile.

The cardboard letters, which are assembled in a special stick, are widely used where the end product will be an engraving. However, the cardboard letters do not bend smoothly around the scanning drum, and very objectionable scanner shadow can result. The cellophane letters will bend all right, but they pose another problem. They do not have an adhesive backing, so you must use a strip of scotch tape to hold the letters together. The extra thickness of scotch tape can cause scanner haze or definite shadow.

Of the two Fototype materials, cellophane letters are best suited to facsimile. They can be used with pleasing results if special care is taken in assembly and placement.

Like Artype, it is best used in connection with features or photographs. It takes too much assembly time and tender handling to serve as regular copy headline material.

Template Headlining

Several template-type headlining methods are available. A lettering pen is traced through letter guide channels ranging up to 36 point. The product is unattractive and unsuited to facsimile. Most template lettering is found on architect's plans and engineering drawings. It bears little resemblance to headlines ordinarily seen in newspapers or magazines.

Applying the letters directly to paper eliminates possible scanner shadow but does not compensate for the other drawbacks.

Use regular library paste and as little as possible. If too much paste is used, the copy immediately above the paste will bulge enough to be noticed by the electric eye, and it will record as an irregular gray shadow.

Rubber cement should not be used, because it heats up under the glare of the scanner light source and releases fumes which can permanently discolor the plastic blanket of the scanner drum.

Keep a good chemical hand cleaner nearby. You may produce neat justified copy, attractive headlines, eye-catching photographs and get them evenly pasted on the paper only to find a thumbprint has botched the job.

The scanner will forgive some errors and magnify others.

Follow the basic make-up rules, and your facsimile editions can stand comparison with other products of the graphic arts.

Laying out the Department

The finest equipment in the hands of capable operators can be inefficient if the working area is improperly planned. In facsimile, as in any publishing plant, there are layout practices which contribute to production.

Make templates of all furniture, and arrange for phone conduits to go under the floor. Foot traffic in the department is heavy. Bury every wire you can.

Overengineer your lighting. Most of the equipment has small parts, and good lighting helps both operation and maintenance. Also, good lighting is imperative throughout copy preparation.

Install a multiple-socket electric power line along one wall for electric typewriters and press-association printers.

Use a Western Union synchronized clock (Naval Observatory Time), because you must watch broadcasts with studio timepieces. Put the clock above the scanner, with the bottom of the case at least 84 inches from the floor, centered on the wall.

When you select the scanner location, allow at least 24-inch passageways on each side and 24 inches between the wall and the back of the scanner. Unless that much space is allowed, you will have difficulty carrying parts and test gear. Also, the scanner's rear

doors and side lids will not be able to swing to a full open position.

Have the outlet for the telephone company circuit line conduit (to the FM transmitter) come out of the wall directly in back of the scanner near the floor. Or the conduit can come up through the floor far enough from the wall to bring it up directly inside the scanner.

The scanner power source should be a 15-ampere line with no other connections on the circuit. It can be adjacent to the outlet for the telephone-line conduit.

Hand Lettering

Hand lettering should be used only for special effects. The process is too slow for a steady flow of pages, and it cannot be made to simulate regular type without reducing headline production to a snail's pace.

It is excellent for emergency use, when a bulletin needs seconds-fast handling and a free-hand headline style is justified. A soft lead pencil may be used. This will reproduce satisfactorily and save time otherwise wasted waiting for ink or paint to dry. (Be sure hand lettering, other than pencil, is thoroughly dry before going on scanner. The plastic copy holder is readily stained. Once marred, the plastic blanket will shadow copy under the stained area.)

As a general practice, hand lettering is the least common of all facsimile news headline techniques. Obviously, it has an important place in advertising layouts. You will do yourself and facsimile readers a favor if you keep it in the advertising portion of your pages.

Make-up Practice and Materials

Throughout the preparation of copy for facsimile pages, a few fundamental rules should be observed. The burden of learning and following these guides rests on the entire staff. Each member should know the scanner's abilities and cater to them.

As copy and heads are set and pages assembled, the ultimate use—scanning—must be kept in mind.

The scanner is versatile. As is outlined in Chap. XIX, emphasis control can compensate for most shading discrepancies. However, other errors in make-up cannot be covered up on the scanner and can result in poor recordings.

All copy and heads should be uniformly black. Keep an eye on the density of each line of copy typed. Watch the distribution of ink on head type. If there is a light patch in the copy or head, the scanner will see it. Retouch the typing or head if there is a weak line in a typed letter, a speck of white or light area in the middle of a headline letter.

Before you powder and dry a headline, look it over for shading flaws. Retouch them with a soft pencil. If there are too many light spots or irregular contours, *reink* the headline and pull another proof.

Give the scanner copy which is as near perfect as possible. It *can* compensate for minor variations in shadings in type or headlines by using the black-white setting. It *can't* fill in white spots or emphasize a single light letter.

Be sure all art, body copy, and headlines line up vertically and horizontally.

The surest way of doing this is to use a reflection make-up table. This has a heavy pane of translucent glass for a top. Underneath the glass are lights. The glass should have the outline of a facsimile page stripped on the top surface. Have an artist draw the outline of a facsimile page 8.2 by 11.5 inches. Divide the page into four columns vertically and into 1/4-inch lines horizontally. A photoengraver can make a transparent positive of the artist's drawing and strip it on the make-up table glass.

Then you can place a make-up sheet over the transparent positive, and when the lights are turned on, the black-and-white facsimile page borders, column lines, and horizontal lines will show through the make-up sheet.

Photographs, headlines, or copy can be accurately positioned by lining them up with the guide lines

showing through the make-up sheet.

Paper for the make-up sheet should be nonglossy and of uniform white opacity. (The scanner will notice a mottled finish.) Sixty- or seventy-pound weight is best. Less than that weight invites wrinkles; more than that is unnecessarily thick, and the make-up table guide lines will not show through clearly.

Glossy finished papers have a tendency to show a slight grain, or gray cast, in recordings. The real objection to such paper, however, is that it will not lend itself to typing without smudging.

Typed copy and headlines should be on the same kind of paper as the make-up sheet. Otherwise, the scanner will be seeing two shades of white paper background. If the variation is not too great, shading controls can compensate for the difference. However, for best results, the make-up sheet and all strips of paper mounted on it should be identical. Then there is no doubt about the way your recorded background will look.

Office supply stores offer a wide variety of white, smooth-finish paper suitable for both typing and make-up requirements.

When a make-up paper has been selected, it should be ordered in quantity and cut to desired size. The usable area is 8.2 by 11.5 inches, but the paper should be 9 x 13 inches for easy handling and placement on the scanning drum.

The third link in good make-up practice is pasting of copy to the make-up sheet.

Assuming you use a reflecting make-up table, with a facsimile page outlined on it as described, the responsibility for properly aligned copy falls directly on the make-up man.

Readers are accustomed to newspapers and magazines with neat borders and margins. The same high standards must be offered in facsimile. Check each piece of copy's position as it is pasted. It must be precisely positioned in relation to the facsimile page borders, column lines, and other copy.

Paste all copy at the extreme left, so it is free to wrap smoothly around the scanner drum.

The artist will need compressed air for his airbrush. If you have a pneumatic tube system in the building, check the possibility of running an air line to facsimile department. Otherwise, allow space in the art and make-up section for a tank of compressed air.

Provide an equipment test and maintenance room adjacent to the studio, properly lighted and ventilated with a multiple-socket electric power line and work bench.

Good ventilation for the entire department is necessary. There will be many electric motors and radio tubes radiating heat. The combination of scanner, typewriters, and teletypes also produces a constant barrage of noise. An acoustic tile ceiling will help. If the location for your facsimile department permits, the most desirable arrangement is to put the scanner in a separate room with a connecting door. If that isn't feasible, acoustic tile can be put on the walls around the scanner as needed.

Minimum Equipment Needed

Give your facsimile staff the proper tools with which to work. The number of units of each item will depend on the size of the staff and the scope of the facsimile enterprise.

One prime need is for press-association wire service printers (AP, UP, or INS). One news ticker will do if it is a complete general news wire. If you have frequent editions and want to give up-to-the-minute sports results, a separate sports wire is worth while.

Even if the facsimile station is affiliated with a newspaper, there should be a separate printer in the studio. This not only saves time; it also makes it possible to use press wire copy directly on the scanner if the staff is too small to retype it or if important news breaks too late to spend any time processing the copy before edition time. Ribbons should be changed often to get sharp, clear reproduction. The machines also can be set for single spacing in order to get more copy on the page. If the facsimile studio has

its own teletype, these important, special considerations can be given to the machine to make it perform to the utmost for facsimile.

Other physical equipment for the staff varies with the size of the operation. A minimum list includes

2 or more telephones (one a private line to the FM transmitter)
1 or more copy-setting machines, stands, and chairs
1 or more desks and chairs
Filing cabinets
Layout table for art work and preliminary make-up
1 reflection make-up table
Artype and head-setting machine, type cabinets
1 paper knife
Artist's equipment

Additional equipment, facilities, and services which can be added are mentioned in other parts of this book.

XVI

FACSIMILE ADVERTISING

One of the great milestones in facsimile came in 1948 when the Federal Communications Commission placed facsimile on a commercial basis.

The Commission, after extensive hearings, found that experimental broadcasting had progressed out of the trial-and-error stages. The equipment technically was good. Facsimile had received wide acceptance in public demonstrations. The FCC agreed to allow its full development as an industry and as an art.

The "printed commercial," however, arrived when facsimile was barely out of the experimental class. Only two stations were ready to use it when commercial operation was authorized starting July 15, 1948. The Miami Herald-WQAM-FM and The Philadelphia Inquirer-WFIL-FM began limited commercial facsimile broadcasts. Only nominal rates were charged for advertising because sets in use were few.

But this early experience indicated that advertising might hold a similar golden future for commercial facsimile as its three sister radio services were already enjoying.

Making advertising pay the bills waited for the mass production of sets, but the outlines of commercial facsimile were clearly marked. Milton Alden forecast that facsimile could be "radio's potboiler." Others saw it as a possible breadwinner for the hundreds of new FM stations.

Yet some of the early enthusiasts were less optimistic. At least half of the group that financed John V. L. Hogan's work and ordered scanners and recorders shelved the equipment in 1948-1949. The few pioneers carried on remembering that advertising under the American system built radio into one of the largest industries.

Back in 1924, when commercial radio was nearly 3 years old, Herbert Hoover publicly doubted that advertising could finance radio. So did some leaders in the radio industry. Less than 25 years later,

advertisers were pouring nearly $500,000,000 a year into radio.

Television was launched with few sponsors and with spectacularly high losses. Yet it boomed so fast that it became a major advertising medium overnight.

The appeal of facsimile is that it doesn't need huge capital outlays and million-dollar advertising budgets to pay its way. The initial cost of starting a facsimile newspaper is much less than the cost of even a small radio station or a small newspaper. The expense of operation is not large.

The limiting factor on commercial facsimile was the same as it was on commercial radio or television. It depended on the mass manufacture and distribution of sets at an increasingly lower price to the user.

Display Ads or Sponsored Programs

The pattern of advertising for facsimile posed a peculiar problem. Since facsimile rides the air waves into the home, should programs be presented as "newspaper" features or as "radio-station" features?

In one, display space is sold to advertisers who have no control over the editorial matter adjoining ads. There is a sharp cleavage between the editorial and advertising content.

In the other, the unit sold is the sponsored program, except for station breaks and spot announcements. In radio, the advertising agency not only writes the commercial but often also buys and stages the radio show of which the advertising becomes a part. The agency and advertiser thus have a big say in determining the character of radio programs.

Newspaper-owned facsimile stations adopted the advertising and rate structure of the printed page. They saw radio as an electronic circulation department. Radio merely replaced the delivery truck and the newsboy in distributing a printed message. Publication-minded facsimilists strongly opposed letting the air newspaper change their accepted editorial and advertising practices.

But what about independent radio stations with

facsimile broadcasts? Would they in the future sell advertising on the same basis as they do spot voice announcements? (This would be the equivalent of the newspaper practice of selling display ads.) Or would they allow a sponsor to buy a 15-minute facsimile edition and determine its content in the same manner that sponsors now determine what goes into many radio shows?

The authors believe that the wisest course is to sell advertising space, not sponsored programs. Broadcasters have not enjoyed freedom of speech to the same extent that newspapers have freedom of the press. Radio stations that sell sponsored facsimile pages or editions might be inviting regulation of what they broadcast. Air time is limited. A few large advertisers could monopolize the most desirable features and control the content.

John S. Knight, publisher of the Knight newspapers, told the 1947 meeting of the National Association of Broadcasters that a facsimile newspaper should "speak its mind with the same freedom we do in the editorial columns of our newspapers." Charles R. Denny, then chairman of the FCC, in a widely quoted statement said he agreed that a facsimile newspaper "has got to have exactly the same privileges and the same freedom as the newspaper which the boy leaves on your doorstep that is printed with ink and type."

So it seems logical that facsimile broadcasters will enjoy the widest freedom if they stick to the accepted policy of the free press in America. They may court regulation if they follow the radio formula of commercial operation (see Chap. IX on Freedom of the Press on the Air).

On straight news programs, radio has built a reputation for the integrity of the news. Newscasters (we are not here discussing commentators) prepare their scripts from the same sources that newspapers gather news and without intervention by the advertiser or agency. The sponsor's message is thus more in the nature of a spot announcement or like a display advertisement next to editorial matter on a printed page. The listening public has no trouble distinguishing

between a straight newscast with a sponsor's message and a radio program whose content is influenced by the advertiser.

A newscast is similar to a news page. The editorial content of a facsimile newspaper closely parallels that of a conventional newspaper or magazine—news, features, pictures, sports results, comics, market reports, etc. And to be effective, news must be believed.

No advertiser should be permitted to buy a block of time (total program space on facsimile) that gives him control of the editorial content. Advertising *space* in the facsimile newspaper should be sold for the attention it gets when printed along with news. The charge should be in proportion to the amount of space used.

Radio techniques may well modify the newspaper pattern, however. There would seem to be no valid objection to "The Sports Arena now brings you the five o'clock baseball results" and ending with a printed commercial telling about the attractions at the arena that night. The pioneers in this new medium will set the precedents.

Ad Form Is Elastic

Facsimile advertising can take many forms.

Between each page, the transmitter sends out a "page-separation signal." This may be simply a black line across the unwinding sheet of paper to show that one page is finished and another about to start. This line, in a reverse white on black, can be sold to advertisers for terse messages or slogans (see Fig. 65).

Experimenters use another advertising device to pay for the cost of the paper. This is a narrow advertising strip along the margins of the paper, preprinted before the paper is placed in the recorder. It can be a slogan, a selling message, a trade-mark, or any symbol that identifies the advertiser's product. It should make an impact on the reader through the power of repetition, yet be small and light enough

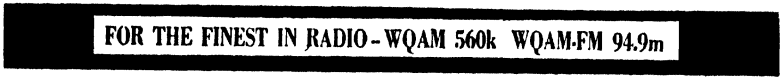


Fig. 65. Page-separation signal strip which can be used for short advertising copy.

to harmonize with the other material on the page. It is most effective if used continuously through an edition without copy change.

The most obvious form for facsimile is the display type of advertisement found in other printed media. It can capitalize on the tremendous public acceptance already built for this type of advertising by newspapers and magazines.

The almost sure-fire appeal of facsimile advertising is based on some of the natural advantages it has over other media.

First of these is its intimacy. Facsimile prints a newspaper right in your own living room. The advertiser virtually steps into your home and hands you a printed sales talk. And it is delivered with the speed of sound. In comparison, your newsboy stands still and the telegraph is a snail.

Another advantage is that whatever is sent on the facsimile broadcast remains in the home to be read. You don't have to be listening to it or looking at it. You may be sleeping or washing the dishes or taking the children to school. The facsimile newspaper is there in permanent, printed form to be read at your convenience.

Only when television is being viewed does it get attention and earn its way in advertising. It has an unavoidable limitation of audience for the advertiser. Few persons can afford the time luxury of sitting for 6, 8, or 10 hours a day with their eyes glued on the television screen. Sound radio has the same handicap of being transitory and fleeting. It must be listened to at the time the broadcast is on to sell the sponsor's product.

Facsimile lacks the motion appeal of television, but it does not have the drawback of requiring constant attention or even the presence of anyone while the program is being received. Unlike the other radio services, facsimile has the power to command attention for every advertisement that is recorded.

The battle for the eye and ear of the potential customer grows steadily more competitive. The possible time that you can get attention becomes divided

and diluted. The movies, sports, the automobile, and all forms of entertainment and recreation bid for people's time along with the various radio and printed services. Facsimile can capitalize on its natural advantages.

Eye and Ear Appeal for Ads

Multiplexing opened an exciting new field for facsimile and directly influenced FM stations' possible earning power.

Under the old simplex method of broadcasting facsimile, it was necessary for the FM station's sound programs to go off the air. Facsimile news and sound programs could not be transmitted simultaneously.

This was an obvious handcuff. It meant that sound programs for which the FM station was being paid had to be silenced in order that facsimile could be transmitted. Revenue for the periods facsimile was broadcast depended solely on sale of facsimile ads in one form or another.

Station managers viewed this situation unhappily.

Multiplex corrected that impasse. FM sound programs continue on schedule, and facsimile is broadcast simultaneously from the same transmitter and antenna. An FM station with facsimile thus obtains revenue from two sources at the same time: voice commercial announcements on regular sound programs and facsimile ads.

Actually, it is a three-barreled advertising barrage. An advertiser can buy a package which includes announcements on regular FM programs, ads on facsimile editions, and voice announcements between facsimile pages.

A system of multiplexing of facsimile was developed in the laboratories of The Miami Herald and has been in daily use over that newspaper's station, WQAM-FM, since mid-1948 under authority of the FCC.

The Format

In the early stages of facsimile, little attention

was paid to possible advertising plans and format. The combination of editorial matter with advertising had to be evolutionary. It had to await the development of the facsimile broadcasting system itself. The whole subject of facsimile advertising has been largely speculative, pending the distribution of enough sets to make facsimile an advertising medium.

Yet it was clear at once that facsimile advertising would center on the preparation of display copy as in newspapers and magazines. The pulling power of such ads was well established.

The techniques and psychology of printed display advertising had been developed into a fine art. Trained copywriters were available, and it was not necessary to start from scratch to develop a new art for facsimile advertising preparation.

