UNIVERSAL
LIBRARY

OU_158907

UNIVERSAL
LIBRARY

AN INTRODUCTION TO COST ACCOUNTANCY

AN INTRODUCTION TO COST ACCOUNTANCY

by

R. WARWICK DOBSON

C.A., F.C.W.A.

VOLUME II

GEE AND COMPANY (PUBLISHERS) LIMITED

27–28 BASINGHALL STREET, LONDON, EC2

FIRST PUBLISHED 1954

SET IN 10 ON 11 POINT 'MONOTYPE' TIMES

Made and Printed in Great Britain by
GEE AND COMPANY (PUBLISHERS) LIMITED, LONDON AND ST ALBANS

CONTENTS OF VOLUME TWO

THE ELEMENTS OF COST ACCOUNTING

		Page
Chapter XVI	COST ACCOUNTING The elements of a cost accounting system – methods of cost accounting – illustration of cost accounting	12
XVII	COST INFORMATION The purpose of cost information – the scope of cost information, prepared generally, prepared for individual businesses – the form of cost information – the provision of cost information – the cost of cost information	17
XVIII	COST BOOK-KEEPING The scope of book-keeping – double entry book-keeping – sectional balancing – control accounts – plan of accounts – basic documents – intermediate records or summaries – books of original entry – ledgers	44
XIX	AN EXAMPLE OF COST BOOK-KEEPING Financial books, books of original entry, general ledger accounts – cost books, books of original entry, cost ledger accounts	59
XX	APPLICATION AND DESIGN OF FORMS Advantages of properly designed forms – the aspects of form design – wording – spacing – ruling – paper – form charts	86
XXI	CLERICAL PROCEDURES AND METHODS Producing – recording – adding and subtracting – multiplying and dividing – punching – verifying – sorting – selecting – collating – analysing – copying – posting – filing – indexing – the factors which affect the choice of method – operation schedule	103
XXII	THE COST ACCOUNTING ORGANIZATION Place in business organization – centralization versus decentralization – internal organization – the factors which determine the form and size of the organization – the small organization – the characteristics of good organization – the formal statement of the organization	196
XXIII	PROCEDURE RECORDS AND MANUALS OF INSTRUCTION Routine charts – routine instructions – form instructions – manuals of instruction	210

Page

Chapter XXIV COST AUDIT 219

The classes of audit – the objects of an audit – the planning of a cost audit – the cost audit programme – the control of a cost audit – the conduct of a cost audit – the extent of a cost audit – the organization of the internal cost audit department

ACKNOWLEDGMENTS

INDEX

CONTENTS OF VOLUME ONE

COSTING AND COST CONTROL

		Page
Introduction	THE SCOPE OF COST ACCOUNTANCY Accountancy and its divisions – cost accountancy – cost control – costing – budgetary control – cost accounting – cost audit	16
Chapter I	COSTING The expenditure incurred – the costs which are to be ascertained – the process of linking primary costs with cost centres and cost units	24
II	PRIMARY COSTS – MATERIAL COST The valuation of material purchases – the ascertainment of material quantities – the valuation of material issues – review of prices used – the valuation of material stocks	30
III	PRIMARY COSTS – WAGES Bases of remuneration – variability of rates based on work or results – variability of number of employees – the evaluation of labour	48
IV	PRIMARY COSTS – 'EXPENSE' 'Expense' – depreciation – premature retiral of assets – rent-charge – interest – asset losses – taxation	56
V	COST CENTRES Impersonal cost centres – personal cost centres – operations and processes	78
VI	COST UNITS	90
VII	THE PROCESS OF COSTING Costing procedures – cost rates – cost apportionment rates – cost apportionment and overhead absorption rates – sequence of costing procedures – reciprocal costs	100
VIII	THE CLASSIFICATION OF COSTS BY CHARACTERISTIC Cost and total cost – the variability of cost – the controllability of cost – the normality of cost	126
IX	THE CLASSIFICATION OF COSTS BY NATURE AND FUNCTION The natural classification of costs – the functional classification of costs – costs in suspense – cost codes	138
X	STANDARD COSTING Historical costing – standard costing – the ascertainment of standard costs – the use of standard costs	162

		Page
Chapter XI	VARIANCE ANALYSIS Chart of variance analysis – profit (or loss) variance – cost variance – total cost variance, primary cost variances, cost centre cost variances, miscellaneous cost variances – sales variance	195
XII	MARGINAL COSTING Definitions – the ascertainment of marginal costs – the ascertainment of profit changes	226
XIII	UNIFORM COSTING The need for uniform costing – objectives of uniform costing – causes of differences in costs – the scope of uniform costing schemes	236
XIV	BUDGETARY CONTROL The establishment of budgets, budgets, the principal budget factor, primary budgets, production factor budgets, functional budgets, summary budget, master budget – the application of budgets, the control of production factors, the control of budget centres – budgetary control and standard costing – the revision of budgets – budgetary control administration, the chief executive, the budget committee, the budget officer, the budget centre managers, the budget manual – financial budgets	249
XV	COST CONTROL The costing techniques available – the interpretation and use of results for cost control – the improvement of costs – the detailed means of cost improvement, products, materials, personnel, services, land and buildings, machinery, tools, equipment, etc., transport equipment, administration – the elements of cost improvement, reduction of expenditure, increase of production – the consequences of cost improvement – the organization of cost improvement, the creation of cost consciousness, the control of expenditure, the efficiency audit	283
	INDEX	309

CONTENTS OF VOLUME THREE

COST RECORDING AND PRESENTATION

Chapter XXV ACCOUNTING FOR SALES
Retailers, cash sales, credit and approval sales, sales information – service undertakings, cash sales, traffic information, credit sales – manufacturers, wholesalers, etc., credit sales, the basis of credit sales accounting, the speed and accuracy of sales accounting, the preparation of groups of records, sales information – book-keeping entries, cash sales, approval sales, credit sales, hire-purchase sales, returnable containers

XXVI ACCOUNTING FOR MATERIALS
The basis of materials accounting – the speed and accuracy of materials accounting – the preparation of groups of records – materials information – book-keeping entries

XXVII ACCOUNTING FOR WAGES
The basis of wages accounting – the preparation of groups of records – wages information – book-keeping entries

XXVIII ACCOUNTING FOR 'EXPENSE'
The basis of 'expense' accounting – the preparation of groups of records – 'expense' information – book-keeping entries

XXIX ACCOUNTING FOR FIXED ASSETS
Introduction – buildings – plant and machinery – contractors' plant – loose tools – fixed asset information – book-keeping entries

XXX ACCOUNTING FOR COST CENTRES
Analysis and accumulation of costs – allotment of cost centre costs to other cost centres – accumulation of costs allotted to cost centres – allotment of cost centre costs to cost units – accumulation of costs allotted to cost units – methods of accounting – cost centre information – book-keeping entries

XXXI ACCOUNTING FOR COST UNITS
The basis of cost unit accounting – the preparation of groups of records – cost unit information – book-keeping entries

XXXII ACCOUNTING FOR STANDARD COSTS
An example of standard cost book-keeping, financial books, cost books – the calculation of actual costs – forms and records – information

Chapter XXXIII ACCOUNTING FOR MARGINAL COSTS
Statement of marginal cost unit costs – the break-even chart – the profit graph – the analysed profit graph

XXXIV UNIFORM COST ACCOUNTING
Cost accounting which is uniform – the advantages of cost accounting which is uniform – the relationship between uniform costing and cost accounting which is uniform – accounting for uniform costs, historical costing, standard costing

ACKNOWLEDGMENTS

INDEX

SYNOPSIS OF CHAPTER XVI

COST ACCOUNTING

	Page
Introduction	12
The fundamentals of cost accounting	12
Cost information	12
Cost book-keeping	12
The elements of cost accounting systems	12
Cost audit	13
The application of cost accounting fundamentals	13

CHAPTER XVI

COST ACCOUNTING

IN THE introduction, cost accounting was defined as the process of accounting for cost which begins with the recording of income and expenditure, or the bases on which they are calculated, and ends with the preparation of statistical data. Briefly, cost accounting involves the preparation of basic documents; the analysis, recording and calculation of data; and the presentation in a suitable form of the information obtained from the data to those who are interested in it.

When considering cost accounting as a subject, it is convenient to deal, firstly, with the fundamentals upon which every system of cost accounting is constructed and, secondly, with the manner in which these fundamentals are applied in accounting for particular types of data.

THE FUNDAMENTALS OF COST ACCOUNTING

It is the purpose of this, the second volume, to deal with the fundamentals of cost accounting. These are classified under four main headings, namely, cost information, cost book-keeping, the elements of cost accounting systems, and cost audit.

Cost information

As the purpose of all modern cost accounting is to provide information to the management of businesses, the principles which underly the preparation of all management information are of primary importance. For this reason, cost information is considered at the beginning of this volume.

Cost book-keeping

Again, as modern cost accounting forms an integral part of the whole accounting system of a business, the most essential operation in the process of cost accounting is double-entry cost book-keeping.

The elements of cost accounting systems

Every cost accounting system is operated by a number of people whose duty is to maintain the necessary records and to carry out the various clerical operations. To do this in an orderly manner, each clerical operation must be carried out in such a way as to ensure that the whole process of cost accounting works smoothly and results are produced

at the required time. It follows that there must be organization and a defined routine.

The elements which it is necessary to consider are as follows:

(1) The forms on which accounting data is recorded.
(2) The clerical procedures and methods of performing the clerical operations involved in cost accounting and its ancillary activities.
(3) The persons who are engaged in cost accounting.
(4) The routines which are followed in the process of cost accounting.

Cost audit

To ensure that the cost accounting process is correctly carried out, a cost audit is necessary, whether it be formal or informal. This subject, therefore, is dealt with in the present volume in the final chapter.

The Application of Cost Accounting Fundamentals

It is the purpose of the third, and last, volume to consider in detail the application of the fundamentals which are discussed in the present volume.

There are considered in the third volume the processes which are involved in accounting for the following:

Sales	Cost centres	Standard costs
Material cost	Cost units	Marginal costs
Wages		Uniform costs
'Expense'		

In order to illustrate the methods of accounting in this volume, a number of forms has been selected which illustrate manual, hand actuated accounting machine and punched-hole accounting machine methods.

In each chapter the forms illustrate the working of the appliances of only a few suppliers. Over all the chapters the appliances of most of the principal suppliers are illustrated.

It must not be thought, therefore, that the appliances illustrated in a particular chapter cannot be applied to the accounting processes illustrated in other chapters. Neither must it be assumed that the appliances used to illustrate a particular chapter are necessarily superior to, or more appropriate than, any other appliances illustrated in the remaining chapters.

As the purpose of the illustrations of the forms and appliances is to illustrate the application of cost accounting principles and procedures, the method of operation of a particular appliance is of secondary consideration and is in no way emphasized. Details and methods of operation can be obtained from those publications which deal specifically with office appliances.

SYNOPSIS OF CHAPTER XVII

COST INFORMATION

	Page
Introduction	17
The purpose of cost information	17
The scope of cost information	18
Prepared generally	18
External	18
Internal	18
Prepared for individual businesses	19
The activities of the business	20
Extractive	20
Manufacturing	20
Trading	20
Service	20
Financial	21
The utilization of the factors of production	21
Material	21
Labour	22
Permanent assets	24
The characteristics of the market	25
Geographical location of customers	25
Type of customer supplied	26
Variability of demand	26
Method of effecting sales	27
Provision of technical sales service	28
The characteristics of the product	28
Value	28
Bulk and weight	28
Complexity	29
Durability	29
Repetitiveness	29
The method of costing	30
Prepared for individual managers	30
The form of cost information	31
Presentation	31
Narrative	31
Pictorial illustrations	32
Pictorial	32
Bar	32
Circular or pie	32

	Page
Space	33
Graphs	33
Tabular statements	34
Comparative data	35
Units of measurement	36
Values	36
Index numbers	37
Percentages	37
Ratios	37
Rates	37
Statistical measures	37
Variations	37
The provision of cost information	38
Sources	38
Timing	38
Interpretation	39
Discussion	40
Individually	40
In group committees	41
The cost of cost information	41

CHAPTER XVII

COST INFORMATION

IN THE introduction, which dealt with the divisions of cost accountancy, it was said in the section on cost control that, at one time, the cost accountant was concerned solely with the ascertainment of costs, primarily with a view to fixing selling prices or ascertaining the costs of jobs or contracts. It is, however, now regarded as the primary job of costing and cost accounting to provide to the managers of a business information of such a type as to enable them to control the costs of operating the business.

It is the purpose of this chapter to deal with the subject of cost information which, together with financial information, makes up what is known by the term 'management information'. With financial information the cost accountant, as such, is not concerned and, for that reason alone, consideration of it falls outside the scope of a work such as this.

Naturally, it is impossible to describe the information to be provided to the management of every type of commercial or industrial undertaking. The information to be provided to the management of a particular business is determined entirely by the special requirements of that business. The selection of the information required in a particular case must be left to the judgment of the persons responsible for presenting the information and of the management for whom it is prepared. This chapter, therefore, confines itself to defining broadly the general types of information to be presented and to considering the underlying factors which determine what sort of information may be selected for presentation to the management of a specific business.

THE PURPOSE OF COST INFORMATION

In general terms, as has already been said, cost information is designed to assist the management of a business to exercise a close control over the costs of operating the business. It cannot be emphasized too strongly that cost information by itself is not a means of managing or intended to be a substitute for management. If used intelligently by those for whom it is prepared, it is a valuable aid to them in discharging their responsibility as managers. Needless to say, if the warnings or indications provided by reliable cost information are ignored, the consequences are due, not to the information itself, but to the failure of management to make full use of it.

In particular, cost information is designed, *inter alia*:

(1) To provide a basis for comparing the results of:
   (*a*) periods of time;
   (*b*) production, selling, distribution or administration departments;
   (*c*) functions and services;
   (*d*) businesses;
   (*e*) types of organization;
   (*f*) alternative policies;
   (*g*) alternative methods or techniques.
(2) To show to what extent targets, budgets or standards have been achieved.
(3) To provide a measure which shows how effectively the persons in an organization discharge their responsibilities.
(4) To reveal how effectively the various factors of production are employed by the persons in the organization of the business.
(5) To disclose losses and waste of materials, time, plant and facilities.
(6) To show what activities are carried on, or what products are manufactured and sold unprofitably.
(7) To disclose adverse trends which require to be corrected or favourable trends of which advantage should be taken.
(8) To provide data which is useful in making plans for the future and for improving on past performances.

The Scope of Cost Information

Prepared generally

Providing the information which is presented to management assists it to discharge its function, there is almost no limit to the subjects concerning which information may be presented. Broadly, cost information falls into two main categories.

EXTERNAL

Information of this variety relates to subjects which are outside the business. The information relates, for example, to the general economic conditions in which a business operates; the extent of available markets; the potential buying power of possible customers; prices and, where available through trade associations, the costs of competitors; movements of prices in overseas markets; political developments at home or overseas which may affect the trade of the business.

INTERNAL

Information of this type relates to the costs and operations of a business itself.

Internal information may be expressed in terms of money or in terms of other units of quantity. Information expressed solely in terms of money is rarely of value unless it is accompanied by information expressed in terms of units of quantity, for the simple reason that the value of money is constantly fluctuating and is, by itself, an inadequate and unreliable unit of measurement. At the same time, much information is capable of being expressed only in terms of units of quantity and not in terms of units of money. Internal information, therefore, is of two kinds:

(1) Monetary and associated quantitative information. The following are examples:
   (*a*) Sales of commodities in terms of quantity and value.
   (*b*) Wages paid and hours worked.
   (*c*) Materials used expressed in terms of quantity and value.
   (*d*) Costs of operating a process and the time for which the process was operated.

The essence of this information is that the money values given are strictly associated with the quantitative information provided.

(2) Quantitative information. Examples of this type are:
   (*a*) Calorific value of fuel used.
   (*b*) Number of rejections of raw materials, components, assemblies, etc., which arise from each cause.
   (*c*) Analysis of customers' complaints.
   (*d*) Analysis of causes of labour turnover.

Each item of cost information, whether it be external or internal, is limited in the following respects:

(1) It relates to a well-defined subject which is known to, or can be identified by, the person who receives the information.

(2) It relates to a place or geographical area.

It will be recognized that all cost information which relates to a cost centre is limited in this respect. At the same time, information relating to cost units must be limited in this way, in so far as the cost units are produced by a defined cost centre.

(3) It relates to a period of time, which may be of any length.

It goes without saying that any cost information which does not define these three limits is of little value to the person who receives it.

Prepared for individual businesses

The activities of every business are complex and are capable of analysis from many points of view. In given circumstances, it is comparatively easy in the light of such analysis to say what cost information should be presented to the management of any business. Just as each business is affected by many widely different but mutually related influences and

circumstances, so the cost information which should be prepared in any particular case must be made up of the information which each influence or circumstance requires.

It is unnecessary, and in fact impossible, to give a detailed list of the information which should be prepared for the management of any specified business. By way of example, it is, however, possible to indicate the factors which determine the information to be prepared for an individual business and to indicate broadly the points of information which each of these factors requires.

THE ACTIVITIES OF THE BUSINESS

Business activities and the information required fall into five groups, as follows:

1. *Extractive* – minerals, rocks, oils, etc.
   (*a*) The quantity of material gained expressed in terms of units of output per unit of the principal factor of production, for example, tons per man-hour or shift or machine-hour or, where necessary, in terms of both.
   (*b*) The cost of extraction in total and by process or operation.
   (*c*) The cost of transporting the products.
   (*d*) The quantity and value of the resources still to be won, based upon the best estimates obtainable.
   (*e*) The present and future demand for the materials which are extracted.
2. *Manufacturing* – iron and steel, engineering, chemicals, food, clothing, etc.
   (*a*) The quantity of each type of product manufactured.
   (*b*) The costs of manufacturing each product in total and by process or operation.
   (*c*) The quantity and value of each product or product group in process at each stage of manufacture.
3. *Trading* – manufacturers, wholesalers, merchants, agents, departmental stores, multiple shops.
   (*a*) Quantity and value of each commodity or commodity group purchased, sold, lost and in stock.
   (*b*) The costs of trading in total and by department, warehouse, shop, etc.
   (*c*) The present and future demand for each commodity or commodity group ascertained as accurately as possible.
4. *Service* – transport, electricity, gas, hospitals, fire brigade, etc.
   (*a*) Where appropriate, the demand for the service expressed in terms of a convenient unit.

(*b*) The service provided expressed in terms of suitable units.
(*c*) The cost of providing each unit of service in total and by department, operation, or activity.

5. *Financial* – banks, investment companies, etc.

(*a*) The service provided expressed in terms of suitable units of measurement.
(*b*) The costs of providing the service in total and by department, activity, etc.

Much of the information required by the activities of a business are available from operating records. As, however, it is essential that the future activities of a business should be considered and controlled by management, it is essential that they should be provided with an idea of future prospects. Especially where past results are not a reliable means of determining future trends, information of this sort should be obtained independently of the operating records. Informed estimates or assessments based upon market research techniques should therefore be employed to obtain this information.

THE UTILIZATION OF THE FACTORS OF PRODUCTION

As mentioned previously, all businesses employ the three factors of production, materials, labour and capital assets. They do not, however, all employ these factors to the same degree and in certain cases one or other of these factors may be employed to such a negligible extent as not to warrant the preparation of information relating to it. Nevertheless, it has been assumed that it is necessary to prepare information which relates to all factors of production.

1. Material

Information requires to be prepared in relation to the two following aspects:

(*a*) The quantities and costs in total and according to individual materials or material groups of materials, which are:

(1) ordered from suppliers;
(2) received from suppliers;
(3) on order from suppliers;
(4) in stock, showing where possible:
  (i) the stock appropriated to production;
  (ii) the balance of free stock available;
  (iii) the period of acquisition to emphasize the danger of obsolescence;
  (iv) range of value;
  (v) location.

(5) issued to production, used or lost, analysed according to the cause of loss where possible.

(*b*) Quality and efficiency.

(1) The number of tests made distinguishing between tests which were satisfactory and those which were not, analysed according to materials or material groups.

(2) The number or quantity of products rejected by inspection as a result of the failure of materials, analysed according to products or product groups and materials or material groups.

(3) The products whose standards were lowered on account of the failure of available materials to meet the specifications.

(*c*) Productivity.

A convenient form of expressing the productivity of a material is the material conversion ratio, which is calculated as the ratio which the quantity of material which appears in the finished product bears to the quantity of that material which is received from suppliers. The difference between the two quantities is a measure of the quantity lost during storage, handling and processing and is a useful indicator of the relative productivity of alternative or substitute materials.

2. Labour

Management is interested in the following three aspects of labour:

(*a*) The number of persons:

(1) employed at the beginning of a period;

(2) employed at the end of the period;

(3) engaged during the period;

(4) transferred during the period;

(5) left during the period, analysed according to cause where appropriate.

This information should be analysed according to:

(i) sex;

(ii) age group;

(iii) skill;

(iv) trade;

(v) cost centre.

(*b*) Remuneration or the cost of labour.

In this connection, there should be provided details of the wages paid analysed according to any suitable combination of:

(1) sex;

(2) age group;

(3) skill;

(4) trade;

(5) cost centre.

This information should, where appropriate, distinguish between:

(i) ordinary time wages;

(ii) overtime wages analysed according to different rates of overtime payment, e.g. time and a quarter; time and a half, and double time;

(iii) piece-work or bonus earned.

(*c*) Productivity of labour. The productivity of labour is affected by the two following factors, in relation to which information is required:

(1) The availability of the labour employed. The figures which are required in this connection are as follows:

(*a*) The number of hours of labour which should have been available for production.

(*b*) The number of hours of labour which were in fact available for production.

(*c*) The number of hours by which (*a*) was in excess of (*b*), i.e. the number of hours of labour which should have been but were not available for production, analysed according to cause.

(*d*) The number of hours of labour engaged in productive work.

(*e*) The number of hours by which (*b*) exceeds (*d*), i.e. the number of hours of labour which were not spent in productive work, analysed according to cause of idleness.

(2) The efficiency of the labour employed. To provide this information there should be given the following details:

(*a*) The output, measured in terms of units of output or standard hours, which should have been produced during the hours for which labour was engaged in productive work.

(*b*) The actual output, measured in the same terms as the potential output, obtained during the hours for which labour was engaged in productive work.

(*c*) The quantity of products rejected on inspection due to inefficient labour, analysed according to products or product groups and related to the total output.

This data relating to the productivity of labour should be analysed as appropriate, according to:

(i) sex;

(ii) age group;

(iii) skill;

(iv) trade;

(v) cost centre.

3. Permanent assets

As mentioned previously, as permanent assets are of interest from both the financial and cost points of view, much of the information is, strictly speaking, of financial interest only. As, however, from the costing point of view permanent assets are costs in suspense, the cost being represented by a depreciation charge, it is convenient to describe the whole of the information prepared in relation to permanent assets as cost information.

Permanent assets are of interest to management from the following four points of view:

(*a*) The resources of the business which are tied up. This information supports the items of permanent assets which appear on the property and assets side of the balance sheet of a business. The information is analysed to show:
  (1) the historical cost;
  (2) the accumulated depreciation;
  (3) where possible, the replacement cost;
  (4) where the replacement cost is given, the accumulated depreciation calculated on a replacement cost basis.

This information should be analysed as appropriate according to:
  (1) type of equipment;
  (2) cost centre;
  (3) estimated life of asset.

(*b*) The cost of operation and maintenance. This information should show in total and in detail the costs of operating and maintaining each item or group of assets.

(*c*) The productivity of the assets. The productivity of permanent assets is indicated by the two following factors:
  (1) The utilization of the asset. To provide this information there should be given the hours for which the asset:
    (i) is scheduled or budgeted to be operated;
    (ii) is not operated, analysed according to the hours lost from each cause;
    (iii) is in operation.
  (2) The efficiency of operation of the asset. This is indicated by showing:
    (i) the quantity, in terms of units of output or standard hours, of the output which is budgeted or expected to be produced during the hours for which the equipment is operated;
    (ii) the output, measured in the same terms as the potential output, actually produced during the hours of operation of the asset;

(iii) the number or quantity of products rejected at inspection as a result of inefficient equipment, such information being analysed according to products or product groups and causes of rejection and, where possible, inefficiency.

(iv) the revenue-earning capacity of the assets.

The indicator which can be used to measure the revenue-earning capacity of permanent assets takes the form of a percentage which is calculated as follows:

Where R denotes the revenue-earning capacity of the asset
P denotes the value of the production achieved — £40,000
O denotes the cost of operating and maintaining the asset — £5,000
C denotes the cost of the asset — £14,000

then $$R = \frac{P - O}{C} \times 100$$

$$R = \frac{£40{,}000 - £5{,}000}{£14{,}000} = 250 \text{ per cent}$$

This normally is only of real value where price levels are steady. In times of rising price levels any inflation of the value of production due to reductions in the value of money artificially inflates the percentage. Further, the incidence of heavy repairs, unless levelled out over the life of the asset, has a disturbing effect.

THE CHARACTERISTICS OF THE MARKET

There are five factors to be considered in this connection, as follows:

1. Geographical location of customers

Geographical location gives rise to two factors concerning which information may be required:

(*a*) Local and national preference for products

As there are marked differences between the requirements of one country and another and between one part of a country and another, where products are sold on anything other than a purely local basis, information should be available to show whether the products of a business satisfy the demands of its various customers. Information of this sort may be presented in the form of:

(1) analyses of salesmen's and representatives' reports;
(2) analyses of complaints and criticisms received from customers;
(3) analyses of market research reports;
(4) analyses of press articles, reports, comments, etc.

(*b*) The organization and cost of distribution

In order to organize distribution of products, information should be provided to show by location:

(1) the number of customers;
(2) the quantity and value of each product or product group sold.

In each case distinction should be made where appropriate between customers who are consumers or users and customers who are agents, wholesalers, merchants, etc.

With regard to the cost of distribution of products to customers, information should be provided, analysed according to location, concerning:

(1) the cost of distributing each product or product group;
(2) the cost of each means of transport employed where necessary or appropriate as a sub-analysis of (1).

2. Type of customer supplied
Three factors arise in this connection:

(*a*) The industry or trade in which the customer is engaged
There should be provided, where this circumstance applies, an analysis, by trade of customer, of the quantity and value of each product or product group sold.

(*b*) The function which the customer discharges
Here there is required an analysis by type of customer, i.e. wholesaler, merchant, final user, etc., of the quantity and value of each product or product group sold.

(*c*) The size of order or delivery
There should be provided an analysis of the quantity and value of the products ordered, invoiced, delivered or sold for cash, as required by individual circumstances.

3. Variability of demand
The demand for the sale of goods or services may fluctuate in one or other of the following ways, each of which requires the information indicated:

(*a*) According to the time of day
The demand for public transport, electricity and gas and the sale of food in restaurants and cafés varies in this way. The analysis should, in these circumstances, be prepared to show for each period of time during each day, the number of units of service provided, in terms which are appropriate to the type of service being supplied, for example, passengers or passenger miles, kilowatts, cubic feet, customers, customers' seats or customers' tables, etc.

(*b*) According to the day of the week
The business of shops, stores, etc., varies in this way and an analysis of the sales, number of customers or other appropriate units, analysed according to the day of the week, should be provided in these circumstances.

(*c*) According to the season of the year
The demand for many products, such as clothing, food, heating appliances, etc., varies according to the season of the year. A monthly analysis of sales according to the product or product group provides the information required in these circumstances.

4. Method of effecting sales
Several methods of selling are available and information requires to be provided according to the method or methods which a particular business employs. The methods and relative information are as follows:

(*a*) By advertising with or without mail-order business.
There should be provided an analysis of advertising costs by type and medium of advertising, together with an analysis of the sales and profits of each product or product group effected through each advertising medium.

(*b*) By salesman.
In these circumstances the sales effected by each salesman, together with the selling costs of each salesman, should be provided. The sales for each salesman may be analysed according to:

(1) product or product group;
(2) location of customer;
(3) class of customer;
(4) industry;
(5) size of sale.

(*c*) By agents.
In this case, the analysis of agency costs and sales according to agents should be provided. It is usually possible to analyse each agent's sales according to products or product groups. Where the agent provides an analysis of his sales, a sub-analysis of sales can be provided to cover customers' locations, classes, industries, and size of sales.

(*d*) By merchants, wholesalers, etc.
An analysis of trade discounts according to product or product group and merchant or wholesaler should be provided in order to test the

appropriateness from a selling cost point of view, of the rates of trade discount allowed to merchants or wholesalers.

5. Provision of technical sales service

Where technical services are necessary to ensure the customer's satisfaction, either before or after sales, there should be provided an analysis of the costs of such services analysed according to customer and product or product group.

THE CHARACTERISTICS OF THE PRODUCT

According to the particular characteristics of the products manufactured, different types of information are required, as follows:

1. Value

Where the value of the product is relatively high, and particularly where physical control is difficult, information should be provided in quantity and value of:

(*a*) stocks in hand, showing, where possible:
  (1) the stock appropriated to customers' orders;
  (2) the balance of free stock available;
  (3) period of manufacture, to emphasize the danger of obsolescence;
  (4) range of value;
  (5) location.
(*b*) purchases or manufacture;
(*c*) sales or usage;

analysed according to product or product group.

2. Bulk and weight

Products which are bulky or heavy are costly for the following reasons:

(*a*) They occupy relatively large areas during manufacture and storage. In these circumstances it is necessary to provide details showing:
  (1) the area occupied for assembly or storage at any time;
  (2) the cost of occupying these areas during assembly or storage.

  Such costs may be analysed according to product or product group.

(*b*) They are difficult to transport from factory to customer. In relation to this factor, details should be provided of:
  (1) the costs of transport;
  (2) the costs of erection or installation at the customer's premises.

(*c*) They are difficult to move within the factory.

Here details should be provided of costs of internal handling and transport. Whether materials are bulky or heavy or not, as material handling costs invariably account for quite a high proportion of

the costs of manufacture, costs of material handling and transport within the factory should always be provided.

3. Complexity

The more complex products are, the greater are the costs of design and development of the product and the maintenance of quality and economy of manufacture. At the same time, stocks of a large number of parts etc. must be maintained. Information should therefore be provided which shows the costs of:

(*a*) design;
(*b*) development;
(*c*) planning;
(*d*) research;
(*e*) laboratory and technical departments;
(*f*) inspection and quality control;
(*g*) storage.

4. Durability

Products which have a long life are obviously sold less frequently to the same customer than those with a short life. The problem of maintaining sales by either constantly improving the design or efficiency of the product or extending the market to new customers requires considerable expenditure in design and development on the one hand and in intensive exploration of markets on the other. Information should be provided to show the costs of:

(*a*) design;
(*b*) development;
(*c*) product research;
(*d*) market research.

5. Repetitiveness

Between the two extremes of continuous production of the product and the manufacture of a number of completely dissimilar products, there are various degrees to which the production of a product is repeated. To each particular degree of repetitiveness a method of production is applicable.

The method of production employed determines in its turn the unit of cost employed in costing. As a result, the information available on product costs varies according to individual circumstances.

It is impossible to define the factors under this heading which affect either the production or the costing methods or to describe the information which should be provided for such a wide range of circumstances as it is possible to envisage.

THE METHOD OF COSTING

The various statements which are prepared in connection with historical, standard and marginal costing are to be found in the third volume of this book. It is necessary, therefore, only to mention in passing the influence of the method of costing on the information which is prepared for individual businesses.

Prepared for individual managers

In this connection also it is impossible to provide, apart from a departmental operating statement, a detailed list of the information which should be presented to any individual manager in any particular undertaking. There are, however, two principles which should be followed in relation to such information:

(1) The subject-matter and geographical extent of the information should be sufficient to enable him to discharge his own responsibilities.

(2) The information should not relate to any subject-matter or geographical location which is outside the sphere of the manager's responsibilities.

As is well understood, it is impossible to define the responsibilities of any manager in such a way as to be applicable to every business. The scope of responsibility of each member of an organization is determined by factors which are too numerous to mention here.

The cost accountant must, therefore, be aware of the extent of the responsibility of each manager to whom he provides information, so that in any particular business he can assist each manager to discharge his particular responsibilities satisfactorily.

Detailed information which concerns the work of any of a manager's subordinates should not be provided to a manager.

Where responsibilities are adequately delegated, each subordinate is responsible for achieving the task which he has been set. Therefore he should receive sufficient detailed information as to enable him to assess the effectiveness with which he has achieved his target and to remedy any defects which may have occurred or to take advantage of results which were better than were anticipated.

So far as the manager to whom that subordinate is responsible is concerned, he should be interested only in the overall or total results as compared with targets of each of the subordinates whom he controls. Naturally any significant reason for divergencies between results and targets should be given to the manager, but for that purpose it is unnecessary to give him the detailed results of his subordinate. The advantages of applying this principle are as follows:

(*a*) The essential information in which the manager is interested is high-lighted.

(*b*) Unnecessary detail is not shown to detract from the importance of the essential information and to distract the attention of the manager.

(*c*) The work involved in preparing the information is minimized.

The Form of Cost Information

Presentation

Information may be presented to management in one or more of three forms, namely, narrative, pictorial and tabular. Information is most usefully presented by a judicious use of all three forms, the interpreting report being written in narrative form and supported by pictorial illustrations and tabular statements.

NARRATIVE

In preparing the interpreting report, in which form information should always be presented to management, attention should be paid to the following points:

(1) The report should be concise and the language used should be free from ambiguity. For this purpose it is not necessarily essential to use several simple words where one compound word will do, providing that the report is framed in language which is appropriate to the education and intelligence of the manager to whom the report is addressed. Thus, generally, the report for the non-technician should be couched in simpler language than the report for the technician.

It is inevitable in a report that, in order to economize in the use of words, use should be made of terms which have a special application. Care must be taken, however, that the person to whom the report is addressed understands the terms which are used. Where there is any doubt on this point the meaning of such terms should be provided. However, where it is possible to avoid the use of these terms of special meaning, this should be done.

(2) For clarity, the report should be typed or printed, preferably on quarto, which is the size most convenient to the reader. Double spacing should be used. The titles, sections, paragraphs, etc., should be brief and a unit system of numbering used. References to schedules or appendices should be shown clearly and ample margins should be provided.

(3) The report should be dated and the names and offices of the managers to whom it is provided should be shown.

(4) The file copy should bear the initials of the persons concerned with the preparation of the information and the date on which each part of the work is completed.

(5) The report should be accompanied as appendices by pictorial and tabular statements which are dealt with in the following sections.

PICTORIAL ILLUSTRATIONS

These should be used to amplify and present in a simple form the data presented in tabular form. They are suitable only for presenting simple relationships or the magnitudes of a small number of items or variables. Pictorial illustrations cannot be used satisfactorily to present complex data because the illustrations become so complicated that the eye is unable to discern the underlying relationships or the important features of the data which is represented.

Pictorial illustrations usually assume one or other of the following forms:

1. Pictorial

The variables compared are represented by silhouettes or pictures of, for example, radio sets, motor-cars, men, money, etc. In good charts of this form the silhouettes or illustrations are of equal size and the magnitude of each variable is represented by the number of silhouettes or pictures. In bad forms of this chart the relative magnitudes are represented by silhouettes of different sizes. As the eye is unable to assess the magnitude of areas, such a form is useless. Where, however, the magnitude of the variables is represented by either the height or the length of the silhouette or picture, the chart is satisfactory, because visual comparisons can then be made.

2. Bar

In this type of chart magnitudes are represented by the length of bars, which may be drawn horizontally or vertically. Where it is desired to show the magnitude of the variations above or below a certain magnitude, the bars are drawn on each side of an axis drawn through the point from which the variations are measured. In this type of chart also it is bad practice to show magnitudes by means of areas or rectangles, by bars which double back, or bars which bend in any direction. Magnitudes should be represented by length of bar only.

3. Circular or pie

The purpose of this chart is to show the relative magnitudes of each of the portions or constituent parts of a total. Here the circumference of the circle represents the total which is to be divided into its component parts. When the circumference has been so divided, the area of the circle is divided into segments, each of which represents the magnitude of a particular component part. Good presentation requires the circle to be

divided as a cake is cut. It is bad practice to mark off the area of a circle into intermingled segments, rectangles, or geometrical designs.

4. Space

Maps are used for this type of chart and the density of the units measured in each geographical area is represented by different types of shading, by circles of different sizes or by dots, each of which represents a number of units of the variable measured. Number of customers, units sold and similar data can be presented in this form.

The following points should be noted with regard to the presentation of pictorial illustrations:

(*a*) It has already been noted that only one dimension should be used for purposes of comparison, no matter in what form the illustrations are presented.
(*b*) The descriptive matter should be concise and should indicate clearly the nature of the data presented.
(*c*) Colour should be used for emphasis particularly where the illustrations tend to be complex.
(*d*) Illustrations of this sort should be produced to the size most suited to the method of display. Such illustrations are useful for display in factories, showrooms, etc.

5. Graphs

Graphs consisting of straight or curved lines joining the points plotted to represent the values of the variables are used to illustrate several types of situation.

(*a*) Time series

In this type, the values of a variable or variables at different points of time are shown, the intervals between each point of time being equal or unequal. For example, production over a number of months or years is shown in this way.

(*b*) Frequency distributions

In this case, the frequency with which different magnitudes of a variable or variables occur is shown. For example, the number of persons of each age group employed by a business can be shown by means of a graph.

(*c*) Correlation or scatter graphs

Graphs of this kind are used to show the relationship between the values of two variables. For example, the relationship between costs and output assumes the form of a scatter graph.

With regard to the preparation of graphs, the following points should be noted:

(i) Scales should be chosen so that lines do not cluster in one or more parts of the graph and thus obscure the relationships which are intended to be shown. The lines should be made distinctive by the use of colour or various types of broken lines.
(ii) Descriptive matter should be concise and should describe clearly the data represented.
(iii) If absolute magnitudes of a variable are to be shown, then the graph should be drawn on normal arithmetic graph paper. If, on the other hand, the relationship between the magnitudes of the variable are to be shown, semi-logarithmic paper should be used.
(iv) The size of the paper employed should be determined by the magnitudes of the variables presented, the need for clear presentation and the purpose for which the illustration is to be used.
(v) By preparing graphs on transparent paper, direct comparisons can be made by superimposing one graph upon another.

TABULAR STATEMENTS

As masses of figures are confusing, every attempt should be made to reduce the appearance of confusion and to give the impression of simplicity. Attention should therefore be given to the following points:

(1) Numerical data should not be compressed into a small space, but should be extended somewhat to a large space. The data should be typed or printed on single or double foolscap used vertically or horizontally. To reduce the time involved in preparation, use should be made wherever possible of forms which are preprinted with colums, lines and constant headings and descriptive matter.
(2) Columns should bear concise but clear headings and, by using double spacing or different colours, vertical and horizontal sub-totals and totals should be emphasized. Plus variances and minus variances should for clarity be shown in separate columns and not in the same column. Excessive variances to which attention is to be drawn should be printed in a different colour or should be starred or underlined.
(3) Values should be shown correct to the nearest £ only. Percentages should be given to as few decimal places as possible and, when large numbers are involved, the figures should be shown correct to the nearest hundred, thousand, ten thousand, etc., according to the significance of the figures, unnecessary ciphers being omitted.

Numerical data prepared in this form is suitable for presentation to all ranks of management. Tabular statements should be used only to amplify the written report and provide a means of reference if required. They should not be considered as the principal piece of information presented to management.

Comparative data

A statement of costs or other related information is, by itself, almost useless, because the person who uses the information cannot tell whether, for example, the costs are excessive or otherwise. To make the information useful, it is essential to provide data with which the actual results can be compared. Comparative data of the following types can be provided.

(1) Targets or standards which have been set previously as being capable of achievement in the conditions which have been in operation.

Comparative data of this sort is the most reliable means of measuring achievement and efficiency. Such data is available where targets are fixed or budgetary control or standard costing is in operation.

(2) Results of comparable subjects or areas.

Data of this variety shows the results for the same period of time of, for example, two or more comparable businesses, factories, products, etc., such as are to be found where uniform costing and cost accounting are in operation. Care must be taken to ensure as far as possible that the two or more things whose results are being compared are subject to the same influences: that is to say that they are in fact comparable.

(3) Results of comparable periods of time.

Progress or otherwise can be measured usefully by comparing the results of two or more periods of time. The following comparisons may be made:

(*a*) The current period (week, month, year) with the preceding period.

(*b*) The current period (week, month) with the corresponding period in the previous year or years.

(*c*) The cumulative period (from the beginning of the financial year to the end of the current period) with the corresponding cumulative period in the previous year or years.

(*d*) The yearly equivalent of the current or cumulative periods obtained by grossing up the results of the current or cumulative periods.

(*e*) The current moving annual total (i.e. one year to the end of the current week or month) with the moving annual total to the end of the preceding week or month.

(*f*) The current moving annual total with the corresponding moving annual total in the previous year or years.

Each of the foregoing six comparisons may be used where appropriate. Two of these comparisons merit special attention as they are applicable in certain circumstances.

(*a*) Where seasonal influences cause variations in the results of each week or month, the results of the cumulative period should be compared for the following reasons:

(1) The information gives a clearer picture of the overall annual progress.

(2) Seasonal influences are to some extent eliminated from the figures.

(3) If required, the results for the current period can be obtained directly by deducting from the cumulative results of the current period the cumulative results of the preceding period.

(4) The information can be obtained direct from ledger accounts, which usually show cumulative totals, with a consequent saving of time.

(*b*) Where seasonal influences do not operate, that is to say, where the results of any period in a financial year are comparable with the results of any other period in the same financial year, the results of the current and cumulative periods may be grossed up to give the yearly equivalent of the results. The advantage of this comparison is that it is made upon the familiar basis of the calendar year. The disadvantage is that the grossing-up operation takes more time.

With regard to comparisons of the current period with the preceding period and with the corresponding period in the previous year or years, the disadvantages of their use are that short-period comparisons are less reliable than long-period comparisons and that seasonal influences, where they operate, are not eliminated from the data.

The disadvantage of certain of these comparisons is that additional calculations are required.

Units of measurement

There are several forms in which the cost and related data can be expressed. They are as follows:

(1) VALUES

Values in terms of pounds, dollars, francs, etc., and quantities in the form of miles, tons, yards, units, etc.

Where it is desired to compare the magnitudes of one or more sets of results, this form should be used. Its main feature is that it emphasizes the magnitude of the data rather than the proportional relationship of one set of results to another.

(2) INDEX NUMBERS
Where it is desired to reduce the results of, for example, comparable periods of time, to a simple, understandable index, index numbers are useful because they show trends quickly and are easy to handle and remember.

(3) PERCENTAGES
Percentages should be used where it is necessary to show the relationship between:

(*a*) Two measurements which are expressed in the same terms, for example, overtime and normal time, advertising expenditure and values of sales.

(*b*) The whole and its constituent parts, for example, wages, materials, services, taxation, dividends and undistributed profits to total sales.

Percentages emphasize proportional relationships and not the magnitudes of the data compared. Like index numbers, percentages are convenient to handle and remember.

(4) RATIOS
Ratios may be used where it is necessary to show the relationship between two measurements which are expressed in different terms, for example number of miles per gallon, number of units of electricity per machine operating hour.

(5) RATES
This particular form of ratio is used to express the relationship between a monetary and a quantitative measurement, for example, wages paid per hour worked, selling costs per customer.

(6) STATISTICAL MEASURES
Measures of dispersion, skewness and the various forms of average can be used to advantage on many occasions.

Variations
Where comparisons are made between two sets of figures there should normally be provided either the amounts by which the two sets of figures differ or the proportional or percentage relationship which the variation bears to the amount in relation to which it is calculated. In certain circumstances, both types of variations may be provided.

While additional clerical time must be spent in calculating and preparing this information, managerial time can be saved, particularly by high-lighting important variations.

The Provision of Cost Information

Sources

As the range of subjects in which management may be interested is extensive, so information on these subjects may be obtained from any of the departments within an undertaking which are responsible for recording, analysing and filing the information in which each is particularly interested. As each of these departments has information available, it is logical, therefore, to extend the responsibilities of these departments to include the preparation, interpretation and presentation to management of the quantitative information based on the data which they have available. As much of this quantitative information is related to the monetary information prepared by the cost accounting department, great care must be taken to ensure a strict comparability of the monetary and quantitative data which is obtained from different sources.