Since the appeal of facsimile is to the eye, and not the ear, except as supplemented by multiplexing, "air ads" should be fashioned for facsimile's special characteristics.

For example, newspaper advertising leans heavily to line drawings because the fine details of many photographs will not reproduce from coarse-screen newspaper engravings. Facsimile skips the engraving department. Its images are not filtered through a screen. It even produces intricate fabric designs and style details with the fidelity and sharp definition of the original photo.

Hence many products that usually are advertised with line cuts or sketches can be presented on facsimile with photographs and attract greater attention. Furniture, clothes, hats, gloves, jewelry, and automobiles are a few of the items that particularly lend themselves to this treatment in facsimile advertising. Such photos provide sharp, attractive contrast against a news column. Morever, the copy preparation is fast, simple, and inexpensive.

Advertising copy, like the editorial matter on a facsimile page, can by-pass the slow, costly methods of conventional printing. Body type can be set on an electric typewriter. The display lines can be composed with paper type. The advertisement is completed

when the artist pastes down the photographs or provides other illustrations in their proper places. The finished paste-up goes directly into place on the facsimile page, ready to be wrapped around the scanner drum and transmitted.

How Large Should Ads Be?

The use of large-space advertising is impossible on standard facsimile pages. And the total available quantity of advertising is limited by the station's time on the air as in radio. Display ads for facsimile, then, must be compact and inoffensive.

As facsimile grows into a mass radio service, it may always cost the user more than radio does. The programs of news and pictures and features will come free—supported by advertising. But the user, in addition to buying and maintaining his set, will have to buy the paper rolls. He will not want to buy the paper and then have the broadcaster fill it up chiefly with advertising.

Surveys have proved, however, that printed advertisements often rank with editorial matter in reader interest. Few listeners have been known to turn on the commercials, yet many women buy The New York Times, for example, to read the ads. If facsimile advertising occupies only a part of the space on a page—perhaps not more than one-fourth—and is surrounded by live, compelling editorial matter, it will be acceptable. This should be true even though the user is paying for the paper.

Where facsimile is used as a public display service and the broadcaster supplies the paper, a larger portion of the space can be used for advertising. Even then, an excessive use of advertising space would seem unwise if the aim is to maintain the highest reader attention (see Figs. 66 and 67).

Small ads can best be handled with the orthodox pyramid make-up, permitting the maximum news and picture appeal on the same page. Another format is the shallow strip advertisement of full-page width, filling the bottom 2 or 3 inches of the facsimile page (see Fig. 69).

Dewey Rips Administration

Truman Swings Punches At GOP

President Truman, out to "take the hide off" his Republican opposition, openly embraced the whole New Deal Monday night and said Thomas E. Dewey "proposes to destroy it with a hatchet job."

Mr. Truman spoke at Akron, O., in the wind-up of a day that saw him swinging at Dewey the sharpest, most direct punches he has cut loose so far in the campaign. He didn't use his rival's name.

Dewey took the wraps off his criticism of the Truman administration and called it "miserable," "incompetent" and "blundering." He laid down a program for better living in America.

Dewey ripped into President Truman as he never has before in this campaign, blasting the present administration in speeches across western Pennsylvania during the day and topping them off with a major address in Pittsburgh.

The Republican candidate, in his speech in Pittsburgh, which he called "this industrial heartland of America," spoke directly to labor. He pledged, in his program for better living, higher minimum wages and support for those wages. He went "to the record" to defend the Taft-Hartley law, but conceded it is not perfect and said it "will be changed" when the need for change is found.

He promised to break the log jam in housing, to release the country from the fear of an economic "bust."

WARREN SMILES

SACRAMENTO, Cal. -(AP)-Gov. Earl Warren went cheerfully back to his office Friday to take up matters of state--of the state of California.

His first full day in the capital since he shared the Republican defeat with GOP Presidential Nominee Thomas E. Dewey found him rested.

EXPORT CURB

PARIS-(UP)-The United States will continue to restrict exports to eastern Europe as long as Russia and her satellites maintain their "aggressive tendencies," American Delegate Willard Thorp told the United Nations Economic committee Friday.

The United States he said, will continue to refuse to help build up "the military potential of countries which have openly and repeatedly proclaimed their hostility toward the programs and purposes of the United States.



LAMPS

exciting styles
animal motif
metal or pottery

MODERNE
12N.Broad

RR Executive Is Optimistic About Future

CHICAGO-(INS)-A railroad executive said Friday that the "traffic and earnings outlook for the American railways is good."

Addressing the Mid-Continent Trust conference of the American Bankers Association in Chicago, John W. Barrington 111, president of the Indianapolis and Louisville Railroad said:

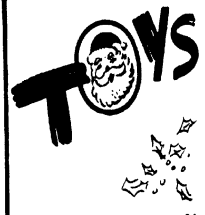
"I believe we can confidently look forward to several years of high levels of economic activity. Good traffic and railway revenues will follow that.

Ban Transporting On County Roads

WHITE PLAINS, N.Y.-(UP)-Although motorists aren't supposed to transport objects such as skis, bicycles and boats on the outside of their cars while driving on Westchester County parkways, police usually were lenient until they spotted a man transporting a bath-tub on top of his car. From now on, offenders either will be ordered off the parkways.

Let us give your home the NEW LOOK with new fabrics and new paints.

moderne interiors
12N.Broad



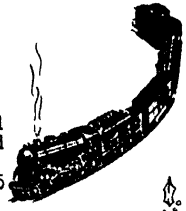
You'll find toys for any age group, priced moderately, too. Our's is the largest selection of toys in town. Shop early and save.

Pedal-car--streamlined steel body, bright colors $9.98





Bicycle - small size only sturdy built - $13.50



Electric trains - all models - but a limited number of each - $7.98 to $24.95

ABRAM'S TOY MART

7800 Whitcher Ave. Call 7-7200

Fig. 66.

Slight Dip In Stocks Chalked Up

NEW YORK-(AP)-In a dull pre-holiday session, the stock market Monday drifted lower by fractions to around a point.

Here and there a few selected issues pushed upward for small gains against the general trend.

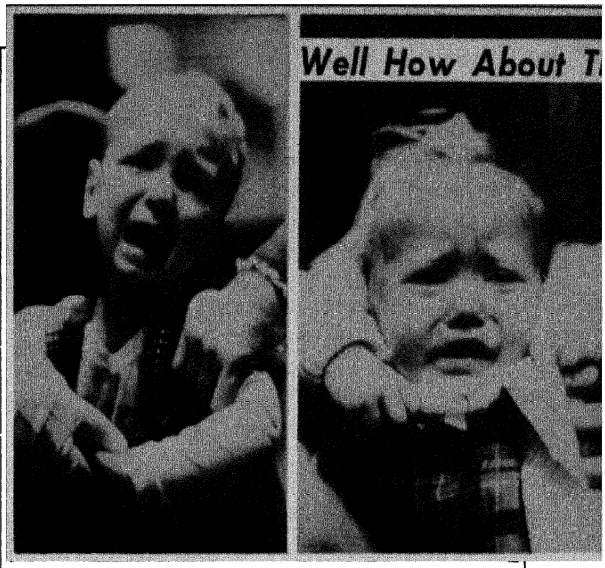
Some of the oils were fairly and generally higher, while rails and steels sold off for the most part. Motors, metals, aircraft and airlines were narrowly mixed.

The volume of trading at 510,000 shares was the lowest for a full day since Aug. 16 and compared with 630,000 on Friday.

Trading narrowed down to 865 issues, the lowest since Aug. 31. Of these, 389 declines and 261 advanced. On Friday there were 939 issues traded.

The Associated Press average of 60 stocks was off .1 of a point to 68.2. The industrial component of the average gained .1 of a point, the rails fell .2 of a point, and the utilities were unchanged.

Brokers felt the action of Monday's market was inconclusive.



VISIT SANTA CLAUS; REACTIONS VARY--Two Chicago tots register varied reactions in a loop department store as they get a closeup of the store's Santa Claus. Gary John Ogurek, two, (left) puts up a howl as Santa's gloved hand and mama's grip keep him in place. Lynn Weston (right), 16 months old, just isn't very happy as willing hands lift her high enough to see St. Nick. (AP Wirephoto)

First Family Of Cuba Expects Heir; Seen As Good Omen

HAVANA--A baby is expected early next year in the Cuban White House. The Cubans are pleased. They mention the fact as a good omen for the administration of their new president, Carlos Prio Socarras.

A house wife put it this way: "He is young and will run the government with a strong hand. His wife is not politically minded--her chief interest is the home."

This is important to Cubans just now. Numbers of them have been critical of their first lady for the past four years.

At 45, Prio is Cuba's youngest elected president. Carlo Hevia, his minister of state, holds the record. Hevia was only 33 when he was president in 1934. But Hevia says that doesn't count because he wasn't elected.

KETTERING WINS WELFARE AWARD

CHICAGO -(INS)- Charles F. Kettering, former general manager of the General Motors Corp. research laboratories Wednesday was presented with the American Petroleum Institute's gold medal of achievement.

The highest honor bestowed by the A.P.I. was awarded to Kettering in recognition of his accomplishments for the general welfare of mankind. He is the third person to be so honored.

Midget Auto Races

FT. LAUDERDALE SPEEDWAY

SUNDAY, MAY 8, 2:30 P. M.

RESERVED SEATS $2.50

GENERAL ADMISSION $1.00

Fig. 67.

The editor may want to use odd-width columns for variety and eye appeal in presenting the news. He usually is limited in such make-up to pages on which the advertising consists of a shallow strip across the bottom, leaving the upper portion of the page open. When advertisements are standard column width and pyramided, the editor may set editorial copy any width as long as it can be "wrapped" neatly around the advertising. This practice also makes it possible to establish advertising rates on a standard column-inch basis with which advertisers are familiar.

Photographs by themselves, with brief cut lines, can be effective advertisements. They can portray such items as houses for sale, room interiors, or used-car bargains (see Fig. 68).

Also, photos and cut lines can be used to show the starting pitcher in tonight's ball game, the featured act at a night club, the star in a new movie opening tomorrow.

And for a direct test of pulling power, the advertiser can use the electronic box top—a coupon printed in your home by facsimile.

Classified Advertising

Audio broadcasting has not been able to touch the classified-advertising field successfully, but facsimile may. The advertisements can be set one column wide and used under a standing headline. A type face different from editorial body type is desirable but not necessary. Ordinarily, the classified advertisements will be much shorter than paragraphs of editorial copy, and this can be sufficient for contrast (see Fig. 70). To set the classified column further apart, a double-width column rule can be drawn.

Stress the News Angle in Ads

Because of the limits on size and volume of facsimile advertising, most copy should be aimed at specific targets. The general, institutional type of advertising is more suited to other media.

Police Offer Escort Plan To Cut Crime

DETROIT-(AP)-The police department inaugurated an escort service Friday in hopes of fending off potential street crime.

It's mainly for the benefit of women and children who have to go out at night on dark streets.

The anxious citizen calls the nearest precinct station. If the inspector approves, a scout car or foot patrolman is assigned to patrol the route, or possibly act as personal escort.

A number of attacks on women and children and increased activities of footpads led to the move.

Men Over 40 Warned About Ability

CHICAGO-(UP)-Men over 40 should take it easy and not try to duplicate the muscular feats of their youth, a health and recreation expert said Friday.

It seems, sighed Dr. Donald B. Thorburn, that there are only two kinds of men, those who are too lazy to exercise at all, and those who exercise too much.

Thorburn, member of the New York state board of medical examiners, recommended moderation in exercise for men over 40 in the health magazine of the American Medical association.

"Sensitive as women are to the limitations of passing years," he said, "men in their way are more so."

But whereas women measure the passage of time by the effect on their face and figure, men figure they are getting old when they no longer can kick up their heels like a stripling.

This is a mistake, Thorburn said, because "men forget that the responsibilities of business competition and the worries of a home make a physical demand and leave them little time to rest."

Men over 40 should forget about trying to beat the pants off someone at games, he said. Instead, they should seek out doubles games, which require partners, for competitive sport.

Two Students Die In Crash

ATHENS--(UP)--Two University of Georgia students were killed in the crash of their light plane late Monday, a tragic climax to an aerial "dog-fight" with friends.

The dead were L. D. Nelson of Kingston, Ga., and Arthur Barron, of Rabun Gap. Both were killed when their light plane failed to come out of a dive, lost a wing, and plunged into the ground.

Elmer Kidder, of New York State, said he and Vincent Improta were in another plane and were "chasing around" with the plane piloted by Barron.



Fig. 68.

RULING ON BAN REFUSED

WASHINGTON-(INS) Solicitor General Philip Perlman said Thursday the Justice Department can not rule on legality of a proposed contract which would end the ban on record-making.

Representatives of President James C. Petrillo of the American Federation of Musicians and the nation's record manufacturers brought to the Justice Department a copy of the contract. Both factions are reported ready to sign the document, if it is ruled legal, and terminate the ban imposed by Petrillo.

The representatives had expected to see Attorney General Clark who was out of the city.

Giant Flood Control Link Started

SALTSBURG, Pa. (AP)-The banging of hammers and the crunch of giant shovels these fall days signal the building of a $33,000,000 reservoir as a vital link in the nation's largest flood control program.

The reservoir is the Conemaugh, nestling in the picturesque foothills of the Alleghenies a mile north of this western Pennsylvania town.

Conemaugh is the seventh in a chain of 13 reservoirs and dams designed to reduce flood dangers and damage at Pittsburgh, 30 miles west. The largest to date in the chain, it eventually will be exceeded only by the $51,520,000 dam at Kinzua in northwestern Pennsylvania.

The whole system is part of the $1,951,300,000 Ohio River basin flood control program which extends into 12 states: Pennsylvania, New York, West Virginia, North Carolina, Virginia, Tennessee, Alabama, Georgia, Kentucky, Ohio, Indiana and Illinois.

The 13 dams in the western Pennsylvania system will cost in the neighborhood of $189,300,000. That's a lot of money.

PRACTICAL

Gifts for Baby



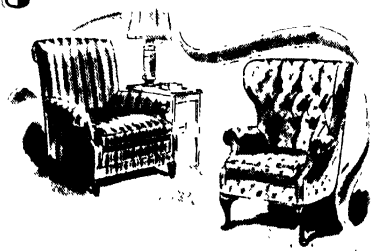
Complete Layettes
Bathinettes Cribs
many other items

INFANT'S
HEADQUARTERS
779 Tremont ave.

For the Budget Wise
VALUES

Unusual values in chairs. A variety at choice prices.

Beautiful
Modern
CHAIRS
$34 up



SPECIAL BEDROOM SUITE

Luxurious, modern 4-piece bedroom suite, consisting of bed, vanity, bench and night table.

Specially priced at... $295



Christmas
TIES



A variety of handsome ties to choose from $1

HILL'S
MEN'S WEAR
66 Devoe St.

MOORE'S FURNITURE CO.
"Where You'll Find Bargains At Their Best"
8767 Strathmore Ave. Phone TR9812

Fig. 69.

Classified Ads

Telephone RA 3-4411

LOST AND FOUND

LOST—Small, black, male dog. Tan feet and tan and white chest. Weight about 3½ lbs. Flop ears and long tail. Name "Jerry." Reward. Ph. 4-4295.

LOST—Wire-haired terrier, vicinity Lincoln Rd., M. B. Liberal reward. 1441 Lincoln Rd. or Ph. 2-3291 from 9 a. m. to 6.

LOST—Gold ring with the initials M. B. If found please return to 5529 Pine Tree Dr. Reward.

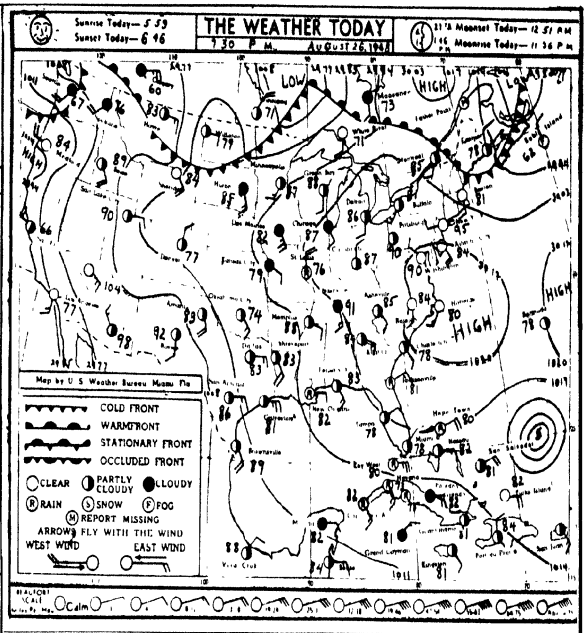
LOST—Dark brown billfold containing cash and papers. Reward E. B. Moore, Jr. Ph 82-4053.

LOST—Female fox terrier, white and black. Answers to name Bitsy, baby's pet, reward. 10 744 N. E. 2nd Ct. Ph. 78-4585.

FOUND—Medium-size, gentle, female dog. Short golden brown coat with collar. No tag. Ph. 7-1189.

LOST—Brown wallet, vicinity Jungle Club. Return papers. Roth. Ph. 82-1860.

LOST—Upper teeth on Le Jeune or Flager. Kindly Ph. 88-3365.



HOCKEY SCORES

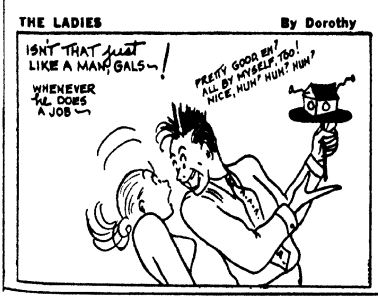
Saturday's Games
By the Associated Press

National League			
Toronto	6	Chicago	1
Montreal	0	Detroit	0 (tie)
American League			
Cleveland	9	New Haven	2
Hershey	4	Buffalo	2
Pittsburgh	3	Washington	0
St. Louis	6	Philadelphia	0
Providence	3	Springfield	1
U. S. League			
Omaha	5	Minneapolis	3
Dallas	2	Tulsa	2 (tie)
Quebec Senior League			
Sherbrooke	6	Boston	5
Los Angeles	3	New Westminister	2

Weather

Chicago, (AP)--The late August heat wave kept scorching most of the nation today.

The Midwest felt the full effects of the blistering weather for the third straight day yesterday and federal forecasters said not much relief was expected until the weekend. Higher temperatures were forecast for most of the Atlantic seaboard today.