In many instances, defects of organization cause the duplication, and frequently the multiplication of records of quantitative data. As each department which requires the information frequently needs it for different purposes, so the same information is frequently compiled in a different way by each department. This often results in the totals of ostensibly identical information prepared by several departments being entirely different. Thus, if each of these departments provides information based on its own data, the confusion which results renders all the information suspect and valueless. It is, therefore, essential that the preparation of all cost information, whether monetary or quantitative, should be co-ordinated in order to ensure that the information prepared independently by several departments is strictly comparable and agrees arithmetically.

For this purpose the cost accounting department should have an overriding functional responsibility for:

(1) The form of both basic records and quantitative information;
(2) the presentation and interpretation of such information;

and should:

(1) collect the information from the department which prepared it;
(2) ensure that the information which it presents to management is comparable and is in arithmetical agreement.

As far as purely quantitative data is concerned, it does not, except in relation to time, tie up with any of the information prepared by the cost department. For that reason the cost department does not need to be responsible for its collection and presentation to management.

Timing

To enable a manager to take prompt action to correct such adverse trends or to take advantage of such improved conditions as may exist in a business, it is essential to present cost information to him frequently

and as soon as possible after the end of the period of time to which the information relates. It is impossible to say how frequently or how soon after the end of the period of time cost information should be presented, because such things depend entirely upon individual circumstances. Generally an interval of one year between successive reports is useless. Some assistance is given by the presentation of quarterly reports. On the average, to be of maximum use, reports should be presented at intervals of four weeks or one month. In many cases it is desirable that information should be presented weekly or even daily. With regard to the time-lag between the end of the period and the date of presenting the information, the shorter the time lag is, the better. Again, on average, the time-lag on annual reports should not be greater than two months and the time-lag on monthly, weekly and daily reports should not be more than two weeks, three days and twenty-four hours respectively.

In effect, the only factor which limits the frequency of presentation of information and the time interval is the expenditure which the management of a business is prepared to incur in obtaining, preparing and presenting cost information. It is, therefore, a question of management policy as to whether cost information should be obtained frequently and quickly at relatively high cost or infrequently and with delay at relatively low cost. This factor must be borne in mind, both by the cost accountant and by his management, in deciding upon the scope and timing of the information which the cost accountant prepares.

Much can be done to speed up the presentation of cost information by making estimates of accrued costs and revenues instead of waiting until such accruals can be ascertained accurately. Experience teaches the extent of the inaccuracy which occurs in cost information as a result of using estimates. Providing the margin of error is reasonable (even on occasions as much as 10 per cent is reasonable) information prepared quickly in this way is more useful than delayed information prepared accurately.

Interpretation

It is the function of the cost accountant to prepare cost information and it is the function of management to take action upon it. The intermediate function of interpretation of the cost information is also the function of the cost accountant. The reasons for this are clear, because:

(1) Most managers do not profess to understand and, on many occasions, are unable to understand information which is presented in numerical form, particularly where it is prepared in accordance with cost accounting conventions, which to the unskilled are unintelligible. Thus their time is saved and their work is made considerably easier by having the numerical information interpreted for them by the cost accountant.

(2) As cost accountants hold a position which stands clear of the detailed workings of departments, they can concentrate in their reports on the essential features of the workings of these departments. Thus, as the attention of managers is guided to those important features, action can be taken more quickly than if the manager had to root out the essential information for himself.
(3) The interest of management in cost information is enhanced and the co-operation between the cost accounting department and the management is improved.
(4) A permanent record in concentrated form of the course of events as disclosed by cost information is available for future reference.

This report of the cost accountant should, firstly, draw attention to important abnormalities of trends, variations from standards or targets, or to conditions which are more favourable than anticipated. The report should, secondly, describe briefly the course of events to which attention is drawn and should, thirdly, indicate the alternative courses of action which may be followed to correct adverse tendencies or to take advantage of favourable conditions.

There are differences of opinion concerning the indication by the cost accountant of the course of action. On the one hand, it is contended that it is the function of the cost accountant to prepare, present and interpret the cost information and not to indicate courses of action. On the other hand, it is contended that if the cost accountant is to play his full part in business, he must extend his function further and give to management an indication of the courses which are open to management to follow, leaving to the management the responsibility of choosing the course to follow and of taking action.

Discussion

Cost information presented to managers may be subsequently discussed with them in two ways:

(1) INDIVIDUALLY

Here a member of the cost accountant's or, in the case of larger undertakings, the controller's department should discuss the cost information personally with each manager, providing him with any additional information or explanations which he requires.

This personal contact should be established with all managers, from the chief executive to the foreman and, in some cases, the charge-hand. It is found that this personal contact, particularly with foremen and shop superintendents, is markedly successful in improving the cost consciousness of managers who are encouraged to, and in fact ultimately do, seek assistance from the cost accountant's or controller's departments.

(2) IN GROUP COMMITTEES

The principle of considering top management information at board meetings may be applied throughout a business.

Where information is presented and discussed in this way, a committee consists of those managers who are all responsible to one senior manager and a member of the cost accountant's or controller's department, whose level is appropriate to that of the members of the committee he attends. There is, therefore, a number of committees, depending upon the size of the organization.

The principal advantages of having these committees are that the members have a common interest and can discuss information and the situations which it represents as a group.

THE COST OF COST INFORMATION

As mentioned previously, the question of cost involved in obtaining and presenting information to the management of a business must always be considered when deciding upon the nature and extent of the information which is to be prepared. It is desirable to compare as far as possible the cost of obtaining information with the savings which can be made by using the information, because, so long as the savings exceed the costs, the preparation of the information is justified. This assessment of cost is, however, extremely difficult in practice, because the operating accounts of a business record only visible expenditure which involves the actual or nominal disbursement of cash and not invisible expenditure in the form of waste of effort or facilities.

As a result, it is usually a matter of estimate or opinion as to whether the savings exceed the cost, because usually it is:

(1) difficult to isolate the costs incurred in collecting the basic data necessary to prepare a particular item of information;
(2) impossible to isolate and measure for use, as a standard for subsequent comparison, the inefficiency or loss incurred prior to the institution of records of the inefficiency or loss;
(3) impossible to measure the inefficiency or loss which would be incurred if the use of existing information were discontinued.

In this chapter, the broad aspects of cost information and its provision have been dealt with. Reference has been made on occasions to detailed information and to methods of presentation, but nowhere in the chapter has an illustration appeared. It is the function of the next volume to provide the necessary illustrations and to it reference should be made to see how the principles and practices outlined in this chapter are applied in practice.

SYNOPSIS OF CHAPTER XVIII

COST BOOK-KEEPING

	Page
Introduction	44
The scope of book-keeping	44
Double-entry book-keeping	44
Sectional balancing	46
Control accounts	46
Plan of accounts	47
Basic documents	50
External transaction documents	50
Supplier's invoice	50
Debit note	50
Supplier's credit note	50
Sales invoice, customer's debit note, sales credit note	50
Cash received voucher	50
Pay-in book counterfoil	51
Cheque-book counterfoil	51
Banker's debit advice	51
Payee's receipt	51
Internal transaction documents	51
Material requisition	51
Material return note	52
Material transfer note	52
Labour time record	52
'Expense' record	52
Cost rate basis record	52
Machine time record	52
Cost journal voucher	52
Intermediate records or summaries	53
Material issue analysis sheet	53
Wages sheet or salaries sheet	53
Wages sheet summary	53
Wages analysis sheet	53
'Expense' analysis sheet	54
Machine time analysis sheet	54
Books of original entry	54
Ledgers	55
Financial ledgers	55
Cost ledgers	55

Chapter XVIII

COST BOOK-KEEPING

THOSE who are familiar with the subject of book-keeping know that its name is derived from the bound books in which, at one time, it was the universal custom and in which, at the present time, it is still frequently the custom, to record all the transactions of a business. Although bound books have given way to loose-leaf books and card records, the principles and practices have remained unchanged and are applicable with equal force to the keeping of the records of the modern accounting system as to the keeping of the books of former days. Although one cannot describe a card record as a book, the original terminology of book-keeping survives and is useful in describing the underlying principles and devices which are employed in keeping books and records.

The Scope of Book-keeping

Book-keeping, as it is commonly understood, embraces what may be described as financial book-keeping and cost book-keeping. Financial book-keeping is concerned with keeping all accounts which record dealings with persons, i.e. personal accounts; the retention of cash and the investment of cash in property, machinery, etc., i.e. real accounts; and the capital and reserves of the business: while cost book-keeping deals with accounts which relate to expenditure and income in all its forms, i.e. nominal accounts.

With financial book-keeping as defined, we are not here concerned. We are, however, concerned with cost book-keeping. It is, nevertheless, impossible to illustrate the principles and practices of cost book-keeping without including certain references to the principles and practices of financial book-keeping because, as has already been mentioned in this book, every transaction which takes place in a business has a financial as well as a costing aspect.

Double-entry Book-keeping

The dual aspect of business transactions is the basis of double-entry book-keeping, because in double-entry book-keeping both of these aspects are recorded. That is to say, if a consigmnent of material is supplied to a business, the fact that a certain supplier has sent the material to the business is recorded and the fact that material has been received by the business is also recorded. At the same time, if a business delivers a consignment of materials to a customer, the fact that the business has sold those materials is recorded and the fact that a customer has received those materials is also recorded.

It is the practice in double-entry book-keeping to debit or place on the left-hand side of the ledger account all the transactions of the receiving person, and to credit or place on the right-hand side of the ledger account all the transactions of the person giving. In the two transactions given by way of example, the supplier's account is credited and the materials account debited in the first transaction and, in the second transaction, sales account is credited and the customer's account debited. By means of the debit and credit, both the financial and cost aspects of these transactions are recorded and a double entry is made. It should be noted that impersonal accounts, such as those which record income and expenditure, are, for the purposes of double-entry book-keeping, considered, like personal accounts, as being capable of giving and receiving. Thus an expenditure transaction is debited and an income transaction is credited to their appropriate impersonal accounts.

As a result of the application of this principle, each transaction, as has been said, is recorded twice. This enables the accuracy of the book-keeping to be tested as the following shows:

Debits		Credits	
Accounts	Amounts	Accounts	Amounts
	£		£
A	5	D	5
F	2	C	2
K	10	A	10
M	4	C	4
D	3	K	3
C	6	F	6
	30		30

In the foregoing series of debits and credits, for each amount that has been debited, an identical amount has been credited. This is proved by the agreement of the totals of debits and credits. No attempt has been made in this table to bring together the transactions on the individual ledger accounts. This is done in the following table:

Accounts	Debits	Credits	Debit Balances	Credit Balances
	£	£	£	£
A	5	10		5
C	6	2		
		4		
D	3	5		2
F	2	6		4
K	10	3	7	
M	4		4	
	£30	£30	£11	£11

From this table it will be seen that the accuracy of the book-keeping can be tested by agreeing the total of the debit balances with the total of the credit balances on the various accounts to which the transactions have been debited and credited. This list of balances, which is used to test the accuracy of the double-entry book-keeping, is a trial balance. This illustrates the first and most important principle of double-entry book-keeping.

Sectional Balancing

The example of a trial balance, which has just been given, was prepared quickly and balanced without much difficulty because the number of accounts whose balances were included in the trial balance was small. In practice, however, the number of accounts which must be maintained in a complete system is usually large and frequently is very great. Coupled with this, the number of transactions which are recorded during an accounting period is also frequently very large. These circumstances make the balancing of the accounts, the extraction of balances, and the preparation and agreement of the trial balance a matter of some difficulty and complexity. The complexity of this job can be greatly simplified by means of sectional balancing, which is the balancing separately of each of a number of groups of ledger accounts, into which the whole of the ledger accounts maintained are divided.

There is no limit to the number of sections which may be maintained separately. Each section may contain that number of accounts which, by experience, it is known can be conveniently handled and quickly balanced.

Control Accounts

To enable sectional balancing to be carried out, a control account is set up in the control ledger, or in the ledger controlled, or in both ledgers. To this account is debited or credited the totals of the amounts respectively credited or debited to the individual accounts in the ledger or section which is controlled by the control account.

The principle of the control account is illustrated on the opposite page.

In this hypothetical example, fourteen ledger accounts have been sectionalized in three groups. As will be seen, the net total of the balances of the accounts in each section agrees with the difference between the totals of the debit and credit entries made to these accounts. The total of the debits and the total of the credits made to all sections are posted to the credit and debit respectively of the accounts which record the second or *contra* aspect of these entries. In this way the double entry is completed.

Accounts	Debits	Credits	Debit Balances	Credit Balances
	£	£	£	£
Section A:				
1	40	60	–	20
2	80	20	60	–
3	40	35	5	–
4	20	10	10	–
5	100	80	20	–
Control totals	£280	£205	£75	
Section B	£	£	£	£
1	40	35	5	–
2	80	90	–	10
3	10	10	–	–
4	45	20	25	–
Control totals	£175	£155	£20	–
Section C	£	£	£	£
1	40	30	10	–
2	55	60	–	5
3	70	30	40	–
4	20	20	–	–
5	80	60	20	–
Control totals	£265	£200	£65	–
Contra totals ..	£720	£560	£160	–

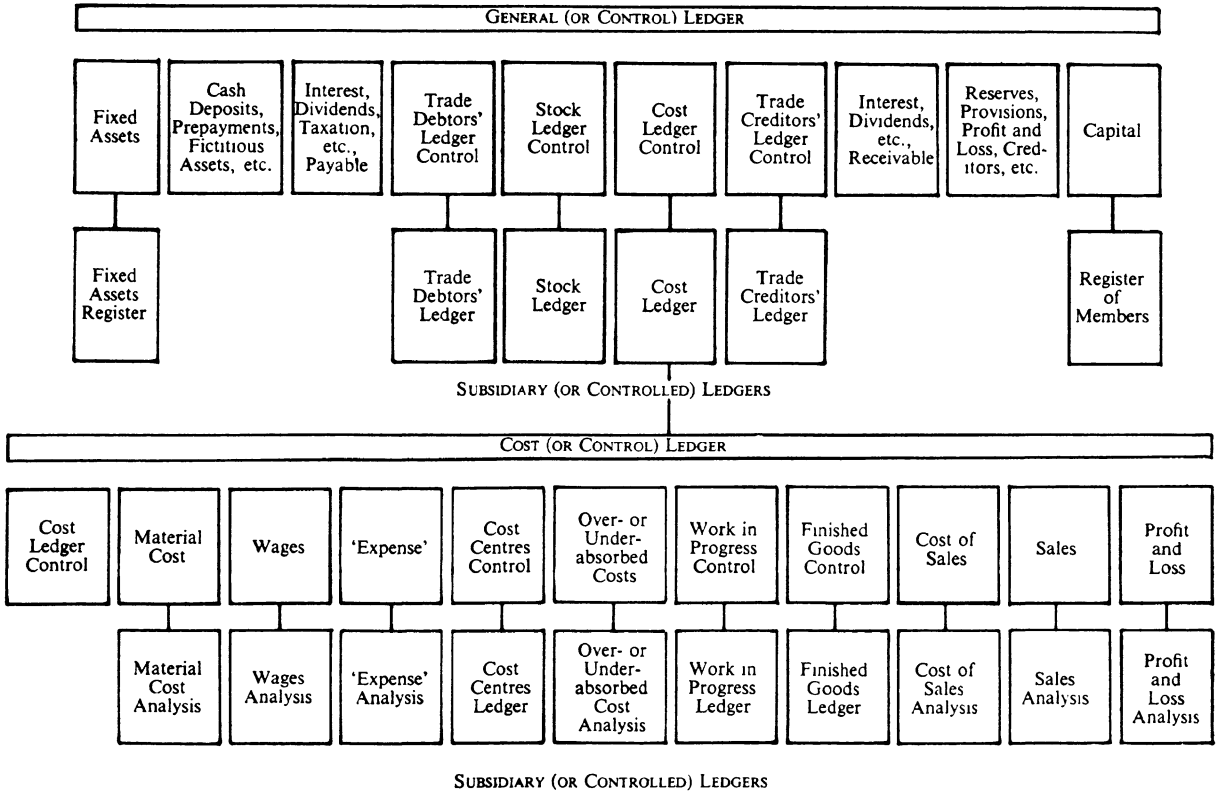
Plan of Accounts

The basic sections into which both financial and cost accounts are divided and the control accounts which control each of these sections are shown in the following plan of ledgers and accounts.

This plan is divided into two sections. The first section shows the general (or control) ledger which contains the control accounts of financial subsidiary ledgers, such as fixed assets, trade debtors, trade creditors and stock. At the same time, the general (or control) ledger contains a number of asset accounts, such as cash, deposits, pre-payments, etc., liability accounts, reserves, provisions, etc., and items of income and expenditure in the form of interest, dividends, taxation, etc., which do not affect the cost accounts.

The general ledger containing the control accounts, and the subsidiary ledgers which have been mentioned, are maintained by the financial accounting section and make up the financial book-keeping system.

In this section of the plan there is also included a stock ledger and stock ledger control account. As stock is an asset, it is, strictly speaking, a financial accounting responsibility. As, however, materials issued from stock are included in costs, it is, to a substantial degree, a cost


GENERAL (OR CONTROL) LEDGER
Fixed Assets
Cash Deposits, Prepayments, Fictitious Assets, etc.
Interest, Dividends, Taxation, etc., Payable
Trade Debtors' Ledger Control
Stock Ledger Control
Cost Ledger Control
Trade Creditors' Ledger Control
Interest, Dividends, etc., Receivable
Reserves, Provisions, Profit and Loss, Creditors, etc.
Capital
Fixed Assets Register
Trade Debtors' Ledger
Stock Ledger
Cost Ledger
Trade Creditors' Ledger
Register of Members
SUBSIDIARY (OR CONTROLLED) LEDGERS
COST (OR CONTROL) LEDGER
Cost Ledger Control
Material Cost
Wages
'Expense'
Cost Centres Control
Over- or Under-absorbed Costs
Work in Progress Control
Finished Goods Control
Cost of Sales
Sales
Profit and Loss
Material Cost Analysis
Wages Analysis
'Expense' Analysis
Cost Centres Ledger
Over- or Under-absorbed Cost Analysis
Work in Progress Ledger
Finished Goods Ledger
Cost of Sales Analysis
Sales Analysis
Profit and Loss Analysis
SUBSIDIARY (OR CONTROLLED) LEDGERS

accounting responsibility. The method of treatment of the stock ledger depends largely on circumstances because, apart from theoretical considerations, where the financial books are maintained at one office and the cost books are maintained at a separate factory, it is essential to maintain the stock ledger in conjunction with the cost ledger. In these circumstances the stock ledger becomes subsidiary to the cost ledger, which then contains the stock ledger control account. For the purpose of illustration, however, it is better to show the stock ledger and its control account as part of the financial book-keeping system.

The second section of the plan shows the cost ledger and the ledgers or sections of ledgers which are subsidiary to it, together with the relative control accounts which are maintained in the cost ledger.

The division into sections and the arrangement of the cost accounts depends entirely on the particular requirements of the individual costing system. In practice, therefore, any suitable subsidiary cost ledgers and their control accounts may be set up. Basically, however, the subsidiary cost ledgers and their control accounts which are set up are illustrated by this section of the plan.

The principal account in the cost ledger is the cost ledger control account, which is posted from the same totals as the cost ledger control account in the general ledger. As the cost ledger is an integral part of the whole of the book-keeping system, the balance of the cost ledger control account in the cost ledger must be equal but opposite to the balance of the cost ledger control account in the general ledger, so that, when a trial balance of all the books is taken out, the balances on the two cost ledger control accounts balance out and by this means may be eliminated. So that the balances on the cost ledger control accounts may be opposite, it is necessary to post to the credit of the cost ledger control account in the cost ledger the totals of items which are debited to the cost ledger control account in the general ledger, and to debit to the cost ledger control account in the cost ledger the totals of items which are credited to the cost ledger control account in the general ledger.

The remainder of the control accounts in the cost ledger follow the process of cost ascertainment from the ascertainment of cost of materials, labour and outside services, through the various cost centres, work in progress and finished goods, to the cost of sales and the profit or loss realized on these sales.

The detail and purpose of the various ledgers with their control accounts will be considered later in a worked example.

Having set out in the plan of ledgers and accounts and in the discussion of double-entry book-keeping and control accounts, some idea of the final form in which data is to be obtained from the book-keeping system of which the cost book-keeping system is a part, it remains to

consider the detailed records which are used in building up the final data. For this purpose it is necessary to deal with the basic documents which record the transactions to be incorporated in the book-keeping system, the books of original entry in which the details and analyses of the information provided by the basic documents are recorded, and a worked example which incorporates the books of original entry and the control and subsidiary ledgers.

Basic Documents

These are the forms and records on which details of business transactions are first provided to a business. These documents are of two classes, namely, those which record transactions which take place between a business and its customers or its suppliers of goods and services, and those which record transactions which take place within a business.

External transaction documents

SUPPLIER'S INVOICE

A supplier's invoice is a document sent by a supplier of goods or services to a business, which sets out details of the goods or services supplied to the business, together with the value charged for the goods or services, the date of the transaction, and other relevant details. It is a document of debt which the business must discharge.

DEBIT NOTE

This is a document made out and sent to a supplier by a business, notifying the supplier that an overcharge has been made by the supplier on an invoice, either by failing to supply the goods specified by the business, or by charging more than the price agreed between the business and the supplier.

SUPPLIER'S CREDIT NOTE

This is a document made out and sent to a business by a supplier, in acknowledgment of an overcharge notified by the business in a debit note, and indicating that the debt is reduced by the amount of the credit note.

SALES INVOICE, CUSTOMER'S DEBIT NOTE, SALES CREDIT NOTE

These documents are identical in purpose to those described above, with the exception that they relate to goods or services provided by a business to its customers.

CASH RECEIVED VOUCHER

This is a duplicate of the document issued by a business in acknowledgment of the receipt from a person of a stated amount.

The cash received voucher contains details of the nature of the debt in respect of which the amount is received. This information is obtained from the statement, document or letter which the person discharging the debt encloses with the amount received.

PAY-IN BOOK COUNTERFOIL

This is a document which contains details of the cheques, notes, cash, etc., paid into a business's banking account. It is stamped by the teller in acknowledgment of the lodgment made. This document is supported by the bank pass-book.

CHEQUE-BOOK COUNTERFOIL

This document contains details of the cheque drawn in payment of a debt. After the cheque has been negotiated, it is returned through the business's bankers to the business and retained as an additional cash payment voucher. It is frequently the practice to require the person to whom the cheque is payable to complete the receipt which is provided on the back of the cheque. In this instance, the cheque itself is the principal and not the additional cash payment voucher.

BANKER'S DEBIT ADVICE

This is a note sent by the banker to a business notifying it that the bank has discharged a debt on its behalf. In this case no other supporting document is available.

PAYEE'S RECEIPT

This document is received from a person to whom a payment is made acknowledging the amount which has been paid and the discharge of the debt. Such documents specify whether payment has been made by cheque or by cash.

Internal transaction documents

Each business has its own particular way of describing the documents which it employs. Thus it is impossible to specify the documents used for recording internal transactions in such a way as to be applicable to all businesses. Whatever the titles of individual business documents may be, they are basically of the same type and record similar transactions. The titles given to the following documents are representative titles.

The documents of this type are as follows:

MATERIAL REQUISITION

This is a document which authorizes and records the issue of material for use.

MATERIAL RETURN NOTE

This is a document which records the return of unused material.

MATERIAL TRANSFER NOTE

This is a document which records the transfer of materials from one store to another, from one cost centre to another, or from one cost unit to another.

LABOUR TIME RECORD

This is a document which records the amount of time spent by an employee of an undertaking, and the manner of its spending and which may record the wages cost of the time spent.

'EXPENSE' RECORD

This is a document which records the quantity of an outside service which is consumed by a cost centre or cost unit.

COST RATE BASIS RECORD

This is a document which records the quantity of the base used for calculating a cost which is consumed by or expended on a cost centre or cost unit.

MACHINE TIME RECORD

This is a document which records, *inter alia*, the amount of time an item of equipment is operated or remains idle, and the work done by the machine, and which may record the cost of the time so recorded.

COST JOURNAL VOUCHER

This is a document which provides the details necessary to support an entry in the cost journal.

The cost journal voucher may consist of either the original and only record of a transaction or series of transactions, or extracts made from either an original record or series of original records, or an intermediate record or summary of basic documents.

The form in which such a voucher is provided depends entirely on whether the entry which the voucher supports is made in the same place as, or in a different place from, the place where the voucher is prepared. If the places are the same the basic document or the intermediate record or summary may be used as a journal voucher, but if the places are different, then the journal voucher must consist of an extract of the basic document or intermediate record, this voucher being sent from one place to the other. In fact, where the places are identical, it is frequently the practice to dispense entirely with the journal and to make postings to ledgers direct from the basic documents or intermediate records or summaries.

Certain of the basic documents mentioned are used mainly in financial book-keeping, but all of the principal basic documents have been mentioned, mainly as a background to cost book-keeping.

Intermediate Records or Summaries

In the same way as basic documents are used for internal transactions, the intermediate records and summaries used in a business are determined by the particular requirements of the business. Different businesses use different names for these documents. By whatever name they are called, however, the following records are usually required.

Material issue analysis sheet

This is a document which, for cost accounting purposes, is a classified record of material issues, returns and transfers.

This record may assume a number of different forms, depending on individual circumstances. It may be drawn up in two parts, the first designed to provide totals convenient for posting to material stock records and the second to provide convenient totals for charging to cost centres and cost units.

Wages sheet or salaries sheet

This is a document which records the details of the make-up of the gross pay, deductions and net pay of each employee.

The use of a wages sheet and a salaries sheet can differ in different businesses. Certain businesses use a salaries sheet for office workers and those engaged in works administration, whether paid weekly or monthly; other businesses use a salaries sheet for employees paid monthly, and a wages sheet for employees paid weekly, irrespective of whether they are office or factory workers. The particular method adopted is not, however, of importance from a cost book-keeping point of view, but is of importance purely from a secrecy point of view.

It is convenient for compiling the wages sheets from labour time records, for paying wages, and for compiling the wages sheet summary to arrange for the names of employees in the same department to appear together in the same section of the wages sheet.

Wages sheet summary

The wages sheet summary, which summarizes the totals of the wages sheet, may, if the book-keeping is carried out in one place, be used as a book of original entry. If, however, the factory and the office are not in the same place, an extract of the total of the wages sheet summary should be used as a journal voucher.

Wages analysis sheet

This is a document which for cost accounting purposes is a classified record of time and/or wages compiled from time records.

This intermediate record is drawn up independently of the wages sheet in any manner convenient for the allotment of wages to cost centres and cost units. The record is, in fact, used to analyse the gross pay details which appear in the wages sheet. Thus, when the wages sheet and the wages analysis sheet have been completed, the total of the latter should agree with the total of the gross pay of the former.

Where an inflated rate of wages is used to cover the personnel costs of a business, the total of the amount so included in the total must be taken into account when agreeing the gross pay figures.

'Expense' analysis sheet

This is a document which, for cost accounting purposes, is a classified record of 'expense'.

This record may also be drawn up in any convenient form which provides the totals of 'expense' to be charged to each cost centre and cost unit.

Machine time analysis sheet

This is a document which, for cost accounting purposes, is a classified record of machine time compiled from machine time records.

This record is designed, not only to provide details of machine time where costs are apportioned or absorbed on the basis of machine time, but also to provide machine capacity and efficiency data.

The information may be arranged to provide machine group and departmental machine times.

Similarly, other summaries may require to be prepared of, for example, material handling, consumption of power, laboratory tests made, steam raised, salesmen's calls, etc. Where these are necessary for the allotment of cost or the measurement of cost in terms of appropriate cost units, their contents are, of course, determined by individual requirements.

Books of Original Entry

The basic books of original entry used in book-keeping are as follows:

Purchase invoice book.
Purchase credits book.
Sales invoice book.
Sales credits book.
Bank cash book.
Cash book.
Journal.

These books record transactions which affect both the financial books and the cost books. For that reason they form part of the cost book-keeping system. In addition to these books of original entry, there is a cost journal. This is a journal which records those transactions which affect solely the cost ledger and which it is customary to journalize.

These books of original entry will be dealt with in the worked example in the next chapter.

LEDGERS

A ledger (a book which contains the accounts to which entries in the books of original entry are posted) may be a principal ledger containing, *inter alia*, the control accounts designed to control the accuracy of the subsidiary ledgers. It may also be a subsidiary ledger whose purpose is to relieve the principal ledger of a number of ledger accounts and to enable the work of ledger-keeping to be sectionalized. The accuracy of a subsidiary ledger is controlled by the relative control account.

Again, a ledger may form part of the financial book-keeping system or it may form part of the cost book-keeping system. The principal ledgers are as follows:

Financial ledgers

General ledger.
Trade debtors' ledger.
Trade creditors' ledger.
Stock ledger.
Fixed assets register.
Register of members (in limited companies only).

Cost ledgers

Cost ledger.
Cost centres ledger.
Work in progress ledger.
Finished goods ledger.

The operation of the accounts in these ledgers is also dealt with in the course of the worked example in the next chapter.

SYNOPSIS OF CHAPTER XIX

AN EXAMPLE OF COST BOOK-KEEPING

	Page
Introduction	59
Financial books	59
Books of original entry	59
Purchase invoice book	59
Purchase credits book	62
Sales invoice book	62
Sales credits book	65
Bank cash book	65
Receipts	65
Payments	66
Cash book	67
General journal	70
General ledger accounts	72
Fixed assets	72
Trade debtors' ledger control	73
Stock ledger control	73
Cost ledger control	74
Trade creditors' ledger control	75
Capital	75
Sundry assets and liabilities, expenditure and income	75
Cost books	76
Books of original entry	76
Cost journal	77
Cost ledger accounts	78
Cost ledger control	78
Material cost	79
Wages	79
'Expense'	79
Service cost centres control	80
Production cost centres control	80
Selling cost centres control	81
Distribution cost centres control	81

	Page
Administration cost centres control	82
Over- or under-absorbed costs	82
Work in progress control	82
Finished goods control	83
Cost of sales	83
Sales	84
Capital expenditure	84
Profit and loss	84

CHAPTER XIX

AN EXAMPLE OF COST BOOK-KEEPING

IN THIS example use is made of the principal books of original entry and the principal ledgers. In the application of this basic book-keeping system to a particular business, additional books and ledgers may be required, or certain of the books and ledgers may not be required. Again, as mentioned previously, the so-called books may take the form of cards, loose sheets, or even the original documents themselves. Whatever may be the form in which the records are prepared, the basic book-keeping records and procedures are nevertheless applicable.

FINANCIAL BOOKS

In this section there are considered the books of original entry and the ledgers which affect the financial book-keeping system as well as the cost book-keeping system.

Books of original entry

These are as follows:

PURCHASE INVOICE BOOK

This book is used to record details of goods purchased or services hired, where cash is not paid at the time of receipt of the invoice, that is to say where credit is taken. It is frequently considered good practice, however, where cash is paid at the time of receipt of the invoice to treat the invoice in the same way as it would have been treated had credit been taken.

In the invoice book are entered identification details, the total amount charged on the invoice and the analysis of the detailed amounts on the invoice according to the ledger in which the various detailed amounts are posted. For example, the first invoice for £187 13*s* 4*d* is posted to five different accounts, three of which are in the stock ledger and two of which are in the cost ledger.

Similarly, where an invoice amount is posted to the fixed asset register or an account in the general ledger, the amount posted to each account in these respective ledgers is entered in the appropriate column.

Where it is the practice to use the invoice as a posting medium, only the totals and not the details of the amounts posted to accounts in each ledger need to appear in the appropriate columns.

At the end of each period, each of the columns is cast and the

PURCHASE INVOICE BOOK

Date	Invoice No.	Name	Creditors' Ledger		Stock Ledger		Cost Ledger		Fixed Assets Register		General Ledger	
			A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount
19—				£ s d		£ s d		£ s d		£ s d		£ s d
Jan. 1	1	H. Lowson & Co Ltd	L 25	187 13 4	M 6	78 13 3	16/5	3 8 4				
					P 25	39 14 6	23/7	14 1 5				
					R 17	51 15 10						
	2	M. K. Bernard Ltd	B 4	198 16 3					28/5	198 16 3		
	3	Carvex Ltd	C 2	7 13 4			19/5	7 13 4				
	4	Leighton, Melton Ltd	L 14	246 12 1	B 9	230 17 1	16/5	15 15 0				
	5	Melton County Council	M18	49 6 8			7/2	49 6 8				
	6	F. D. Rentals Ltd	R 11	27 0 0			19/5	27 0 0				
	7	Automax Ltd	A 93	13 3 4							13	13 3 4
		etc., etc.										
31				£18,653 10 11		£14,297 18 6		£2,183 7 9		£1,876 0 0		£296 4 8
				A/c No. 5		A/c No. 3		A/c No. 4		A/c No. 1		A/c No. 7

PURCHASE CREDITS BOOK

Date	D/N No.	Name	Creditors' Ledger		Stock Ledger		Cost Ledger		Fixed Assets Register		General Ledger	
			A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount
				£ s d		£ s d		£ s d		£ s d		£ s d
19— Jan. 1	1	Moroling Shepheard Ltd	M29	16 3 5	P 16	16 3 5						
	2	Carter Bedford & Co	C 3	14 2 7	L 14	14 2 7						
	3	John Belling Ltd	B 19	16 0 0			13/7	16 0 0				
		etc., etc.										
31				£296 3 8		£214 9 10		£44 10 6		£30 0 0		£7 3 4
				A/c No. 5		A/c No. 3		A/c No. 4		A/c No. 1		A/c No. 7

accuracy of the casting is tested by cross-casting the totals of the four last columns to agree with the total of the first column. The postings are then made of the total in the first column to the credit of the creditors' ledger control account, and the total of each of the last four columns to the debit of their respective ledger control accounts. In this way the double entry is completed.

It is, as has been mentioned previously, a waste of space to extend much further the number of analysis columns used because the analysis of the amounts in each column can be prepared independently much more easily and neatly.

PURCHASE CREDITS BOOK

In this book are entered details of the debit notes issued to suppliers in respect of overcharges made on invoices which have been entered in the purchase invoice book. The purchase credits book is maintained in precisely the same manner as the purchase invoice book. The only difference is in the posting of the totals of the analysis columns. In this case, the entries are opposite to those which are made from the purchase invoice book, namely, the total of the first column is debited and the total of each of the last four columns is credited to the appropriate ledger control accounts.

SALES INVOICE BOOK

In this book are recorded details of the invoices issued to customers in respect of sales of goods or services. Identification details are provided, together with the analysis of the details of the invoices according to whichever ledger the amounts are posted to.

It will be seen that a column is included for the analysis of trade discount. While the practice of entering in the sales invoice book the net amount of an invoice after deduction of trade discount is universally advocated in book-keeping text-books, as trade discount is in fact a cost, it is advisable that it should be recorded separately and the total allowed by way of trade discount calculated.

The sales invoice book is totalled, the cross-cast of the totals tested and the postings made to the appropriate ledger control accounts at the end of each period. In this case, the total of the first column is posted to the debit of the trade debtors' ledger control account, the total of the trade discount column is posted to the debit of the cost ledger control account, while the totals of the gross sales and fixed asset register columns are posted to the credit of the appropriate control accounts. The total of the general ledger column, while posted to one account in this example, is not posted to any account in practice. The postings from this column are made individually.

SALES INVOICE BOOK

Date	Invoice No	Name	Trade Debtors' Ledger		Cost Ledger				Fixed Assets Register		General Ledger	
					Gross Sales		Trade Discount					
			A/c No.	Amount	A/c No.	Amount	A/c No	Amount	A/c No.	Amount	A/c No.	Amount
19—				£ s d		£ s d		£ s d		£ s d		£ s d
Jan. 1	1	Arthur Mossley & Co	A 14	386 4 3	15/7	408 6 5	16/3	22 2 2				
	2	Stirling Bennett Ltd	S 93	571 8 6	15/11	571 8 6						
	3	Harriman Ross & Collier	R 82	148 7 5	15/2	163 8 4	16/8	15 0 11				
	4	Benson Machinery Co Ltd	B 9	87 4 2					18/29	87 4 2		
	5	J. H. Dunn & Co	D 27	6 8 5							14	6 8 5
		etc., etc.										
31				£32,785 11 2		£34,191 6 2		£1,641 7 9		£200 4 6		£35 8 3
				A/c No. 2		A/c No. 4		A/c No 4		A/c No. 1		A/c No. 7

SALES CREDITS BOOK

Date	C/N No.	Name	Trade Debtors' Ledger		Cost Ledger				Fixed Assets Register		General Ledger	
					Gross Sales		Trade Discount					
			A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount
19—				£ s d		£ s d		£ s d		£ s d		£ s d
Jan. 1	1	Mirrlees Caxton & Co	M14	3 6 4	15/7	3 6 4						
	2	Standing Watney & Co	S 63	27 8 4	15/11	29 16 10	16/3	2 8 6				
	3	Harrod, Pickford & Day Ltd	H 5	16 2 10							16	16 2 10
	4	Chain Manufacturing Co	C 24	3 11 5					21/5	3 11 5		
		etc., etc.										
31				£185 11 4		£181 1 4		£28 11 9		£3 11 5		£29 10 4
				A/c No. 2		A/c No. 4		A/c No. 4		A/c No. 1		A/c No. 7

SALES CREDITS BOOK

This book is used to record details of the credit notes issued by a business to its customers in respect of overcharges made on sales invoices which have been entered in the sales invoice book. The totalling, cross-casting, agreeing and posting of the totals is carried out in the same manner as the sales invoice book, with the exception that the postings from the sales credits book are posted to the opposite sides of the various control accounts from the posting of the totals in the sales invoice book.

BANK CASH BOOK

For convenience the receipts side of the bank cash book is shown separately from the payments side.

BANK CASH BOOK RECEIPTS

In this book is recorded the details of all amounts received by a business and paid into its bank account. It does not record amounts received by a business and retained in the form of cash.

Apart from the identification details and, where the amount is posted to the credit of an account in any ledger other than the trade debtors' ledger, the description of the receipt, details of the total of each amount received, the cash discount deducted, and the amount posted to the credit of each ledger account are entered in the appropriate columns. In addition, the totals of the amounts received and paid into the bank are entered in a separate column so that identification of amounts in the bank pass-book is facilitated. It should be noted that the amount posted to the credit of a ledger account in the trade debtors' ledger is the total of the cash received and the cash discount allowed. The details in the bank columns should agree with the details on the bank pay-in slip counterfoil.

At the end of each period, the columns are totalled and cross-cast. The total of the bank and cash discount allowed columns should equal the total of the remaining four ledger columns. As the bank cash book is not only a book of original entry but also a ledger account, the balance at the beginning of the period should be entered in the bank total column and, so that the cross-cast of the columns at the end of the period may agree, should be entered also in the general ledger column.

Although, in this example, the total of the general ledger column is posted to the credit of an account, in practice no such posting is made, the amounts which are posted being the individual amounts in that column.

The postings which are made at the end of the period from this book to the various ledger accounts are: the total of the cash discount

BANK CASH BOOK RECEIPTS

Date	Receipt No.	Name	Description of Receipt	Bank		Cash Discount Allowed	Trade Debtors' Ledger		General Ledger		Cost Ledger		Trade Creditors' Ledger	
				Details	Total		A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount
19—				£ s d	£ s d	£ s d		£ s d		£ s d		£ s d		£ s d
Jan. 1			Balance		12,847 19 6					12,847 19 6				
3	11385	Harriman Ross & Cohen		3,275 3 8		97 4 6	R 82	3,372 8 2						
	6	Henley Borthwick & Co		396 7 11		13 10 4	H 21	409 18 3						
	7	Graham, Stirling Ltd		1,583 2 7		61 4 3	G 85	1,644 6 10						
					5,254 14 2									
4	8	National Insurance Co	Damage claims		187 3 4					187 3 4				
5	9	John Vickery Ltd		863 2 7			V 16	863 2 7						
	90	Bolling Howard Ltd	Overpayment	16 9 5									B 45	16 9 5
	1	Maynard Hayling Ltd	Rental of sports ground	18 10 0							16/7	18 10 0		
					898 2 0									
		etc , etc.												
					£44,843 6 11	£946 2 5		£27,964 17 8		£17,586 11 9		£194 11 6		£43 8 5
						A/c. No. 4		A/c No. 2		A/c No. 7		A/c No. 4		A/c No. 5

allowed column is posted to the debit of the cost ledger control account and the totals of the remaining columns are posted to the credit of their appropriate ledger control accounts in the general ledger.

BANK CASH BOOK PAYMENTS

In this section are recorded details of amounts paid out of the bank account of a business by means of cheques or by the action of the bank on behalf of the business. Details of the payments to facilitate identification should be entered. These are the number of the cheque or banker's debit advice, the number of the cash voucher, the name of the payee and, where the payment is posted to an account in any ledger other than the trade creditors' ledger, a description of the payment. The total of the payment should be entered in the bank total column while details of the amounts posted to the various ledgers should appear in the appropriate ledger columns. The amount of cash discount received should also be entered. At the end of each period this section of the cash book is totalled, balanced and cross-cast in the same way as the receipts side, the balance at the end of the period being entered in the total and the general ledger columns. The totals of columns and the detailed amounts in the general ledger column are posted to the opposite sides of the ledger accounts from the postings of the totals of the columns on the receipts side.

Analysis columns should be provided in a bank cash book only to the extent indicated, because any extension to provide for further analysis, save where other controlled ledgers are used, is rarely justified.

CASH BOOK

This book is used to record payments made out of a cash float which is periodically reimbursed either by a fixed amount or by an amount sufficient to bring the balance of cash in hand up to the amount of the float. In the latter case, the cash book is said to be kept on the imprest system. Details should be provided, as in the case of the payments side of the bank cash book, of identification, cash paid, cash discount received, and the amounts posted to accounts in their respective ledger columns. While only ledger columns are provided in the example, in practice, an extension of the number of analysis columns is occasionally justified where the number of identical payments made is substantial and a reasonable saving can be made in the time required for cost analysis and posting. Care must be taken to ensure that analysis

BANK CASH BOOK PAYMENTS

Date	Cheque No.	Voucher No.	Name	Description of Payment	Bank		Cash Discount Received	Trade Creditors' Ledger		General Ledger		Cost Ledger		Trade Debtors' Ledger	
					Details	Total		A/c No.	Amount	A/c No.	Amount	A/c No.	Amount	A/c No.	Amount
19—					£ s d	£ s d	£ s d		£ s d		£ s d		£ s d		£ s d
Jan. 1	68934	1	A. D. Clements	Cash		100 0 0					100 0 0				
	5	2	H. H. Lawson	Cash – Dec. 19 -		486 19 3					486 19 3				
	6	3	Commissioners of Inalnd Revenue	P A.Y.E.		538 6 4					538 6 4				
	7	4	J. J Biggs	Overpayment		17 3 5								B 17	17 3 5
	8	5	Marlow Davies & Co			1,853 2 7	87 3 8	D 13	1,940 6 3						
3	46	21	H. Lowson & Co Ltd			943 2 7	48 3 1	L 25	991 5 8						
	7	2	F. D. Rentals Ltd			33 0 0		R 11	33 0 0						
	8	3	M. K. Bernard Ltd			562 4 7	18 7 5	B 4	580 12 0						
	9	4	Wilson, Melling & Gee Ltd			2,965 4 7	103 6 3	W17	3,068 10 10						
7	73	53	B C. Adam	Wages, cash	1,863 4 7						1,863 4 7				
				Salaries, cash	286 2 5						286 2 5				
						2,149 7 0									
	4	4	National Supplies Ltd	Machinery rentals		197 3 11						16/43	197 3 11		
	5	5	L. V. Mavor	Interest on loan (net)	27 10 0						27 10 0				
				Repayment of loan	75 0 0						75 0 0				
						102 10 0									
	6	6	W. B. Roberts	Gratuity		20 0 0						31/5	20 0 0		
			etc., etc.												
				Balance		11,643 2 10					11,643 2 10				
						£44,843 6 11	£651 2 8		£20,468 6 11		£22,896 4 3		£1,942 6 1		£187 12 4
							A/c No. 4		A/c No. 5		A/c No. 7		A/c No. 4		A/c No. 2

columns are not just provided for their own sake. The use of a sundries column as a general monetary dustbin is strongly deprecated.

At the end of each period, the columns are totalled and the cross-cast tested. In this connection, the sum of the totals of the cash paid and the cash discount received columns should equal the sum of the totals of the remaining analysis columns.

As the cash book, in the same way as the bank cash book, is not only a book of original entry but also a ledger account, the balance of the account should be entered in the cash paid and general ledger columns.

With regard to the amounts of cash received, these can be treated in two ways. Firstly, they can be posted to the credit of a cash account in the general ledger, in which case the *contra* payment out of the bank account is entered in the payments side of the bank cash book and posted to the same cash account in the general ledger. Secondly, neither of these amounts are posted to any account. Although the former method involves the making of two additional postings, it is to be preferred to the latter method.

The totals of columns posted at the end of each period are the totals of the cash discount received column to the credit of the cost ledger control account, and the totals of each of the last four columns to the debit of their respective control accounts. No posting is made, in practice, of the total of the general ledger column, as the details of this column are posted during the period to the general ledger.

CASHBOOK

Date	Cash Received A/c No.	Cash Received Amount	Name	Description of Payment	Voucher No.	Cash Paid	Cash Discount Received A/c No.	Cash Discount Received Amount	General Ledger A/c No.	General Ledger Amount	Cost Ledger A/c No.	Cost Ledger Amount	Stock Ledger A/c No.	Stock Ledger Amount	Trade Creditors' Ledger A/c No.	Trade Creditors' Ledger Amount	Trade Debtors' Ledger A/c No.	Trade Debtors' Ledger Amount
		£ s d				£ s d		£ s d		£ s d		£ s d		£ s d		£ s d		£ s d
19— Jan. 1	B/f	113 0 9	L. B. Evans		1	2 18 6									E 29	2 18 6		
			Hendey's Motors Ltd		2	18 7 3							F 73	18 7 3				
			W. Cooper	Postages	3	10 0 0					26/14	10 0 0						
		486 19 3																
			A. D. Clements	Cash	4	50 0 0				50 0 0								
			Wallace & Co	Balance due	5	3 10											W14	3 10
			etc., etc.															
					C/f	147 9 11				147 9 11								
		£600 0 0				£600 0 0		£2 16 3		£234 11 7		£199 11 0		£95 8 3		£68 4 2		£5 1 3
		A/c No. 7						A/c No.		A/c No. 7		A/c No. 4		A/c No. 3		A/c No. 5		A/c No. 2

GENERAL JOURNAL

In this book are recorded details of transfers between accounts contained in the principal and subsidiary financial ledgers. In addition to the headings of accounts to which postings are made and the amounts posted to accounts entered in the various ledgers in their appropriate ledger columns, a brief description of the entry and a voucher number are given. A series of debit columns and a series of credit columns are provided.

The general journal is used to record the following types of transactions:

1. Opening and closing entries

It is good practice to journalize the opening and closing balances of the control and other accounts in the general ledger, together with the balances in the various cash books. These entries are, in fact, the formal statement of the trial balances which prove the arithmetical accuracy of the books at the beginning and at the end of an accounting period.

2. Provisions

At the end of the accounting period, the general journal is used to make provision in the books for outstanding, accrued and unexpired expenditure and accrued and prepaid income. It is also used to write back these provisions at the opening of a new accounting period.

3. Wages

The general journal may be used, where the wages book is used as an intermediate record, for recording gross wages and national insurance paid by a business and the various deductions made from the pay of employees. Alternatively, the posting of these items may be made direct from the wages summary.

4. Error corrections

The correction of errors made in book-keeping is carried out by means of the general journal.

5. Losses

Making reserves for losses or writing off losses of such things as bad debts, stocks, etc., is carried out by means of the journal. Similarly, the subsequent recovery of such losses is recorded in the general journal.

6. Contras

Where there is a set-off between debts owing to and by a business, the journal may be used for transferring the amount of one debt against the amount of the other. Alternatively, the bank cash book may be used for this purpose by recording the amount of the larger debt and, as a deduction from it, the amount of the smaller debt, the difference between the two being the amount of the receipt or the payment,

whichever is applicable. In these circumstances, the entry recording the amount of the smaller debt is usually made in red.

7. Stock movements

Where, as in the example, the stock ledger is controlled by an account in the general ledger, issues from or returns to stock are recorded in the general journal.

8. Depreciation provisions

The provision in the financial accounts for depreciation is recorded by means of the general journal.

9. Appropriations of profit

The setting aside of appropriations from profits is recorded in the journal.

10. Miscellaneous transfers

The general journal is also used for recording any other transactions which are not recorded in any other book of original entry. For example, making an issue of shares or capitalizing the cost of plant manufactured by the business's own employees.

At the end of each period, the analysis columns are totalled and cross-cast. If entries are correctly made, the aggregate of the totals of the debit columns agrees with the aggregate of the totals of the credit columns.

During the period, the individual items which appear in the analysis columns are posted to the accounts in the subsidiary ledgers and, at the end of the period, the totals of the columns, with the exception of the general ledger column, are posted to the control accounts of the respective ledgers in the general ledger.

General ledger accounts

FIXED ASSETS — A/c No. 1

19—			£	s	d	19—			£	s	d
Jan. 1	To Balance	JNL	126,000	0	0	Jan. 31	By Trade creditors' ledger control account	PCB	30	0	0
31	„ Trade creditors' ledger control account ..	PIB	1,876	0	0		„ Trade debtors' ledger control account	SIB	200	4	6
	„ Trade debtors' ledger control account	SCB	3	11	5		„ Sundries ..	JNL	490	0	0
	„ Sundries ..	JNL	583	10	0		„ Balance ..	JNL	127,742	16	11
			£128,463	1	5				£128,463	1	5

In this example, one fixed asset account is used, but in practice separate accounts are used for each class of fixed assets. As details of each asset are recorded in a subsidiary register, the fixed asset account in the general ledger is, in effect, a fixed asset register control account.

This account is debited with the cost of the fixed assets owned by a business at the beginning of the accounting period and credited with the cost of the fixed assets owned by the business at the end of the accounting period. It is debited also with the cost of new assets acquired by the business, either by way of purchase from suppliers or by manufacture by the business's own employees. The account is also credited with amounts which, in total, are equivalent to the cost of the fixed assets sold or scrapped by the business. The manner of treatment of these particular credits is of no interest in cost book-keeping.

TRADE DEBTORS' LEDGER CONTROL A/c No. 2

19—			£	s	d	19—			£	s	d
Jan. 1	To Balance	JNL	23,216	7	5	Jan. 1	By Balance	JNL	143	2	7
31	,, Sundries ..	SIB	32,785	11	2	31	,, Sundries ..	SCB	185	11	4
	,, Bank	BCBP	187	12	4		,, Bank .. .	BCBP	27,964	17	8
	,, Cash	CB	5	1	3		,, Sundries ..	JNL	485	7	10
	,, Sundries ..	JNL	394	3	2		,, Balance . ..	JNL	27,939	1	3
	,, Balance	JNL	129	5	4						
			£56,718	0	8				£56,718	0	8

This account, which in the example is shown as a single account, may be subdivided into any number of accounts, depending on the extent to which the trade debtors' ledger accounts are sectionalized. Its purpose is, of course, to control the relevant trade debtors' ledger account balances.

To this account are debited the total of the amount owing by customers at the beginning of the accounting period, the totals of the trade debtors' ledger columns in the sales, bank cash payment and cash books, and the general journal. The account is credited with the totals of the trade debtors' ledger columns in the sales credit and bank cash receipts books and the general journal. There is also credited the total of the amounts owed by customers at the end of the accounting period. It will be noted that the total of the customers' accounts which are temporarily in credit at the beginning and the end of the accounting period are separately credited and debited respectively.

STOCK LEDGER CONTROL A/c No. 3

19—			£	s	d	19—			£	s	d
Jan. 1	To Balance	JNL	33,295	6	4	Jan. 31	By Trade creditors' ledger control account	PCB	214	9	10
31	,, Trade creditors' ledger control account	PJB	14,297	18	6		,, Sundries	JNL	19,527	16	6
	,, Cash	CB	95	8	3		,, Balance	JNL	32,828	5	2
	,, Sundries	JNL	4,881	18	5						
			£52,570	11	6				£52,570	11	6

In this example, it is assumed that there is in fact a subsidiary stock ledger. In practice, however, it is not always the practice to maintain a subsidiary stock ledger in terms of money values.

To this account are debited and credited, respectively, the cost of the stock held by the business at the beginning and the end of the

accounting period. The account is debited with the totals of the stock ledger columns in the purchase invoice book, cash book and general journal and is credited with the totals of the stock ledger columns in the purchase credit book and general journal.

The debits represent purchases or returns of materials to stock and the credits represent returns of material to suppliers, allowances made by suppliers or materials issued from stock.

In this example the stock ledger control is assumed to cover raw materials, work in progress and finished goods; in practice, separate ledger accounts would be employed.

It will be seen later in the example that there are a work in progress and a finished goods control in the cost ledger. What happens is that the balances on these accounts at the beginning and end of the accounting periods are respectively transferred from and to the stock ledger control via the general journal.

COST LEDGER CONTROL — A/c No. 4

19—			£	s	d	19—			£	s	d
Jan 31	To Trade creditors' ledger control account	PIB	2,183	7	9	Jan. 31	By Trade creditors' ledger control account	PCB	44	10	6
„	„ Trade debtors' ledger control account	SIB	1,641	7	9		„ Trade debtors' ledger control account	SIB	34,191	6	2
„	„ „	SCB	181	1	4		„ „	SCB	28	11	9
„	„ Bank	BCBP	1,942	6	1		„ Bank	BCBR	194	11	6
„	„ Discount	BCBR	946	2	5		„ Discount	BCBP	651	2	8
„	„ Cash	CB	199	11	0		„ „	CB	2	16	3
„	„ Sundries	JNL	33,612	13	4		„ Sundries	JNL	5,593	10	10
			£40,706	9	8				£40,706	9	8

This account, which is in fact a profit and loss account, is debited with all costs and credited with all income – both of a non-financial nature. At the same time the account controls the accuracy of the balances in the cost ledger.

It is debited with the totals of the cost ledger columns in the purchase invoice book, sales credits book, bank cash payments book, cash book and general journal. It is also debited with the totals of the trade discount column in the sales invoice book and the cash discount column in the bank cash receipts book. It is credited with the totals of the cost ledger columns in the purchase credits book, sales invoice book, bank cash receipts book and the general journal. It is also credited with the total of the trade discount column in the sales credits book and the totals of the cash discount columns in the bank cash payments book and the cash book.

The cost ledger control account is the connecting link between the cost book-keeping and financial book-keeping systems and, for that reason, is a most important account. At any time, by adjusting the balance on the account for outstandings and stock-in-hand, the profit or loss which has arisen can be easily calculated without needing to

laboriously extract the balances on a large number of income and expenditure accounts.

The subsidiary cost ledger which this account controls provides, in effect, the analysis of the cost ledger control account.

TRADE CREDITORS' LEDGER CONTROL — A/c No. 5

19—			£	s	d	19—			£	s	d
Jan. 1	To Balance ..	..JNL	75	3	8	Jan. 1	By Balance ..	.. JNL	25,118	19	4
31	„ Sundries ..	..PCB	296	3	8	31	„ Sundries ..	.. PIB	18,653	10	11
	„ Bank ..	..BCBP	20,468	6	11		„ Bank ..	.. BCBR	43	8	5
	„ Cash ..	..CB	68	4	2		„ Sundries ..	.. JNL	943	2	5
	„ Sundries ..	..JNL	876	1	4		Balance ..	.. JNL	85	9	7
	„ Balance ..	..JNL	23,060	10	11						
			£44,844	10	8				£44,844	10	8

The purpose of this account is to control the accuracy of the trade creditors' ledger. Like the trade debtors' ledger, this ledger can be sectionalized in order to spread the work over any number of operators, as required by the circumstances. Where the ledger is sectionalized, control accounts require to be set up for each section. In this example, one account only is used.

This control account is debited with the periodic totals of the trade creditors' ledger control columns in the purchase credit book, bank cash payments book, cash book and general journal, and with the total of the balances at the end of the period of the accounts in the ledger which it controls. It is credited with the totals of these balances at the beginning of each accounting period and with the totals of the trade creditors' ledger control columns in the purchase invoice book, bank cash receipts book and the general journal.

In a manner similar to the entries in the trade debtors' ledger control, both the credit and the temporary debit balance totals in the control ledger are entered in the control account.

CAPITAL — A/c No. 6

19—			£	s	d	19—			£	s	d
Jan. 31	To Balance..	.. JNL	£130,000	0	0	Jan. 1	By Balance..	.. JNL	£130,000	0	0

This account, in a limited company, takes the form of share capital, whose details are entered in the share register. In the case of a firm, it takes the form of partners' capital. The account is only of financial book-keeping interest.

SUNDRY ASSETS AND LIABILITIES, EXPENDITURE AND INCOME — A/c No. 7

19—			£	s	d	19—			£	s	d
Jan. 1	To Balance ..	.. JNL	2,641	10	6	Jan. 1	By Balance ..	.. JNL	42,927	6	3
31	„ Trade creditors' ledger control account ..	.. PIB	296	4	8	31	„ Trade creditors' ledger control account ..	.. PCB	7	3	4
	„ Trade debtors' ledger control account ..	.. SCB	29	10	4		„ Trade debtors' ledger control account ..	.. SIB	35	8	3
	„ Bank ..	.. BCBP	11,253	1	5		„ Bank ..	.. BCBR	4,738	12	3
	„ Cash ..	.. CB	87	1	8		„ Cash ..	.. CB	486	19	3
	„ Sundries ..	.. JNL	1,454	5	3		„ Sundries ..	.. JNL	14,762	13	11
	„ Balances ..	.. JNL	49,544	12	6		„ Balance ..	.. JNL	2,348	3	1
			£65,306	6	4				£65,306	6	4

In this example, this omnibus account takes the place of the various detailed accounts of financial book-keeping interest only, which are to be found in the general ledger and which there is no point in detailing in this example. It is, in this example, debited and credited with the totals of the general ledger columns in the various books of original entry. The individual accounts in such columns would, in practice, be posted to the individual accounts which this account represents.

Cost Books

In this section the books which make up the cost book-keeping system are dealt with. None of the entries in these books is posted to any of the financial ledger accounts. They are posted only to cost ledger accounts.

Books of original entry

In this example, for convenience only, one book of original entry, namely, the cost journal, is described. In practice, the books and records which in the previous chapter are intermediate records and summaries, themselves become books of original entry from which the necessary postings may be made to the cost ledgers. Whether these books are used as intermediate records or books of original entry depends entirely on the particular circumstances of the cost book-keeping system which is established for a given business.

In this example the cost journal is used to record the following transactions:

(1) The charging of material cost, wages and 'expense' to cost centres and cost units.

(2) The crediting of sundry revenue items to cost centres.

(3) The charging of costs of service cost centres to other cost centres.

(4) The charging of costs of production cost centres to work in progress.

(5) The transfer from work in progress to finished goods, of the cost of manufactured products which are ready for sale.

(6) The transfer from finished goods to the cost of sales, of the cost of goods sold from stock.

(7) The charging to cost of sales of the costs of the selling, distribution and administration cost centres.

(8) The transfer of the balances on the accounts of cost centres (which represent costs over- or under-absorbed during the accounting period) via over- or under-absorbed costs account, to the profit and loss account.

COST JOURNAL

Date 19—	Narrative		A/c No.	Debits £	s	d	Credits £	s	d
Jan. 31	Service cost centres control account	Dr.	5	1,219	4	8			
	Production cost centres control account	,,	6	12,466	10	9			
	Selling cost centres control account	,,	7	76	10	10			
	Distribution cost centres control account	,,	8	227	5	0			
	Administration cost centres control account	,,	9	49	18	7			
	Finished goods control account	,,	12	89	5	6			
	To Material cost account		2				14,128	15	4
	Being allotment of material issues as per material issues summary.								
	Service cost centres control account	Dr.	5	1,452	1	8			
	Production cost centres control account	,,	6	5,746	13	2			
	Selling cost centres control account	,,	7	2,475	19	9			
	Distribution cost centres control account	,,	8	1,395	16	3			
	Administration cost centres control account	,,	9	856	10	4			
	To Wages account		3				11,927	1	2
	Being allotment of wages as per wages summary.								
	Service cost centres control account	Dr	5	1,908	19	10			
	Production cost centres control account	,,	6	337	2	4			
	Selling cost centres control account	,,	7	2,896	4	3			
	Distribution cost centres control account	,,	8	2,522	19	3			
	Administration cost centres control account	,,	9	783	0	11			
	To 'Expense' account		4				8,448	6	7
	Being allotment of 'expense' as per 'Expense' Summary.								
	'Expense' account	Dr.	4	848	10	5			
	To Service cost centres control account		5				848	10	5
	Being allotment of sundry revenue.								
	Service cost centres control	Dr.	5	753	2	4			
	Production cost centres control	,,	6	2,177	13	11			
	Selling cost centres control	,,	7	360	5	6			
	Distribution cost centres control	,,	8	281	11	0			
	Administration cost centres control	,,	9	396	0	7			
	Capital expenditure account	,,	15	583	10	0			
	To Service cost centres control account		5				4,552	3	4
	Being allotment of costs of service cost centres as per cost centre allotment summary.								
	Work in progress control	Dr.	11	19,880	12	6			
	To Production cost centres control		6				19,880	12	6
	Being allotment of costs of production cost centres to work produced as per production summary.								
	Finished goods control	Dr.	12	20,113	15	2			
	To Work in progress control		11				20,113	15	2
	Being transfer to finished goods stock of work completed as per production summary.								
	Cost of sales account	Dr.	13	19,889	0	5			
	To Finished goods control		12				19,889	0	5
	Being production cost of goods sold as per cost of sales summary.								
	Cost of sales account	Dr.	13	12,121	15				
	To Selling cost centres control		7				5,740	12	0
	,, Distribution cost centres control		8				4,571	3	8
	,, Administration cost centres control		9				1,809	19	11
	Being allotment to cost of sales of costs of selling, distribution and administration.								
	Service cost centres control account	Dr.	5	67	5	3			
	Distribution cost centres control account	,,	8	143	12	2			
	Over- or under-absorbed costs account	,,	10	980	9	1			
	To Production cost centres control account		6				847	7	8
	,, Selling cost centres control account		7				68	8	4
	,, Administration cost centres control account		9				275	10	6
	Being over- or under-absorbed costs transferred.								
	Profit and loss account	Dr.	16	32,991	5	1			
	To Cost of sales account		13				32,010	16	0
	,, Over- or under-absorbed costs account		10				980	9	1
	Being balances transferred to profit and loss account.								
	Sales account	Dr.	14	34,010	4	10			
	To Profit and loss account		16				34,010	4	10
	Being balance transferred to profit and loss account.								

(9) The transfer of sales effected to the profit and loss account.

(10) The transfer of the profit on sales to the profit and loss account.

The entries which have been outlined are the basic entries involved in the cost book-keeping system of a manufacturing business. In other types of business the entries naturally vary individually, and in manufacturing businesses themselves these entries are amplified in many respects. Whatever modifications may be made in practice, the entries made are in fact based on the fundamental pattern of the entries described above.

Naturally, in an illustration of this sort, it is possible to deal only with the totals of the numerous cost entries which require to be made in practice; hence, no entries are given which should be posted to the subsidiary cost ledgers. Such postings require, in practice, to be made direct, either from the cost journal voucher or from the summaries of the intermediate records upon which the cost journal entries are based. Again, where entries are numerous, postings may require to be made from the intermediate summary and not from the cost journal voucher.

Cost ledger accounts

As mentioned above in connection with the cost journal, it is impossible to show in this example any of the accounts in the subsidiary cost ledgers. The only accounts which can be dealt with are the control accounts in the cost ledger, as follows:

COST LEDGER CONTROL — A/c No. C1

19—			£	s	d	19—			£	s	d
Jan. 31	To 'Expense' account	PCB	44	10	6	Jan. 31	By 'Expense' account	PIB	2,183	7	9
,,	,, Sales account .	SIB	34,191	6	2	,,	,, ,,	SIB	1,641	7	9
,,	,, 'Expense' account	SCB	28	11	9	,,	,, Sales account ..	SCB	181	1	4
,,	,, ,, ,,	BCBR	194	11	6	,,	,, 'Expense' account	BCBP	1,942	6	1
,,	,, ,, ,,	BCBP	651	2	8	,,	,, ,, ,,	BCBR	946	2	5
,,	,, ,, ,,	CB	2	16	3	,,	,, ,, ,,	CB	199	11	0
,,	,, Sundries	JNL	5,593	10	10	,,	,, Sundries	JNL	33,612	13	4
			£40,706	9	8				£40,706	9	8

This account, which is the principal account in the cost ledger, is the counterpart of the cost ledger control account in the general ledger, which has been dealt with previously. The inclusion of this account in the cost ledger enables the trial balance of the cost ledger to be taken out independently of the financial books.

The account is compiled from the totals which were used to compile its counterpart in the general ledger. Its debits are obtained from the totals of the cost ledger columns in the purchase credits book, sales invoice book, bank cash receipts book and general journal, the trade discount column in the sales credit book and the cash discount column in the bank cash payments book and the cash book. It is also debited through the cost journal, with the total of the sundry items of income which are credited to the 'expense' account. Its credits are obtained

from the totals of the cost ledger column in the purchase invoice book, sales credit book, bank cash payments book, cash book and general journal, the trade discount column in the sales invoice book, and the cash discount column in the bank cash receipts book.

MATERIAL COST — A/c No. C2

19–		£	s	d	19—		£	s	d
Jan. 31	To Cost ledger control JNL	14,520	19	5	Jan. 31	By Cost ledger control JNL	392	4	1
						„ Sundries .. C.JNL	14,128	15	4
		£14,520	19	5			£14,520	19	5

This account is debited with the cost of materials issued from material stocks and is credited with the value of materials returned to stock. It is also credited with the total of the materials allotted to cost centres and cost units.

It is not obligatory to use this account, but where an analysis of the material cost is necessary it provides a control total for the agreement of such material cost analysis.

WAGES — A/c No. C3

19—		£	s	d	19—		£	s	d
Jan. 7	To Cost ledger control JNL	2,450	18	9	Jan. 31	By Sundries .. C JNL	11,927	1	2
	„ „ „ „	360	12	11					
14	„ „ „ „	2,468	4	2					
	„ „ „ „	363	18	8					
21	„ „ „ „	2,494	5	4					
	„ „ „ „	364	0	8					
28	„ „ „ „	2,410	0	8					
	„ „ „ „	369	0	0					
31	„ „ „ „	646	0	0					
		£11,927	1	2			£11,927	1	2

This account is debited with the gross wages and salaries, commissions, bonuses, etc., paid to the employees of the business. It is credited with the total of the wages allotted to cost centres and cost units. Like the material cost account, its use is optional, but where it is used a convenient control total is provided for the analysis of wages.

'EXPENSE' — A/c No. C4

19—			£	s	d	19—			£	s	d
Jan. 16	To Cost ledger control JNL		88	9	1	Jan. 1	By Cost ledger control JNL		157	2	11
31	„ „ „ PIB		2,183	7	9	10	„ „ „ „		65	10	0
	„ „ „ SIB		1,641	7	9	31	„ „ „ PCB		44	10	6
	„ „ „ PCBP		1,942	6	1		„ „ „ SCB		28	11	9
	„ „ „ BCBR		946	2	5		„ „ „ BCBR		194	11	6
	„ „ „ CB		199	11	0		„ „ „ BCBP		651	2	8
	„ „ „ JNL		978	0	0		„ „ „ CB		2	16	3
	„ „ „ „		648	0	0		„ Sundries .. C.JNL		8,448	6	7
	„ „ „ „		40	16	2						
	„ „ „ „		76	1	6						
	„ Sundries .. C.JNL		848	10	5						
			£9,592	12	2				£9,592	12	2

To this account is debited the totals of the cost ledger column in the purchase invoice book, bank cash payments book and cash book (all of which contain 'expense' items only), the trade discount column in the sales invoice book and the cash discount column in the bank cash

receipts book. It is also debited with the individual entries in the general journal which are of an 'expense' nature.

The 'expense' account is credited with the totals of the cost ledger columns in the purchase credits book and bank cash receipts book, the totals of the trade discount column in the sales credit book, and the totals of the cash discount columns in the bank cash payments book and cash book. It is also credited with the individual items of an 'expense' nature which appear in the general journal and, through the cost journal, with the total of the amounts debited to this account which are allotted to cost centres and cost units. Like the previous two accounts, the 'expense' account is not essential but is useful for controlling the accuracy of an 'expense' analysis.

SERVICE COST CENTRES CONTROL — A/c No. C5

19—			£	s	d	19—			£	s	d
Jan 31	To Material cost account	C JNL	1,219	4	8	Jan. 31	By 'Expense' account	C.JNL	848	10	5
	,, Wages account	,,	1,452	1	8		,, Sundries	,,	4,552	3	4
	,, 'Expense' account	,,	1,908	19	10						
	,, *Contra*		753	2	4						
	,, Over- or under-absorbed costs account	,,	67	5	3						
			£5,400	13	9				£5,400	13	9

The purpose of this account is to control the accuracy of the detailed service cost centres accounts in the subsidiary ledger, and to show the relationship between the costs incurred and charged by the service cost centres to other cost centres. It is debited with the cost of materials, wages and 'expense' incurred by service cost centres, and the charge to individual service cost centres of the costs of other cost centres. It is credited with the total of the 'income' which goes to reduce the cost of the service cost centres. It is also credited with the total of the cost of service cost centres charged to other cost centres.

At the end of each period, it is debited or credited with the balance on the account. This represents the amount by which service cost centre costs are under- or over-absorbed.

PRODUCTION COST CENTRES CONTROL — A/c No. C6

19—			£	s	d	19—			£	s	d
Jan. 31	To Material cost account	C JNL	12,466	10	9	Jan. 31	By Work in progress control	C.JNL	19,880	12	6
	,, Wages account	,,	5,746	13	2		,, Over- or under-absorbed costs account	,,	847	7	8
	,, 'Expense' account	,,	337	2	4						
	,, Service cost centres control account	,,	2,177	13	11						
			£20,728	0	2				£20,728	0	2

This account is designed to control the accuracy of the subsidiary ledger which contains the accounts of the individual production cost centres and to show at any time the difference between the totals of

the costs incurred by production cost centres and the costs allotted to production as represented by work in progress.

The account is debited with the cost of materials, wages and 'expense' incurred by production cost centres and with the cost of the service cost centres which supply ancillary services to the production cost centres. The account is credited with the total of the costs absorbed by the cost units produced.

SELLING COST CENTRES CONTROL — A/c No. C7

19--			£	s	d	19—			£	s	d
Jan. 31	To Material cost account	C.JNL	76	10	10	Jan. 31	By Cost of sales account	C.JNL	5,740	12	0
	„ Wages account	„	2,475	19	9		„ Over- or under-absorbed costs account	„	68	8	4
	„ 'Expense' account	„	2,896	4	3						
	„ Service cost centres control account	„	360	5	6						
			£5,809	0	4				£5,809	0	4

This account controls the accuracy of the subsidiary selling cost centres ledger. It also shows the difference between the costs incurred by and the costs absorbed from the selling cost centres.

It is debited with the cost of materials, wages and 'expense' which are incurred by the selling cost centres and with the total of the cost of services supplied by the various service cost centres. It is credited with the total of the selling costs absorbed by the products or services sold by the business.

At the end of each accounting period the account is debited or credited with the over- or under-absorbed cost balance on the account.

DISTRIBUTION COST CENTRES CONTROL — A/c No. C8

19—			£	s	d	19—			£	s	d
Jan. 31	To Material cost account	C.JNL	227	5	0	Jan. 31	By Cost of sales account	C.JNL	4,571	3	8
	„ Wages account	„	1,395	16	3						
	„ 'Expense' account	„	2,522	19	3						
	„ Service cost centres control account	„	281	11	0						
	„ Over- or under-absorbed costs account	„	143	12	2						
			£4,571	3	8				£4,571	3	8

The accuracy of the subsidiary ledger which contains the individual accounts of distribution cost centres is controlled by this account. It also reveals the over- or under-absorption of distribution costs.

It is debited with the cost of materials, wages and 'expense' incurred by distribution cost centres and the costs of services provided to the distribution division. It is credited with the total of the distribution costs absorbed by the products or services supplied to customers. The balance, which represents the over- or under-absorption of distribution costs, is debited or credited as required at the end of each accounting period.

ADMINISTRATION COST CENTRES CONTROL — A/c No. C9

19—			£	s	d	19—			£	s	d
Jan. 31	To Material cost account	C.JNL	49	18	7	Jan. 31	By Cost of sales account	C.JNL	1,809	19	11
	„ Wages account	„	856	10	4		„ Over- or under-absorbed costs account	„	275	10	6
	„ 'Expense' account	„	783	0	11						
	„ Service cost centres control account	„	396	0	7						
			£2,085	10	5				£2,085	10	5

The accuracy of the accounts in the administration cost centres subsidiary ledger is controlled by this account, which at the same time reveals the amounts by which administration costs have been over- or under-absorbed by the products or services sold. It is debited with the costs incurred by administration cost centres in the form of materials, wages, 'expense' and services provided by other cost centres. It is credited with the amount charged by way of absorption to the cost of sales effected.

The over- or under-absorption of administration costs is debited or credited periodically to this account.

OVER- OR UNDER-ABSORBED COSTS — A/c No. C10

19—			£	s	d	19—			£	s	d
Jan. 31	To Sundry cost centre control accounts	C.JNL	£980	9	1	Jan. 31	By Profit and loss account	C.JNL	£980	9	1

This account brings together the amounts by which the costs of the various cost centres are over- or under-absorbed. The balance on this account at the end of each period is transferred, if costs are under-absorbed, to the debit of the profit and loss account and, if over-absorbed, to the credit of the profit and loss account.

WORK IN PROGRESS CONTROL — A/c No. C11

19—			£	s	d	19—			£	s	d
Jan. 1	To Cost ledger control	JNL	2,785	6	6	Jan. 31	By Finished goods control	JNL	20,113	15	2
	„ Production cost centres control	C.JNL	19,880	12	6		„ Cost ledger control	JNL	2,552	3	10
			£22,665	19	0				£22,665	19	0

The purpose of this account is to indicate the cost of the products which are in course of manufacture, that is to say, products which are at various stages of manufacture between the issue of the raw materials and the transfer of finally completed products to the finished goods warehouse.

The account has been called a control account in this example, but, in practice, it may or may not be an account which controls a subsidiary ledger, depending on individual circumstances. In certain cases, detailed records in the form, for example, of costs of jobs or contracts are maintained in a subsidiary ledger, and in such cases a control account

is essential. In other circumstances it is unnecessary to keep detailed records of work in progress and the work in progress account in the cost ledger is used solely to provide a cost valuation of the work in progress at any time.

The control account is debited with the value of the work in progress at the beginning of an accounting period and with the costs of materials, wages and 'expense' allocated or, through the production cost centres, apportioned to the work in progress. The account is credited with the cost of the finished products taken into the warehouse and with the cost valuation, which is a balancing figure, of the work in progress at the end of an accounting period.

FINISHED GOODS CONTROL — A/c No. C12

19—			£	s	d	19—			£	s	d
Jan. 1	To Cost ledger control	JNL	1,528	19	9	Jan. 31	By Cost of sales	C.JNL	19,889	0	5
31	„ Material cost account	C.JNL	89	5	6		„ Cost ledger control	JNL	1,843	0	0
	„ Work in progress control	„	20,113	15	2						
			£21,732	0	5				£21,732	0	5

This account performs the same function for finished goods as the work in progress control performs for work in progress, and its use as a control or valuation account is determined by the same circumstances as the work in progress control.

It is debited, through the general journal, with the cost of finished stock in hand at the beginning of the accounting period; through the cost journal with goods purchased by the business in a form which is suitable for immediate resale and with the cost of completed products taken from work in progress into the finished goods warehouse. It is credited, through the cost journal, with the cost of products sold by the business and with the cost of the finished goods in stock at the end of the accounting period.

COST OF SALES — A/c No. C13

19—			£	s	d	19—			£	s	d
Jan. 31	To Finished goods control	C.JNL	19,889	0	5	Jan. 31	By Profit and loss account	C.JNL	32,010	16	0
	„ Sundry cost centre control accounts	„	12,121	15	7						
			£32,010	16	0				£32,010	16	0

The purpose of this account is to bring together all the costs which relate to the goods or services sold by a business. It is accordingly debited, through the cost journal, with the cost of the goods or services sold and the costs of selling, distribution and administration apportioned to them. The sole credit to this account is the transfer to profit and loss account of the cost of sales.

SALES — A/c No. C14

19—			£	s	d	19—			£	s	d
Jan. 31	To Cost ledger control account	SCB	181	1	4	Jan. 31	By Cost ledger control account	SIB	34,191	6	2
„	Profit and loss account	C.JNL	34,010	4	10						
			£34,191	6	2				£34,191	6	2

This account records on the credit side the total of the sales effected during a period as shown by the total of the gross sales column in the sales invoice book. Sales returns and allowances are debited from the total of the gross credits column in the sales credit book. The balance on this account is transferred, via the cost journal, to the profit and loss account.

CAPITAL EXPENDITURE — A/c No. C15

19—			£	s	d	19—			£	s	d
Jan 31	To Service cost centres control account	C.JNL	£583	10	0	Jan. 31	By Cost ledger control	JNL	£583	10	0

In this account is recorded the total of the work carried out by a business's own employees on the production of equipment, buildings, etc., which require to be capitalized. The amount of the work so carried out is not included as a charge in costs but is transferred out of the cost ledger by means of an item crediting this account and debiting the cost ledger control account.

PROFIT AND LOSS — A/c No. C16

19—			£	s	d	19—			£	s	d
Jan. 31	To Sundries	C.JNL	32,991	5	1	Jan. 31	By Sales	C.JNL	34,010	4	10
„	Cost ledger control	JNL	1,018	19	9						
			£34,010	4	10				£34,010	4	10

The final basic account in the cost ledger brings together the sales effected during a period and the total cost of manufacturing, selling and distributing the goods or services to customers.

The difference between costs and sales which represents the profit or loss is transferred by means of the general journal from this account to the cost ledger control account, thus closing off, apart from stocks of work in progress and finished goods, the cost ledger.

As has been stated in the course of this chapter and must be reiterated at its close, there has been set out a description and illustration of the basic financial and cost book-keeping system upon which the book-keeping structure applicable to any particular business may be based. Certain terms and titles have been used as a guide. Those other terms and titles used in different businesses, industries and trades may be substituted for these when the occasion demands. Providing the principles and practices of book-keeping employed in particular circumstances are basically sound, it does not matter by what name the records or accounts are described.

SYNOPSIS OF CHAPTER XX

APPLICATION AND DESIGN OF FORMS

	Page
Introduction	86
Advantages of properly designed forms	86
The aspects of form design	87
Wording	88
Application	88
Form	88
Type face	88
Layout	89
Spacing	89
Application	90
Size	90
Layout	90
Ruling	92
Application	92
Type	92
Layout	93
Paper	93
Size	93
Thickness	94
Quality	94
Colour	95
Quantity	95
Make-up	95
Punching	96
Perforating	96
Scoring	96
Cutting	96
Carbon backing	96
Form schedules	97

Chapter XX

APPLICATION AND DESIGN OF FORMS

THE first element of the process of cost accounting to be considered is forms. This chapter is devoted, therefore, to considering the essentials of form design in relation to their applications.

A form may be described as a piece of paper or card upon which information is recorded and which is ruled or printed in such a way as to indicate what information is to be recorded and to limit the space where it can be recorded.

Advantages of Properly-designed Forms

The advantages of properly-designed forms are:

(1) They regularize the form in which information is prepared. This makes it easier for the person who makes the record, because, in place of recording the information according to his personal ideas, he records the information according to the instructions contained in the form, in certain well-defined areas of the form. It also helps the person using the information because he can quickly locate the portions of the information required by him and, moreover, where several identical forms are used, he can expect to find the information he requires recorded always in the same section of the form.

(2) They regularize the size and shape of the paper upon which information is recorded, in this way making it easier to handle the documents and enabling filing methods and facilities to be standardized.

(3) Their use eliminates the need for the repeated recording of non-variable information, with a consequent saving of time.

(4) They facilitate the preparation of accurate copies and enable colour coding for routing purposes to be employed.

(5) They enable a regular routine to be established for the handling of forms and the use of the information supplied by them.

In short, the use of forms ensures that formal methods are substituted for informal methods of recording information.

Much time can be saved by the production of forms for all stages in the cost accounting process, because, where the time taken to record headings of a non-variable nature can be saved, a form is justified; and this applies to final statements of information to the same extent as to basic documents. Formal documentation should be applied, therefore,

to all information from the recording of the basic data on which costs are constructed, to the presentation of the final results to those members of management who require such information.

The Aspects of Form Design

In designing a form, four main aspects of design must be considered, as follows:

Wording	*Spacing*	*Ruling*	*Paper*
Application	Application	Application	Size
Form	Size	Type	Thickness
Type face	Layout	Layout	Quality
Layout			Colour
			Quantity
			Make-up
			Punching
			Perforating
			Scoring
			Cutting
			Carbon backing

When considering each of these aspects of design, consideration must be given to the following factors which have an influence on form design.

(1) What information is to be provided by the form?
What forms are to be prepared from the information?
What information is, for that purpose, to be recorded on the form?
What forms are to be used to supply the information recorded on the form?
What operations will be carried out on the form?

(2) Who will use the form – an operative; a clerk; a typist; a manager?

(3) Where will the form be used – in the open; in a dirty workshop; in an office; on a desk; supported by hand?

(4) How will the various operations be carried out – by hand; by typewriter; by accounting machine?

(5) When will the form be used – once only or several times; once a day, month or year; to cover a day, week or month?

(6) Why is the form required – because the information is not supplied at all; because existing forms are inadequate or unsatisfactory?

When a person is designing a form, the answers to these questions enable him to decide whether an existing form supplies, or can be made to supply, the required information or, if a new form is to be instituted, to deal satisfactorily with each of the aspects of form design which have been mentioned.

In the remainder of this chapter the various aspects of form design will be discussed in relation to the appropriate factors which influence the design.

Wording

The aspects of wording which must be considered are the application of words to a form, the form which the wording should take, the type face used to print the wording and the layout of the wording on the form.

APPLICATION

The wording on a form should consist of:

(1) the title of the form;
(2) a reference number;
(3) where several copies are made simultaneously, a copy number;
(4) descriptions of information contained in panels, boxes, columns and lines;
(5) line and column numbers and formulae which embody the numbers of the columns whose contents are to be included in arithmetical processes;
(6) where necessary and possible, instructions as to what information is to be recorded on the form and how the form is to be used.

It is not necessary on internal forms to include the name of the business.

FORM

The characteristics of good form are that titles, references, descriptions, etc., should be appropriate, brief and explicit (the latter being related to the intelligence and training of the persons who use the form). It is important that titles and descriptions should clearly describe the contents of the information to which they refer, particularly where quantities or values are described or units of measurement are given. Where identical information appears on several forms, it is obviously desirable that the descriptions or titles relating to it should be identical on all forms.

TYPE FACE

Many styles and sizes of type are available for printing forms. As descriptions, instructions, references, etc., should be easy to read, it is frequently important to consider the lighting conditions in which the form is used, because, where such conditions are bad, small type or type printed in pale ink may be unreadable. Where internal forms are familiar to the persons using them, smaller type may be used.

Generally, the rule is that one style of type should be used throughout, except where it is necessary to give special emphasis or contrast by the use of reverse type. Capital letters may be used for panel and box headings, but capitals and lower case should be used for line headings

and textual matter. At all costs, the form should look attractive and try to avoid giving a complicated appearance; and the choice of good type face assists in this direction.

LAYOUT

The wording on a form should be so arranged that information is recorded (as in writing) from left to right, from top to bottom, so that the person recording the information does not have to dodge about from one place to another. To enable this to be done the sequence of information on the form from which it is taken should be the same as the sequence of information on the form on which it is entered. As a general rule, therefore, a standard layout should be adopted in a series of forms relating to the same subject.

The following particular points regarding layout should be noted:

(1) Where recording is done on a typewriter or accounting machine, the lines of type should coincide with the vertical spacing on the typewriter (1/6th inch) or accounting machine.

(2) If certain entries are made on a typewriter by reference to previous entries on a form, the latter entries must be visible without moving the form.

(3) Where forms are wide, line descriptions may be repeated in the middle or at the right-hand side of the form.

(4) Where columns are narrow or descriptions long, column titles may be placed vertically, diagonally or horizontally to link up with extensions of the columns. The alternative method is to print the long titles in a separate part of the form together with references to the appropriate columns. Long titles may be divided over two or more lines, or abbreviations may be used for long words.

(5) Where forms are made up in books or pads, instructions may be printed inside the cover page.

(6) Where the information on one form is to be checked against the information on another, checking is simplified if the entries on one of the forms is placed at the edge of the form.

(7) Serial numbers should, for ease of reference when handling a batch of forms, be placed at the top right-hand corner, while the number of the copy should be located at the right-hand bottom corner.

Spacing

The aspects of spacing to be considered are the application of spacing, the dimensions of the spaces, and the layout of the spaces.

APPLICATION

Spaces are used as follows:

(1) To segregate different portions of information which require to be recorded.

(2) To segregate the spaces to be used by each person using the form and to provide margins for filing, supporting the hand during hand writing and gripping in typewriters or accounting machines.

(3) To make provision for wording, where required, check marks and the initials of the persons who use the form.

SIZE

The size of the spaces is determined by the following:

(1) The quantity of information to be recorded. This should, of course, be kept at a minimum and in this connection large spaces frequently encourage verbosity which wastes time in reading. It should be noted that where totals of columns consist of a larger number of digits than items in the column, the space for the total should be allowed to exceed the width of the column.

(2) The type of person who will use the form. Generally, persons who are unskilled in clerical work, such as workshop employees, require more space to record information than persons accustomed to such work.

(3) The place where a form is to be used. Where a desk or bench is not available for recording, it may be impossible to limit the size of the written characters to the space provided.

(4) The means by which the various operations are carried out. More horizontal space is required for handwriting than for typewriting and machine recording. The typewriting space which should be allowed is 10 pica or 12 elite characters per inch.

The vertical spacing which should be provided is, if handwritten by clerks, four lines to the inch or, if typewritten or handwritten by non-clerical workers, three lines to the inch.

Where circular stamps are used for imprinting, adequate room should be provided to allow for inaccurate registration when stamping at speed.

LAYOUT

In laying out the spaces on a form, it is essential that the form should not present a patchwork appearance. To this end, all panels, boxes, columns, etc., should be aligned both horizontally and vertically as far as possible.

The following particular points should be noted:

(1) Adequate margins must be provided where side clips on typewriters limit the typing space or where the forms require to be filed in binders and recording is required to be done after such filing. Regard must also be paid to the difficulty, in certain circumstances, of writing on spaces near the bottom of the form without the use of a support.

In providing for a margin, it must be remembered that the margin at each side must be identical on both sides of a form. This, in turn, depends on the manner in which both sides are printed. (*See* page 96.)

(2) If accounting machines are used, their mechanism may limit certain entries to certain printing positions.

(3) Where an entry is made by addressing machine, the distance between the space in which the entry is to be made and the edge of the form is limited by the length of the printing arm. If the latter distance is exceeded, the form requires to be folded before the entry is made.

(4) Where entries are made by repetitive stamping, the space for such entries should be placed as near the corner as possible so that turning over is facilitated.

(5) Where a form is to be enclosed in a window envelope, the space for the name and address must be located according to the position of the window.

(6) On typewritten forms, the spaces should be so arranged as to enable the tabulator stops to be used for all lines and to enable several items to be typed on one line.