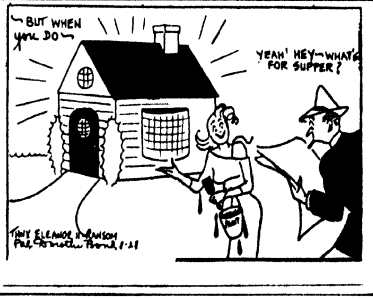


Fig. 70.

The Philadelphia Inquirer polled agencies and advertisers on their views about facsimile as a potential advertising medium. The head of one large agency replied:

> Perhaps this medium would be best adapted to advertising of a shopping guide nature, such as retail-store copy, stating items for sale that day at a specific price, or advertising on any product where the story to be delivered at the time was one of definite news value, a new feature, a new price, a new dealer, a new addition to the line, or some simple specific point which could be gotten over quickly in news-summary fashion.

The terse, informative message and the picture type of display, matching the tempo of the facsimile program itself, are the most effective. It doesn't take much space to say, "Football. Chicago Cardinals vs. All Stars. Soldiers Field, 8:15 p.m. Tonight. Admission $4.40, $5.50." The same is true of specific items of easily illustrated merchandise. Advertising will be welcomed if it gives definite, useful information.

Just as facsimile calls for a new art in programming, it needs bright, imaginative handling of all types of advertising to pay its way.

XVII

OTHER WAYS TO MAKE MONEY WITH FACSIMILE

In addition to regular advertising revenue, facsimile publishers can make money by leasing recorders and selling air time to special groups interested in publishing limited-interest editions. The lease arrangement is a possible intermediate step in communities where facsimile is being introduced. Because radio stores did not stock facsimile receivers, some early facsimilists temporarily were in both the receiver and broadcasting business. To help underwrite the cost of operation, one participant leased recorders on a monthly basis, providing for a flat fee a combined FM-FX receiver, paper, maintenance, and facsimile news.

This is feasible in some cities where large hotels, restaurants, clubs, and other gathering places provide a concentrated audience. Facsimile offers the lessee an added attraction for his customers and at the same time provides the publisher with an excellent opportunity for making the public acquainted with what facsimile can do. Facsimile as a leased service is practicable until such a time as FM-FX combinations or facsimile attachments for FM receivers are commonly available through retail radio outlets.

When FM-FX receivers are for sale in radio stores, the lease-revenue period automatically expires. Facsimile readers may then purchase their own recorders and get the news editions without cost, except for electricity required to operate the receiver, the paper, printing blades, and maintenance.

Selling "Air Space"

A second source of facsimile income, aside from advertising, is the sale of FM air time or "air space" for editions published by special groups. These may include churches, schools, clubs, fraternal organizations, business, and industry. They prepare their own copy and publish "house organs of the air" by facsimile.

Such editions are feasible because, unlike newspapers, special-interest material can be published by facsimile without waste. The general public is advised in advance that a specialized edition is going on the air. Only those interested in the special material tune in the edition.

Brokerage firms may buy air time for publication of market letters, explanation of investment counsel available, and a general review of economic conditions.

Garden-club editions may be sponsored by greenhouses, landscape firms, or hardware stores. These provide general information about raising flowers and shrubbery, timed to the calendar. Exhibits and contests are promoted. Reviews of magazine articles and books related to gardening round out the programming.

Churches can sponsor editions which cover group activities within the church, related religious literature, and announcements of coming events. Published as a midweek feature, the edition can help bridge the gap between Sunday services. Properly edited, church editions can gain wide readership and stimulate attendance.

Schools can use sponsored editions for many purposes. There is such a diversification of activities in most schools and school systems that the edition becomes a problem of selection rather than getting enough material to fill the space. (Two schools of journalism, at the University of Miami and the University of Missouri, are publishing campus facsimile newspapers. Students prepare the copy and operate the facsimile scanner. See Chap. XXII.) New teachers can be introduced to the community with a photograph and thumbnail sketch of his or her background. Outstanding individual or class accomplishments in studies, dramatics, athletics, or other school activities can be cited.

The high lights of the past week in the schools and preview of events to come offer a solid foundation of programming. This will overlap to some extent with normal coverage in regular news editions, but an ample supply of new material is usually available.

Fraternal organizations with large membership lists

or activities that include the public can use special editions to tell their story. These may not be regular features, but most fraternal groups have pet projects that need public support, and the editions can be timed to help summer-camp drives, aid-to-the-blind campaigns, or similar events.

Fishing clubs, yacht clubs, tennis clubs, golf clubs, and other organized recreation groups have periods of intense activity during the year. Regular newspaper sports coverage touches only the high lights of their programs. Special facsimile editions open the door to other details and sidelights of the club work. No one club in the sports category is likely to publish frequent special editions, but as a group, they can purchase an appreciable amount of air space.

Telling Industry's Story

Industrial public relations men have been told "prepare to use facsimile." Getting industry's story over to the public has become a major industry in the past 15 years, and facsimile does offer a new medium. Special editions, sponsored by large manufacturers, can give the community a weekly review of events which influence the local payroll. Sales trends in the particular industry, raw material prices, the company's earnings, promotions, safety campaigns, new products, new processes, and plant expansions can be discussed in detail.

Unions can use special facsimile editions to tell their side of the industrial picture.

The list of special users of facsimile will vary according to your circulation area. One publisher may have predominantly rural readers. Another may be aiming at steel workers. Whatever the composition of your audience, it will have many special-interest groups and facsimile can serve them all.

Preparation of copy for special editions can be done in outside print shops or by advertising agencies. The completed copy is delivered to the facsimile department for publication. Or the regular facsimile staff can prepare the copy for the special

edition publisher. In either case, the facsimile publisher has to get enough out of the air-space sale to cover the proportionate expense of operating the facsimile equipment, plus a reasonable profit. Part of this income can be advertisements sold to merchants or manufacturers whose products key into the special-interest-edition subject matter.

Such editions have limited interest, and facsimile readers should be informed well in advance of publication so that they can turn off their receivers if they don't want to read the sponsored copy.

New Market for Manufacturers

As facsimile was introduced by publishers in New York, Philadelphia, Miami, and other cities, the pioneers in receiver construction carefully studied this new market. The General Electric Company, Alden Products Company, Finch Telecommunications, Inc., the Stewart-Warner Corp., and others began building or designing facsimile receivers. A low-cost attachment for FM radios, in addition to factory-built FM-FX combinations, is an immediate goal.

Facsimile recorders do not have to be housed in an elaborate expensive console. Some recorder buyers, of course, will want pretentious equipment. However, the sets can be primarily functional. Many recorder owners are interested only in what comes over the receiver, not in how it looks as a piece of furniture. This is particularly true of small stores, bars, fishing camps, motels, and other places where facsimile has a potential market.

Sales for Retailer

Retail radio-store operators have a double-barreled revenue source in facsimile. First there is the profit in original equipment sales. Then there is a secondary profit in sales of paper, printer blades, and other parts and in maintenance.

XVIII

HOW FACSIMILE EQUIPMENT FUNCTIONS

Facsimile equipment described in this chapter is typical, though not necessarily identical with all makes of facsimile equipment. The page size, scanning rate, and sequence have been standardized by the Federal Communications Commission; thus all current makes of home broadcast service facsimile equipment can be used interchangeably. Private facsimile systems, such as used by Western Union, the United States Weather Bureau, and the armed services do not necessarily use the same standards as for the home broadcast service. However, the electronic and mechanical principles will be the same.

Facsimile systems have two basic parts, scanner and recorder. These correspond to the microphone and loudspeaker of conventional broadcasting. The scanner looks at copy line by line. Various shadings of black and white are converted into varying electrical voltage. This voltage is sent out by an FM station as tone impulses (see Fig. 71).

An FM radio receiver picks up the tone impulses and feeds them into a facsimile recorder attachment as varying electrical voltage. The recorder converts the electrical voltage back into black and white. This is done line by line, from top to bottom of the page. The recorder copy is a precise duplication of the original material viewed by the scanner.

Scanner Drum

Original facsimile copy is mounted on a scanner drum, a cylinder approximately 3 inches in diameter and 12 inches long, which resembles a tin can. The drum is installed in a horizontal position and revolves on its axis, like a lawn roller.

Covering the drum is a transparent plastic blanket. One edge of the blanket is permanently fastened to the drum, lengthwise, like a sheet tucked in down the side of a bed. The other edge can be detached and

lifted up so copy pages can be changed.

The copy is faced outward, like the label on a tin can. The plastic blanket is drawn taut over the copy to hold it smoothly against the drum. The free blanket edge is then tucked in, moored securely, and the drum is ready to spin. It now resembles a tin can with a black-and-white label wrapped in cellophane (see Figs. 72 and 73).

Scanning Head

Immediately adjacent to the drum is the scanning head, which moves along a horizontal course parallel to the surface of the drum. While the drum spins, the scanner head moves beside it, "eying" the revolving copy.

The drum revolves 360 times per minute. The scanning head moves along the side of the drum, at a pace equivalent to 1 inch for every 105 revolutions of the drum, or 3 3/7 inches per minute.

Electric Eye

The brain of the scanning head is photoelectric cell, more commonly called an "electric eye." Beside the electric eye is the scanner light source, a pair of miniature searchlights powered by an automobile headlight bulb.

Two mirrors, one on each side of the bulb, reflect the light through the searchlight tubes. The beams of light converge on the drum, illuminating an area about the size of a pinhead. The electric eye is aimed directly in the center of the illuminated area, like a rifle held true to a bull's-eye.

The area on which the eye focuses is approximately 1/10,000 square inch; 1/105 inch high and less than 1/100 inch wide. Thus, when the scanner is started and the drum spins around, the scanning head sees the copy go by in slices 1/105 inch high (see Fig. 74).

Imagine, if you can, what these lines of type in this book would look like sliced into strips from one side of the page to another, each strip 1/105 inch

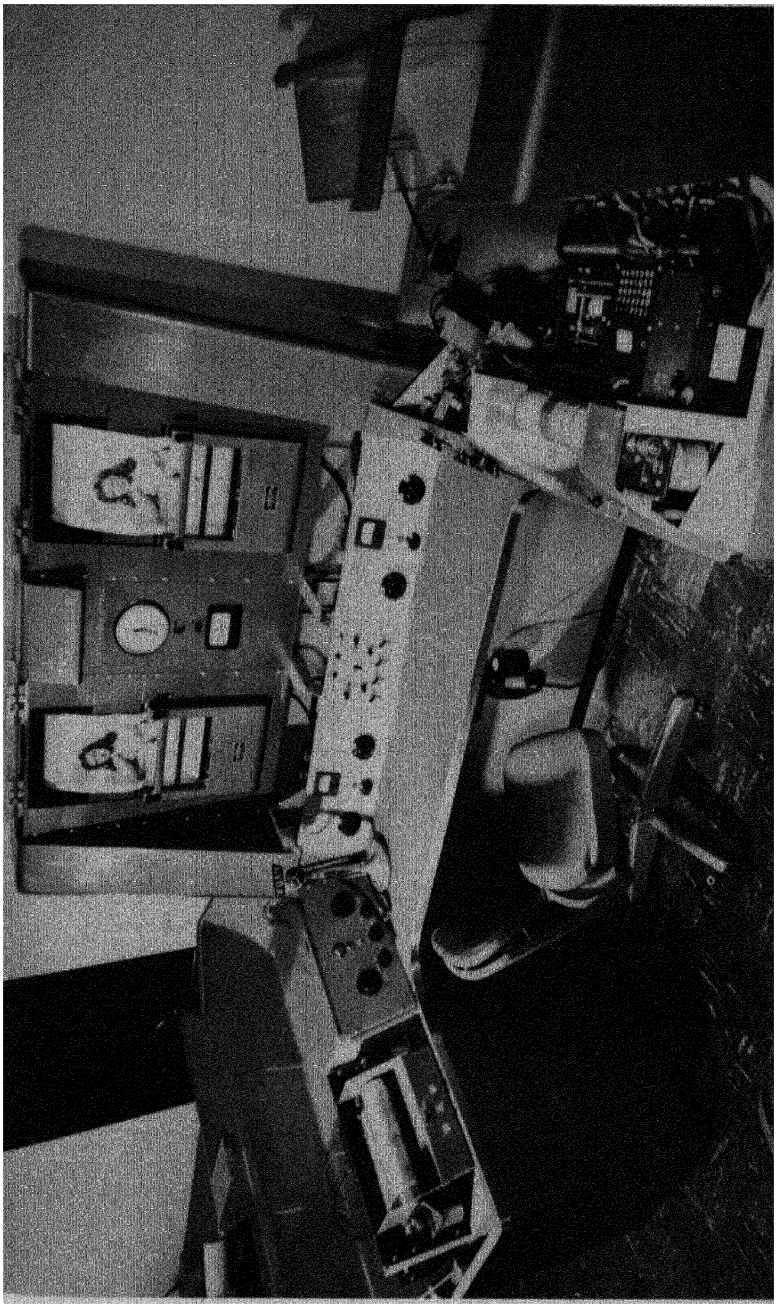


Fig. 71. Dual scanner (Hogan-General Electric) with access lids open. Monitor recorder upper left; test recorder upper right.

high. They would be a series of black-and-white dots and dashes. Between the lines of type would be slices of pure white. That is exactly how type on the spinning drum looks to the photoelectric cell.

The complex mechanism of the human eye and brain sees this page and gains an impression at once. That is instantaneous scanning. But the facsimile scanning head is not so blessed. It must be content to absorb copy in small slices, in rapid succession.

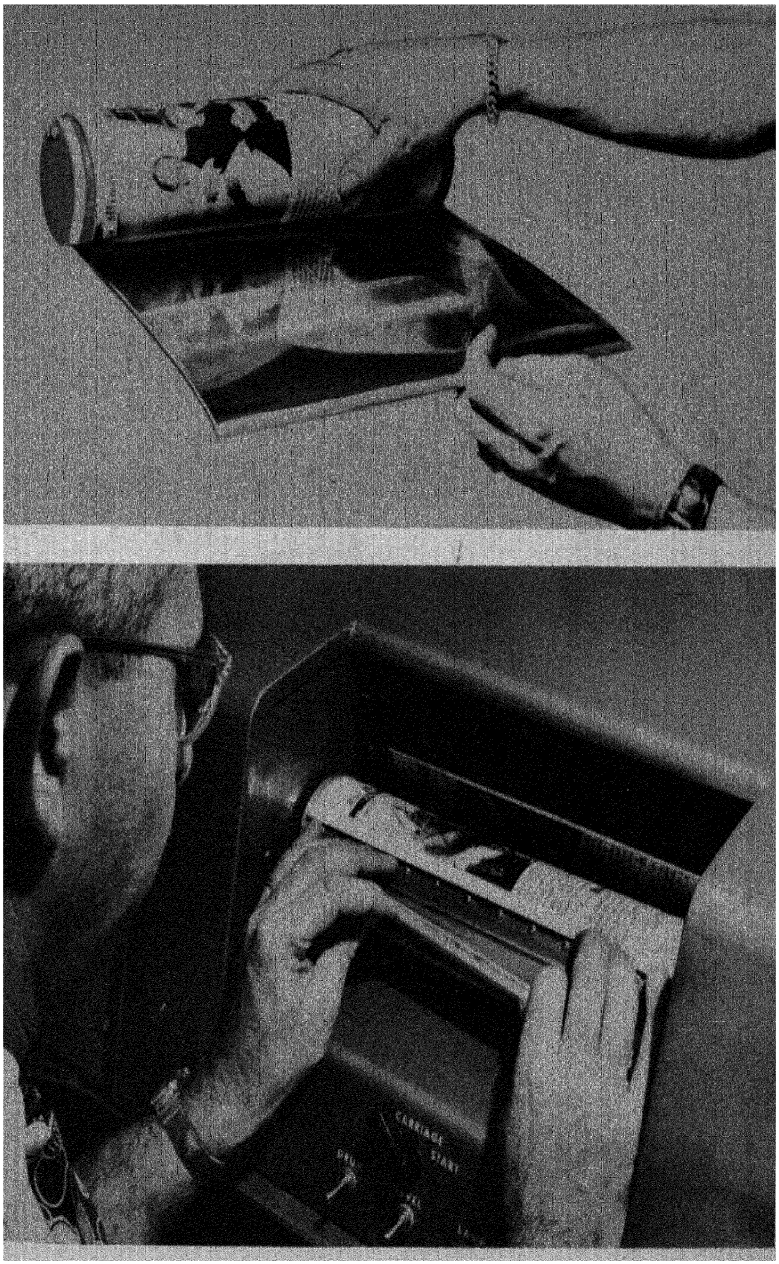
The facsimile scanner head is color blind. If you put a four-color photograph on the scanner, it will record as black and white. The color is unimportant; if it is a light shade, it will record light gray; if it is a medium shade, it will make a medium gray; and if it is a deep or solid color, it will make a deep or solid black.

The hard-working electric eye in the scanning head is a vacuum tube. This tube has within it a cathode extremely sensitive to light. When light hits this cathode, it releases electrons, invisible specks of electricity. At the risk of shocking technical readers, we might liken the cathode to a rug hanging on a clothesline. When the rug is struck with a broom, it releases tiny particles of dust on the opposite side. When the cathode is struck by light, it releases electrons.

The electric eye, focused on the revolving copy, sends varying shades of light back to the cathode as it "slices" up the copy. Type matter is part white, part black. A photograph might be a "slice" with a variety of shadings. Cut a slice out of a photograph and note the tone variations.

The cathode is bombarded with the varying light—maximum light if the eye sees white on the copy, minimum if it sees black—because the miniature searchlight reflects brightly from white and practically no light bounces back if black is being scanned.

Inside this tube are nine dynodes, or plates. Electrons released from the cathode fly through the vacuum in the tube and bombard the first dynode. The dynode is harboring a load of electrons itself. When the visiting electrons arrive, the dynode evicts some of



Figs. 72-73. Mounting copy on scanning drum. In Fig. 72 the page has been placed on drum, and operator is about to wrap plastic blanket around the drum. In Fig. 73, operator is tucking metal edge of plastic blanket into holding slot, completing the operation.

the original residents.

By a phenomenon of electronics, the number of electrons evicted is greater than the number which move in from the cathode. Evicted electrons, in turn, hurtle through the tube and run into the second dynode. A greater number of electrons fly out the opposite side of the second dynode. This sequence continues until the ninth and last dynode in the tube is reached. The ninth dynode delivers a rated output of 0.6 volt.