(7) In the layout of columns and lines, provision should preferably be made for items to be cast vertically. Where, however, cross-casting is unavoidable, it is preferable that cross-casting should be continuous and not interrupted by intervening columns which require to be skipped.

(8) Where mixed addition and subtraction is involved, it is preferable that separate columns should be provided for the totals of the items added and subtracted respectively.

(9) Where the number of digits in a total of a column of figures is greater than the number of digits in the items, the spaces for the total may be staggered.

While it is desirable that the foregoing points regarding the layout of spaces should be observed, certain of them are in fact contrary to others. Thus what may be desirable from the recording point of view may not be desirable from a using point of view and vice versa.

Ruling

There must be considered in this connection the application, type and layout of lines.

APPLICATION

The lines on a form are used for the following purposes:

(1) To limit the spaces in which information is to be recorded.
(2) To segregate the sections of the form to be used by different persons.
(3) To focus each user's attention to the section of the form with which he is concerned.
(4) To guide the hand where the form is handwritten.
(5) To obscure portions of the form which must not be written on.
(6) To assist in carrying out clerical operations.

TYPE

Lines may be ruled singly or doubly; in various thicknesses; continuous or broken; in the form of shading, symbols or printer's ornaments, and in a variety of colours. The uses of these various types of lines are as follows:

(1) Double lines may be used to outline columns and column headings. In all other cases single lines should be used.
(2) The heaviest type of line should be used for identification symbols. Progressively lighter lines should be used for emphasizing panels or boxes containing the most important information, guiding the eye in recording and cross adding by emphasizing, for example, every fifth line and all total columns; for outlining panels and boxes which do not require emphasis; and for defining lines for handwriting.
(3) Dotted guiding lines should be printed horizontally and vertically in money or quantity columns if figures are handwritten. If the information is typewritten, lines can be dispensed with. Broken lines can be used to indicate the perforations on a form.
(4) Shading can be used to emphasize certain lines or columns to assist recording and cross adding. It may also be used to ensure that certain parts of a form are not written upon. Printer's ornaments can also be used for this purpose.
(5) The operations of sorting, analysing, collating, etc., are assisted by the printing of symbols consisting of triangles, squares, diamonds, parallel lines, etc.
(6) Lines of a contrasting colour may also be used to emphasize every fifth line and total columns. Printing in more than one colour, however, adds to the cost.

LAYOUT

The following points regarding the layout of lines should be observed:

(1) As far as possible, lines should be drawn continuously and not broken, so that the form does not have a patchwork appearance.
(2) Lines setting out the spaces for column headings should be ruled in family tree form, so that descriptions which are common to a number of columns extend over the columns to which they refer.
(3) If several documents are recorded simultaneously, accurate registration of lines on all such documents is essential.
(4) Typing can be assisted by the printing of short guide lines at the edge of a form or by a single line to be used as a warning against typing too near the bottom margin of the form.
(5) The folding of forms can be assisted by printing a line where the fold should be made or, preferably, to which the edge of the form should reach when folded.
(6) Printer's ornaments should be used to mask portions of the form which must not be written on.
(7) Heavy line symbols should be placed for ease of reference at the right-hand top corner of the form.
(8) To assist the operation of analysis, long code numbers should be split up into conveniently sized groups of digits by means of short vertical lines.

Paper

Considerable economies, not only in the initial cost of a form but in the time and cost of using the form, can be effected by the choice of the most suitable paper for the particular requirements of the form. The different considerations which affect the choice of paper are as follows:

SIZE

The size of a form is determined by the following factors:

(1) The space required to record information.
(2) The standard size of paper nearest to the size required.

When the design of a form is laid out, it should be related to the standard size of paper which is nearest to the size required. It is essential that standard sizes of paper should be employed as, if the additional cutting of standard sizes of paper or of special sizes of paper is required, the cost is increased. Therefore the design should be made to fit a standard size of paper, either by expanding or by contracting the design.

(3) The operations to be carried out on the form.

Where several copies require to be taken of a form, it is difficult to maintain the accurate registration of large forms without the use of special holding devices. If only a certain size of filing equipment is

available, the size of sheet which can be adequately protected at the edges is limited. In this connection it is frequently better to use two forms of half-size or even three forms of one-third size. If a form is to be enclosed in an envelope, regard should be paid to the standard size of envelope available. Large forms are also difficult to sort. The length of platen on a typewriter or accounting machine limits the size of the form.

(4) The conditions in which the form will be used.

If used in the open air, small forms may be lost, while large forms are unmanageable.

(5) The person who uses the form.

If it is used by an operative in an open workshop, any but the smallest forms are likely to be folded several times and put in the pocket of an overall, thus creasing and smearing the information.

THICKNESS

Thickness of paper, which partially determines the space occupied by a set of records, is determined by the following:

(1) The number of copies of the information which is required simultaneously. The greater the number of copies, the thinner must the paper be. If both sides of the paper are to be used, thicker paper is necessary.

(2) Where the form is to be used. Thin paper is difficult to handle out of doors and if filed in a drawer, cabinet, posting tray, etc., it does not remain upright. In these circumstances a card is usually required.

(3) The manner in which the form is used. If entries are made by pen, the danger of the nib tearing the paper must be provided for. Large forms soon tear if filed in ring or post binders.

(4) The number of times the form is to be used. If used several times, the paper must be capable of surviving the additional handling.

QUALITY

The quality of the paper used for a form is very closely related to thickness of paper and is determined by the following:

(1) The number of copies required.

If thin paper is required the quality must ensure that the paper will be capable of surviving. If practicable, transparent paper may be used in conjunction with double-sided carbons which make copies on the under side of one of two adjacent transparencies.

(2) The person using the form.

Information should be presented on better quality paper than that on which data is built up. Similarly, better quality paper should be used where a form is to be handled by persons outside the business.

(3) The method of using a form.

If entries are made by pen, a calendered surface and not an absorbent or rough surface should be used. If made by pencil, a rough surface is preferable to a calendered surface. The type of accounting machine employed may also affect the quality of paper. Economies in postage can be effected by using lightweight forms.

(4) The frequency of use of the form.

If used several times, a hard-wearing quality of paper is required. Where the form is to be used for permanent recording, good quality paper is essential.

COLOUR

This is determined by the following:

(1) The number of copies required.

Where a different colour is required for each copy, the number of colours required is determined by the number of copies. The colours used should be progressively lighter from the top to the last copy, so that all impressions are as legible as possible. The risk of eyestrain should be guarded against by the avoidance of reddish tints.

(2) The colour of related forms.

It is an advantage to be able to distinguish by colour between one form and another, particularly where it is necessary to collate a number of different forms.

(3) The place where the form will be used.

In a workshop buff-coloured forms make soiling less obvious.

QUANTITY

The quantity of forms which should be provided is determined by the following:

(1) The number of copies which require to be made simultaneously.
(2) The rate of use of the form.
(3) The period of time which the supply is intended to cover. In this connection, the first supply of a form should cover a short period as, if modifications are necessary, the expense of an excessive supply is avoided.
(4) The time required to obtain a fresh supply of forms.

Make-up

Forms may be made up in single or continuous sheets or sets, gummed pads, or in bound books. The method of make-up is determined by these factors:

(1) The number of copies to be provided.

Where several copies are to be provided simultaneously, forms should

be made up in single or continuous sets or in pads. They may or may not be interleaved with carbons. For this purpose, coloured carbons are available.

(2) The security which must be provided.

This determines whether the forms should be bound in book form, made up in pads or in numbered sets, or left loose.

(3) The place where the form is to be used.

Carbon copies are difficult to take in conditions of wind and rain. In places where writing desks are not conveniently placed, writing boards are necessary to support the documents.

(4) The manner in which the form is used.

If used in a typewriter or accounting machine, perforated continuous stationery, with or without interleaving carbons or rolls of paper, can be applied to the best advantage. In connection with machine accounting, the forms may be printed on both sides, either head to head or head to foot, i.e. 'tumble turn'. The latter has a distinct advantage in handling over the head to head form.

Handwritten forms made up in pads gummed along the bottom edge are less liable to become dog-eared. Where simultaneous records are made, good registration is provided by gummed pads or sets. These also keep unused forms in good condition.

Punching

If forms are filed in a ring- or post-binder, or are registered on a typewriter or accounting machine by means of a sprocket alignment device, holes must be punched in the required places.

Perforating

Perforations are required in continuous stationery, in certain form sets and where portions of a form require to be detached.

Scoring

The folding of cards is made easier by scoring the cards.

Cutting

Where cards require to be filed or sorted, the top right-hand corner should be cut off so that a card placed the wrong way round may be located. The dog-earing of cards etc. can be prevented by cutting off curved portions of all corners. The extraction of carbons is facilitated by cutting away one corner.

Carbon backing

Where handling can be assisted by eliminating the insertion or removal of loose carbons and where copies of certain sections only of a form

require to be copied, the forms may be carbon-backed. Carbon backing is, however, more expensive than loose carbons and may, at times, soak through the paper and obscure pencil entries made over it.

Although the different aspects of form design have been considered separately, in practice they must be viewed simultaneously when designing the forms and records required for cost accounting, because they are interdependent. For example, a variation in the method of recording may affect the spacing which, in turn, affects the size of the paper. This may require the rearrangement of the sections for recording the information which, in turn, may influence the design of a related form and the method of filing.

Again, what may appear a satisfactory design on paper may prove to be unsatisfactory in practice. For that reason, when instituting a form it is better to have a trial run of forms made out on the office duplicator and tested in practice before having a large quantity printed.

From the point of view of economy, it is essential, not only to design and use the form correctly, but also to review frequently the design and use of the forms which are being used, with a view to effecting improvements in design and use and to eliminating forms which are no longer required and whose preparation is becoming, in fact, an unquestioned routine. In this connection, consideration should be given to the possibility, where the major function of a number of existing or proposed forms is identical, of making one form combine several functions. In this way, a desirable reduction in the number of forms can be made.

Form Schedule

To this end, each form should bear a number which identifies it and relates it to a form schedule, which may be drawn up in the form shown overleaf.

This schedule, which assists in the review of the use of forms and records, gives, in respect of each document, details of operations and methods of carrying them out, items of equipment, operator and operation speeds. At the same time, references to related schedules are provided as follows:

Column (5) to Operation Schedule (see page 192)
,, (7) to Equipment Schedule (see page 192)
,, (9) to Organization Chart (see page 200)

Alterations can be made to the information on the schedule in any convenient way.

In connection with the instruction of the persons using the form, such instructions may be incorporated in a form instruction, which will be dealt with in a later chapter.

FORM SCHEDULE

Page 1

Line	Document		Operation		Equipment		Operator	No. of documents		Hours Employed (11)= (9)÷(10)
	Description	No.	Description	Opn. Chart ref.	Description	Equipment Chart ref.	Orgn. Chart ref.	per period	per hour	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
1										
2										
3										
4										
5	Sales invoice	S101	Recording	11	Electric Typewriter	814	304	2,000	20	100
6			Checking	13	Visual	—	308		33	60
7			Multiplying	14	Rotary Calculator	916	403		60	33
8			Posting	16	A.B. Accounting					
9					Machine	1,011	513		120	17
10										
11										
12										
13										
14										

SYNOPSIS OF CHAPTER XXI

CLERICAL PROCEDURES AND METHODS

	Page
Introduction	103
Producing	103
By hand	103
By standard typewriter	103
By electric typewriter	104
By spirit duplicator	104
By stencil duplicator	104
By offset litho machine	106
By type-set machine	107
Recording	107
By hand	107
By hand on a recording device	108
Manifold register	108
Cash register	108
Signature time recorder	109
Copy-writer	110
By a machine which is operated manually	110
Typewriter	110
Adding listing machine	114
Cash register	114
Keyboard accounting machine	115
Time recording clock	121
Radial recorder	121
Card recorder	121
Key recorder	123
Addressing machine	123
Time stamp	124
By a machine which is operated mechanically	124
Punched-card tabulating machine	124
Punched-card interpreter	125
Addressing machine	126
Posting machine	128
Adding and subtracting	137
Mentally	137
By non-listing adding machine	137
By adding listing machine	137
By accounting machine	139

Page

By high-speed adding machine 139
By cross-adding punch 140

Multiplying and dividing 140
Mentally 140
By table 142
By slide rule 142
By non-listing adding machine 142
By calculating listing machine 143
By rotary calculating machine 143
By keyboard accounting machine 143
By punched-card multiplying punch . . . 144
By electronic computor. 144

Punching 146
By hand punch 146
By hand-operated key punch 146
By tabular skipping key punch 146
By hand-operated gang punch 147
By automatic duplicating punch 147
By treadle-operated gang punch 147
By automatic key punch 148
By tape to card machine 148
By multiplying punch 148
By cross-adding punch 149
By summary card punch 149
By high-speed adding machine 149
By reproducing punch 149
By mark-sensing reproducing punch . . . 149

Verifying 151
By repetition of the process whose results are verified 151
By agreement of totals with predetermined totals . 153
By needling 154
By hand-operated key verifier 154
By automatic verifier 154
By digiting on a punched-card tabulator . . . 154

Sorting 157
On a flat surface 157
By means of a flap sorter 157
By means of pigeon-holes 158
By means of a fan sorter or concertina file . . 160
By needling 160
By mechanical sorter 160

	Page
Selecting	161
By visual inspection	161
By needling	162
By mechanical sorter	162
Collating	163
On a flat surface	163
By means of a collating stand	163
By means of a mechanical collator or interpolator	164
Analysing	164
On columnar paper with parallel total column	164
On columnar paper without parallel total column	166
By pegboard and pegslips or 'Summarizer'	166
On consecutive cards or sheets	167
Copying	167
Direct copying	167
By means of carbons	167
By means of carbon-backed stationery	167
By roller copier	168
By reflex photocopying	168
By microphotography	169
Posting	169
From documents	171
Bulk posting	171
Multiple posting	171
Dual-run posting	171
Slip posting	172
From records	172
Dodge posting	172
Exhaust posting	172
Filing	173
In bound books	173
In loose-leaf binders	173
In box files	174
In small drawers or trays	174
In large drawers	177
In large trays	178
In ledger posting binders	180
Indexing	181
Book index	181
Card index maintained separately	181
Strip index	181

	Page
Card index combined with record	185
In loose-leaf books	185
In metal trays or panels	185
In card-wheels	188
Folding and inserting	188
The factors which affect the choice of method	190
Speed	191
Volume	191
Cost	191
Operation schedule	193
Equipment schedule	193

Chapter XXI

CLERICAL PROCEDURES AND METHODS

Although the documents upon which information is recorded must first be made available before the clerical operations can be carried out upon them, the operations through which records pass must be determined and their method of performance must be studied before the design of these documents can be attempted. In order of precedence, therefore, clerical procedures and methods must be considered before the application and design of forms.

The operations which may be carried out in preparing and maintaining cost accounting records are as follows:

Producing	Selecting
Recording	Collating
Adding	Analysing
Subtracting	Copying
Multiplying	Posting
Dividing	Filing
Punching	Indexing
Verifying	Folding
Sorting	Inserting

Producing

Although producing documents is not a clerical procedure, it is of sufficient importance in relation to the application and design of forms to merit attention being paid to it. The various methods of producing documents are as follows:

1. By hand

Where a single document is required, it can be drawn and lettered by hand, using a pen or pencil. Where thin paper can be employed, up to five additional copies can be obtained by using a ball pen or hard pencil and pen or pencil carbon paper. The method is naturally severely limited in application as only a very small number of documents can be obtained at one ruling.

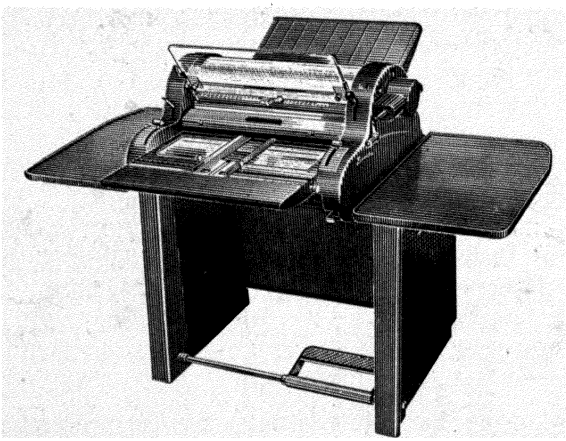
2. By standard typewriter (*See also* page 110)

The number of copies obtainable by the use of a standard typewriter is no greater than that obtainable by hand production on thin paper. The superiority of the typed over the handwritten document is, of course, its

appearance. The varieties of type obtainable from a standard typewriter are, however, limited. Variations can be obtained only by the use of capital and lower case letters, spacing between letters and underlining. Different forms of type may, however, be obtained by the use of a varityper which, being expensive, is rarely economical.

By the use of special lining devices, the number of copies which can be obtained from a standard typewriter can be increased to about ten.

3. By electric typewriter (*See also* page 110)
The use of such typewriters enables a larger number of documents (up to about twenty) to be produced at a single typing. The typing is, in addition, more legible and even than that of a standard typewriter.



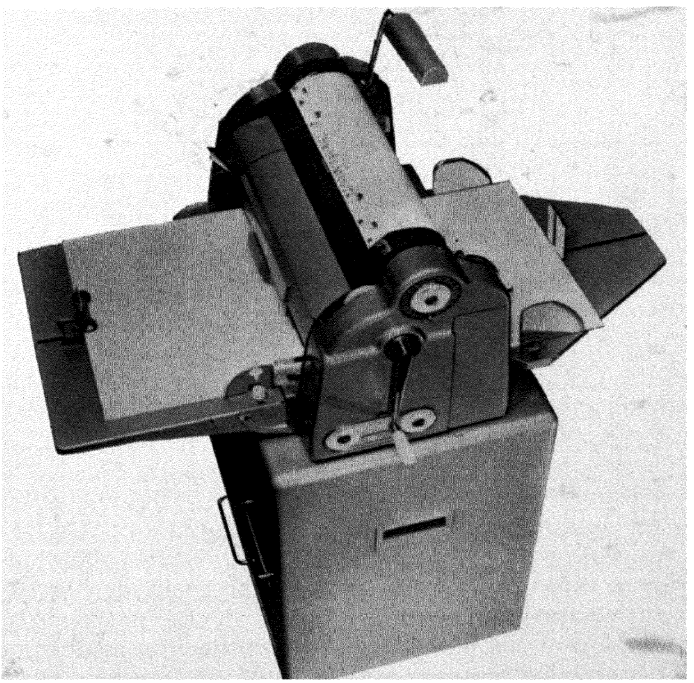
Banda Spirit Duplicator, Model 170ES

4. By spirit duplicator (*See also* posting machine, page 128)
This, the first of three methods to employ a master sheet prepared by hand or by typewriter, is the simplest machine for producing up to 100 documents and with special paper up to 250 documents. Alterations can be made easily and multi-coloured productions can be obtained by using coloured carbons for the preparation of the art-paper masters. A disadvantage is that, owing to the thickness of the paper used, it is impossible to take more than one or two copies of the information subsequently recorded.

5. By stencil duplicator
The second master sheet method employs a stencil cut by hand or by typewriter. Up to 5,000 documents can be produced from one stencil. The disadvantage of the method is that the absorbent nature of the



Imperial Hectograph Carbon Roll Machine

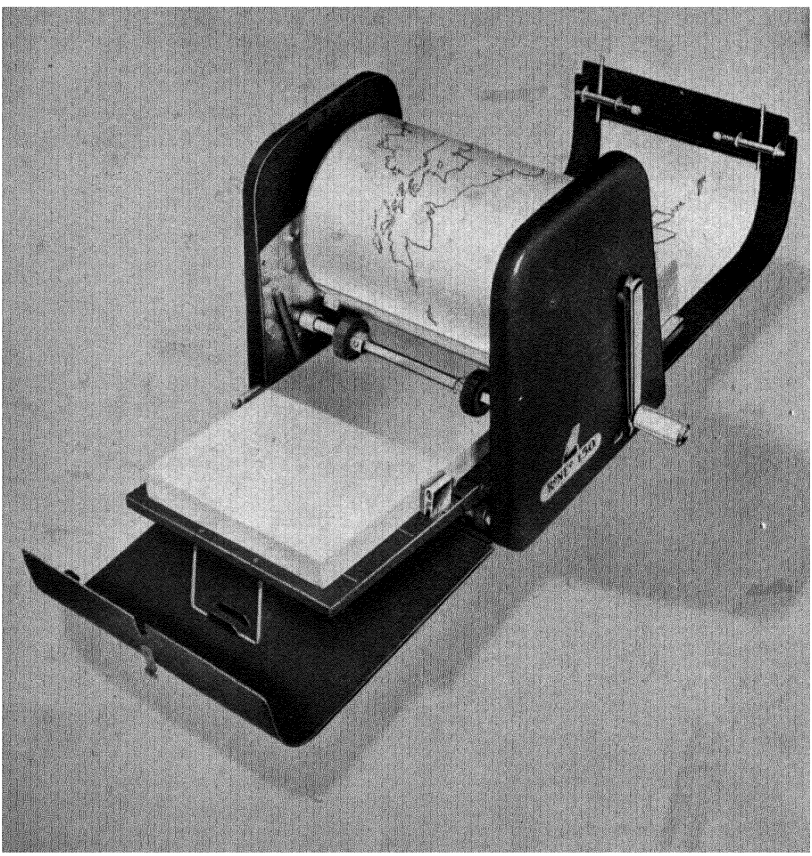


Gestetner Stencil Duplicating Machine, Model 280

paper used does not lend itself very well to the use of pen and ink recording.

6. By offset litho machine

In this case the master consists of a metal plate on which the typed or written master is fixed by means of a special fluid. The results obtained

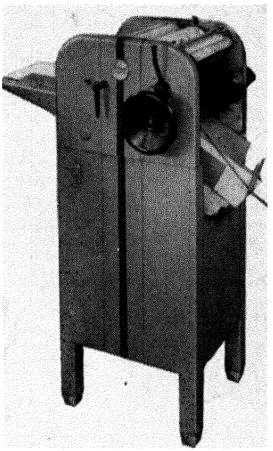


Roneo Portable Duplicator, Model 150

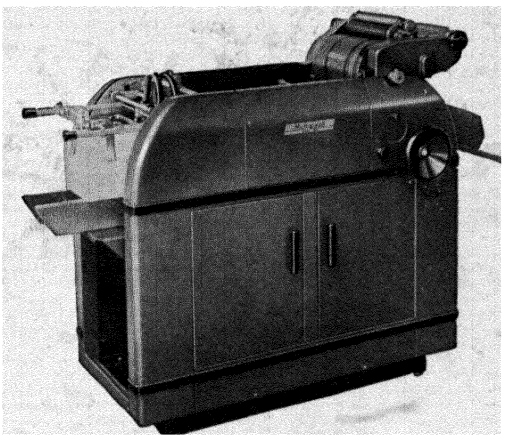
are superior to those obtained by the previous methods. Up to 50,000 documents can be produced by this process, which is particularly suited to the production of complicated rulings. Production of documents in colour and containing line-drawings or half-tones can be made by this machine.

7. By type-set machine

Up to 500,000 documents may be obtained by this method. It is a rotary machine in the semi-circular segments of whose drum, type is set from banks or trays. First-class results are obtainable, although some considerable skill is required in setting the type in the segments.



Multilith Machine, Model 50



Multigraph, Model 250 Duplicating Machine

It will be seen from the above that the factors which determine the method employed in producing a document are as follows:

(1) The number of documents required.
(2) The number of copies of the document which requires to be made at one recording.
(3) The use of pen and ink, pencil, etc.
(4) The need for multi-coloured printing.
(5) The clarity of printing.
(6) The cost of production.
(7) The ease of production.

Recording

The first purely clerical procedure consists of entering information on a document. The information may be recorded for the first time or it may be copied from another document. The various methods of recording information are as follows:

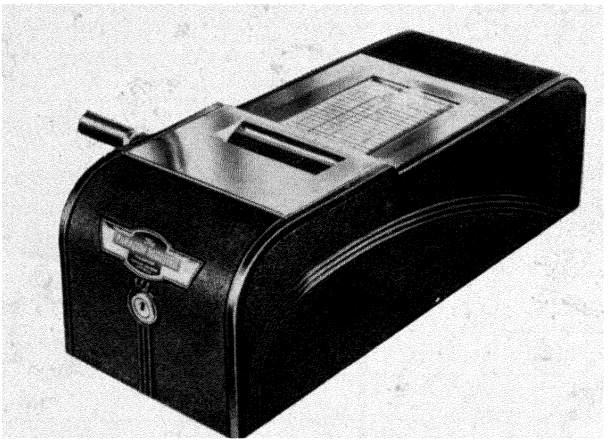
1. By hand

The simplest and most common method of recording information is by hand, using pen or pencil. While it is desirable that records should

be made in ink and while it is possible to do so in offices, records made in the open or in workshops must usually be made in pencil. The clarity of records depends also on the person recording the information – clerical grades generally producing clearer records than factory operatives.

2. By hand on a recording device

There are several devices on which records can be made by hand, for example; the following:



Paragon Security Register

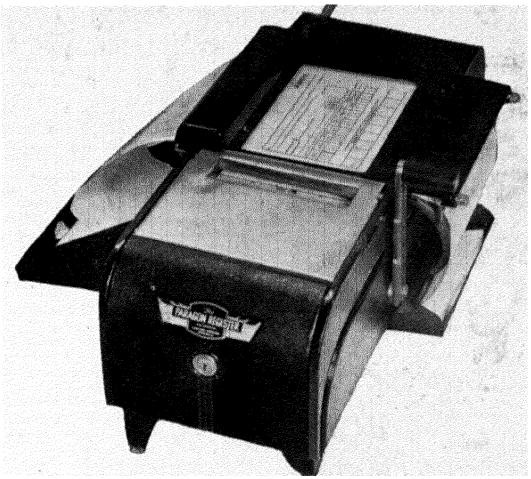
(A) MANIFOLD REGISTER

By this means, up to six copies can be made simultaneously on a pack of forms, which is brought accurately into the writing position by the operation of a lever. A firm and hard writing surface is provided and, owing to the fixed interleaving of carbons, time is saved and handling is made easy. Usually on removal of the recorded pack of forms, one form is retained within the register as security. The register is usually sufficiently light to enable it to be carried about by the operator and, for this reason, is ideal for use in stock-yards and in workshops for recording the movement of materials and, where appropriate, as in garages, the invoicing of sales.

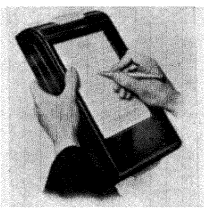
(B) CASH REGISTER (*See also* page 114)

The recording of information relating to cash sales transactions may be made on what is in effect a manifold register which incorporates a till.

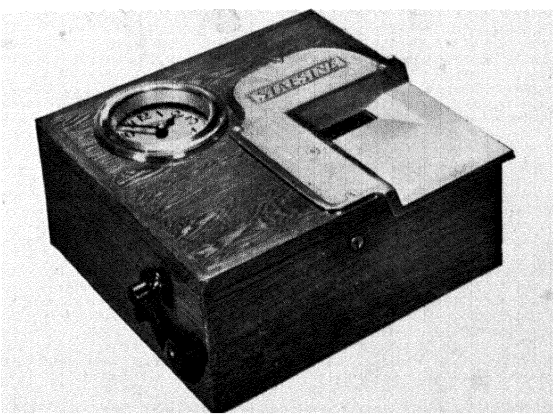
Certain cash registers of this type do not issue a document, but provide a roll of paper on which the record is made. This roll can be removed from the register only by the person possessing the key.



Paragon Summary Register



Fanfold Portable Register



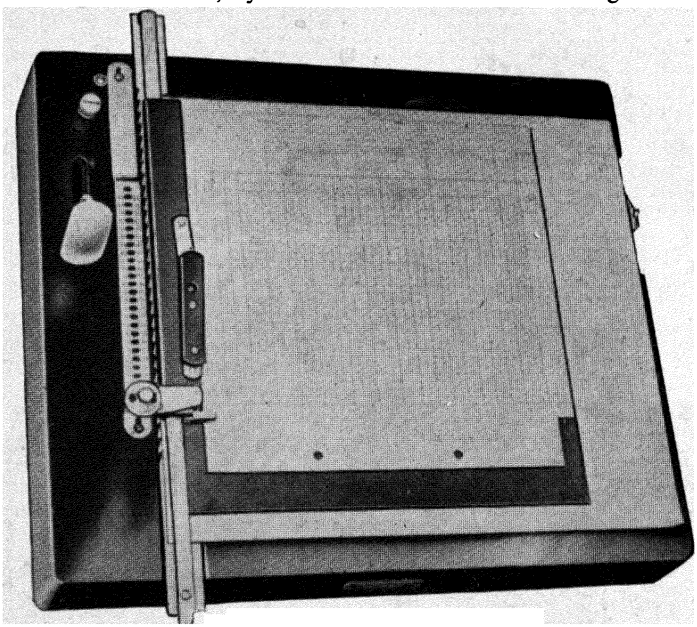
Blick Portable 'Stafsine'

(C) SIGNATURE TIME RECORDER

The recording of employees' signatures opposite attendance times may be made on the tally roll maintained in certain types of time-recording clocks. The operation of a lever causes the time to be printed on the tally roll opposite the signature.

(D) COPY-WRITER

Records, such as sales and purchase books, whose items can be posted simultaneously to ledger accounts and statements, and wages and salaries sheets whose items can be entered simultaneously on tax deduction cards and pay slips, can be made by means of a copy-writer. This is a device which, by the use of carbons and a lining mechanism,



Anson P.A.Y.E. Machine

enables several records to be made simultaneously, by this means ensuring that so long as the record made is correct all other postings or copies of this data are also correct.

3. By a machine which is operated manually

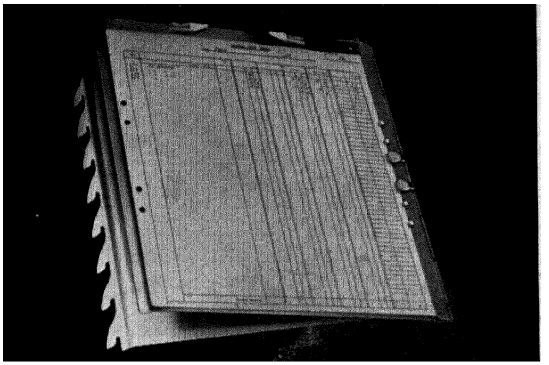
Manually-operated machines are of the following kinds:

(A) TYPEWRITER (*See also* pages 103 and 104)

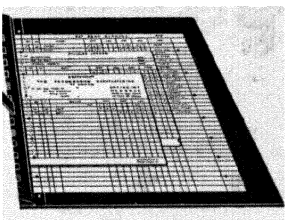
Typewriters of many kinds are available. They may differ in any of the following respects:

1. Manually or electrically operated keyboard

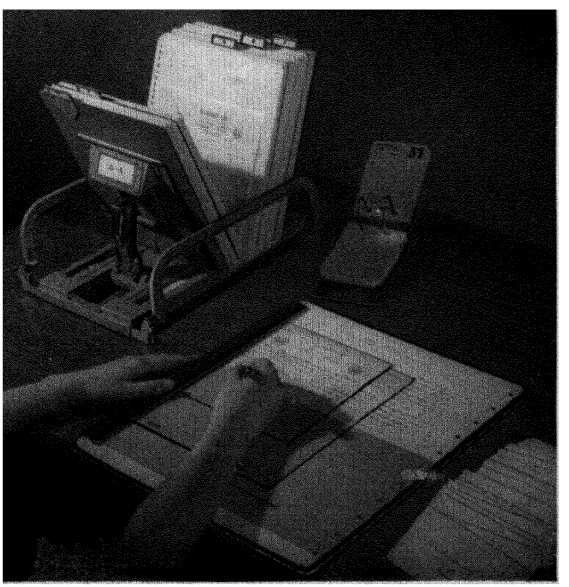
In this case the electrical operation results in a more evenly and clearly typed record than manual operation. The speed of operation is also greater.



Shannon Visicopier



Twinlock Billing Board



Kalamazoo Copywriter

2. Manually or electrically operated carriage return

Electrical operation increases the speed by saving the time taken by the typist in returning the carriage and spacing vertically.

3. Front or rear feed for stationery

While in a rear-feed typewriter all documents to be typed simultaneously must be fed into the machine together, it is possible, by using a front-feed machine, to keep a record, such as a salary list, continuously in the



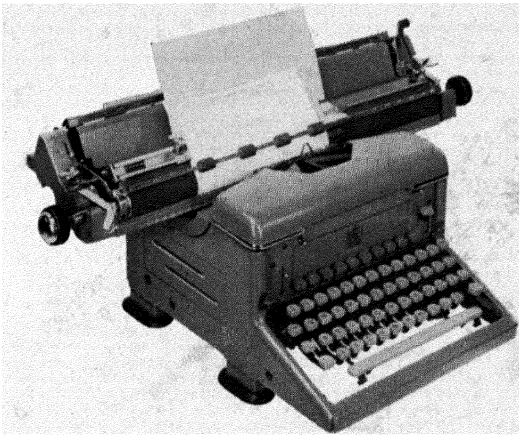
I.B.M. Electric Typewriter

rear-feed position, while all the salary cheques whose details are recorded on the list can be front-fed into and removed from the machine without disturbing the salary list. Its use enables two records of different line spacing to be inserted in the machine.

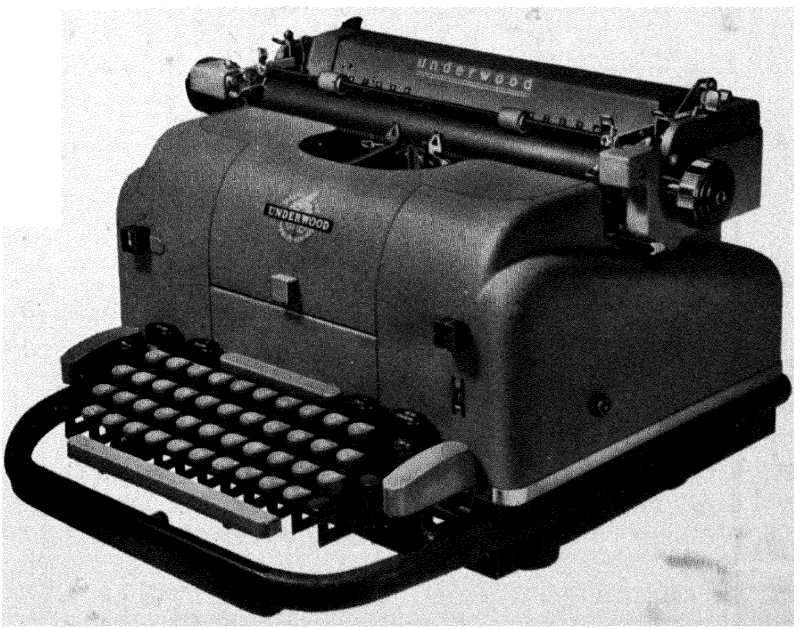
4. Cylindrical or flat platen

On the standard typewriter the platen is cylindrical, while on the flat-bed machine the type-bars strike downwards on to the documents, which are aligned and kept in position on the flat platen.

The flat-bed typewriter is particularly useful where information is to be typed simultaneously on forms of different size or on different positions on the forms, or where the set of documents contains a card. It was devised originally to type on the pages of bound books.



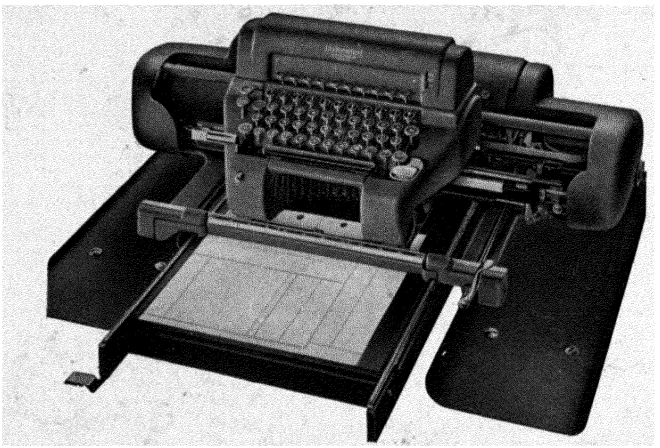
Imperial 106 Dual-feed Machine



Underwood All-electric Typewriter

5. Length of platen
The length of line which can be typed varies according to the length of platen. Platens are available from ten to twenty-one inches.

6. Type
The type used varies according to the machine. The varityper has already been mentioned.



Elliott Fisher Writing Machine

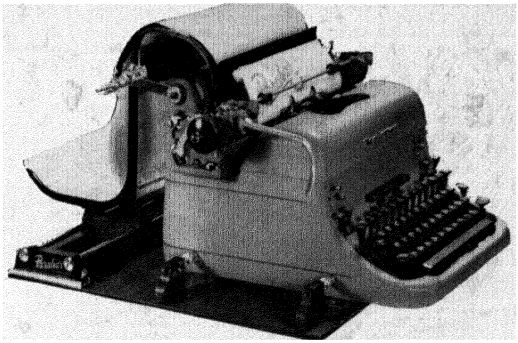
7. Attachments for continuous stationery
Considerable savings in time can be effected by the use of continuous stationery instead of packs of forms; by the feeding of the forms to the typing position in correct alignment; by the use of interleaved carbons which do not have to be continuously removed and replaced; and by the continuous feeding of the stationery under the platen.

Attachments of this sort either form an integral part of the machine or can be attached to a standard typewriter.

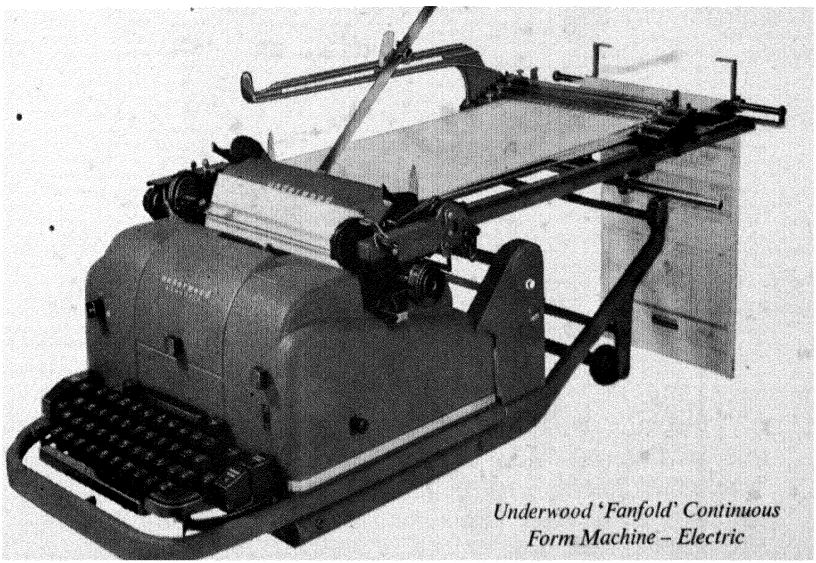
(B) ADDING LISTING MACHINE (*See also* pages 137 and 143)
Primarily, the function of these machines is to add or subtract, but where it is necessary to provide a list of values or quantities together with their respective totals, against which the listed documents may be compared, adding listing machines carry out a recording operation.

(C) CASH REGISTER (*See also* page 108)
Basically, cash registers are adding listing machines which are fitted with a till for the control of cash.

(D) KEYBOARD ACCOUNTING MACHINE (*See also* pages 139 and 143)
All recording operations which involve the recording of figures together with totals or balances can be performed by means of accounting



'Parabar' Continuous Form Feed



Underwood 'Fanfold' Continuous Form Machine – Electric

machines. Machines are available for preparing the equivalent of day books, cash books, wages books, journals, ledgers of all kinds, and statistical records and summaries.

According to the particular type of record which requires to be made, a machine which incorporates the features appropriate to the job must be employed. The various contrasting features of accounting machines are as follows:

1. Automatic or human recording of totals or balances

In certain machines, totals or balances can be recorded simply and quickly by the depression of a key. In other machines, totals or balances are computed visibly in adding boxes. To record a total or balance, the figures shown in an adding box are recorded by the depression of the appropriate numerical keys. This action subtracts the figures



National Class 6000 Cash Register

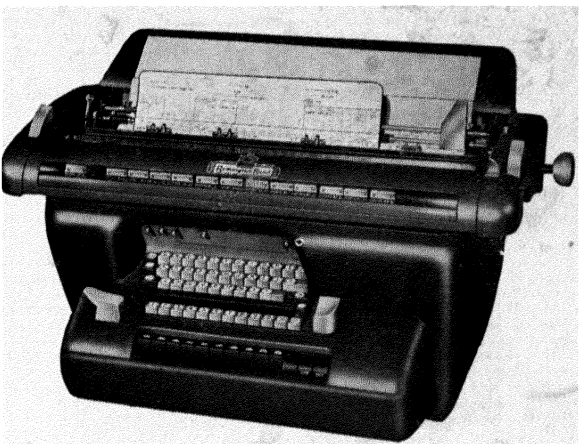
recorded from the figures in the relative adding box and should any figure other than zero remain in the adding box after the recording operation, the machine remains automatically locked until the correct recording has been made.

2. Provision of vertical and horizontal totals

The number of vertical totals obtainable depends on the type of machine. While the provision of up to eight totals is common, certain machines can provide up to about thirty totals. Machines usually provide horizontal totals. The application of horizontal totalling machines to wages sheets and statistical statements is apparent.

3. Provision of sub-totals

Automatic total recording machines usually provide sub-totals if required, for example at the foot of each sheet. On the other hand, machines with adding boxes can provide only totals. If sub-totals are required, the totals cleared from the adding boxes must be reinstated before proceeding.



Remington 'Foremost' Accounting Machine

4. Type of accounting keyboard

Certain machines employ a multi-figure keyboard which means that for each digit in a line of figures, keys numbered from 1 to 9 are provided. The advantage of this keyboard is that, by the use of both hands, all the digits in a row of figures can be depressed simultaneously. Against this advantage, time is taken up by the movement of the hands over the keyboard and the selection of the correct columns of keys.

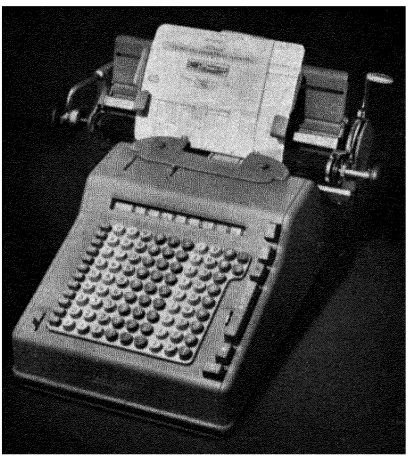
Other machines employ simplified keyboards which consist of ten or twelve keys. A line of figures is obtained by firstly depressing in succession the keys which correspond with the figures in the line and, secondly, depressing a bar which causes the line of figures to be recorded. The advantage of such a keyboard is that time is saved by the elimination of key-column selection and of the movement of the hand over a large keyboard.

In both types of machine it is necessary to use the multi-keyboard form for the provision of abbreviated descriptions such as dates.

5. Provision of typewriter keyboard

Certain machines of both the multi-figure and simplified keyboard varieties are provided with typewriter keys. This increases considerably the flexibility of the machine, because complete headings, descriptions,

etc., can be recorded as required. Usually the typewriter keys are manually actuated, but in certain models they are actuated electrically, thus increasing the speed of operation.