Scanner Amplifier

The power output, or electrical voltage (0.6 volt maximum), of the photoelectric cell is used to control the output of the scanner amplifier. The strength of the voltage is increased to a level which lends itself to further amplification. Also it is modified to ensure maximum clarity of reproduction.

In effect, the scanner amplifier builds a facsimile signal from embryo to adolescence, with desirable adjustments en route.

The amplifier reverses tone values so that maximum voltage corresponds to black areas rather than white areas of copy. Otherwise, the reproduced picture would be a negative.

Shading Control

Some facsimile copy has varied shading, such as a photograph. Other copy is simply black and white, e.g., type or a line drawing. Controls on the scanner can adjust the facsimile signal so a photograph is recorded with smooth shading or type is maximum black on a clear white background. These adjustments are made by the facsimile scanner operator and contribute importantly to the attractiveness of facsimile recordings in a home. All the adjustments are done at the facsimile studio; the home-recorder operator merely has to tune his set to a facsimile program or have it tuned automatically. He is not concerned with constant adjustment for maximum results.

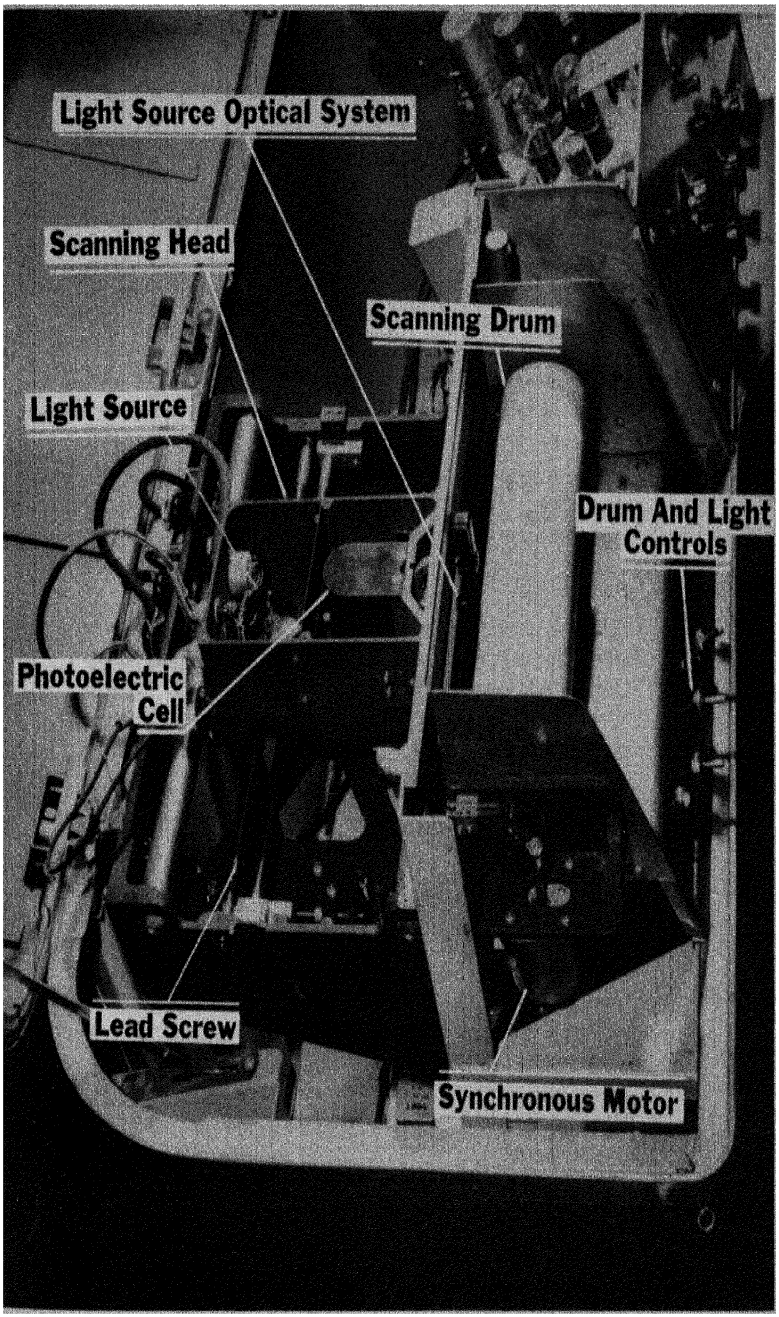


Fig. 74. Scanner assembly showing scanning drum and photoelectric cell within the scanning head.

If copy is black-white without shadings (type, maps, line drawings, etc.) and background paper is pure white with dense black markings on it, virtually no adjustment of the facsimile signal is necessary. However, there are instances in practical operation when background paper is not pure white nor markings intensely black. This is the case when ordinary copy from a wire-service teletype is used directly on the scanner. Frequently a news item arriving by teletype has so much urgent news value that the facsimile editor does not wish to consume time retyping it on pure white paper. In such instances the facsimile scanner is adjusted so yellow or off-white paper appears pure white on the home recorder and comparatively gray teletype printing appears solid black.

This is done quickly and simply. The facsimile scanner operator can tell at a glance if background paper is off-white or type is too light in color. He places the copy on the scanning drum and disengages the scanning head from its channel-guide screw. The scanning head can then be slid freely up and down the channel.

Turning the scanning drum by hand, any portion of the original copy can be brought into the photoelectric cell's focus. The operator turns the scanning drum and slides the scanning head until the photoelectric cell's miniature searchlights concentrate on the lightest portion of the copy. He then adjusts the "white" balance control. On the scanner is an instrument which indicates when this control has been set to create maximum white recorded background.

That achieved, the background will appear white on the home recorder even if to the human eye it is yellow or gray on the original.

Compensation for the light black print or lines on the original copy is then made. The scanner drum is again turned and the scanner head moved along its course until the faintest portion of the type or line is in focus. The "black" amplifier control is manipulated. When the photoelectric eye position indicator shows that the eye is in maximum closed position, the adjustment has been made. The lightest

portion of type or line will appear a full black on the home recorder.

The page is then ready to transmit. The scanning head is connected again to the lead screw by turning a small lever, and prescanning adjustments have been completed. The entire operation requires less than 1 minute.

Actually what this accomplishes is to make the photoelectric cell and amplifier system send a sound signal which interprets the copy exclusively as pure white or full black, regardless of the original shading range. If the paper background is a gray and the type or lines not a full black, the adjustments make the gray record pure white and the type or lines record a full black.

Photographic-emphasis Control

It is obvious this phase of scanner amplifier adjusting interprets original copy only as black and white without gradations. This is not suitable for photographs in which gradations from white to black are desired. However, control of such copy is provided for and equally simple to execute. The facility of a facsimile scanner to emphasize or deemphasize the tone range in photographs gives the facsimile editor considerable latitude in using photographic copy.

Should the subject matter be a photograph which is underexposed, the desired adjustment would be to darken the background uniformly. It may be desirable to deemphasize, or lighten, a photograph when the original print is too dark. These adjustments are made with an emphasis or contrast control which has five positions. The central post, "0," is used for photographs which are balanced in shading and require no adjustments. Flanking the "0" post are white-control positions 1 and 2 and black-control positions 1 and 2.

For photographic subject matter which is too light, the emphasis-control switch can be shifted to the No. 1 or 2 black position, depending upon the degree of black emphasis desired or required.

For photographs which are too dark, controls may set at No. 1 or 2 white. This elasticity of control, or retouching on the scanner, makes it possible to use many photographs which otherwise would not reproduce satisfactorily on facsimile.

Of course, the right photographic printing expressly for facsimile can obviate need of adjustment at the scanner. However, many photographs that are good facsimile subject matter have technical shortcomings which can be corrected by emphasis control.

After the scanner amplifier controls have been set, whether for black-white or photographic copy, the scanner is then operated with a two-position switch set for "black-white" or "photo" completing the adjustment.

In addition to providing black-and-white intensification and tone-emphasis controls, the scanner amplifier unit contains power-supply systems for the photoelectric cell, for the amplifier itself, and for the miniature searchlight system that is coordinated with the electric eye.

Also included is a subcarrier oscillator which changes the voltage from the photoelectric cell into audible frequencies ranging from 11 kilocycles up. These, in turn, are used to modulate the FM transmitter. In this range the sound is not disturbing when heard on an FM radio tuned to the regular aural programs, which are confined to 10 kilocycles or lower.

Once the scanner amplifier controls are set, they cannot be readjusted during transmission of a page. However, tone-emphasis control, or black-white intensification, can be used alternately on the same page, merely by flipping the two-position switch to "black-white" or "photo" as needed. When photographs and type are side by side, the page is transmitted on "photo."

Line Amplifier

The line amplifier is another step in strengthening the facsimile voltage and controlling it. The photo-

electric cell first creates the voltage; the scanner amplifier strengthens that voltage. It is then passed along to the line amplifier, which boosts the voltage again. From the line amplifier, the voltage goes to the FM radio station with sufficient strength to modulate the FM transmitting equipment.

The line amplifier performs the important service of being able to send strong voltage signals to the FM transmitter which are either intensification of black-white type or lines or control of shading in photographs. Connecting it with the scanner the amplifier has two circuits controlled by the two-position switch: "black-white" or "photo."

When the switch is on "photo" position, the facsimile signal is determined by emphasis controls previously set for the scanner amplifier. Fine shadings of photographs are then possible. When the switch is on the "black-white" position, the scanner output is altered to intensify blacks and virtually eliminate grays, which bring out type matter or line drawings to best advantage on the home recorder. If the scanner amplifier has been adjusted to an off-white paper background or light type, the "black-white" switch of the line amplifier will correspondingly intensify the contrast. This gives a facsimile editor elasticity in make-up. Photographs and type can alternate or be used side by side on a page (see Make-up Style, Chap. XIV).

The scanner operator must watch the progression of copy under the scanner's eye very closely. When scanning of a photograph is completed and the "eye" is moving toward type, the line amplifier switch must be thrown from "photo" to "black-white." The emphasis-control switch of the scanner amplifier has been adjusted to get the best possible recorded quality out of the photograph, but a "black-white" intensification is needed to get maximum contrast and legibility from type. Type matter will not suffer too much when transmitted on a "photo" setting with type and photos side by side on a page. However, if a photo is transmitted on "black-white," it will have all intermediate tones of gray eliminated. What

should be a finely shaded photograph will appear on a home recorder as an unattractive black and white of generally blotchy cast like an ink blot.

The line amplifier also can limit the signal voltage so the FM transmitter's modulation limits are not exceeded. This is a technical consideration of more concern to the scanner operator than to facsimile staff members.

Pulse Generator

Home facsimile recorders must watch the timing of the transmitter with the unfailing synchronization of a shadow following a sprinter down the cinders.

The scanning drum revolves 360 times per minute, and the facsimile copy is sliced into strips 1/105 inch thick. Those slices are laid side by side, 105 to an inch of copy down the page. The slices must have a left-hand margin accurate to 1/100 inch or better, because the electric eye makes the slice by splicing together glimpses of the copy that size. The recorder drum in a home must revolve at the same speed as the scanning drum. It must lay each slice flush against the left-hand margin. Each slice must be precisely laid beside the other. Otherwise, copy produced on the home recorder will not duplicate original copy on the scanner.

Since the copy is transmitted in such small pieces, a minor deviation can make recorded copy unreadable. Getting the scanner drum and recorder drum to turn at the same speed is relatively simple. Each drum is revolved by an identical motor—a 60-cycle, four-pole, synchronous motor, which revolves 1,800 times a minute. Each drum is geared to the motor by a five-to-one ratio, so that the drum turns over once every time the motor turns over five times, or 360 rpm. Thus, because the motors are of identical design and operation, they will rotate at identical speeds, and so will the drums to which they are linked by identical gear systems.

However, the drums not only must rotate at the same speed but must be in precisely the same positions.

When the scanner eye starts to take the first slice of copy from a facsimile page, the recorder drum's helix must be at the extreme left-hand margin of the facsimile paper ready to receive the impulse.

The synchronous motors ensure that the drums will turn at the same speed but do not, by themselves, guarantee that the drums will be in the same position. When a synchronous motor is started in a home facsimile recorder, it does not immediately reach a uniform speed. The magnetic field of the motor causes the rotor to gain momentum. The rotor speeds up, passes by the 60-cycle pace of the magnetic field, and gradually settles back to an even, 60-cycle pace, locking with the magnetic field. In a four-pole motor, the rotor may lock in any of four positions. Meantime, the recorder or helix drum is geared to the motor on a five-to-one ratio.

As a result, when the rotor locks in the magnetic field, the helix may be in any of 20 positions in relation to the scanning eye. Only one position will result in legible, properly placed facsimile copy. To obtain the desired relationship between scanning and recording drums, the synchronous motor must be unlocked from a wrong position and relocked into the proper one. This will, in turn, adjust the helix' position.

Visualize the two drums, turning at the same speed, as being meshed gears. Each gear has 20 teeth. One tooth is painted white on each gear. For the drums to be in proper position, not only must those gears mesh but the two white teeth must touch each other. In order to get the gears in proper position, they must be disengaged, then meshed again with the white teeth touching. When that is done, the gears can again revolve, and with each revolution the white teeth will smoothly come together (just as the recorder drum's helix will start a scanning line at the same time the scanner drum starts by the electric eye).

Getting the two drums in proper position at the outset is the responsibility of the synchronizing pulse. We know that, once this is accomplished, the

motor's inherent abilities to synchronize will keep the drums in accord.

The pulse, or synchronizing signal, is created by a pulse generator, which is part of the facsimile scanning equipment, and is radiated by the FM transmitter. It is generated and transmitted during that period of the scanner drum revolution not devoted to facsimile copy. Of the 360 degrees available on the circumference of the scanning drum, the facsimile copy covers 315 degrees. Remainder of the drum's circumference, or one-eighth, is occupied by the plastic copy-holder moorings. The electric eye is adjusted to skip this area and concentrate its perfection solely on that portion of the drum's surface occupied by facsimile copy.

The scanner drum revolves 360 times a minute, so the one-eighth of the drum's surface devoted to copy-holder moorings flashes by the electric eye six times a second. It is then that the pulse, or synchronizing signal, goes on the air, keeping all originating and recording equipment literally on the beam. The pulse ensures that the scanning drum and recording drum are in properly related positions at the start of each scanning line (helix wire on the recorder drum at the extreme left-hand side of the recording area on the facsimile paper when the scanner drum is starting to flash the start of a line by the electric eye).

The process of assuring that the drums are in proper positions to start scanning and recording a line in unison is called "framing." This unison must be maintained for every line, 105 to each inch, through the 11.5 inches copy depth of a facsimile page. As we have noted, this unison stems from locking the recorder synchronous motor rotor in the proper position in the motor's magnetic field.

Here is how that is done.

The pulse goes out during the time the copy-holder area is passing the electric eye. If both drums are in precise unison, the pulse is radiated exactly in the center of the copy-holder area, which on the scanner and recorder drums is the center of the white marginal areas. If the recorder drum is in a wrong

position, the pulse will arrive while the helix is touching what should be copy areas. The recorder drum's position must be altered so that the helix's circuit is in a neutral position, exactly halfway between the end of one scanning line and the start of another.

This alteration, or framing, takes place between transmission of facsimile pages and is aided by a page-separation signal, which is black. The signal is sent during 54 revolutions of the scanning drum, producing a black strip approximately 0.5 inch deep across the full 8.2-inch scanning width of the facsimile page. The page separation signal is sent by an independent, miniature scanning mechanism balanced with the pulse generator. A page-separator strip is scanned during 315 degrees of each drum revolution, leaving 45 degrees of rotation reserved for framing.

This 45-degree interval is utilized in portions of 15 degrees each to accomplish framing. In the first 15 degrees of the interval a white signal is transmitted. Black is transmitted during the center 15 degrees. White is again sent during the last 15-degree interval.

The synchronizing pulse is transmitted in the middle 15 degrees of the 45-degree interval, which takes place every time the scanning drum revolves, or six times per second. When this pulse goes out, the drums should be precisely between the end of one line and the beginning of another. Thus, the first one-third of the framing signal is white, the second third black, the last third white, the pulse starting with the center one-third.

Recorder motor circuits are so designed that, when the page separation signal is transmitted, the synchronous motor rotor can slip, or shift, within the magnetic field. In effect, the black page-separation signal serves as a clutch to disengage the rotor from its locked position and move it toward a position which will bring the recorder drum, to which the motor is geared, in proper relation to the position of the scanner drum.

The rotor slips back one-twentieth of a revolution

in the magnetic field if a black signal is received at the recorder during the first 15 degrees of framing signal. It will continue to slip one position for each revolution of the scanning drum as long as the recorder drum is out of position. This slipping will stop when, instead of a black signal received during the first third of the framing period, a white signal reaches the recorder. When that happens, the recorder drum is in precisely the same position as the scanner drum, the slipping ceases, and the recorder synchronous motor rotor locks in the new, desired position.

This major adjustment in position accomplished, the drums are in precisely the same position, the synchronous motors are locked so that the position is maintained, and because they are identical, with identical gearing to the drums, scanner and recorder drums revolve at the same speed.

The pulse continues to be radiated for 15 degrees of each scanner drum revolution, aiding the precise drum relationships.

The pulse synchronizes not only home recorders but monitor and test recorders and the scanner synchronous motor.

In a few areas the power source of home recorders may be different from that of the scanner. To correct this, it is possible to attach to a recorder a unit which controls the speed of the recording drum from the transmitter. Such a power-source problem is relatively uncommon.

Recording

The process whereby facsimile copy is actually printed on paper is called "recording" and has its origin at the scanner.

There the scanning head sends thin slices of copy to the FM transmitter as electrical voltage. The voltage goes over the air as a machine-gun stream of tone impulses. An FM receiver picks up the radio tone impulses and ferries them to the facsimile recorder as electrical voltage. This causes the

recorder to mark the paper in a series of lines, each 1/105 inch high and four newspaper columns wide.

No sooner is one slice of the copy transmitted and recorded when another is laid underneath it. Each minute 360 slices are transmitted and received.

Swiftly the black and white slices pile up. A complete line of type or cross section of a map or photograph takes form on the paper. (Take a deck of cards. On the edge of the deck write your name. No one card spells out your name. But when you look at the edge of the deck, the 52 cards, each contributing a thin slice of your handwriting, do spell your name.)

The facsimile staff must know how their pages look as they come out of the home recorders, and they also need a complete record of all pages transmitted. They learn this from looking at a master copy which is made in the studio on a monitor recorder built into the scanner unit.

Mechanisms in the home recorder and the studio monitor recorder are identical.

The monitor recorder produces copy simultaneously with the home recorder and precisely duplicates the pages a home facsimile reader receives. The difference is this: The home recorder gets its facsimile signal by radio; the monitor recorder gets the same signal by tapping the line from the scanner to the FM transmitter. Only a tiny portion of the varying signal voltage is siphoned from the line, amplified, and fed into the monitor recorder. The amount of signal voltage tapped from the line is so slight that it does not interfere with the transmission process.

Occupying about the same space as a portable typewriter, a typical recorder includes a humidor for storing facsimile paper, a mechanism for unrolling the paper at the proper speed, a printer blade which marks the paper, a helix, or backup, roller, a drying bar over which the paper passes and is "ironed" after printing, and a roller which collects the paper at the same speed as the mechanism which unrolls it from the humidor (see Fig. 75).

Facsimile paper is available in rolls 9½ inches wide and 400 feet long, enough for about 24 hours or

more of continuous programming, delivered in an air-tight metal container which is opened by a can opener. The roll is mounted in a humidor in the recorder and pulled over the recorder drum and drying bar. A hinged rack, controlled by two twist knobs, is then swung back into place, the paper loading is completed, and the recorder ready for operation.

No step of the procedure takes any more technical skill than that used by the average housewife in her daily routine and requires less time than changing a typewriter ribbon.

Facsimile paper is approximately 40 per cent moist when it comes out of the sealed container and is chemically treated. The moisture content helps pass an electric current through the paper in the recording process and aids in retaining proper balance of the paper's chemical properties.

The sealed container retains the desired moisture content of the paper until it is put in the humidor. There the moisture level is maintained for 5 or 6 weeks, longer if the recorder is operating in humid climate. Under normal conditions the roll of paper is used up long before it could dry out.

The paper feeds smoothly, keeping precise pace with the photoelectric cell's scanning of copy. Rollers controlling the facsimile paper are geared to the helix drum and thereby synchronized with the scanning drum.

After the paper unwinds from the humidor, it passes over a drum which revolves. On the drum a wire—or helix—is wound in a spiral pattern. This helix drum is as wide as the facsimile paper. Opposite the helix is the printer blade, a narrow strip of iron. The paper travels between the printer blade and the helix.

The spiral helix wire brushes continuously across the back of the facsimile paper, like the spiral cutting blade of a lawn mower brushing across the face of the mower's backup bar. It touches one place at a time, delivering a fleeting touch in a straight line. The printing blade is in the relative position of the mower's backup bar, and continuous, sliding contact is maintained with the revolving helix.

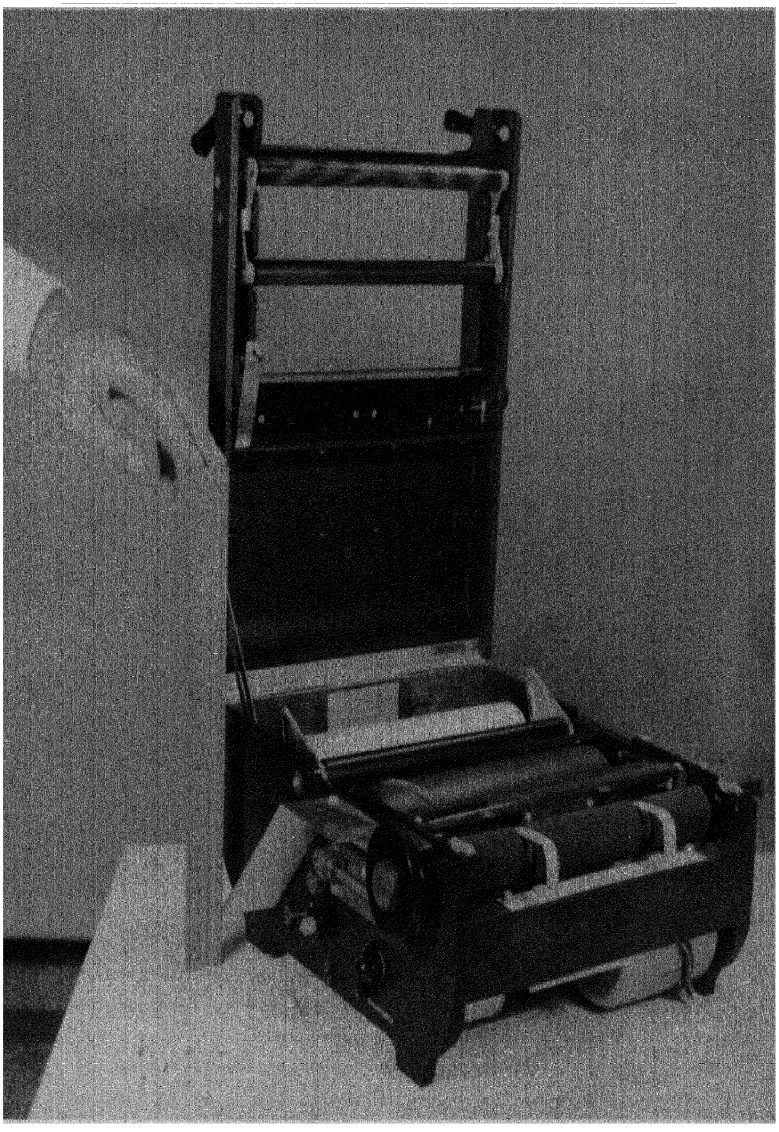


Fig. 75. Complete facsimile recorder with lid open.

The facsimile signals are received by the FM radio and reconverted into electrical impulses which vary in intensity according to what the scanner eye sees. These impulses are then fed through the recorder to the printer blade, which lies against the surface of the facsimile paper. The current reaching the blade varies from almost zero for white to 250 milliamperes for maximum black, with proportionate gradations according to shadings from white to black in the copy being scanned.

The printer blade, made of highly refined iron, sends the electric impulses through the moist paper, which is a good conductor of electricity. On the other side of the paper the revolving helix completes the electric circuit. The varying voltage removes infinitesimal particles of iron from the printer blade and deposits them in the facsimile paper. These iron deposits, together with simultaneous chemical changes in the paper caused by the electricity, result in a mark, or facsimile recording.

If the scanner eye is seeing pure black on the facsimile copy, pure black is marked on the facsimile paper. If the scanner eye is seeing white, there is no mark made on the paper.

A printer blade will last for approximately 1,200 feet of paper or 72 continuous hours of facsimile recording. The blades are inexpensive and can be replaced quickly.

Because the helix (like the lawn-mower blade) is revolving gently against the back of the facsimile paper, at the same speed as the scanner drum (360 rpm), and is synchronized with the scanner drum, markings are made in exact sequence with the reaction of the photoelectric eye viewing the revolving facsimile original page.

One rotation of the helix drum corresponds precisely to one rotation of the scanning drum. The impulses sent out by the scanner, 1/105 inch high, become a line across the page 1/105 inch high.

The paper is fed over the helix at the rate of 105 lines per inch. As each succeeding revolution of the scanner drum is matched by a revolution of the helix,

an exact duplicate of the original copy is marked on and in the facsimile paper.

After the copy has been recorded, it is desirable to remove the moisture from the paper. This is accomplished by an electrically heated drying bar located a few inches along the paper's route after passing the printing point. The drying bar evenly removes all but a laboratory trace of moisture and "irons" the facsimile paper somewhat. The paper has a gray hue when moist. After drying, the paper becomes clear white, and copy recorded on it is accentuated.

The printed copy delivered to the reader is 8.2 inches wide on a page 9.5 inches wide. The copy area is 11.5 inches deep. Adequate margins, top and bottom, can be allowed at the discretion of the scanner operator.

Monitor Recorder Amplifier

The monitor recorder amplifier, which takes a small amount of voltage from the line feeding facsimile impulses to the FM transmitter, is a two-stage amplifier. The picture signal is built up in strength and converted back into the same signal which left the photoelectric cell. This signal is then fed into the monitor recorder in the same form and dosage (40 volts and 250 milliamperes, approximate) in which the home recorder receives the facsimile signal impulse.

The recorder amplifier has a limiter to prevent too much current entering the monitor recorder, because if marking current exceeds that required for maximum black (40 volts and 250 milliamperes, approximate), the facsimile paper markings will have an electronic coat of tan instead of legible black (see Fig. 76).

The monitor recorder is not operated directly from the scanner for technical reasons. The scanner power output could be boosted enough to operate the monitor recorder directly and send a healthy signal to the radio transmitter at the same time. However, this would create the technical hazard of possibly overloading one or the other. If either the transmitter line or the monitor connection failed, or if either was turned off, the other link would be

overloaded. It is simpler, safer, and less expensive to tap the wire to the FM transmitter. With this arrangement there is no chance of overloading and at the same time an exact duplicate of the home recording is made.

Test Recorder

In addition to the monitor recorder, the studio facsimile unit includes a test recorder.

This is used to test pages before they are put on the air and operates directly from the scanner.

Unattended, Automatic Operation

Fully automatic operation of facsimile receivers is feasible and has been operated successfully for hundreds of editions in at least one area. No one knows whether most facsimile users eventually may or may not require unattended or automatic operation, but the tools are at hand if they desire it.

Here is a brief description of one of the successful automatic operations:

The receivers are turned on at preset times with a time switch in the receiver set to give ample warm-up time before recording. The time switch "on" period is set wide enough to allow for possible inaccuracy in the clock mechanism. Time switches are commonly available in electrical supply stores and are inexpensive. They have been tested and refined over many years of use for turning on store displays, billboards, and other after-dark features.

After the receiver has been turned on by the time switch, tone-sensitive relays perform the switching functions required at the receiver. The relays stop and start the recorder motors or switch the loudspeaker on and off (see Fig. 77).

These relays are activated to do the switching jobs by means of tones transmitted over the FM radio station at the will of the scanner operator.

A typical operation for a news edition follows:

The time clock turns on the receiver.

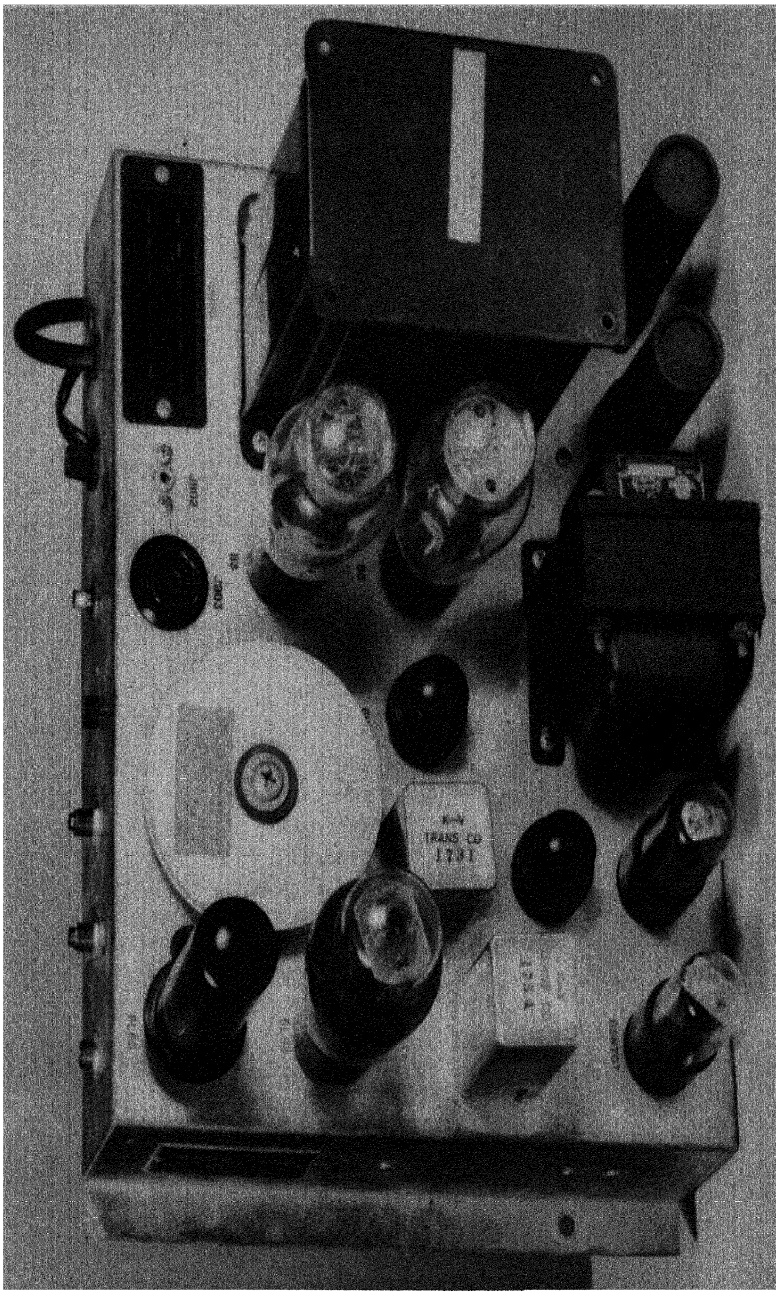


Fig. 76. Recorder amplifier, which strengthens the facsimile radio impulses before they reach the recorder.

When it is time for the edition to start, the scanner operator pushes a button on the scanner. This transmits a tone which makes the proper relay in each receiver start the recorder.

The scanner operator then pauses long enough to ensure the recorders are moving and fresh paper is in position for recording.

The edition is then put on the air.

At the end of the last page, the scanner operator presses a different button, causing a different tone to be transmitted. This tone moves another relay in each receiver which stops the recorder mechanism. If desired, the relay may also turn off the receiver.

The tones used to perform these switching functions may be sufficiently high frequency to be inaudible or nearly so.

Voice Announcements

Additional dramatic interest may be had by using voice announcements in conjunction with the facsimile recording. An announcement preceding an edition serves to attract attention to the receiver and the news coming up. It is a "newsboy" cry by radio. Other announcements may be used between pages to call attention to news bulletins or special features. If appropriate, the announcements can be used as spot advertising keyed into the subject matter of the facsimile pages.

In some instances, experimental programs have had voice comments and facsimile recordings coming out of the receiver at the same time. This gives the over-all effect of a lecture illustrated by slides. It has unlimited possibilities, e. g., delivering the funnies by facsimile and having an announcer read them at the same time.

Automatic, unattended operation is particularly useful when you have a large number of receivers in public places. Home facsimile receiver users may have their receivers equipped for automatic operation if they wish. The tones used to operate the relays will not affect a receiver which is not equipped for automatic operation.

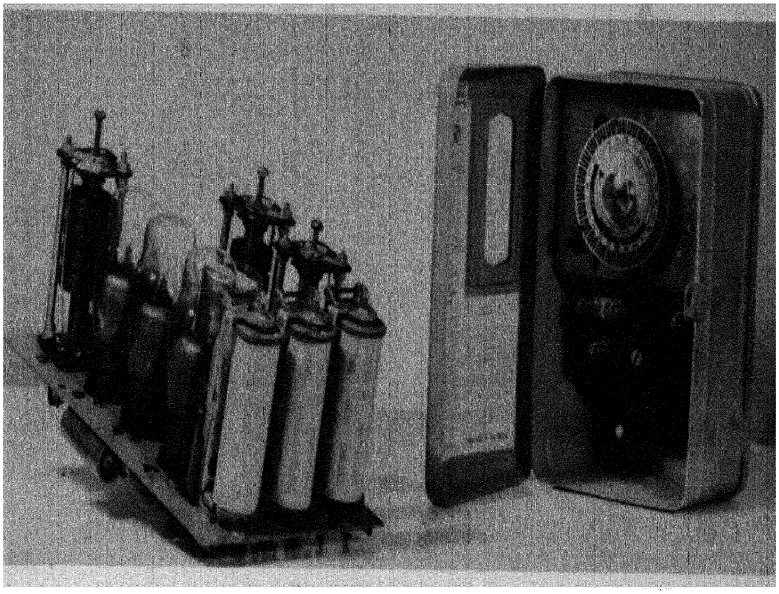


Fig. 77. Remote-control units. Tone-sensitive relay, left, and electric time switch.

XIX
MULTIPLEXING

The most significant technical development in facsimile during the 1940's was successful application of previous multiplex research to facsimile.

As facsimile grew out of the laboratory and into regular daily use, broadcasters watched facsimile encroach on FM air time with mixed emotions.

At that time FM stations were required by the FCC to put only 6 hours of FM programs on the air daily. (Now most FM stations are "full-time" operations.) In most instances, it was a simple matter to schedule facsimile broadcasts between the required aural programs. However, it was obvious that FM would ultimately grow into a full-time service like AM, and when that time came, what would happen to facsimile?

This prospect made many broadcasters extremely cautious about entering the facsimile field. Their fears were justified when FM stations with AM affiliations began to duplicate all AM programs in the spring of 1948. There were no free hours for facsimile except in the early morning hours. Facsimile publishers had no interest in transmitting copy during those hours. They remembered that early AM experimenters had been confined to early morning programming and failed to capture an audience.

Newspaper-affiliated facsimile publications realized that facsimile could not compete with the standard newspaper if transmission were confined to the "sleeping hours."

The morning newspaper would have more news waiting at the door than facsimile would probably deliver overnight. To be successful, facsimile had to be a predominantly daytime operation, when it could beat regular newspapers to the public with the latest news.

FM-station operators hesitated to make ambitious facsimile plans so long as it meant shutting off their FM aural programs temporarily and subjecting unwary home listeners to the beep-beep of facsimile tones. They had long known that, if a listener once switches

his dial to another station, "living room-inertia" tends to leave the set on the new station. Getting listeners and keeping them is axiomatic in the radio broadcasting business, and interruptions for facsimile transmissions meant throwing an audience over to a competitor's station if they didn't have a facsimile recorder. And at that time few facsimile receivers were in the hands of the public.

The Federal Communications Commission can be thanked for making a solution possible before the air time squeeze knocked facsimile out. When the FCC issued facsimile standards, effective July 15, 1948, it was specified that multiplex facsimile was authorized. Facsimile and FM station operators were elated when they got that news.

The FCC's permission for multiplexing meant that FM aural programs and facsimile could be transmitted simultaneously over the same assigned wave length. Strings were attached to the permission, of course. The facsimile beep-beep could not interfere with the aural programming. FM-station operators were wholeheartedly in accord with that suggestion. There was no advantage in having uninterrupted aural programs if a symphony was going to have facsimile rumbling through the orchestra, or a newscaster was to have facsimile's tom-tom accompaniment in the background.