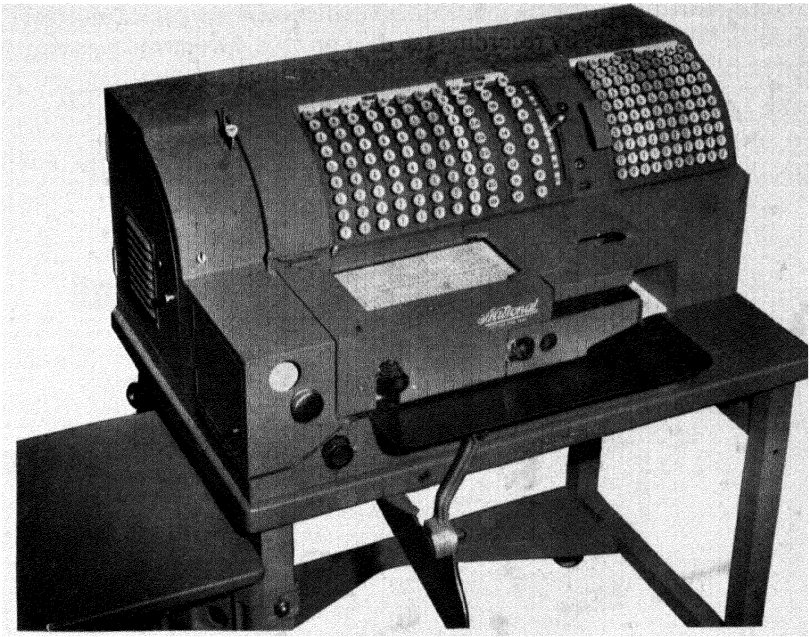
National 17EN Desk Model Book-keeping Machine



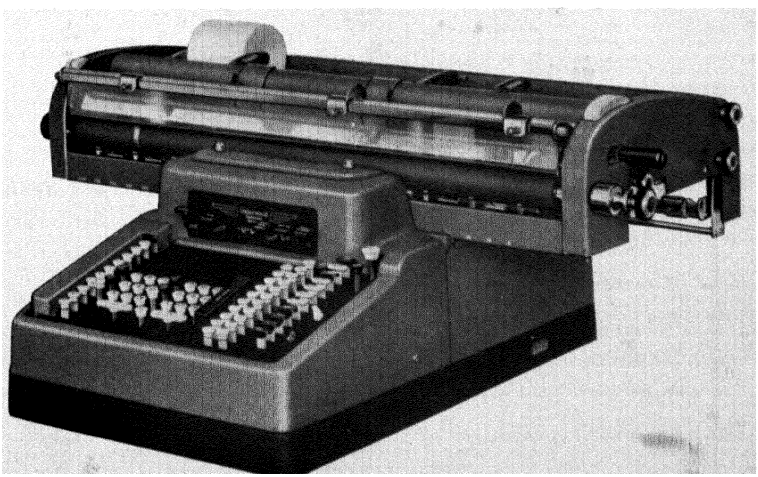
National Class 31 Accounting Machine

6. Position of documents

The same entry can be made by using carbons or ribbons and front- and rear-feed mechanisms, on documents placed one below the other, in the same manner as described in relation to typewriters.

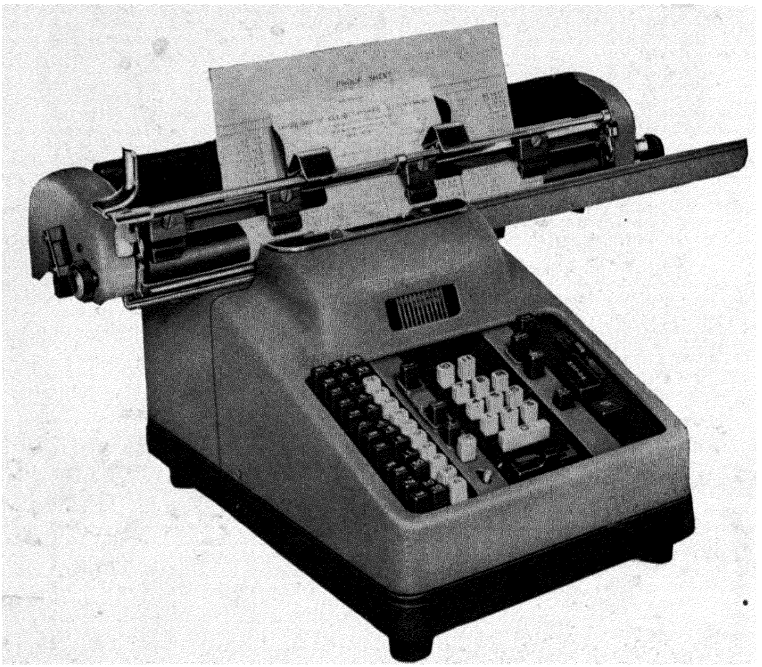


National Class 2000 Analysing Machine



Underwood Sundstrand Class D Accounting Machine

The record can also be made on several documents placed side by side on the carriage, by recording the data on each document in successive operations or, where possible, in one operation.



Underwood Sundstrand Portable Accounting Machine

7. Type of platen

As in the case of typewriters, certain accounting machines have cylindrical platens, while others have flat platens.

8. One or more of a number of other features may be incorporated in certain machines, as follows:

(*a*) Handling of special units of quantity, decimals instead of, or as well as, values.

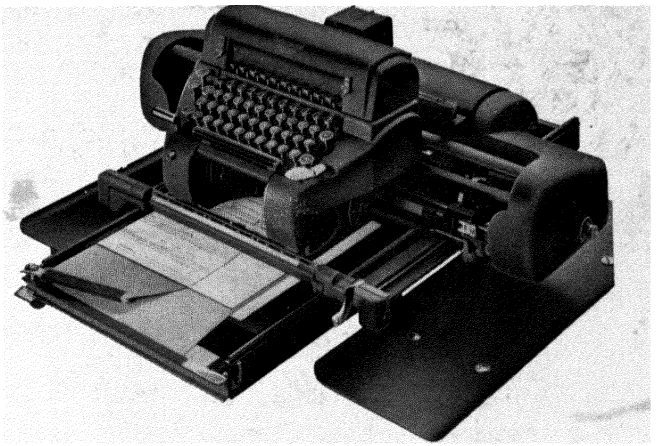
(*b*) Automatic repetition of standard information, such as dates.

(*c*) Automatic repetition of amount or description previously recorded.

(*d*) Automatic opening of front-feed mechanism on completion of recording.

(*e*) Automatic return of carriage to predetermined position.

(*f*) Automatic selection of column in which record is to be made.



Elliott Fisher Simplex Accounting Machine

(E) TIME RECORDING CLOCK

Time can be recorded on attendance records, job or operation records by means of time recorders, which may be of the following types:

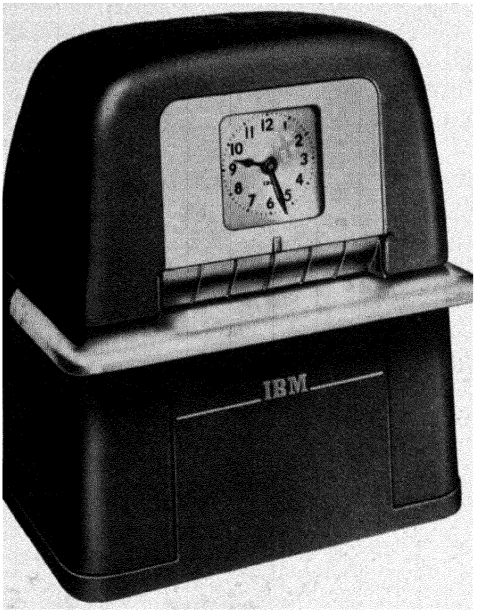
1. Radial recorder

These consist of a large clock-like face round which employees' numbers up to 200 are marked. By the rotation of an arm to the employee's number the roll of paper placed round an internal drum is rotated, and by pressing the arm inwards the time is imprinted in the correct position on the roll of paper opposite the employee's pre-printed name. The recorder is so set that lost time and overtime are automatically printed in red.

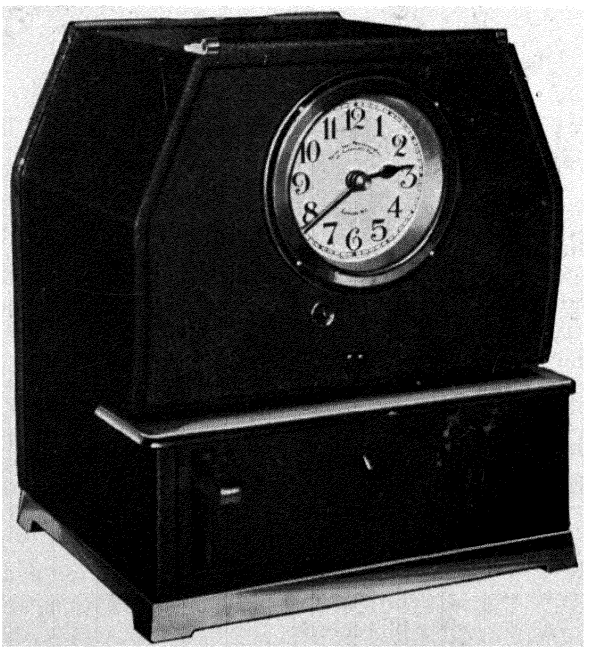
The disadvantages of such recorders are that the number of employees who may be catered for is limited to the capacity of the clock and the clock can be used only for the recording of times of attendance.

2. Card recorder

Card recorders are used to print, by the operation of a lever, the time of arrival and departure on a card inserted in an aperture in the recorder. In certain types of recorder the insertion of the card is sufficient to



I.B.M. Job Time Recorder



Blick Sideprinting Time and Cost Recorder, Model 521

record the time without the use of a lever. In the same manner as dial recorders, certain models print lost time and overtime in red. The advantage of card recorders is that the number of employees' cards with which the recorder can deal is not limited to a stated number as in the case of dial recorders. Times are recorded in the 'in' and 'out' positions by the operation of a second lever incorporated in the recorder.

Card recorders are used, in addition, for recording the time of an employee starting and finishing a job, operation or other similar cost unit.



I.B.M. 'Superelectric' Attendance Time Recorder

3. Key recorder

Times of arrival and departure, together with an employee's number are printed on a tally-roll inside the clock by the insertion in the clock of a key bearing the employee's number. Like the card recorder, the key recorder does not limit the number of employees which can be handled. The disadvantage of the key recorder is that the times of arrival and departure of a single employee are separated by the recording made between these times by all other employees using the clock. To obtain the time spent, it is necessary to compile an additional record.

(F) ADDRESSING MACHINE (*See also* page 126)

Names and addresses, headings of forms, names of employees and constant information of any kind can be recorded by means of manually-operated addressing equipment.

(G) TIME STAMP

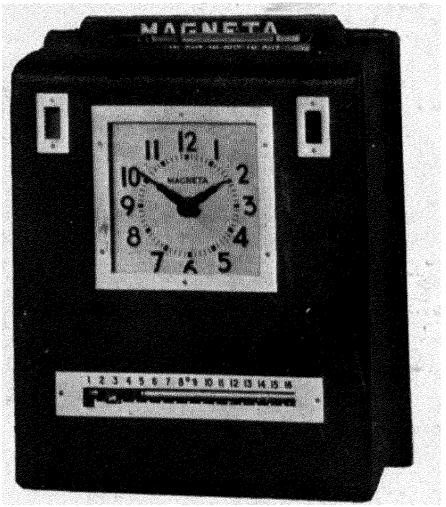
The time and date may be recorded where required by means of time stamps which can print, in addition, any required description.

4. By a machine which is operated mechanically

Mechanically operated machines are of the following kinds:

(A) PUNCHED-CARD TABULATING MACHINE (*See also* pages 139 and 154)

Punched-card tabulators are operated by electrical power, the figures



Magneta Job Coster

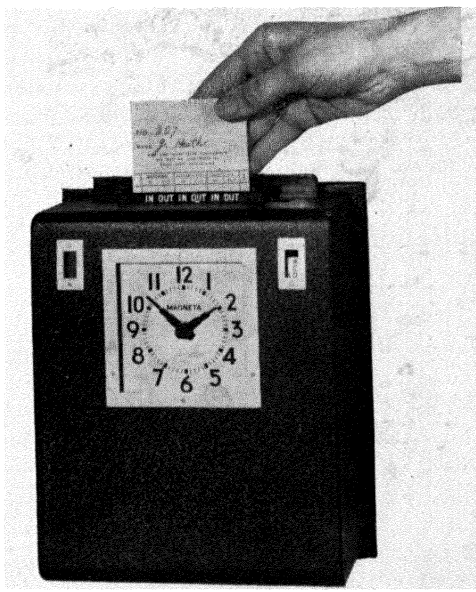
recorded and the types of operation, such as sub-totalling, balancing, non-listing, etc., being controlled by the insertion in the sensing mechanism of a punched-card.

The sensing of the holes in a punched-card is carried out in one type of machine by electrical contact and in the other type of machine by mechanical contact. The punched-card tabulators are capable of adding, subtracting and tabulating data in groups, sub-groups, etc., as required. The capacity of each machine is limited and according to the type of work which is required to be done the tabulator with the appropriate capacity has to be employed. In this connection the number of counters on machines varies from one to seven.

The speed of tabulating, according to machine, is between 80 and 175 cards per minute. Up to 100 letters or figures per line can be printed simultaneously. The tabulations may be made on single sheets of

paper, rolls of paper, continuous stationery, ledger sheets, etc. Single-double- or treble-spacing can be obtained as required. The tabulator, by the operation of a non-listing mechanism, can add the amounts on a batch of cards, printing only the total. The adding mechanism can be supplied to deal, not only with pounds, shillings and pence, but with various weights and measures.

The advantage of punched-card tabulators is the speed of operation and the clarity of the recording. The disadvantage is that, as it is only



Magneta M15 Time Recorder

economical where long runs of tabulation are required, it is often impossible to arrange the work so that day-by-day records are available for use. This disadvantage does not arise where statistical work which can be done at the end of a period is tabulated.

Tabulators can be provided to print letters as well as numerals; and in certain types the number of cards passing through the tabulator are counted.

(B) PUNCHED-CARD INTERPRETER

This machine automatically interprets alphabetical and/or numerical information punched on a card and prints it visibly on the same card.

As a result of this operation, the cards can be placed by hand in any desired sequence and selected cards may be pulled from a file of cards without the necessity of putting all the cards in the file through the sorting operation.

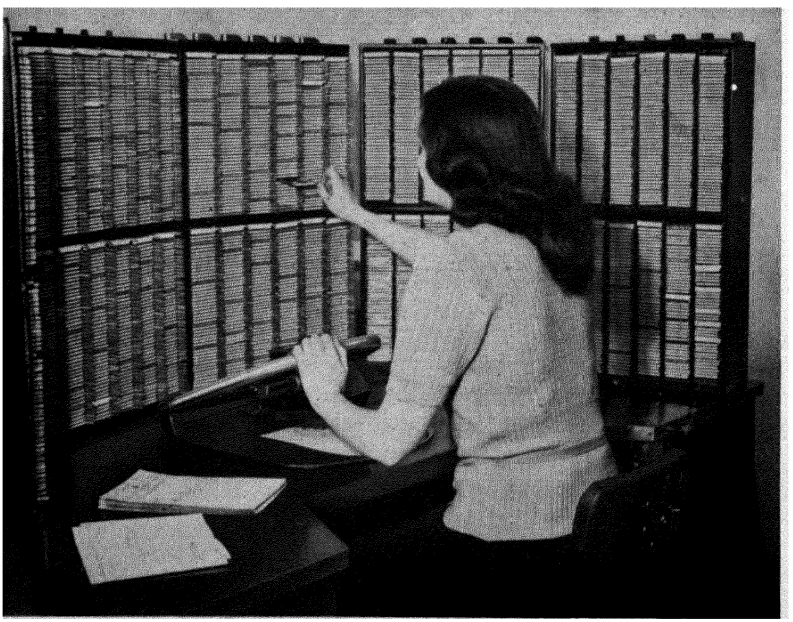
(c) ADDRESSING MACHINE (*See also* page 123)

Addressing machines record information, either on single documents, such as envelopes, invoices, time cards, statements, ledger cards, etc., or on continuous stationery or rolls of paper, by means of embossed metal plates or cut fibre stencils.

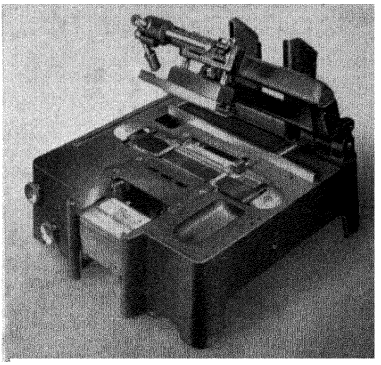
A special embossing machine is necessary where metal plates are employed, while the fibre stencils may be cut on any typewriter. The amount of information which can be cut on the stencils varies according to the size of stencil or plate. The maximum information on the largest plate is nine lines of forty-six characters per line.

Various mechanisms are incorporated in addressing machines which are capable of:

(1) Causing the information on plates to be repeated a given number of times.



Adrema WHB Hand Addressing Machine and Plate Files



Addressograph Addressing Machine, Model 300

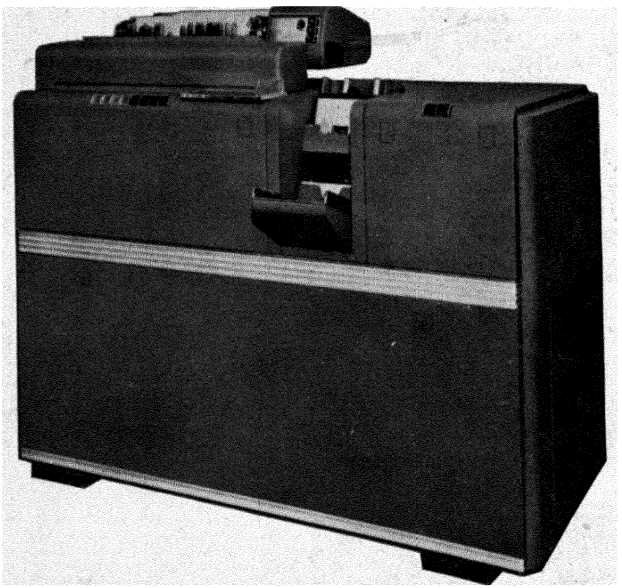


Imperial Address Stencil Card Machine



I.B.M. Electric Time Stamp

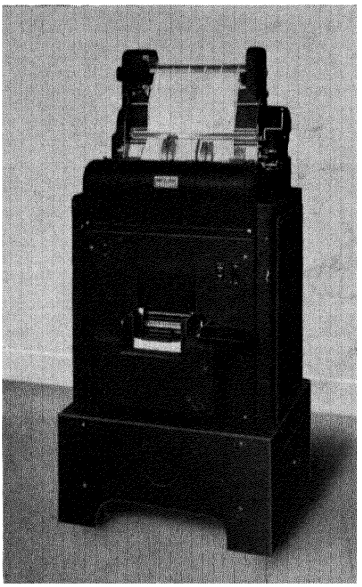
(2) Passing unwanted plates without printing.
(3) Limiting the information recorded to selected parts of the plate.
(4) Repeat printing of the data.
(5) Serially numbering the documents printed.
(6) Counting the number of documents printed.
(7) Automatically feeding and ejecting the form used.



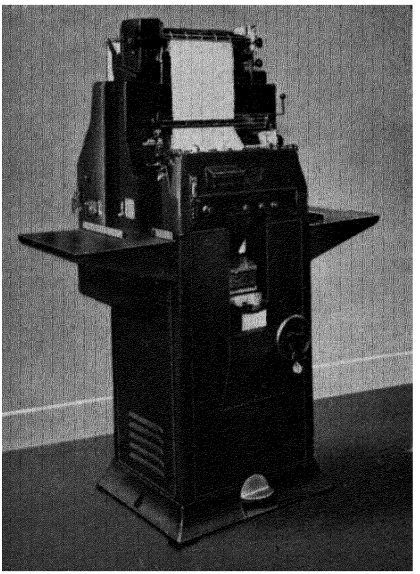
I.B.M. Electric Punched-card Accounting Machine

The advantages of this equipment are the high speed (in certain cases up to 6,000 per hour, although normally from 1,000 to 2,000 per hour) with which addressing or the recording of constant information can be carried out and, as the information on the plates or stencils is ascertained to be accurate before use, the elimination of temporary inaccuracies.

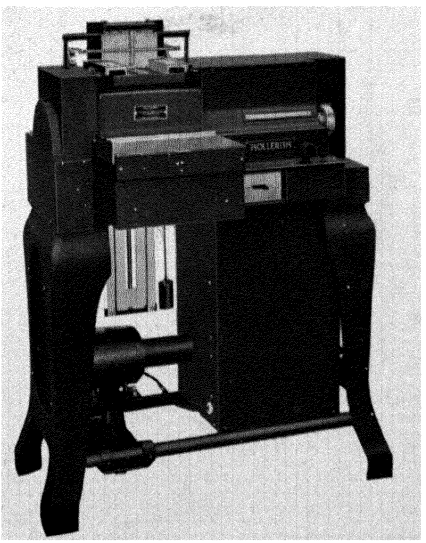
(D) POSTING MACHINE (*See also* page 104)
The posting machine is a development of the spirit duplicator and, like it, requires the use of a hectograph carbon at the typing stage. If the machine is used to post, for example, each item on an analysis sheet to the relative analysis cards, then the analysis is typed by means of a hectograph carbon on a sheet of special paper. This sheet is then



Powers-Samas Printing Machine

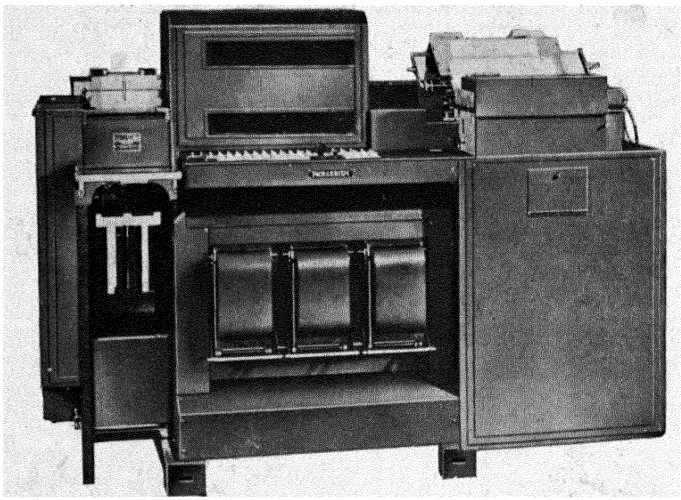


Powers-Forty Tabulator

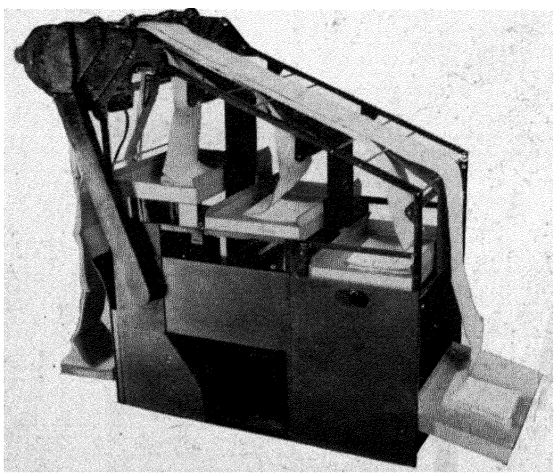


Hollerith Balancer

placed round the cylinder of the posting machine. The analysis card appropriate to the first item on the sheet is selected and fed into the machine in the proper position. The cylinder revolves and the line of



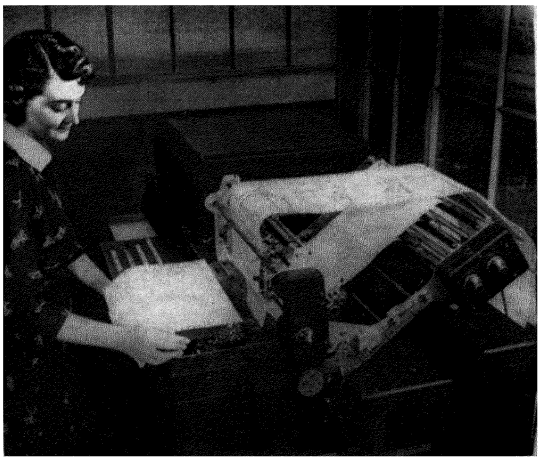
Hollerith Alpha-numerical Tabulator



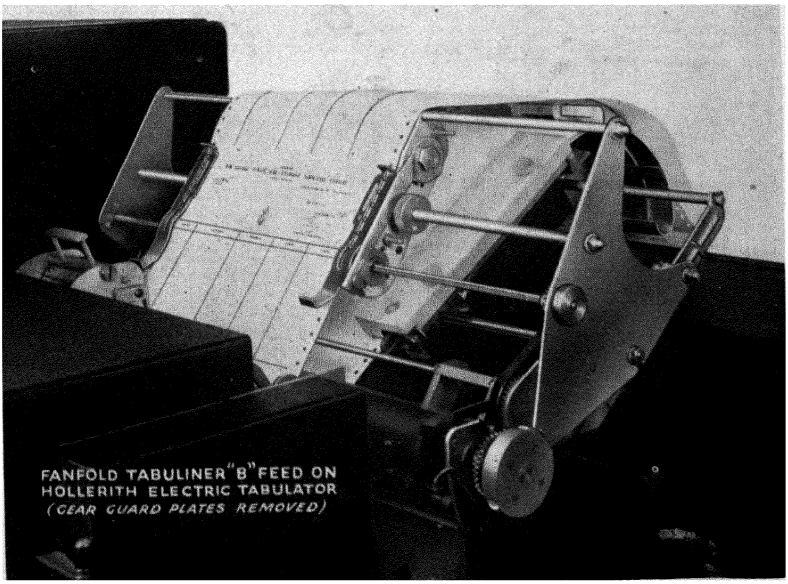
Paragon Continuous Form Decollator

information on the sheet is recorded on the card. Each line of the analysis is posted in succession to the analysis cards.

Providing the information on the analysis sheet is correct and providing the correct analysis card is selected, no error in posting can occur.

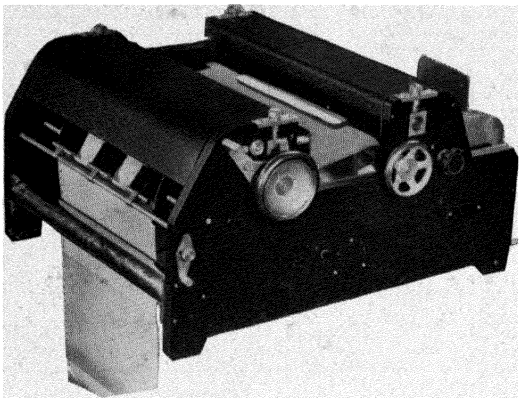


'Formaliner' Continuous Form Feed for Tabulators with Controlled Carbon Feed

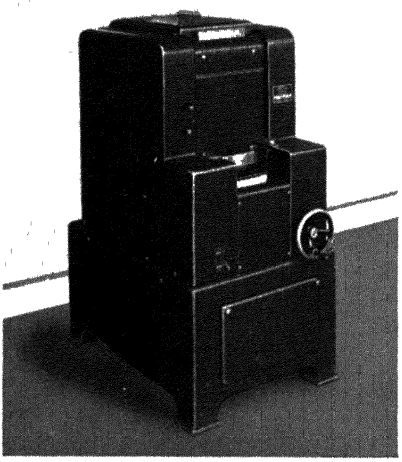


Fanfold Tabuliner 'B' Feed

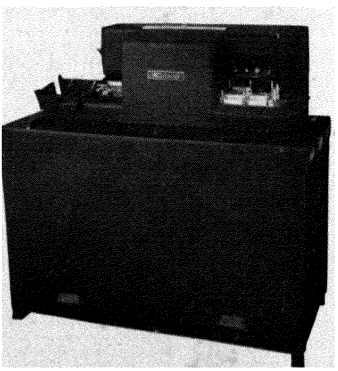
A study of the features of the various methods of recording information shows that from the method of recording by hand through intermediate methods to the completely automatic recording of information, there



Paragon Continuous Form Burster



Powers-Samas Interpreter



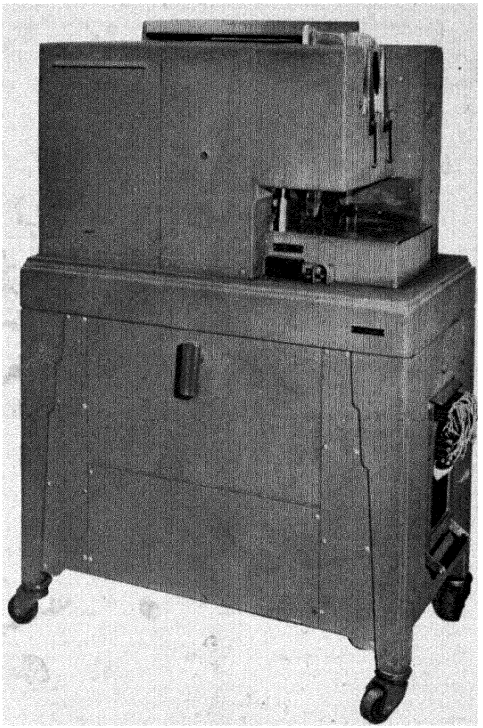
Hollerith Interpreter

is an improvement in the following characteristics, such improvement resulting in economies in time. These factors are as follows:

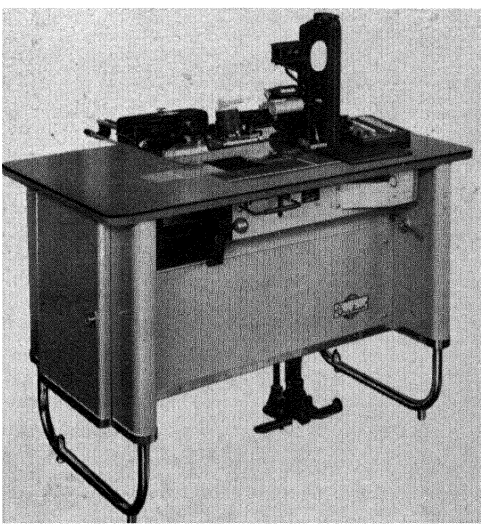
(1) Legibility.

(2) Accuracy of recording.

(3) Speed of recording.

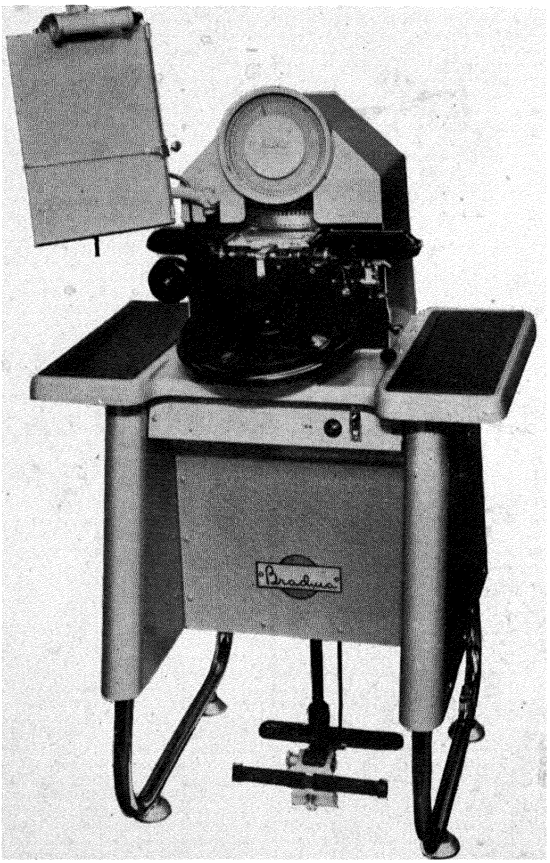


I.B.M. Alphabetical Interpreter



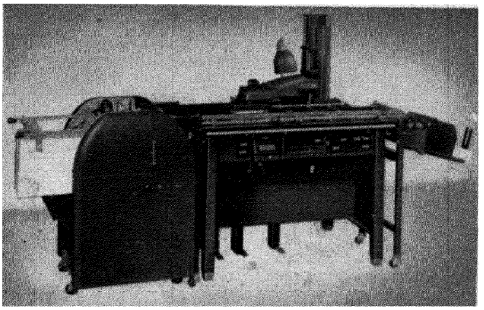
Bradma 'NEB Plus' Electric Printer

Generally machine methods are superior to manual methods in all of these respects as a result of the incorporation in the machines of mechanisms and devices which eliminate manual movements and the

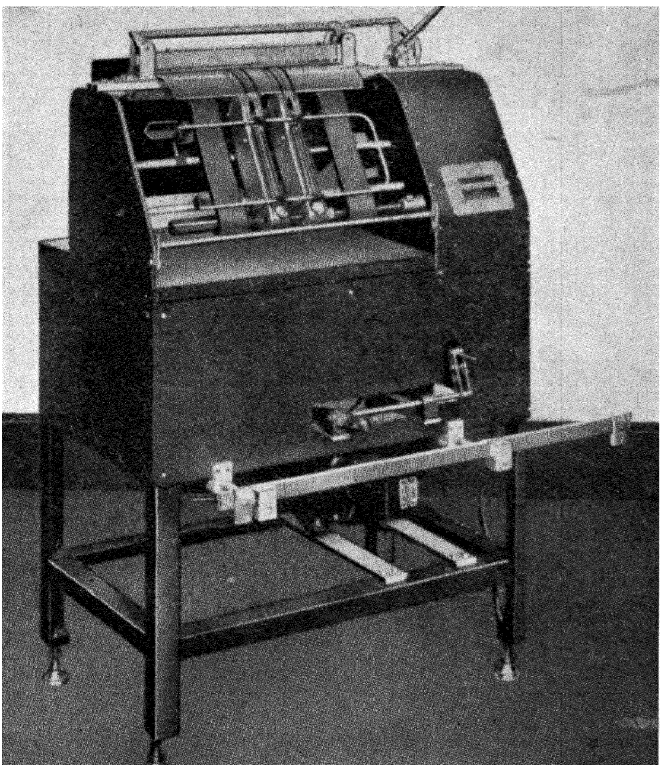


Bradma Embossing Machine

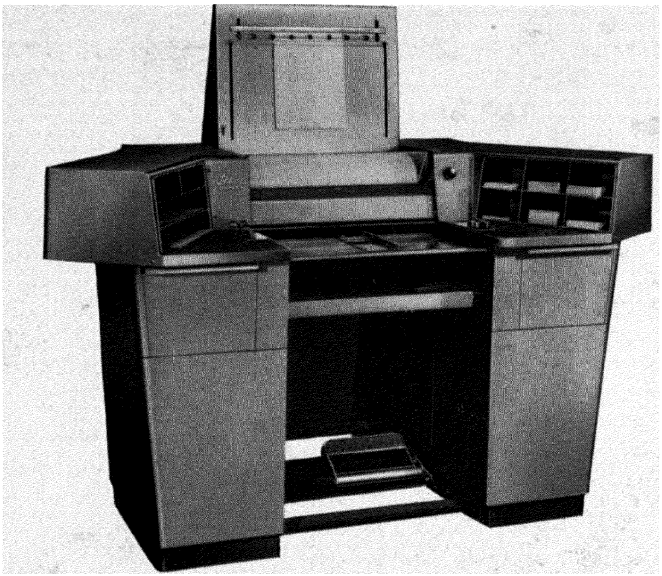
repeated recording of information, although in this latter respect the use of manual copy-writing devices goes a very long way towards eliminating errors of this kind. Of course, against the savings in time and cost effected by machine methods there must be set off the additional cost of the particular machine employed.



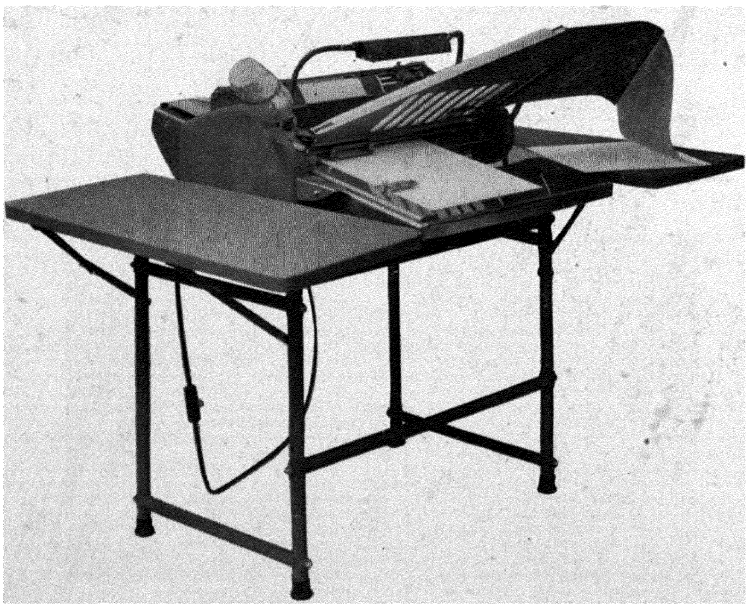
Addressograph Addressing Machine, Model 1900, With Suction Feed



Fanfold 'Conformulator' Feed Unit



Banda Duplex Line-posting Machine



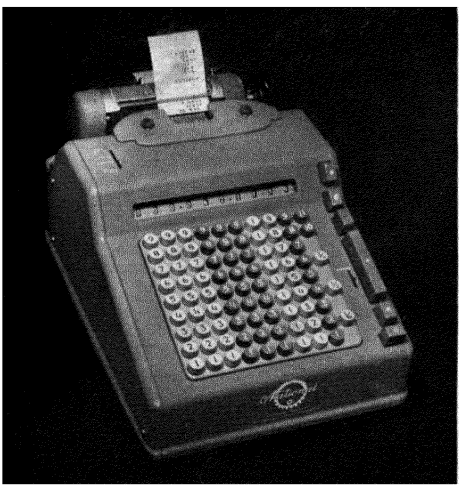
I.B.M. Facsimile Posting Machine

Adding and Subtracting

These arithmetical operations may be carried out in the following three ways:

1. Mentally

This is, of course, the simplest method, but depends for accuracy on mental ability and the absence of interruptions. At the same time, the adding of long columns of figures or the totals on a large batch of documents is a lengthy operation.



National 11 EN Adding Listing Machine

2. By non-listing adding machine (*See also* page 142)

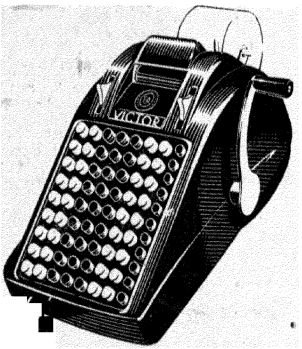
These machines are provided either with a full keyboard or with a simplified keyboard, in the same manner as manually operated accounting machines. As the machine only adds the figures included in the adding mechanism and does not provide a list of the figures added, where a predetermined total is not agreed, the whole operation must be repeated until the inaccuracy is found. Thus, the accuracy of the operation depends entirely on the skill of the operator. Either money or quantities can be added by these machines. As no listing mechanism requires to be operated, the speed with which adding and subtracting can be carried out is greater than with adding listing machines.

3. By adding listing machine (*See also* pages 114 and 143)

These machines have already been mentioned in connection with the recording operation. In addition to adding and subtracting, these



Add-Master Adding Listing Machine



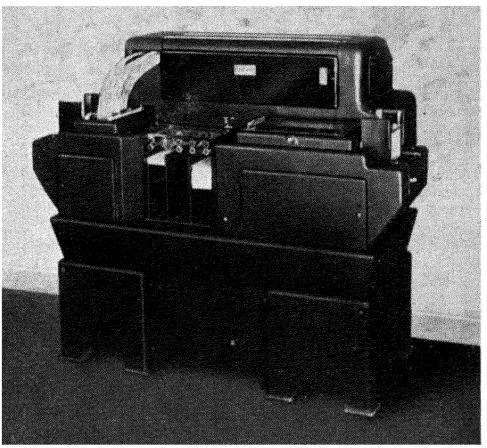
Victor Portable Adding Listing Machine



Underwood Sundstrand Adding Listing Machine, Manual

machines provide a printed list of the figures added, together with sub-totals and totals as required. While they are slower in operation than the non-listing machines, they have the advantage that if a predetermined total is not agreed, the figures added can be checked independently against the printed list without the necessity of performing the adding operation a second time.

These machines are capable of adding both quantities and values,



Powers-Samas High-speed Adding Machine

and in the case of certain machines which are provided with a split keyboard, quantities and values may be dealt with simultaneously.

Non-listing and adding listing machines with different capacities can be provided, the use of which is determined by the number of digits in the figures added. Both of these types of machines can be provided for either manual or electrical operation.

4. By accounting machine (*See also* pages 115, 124 and 154)

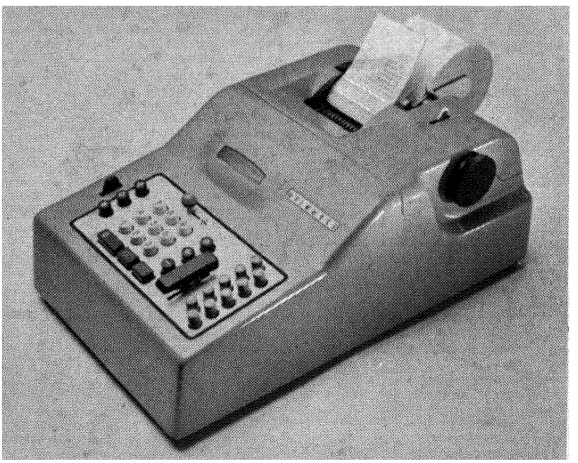
Although keyboard operated and punched-card accounting machines are not devised primarily for adding and subtracting, these operations are carried out by them in the course of their recording operation. Punched-card machines, as mentioned previously, can add automatically without printing the figures on any given group of cards.

5. By high-speed adding machine (*See also* page 149)

The information punched on cards can be summarized at high speed on this special machine. No printing mechanism is incorporated, but

totals are punched into cards which can subsequently be used in a punched-card tabulator to obtain a printed list of the totals.

6. By cross-adding punch (*See also* page 149)
Where punched-cards are used, a machine is available which can add four quantities or values in the same line of figures pre-punched on a card and can punch the total on the same card, at the same time recording the total punched on the card.



Olivetti 'Divisumma' Calculating Listing Machine

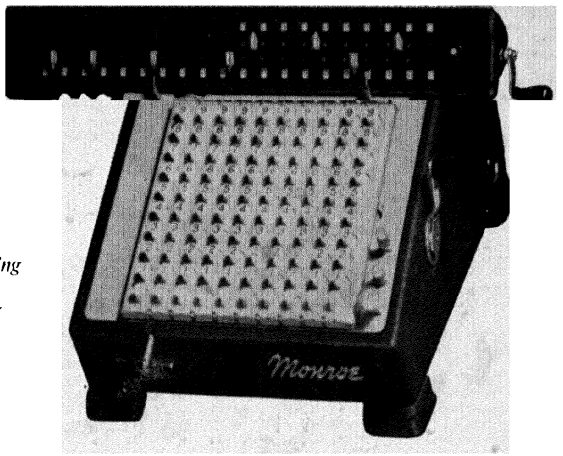
The factors which determine the choice of method of adding and subtracting are as follows:

(1) The number of items cast at one run.
(2) The need to provide a printed list of the items cast.
(3) The ease and speed of operation.
(4) The capacity of the equipment.
(5) The weight of the equipment where it is required to be used in various locations.
(6) The cost of the equipment.

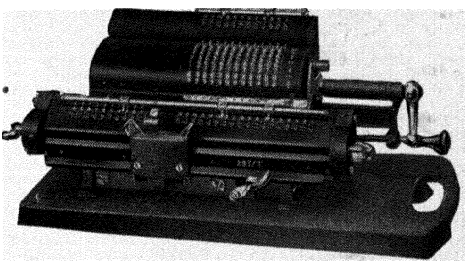
Multiplying and Dividing

The second group of arithmetical operations can be carried out as follows:

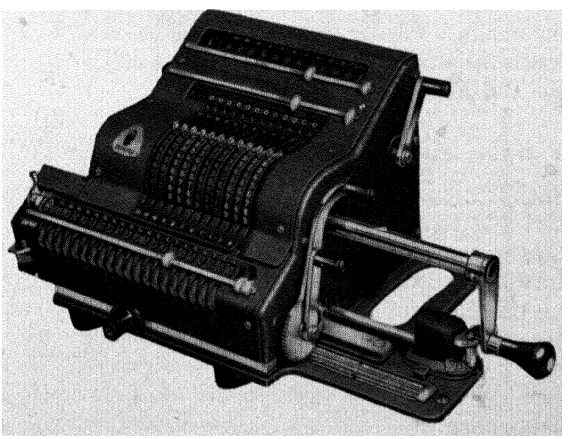
1. Mentally
This can, of course, be applied to any calculation but is only economical in the case of figures with few digits.