Careful study had gone into the establishment of the FCC standards for facsimile (see Chap. VII). Leading FM broadcasters and facsimilists had appeared before the commission in March, 1948, and outlined facsimile's position as an industry and its relation to the entire FM picture.

Here, in essence, is what the commission was told:

The then existing method of radio called simplex facsimile had to be broadcast only when FM aural programs were off the air. That meant early morning, when the FM station was not aiming at sound listeners or interrupting daytime sound programs for intervals of 15 minutes or more for the transmission of a facsimile edition.

Facsimile advocates were generally unhappy about the situation.

If facsimile was to mature into a major mass-communications industry, as witnesses before the FCC agreed was possible, a successful method must be perfected which would permit *both* FM aural and FM facsimile to be transmitted simultaneously, without rubbing elbows on the FM channel, or else separate channels would have to be assigned to facsimile.

In its statement released June 10, 1948, the Commission pointed out that, whereas there was no technical difficulty in simplex FM facsimile transmission, the necessary interruption of FM aural programs was a problem that not only existed but would undoubtedly become more serious. Recognizing that the problems of multiplexing were technical in nature, but that some success had been had in the experimental transmission of sound and facsimile programs simultaneously, the Commission made special provision for such multiplex broadcasting.

At the time of the March hearings, the Commission had witnessed a demonstration of multiplexed facsimile which resulted in little or no degradation of the FM sound below 10,000 or 12,000 cycles and in which the background facsimile noise heard in sound receivers was slight and not objectionable. Taking this as a starting point, the Commission decided that it would be better to permit facsimile to infringe upon the sound spectrum above 10,000 cycles than to hold back permission for multiplexed facsimile until the problems of multiplexing, without even partially degrading the sound, were solved. Suggesting that such multiplexed operation be carried on while the sound programs were such as not to require the full tonal response of which FM is capable, the new Rules allowed 3 hours of multiplexed operation during the broadcast day between 7 a.m. and midnight. Such multiplexed operation was required to be on a basis that did not impair the quality of the aural programs below 10,000 cycles per second and did not require a filter or other additional equipment for FM sound receivers not equipped to receive facsimile.

The Commission emphasized, however, that it was important to continue multiplex technical developments

to provide a system that would not cause any degradation in the aural programs below 15,000 cycles. Having gone all out to provide capacity for full fidelity sound in the FM band, it is clear that the Commission felt that no permanently retrogressive step should be taken. In fact, in its statement accompanying the new facsimile Rules, the Commission "strongly urged all interested persons" to continue multiplex experimentation so that a system could be developed at an early date which would involve no degradation of the aural program below 15,000 cycles. The Commission said further, "In this way, simplex operation can be eliminated entirely and multiplexing will be possible during all hours."

The FCC's green light for multiplex facsimile and sound cleared the last legal hurdle for the continued expansion of the home facsimile service. All interested groups could now base their plans on practically unlimited facsimile operation.

The FM station's sound program schedules no longer were a worry. Establishing a multiplex system that would faithfully meet the FCC's requirements was something else.

Multiplex broadcasting, but not on a facsimile basis, had been experimented with by many broadcasters. Facsimile multiplex experiments had been conducted on an essentially laboratory basis by Radio Inventions, Inc., Finch, Alden, the Rural Radio Network of New York State, The Miami Herald-WQAM-FM, and others.

The Miami Herald's laboratory work on multiplex had progressed to a point that it felt confident the new regulation could be met.

When the first minute multiplex facsimile was legal, at 12:01 a.m., July 15, 1948, The Herald transmitted a multiplex news edition with representatives of press associations as readers. Refinements of The Herald's process have continued since then, and the newspaper's multiplex facsimile system does not degrade aural FM programs below 10,000 cycles and starts its facsimile tones at 11,000 cycles, leaving a 1,000-cycle guard band between the two. There is no interference

discernible to a listener using an average FM receiver.

The Miami Herald's multiplex system, with which the authors are familiar, uses a low-pass filter at the FM transmitter to keep the FM aural program out of the facsimile, and a high-pass filter at the scanner keeps the facsimile out of the line to the transmitter. In the field, a high-pass filter in the facsimile receivers separates the mixed program material.

Facsimile mixed with sound would be a staccato beat, and sound mixed with facsimile would be black dots on the recorded paper.

Under this system, there is no modification or filter attachment needed for existing FM sets used exclusively for listening to FM aural programs. They operate as before without interference from the facsimile.

Listeners with very high fidelity receivers wishing to utilize the full tone range of their receiver can hear weak interference from a facsimile signal utilizing tones from 11,000 cycles upward. The FCC, wishing to ensure full tone fidelity to FM listeners provided that facsimile tones should eventually utilize only frequencies above 15,000.

Research was stimulated so that by September, 1948, Radio Inventions, Inc. successfully demonstrated a multiplexing system with all facsimile tones well above 15,000 cycles. This system allows facsimile signals to ride along with a regular aural program and not be heard on the highest fidelity receivers.

The facsimile signals are applied to a 25,000-cycle subcarrier tone which is used to modulate the radio waves transmitted by the FM station. Filters are used to prevent the aural signals from appearing as marks on the facsimile copy, and also to prevent the loudspeakers from reproducing any part of the scratching sound that is characteristic of facsimile. The first successful field tests were made over WQXR-FM in New York from September 8 to 14, 1948, and further multiplexed operations were carried out over WFIL-FM in Philadelphia and WEAW-FM in Evanston during the

Chicago Convention of the Frequency Modulation Association later that same month. Thus the stimulus to development applied by the FCC resulted, more rapidly than had been hoped, in a satisfactory multiplexed-facsimile-and-sound system which met all of the industry and Commission requirements. By means of such a system, all FM broadcasters are enabled to add facsimile to their normal FM sound operations, without sacrificing time or quality. In this way, each FM station is enabled to render two distinct broadcast services, one by means of sound, and the other by facsimile.

XX
MOBILE UNIT

Special-event, on-the-spot, coverage can be accomplished with a mobile facsimile scanning unit. Its primary use is for events which require photographs to tell the story best. Therefore, the mobile unit must include portable darkroom equipment.

Events which can be described in type alone or where photographs are a secondary need can be adequately covered by telephone from the scene of action. Copy and heads are set and transmitted from the main facsimile department. Photographs related to the story may be rushed back to the main photographic department; prints passed on to facsimile and published in later editions. Often your staffer will phone new leads, and the photographs can be used with the revised story.

The need for a mobile unit varies widely between facsimile publishing areas. In some it can be used regularly; in other areas but rarely, and then it would be a luxury.

Each facsimile publisher covers events within his "circulation" area that have great reader interest and are best reported when photographs accompany the type, e.g., county fairs; baseball, football, basketball, and other sports; the visit of a nationally prominent person; parades; and countless other happenings with photographic possibilities.

The quickest way to give the facsimile reader printed news and photographs is to have a mobile unit at the scene of action. There is far more impact to a story about a big fire if a photograph follows in a few minutes than if the photograph trails the story by an hour or more.

When photographers must return to the studio to develop their negatives and make photographic prints, much of the appeal of their photographs is wasted because of the time lag. If the photographic processing is done on the spot and a print handed to the mobile-unit operator, the time lag is minimized and

the dramatic effect of facsimile reporting is heightened.

When the facsimile edition is an adjunct to a regular newspaper, the mobile unit gives the city desk a boost in covering a fast-breaking story. Not only are facts relayed back quickly, but the photographs received by facsimile can be rushed to the engraver for newspaper editions.

The mobile facsimile unit consists of a single scanner and related amplifiers. The equipment can be transported in separate parts and assembled on a panel rack at the scene, or the parts can be laid side by side on a table and wired together.

One man can carry any single part, and there is enough room in the back seat of a sedan to transport all of them in one trip.

The staff engineer will be needed to assemble the equipment. He can serve also as the scanner operator. The size of your special-events editorial staff and their equipment will depend on the kind of activity being covered and volume of copy required to tell the story.

First step in using your mobile unit is to arrange for a telephone line capable of frequencies up to at least 7,500 cycles. The engineer will select a suitable subcarrier frequency.

The telephone line should terminate near an electric power outlet (15 amperes, 110 volts). After the mobile unit is set up, tests should be run on the telephone lines well in advance of actual programming.

A telephone line with a response to 7,500 cycles is adequate for linking the mobile unit with your multiplexing equipment. There the impulses from the 7,500-cycle line are moved up to the higher multiplex frequencies (10,000 cycles up) by another subcarrier.

Lines with sufficiently broad frequency response to handle multiplexing directly from a mobile unit, without a subcarrier adjustment at the terminal, are available for short distances. Most of your special-events work will be in stadiums or public buildings

miles from the facsimile department or FM transmitter. Therefore, you must rely on the 7,500-cycle line, which can be 25 miles or more long, and adjust the facsimile impulses before they are put on the air.

The terminal of the mobile unit line may be at the facsimile department or at the FM transmitter, depending on where you have your multiplexing equipment.

If the multiplex equipment is at the FM transmitter, the 7,500-cycle line terminates at the transmitter building, where it feeds the facsimile into the multiplexing equipment. This, in turn, boosts the frequency and sends the facsimile directly into the FM transmitter and antenna.

If your multiplexing equipment is at the facsimile department, the 7,500-cycle line terminates there, The impulses are moved to the higher multiplexing frequencies and sent to the FM transmitter over the line from the scanner which has a very high frequency capacity.[1]

There are two important advantages to having the mobile unit line terminate in the facsimile department. You can pretest pages on the department's monitor recorder before actually putting them on the air. And by alternating between the mobile unit and the facsimile department a continuous edition can be kept on the air even if the flow of photographs or copy at the mobile-unit end is not sufficient for a continuous edition.

This requires that the facsimile department be manned as well as the mobile unit. The arrangement is similar to a remote pickup in regular radio broadcasting. The main studio is standing by to take over the programming if for any reason the remote unit fails, wants a "breather," or something comes up through regular channels which should go on the air promptly.

News is unpredictable and in the middle of a mobile-unit transmission an important story may come over

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[1]The Miami Herald's facsimile department scanner-FM transmitter line is equalized to 19,000 cycles, constant.

the press-association wires or from the city desk. You must be staffed to get the news on the air without delay. In that case you switch off the mobile unit and use the studio scanner to transmit the news break.

It is imperative to have a constant telephone connection between the facsimile department and mobile unit so that the two crews can discuss programming and keep each other informed about scheduling pages.

The portable darkroom that accompanies the mobile unit requires some preevent planning. You need an electric power source for the enlarger, space for trays and chemicals, access to running water, and a room which can be made lighttight. Most athletic stadiums and public buildings have a place with these facilities in which your photographers can set up shop.

An International Business Machine electric typewriter can do your picture captions. The remainder of your copy and all heads can be phoned to the facsimile department. To cover major events for which you can plan a long time ahead, such as a Bowl game, World Series, or similar activity, you can increase the size of your IBM staff with the mobile unit and include head-setting equipment.

The most practical arrangement is to hold the mobile staff and equipment to as small a unit as possible.

This can consist of the engineer-scanner operator, one photographer, one copy editor, one copy setter. The scope of the event being covered will dictate what expansion from this base is necessary.

XXI

LAUNCHING A FACSIMILE NEWSPAPER

Written descriptions of facsimile can give a reader a general understanding of the process, but nothing takes the place of seeing it. Therefore, when you introduce your facsimile publication, you can plan a series of demonstrations that give every group in the community an opportunity to see facsimile work.

Tie these demonstrations in with newspaper stories and FM-station promotions. If you are newspaper affiliated, that part of your promotion is assured. Even if you are not, the introduction of facsimile is news that stands on its own feet and merits some attention.

Advance publicity should reduce the technicalities of facsimile to simple terms. Illustrate your publicity profusely. Don't try to explain in detail *how* facsimile works. Radio is one of life's great mysteries to most persons. And they are not particularly interested in understanding what goes on inside a radio set.

Keep your stories simple. Concentrate on telling *what* facsimile does. The photographs will help do that. Reserve technical details for the few who are interested, and let your radio engineer tell them in person.

Carefully plan each step of the promotion. Select the places you want to give demonstrations, set an exact date and time, and arrange for installation of FM antennas. Know the precise location for each receiver, and be sure a dependable electric-power source is available. Rent a panel truck if you do not have one, so you can move the receivers on schedule.

Make it easy to see your display. Select sites with heavy foot traffic or a concentrated audience. Department stores, hotels, banks, utility company offices, and theater lobbies are ideal. Special demonstrations for schools, churches, luncheon clubs, or fraternal organizations should be an important part of your promotion program.

Prepare an illustrated booklet outlining your facsimile publishing plans. Distribute them at the demonstrations. Observers will want samples of facsimile pages. It isn't practical to meet these requests with actual pages. Have photo-offset copies of pages made in advance, and give those away.

Prepare an illustrated chart, to be displayed with the receivers, which highlights the sequence of facsimile publishing. Photographic enlargements can be made of the facsimile department, scanner, FM transmitter and antenna, and receiver.

Key these photographs with large numbers so observers can trace the path of facsimile news from editor to receiver. Use appropriate explanations under each photograph, and set them in large type. The whole chart should be designed for reading at a distance. Display it on a high pedestal so that crowds around a receiver do not block it from general view.

Make up in advance the feature pages for your facsimile demonstration editions, with photographs and headlines large enough to catch the eye of a passerby. All copy used for public demonstrations should be larger than for home editions.

The feature pages should have diversified appeal. Give the public a sample of all kinds of programming; let them know that facsimile can send menus or a wire photo, an article about baseball or the latest Paris fashions, because your observers will be a mixed-interest group. Include some pages typical of a home facsimile service. And in your give-away booklet, point out that the demonstration editions are deliberately mixed to show facsimile's versatility.

Demonstrations should dramatize the speed with which facsimile can handle news. This is done best in demonstrations for special groups. Have photographs taken of the school assembly at which the receiver is being demonstrated. Rush the photographs to the facsimile department, and return them by facsimile to the school before the assembly is recessed.

Guests arriving for a Rotary luncheon can be photographed as they enter a dining room, and their pictures

recorded on the receiver before they have finished the meeting. Underscore the ability to send anything that can be written or printed on paper. Get teachers, students, Rotarians, or Bible class members to sign their names on a sheet of paper. Send it back to them by facsimile.

The most effective group demonstration includes a speaker who describes facsimile before the news is transmitted. Then the audience does not have a cold start when the recorder begins turning out pages. They already know a little bit about facsimile, and watching the operation of the receiver is that much more understandable and enjoyable.

Voice announcements from the studio preceding editions are important and will increase interest. The voice coming out of the receiver can call attention to the receiver itself and explain that it is about to produce news and photographs delivered by radio. This sort of voice promotion also can be used effectively between pages and at the end of editions.

As your demonstration period progresses, link prominent members of the community with the endeavor. A panel of educators, churchmen, or businessmen on an FM program can discuss the possibilities of facsimile as applied to their activities.

Make live broadcasts from the scene of the demonstrations. Get the audience to participate. This is particularly desirable when a demonstration is being given for a well-known community club or group.

Follow up advance newspaper publicity with photographs and stories about the demonstrations, together with a schedule for the next day. Move demonstration receivers from neighborhood to neighborhood. Supermarkets are excellent locations.

Early in the demonstration period you should cater to the men and women who work and may not have a chance to see facsimile during the day. Invite the public to an evening demonstration in a school auditorium or public hall.

Radio technicians and retail-store men should be given special attention. Put them first on the list for a preview of your publication. Their interest

will be more technical and economic than editorial, so let your radio engineer preside over the meeting. Let them know how they can benefit from the growth of facsimile through sales of receivers, parts, and supplies. They should be your friends and partners in facsimile. Take them into your confidence.

There are other groups with a special interest in the start of facsimile, including journalism students, technical students, and their teachers. Demonstrations at schools will reach them, but be sure to arrange for visits to the facsimile department, where they can study the operation in detail. Offer to provide special lecturers on the subject if the schools are interested.

The demonstration period should make virtually every person in the community conscious of your facsimile publication and generally familiar with how it works. The demonstrations, newspaper and FM promotions, and booklet can be combined to meet your particular needs best. After your initial introduction of facsimile, keep your door to the facsimile department open for visitors. As in any industry, you never stop advertising your product.

XXII
TEACHING FACSIMILE

The expanding demand for men and women trained in facsimile procedure and techniques is being met by facsimile courses taught in schools of journalism.

Teaching techniques have combined lectures with laboratory sessions, so that students not only get an academic grasp of facsimile but also know how to operate the equipment. Instructors feel that the full resources of facsimile can be utilized only if editorial workers learn first hand exactly what the equipment can do.

A typical facsimile journalism course includes 3 lecture hours weekly and 5 hours of laboratory work, using a scanner, recorder, electric typewriters, head-setting equipment, make-up tables, and artist's supplies. The lecture room and laboratory are combined so equipment can be used to illustrate points covered in lectures, which follow the basic pattern of this book. Whenever equipment is discussed, the function of the part is demonstrated (see Fig. 78).

Laboratory sessions first concentrate on editing and rewriting press-association and city-staff copy to conform with facsimile style. This is followed by learning to operate the electric typewriters, justify copy, and set heads. Students are then given enough copy to fill a page, and they must write and set the heads, edit and type the copy, lay out and paste up the page. Each student learns to use an airbrush and retouching paints. Test pages are then expanded to include photographs, which students crop, retouch, and include in their layouts.

Sample pages produced in the laboratory sessions are test-recorded by the instructors and returned to the students for correction. As soon as the class has mastered the editing and make-up techniques, they are given practice operating the scanner. At that point they start with material for a page, prepare the page, and test-record it themselves (see Fig. 79).

Laboratory work is stepped up until each student

is getting out a complete edition, working against deadlines. Practice in voice announcements comes near the end of the course. Major diction errors are corrected, but this practice is designed primarily to rid the students of mike fright.

The concluding part of the course includes preparing editions for broadcast, by wire loop, to facsimile receivers on the campus. By that time the students are capable of taking news from a press-association teletype and from campus reporters and getting out an up-to-hour news edition (see Fig. 80).

Every phase of facsimile, from the electronic principles to Federal radio regulations, is covered. Specialists in fields allied with facsimile are used as guest lecturers. These have included radio broadcast engineers, radio announcers, a newspaper art director, and a receiver manufacturer's representative. Students are kept abreast of developments in the field, and a realistic appraisal is given of facsimile's progress.