Monroe Calculating Machine, Model L.200-X



Brittanic 2 BT Calculating Machine



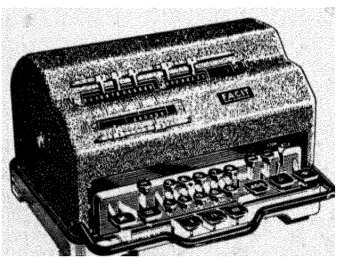
Brunsvega, Model 20 Calculating Machine

2. By table

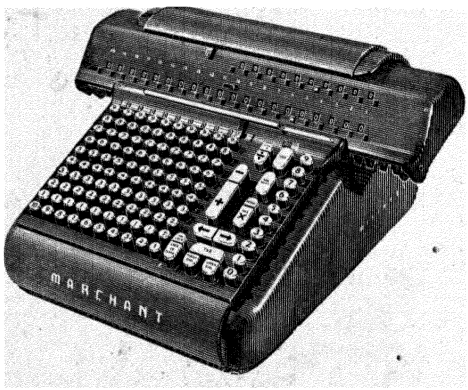
Many calculations, particularly those involving money and various weights and measures, can be quickly carried out with the aid of specially constructed tables in the form of ready-reckoners. With practice, calculations made with the use of tables can be very quickly carried out.

3. By slide rule

Calculations involving decimals or values and quantities which can be easily expressed as decimals can be quickly carried out by this means.



Facit ESA-O Calculating Machine



Marchant 'Figurematic' Calculating Machine

However, the simpler the slide rule employed the smaller is the size of the numbers which can be multiplied or divided by this means and the less is the accuracy of the result, due mainly to errors of observation of the measurement on the slide rule.

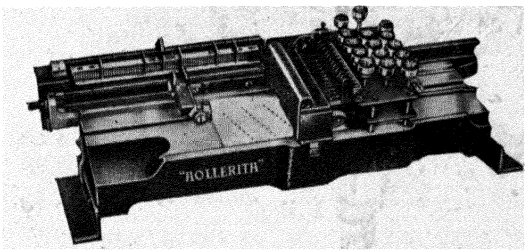
4. By non-listing adding machine (*See also* page 137)

Such machines, which have been mentioned in connection with adding and subtracting, can be used for multiplication and division which, in these machines, is achieved by continued addition or continued subtraction respectively. This method depends for the accuracy of results on the ability of the operator to ensure that no change occurs during the calculation in the figures which are continuously added or subtracted. It is convenient to employ these machines on multiplication and division where these machines are not fully employed on adding and subtracting.

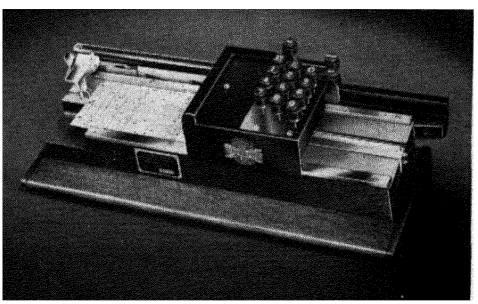
sorted punched-cards. It operates by skipping automatically the areas of the cards which require to be left unpunched.

4. By hand-operated gang punch

Slots in hand-sorted punched-cards which are required to be made on a quantity of cards may be punched out at one operation by means of a hand-operated gang punch.



Hollerith Hand Punch



Powers-Samas Hand Punch

5. By automatic duplicating punch

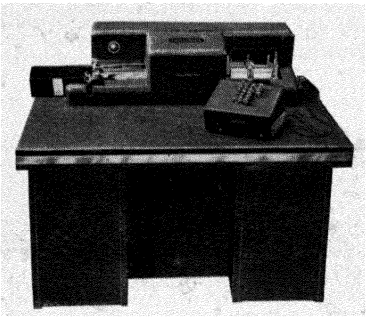
The operation just described of punching the same information on a batch of cards can be carried out automatically by the automatic duplicating punch. In this operation a master card containing the information to be duplicated is employed to supply the required information to the machine.

6. By treadle-operated gang punch

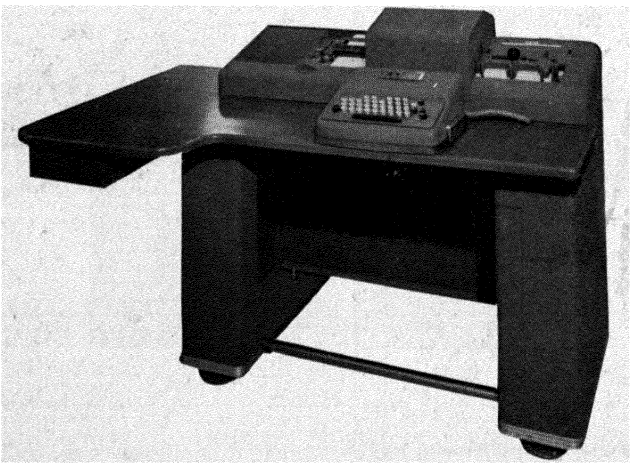
This type of gang punch may be used as an alternative to the hand-operated gang punch mentioned above.

7. By automatic key punch

Holes can be punched in certain types of machine-sorted punched-cards by means of this punch, which mechanically feeds, perforates and ejects the punched-cards at a high speed.



Hollerith 'Keystor' Automatic Punch



I.B.M. Electric Card Punching Machine

8. By tape to card machine

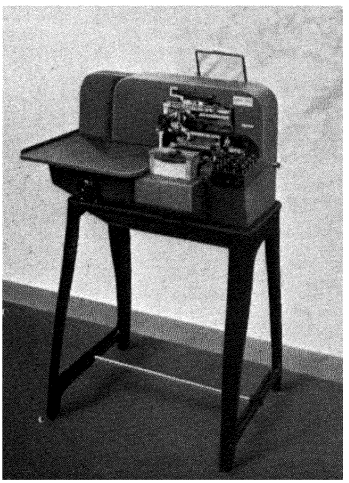
Information which has been punched on teleprinter tape can be punched into cards by means of this machine.

9. By multiplying punch (*See also* page 144)

The use of this punch, to punch on a machine-sorted punched-card the product of a multiplier and multiplicand has been referred to previously.

10. By cross-adding punch (*See also* page 140)
Reference has already been made to this machine, which cross-adds and punches the total of four sets of figures pre-punched on a card.

11. By summary card punch
This is a punch which, when connected to a tabulating machine, is capable of punching on a card the total of a group of figures printed on the tabulator. The cards so punched can be used to tabulate summaries of the information previously recorded in detail.



Powers-Samas Automatic Key Punch

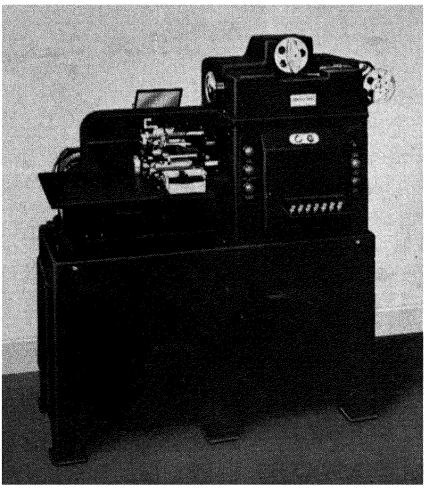


Hollerith Gang Summary Punch

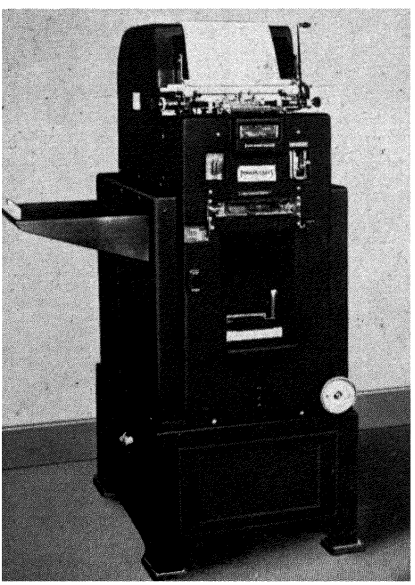
12. By high-speed adding machine (*See also* page 139)
This machine performs the same operation as the summary card punch. The difference is that this machine itself performs the operation whose results are punched into the cards.

13. By reproducing punch
This machine automatically punches from existing sets of cards duplicate sets containing some or all of the information contained in the cards which are reproduced, punching the information so reproduced either in the same position as, or in a different position from, the information punched on the reproduced cards.

14. By mark-sensing reproducing punch
This type of punch is capable of interpreting marks made by hand on a



Powers-Samas Tape to Card Machine

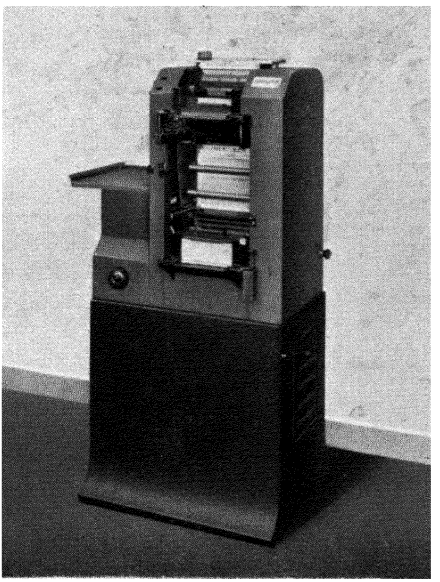


Powers-Samas Cross-adding Punch

blank card and punching the information on the required area of the same card. It also punches on these cards information contained on a separate set of punched-cards.

The factors which determine the equipment to be used for punching are as follows:

(1) The clerical operations as the result of which or for which the punching is required.



Powers-Samas Reproducing Punch

(2) The type of card to be punched.

(3) The number of cards to be punched.

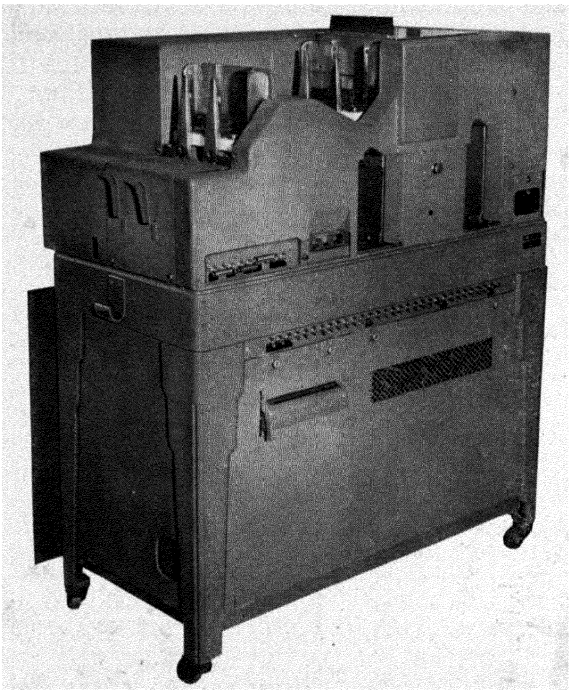
(4) The cost of the equipment.

VERIFYING

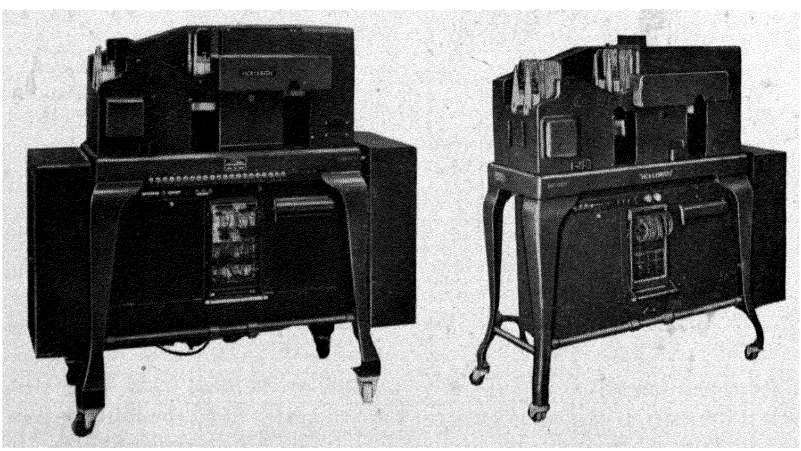
The operation of verifying information is carried out in the following ways:

1. By repetition of the process whose results are verified

This is the only means of ascertaining the accuracy of all the information recorded on documents by any means other than punched-cards. It consists of calling back information, of repeating the arithmetical



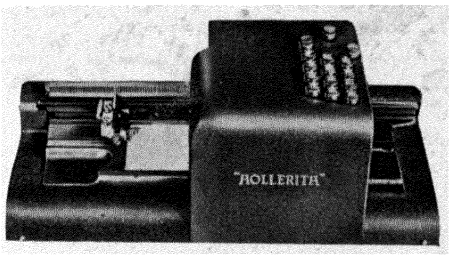
I.B.M. Reproducing Punch



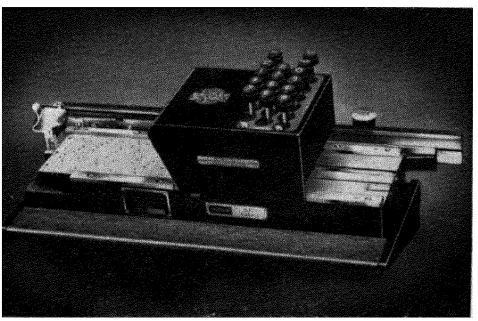
Hollerith Mark-sensing Reproducing Punch *Hollerith Reproducing Punch*

process by means of which information is calculated, or of carrying out the complementary arithmetical process to that by means of which the information is calculated. Complementary arithmetical processes are addition and subtraction; multiplication and division; involution and evolution.

The repetition of the process does not necessarily guarantee the accuracy of the information verified because for many reasons the checker can make the same mistake as the recorder of information, although such cases are fortunately rare.



Hollerith Verifying Punch



Powers-Samas Hand Verifier

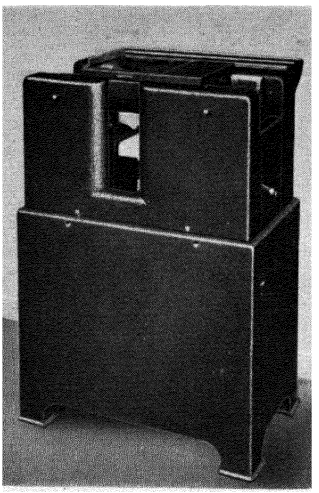
2. By agreement of totals with predetermined totals

This method is applicable in almost all accounting machine operations. For example, before posting a batch of invoices, a pre-list of the invoice values may be prepared. During posting, the values posted are accumulated on a proof sheet or tally-roll, the total of which at the end of the run of postings should agree with the total of the pre-list. The agreement of the total of ledger account balances with the control account balance is an example of this type of check.

Such a check does not reveal compensating errors, nor does it show where invoices have been posted to the wrong account. Again, it only tests the accuracy of numerical data capable of summation and not the accuracy of descriptive data.

3. By needling (*See also* pages 160 and 162)

This method is applicable to the verification of holes representing data, such as a date, reference number, etc., which is common to a batch of punched-cards. The needle can be quickly passed through holes punched correctly in the same position of a batch of cards.



Powers-Samas Automatic Verifier

4. By hand-operated key verifier

Punched-cards can be verified by machines operated by depressing keys in the same manner as hand-operated key punches.

5. By automatic verifier

The accuracy of punched-cards can be verified by this means instead of by hand verifying.

6. By digiting on a punched-card tabulator (*See also* pages 124 and 139)

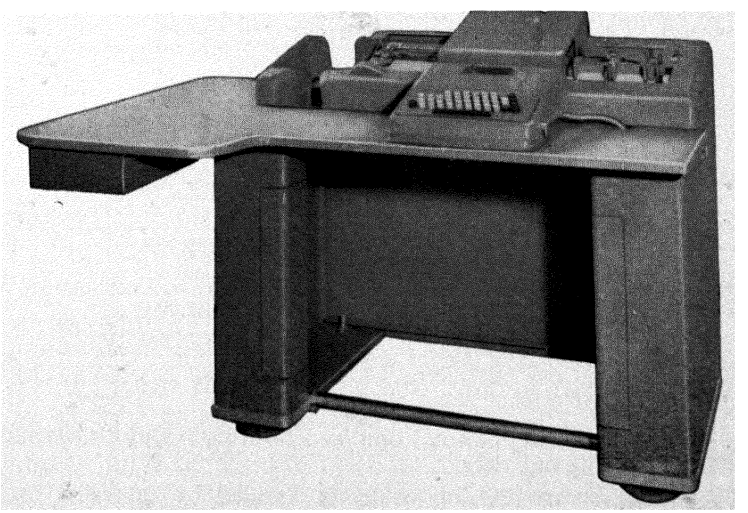
This is a purely arithmetical process which is carried out on a punched-card tabulator as a non-listing operation, to check the accuracy of

multiplication of numerical data punched on the cards. To do this, it is necessary to have punched on each card, not only the product, but the multiplier and the multiplicand. The process of verification will be seen from an example.

Suppose that ten cards are punched with the following data:

Card	*Multiplier* (*a*)	*Multiplicand* (*b*)	*Product* (*c*)=(*a*)×(*b*)
1	150	25	3,750
2	280	38	10,640
3	1,875	121	226,875
4	930	116	107,880
5	2,540	83	210,820
6	670	5	3,350
7	80	242	19,360
8	1,500	64	96,000
9	730	210	153,300
10	135	80	10,800
	8,890		842,775

The process involves sorting the cards on each digit of the multiplicand (because the largest number contains three digits as against four in the multiplier) and casting the multipliers containing the same numeral in the digit according to which the cards are sorted. The total of each group of multipliers is multiplied by the appropriate digit numeral and the grand total of all such products obtained. If calculations have been made correctly, the total obtained by listing should agree with the total obtained by digiting.



I.B.M. Electric Punched-card Verifying Machine

The following results are obtained in the example given:

Sorting on the units of the muliplicand:

Card	*Multiplier* (*a*)	*Multiplicand* (*b*)	*Product* (*c*)=(*a*)×(*b*)	
9	730			
10	135			
	865	0	—	
3	1,875	1	1,875	
7	80	2	160	
5	2,540	3	7,620	
8	1,500	4	6,000	
1	150			
6	670			
	820	5	4,100	
4	930	6	5,580	
2	280	8	2,240	
	8,890			27,575

Sorting on the tens of the multiplicand:

6	670	00	—	
4	930			
9	730			
	1,660	10	16,600	
1	150			
3	1,875			
	2,025	20	40,500	
2	280	30	8,400	
7	80	40	3,200	
8	1,500	60	90,000	
5	2,540			
10	135			
	2,675	80	214,000	
	8,890			372,700

Sorting on the hundreds of the multiplicand:

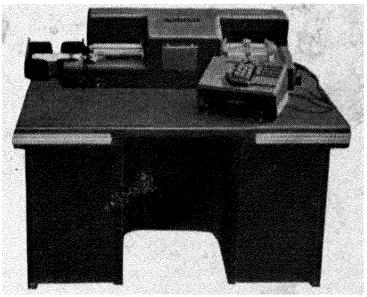
1	150			
2	280			
5	2,540			
6	670			
8	1,500			
10	135			
	5,275	000	—	
3	1,875			
4	930			
	2,805	100	280,500	
7	80			
9	730			
	810	200	162,000	
	8,890			442,500
				842,775

It will be seen that the total obtained both by listing the products and by digiting is 842,775.

The operation of division could be verified by reversing in the digiting process the product and the multiplier.

The factors which determine the method of verification are as follows:

(1) The availability of punched-card machines.
(2) The number of cards to be verified.
(3) The type of data to be verified.
(4) The availability of pre-list totals.
(5) The cost of the equipment.



Hollerith Automatic Verifying Punch

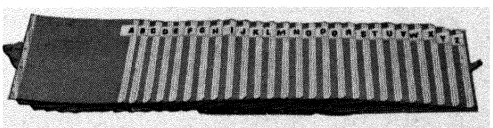
SORTING

This operation, which is ancillary to purely accounting operations, may be carried out in the following ways:

1. On a flat surface

This, which is the most common method, is the most laborious and inconvenient. Its disadvantages are as follows:

(*a*) The number of piles of documents obtainable is limited by the size of documents and the space available.



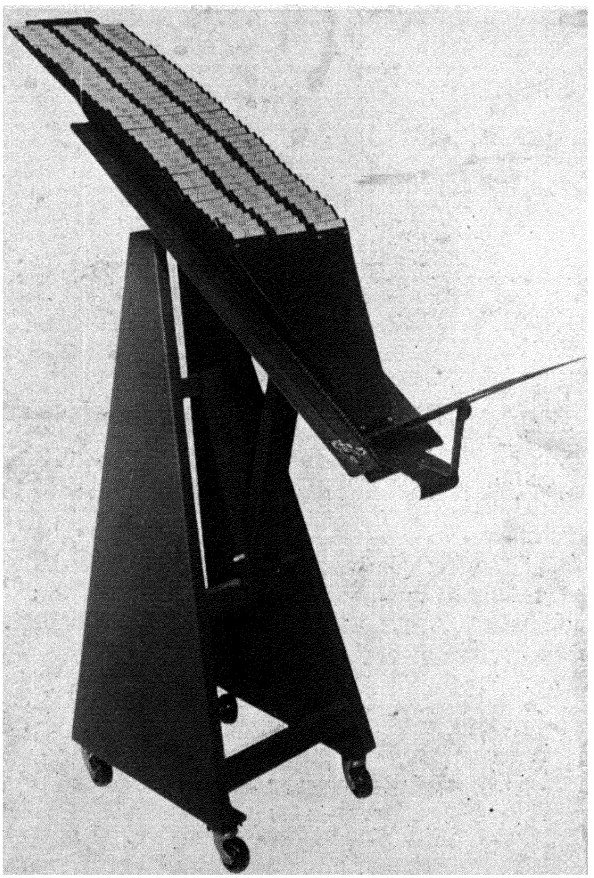
Stolzenberg Ready Sorter

(*b*) No readily visible indication of the contents of each pile of documents is provided.
(*c*) The sorting can be spoiled by a sudden draught.
(*d*) The rate of sorting is slow.

2. By means of a flap sorter

Economies in the surface area taken up can be made by using a flap sorter. These can be obtained in several sizes (25 up to 1,000), the smaller of which may be placed on a table and the larger of which are placed in

tiers on each side of the operator. The latter run on rails so that the sorters may be moved to within easy reach of the operator, who remains seated during the operation. A high rate of sorting can be achieved by means of flap sorters.



Sortergraf Mobile Sorter

3. By means of pigeon-holes

The disadvantages of the first method, except that of speed, are completely overcome by using pigeon-holes, although for a large number of groups a considerable space is required by the nests of holes. Space is wasted, particularly where certain groups cover only a small number of documents.



Sortergraf Sorting Installation

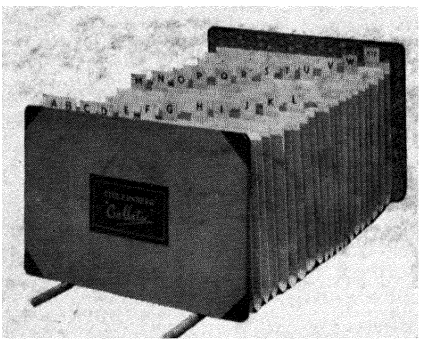
*

4. By means of a fan sorter or concertina file

A simple method of sorting a relatively small number of documents is by placing the documents in the appropriate pockets of the sorter or file. Such a device offers the advantages of the pigeon-hole method, with the additional advantage that it is portable and when not in use it can, unlike pigeon-holes, be compressed into a small space.

5. By needling (*See also* pages 154 and 162)

The sorting of hand-sorted punched or slotted cards can be carried out by inserting specially shaped needles through the holes or slots



Stolzenberg Collator-Sorter

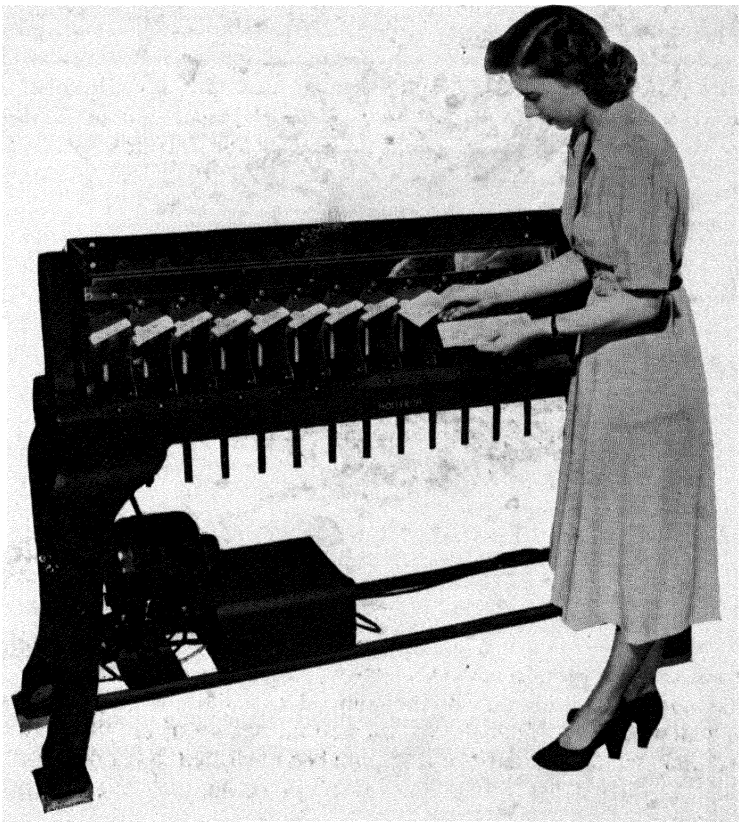
which represent the information according to which the cards require to be sorted. A high rate of sorting can be achieved, because the needle can be passed simultaneously through all cards to be sorted, those cards which have been punched or slotted in that position falling away immediately from those cards not so punched or slotted. By comparison, although mechanical sorters operate at a high speed, only one card at a time is sorted.

6. By mechanical sorter (*See also* page 162)

Sorting of punched-cards at the rate of 24,000 card sorts per hour can be carried out mechanically by a sorting machine which is controlled, according to make, by electrically or mechanically sensing the position of the holes punched in cards. When any pocket, which takes up to 800 cards, is full, the machine stops automatically. As mentioned above, one card is sorted at a time, but the high speed is achieved partly by the cards following closely behind each other.

The following factors determine the method to be employed in sorting:

(1) The type of document sorted.
(2) The size of document sorted.
(3) The number of documents sorted.



Hollerith Sorting Machine

SELECTING

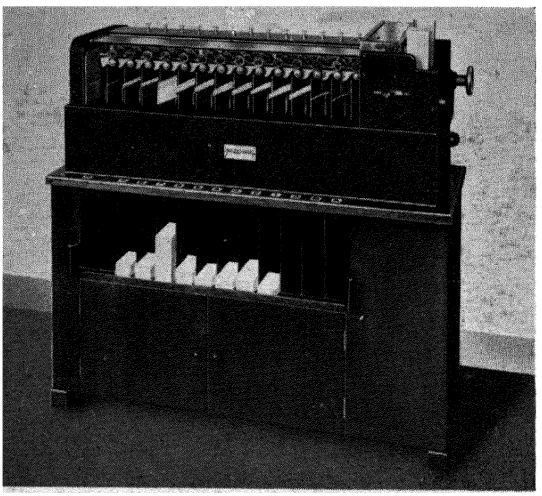
The operation of selecting documents from a larger number of documents may be done:

1. By visual inspection

This is the most common method of selecting documents (including punched-cards on which the information has been printed by means of an interpreter) the documents from which the selection is made, being

arranged or filed according to one or more designations whose plan is understood by the person making the selection. This method of selecting is used in selecting ledger cards which require to be posted mechanically. They may be either marked in the file of cards or extracted from the file before, and replaced in the file after, posting.

2. By needling (*See also* pages 154 and 160)
The process described previously in connection with sorting can be applied to selecting. By the simultaneous insertion of a number of



Powers-Samas Sorter

needles determined by the number of digits in the code number according to which the selection is made, the required card or group of cards required can be selected instantly.

3. By mechanical sorter (*See also* page 160)
Selection of punched-cards can be made by passing the cards from which the selection is to be made through a sorting machine as described previously in connection with sorting. The sorter is fitted with a cut-out device which ensures that only the selected cards are withdrawn from the pack, in which, as a result, the cards maintain their original sequence throughout the operation.

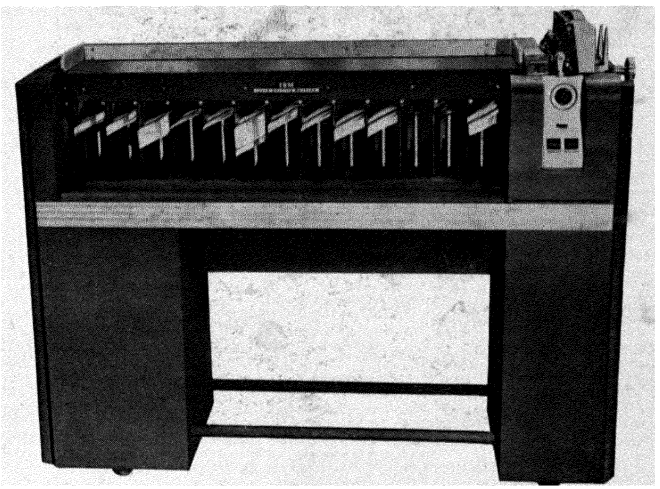
The only factor which determines the method of selection to be employed is the type of document to be selected.

COLLATING

The operation of bringing together according to a particular characteristic, documents which are arranged according to different characteristics in one or more sets is termed collating. For example, three sets of documents may consist of cheques paid, invoices and credit notes. These documents may be collated according to supplier, that is to say, all cheques, invoices and credit notes relating to each supplier may be brought together by this process, which may be carried out as follows:

1. On a flat surface

Where the number of sets of documents to be collated is small, this method can be used. Where, however, the number is large, the docu-



I.B.M. Electric Sorting Machine

ments occupy a large area, extending in some cases over several large tables, necessitating the walking of the collator over long distances.

2. By means of a collating stand

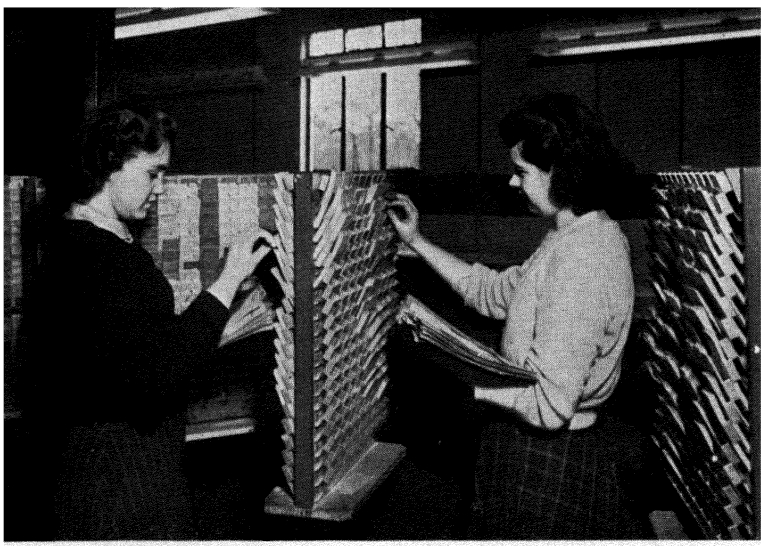
This device is constructed on the pigeon-hole principle, the holes being long and narrow. The holes may be arranged with the long side either horizontal or vertical. In the horizontal arrangement the documents lie flat and in the vertical arrangement the documents stand on edge. Where one document only is taken from every hole, this device is of greatest benefit. Owing to the fact that more than one successive document may require to be selected from any hole, or documents in any holes may have at times to be passed over, it is essential that the

characteristic according to which collation is made should be visible. This is usually impossible with a pigeon-hole device.

Where it can be used, a high rate of collation can be achieved owing to the elimination of walking distances.

3. By means of mechanical collator or interpolator

Two packs of punched-cards may be collated at a rate varying according to type of collation, from 12,000 to 24,000 cards per hour. According



Selecting Pre-punched Powers-Samas Invoice Item Cards

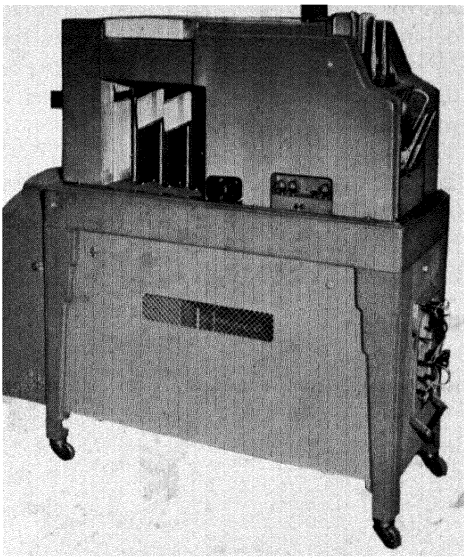
to make of machine, cards can be collated according to numerical or alphabetical characteristics. The machine separates the two packs of cards into three packs, namely, those of the first pack which have no corresponding cards in the second pack, those of the first and second packs which are collated, and those of the second pack which have no corresponding cards in the first pack.

ANALYSING

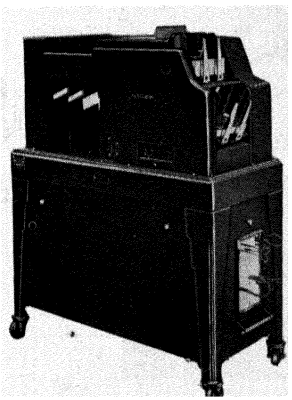
The process of analysing data may be carried out by means of the following:

1. Columnar paper with parallel total columns

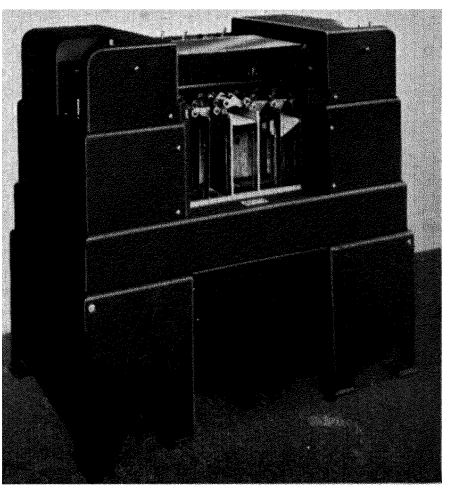
While this method has been employed for many years, for analysing invoices, cash, etc., in the form of analysis books, it is the most wasteful



I.B.M. Collator



Hollerith Collator



Powers-Samas Interpolator

known method of using paper, because, in effect, usually only two columns, namely, the total column and the total of the spaces occupied by individual analysed figures, which is equivalent to one column, are used. Columnar paper of this sort is used for both hand, typewriter and machine recording.

2. Columnar paper without parallel total column

This method of analysis is less wasteful than the previous method, because entries are made from the top of all columns downwards and are not staggered to correspond with entries in a parallel total column.



Kalamazoo Summarizer

One or more columns can be used as separate total columns and can be used for the same purpose as a parallel total column, namely, the location of errors. This method can only be used conveniently for hand analysis.

3. Pegboard and pegslips or 'Summarizer'

A useful and flexible method of analysis is by the use of pegslips on each of which the analysis of a total, which is entered on the bottom line, is made vertically on the lines above the total. These pegslips may be sorted according to any desired classification. Thereafter they are placed on a pegboard, one overlapping the other, and by means of a T-square to guide the eye and an adding machine, the data on each line is cross-totalled on to a sub-total pegslip. Finally the sub-total pegslips are dealt with in the same way to provide a total pegslip.

The advantage of this method, particularly where the total is analysed

according to several headings, is that the pegslips can be used more than once to provide as many different types of analyses as are required. This method, in effect, employs columnar paper, cut into columns and placed side by side on the pegboard.

4. Consecutive cards or sheets

Like the pegslip method, this method is economical and extremely flexible as additional cards or sheets can be inserted as additional analysis headings are required. Each card or sheet is, in effect, a column of the columnar sheet, the 'columns' being placed one behind the other instead of side by side.

While the method is used extensively in machine accounting, it provides the most flexible method of manual analysis.

As an aid to this method when basic documents contain a number of items, each of which must be analysed separately, 'tagging' may be used. This is the recording of single items on a tally roll, with spaces of about one inch between each item, the cutting of the tally roll into 'tags', each containing one item, the sorting of the 'tags' according to the required analysis, and the recording of the analysed items.

COPYING

Although it is not a main accounting operation, mention may be made of the methods of copying, as certain of them are applicable to copying documents for storage. The methods of copying are as follows:

1. Direct copying

Copies may be made of information by any of the methods used for recording information, namely, manual, typewriter, accounting machine, etc.

2. By means of carbons

Copies are made in typewriters, accounting machines, copy-writing devices, etc., by means of carbons inserted between the documents. Usually carbons may be used repeatedly before becoming useless. In certain cases, however, cheap carbons, which are used once only, are collated with forms in packs. This eliminates the time involved in inserting carbons.

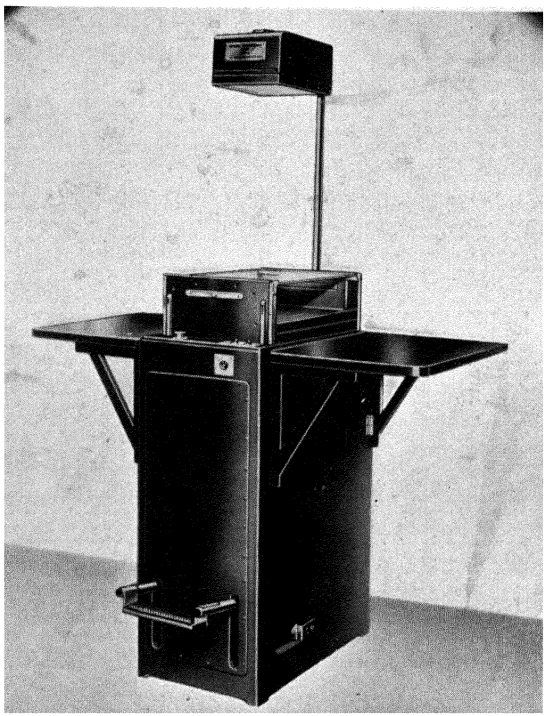
3. By means of carbon-backed stationery

Copies can be made of any desired sections of the information recorded on a form or book by means of a special ink with which the required sections of the back of a form or book may be coated. This method is

of immense advantage in eliminating the insertion and withdrawal of carbons. At the same time the carbon does not smear and a clear copy of the information is obtained.

4. By roller copier

By this means copies of documents are made on a roll of paper, which is cut to size. The single sheets may then be filed or made into a book



'Copycat' Standard Model

ready for numbering of copies. Up to six copies may be made of a single letter typed by means of special ribbons.

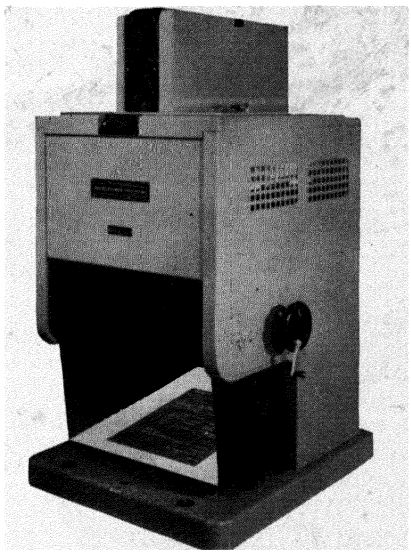
5. By reflex photocopying

Depending upon the type of process, a negative and a subsequent positive, or a direct positive the same size as the original, may be obtained by this method. The copy, which cannot be larger or smaller than the original, can be made according to process on paper, translucent cloth, or metal. Results are permanent and an unlimited number

of copies can be made. Bound books can be copied by this means. Several types of equipment, which it is unnecessary to describe, are available for this type of copying.

6. By microphotography

Greatly reduced copies can be rapidly made by this process, which photographs direct on to microfilm the document to be copied. Reduc-



'Recordak' Desk Model Micro-Filmer

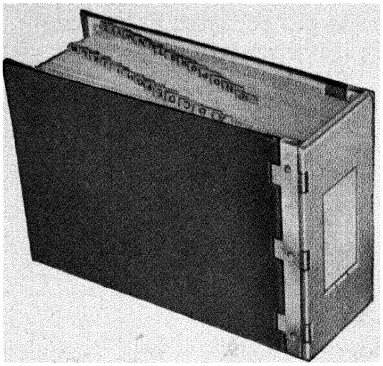
tions of 17 to 1, 18 to 1, or 23 to 1, dependent on the type of equipment, can be obtained, at a rate dependent on the size of document copied, the substance of the paper and the make of camera, of up to 5,000 exposures an hour.

Positives are not made from the negatives, as the films can be read in a reader, which can also be used as a projector of the images.

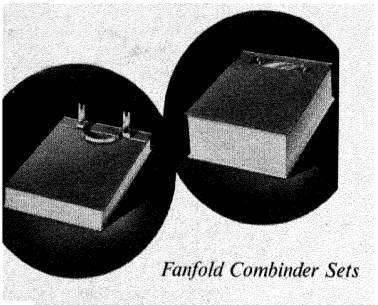
The use of microfilms reduces tremendously the space required for storing copies, as the originals do not have to be retained indefinitely. At the same time it is useful when, as a security measure, copies are required to be stored in different places.

POSTING

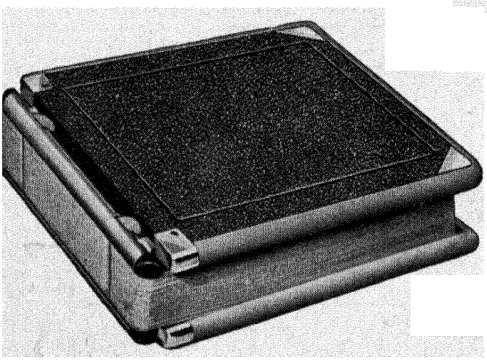
The figures posted to a document may be made directly from single documents, such as invoices, or from a book or record such as a sales



M.M.M. Improved Four-post Binder

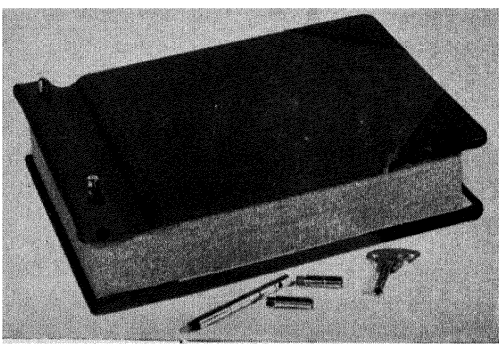


Fanfold Combinder Sets



Twinlock 'Sentinel' Thong Binder

'Saxon' Endlock Binder

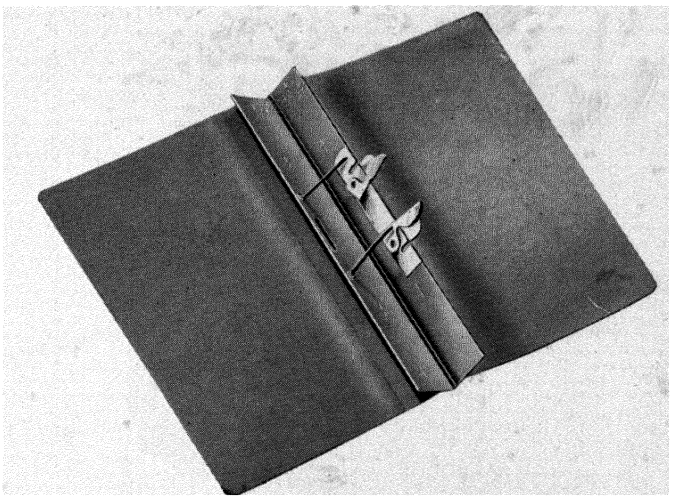


book. The method of posting depends largely on the type of posting media, i.e. documents or records. The methods are as follows:

1. From documents

(A) BULK POSTING

Where the number of entries is substantial, in the case, for example, of the issue of small items of material, it saves space in the record posted, just to total the quantities and values of all issues of the material recorded in the batch of posting media which have first been sorted



Stolzenberg Double Wing File

according to the order of the posted records, and then to post the total. This method is frequently employed where invoices are posted to suppliers' or customers' accounts at the end of each week or month. Where an invoice record is used, the details and posting totals are entered on this record.