After students have practiced preparing the campus editions, they spend part of their laboratory time in the facsimile department of a newspaper, assisting in preparation of daily editions for public broadcast.

Experience thus far in teaching facsimile to college journalism students indicates that if proper equipment is available, and the students have already been trained in newspaper writing and editing, that they can become reasonably expert facsimilists in one academic year. One of the facsimile students summed it up by saying: "I learned to fly a bomber in 7 months. This is less complicated and a lot more fun."

The methods used in teaching facsimile may vary and this typical course may become obsolete, but a significant conclusion obtainable from the lecturer's records is the fact that facsimile procedure is not difficult to teach. The students averaged at least 3 years of journalism training but none had a practical knowledge of radio when they entered the class. Nine months later, all of them, including three girls, were competent to operate the equipment and apply their journalism training to facsimile's special requirements.

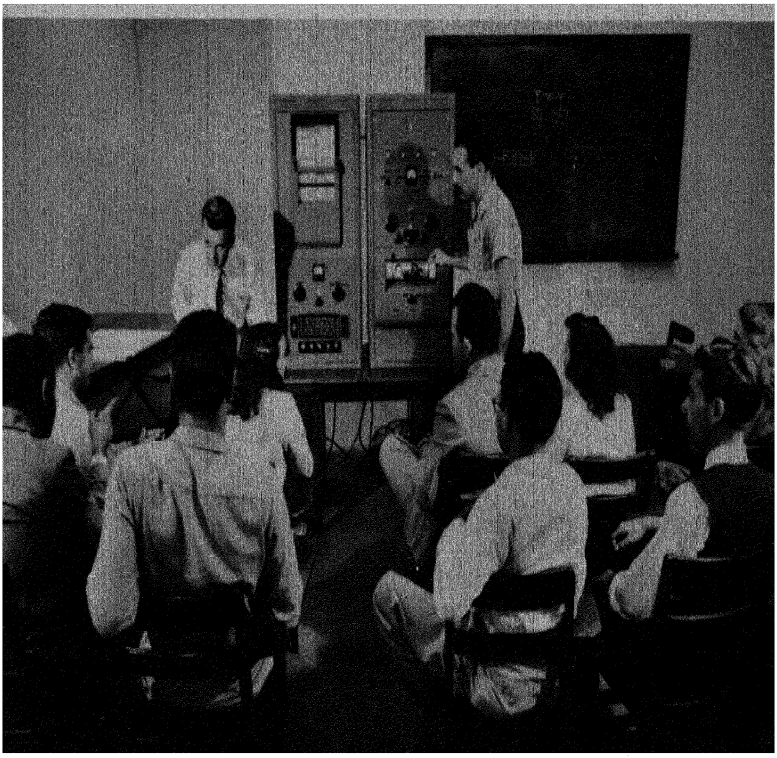


Fig. 78. University of Miami facsimile class. Facsimile equipment is used in connection with lectures. Students learn to operate the scanner in laboratory sessions.

New Kind of Newspaper Is Received by Radio

F R I D A Y

OCTOBER 22 1948

Columbia watches the beginning of a new kind of newspaper today, a journal that brings news, pictures, and features as fast as electricity can travel, clear for the eye to see. "Missouri FAX" is your radio newspaper.

Columbia becomes the second city with a daily radio facsimile newspaper. The Miami (Fla.) Herald airs a daily FAX edition on Station WQAM-FM and the Philadelphia Inquirer transmits a weekly FAX newspaper on station WFIL-FM.

"Missouri FAX" is the first experimental daily FAX newspaper. It is non-commercial. With it the University of Missouri School of Journalism intends to investigate the possibilities of radio newspaper, to develop it by trial use. Thus FAX will be presented to you in many different forms.

The radio newspaper may be seen on the University campus at Read Hall, the library, and Jay H. Neff Hall, and downtown at the Columbia Savings Bank. Five times a week an edition will be transmitted at noon.

Here is how it works. In the editorial studio, 222 Walter Williams Hall, up-to-the-minute United Press and local news is edited especially for facsimile. A new kind of typewriter is used to set copy; headlines and pictures are pasted up along with the copy.

Ready for transmission, the copy page is wrapped around a drum. An electric eye "scans" the page as the drum revolves rapidly, sending out signals corresponding to the black and grey shades of the copy.

At the receiver the signals are converted into words and pictures by a chemical process.

Though "Missouri FAX" goes by direct wire, facsimile may be sent by FM radio. Columbia has no FM station.

"Missouri FAX" is produced by graduate students in the facsimile laboratory at the School of Journalism. FAX equipment has been loaned by the St. Louis STAR-TIMES.



Fig. 79. One of the original facsimile pages transmitted by the University of Missouri School of Journalism when facsimile was added to the school's curriculum.

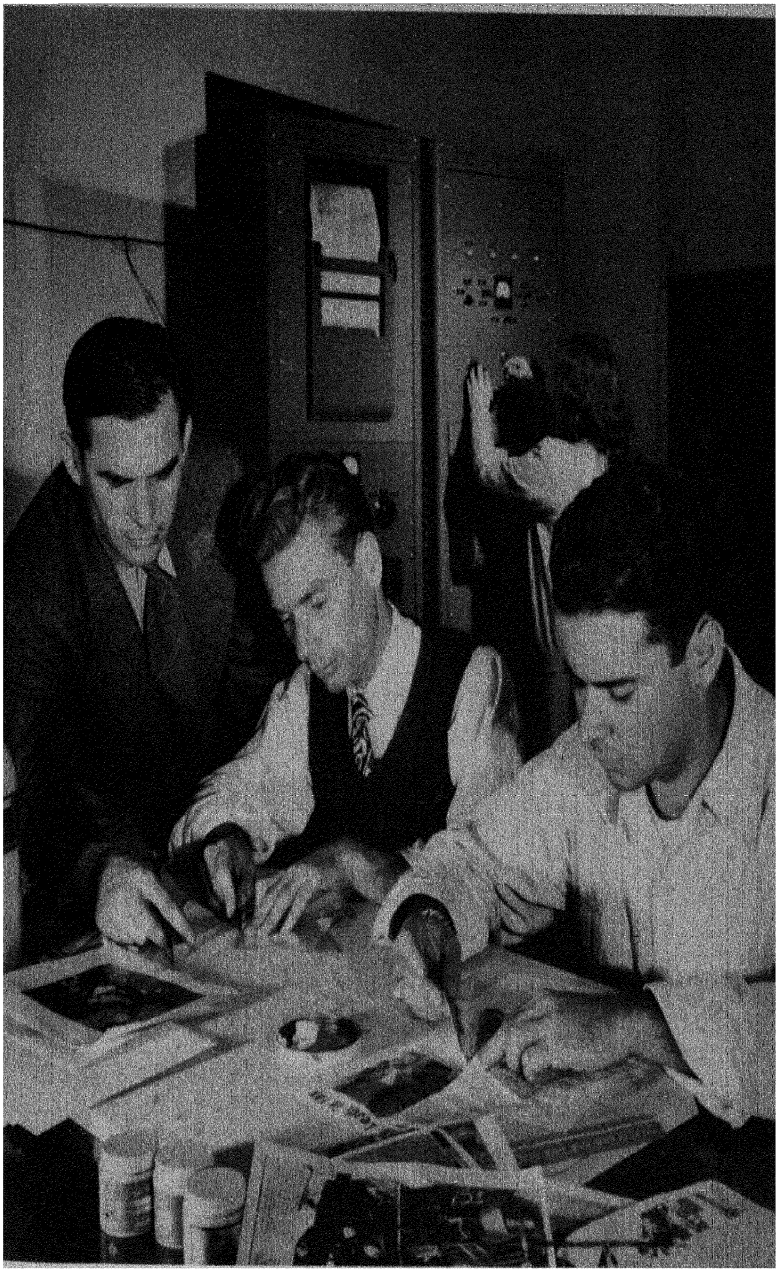


Fig. 80. University of Miami facsimile class students prepare campus editions and transmit them on their own scanner.

XXIII
A NEW ERA

Stepping into our economy after more than a century of development, facsimile is opening a new era in printed communications.

The ability to serve almost every phase of communications and a green light from the Federal Communications Commission give facsimile a flying start.

Unlike many new industries, facsimile is not competing with anything that closely resembles it. Nothing else does precisely what facsimile can do. Aural radio, telegraphy, teletype printers, and television deliver information, but it is either a fleeting sound or image or slower and less versatile.

One of the strongest pillars under facsimile is the fact it is simple to operate. A housewife, businessman, or teen-ager can use the equipment without extensive training or particular skill. Journalism schools require only 3 months to train students in the fundamentals of studio jobs. Engineers become proficient in facsimile quickly, because the technical principles are only slightly different from standard radio practice.

These favorable factors would be meaningless if it were not for the increasing demand for improved communications. The world's population is expanding, the tempo of living is stepping up, and communications equipment is sorely taxed to meet the heavier load. Facsimile is one of the answers to the new demand. It offers a fast, new delivery agent with spare pockets for carrying information the old methods cannot now handle.

This nation is accustomed to discarding an old tool and accepting a new, better one. Since the turn of the century, radio, electric refrigeration, air conditioning, steelmaking techniques, air transportation, "wonder" drugs, and other scientific strides have tossed miniature revolutions into our society and found they were welcome. The unusual has become commonplace so often that we are casual

about change.

Underlying all of facsimile's growth is the interest and investments of organizations in the communications field. Western Union, the armed forces, radio manufacturers, newspapers, radio broadcasters, and others are expanding their use of facsimile. For the armed forces the process can mean a strategic usefulness. Most of the others consider facsimile a potential source of savings and increased earnings. However, no user has indicated that he expects large profits immediately.

Thus, facsimile has been publicly born with good heritage: a useful process that meets a growing need in a favorable economic and sociological atmosphere. The world is its market: wherever men live, there is a need for information, and facsimile can keep them informed.

GLOSSARY

A

Acoustic range...The ability of an instrument to create, carry, or reproduce sound from lowest to highest tones. Or the range of sound itself.

Airbrush...Artist's tool used to distribute a fine spray of color for lightening or darkening. Powered by compressed air.

Air space...A measurement of air time in terms of the length of a facsimile page or a portion of the page.

AM...Amplitude modulation.

Amplitude modulation...A method of radio broadcasting in which the transmitter output power is varied according to the volume of the sound.

Antenna...A wire or metal appliance or structure used to receive a radio signal or to transmit the signal.

Artype...A trade name for waxed-paper alphabets, figures, and symbols of various sizes and designs used to make headlines.

Aural programs...Radio programs which are voice, music, and sound effects.

Automatic synchronization...A system of synchronizing facsimile recorders with the scanner when both are not on the same power source.

Available line...The portion of the total length of scanning line that can be used specifically for picture signals.

B

BFA...Broadcasters Faximile Analysis, a cooperative group of radio broadcasters, newspapers, and technicians which was formed to launch facsimile as a public service.

Black amplifier balance...Part of facsimile scanner used to control the black color tones in original copy.

Blanking interval...The period of time during the revolution of the scanning drum when the portion of the drum not available for copy is passing the photo-electric cell.

Block of time...A definite period on the air sold to an advertiser by a radio broadcaster.

Buckle...Uneven surface of copy on the scanning drum, caused by use of physically unsuitable material or improper placement on the drum.

Bugs...Improperly functioning parts in equipment (technical jargon).

Bulletin...News of unusual importance.

By-line columns...Written articles which carry the name of the writer.

C

Caption...Copy used to identify persons or objects shown in photographs, usually a one line headline. See Overline.

Carbon paper...An early facsimile paper used in recorders to make a carbon copy of material transmitted.

Carbon ribbon...A typewriter ribbon made of paper with a carbon backing. Ordinarily used only once.

Carrier...A high frequency upon which lower frequencies can be superimposed and later separated after transmission.

Cartoon panel...A cartoon confined to a single square or rectangle rather than a series of cartoons in a continuous strip.

Cathode...An element in a vacuum tube which gives off electrons under influence of light or heat.

Colorfax...A process for transmitting and recording colored facsimile copy. A trade name.

Commercial facsimile broadcasting (or license)... Facsimile which adheres to the standards established by the Federal Communications Commission, with advertisement included in the pages.

Compositors...Persons who set type and/or assemble type into pages.

Conduits...Shielded channels through which wires are strung.

Contrast...The relationship of color tones in a photograph or type matter. This can be very marked, as in black-white, or finely shaded, as in a portrait photograph.

Copy...A general description of typed, written, or photographic material used in a publication. It can range from material in its original form as it comes from press association teletypes to the finished material in the completed pages.

Copy holder...The plastic blanket with metal edge which holds facsimile copy, or pages, against the scanning drum.

Crop...The process of eliminating unnecessary areas in a photograph in order to make it more attractive by keeping only the most newsworthy or interesting portion.

Cut lines...Literally, the lines of type underneath a newspaper engraving, which is often called a "cut." Loosely, any description that accompanies a photograph giving details of the subject or action shown.

Cycles...The number of variations in a current or wave—usually the number per second.

D

Darkroom...A room which can be made completely dark in which photographic negatives are developed and prints or copies of photographs are made.

Deadline...The time when copy must be edited or pages assembled so that an edition can be published on schedule. Similar to the departure time of a train.

Degrade...To lower the quality of a radio program.

Desk-Fax...A small, commercial facsimile recorder and transmitter for desk use developed and used by Western Union.

Drum speed...See Scanning speed.

Drying bar...A smooth metal bar, heated by electricity which removes moisture from facsimile paper after it passes the printer blade and irons the surface of the paper at the same time. The heat from the bar also accelerates the action of the chemical elements with which the paper is impregnated.

Dynode...Metal plate used in photoelectric-eye tubes to increase output or sensitivity.

E

Editing...Selecting news stories and photographs; checking them for grammar, typographic errors, and truthfulness. Changing the form and length to match a publication's writing style and space available.

Electrolytic printing...A process of passing electric current through the printer blade and moist facsimile paper which deposits small particles of iron in the paper and marks it permanently.

Electronics...Specifically that part of science in which a vacuum tube is used. Loosely, a term applied to the many diverse and highly specialized uses of electricity.

Engraving...The marking of metal with acid to create a copy of a photograph, type or drawing. Used in standard metal-to-paper printing.

Enlarger...A piece of photographic department equipment in which a negative is placed and which, by adjusting the distance of the enlarger from photographic paper, produces prints of different sizes.

Equalized lines...Telephone lines (with special equipment at one or both ends) to ensure that all tone frequencies up to a fixed limit are passed equally well.

Exclusive stories...News which competing publications do not yet have.

Experimental facsimile broadcasting (or license)... Transmission of facsimile tests using various systems and radio techniques.

F

Fabric ribbons...Conventional typewriter ribbons made of cotton or other fiber which has been saturated with an ink compound.

Facsimile paper...The special paper used in facsimile recorders on which the transmitted images are reproduced.

Facsimile tones...The facsimile impulses transmitted by FM radio.

Facsimilist...One who is associated with the editorial or technical phases of facsimile.

Fast developer...A chemical used in photographic studios which speeds the processing of photographic film.

Fax...Abbreviation for facsimile—slang.

Faximile...Copywrited trade name for the Hogan Faximile System.

FCC...Federal Communications Commission.

Feature...News written to appeal to the emotional senses of the reader.

Ferrotype tin...A polished metal sheet used to dry photographs and give them a smooth finish.

Flash...A terse announcement of a major news event, e.g., "FDR Dead."

Flat prints...Photographs with little variation between light and dark areas or an over all grey tone.

FM...Frequency modulation.

FM transmitter...The equipment which provides the power for frequency-modulation signals and puts them on the air.

Format...The physical size and design of a publication.

Framing...The process of phasing or centering the page on a facsimile scanner and receivers.

Frequency...Rate of change in an electric current or wave. See also Cycles.

Frequency modulation...A method of radio broadcasting in which changes of volume or program level cause a variation of the transmitter frequency rather than its power output.

Frequency response...The degree to which a piece of radio equipment responds to various tones equally well.

Fronts (weather)...An unsettled weather condition which may be standing still or moving across the country.

FX...Abbreviation for facsimile.

G

Glossy prints...Photographs with a shiny surface.

H

Hand-set heads...Headlines which are set in type by hand.

Head...A headline.

Head shot...A portrait photograph, usually head and shoulders.

Helix...The wire which is wound in a spiral pattern around the drum in a facsimile recorder. The negative electrode in the recording process.

High fidelity...Broadcast music which closely approximates the actual tones of the instruments or singer. Also, radio equipment which can reproduce such tones.

High-frequency stations...Radio stations operating at a frequency higher than that used by standard broadcast stations.

High-pass filter...An electrical device which will pass all tones above a certain frequency and reject all tones below that frequency.

Hogan Faximile...Trade-name spelling of the facsimile system developed by John V. L. Hogan, President, Radio Inventions, Inc.

I

IBM...Abbreviation for International Business Machines Co. Also used in referring to electric typewriter.

Index of cooperation...As applied to facsimile broadcasting, this is the product of the number of lines per inch, the available line length in inches, and the reciprocal of the line-use ration, e.g., 105 x 8.2 x 8/7 = 984.

Indirect facsimile...Transmission of copy which delivers a negative at the receiving end which must be processed photographically to create a true copy.

Ionosphere...Practically, the infinite area surrounding the earth.

J

Justify...The process of adjusting spaces in typing to make all lines of copy an even length.

Justowriter...A machine which produces typed material closely approaching the appearance of type set on a Linotype and with an even right-hand margin. A trade name.

K

Kilocycle...One thousand cycles per second.

L

Label head...A headline which classifies stories by subject or place of origin, for example, "Sports," "Education," or "Europe."

Lead screw...A round bar with a spiral thread on which the scanning head moves parallel to the scanning drum.

Line advance...The standard is set at 105 lines per inch. This means that the photoelectric cell will view the circumference of the drum 105 times as it advances 1 inch along the drum. Thus it views copy in strips 1/105 inch wide.

Line amplifier...Part of the facsimile scanner which increases the power of the signal and sends it over the line to the FM transmitter.

Line-use ratio...As applied to facsimile broadcasting, this is the ratio of the available line to the total length of scanning line (the circumference of the drum).

Linotype (and Intertype)...Machine which casts lines of type. Trade names.

Low-pass filter...An electrical device which will pass all frequencies below a certain number but rejects all frequencies above it.

M

Magnetic field...The space between two magnetic poles where magnetic force is present.

Make-up...The arrangement of news and photographs on a page. The process of putting news and photographs together in page form.

Marginator...An attachment to typewriters which can make consecutive lines of copy have an even right-hand margin.

Mask...A pattern, or outline, used by photographer to obtain photographic prints of uniform size.

Megacycles...One million cycles per second.

Mobile scanning unit...Portable facsimile transmitting equipment.

Modulation...The process of putting impulses on the transmitter channel for delivery over the air.

Monitor recorder...Equipment built into the facsimile scanner which is used to make a copy of the page being sent over the line to the FM transmitter.

Monitor recorder amplifier...Equipment which amplifies the signal used to operate the monitor recorder on the facsimile scanner.

Multigraph...A piece of office equipment that can be used for setting headlines. A trade name.

Multiplex...Transmission of two or more unrelated tone impulses over one radio channel at the same time without one interfering with the other.

N

Negative...Film from which photographic prints are made.

Network circuits...Long-distance wires leased from the Bell System for transmission of radio programs, enabling many radio stations to broadcast the same program simultaneously.

News break...Any sudden development in the news, a story or photograph.

NPFS...Newspaper Publishers' Faximile Service.

O

Odd measure...Type set wider or narrower than the usual 2-inch column width of regular newspapers.

Optical density...The logarithm (to the base 10) of the ratio of the incident to transmitted or reflected light.

Overline...A word or phrase set in type and used above a photograph or drawing. See Caption.

Overtones...Tones one or more octaves above the fundamental tone. Together they deliver the true sound. Without the overtones the fundamental tone is only partially true.

P

Page-separation signal...A black mark across the full width of the facsimile paper which serves to separate pages and also frame the recorders.

Panel rack...A metal frame on which radio equipment is mounted.

Photoelectric eye (cell)...A vacuum tube which delivers an electric voltage proportional to the amount of light entering the tube.

Photographic print...A copy of a photograph, usually referred to as a "print."

Photographic tones...The light and dark areas in a photograph.

Photo offset...A method of printing from engraved plates in which the metal does not actually touch the paper. The plate prints on a composition roller which transfers the image to paper rather than the plate placing the image directly on the paper as in letterpress printing.

Pigment pencils...Colored pencils used in a color facsimile recorder.

Pretuned...A receiver which is adjusted so that it will get only one radio station.

Primary colors...The basic colors from which all hues are mixed—red, yellow, and blue.

Printer blade...Part of a facsimile recorder—the positive electrode—which marks the paper.

Printer's proofs...Copies of stories or photographs made from the type in advance of actual printing on a press.

Proportional spacing...Allotment of space to printed letters in relation to the width of each letter, e.g., less space for the letter "i" than for "w"; a built-in feature of typesetting machines and some typewriters.

Pulse generator...A device used in facsimile transmitting equipment which transmits impulses necessary to keep recorders synchronized or in step with the transmitted copy.

R

Ray photo...An early radio facsimile process.

Recorder...The mechanism in a facsimile receiver which actually prints the type and pictures.

Recorder drum...The cylindrical drum to which the helix wire is attached, an important part of the facsimile recorder. The negative electrode in the printing process in relation to the printer blade.

Recording...The printing of facsimile copy by a recorder or the printed copy.

Rectilinear scanning...The process of scanning an area in a predetermined sequence of narrow straight parallel strips.

Retouching...Lightening or darkening lines or areas of photographs and drawings, usually with water colors.

RMA...Radio Manufacturers Association.

Roundup...Two or more related stories which are rewritten into one story.

RTPB...Radio Technical Planning Board.

S

Scanner...The equipment on which original facsimile pages are placed and converted into tone impulses which vary according to the color gradations of the type or photographs on the pages.

Scanner amplifier...Accessory to the scanner which amplifies the small voltage delivered by the photoelectric cell.

Scanner drum...The cylinder on which original facsimile pages are wrapped.

Scanner light source...The automobile lamp which illuminates original facsimile copy during the scanning process, as related to photocell.

Scanner operator...The man who places facsimile pages on the scanning drum, makes proper adjustments, operates the scanner, and keeps in touch with the FM transmitter.

Scanning head...Part of the scanner which includes the light source and photocell and converts the type and photographs into varying electrical voltage.

Scanning speed or rate...The number of times per minute which the scanning drum revolves. The standard is fixed at 360 rpm. When scanning with the standard 105-line resolution, the paper advances at the rate of 3.43 inches a minute. This is obtained by dividing 360 by 105.

Schematic drawings...A drawing showing the electrical connections without showing the location of the parts.

Screen...In photoengraving an image is transferred to metal in the form of fine dots. These dots result from photographing the image through glass on which fine lines are drawn at right angles. This glass is known as a "screen," and the finished product is described as having a screen.

Shadow...Unwanted markings on recorded pages caused by imperfections in the original facsimile copy.

Short wave...Frequencies higher than those used for standard broadcasting (AM) but not so high as those used for FM.

Showcard machine...A machine designed for making store show cards which can be used for facsimile headlines.

Simplex...Broadcasting one signal at a time on a radio channel.

Slotted type...The Showcard machine and Multigraph use individual type characters with slots cut in them so that they can be slid into a channel and "locked" in place.

Sound programs...Ordinary AM or FM radio programs.

Special-interest editions...News and photographs aimed at a geographic area or group of people interested in a particular brand of news.

Sponsored copy...Pages which are paid for by a company, industry, club, etc., to tell its story in more detailed form than is possible with display advertising.

Spot news...A story which develops quickly, such as a plane crash.

Standards...The specific technical conditions under which commercial facsimile may be transmitted, as laid down by the FCC.

Static interference...Noise which is caused by atmospheric conditions and intrudes on the regular sound radio programs.

Straight news...The ordinary story which describes an event in factual, simple style.

"Stretching the Page"...Switching from one scanner to another and transmitting two or more pieces of copy which together are longer than the standard 11.5-inch facsimile page.

Subcarrier...An intermediate carrier. See Carrier.

Synchronized clock...A battery or electrically operated clock which is automatically reset to the correct time at regular intervals by an impulse sent over a wire from a master clock.

Synchronizing pulse...The pulse transmitted to keep all motors in facsimile receivers synchronized with the scanner.

Synchronous motor...A motor whose speed bears a fixed relation to the frequency of the applied power.

Teledeltos paper...A dry facsimile recording paper which reacts only to electric current. Used by Western Union for Desk-Fax.

Teletype...A form of electric typewriter which is operated by impulses sent over a wire. Commonly used by press associations (AP, UP, INS).

Teletype punch machine...Part of the sending equipment in a teletype system.

Television screen...Part of a television receiver on which the image appears, comparable to the motion-picture-theater screen.

Template...A guide or pattern.

Test recorder...Part of the scanner used to test pages before they are transmitted.

Tight...A term used to describe stories which are written as concisely as possible. Also refers to an already crowded page.

Time switch...An electric clock which serves as a switch.

Tone impulse...A pulse of electrical energy which may be an audible or inaudible tone.

Tone response...The ability of the human ear to hear tones or of equipment to transmit or reproduce tones.

Tone-sensitive relays...Small switches which can be moved by radio tones.

Transmitter...The equipment which feeds radio programs into the station's antenna.

Transmitting line...A wire used to transmit tone impulses.

TV...Television.

TV-FX...Television and facsimile in combination.

Type font...A complete set of letters, symbols, numbers, punctuation marks, etc., of a type face.

Type fork...A tool used in setting Multigraph type.

U

UHF...Ultrahigh frequency.

Ultrafax...A process for transmitting type or photographs at phenomenal speeds by radio. A trade name.

Ultrahigh frequency...Radio frequencies in the range of 300 to 3000 mc.

Useful scanning line...Circumference of the scanning drum minus space used for phasing and/or margin.

V

Vacuum tube...An evacuated glass or metal tube containing electrical components. It serves to amplify signals and in many other ways.

Varying voltage...Voltage which varies in proportion to some external influence.

Very high frequency...Frequencies in the range 30 to 300 mc. FM transmitting frequencies fall in this range.

VHF...Very high frequency radio transmission.

Video...Television. A voltage proportional to the variations of light and shade encountered as a television scene is scanned by the camera.

Voice commercials...Advertisements which are spoken over the radio.

Volts...A measurement of electrical pressure.

Washout...A portion of a photograph which is so light that most of the details are gone.

White amplifier balance...A part of the scanner which adjusts copy for maximum white when desired.

Wire circuit...A wire path for electric impulses, inside equipment or between two pieces of equipment.

Wire loop printer...A teletype.

Wireless telegraph...Morse code sent by radio.

Wire photos...Photographs which are scanned and transmitted as impulses over a wire to create a negative, from which prints are made. An application of indirect facsimile.

INDEX

A

Advertising, agencies, view of, 242
background of, 227-229
eye and ear appeal, 233
form, 230, 232
format, 233-235
selling, 94
Air lines, use of facsimile, 1, 23, 114, 115
AM facsimile, characteristics of tone impulse, 53
early experiments, 8-11
FCC recognizes complaints, 53
American Airlines, use of facsimile, 23
American Federation of Musicians, restrictions on FM programs, 51
Ankenbrandt, Brig. Gen. F.L., comments on military uses, 18
Announcer, duties, 90
Artist, duties, 91
Artype, 218
Automatic operation of receivers, 268, 270
Available line, defined, 69

B

Bain, Alexander, 5
Banks, facsimile use, 1, 24
Bell Telephone System, program transmission circuits, 55
Blue Book, of the FCC, 80, 82
Broadcasters Facsimile Analysis, formation, 13
Broadcasting Magazine, views on editorial freedom, 82

C

Carbon paper, process, 8, 9
Coaxial cable, 56
Colorfax, converting receiver, 34
first demonstration, 31
pigment pencils, 34
publisher's reaction, 36
quality, 32
receiver process, 33
scanning, 32
Columbia Broadcasting System, editorial views, 81, 82
Commercial facsimile, first, 7
Communications Act of 1934, 79
Cooley, Austin G., 7
Copy setting, flexible tape printer, 214
IBM electric typewriter, 206, 208-210
Justowriter, 214, 215
Multigraph, 212
Varityper, 210, 211

Cropping photographs, 147-149
Cutlines, 150, 151

D

Demonstration permit, 77, 78
Desk-Fax, 21, 22
(*See also* Western Union)
d'Humy, F. E., 22
Dummies, for pages, 124

E

Early experiments, AM, 6, 8-11
EBASCO Services, Inc., facsimile survey, 28
Editing, 124, 125
Editor, duties, 89
Education, by facsimile, 28
Electric eye, 248, 250, 252
(*See also* Scanner)
Electrochemical recording telegraph, 5
Electrolytic recording, explanation, 13
Electromechanical "Tickers", 5
Engineer, duties, 91
Engstrom, Dr. E. W., Ultrafax comments, 36, 38, 40

F

Facsimile-only station, 76
Farm, programming for, 114
Fast cameras, 147
Feature pages, 99
Federal Communications Commission, encouragement of FM, 52
limitations imposed on AM Fax, 53
recognizes complaints about AM-FX, 53
rules and transmission standards for facsimile broadcasting, 57-72
summary of facsimile applications, 29
Finch Telecommunications, Inc., facsimile research, 8, 9
Finch, Capt. W. G. H., 9, 31
First page, 165
Flexible tape printer, 214
Follow pages, 181
Fototype, 218, 219
Frequency modulation, atmospheric interference, 50
duplicating AM programs, 49
electrical interference, 50
facsimile's dependence on, 53
FCC licenses, 52
growth, 50
modifies Mayflower doctrine, 81, 82
programming, 51
range of signal, 54

receiver sales, 52
replacement of AM, 49
role of receiver, 51
technical superiority, 50
tone range, 50

G

General Electric Co., 14

H

Headlines, Fototype, 218, 219
handlettered, 218, 221
showcard machine, 217
template, 219
typewriter, 216
Varityper, 216
Hogan, John V. L., 8, 12, 13, 14, 58, 60
Hospitals, facsimile use, 26

I

IBM Electric Typewriter, 206, 208-210, 216
Independent facsimile, programming, 106
small-town field, 114
staff, 106
Index of cooperation, defined, 69
Indirect facsimile, 8
Industries, facsimile use, 26, 245, 246
Institute of Radio Engineers, 58, 59
Intermediate gray tones, 6
(*See also* Scanner, photographic-emphasis control)

J

Justowriter, 214, 215

K

Knight, John S., facsimile editorial freedom views, 83
introduces facsimile, 14

L

Launching facsimile newspaper, advance publicity, 283
demonstration techniques, 284, 285
previews for special groups, 285, 286
selecting receiver sites, 283
Layout, of facsimile dept., 220
Library of Congress, Ultrafax demonstration, 36, 40, 42
License for facsimile, 73, 74
AM experimental, 76
demonstration permits, 77
facsimile-only station, 76
how to apply, 73
multiplex permit, 78
special HF experimental, 77

Line amplifier, 256-258
Line-use ratio, defined, 69

M

Make-up, column widths, 164
fashions, 189
features, 189
first page, 164
follow pages, 181
mechanical equipment, 205
overlines, 163
practice and materials, 221-223
preprinted forms, 201
short pages, 189
teletype copy, used directly, 201
without using composing room, 205-225
Manufacturers, new market for, 246
Mayflower case, 80, 84
Mechanical equipment, for make up, 205
Military facsimile, 12, 16, 18, 20, 21
Mobile facsimile unit, copy setting, 282
equipment, 280
portable dark room, 282
staff, 282
telephone line, 280, 281
uses, 279
Monitor recorder amplifier, 267, 268
Multigraph, copy setting, 212
headlines, 216, 217
Multiplexing, application for permit, 73
authorized by FCC, 274, 275
early experimentation, 276
FCC standards, 66-69
Miami Herald system introduced, 276, 277
Radio inventions system, 276-278

N

National Association of Broadcasters, 83
Newspaper Publishers Facsimile Service, views on editorial freedom, 75

O

Optical density, defined, 69

P

Page sizes, early tests, 13
FCC standards 60, 63-66
Panel 7 of Radio Technical Planning Board, 58, 71, 72
Pencil-marking, in Colorfax, 31
Philpott, Dr. LaVerne R., 31
Photographic-emphasis control, 255, 256
Photography, cropping, 147-149

cutlines, 150, 151
electronic retouching, 144, 145
for facsimile, 143, 144
"fast" cameras, 147
retouching, 149, 150
separate dark room, 146
wirephotos, 145
Photographer, duties, 92
Phototype, 218, 219
Police, facsimile use, 26
Port Huron case, 80, 82
Program transmission circuits, 55
Programming, aviation, 114, 115
church editions, 109
club editions, 110
exchange papers, 119, 120
for general newspaper, 96
general suggestions, 116-119
hourly editions, 99-105
illustrating sound programs, 111
independent publisher, 106
new publications, 114
rural, 112-114
school editions, 108, 109
special interest editions, 107
sponsored editions, 107-110
suburban editions, 110
syndicated pages, 119, 120
two-three-a-day, 105, 106
weather, 114, 115
Pulse generator, 258-262 (*See also* Scanner)

R

Radio Act of 1927, 79
Radio Corporation of America, AM radio facsimile experiments, 7, 8
Charles J. Young, researchist, 8, 9
Radio Inventions, Inc., multiplex development, 276-278
research for government, 13
Radio Manufacturers Association, 58, 59
Radio Technical Planning Board Panel 7, 71, 72
Railroads, facsimile use, 1, 24
Ray photo, introduced, 7
Readability studies, 123
Recorder, maintenance engineer, 90
Recording process, explained, 262-264, 266, 267
speed experiments, 14
Relay by ultrahigh frequency, limitations, 55
network possibilities, 55
use in facsimile, 56
Rectilinear scanning, defined, 69

Reporter, duties, 92
Retailer revenue, source for, 246
Retouching photographs, 149, 150
(*See also* Photography)
Rewrite men, duties, 92
Ridings, Garvice H., 22
Rules and standards for facsimile broadcasting by FCC, 57-72
Rural Radio Network, 276

S

Sarnoff, Brig. Gen. David, 40
Scanner, amplifier, 252
drum, 247, 248
electric eye, 248, 250, 252
head, 248
line amplifier, 256-258
monitor recorder amplifier, 267, 268
operator's duties, 89, 90
photographic-emphasis control, 255, 256
pulse generator, 258-260
shading control, 252, 254, 255
test recorder, 268
Scott, Robert Harold, 82
Selling "air space," 243, 244
Shading control, 252, 254, 255
Shipping, facsimile use, 26
Short pages, 189
Showcard machine, 217
Simplex facsimile, 66-68
Single-weight photographic paper, 143
Special editions, 243-245
Spielvogel, Joseph, 214
Spot news, editing, 98
photographs, 98
Staff, for facsimile publication, newspaper connected, 86
duties, 88-91
minimum, 92, 93
Static, interference with facsimile, 11
Streibert, Theodore C., 12

T

Teaching facsimile, 287-291
Teledeltos paper, 7, 22
Telegrams, by facsimile, 21-23
(*See also* Desk-Fax; Western Union)
Television, contrasted with facsimile, 43-47
Test recorder, 268
(*See also* Scanner)
Times Facsimile, Inc., 7, 20
Trammell, Niles, 36
Typists, duties, 91
(*See also* Copy setting)

U

Ultrafax, commercial uses, 38

introduction, 36
picture enlargement, 38
possible uses, 40
speed, capacity, 36
transmitting, receiving steps, 38
Ultrahigh frequency, RCA research, 8
United Broadcasting Co., 82
U.S. Office of Education, 28
Utilities, facsimile use, 26
(*See also* EBASCO Services)

V

Varityper, copy setting, 210, 211
headlines, 216
Voice announcements, 270

W

WAAB, in connection with Mayflower case, 80, 81
WEAW-FM, multiplex work, 277
Western Union, d'Humy, F. E., 22
facsimile use, 16, 21-23
Ridings, Garvice H., 22
Wise, Raleigh J., 22
WFIL-FM, facsimile staff, 86, 88
multiplex experiments, 277
WGN, facsimile research, 9
Willard, Arthur D., 82
Wise, Raleigh J., 22
WLW, 9
WOR, 8
WQAM-FM, duties, 88-91
facsimile staff, size, 86, 87
WQXR-FM, multiplex experiments, 277
Writers, duties, 91
Writing, style, 123, 126-142

Y

Young, Charles J., 8