(B) MULTIPLE POSTING

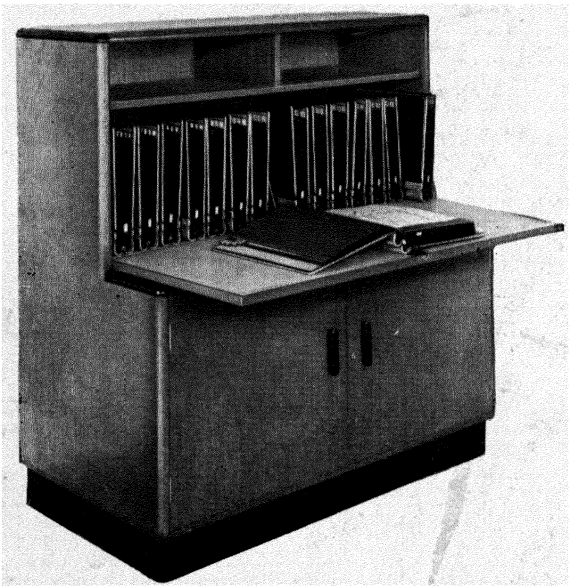
The operation is exactly the same as in bulk posting, with the exception that each of the pre-sorted posting media is posted individually.

(C) DUAL-RUN POSTING

Where a double check is required on customers' ledger accounts, the posting media may be posted to the ledger accounts by one operator and posted to the statements by another. When the operation is completed, the balances on accounts and statements are compared and errors localized and corrected. •

(D) SLIP POSTING

This method eliminates ledger cards or accounts, by filing in each supplier's or customer's unpaid file the actual document or copy of the actual document on which the amount to be posted appears. When invoices are paid, the corresponding payment 'slip' is attached to the invoices paid and the 'slips' are removed to a paid file. Invoices remaining at any time in the unpaid file represent either the amount due to a supplier or due by a customer.



Shannoleaf Bureau

2. From records

(A) DODGE POSTING

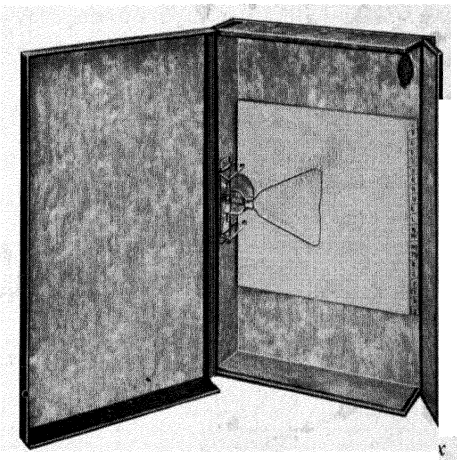
In this operation, each successive item in the record is posted. Naturally, where several items require to be posted, it involves the pulling or locating of the document to be posted as many times as there are postings to be made. It is of practical use only where multiple posting is not involved.

(B) EXHAUST POSTING

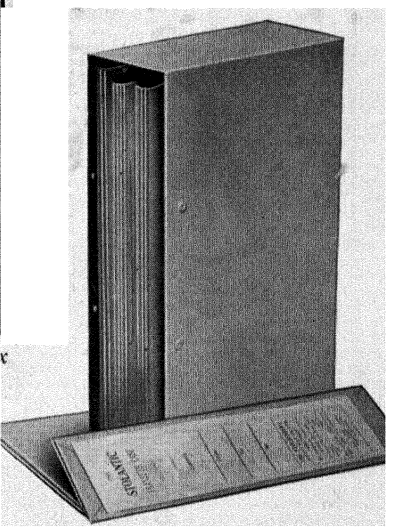
The disadvantage of dodge posting is overcome by locating the posted document corresponding to the first item to be posted, and locating on

the posting medium all the entries to be posted to the same document before replacing it. The operation is repeated for the second item to be posted and so on until the items to be posted have been exhausted.

Owing to the ease with which unit documents can be sorted to correspond with the order in which the posted documents are maintained, unit posting media are far superior to records of these documents.



Stolzenberg Spring-clip Box File with Index



Stolzenberg Collapsible Transfer Case

FILING

Documents can be filed in the following ways:

1. In bound books

Where security is of supreme importance, accounting records should be maintained in bound books provided with suitable means of reference, such as coloured sectional cards or thumb indexes.

2. In loose-leaf binders

In post, pillar, thong, ring, string or tape binders, documents of uniform size suitably punched, including where security is not of paramount importance, accounting records may be filed for reference or use.

Documents of the same size as the binder, such as ledger sheets, sales invoice copies, etc., or shorter documents such as record sheets, index cards, etc., whose edge requires to be visible for speedy reference to classification details, may be filed in loose-leaf binders.

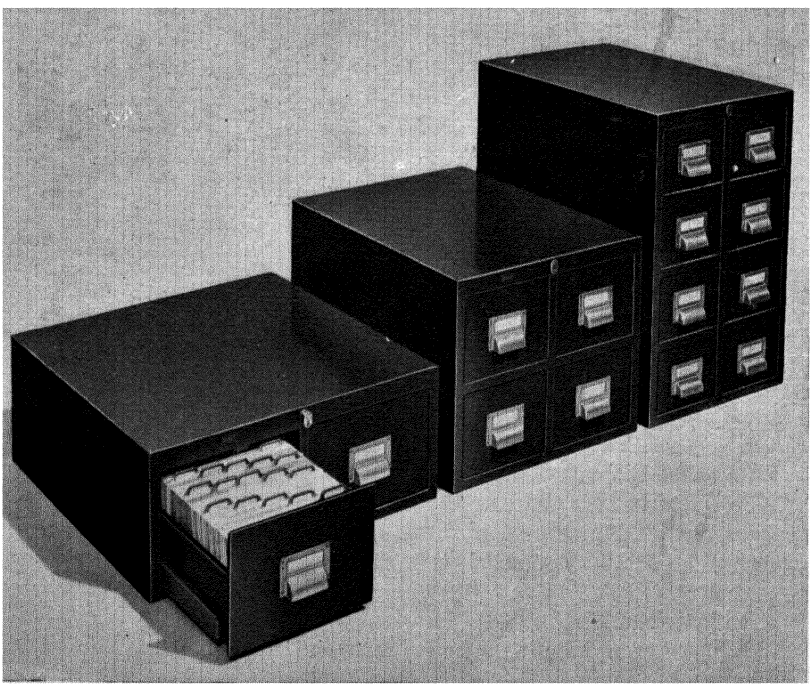
Dividers, index tabs, signals and other means of identification can be incorporated with the filed documents.

3. In box files

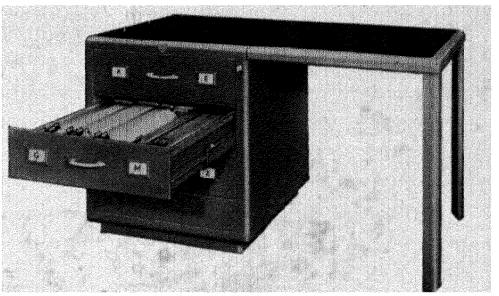
Documents of all types, but particularly those which vary in size, may be filed in box files, some of which are provided with springs or clamps or index sets. Box files may be positioned flat or upright according to the storage accommodation used.

4. In small drawers or trays

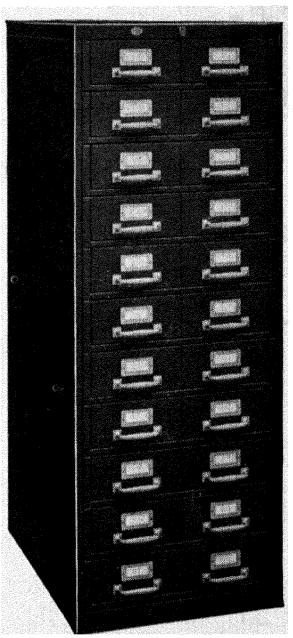
Drawers stored in cabinets are used principally for storing punched, index or record cards, divided into groups by means of inserted coloured divider cards and reference cards, letters or numbers on the outside of the drawers.



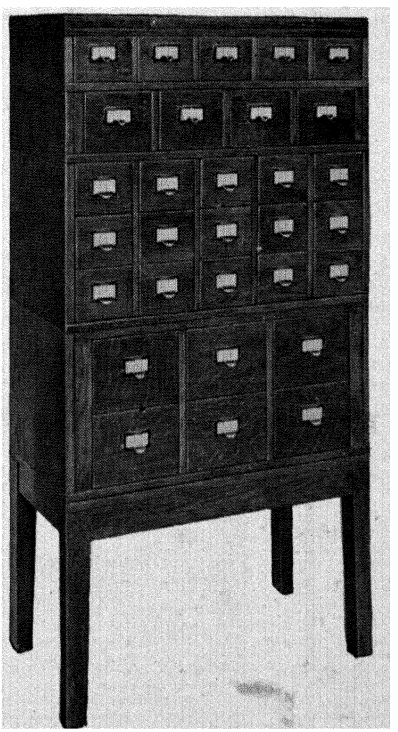
Roneo 'A' Grade Card Index Cabinets



Vistem Single-pedestal Desk



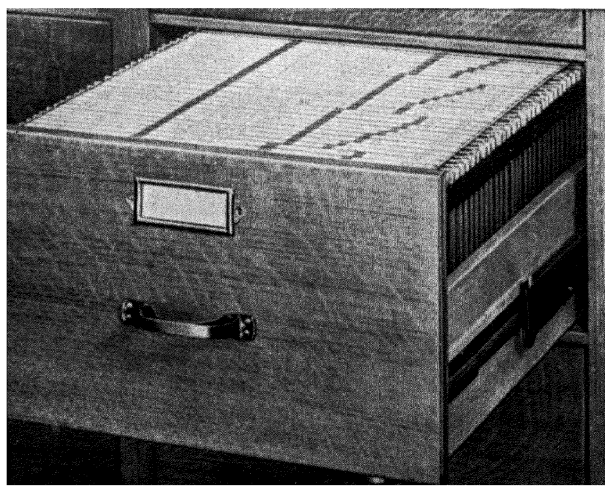
Art Metal Punched-Card Cabinet



Shannon Card Index Sections



Vistem Trolley



Shannograph Filing Cabinet



Roneo 3000 Series Card Filing Cabinets

Instead of being stored in nests of drawers, the documents may be stored in open trays. This is the practice where the 'pulled-card' method of selecting pre-punched-cards is employed. The advantage is that it saves the time of opening and closing drawers.

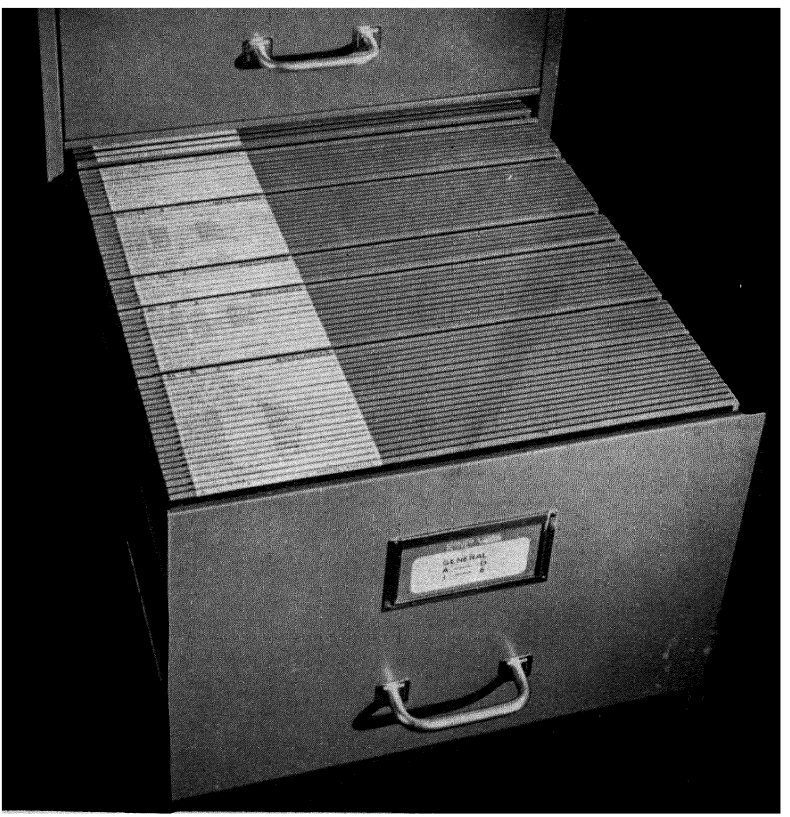
5. In large drawers

Documents in the form of papers, letters, invoices, etc., can be filed in drawers of wood or steel contained in cabinets. The documents can be separated by means of indexed dividers, or they can be filed in manilla folders with or without storage pockets, or in the pockets of a suspension filing system. Where they are filed in manilla folders, these folders may be placed directly into the drawers or may be placed in the appropriate pockets of a suspension filing system. A suspension filing system maintains files in better order. Certain suspension systems provide a visible means of identifying the contents of individual files.

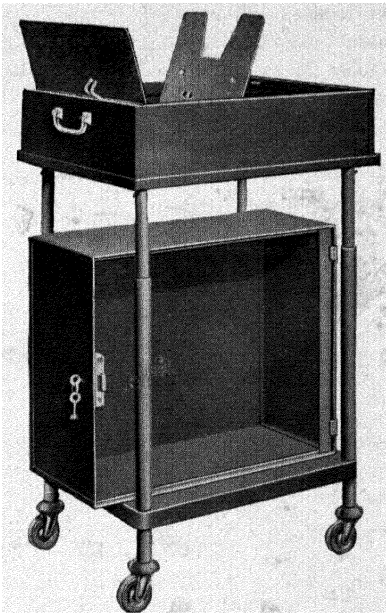
Statements, invoices, etc., may be first filed in vertical panels which contain a number of pockets arranged so that the top edge of each pocket is exposed to show classification details. These panels, in turn, may be filed vertically in the drawers.

6. In large trays

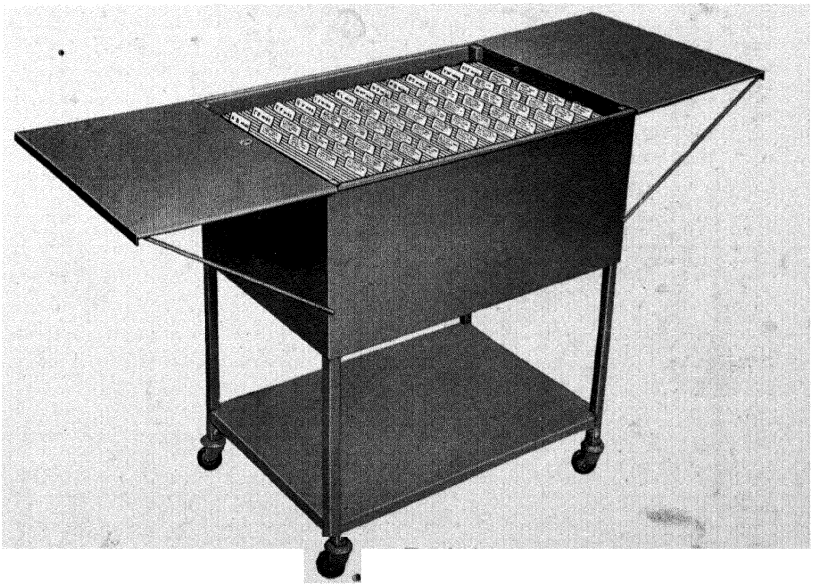
Ledger cards posted by accounting machines may be conveniently stored in trays provided with drop ends, which give better access to the cards during the posting operation. The trays may be placed on trolleys while in use, and when not in use may be stored in several ways, such as under locked cover on the trolley, in the drawers of a fire-proof cabinet, in suspension fittings in a fire-proof cabinet, in a fire-proof roll-top desk, or in a variety of fire-proof ledger containers.



Roneo Visible '80' Filing System



Art Metal Posting Tray and Trolley



Twinlock 'Vetromobil' Trolley

7. In ledger posting binders

Ledger cards or sheets may be kept in ledger posting binders provided with a special locking device which secures the cards or sheets when not in use and loosens them for easy withdrawal and replacement during use. They may be stored in the same manner as ledger posting trays.

The factors which determine methods of filing and storage are these:

(1) The type of document filed.

(2) The purpose for which the document is used.

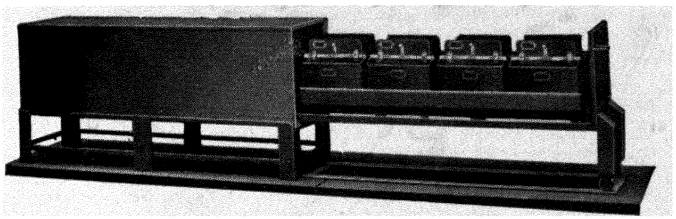


Roneo Flyweight Posting Trays and Trolley

(3) The need for security against loss by fire or pilfering.
(4) The number of documents filed.
(5) The cost of equipment.

INDEXING

There are three principal methods of providing indexes, namely, by book, card, or strip. While book, strip and certain types of card indexes are maintained apart from the records or data to which they refer, certain types of card index are incorporated with the record to which they refer. In effect, therefore, there are four types of index, as follows:



M.M.M. Fleet Rail Machine Equipment

1. Book index

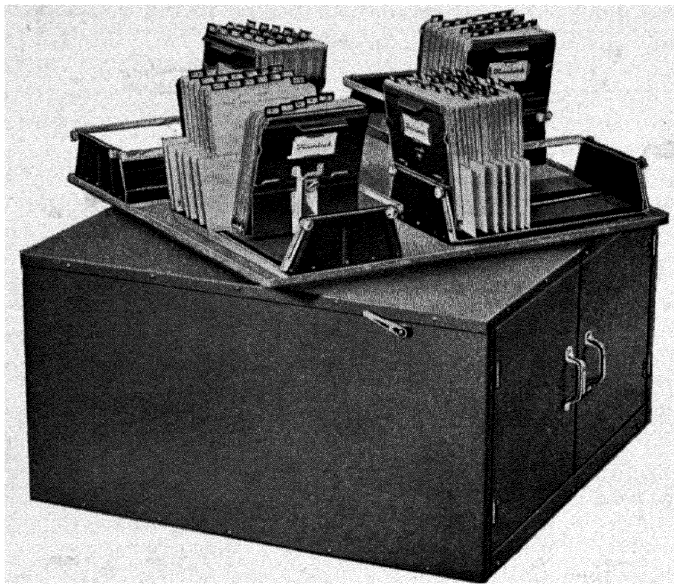
The earliest type of index was a bound or loose-leaf book with a thumb index which enabled any desired page of the index to be located quickly. Apart from the loose-leaf book, which can be expanded as required, the capacity of such indexes is limited. Again, certain parts of the index contain fewer references than others, which results in a waste of space. They are, however, the cheapest form of index, and in the case of ledgers etc. they may be incorporated within the binding.

2. Card index maintained separately

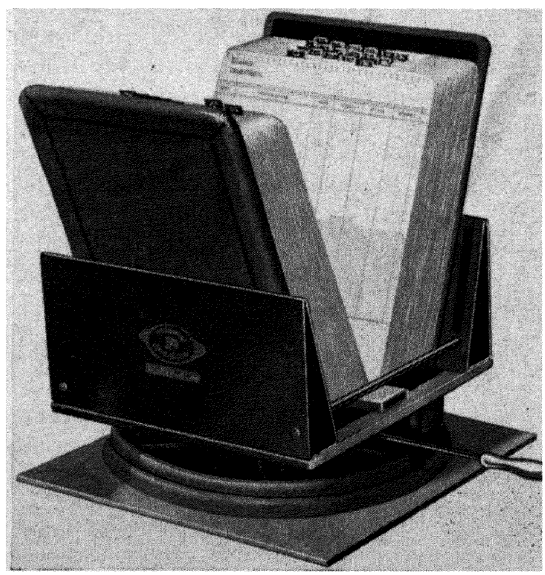
This type of index consists of card, wood or metal boxes, or drawers of cards of standard size on which references are recorded on each line on both sides of the card. Location of cards is assisted by the insertion of coloured dividing cards, tab indexes, etc. This index is much more flexible than the book index and can accommodate a large number of references with little wasted space. 'Dead' cards can be withdrawn and new cards inserted as required. The disadvantage of this method is that the pulling of unwanted cards during the locating process wastes time, which is occasionally considerable when there is a large number of cards.

3. Strip index

The strips of various colours on which the record is made may vary in width from one-sixth of an inch, on which one line of type appears, to

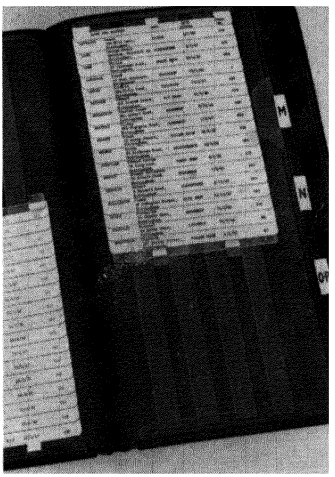


Twinlock Revolving Posting Unit

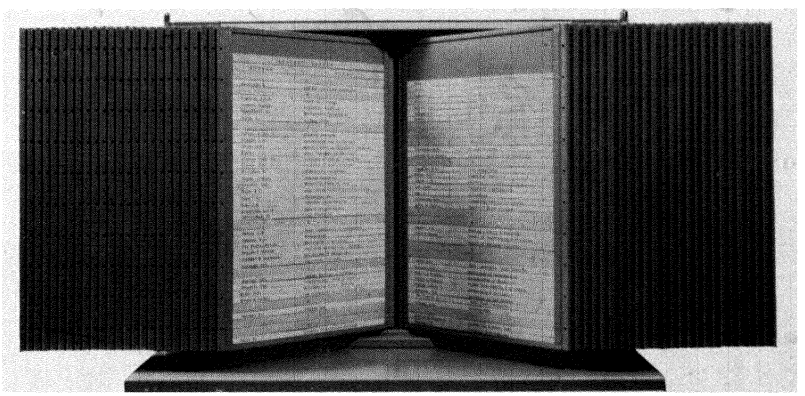


Kalamazoo Double-fast Posting Equipment

one inch, on which six lines of type appear. The strips may be made of stiff paper, card or paper-faced cardboard, or wood. They are provided in tear-off sheet form so that they can be inserted in a typewriter.



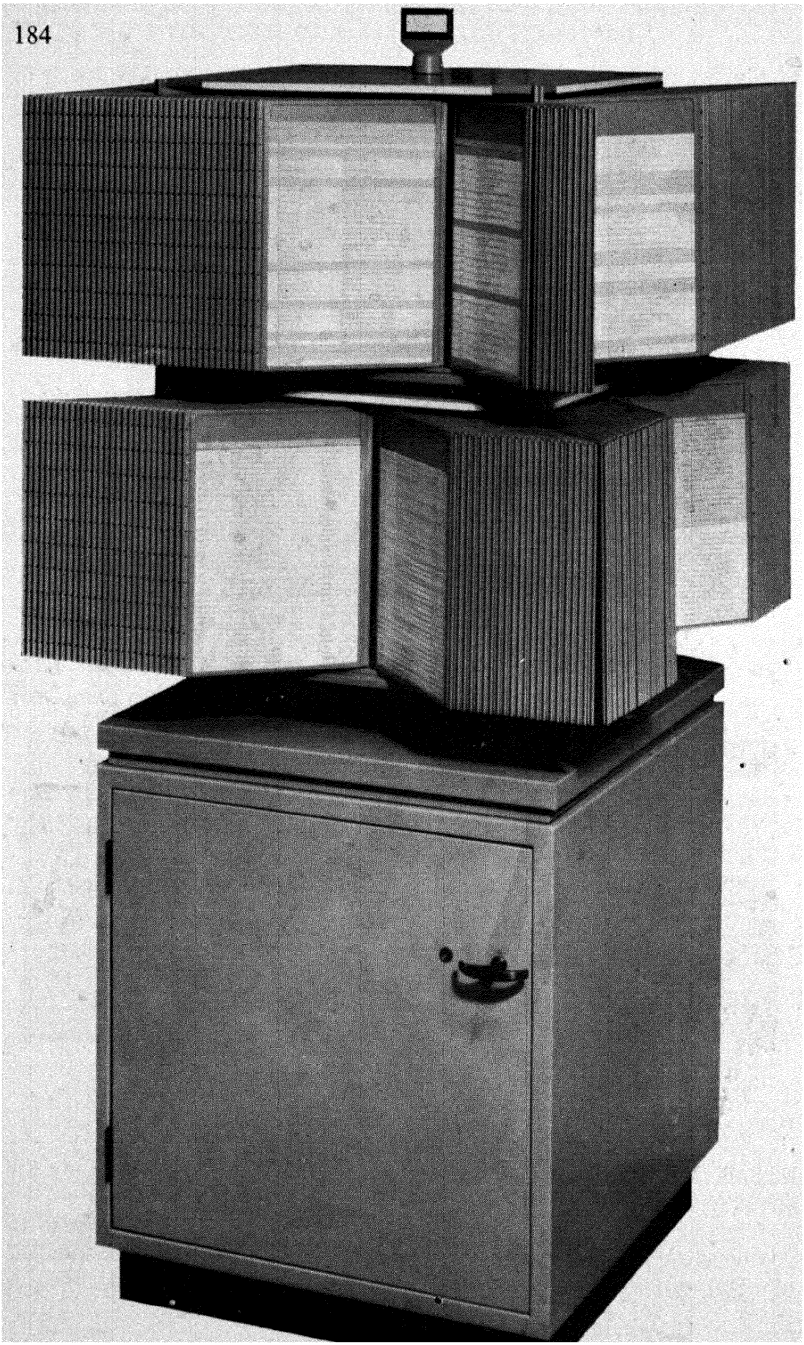
Kalamazoo Strip Index Book



Roneo Visible Strip Index Desk Stand

Signals can be incorporated by inserting coloured tags or marking the strips with colour.

The one-sixth inch wood or board strips are filed by insertion in grooves to be found on both sides of metal panels, which are suspended in metal stands of varying capacities. One stand provides a book opening

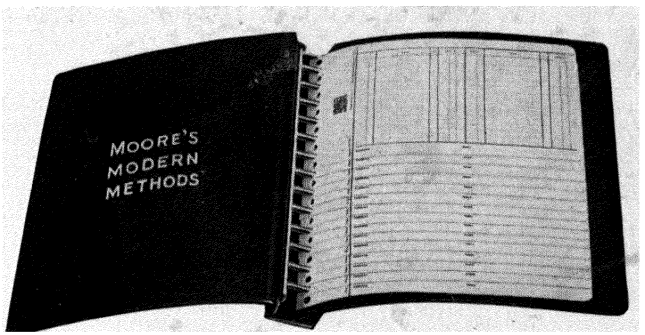


of the panels while another allows the panels to be rotated into view. Expansion of indexes is made by the use of additional stands.

The stiff paper or card strips are inserted in slots on the pages of loose-leaf binders, which can be expanded as required. The complete index can be sectionalized in different binders.

4. Card index combined with record

The index in this instance is a space half-inch wide along the bottom edge of the card on which the relevant information is recorded. By the staggering of the cards in their container, these spaces are made visible,



M.M.M. Minor Visible Record

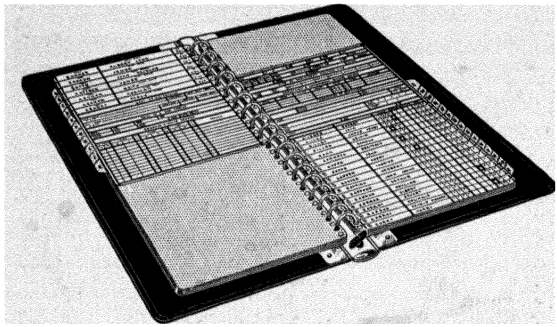
being protected where necessary by a transparent pocket. Fixed or sliding coloured signals may be inserted in these transparent pockets.

A number of methods of filing these cards is available, as follows:

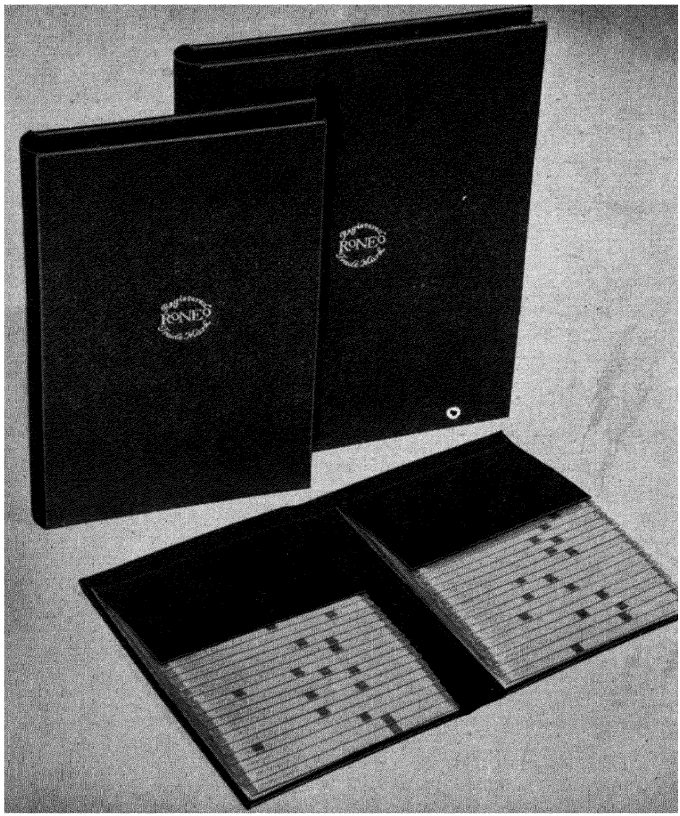
(*a*) *In loose-leaf books*, mainly of the ring variety, which allow entries to be made on both sides of the card by opening in one type horizontally and in another type vertically. The latter type of card is printed 'tumble-turn'.

(*b*) *In metal trays* or panels containing transparency-protected pockets into the slots of which the cards are inserted, or metal rods into which the top edges of the cards can be slid. In the latter case the protecting pocket fits over the card itself.

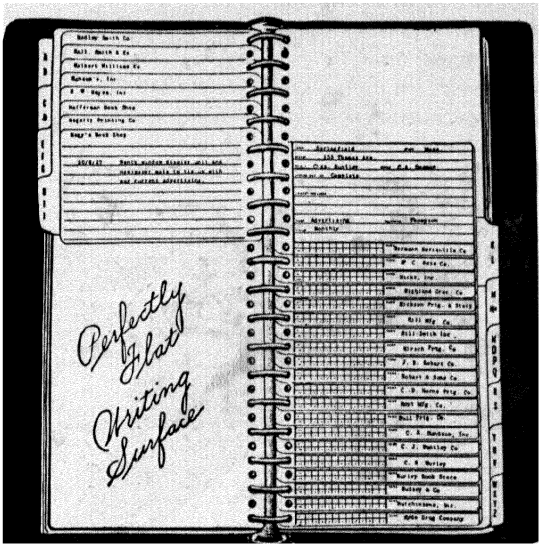
The filing of cards in metal rods allows both sides of the cards to be used by opening vertically, while the pocket system exposes to view only one side of the card. In the pocket system, however, cards can be inserted or removed without disturbing the transparency, which is fixed to the pocket, while in the rod system the transparency must be removed from the card itself. Double-row or single-row trays are available.



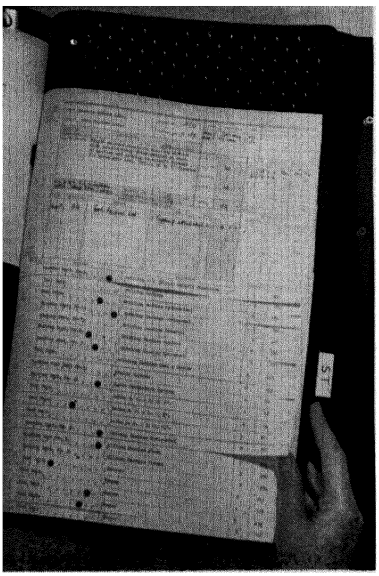
Twinlock 'Rapidref' Visible Record Binder



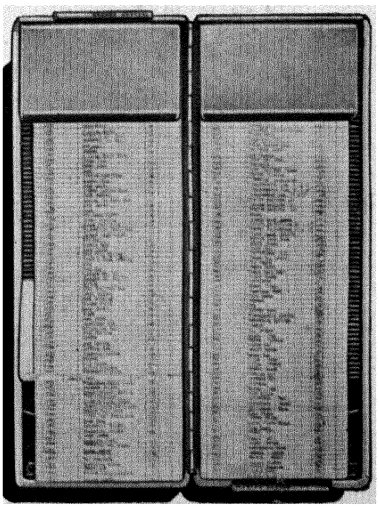
Roneodex Desk Wallets



National Visible Record Binder



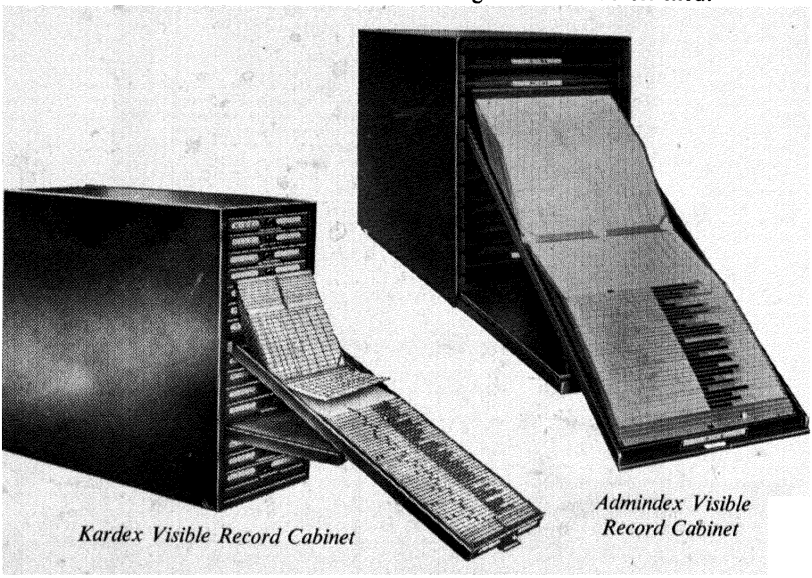
Kalamazoo Visible Loose-leaf Book



Postindex Book

The panels are housed horizontally in frames, which provide a book opening, while the trays are housed in standard or fire-proof cabinets of various capacities and designs.

(*c*) *In card-wheels*, which house the cards by means of belts running round the perimeter of the wheel. Both sides of the cards, which can be removed or replaced easily without disturbance of other cards, can be written on. Coloured dividing cards can be inter-filed.



Kardex Visible Record Cabinet

Admindex Visible Record Cabinet

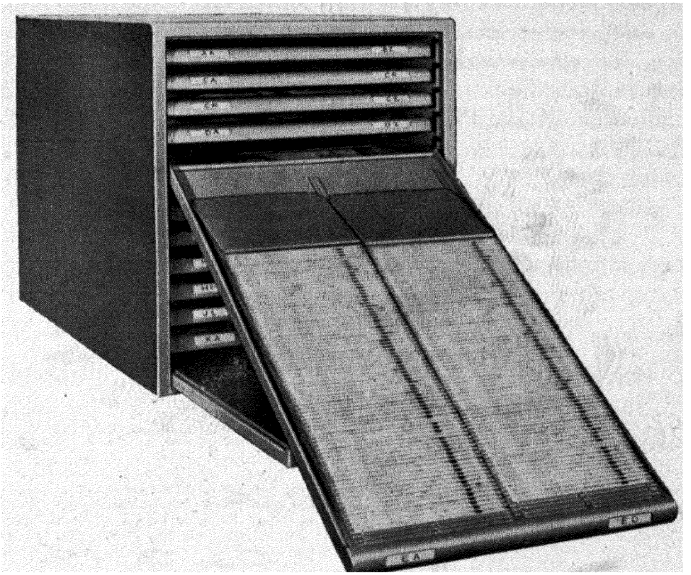
The method of indexing depends on the following factors:

(1) The number of indexes required.
(2) The need for the record to be combined with the index.
(3) The volume of information required to be recorded on one record.
(4) The need for mobility of index.
(5) The need for security.
(6) The cost of the equipment.

Folding and Inserting

While folding forms and, where necessary, inserting them in envelopes are frequently manual operations, they can be carried out by means of special machines, quickly and effortlessly.

In this chapter there has been considered a number of clerical operations which include more than purely accounting operations. These additional operations, though ancillary to accounting, are nevertheless essential



Admindex Double-tray Visible Record Cabinet

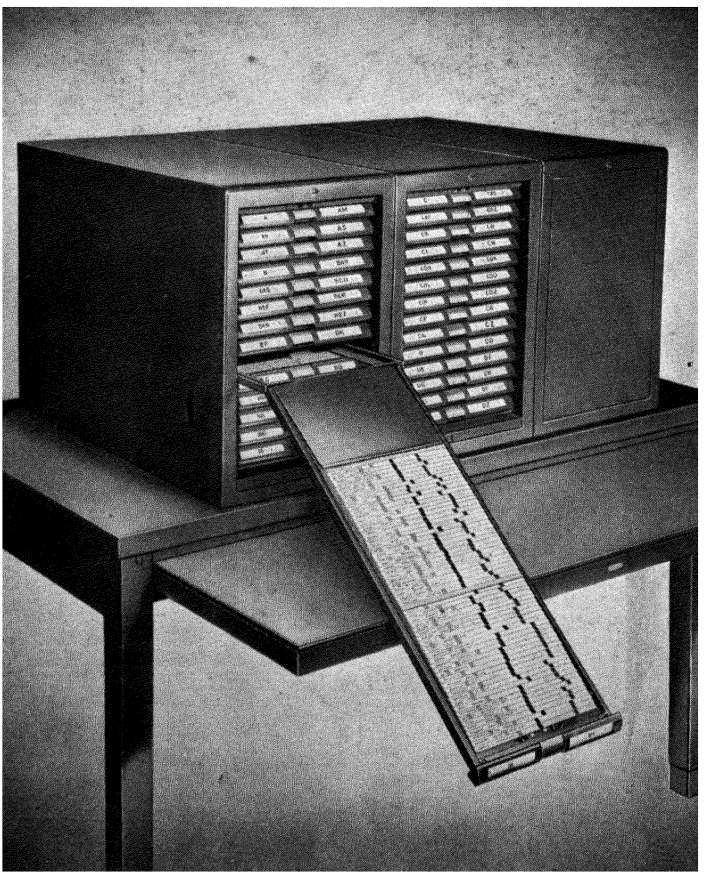


Art Metal Rollindex Unit

prerequisites to the carrying out of accounting operations. At the same time certain operations, such as coin-counting and insurance card stamping, for which certain devices are available, have been omitted, because although the payment of wages may in practice, as a matter of convenience, sometimes be included in the cost accountant's function, it is, being concerned with the disposal of cash, essentially a financial accounting operation.

The Factors which Affect the Choice of Method

The various factors which affect the choice of method to be employed in carrying out these operations, and which have been set out in this

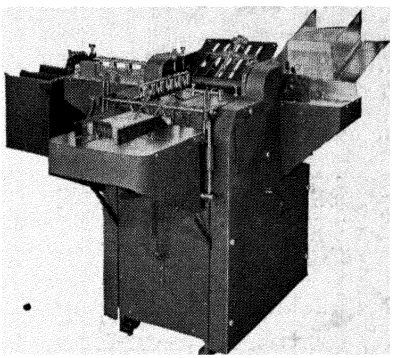


'Roneodex' Visible Card Recording Units

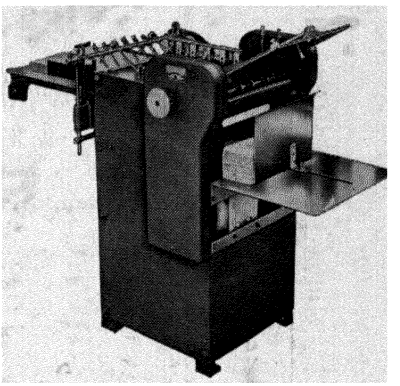
chapter, must be considered when setting up the cost accounting system. The overriding factors which determine as a whole the choice of methods are as follows:

1. The speed with which final results must be obtained

It has become a costing cliché that what is wanted is news, not history. That is to say that the more distant the happenings to which information relates, the less useful is the information. It is possible, by the employment of sufficient staff and adequate machinery, to present information almost immediately after an event has occurred, but the



Unifold Mailing Machine, Model L



Unifold Folding Machine, Model K

cost is so great that the value of the benefits obtained from the news is less than the cost of obtaining the news. So, therefore, a reasonable balance between the cost of obtaining and the value obtainable from information must be determined.

2. The volume of documents handled

Cost accounting is a process which, as a whole, must be kept in balance. That is to say, bottlenecks should not exist, nor should there be more than a reasonable amount of unused capacity either of persons or machines. To maintain this balance, a very close control of the methods employed to carry out clerical operations must be kept. At any stage in the cost accounting process, machines or persons should be capable of handling the number of documents which pass through their hands; and the most economical method of handling these documents should be employed.

3. The cost of the clerical methods

Emphasis must be made constantly on the cost of cost accounting, when deciding on the methods to be employed. Any increase in speed of

OPERATION SCHEDULE — Page 1

Line (1)	Operation (2)	Document: Description (3)	Document: Form Sch. ref. (4)	Method: Description (5)	Method: Equipment Schedule ref. (6)	Person: Orgn. Chart ref. (7)	No. of documents: per period (8)	No. of documents: per hour (9)	Hours (10)=(8)÷(9)
1	Recording	Sales invoices	15	Electric Typewriter	814	1,304	2,000	20	100
2	Checking	,, ,,	15	Visual	—	1,308	2,000	33	60
3	Multiplying	,, ,,	15	Rotary Calculator	901	1,503	2,000	60	33
4	Posting	,, ,,	15	A.B. Accounting Machine	1,011	1,513	2,000	120	17
5									
6									
7									
8									
9									

EQUIPMENT SCHEDULE — Page 9

Line (1)	Equipment: Description (2)	Equipment: No. (3)	Operation: Description (4)	Operation: Opn. Sch. ref. (5)	Document: Description (6)	Document: Form Sch. ref. (7)	No. of documents: per period (8)	No. of documents: per hour (9)	Hours Employed (10)=(8)÷(9)	Operator Opn. Chart ref. (11)
1	Rotary Calculator	901	Multiplying	14	Sales Invoices	15	2,000	60	33	1,503
2					,, ,,	16	4,000	80	50	
3					,, ,,	17	3,000	60	50	
4					Purchase Invoices	21	2,000	120	17	
5							11,000	73	150	
6										
7										

obtaining final results or in the number of documents handled causes a corresponding increase in the total cost of cost accounting. While this is inevitable, what should be aimed at is the constant reduction in cost per unit of output and to this end it may be better to employ a costly machine than a cheaper one.

Operation Schedule

In reorganizing a cost accounting system an operation schedule may be constructed on the lines of that shown opposite:

This schedule gives details of the operations, documents, persons, machines, times, etc. The information is cross-referenced to three other charts as follows:

Column (4) to Form Schedule (see page 98)
,, (6) to Equipment Schedule (see page 192)
,, (7) to Organization Chart (see page 200)

Equipment Schedule

The equipment schedule to which reference is made may be drawn up in the form shown opposite:

This schedule gives details of the documents, persons, times occupied, etc., in relation to each item of equipment. Cross-references are made as follows:

Column (5) to Operation Schedule (see page 192)
,, (7) to Form Schedule (see page 98)
,, (11) to Organization Chart (see page 200)

In these two schedules the essential details relating to clerical procedures and methods are set out.

Such alterations as require to be made to the information recorded in these schedules may be made in the manner which is most suited to the type of schedule employed.

SYNOPSIS OF CHAPTER XXII

THE COST ACCOUNTING ORGANIZATION

	Page
Introduction	196
Place in business organization	196
Centralization versus decentralization	199
Advantages of centralization	199
Disadvantages of centralization	199
Advantages of decentralization	200
Disadvantages of decentralization	200
Internal organization	200
The factors which determine the form and size of the organization	201
Number of locations	202
Employment of specialist groups	202
Employment of office appliances	202
Volume of documents	202
Availability of personnel	202
Cost of operation	202
The small organization	203
The characteristics of good organization	203
The formal statement of the organization	204
Organization chart	204
Schedule of posts	205
Statements of responsibility	205
Schedule of personnel	208

Chapter XXII

THE COST ACCOUNTING ORGANIZATION

THE carrying out of the clerical procedures on the various forms and records which have been instituted is the work of the persons employed by a business to carry out these procedures. In the two previous chapters, forms, procedures and methods have been dealt with, and it remains to this chapter to deal with the persons, or as it is called, the organization.

Place in Business Organization

Cost accounting was defined as the process of accounting for cost which begins with the recording of expenditure and income or the bases upon which they are calculated and ends with the preparation of statistical data. Many of these records originate in factory departments, stores, warehouses, lorries, etc., and pass through other similar places before finding their way to the department which collates the data and presents the results. Many of these persons who do this recording and handling of documents are not members of the accounting organization, but members of other departments and responsible to persons who do not carry out accounting functions as their principal occupation.

The cost accounting organization consists of those persons whose principal activity is that of cost accounting. In fact, the cost accounting function is severely limited in extent. It does not cover the preparation of the basic documents, such as sales invoices, stores requisitions, machine time records, man-hour records, etc., but begins with the money and the quantities which have previously been recorded on these documents.

In this connection, the preparation of sales invoices presents a difficulty because, while the basic data on a sales invoice is not complete until the total value of the invoice has been entered, the intermediate operations of calculating the values of individual items and adding these values to determine the total invoice value are accounting operations. In practice, this type of situation is dealt with in one of three ways, as follows:

(1) Where the sales office organization is large enough, persons can be employed in that organization solely to carry out these arithmetical operations on sales invoices.

(2) Where the sales office organization cannot support such persons, these arithmetical operations may be carried out by persons

employed by the cost accounting organization, which technically lends its facilities to the sales organization.

(3) The whole operation of preparing sales invoices may be carried out by the cost accounting organization.

Needless to say, these three methods are set out in order of desirability. The last method is an example of bad organization which should be avoided wherever possible. It is bad because the cost accounting organization should not originate a basic document, it should only make use of the information recorded on it.

So far, the point in the process of building up costs and sales to which the cost accounting organization extends has been defined. That is, the extent in one direction has been defined. It remains to define the other.

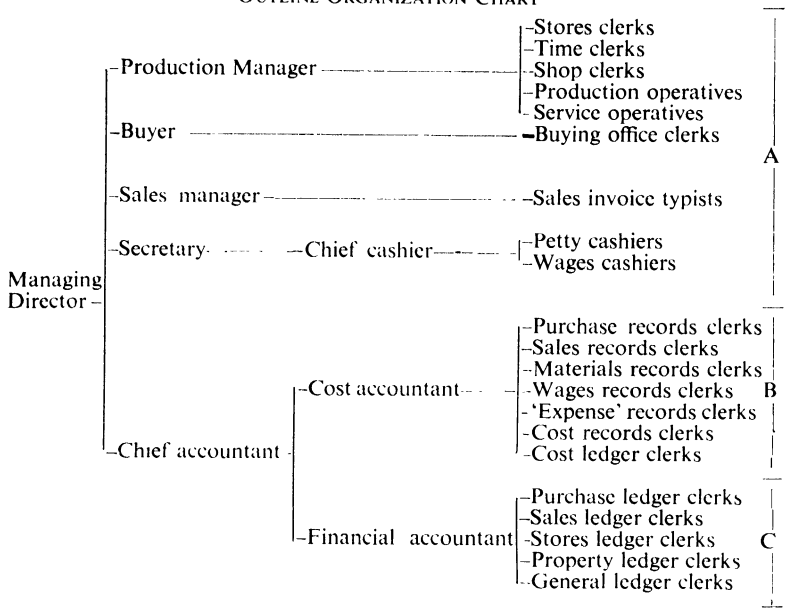
All purchasing of material, employment of labour and hiring of outside services results in the disbursement of cash; all purchasing of material results in the holding, for varying lengths of time, of stocks; the purchasing of goods and services on credit results in the creation of liabilities which exist until liquidated; the sale of goods and services results in the creation of debts until they are realized in the form of cash; the acquisition and manufacture of machinery, plant, etc., by a business results in the creation of fixed assets. To sum up, complementary to the revenue-earning and cost-incurring aspects of the sale of goods and services and the employment of materials, labour and services, respectively, there are the property-holding and liability-creating aspects. The former are described as the costing aspects, while the latter are described as the financial aspects; and the accounting procedures which are involved are described as cost accounting and financial accounting respectively. In the same way, the organization which is created to deal with the financial and financial accounting aspects of a business is, in principle, quite distinct from the organization set up to handle the costing and cost accounting aspects.

The extent of the cost accounting function has been defined negatively by considering what it does not embrace. To define it positively, the cost accounting function embraces the recording of income and expenditure incurred on credit (expenditure incurred otherwise involves the payment of money); the evaluation of the internally recorded basic data upon which costs are calculated; the use of the records of income, expenditure and costs; and the preparation and presentation of information relating to costs and revenue.

The relationship of the cost accounting organization to the other organizations involved in the cost accounting process is illustrated by means of the following outline organization chart of a business.

This outline organization chart shows, in section A, the persons from whom the basic data is received, in section B, the cost accounting

OUTLINE ORGANIZATION CHART



personnel and, in section C, the financial accounting personnel – all persons engaged to some degree in accounting.

Although the persons in section A are responsible to persons other than the chief accountant, in so far as these persons in section A carry out an accounting function, they should nevertheless recognize their implied responsibility to the chief accountant and their obligation to carry out in a satisfactory manner such accounting procedures as are required of them.

While this organization chart illustrates the principles of organization for cost accounting, in practice certain alterations may be necessary. It must, nevertheless, be stated emphatically that such modifications are made on the grounds of expediency and in no way violate the basic principles of organization.

The most frequent modification of the basic organization arises where a number of factories, each with its own cash, cost accounting and financial accounting functions to discharge, is in existence together with a head office organization which includes the chief and financial accountants and may include the chief cost accountant. In such circumstances, it is clear that the stores ledger clerks, for instance, must be located at the factories and not at the head office. Again, it may be the policy of the business to decentralize all accounting functions, in which case each factory and the head office has its own cost

and financial accounting organizations. In most cases of decentralization, there is no need to have a cost accountant and a financial accountant at each factory. The functions are, therefore, combined in one person, who may be designated cost accountant or works accountant, and who controls both cost and financial accounting personnel. This person should preferably be called a works accountant as, if he is called cost accountant, the fact that he controls financial accounting personnel appears to violate the fundamental principles of accounting organization. In fact, it does not.

Again, each works accountant may be responsible to both the cost accountant and the financial accountant at the head office for the cost accounting and financial accounting organizations respectively. This dual responsibility is unsatisfactory from an organizational point of view. The disadvantages of this arrangement can be overcome by making the works accountant responsible to the chief accountant, with an implied or functional responsibility to the cost and financial accountants for satisfactorily carrying out their respective functions.

These examples illustrate the type of organizational problem which is met in practice and the means by which basic organizational principles can be applied to their solution.

Centralization versus Decentralization

Where several factories exist, the problem of where to locate the cost accounting function always arises. For this reason, it is appropriate to consider the relative merits of centralization and decentralization.

The cost accounting personnel responsible for any or for certain only of the cost accounting procedures may be centralized or decentralized. Centralization may, therefore, be complete or partial. To whatever degree centralization may exist, the relative merits of the alternative types of organization are the same, as follows:

Advantages of centralization

(1) As the documents from all factories are handled together, the volume justifies the use of high-speed, special-purpose equipment.

(2) Mass-production methods of accounting can be employed with a resultant improvement in the speed of work and the employment of lower grades of clerical labour for the routine repetitive operations.

(3) No delay is experienced in receiving final statements and returns.

Disadvantages of centralization

(1) Copies of all basic documents must be transmitted to the central office, with consequent delay.

(2) As records are centralized, they cannot be referred to direct by the factory personnel when they require information.

(3) Information of use to factory managements must be transmitted from the central office to the factories, again with resultant delay.

Advantages of decentralization

(1) Only final summaries and returns, and not copies of all documents, need travel between factories and the central office.

(2) Information and records of use to factory management and personnel are immediately available for inspection.

Disadvantages of decentralization

(1) Where the volume of documents is small, the advantages of special-purpose equipment and mass-production methods cannot be obtained.

(2) More highly paid clerks capable of undertaking a larger number of responsible duties must be employed.

In deciding the organization to be set up for cost accounting in these circumstances, due regard must be paid to the merits and demerits mentioned. To some extent the demerits of centralization have been overcome by some businesses by the use of teleprinters and private telephone lines, which speed up internal communication between factories and office.

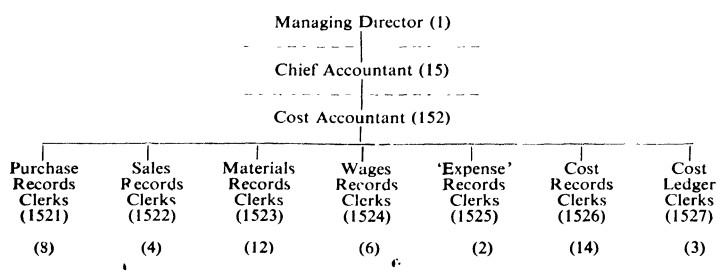
Internal Organization

So far there has been discussed the position, in relation to the whole organization of a business, of the cost accounting organization. There remains to be discussed the internal organization necessary for cost accounting.

In the skeleton organization chart shown previously, the cost accounting organization appeared as follows:

Organization Chart of the Cost Accounting Division

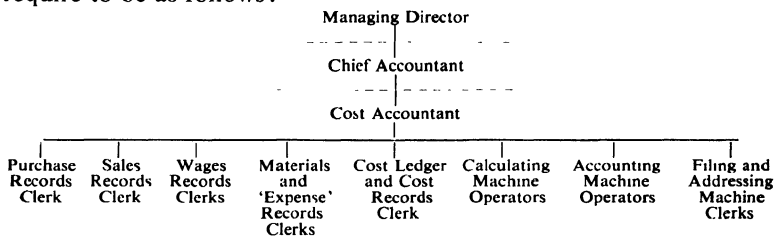
Chart No. 152/3 As at June 30th, 19—



The groups into which the organization of the cost accounting department is divided in this chart are, of course, only the basic groups upon which any particular organization is built. If such an organization were set up in practice it would presuppose the following:

(1) That each group of clerks was responsible for carrying out every operation from the receipt of basic documents to their filing.
(2) That the volume of records handled by each group was sufficient to occupy the time of more than one clerk.
(3) That mental and manual methods of carrying out operations were employed throughout and that, if machine methods were employed, each group of clerks used their own machines.

If the conditions were not as just stated, the organization might require to be as follows:



In this type of organization, the following conditions appear to exist:

(1) Calculations on all records are carried out by a calculating machine section.
(2) Ledger postings, analysis records, summaries, etc., are the responsibility of an accounting machine section.
(3) Filing is centralized.
(4) The function of the various groups of clerks is the preparation of the documents for the calculating and accounting machine sections, and the use of records provided by these specialist sections.

This is an example of a two-way cost accounting organization which is the type almost invariably encountered in any but the smallest organizations. This type is composed of the 'line' organization represented by the first organization chart and the 'functional' organization represented by the specialist functions which provide services to all the 'line' groups. Naturally, every organization differs in some respect from every other, depending entirely on the particular conditions which have to be provided for.

The Factors which Determine the Form and Size of the Organization

In setting up the cost accounting organization, consideration must be given to a number of factors, which are as follows:

1. The number of different locations in which the organization must be set up

This determines, in addition to the locations, the scope of the responsibility of the persons in charge of the local organizations and of the chief officers at headquarters.

2. The extent to which specialist groups can be employed to carry out particular clerical operations

The employment of junior personnel capable of carrying out repetitive operations as opposed to the employment of senior personnel capable of carrying out a number of operations is influenced by this factor.

3. The extent to which mechanical methods or time-saving devices can be employed

The number of persons required, whether in 'line' or 'functional' groups, to carry out the clerical operations is determined by this factor in conjunction with the factor of volume of work. At the same time, mechanical methods require less skilled persons than mental or manual methods, because the risk of error is less in the former case than in the latter, where accuracy depends entirely on mental ability and manual skill.

4. The volume of documents of each type handled

This, in conjunction with the mechanical methods factor, determines the number of persons required in each group.

5. The availability of the required personnel

In many cases, the most desirable organization is incapable of achievement, because it is impossible to recruit the required number of persons with the requisite ability, owing to the unsuitability of the type of person resident in the particular district in which the organization is located, or the availability of more lucrative or congenial alternative occupations.

6. The cost of running the organization

Again, the most desirable organization may be impossible to achieve because it is too costly.

These factors, as can be seen, are not mutually exclusive, and must be considered jointly when setting up the cost accounting organization. This can be most difficult where there is a limiting factor, such as cost or supply of labour, because it entails the modification of all the plans which have been made. For example, the restrictions of labour supply may mean that centralization must be adopted where other considera-

tions point to the adoption of decentralization. This, in turn, requires the adoption of different clerical methods and, as a result, the use of different forms and records.

The Small Organization

The examples given so far are of large-scale organizations. For this reason it might be thought that organizational principles apply only to such organizations. The only difference, however, between the large-scale and small organizations is that, whereas in the former many persons may be required to carry out a single operation on one document, in the latter organization all operations on all documents can be carried out by a small number of persons – even, in certain instances, by one person. The organizations differ only in size and not in the bases on which, or the principles in accordance with which, they are constructed.

The Characteristics of Good Organization

Having decided on the type, grade and number of persons required by each division of the cost accounting organization, it is necessary to pay attention to the manner in which these persons are employed within the organization. A number of principles should be observed in this connection, particularly concerning the relationship of persons to their superiors and subordinates and their general and detailed responsibilities.

The characteristics of a good cost accounting organization are these:

(1) Each person should be responsible, as far as possible, to only one superior and should know definitely who that superior is.

'A man cannot serve two masters' is applicable to the personnel in a cost accounting organization. There is nothing worse than the position where two persons are competing for the services of one subordinate. Not only does priority of work have to be decided, the subordinate is frequently compelled to divide his loyalty.

(2) The general and detailed responsibilities of each person should be clearly defined and understood, not only by superiors and subordinates, but by all other members of the organization.

By this means, the shifting of responsibilities and the misunderstanding by a person of his own or any other person's functions is obviated, with a resultant improvement in working harmony.

(3) The capabilities of each member of the organization should be used to the best advanatage.

A person should not be required to perform operations which are either below or above his capabilities. In the former case, the operation can be performed more economically by a lower paid grade of operator and in the latter case diseconomies occur through the operator taking longer or making more errors, which require subsequent correction, than a person with the requisite skill.

(4) The capabilities of each person are adequately rewarded.

This is essential if operators are to be encouraged to work well and contentedly. To this end, emphasis should be placed on ability, while age, sex and length of service should be reasonably remunerated.

(5) The designation or title of each person should be clearly stated.

This assists to quite a substantial degree in the establishment of personal satisfaction.

The Formal Statement of the Organization

It is good practice to commit to paper, as in the case of procedures, methods, forms and records, the details of a cost accounting organization. These details are formally stated in the following types of document.

Organization chart

An organization chart, which is a diagrammatic representation of the members and the relationships between the members of an organization, can be prepared in any of the three forms which have already been used, namely:

(1) circular (see page 85, Volume I);
(2) horizontal (see page 200);
(3) vertical (see page 198).

Such a chart should be drawn up in accordance with the following principles:

(1) It should be dated.

This simple principle is designed to ensure that the organization represented by the chart is related to the organization in existence at a certain date. Organizations change in course of time and it must be possible, by comparison of two or more charts, to see the changes which have occurred during a given period of time.

(2) It should show only the titles of the various posts and lines of responsibility.

It should not include names of persons because these can change more frequently than the organization. It should not include duties, procedures or work locations, because these obscure the important facts.

(3) The number of persons in each group who have no subordinates may be stated in figures or represented by short vertical lines.

This information may be given when the numerical strength of the organization requires to be stated.

(4) For identification with other charts, each post should bear a code number.

The most convenient system allocates a separate digit to each level in the organization below the governing body, e.g. the board or the executive.

The chart on page 200 is drawn up on the foregoing principles.

Schedule of posts

This schedule should contain a summary of the work involved in each post in the organization at a given time and may be drawn up in the form shown overleaf.

The information on this schedule is cross-referenced to other documents as follows:

Column (3) to Organization Chart (see page 200)
,, (5) to Operation Schedule (see page 192)
,, (7) to Equipment Schedule (see page 192)
,, (9) to Form Schedule (see page 98)

and may be kept up to date in the most convenient way.

Statements of responsibility

The purpose of a statement of responsibility is to set out formally the responsibilities of a post in the cost accounting organization for the information of the person holding that post and of the persons whose posts bring them into contact with the person whose responsibilities are set out.

Such a statement sets out the title and the organizational code number of the post; the title of the person to whom the person holding the post is responsible; the titles of the posts held by the persons whom he controls; the principal function which the person discharges; and the subsidiary or ancillary duties which the person undertakes within the framework of his principal function. The statement is also numbered and dated for reference.

With regard to the manner of stating subsidiary or ancillary duties, these should not be stated in any great detail. It is quite sufficient to say, for example, that a clerk should file purchase invoices without saying where they should be filed or how they should be prepared for filing and placed in the files. These latter details, it is the function of procedure records to record.

SCHEDULE OF POSTS — Page 1

Line	Posts		Operation		Equipment		Documents		No. of Documents		Hours Employed
	Description	Org. Chart ref.	Description	Opn. Sch. ref.	Description	Equip. Sch. ref.	Description	Form Sch. ref.	Per period	Per hour	(12)= (10)÷(11)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
1	Calculating		Multiplying		Rotary		Sales invoice	15	2,000	60	33
2	m/c operator	1503		14	Calculator	901	,, ,,	16	4,000	80	50
3							,, ,,	17	3,000	60	50
4							Purchase				
5							invoice	21	2,000	60	17
6									11,000	73	150
7											
8											
9											
10											

An example of a statement of responsibilities for a book-keeping machine operator in a hypothetical business is shown below:

THE MANUFACTURING CO LTD NEWPORT

STATEMENT OF RESPONSIBILITIES NO. 195/5/13

BOOK-KEEPING MACHINE OPERATOR

Issue No. 5 *Date Operative:* January 1st, 19—

A. ORGANIZATION

The Book-keeping Machine Operator is directly responsible to the Accountant.

B. RESPONSIBILITIES

The responsibilities of the Book-keeping Machine Operator are:

1. To carry out the instructions of the Accountant.
2. To maintain in safe custody:
   - (*a*) Purchase ledger cards.
   - (*b*) Remittance advices.
   - (*c*) Sales ledger cards.
   - (*d*) Customers' statements.
   - (*e*) Drum ledger cards.

   Allowing access only to:
   - (*a*)The Accountant.
   - (*b*) The Assistant Accountant.
   - (*c*) The Accounts Clerk.
3. To post daily:
   - (*a*) Purchase invoices and credit notes to:
     - (1) Purchase ledger cards.
     - (2) Remittance advices.
     - (3) Stock ledger cards.
     - (4) Cost ledger cards.
   - (*b*) Sales invoices and credit notes to:
     - (1) Sales ledger cards.
     - (2) Customers' statements.
     - (3) Sales analysis cards.
   - (*c*) Drum invoices and credit notes to:
     - (1) Drum ledger cards.
     - (2) Stock ledger cards.
   - (*d*) Bank cash book, cash book advice and transfer journal to:
     - (1) Purchase ledger cards.
     - (2) Remittance advices.
     - (3) Sales ledger cards.
     - (4) Customers' statements.
     - (5) Stock ledger cards.
     - (6) Cost ledger cards.
     - (7) Sales analysis cards.
4. To prepare, post to control cards and supply:
   - (*a*) The Accounts Clerk with proof of sales and drum postings.
   - (*b*) The Assistant Accountant with proof of all other postings.

Note. – 1. This Statement of Responsibilities is subject to modification at any time to meet altered conditions and requirements.

2. Any alterations found necessary will be authorized by the Accountant.

Signed.....
Accountant.

Distribution

Issued to: Book-keeping Machine Operator.

Copies to:

Schedule of personnel

The personal details of the persons who at any given time fill the posts in the schedule of posts may be maintained in this record. The posts are identified by means of the code number and titles which appear on the organization chart and on the schedule of posts.

In this chapter the broad outlines of the cost accounting organization and its formal documentation have been considered in sufficient detail to enable the problems of organization to be appreciated, and perhaps to enable some of them to be solved. Much has been written elsewhere about organization to which the reader is referred if he wishes to know more about the subject. There are some who consider that setting up an organization is an art; there are others who consider it is a science. Perhaps it is best left at that, so that the student can combine science and art to the degree best suited to the solution of organization problems.

SYNOPSIS OF CHAPTER XXIII

PROCEDURE RECORDS AND MANUALS OF INSTRUCTION

	Page
Introduction	210
Routine charts	210
Routine instructions	211
Form instructions	214
Manuals of instruction	215

CHAPTER XXIII

PROCEDURE RECORDS AND MANUALS OF INSTRUCTION

THERE have been dealt with in the previous chapters the four distinct, though interrelated, cost accounting elements of clerical operations, methods of performance, forms, and personnel. So far they have been considered as distinct elements. It is the purpose of this chapter to consider them as interrelated elements and to demonstrate how their interrelationship can be formally recorded, so that, when an existing cost accounting system requires to be criticized or plans for a projected cost accounting system require to be prepared, the effectiveness in joint operation of the several elements of the system can be appraised, the elements can be modified, and the dynamics of the system can be demonstrated to those concerned with its operation.

The cost accounting system is comprised of the persons who, making up the organization of the cost accounting department, are together engaged in receiving basic documents from other departments; in carrying out the necessary clerical operations upon them by various means – mentally, manually, mechanically; in cost book-keeping; and in preparing the information to be fed back to those controlling the departments from which the basic data is received – all in accordance with a routine and time schedule which enables the work to be carried out with the minimum cost and the maximum speed and efficiency. The essence of this system is the organized movement of forms and records between personnel and the organized methods of carrying out clerical operations. To keep control of this organization by periodically appraising its efficiency of operation, it is of value to commit to paper the movement of documents and methods of operation, and to employ a suitable technique which is simple.

Cost accounting procedures can be represented in several ways which may be used separately or together. Each of the methods described has a particular set of characteristics and individual uses and advantages. The methods are as follows:

ROUTINE CHARTS

A routine chart shows the flow of forms from one person to another and gives a brief description of the work which each person carries out on each form. The purpose of a routine chart is:

'(1) to ensure that all the operations are accurately and completely recorded;

(2) to indicate avoidable complications in the flow of work and in the working methods;

(3) to provide some of the data for
   (*a*) designing new forms;
   (*b*) determining the equipment (appliances, machines) needed;
   (*c*) determining the physical layout which entails the minimum movement of both individuals and material;

(4) to provide a basis for writing new instructions for the staff;

(5) to provide simple charts for training staff in a new working method.'[1]

Such a chart emphasizes flow and the satisfactory disposal of documents rather than the method of carrying out a particular clerical operation.

Routine charts should not attempt to illustrate simultaneously the flow of all the forms and records which are handled by a cost accounting department. Instead, a separate chart should be prepared for each distinct cost accounting process, e.g. material records, wages records, sales records, etc., handling. Charts can be prepared in several forms, but for the purpose of illustration the form overleaf is used to illustrate a purchase invoice routine in a small business where the handling of invoices is the responsibility of a department which deals on a functional basis with both cost and financial records and accounts.

It will be seen from this chart, that the movement from receipt to final filing of every document involved in the entire process can be traced, thus ensuring that there are no gaps in the process. The chart contains only sufficient information to make it intelligible. Too much information should not be included, as this serves only to make the chart too lengthy and the procedure appear too complicated.

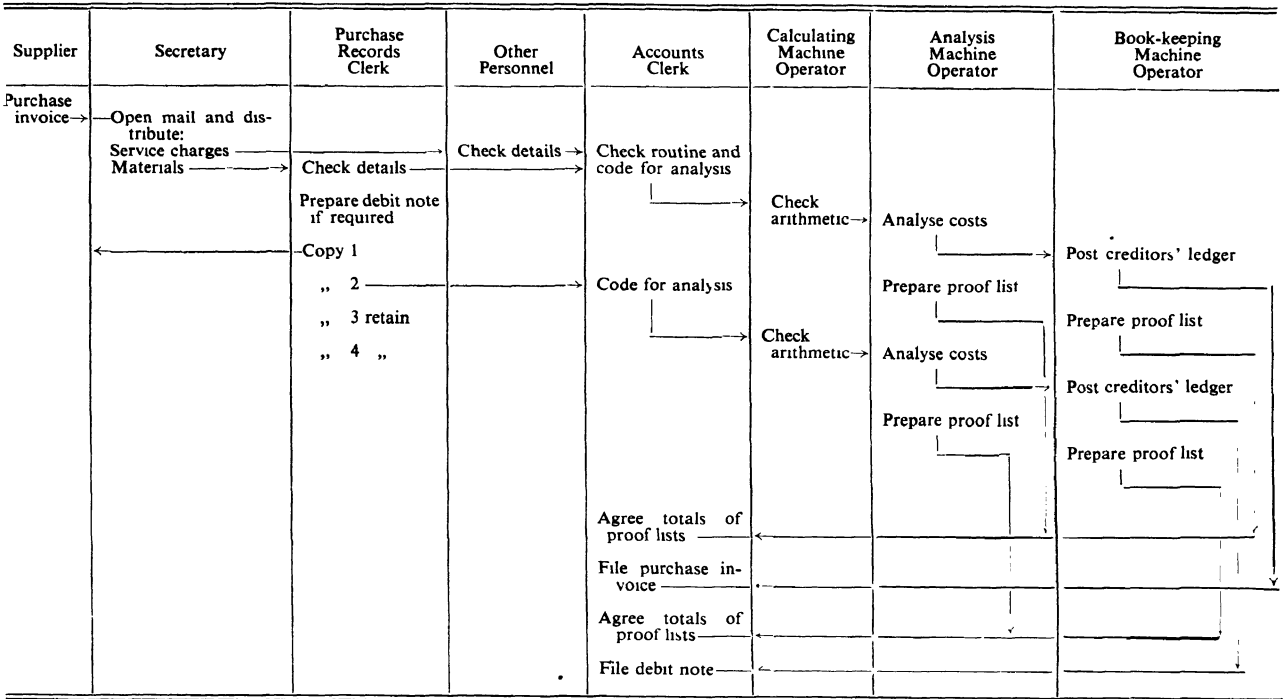
Routine Instructions

A routine instruction is a written statement of the manner in which all operations in a complete cost accounting process are carried out. It deals with the manner of handling every document involved in the process and covers the methods and personnel employed in carrying out the operations from inception to filing. A routine instruction should be prepared for each routine for which a routine chart is prepared. It is, therefore, an amplification of the information provided by a routine chart and, because it is presented in written instead of graphic form, it emphasizes the methodological and static aspects rather than the routing and dynamic aspects of a clerical process. The purpose of a

[1] *Procedure Records*. Published by Her Majesty's Stationery Office. Crown copyright. 1950.

THE A. B. CO LTD — LONDON

PURCHASE INVOICE ROUTINE CHART



routine instruction is, in addition to that stated above in relation to a routine chart:

'(1) to provide the data necessary for standardizing operations as a preliminary to training;

(2) to provide a clear account of proposed methods for those who implement them;

(3) to provide the data necessary for standardizing operations for similar work at comparable offices;

(4) to provide a concise account of working methods as an appendix to a report'.[1]

To illustrate the form of a routine instruction, a section of a purchase invoice routine is used:

THE A. B. CO LTD — LONDON

Routine Instruction No. 215

PURCHASE INVOICE ROUTINE

From		*To*
Supplier	A. The Secretary will: 1. Receive the *purchase invoice* from the supplier.	
	2. If the *purchase invoice* relates to materials received at, or carriage on goods to or from, the factory, pass the *purchase invoice* to the Purchase Records Clerk.	Purchase Records Clerk.
	3. If the *purchase invoice* relates to the provision of services to the company, pass the *purchase invoice* in accordance with such instructions as may be issued, to other personnel.	Other Personnel.
Secretary	B. The Purchase Records Clerk will: 1. Receive the *purchase invoice* from the Secretary. 2. Make available: (*a*) The *Purchase Order* Alphabetical File. (*b*) The *Goods Received Note* Alphabetical File. 3. By reference to the name of the supplier, the date of delivery or of the *purchase invoice* and all other information available on the *purchase invoice*, *purchase order* and *goods received note or notes*, locate: (*a*) The relevant blue copy of the *purchase order or orders* in the Purchase Order Alphabetical File. (*b*) The relevant pink copy of the *goods received note or notes* in the Goods Received Note Alphabetical File. 4. Check all possible details on the *purchase invoice* with the details shown on: (*a*) The blue copy of the purchase *order or orders*. (*b*) The pink copy of the goods *received note*.	

[1] *Procedure Records*. Published by Her Majesty's Stationery Office. Crown copyright. 1950.

From		*To*
Secretary *contd.*	5. Enter on the blue copy of the *purchase order or orders*: (*a*) The date of the *goods received note* at (3). (*b*) The number of the *goods received note* at (4). (*c*) The number of the *purchase invoice* at (5). 6. Enter on the pink copy of the *goods received note*: (*a*) The date of the *purchase invoice* at (4). (*b*) The supplier's number of the *purchase invoice* at (5). (*c*) The date of the *purchase order* at (20). (*d*) The number of the *purchase order* at (21). (*e*) His or her initials at (22). 7. Remove and attach to the *purchase invoice or invoices*: (*a*) The blue copy of the *purchase order or orders* from the Purchase Order Alphabetical File. (*b*) The pink copy of the *goods received note or notes* from the Goods Received Note Alphabetical File.	
Buyer.	8. If there is any discrepancy between the materials received and the materials invoiced, ascertain from the Buyer whether a *debit note* is to be prepared. 9. If a *debit note* is to be prepared, prepare four copies of the *debit note*. 10. File copy 3 of the *debit note* in the Debit Note Numerical File. 11. File copy 4 of the *debit note* in the Debit Note Alphabetical File. 12. Distribute copies 1 and 2 of the *debit note* as follows: Copy 1 to Supplier. Copy 2 to Accounts Clerk. 13. Pass the *purchase invoice* and attached *purchase order/s* and *goods received note/s* to the Calculating Machine Operator.	Supplier. Accounts Clerk. Calculating Machine Operator.
	etc., etc.	

In a routine instruction, each operation should be described in sufficient detail as to enable an untrained person to grasp the essentials of the operation and the method of carrying it out.

Form Instructions

Like a routine instruction, a form instruction is a written statement – a statement of the manner in which a form is prepared and used at all stages. Like a routine instruction, it deals with the methods and personnel employed in carrying out the clerical operations on it. It is, in fact,

the section of the routine instruction, or where a form serves more than one purpose, of the routine instructions, which deal with the particular form. It is therefore unnecessary to illustrate a form instruction separately.

Manuals of Instruction

It is useful in a cost accounting organization to have available, in a single volume, the essential details of the working of the organization. These details may be incorporated in a cost manual, which should be circulated to all persons who control clerks or operatives. To those persons who do not control staff, there should be circulated only those portions of the manual which refer to the work of those persons. The organization chart issued to them should, however, relate to the whole accounting organization, so that their place in that organization can be seen clearly.

A cost manual should contain all or some of the following:

(1) Copies of statements prepared for the information of the management and for other purposes, such as trade associations, government departments, etc.
(2) The purpose and use of the statements prepared for the information of management.
(3) A description of the principles of costing which are employed.
(4) A description of the cost accounting and cost book-keeping principles which are employed.
(5) Organization records in the form of organization charts and statements of responsibility of all persons in the cost accounting organization.
(6) Procedure records in the form of routine instructions and, if necessary, routine charts and form instructions.
(7) Samples of all forms and records employed.
(8) Schedules of forms, equipment, cost centres, cost units, cost ledger accounts, and of material cost, wages, 'expense' classifications, code numbers, etc., and bases of cost allotment and absorption, etc., which are used in costing and cost accounting.

A manual of instruction can contain any amount of information that may be considered desirable in the circumstances. There is no fixed rule regarding its contents. Some little difficulty may be experienced by the reader of a manual in absorbing the details, largely because, as much has to be condensed into relatively small bulk, the extended narrative form which may be employed where verbal instruction is given cannot be employed in manuals of instruction, which must, therefore, employ the condensed narrative form. With experience, however, the initial difficulties are usually overcome, and a manual of this type is found to be a valuable work of reference.

SYNOPSIS OF CHAPTER XXIV

COST AUDIT

	Page
Introduction	219
The classes of audit	219
Statutory audits	219
Non-statutory audits	220
Complete audit	220
Partial audit	221
Continuous audit	221
Interim audit	221
Final audit	221
External audit	222
Internal audit	222
Financial audit	222
Cost audit	222
The objects of an audit	223
The detection of errors	223
Errors of omission	223
Errors of commission	223
Errors of principle	224
Clerical errors	224
Compensating errors	224
The detection of fraud	224
Manipulation of accounts	225
Defalcations	225
Internal check	225
The planning of a cost audit	226
The cost audit programme	227
Cost audit checking programme	227
Cost audit attendance programme	230
The control of a cost audit	230
Cost audit checking record	230
Cost audit attendance record	230
Weekly work record	230
Job time summary	231
Auditor time summary	231
Audit note sheets	231
The conduct of a cost audit	232
Check marks	232
Condition of work checked	233

	Page
Nature of test checks	233
The extent of a cost audit	233
Material cost	234
Wages	234
'Expense'	235
Depreciation	235
Cost apportionment	235
Overhead absorption	236
Sales	236
Containers	237
The organization of the internal cost audit department	238

CHAPTER XXIV

COST AUDIT

COST audit is the verification of the correctness of cost accounts and of the adherence to the cost accounting plan.

Its first purpose is to verify that the cost accounts are correctly kept in accordance with the principles of costing employed by the business.

Its second purpose is to ensure that the cost accounting routines laid down by the business are properly carried out.

Its third purpose, where the audit is internal, is to assist in reducing the amount of detail checking carried out by the external auditors.

The audit may be carried out by either an internal or an external auditor.

The accounts which are audited are the cost accounts and not the financial accounts.

These principal features of a cost audit will be dealt with in the succeeding sections, not necessarily in the same order.

THE CLASSES OF AUDIT

It is useful to consider the whole field of auditing in this respect, so that the interrelation of the cost audit with the whole may be clearly seen. Audits may be classified in several ways, as follows:

Statutory audits

The most common form of statutory audit is that of limited companies, which is made compulsory by the provisions of the Companies Act, 1948. The statutory audit of limited companies was brought into being by the Companies Act of 1900, although the audit of banks was made statutory in 1879. The purpose of an audit of this type is to safeguard the interests of shareholders who, on account of their large number and the absence of permissive articles of companies, are unable to make a personal examination of the accounts. At the same time, the statutory audit acts as a check upon the activities of directors and helps to prevent fraud on the part of employees.

What such audits are concerned with are the balance sheet and such items of revenue or expenditure as, in terms of the Companies Act, must be disclosed to the shareholders in the form of a profit and loss account. It is a common error to suppose that auditors who carry out a statutory audit are concerned with the form of the various manu-

facturing, trading and profit and loss accounts prepared at the same time as the balance sheet and the section of the profit and loss account which are subject to the statutory audit. They are most emphatically not so concerned; the form of such accounts is entirely the concern of the company itself.

Other statutory audits are those which are carried out in accordance with the provisions of building society, friendly society, assurance company, local authority, etc., legislation. The powers of auditors under legislation of this type are frequently wider than those accorded to them by limited company legislation, as in the case, for example, of district auditors of local authorities, who have powers to disallow expenditure which, in their opinion, is unauthorized.

Non-statutory audit

Audits of this type are usually made at the request of, or by the consent of, the proprietors of a business. The purpose of these audits is generally to satisfy a sole trader or partners in a firm that their books have been properly maintained and their affairs properly conducted by their staffs; to satisfy the partners of a firm that profits have been calculated and their respective financial interests have been satisfied in accordance with the partnership agreement; to enable the accountant employed to certify the accuracy of the profits made by a business, to prepare computations of taxable profits, and to agree the tax liability of a firm and its partners. For all such purposes, there is no compulsion attached to the audit, only very great advantages to be derived from it.

Usually, in connection with audits of this type, the auditor acts in the capacities of accountant as well as auditor. His duties as accountant are, in many cases, not only to prepare the final accounts of the firm, but also to balance the books and even, in certain instances, to write up the books themselves. The dual capacities of an auditor in these circumstances must be clearly distinguished: many firms have the idea that because the same person carries out both duties they are both part of the audit. This duality of function is to be found, not only in the audit of firms, but also in the audit of the smaller limited companies. Here, the distinction between the accounting and auditing functions must be even more clearly made, because of the statutory nature of the audit.

Complete audit

A complete audit is one in which the whole of the entries made in the books are checked. Needless to say, a complete audit is rarely carried out because of the great amount of work involved in checking a large amount of detail.

Partial audit

An audit of this type is one in which only a sufficient amount of detail checking is carried out as reasonably to satisfy the auditor of the correctness of the records. The checking is carried out at random, and the basis of the tests made is varied on the occasion of each audit so that those who keep the records tested cannot anticipate the audit. By these means, the auditor can employ his time on matters of principle rather than detail.

Continuous audit

Where, on account of the large number of transactions which occur the audit is carried out without a break throughout the whole period, the audit is described as continuous.

Interim audit

Where the volume of transactions is not so great as to require a continuous audit, an interim audit may be carried out, either at regular or irregular intervals. An irregular interim audit has the principal advantage of surprise over the regular audit.

Considerable advantages accrue from both continuous and interim audits:

(1) The audited accounts are made available at the earliest possible date after the close of the audit period.
(2) The effect upon staff results in work being kept up to date and any tendency towards manipulation of records considerably reduced.
(3) Manipulation of records, if it has occurred, is discovered more quickly and the effect of fraud, if it has taken place, is considerably reduced.
(4) Work can be checked and errors located and corrected reasonably quickly.
(5) The amount of work checked can be increased.

At the same time, disadvantages exist because figures may be altered after they have been checked and a series of transactions whose start has been checked may not be followed up at succeeding audits owing to the auditor's losing the thread after the lapse of time. These tendencies can be counteracted by, on the one hand, the use of special ticks and, on the other hand, by the noting of points which require to be taken up subsequently.

Final audit

The third type of audit of this class is that which is carried through completely at the end of the accounting period, usually where the business is small. It is most satisfactory in certain respects because

there is no danger of the auditor losing the thread of continuity. It is, of course, only possible to carry out a final audit where no delay in the publishing of the accounts results from it. The advantages of the continuous or interim audits are, therefore, lost.

External audit

An external audit is one which is carried out by an auditor engaged by a business to act in a professional capacity. All statutory audits must, by their nature, be external. Non-statutory audits also are invariably external, not by necessity, but by choice, because the advantages to be obtained from the employment of public auditors are considerable.

Internal audit

In contrast to the external audit, an internal audit is carried out by employees of a business. An internal audit is a most useful adjunct to an external audit because it relieves the external auditor of much of the detail checking. As a result, the external auditor can concentrate to a much greater extent upon matters of principle. Where both types of audit are carried out, the pattern of the internal audit is designed to assist the external auditor to discharge his responsibilities. At the same time, the external auditor must satisfy himself that he can rely upon the internal audit to such an extent as to divest himself of the responsibility of the bulk of the detail checking, The existence of an internal audit does not, however, relieve the external auditor entirely from the burden of detail checking. In effect, the external auditor must test the effectiveness of the internal audit.

Financial audit

It has been shown already that financial accounts are concerned with the capital, reserves, liabilities and assets of a business. A financial audit is therefore concerned with the same things. As the undistributed profits of a business form part of the reserves, and as undistributed profits are contributed to by the difference between revenue and expenditure, it is apparent that, to a certain degree, a financial audit is concerned with costs. It is concerned, however, with costs only to the extent that they represent a diminution in the stock of assets and with revenues only to the extent that they represent an accretion to the stock of assets. With the division of costs into classes and with the procedures and methods of costing, the financial audit is not concerned.

Cost audit

The cost audit is concerned, not with the financial implications of costs and revenue, but with the division of total cost and total revenue into

classes, the procedures by which costs are ascertained and the accuracy of the costs which are ascertained and presented to management.

This distinction between financial and cost audits, while clear in principle, is almost impossible to observe in practice because, as already explained, there is a cost and a financial aspect of every business transaction. As a result, in practice, the cost audit is concerned with all records which deal with costs. That means, in effect, that the only records which are not subject to a cost audit are the financial ledgers, such as general, debtors, creditors, capital, etc. Exceptions to this rule are the fixed asset and stock records which, as they are in effect costs in suspense as well as assets, come within the purview of the cost audit.

The Objects of an Audit

The objects of an audit, which are equally the objects of a cost audit, are the detection of errors, the detection of fraud and, as a result, the prevention of fraud.

The detection of errors

Errors which may, as the result of carelessness, be unintentional or may, in order to cover up the manipulation of records, be intentional, are of the following types:

ERRORS OF OMISSION

These errors occur where one or both aspects of a transaction are omitted from the books. For example, a purchase invoice may be omitted entirely from the purchase invoice book, in which case both aspects of the transaction are omitted. Again, the cost of one cost centre absorbed by another may be recorded in the account of the former but not in the account of the latter cost centre. Here the omission is only partial.

A complete omission does not affect the agreement of the totals of a trial balance, whereas a partial omission does. It is, therefore, more difficult to detect a complete omission than a partial omission.

ERRORS OF COMMISSION

An error of this type may also be complete or partial. Where, for example, the value of an issue of material is incorrectly calculated, the error is complete because the debit and the credit which include that value are both incorrect. Where, however, the value of such an issue of material is correctly calculated, but the amount debited is incorrect while the amount credited is correct, the error is partial. The result is that a complete error does not affect the agreement of the trial balance,

while the partial error does. The former is, as a result, more difficult to locate than the latter.

ERRORS OF PRINCIPLE

Where an error of commission is made as the result of applying an incorrect principle, the error is one of principle. For example, if a cost which is capable of being allocated to a cost unit is incorrectly allocated to a cost centre and then absorbed by several cost units, an error of principle has been made. Again, a cost which is recoverable from a customer direct may be included in the costs of a cost centre and absorbed by several cost units.

This is the most important type of error from the cost audit point of view because it affects entirely the accuracy of the costs and records prepared. It is essential that such errors should be located. As errors of this class do not affect the agreement of the trial balance they are difficult to locate.

CLERICAL ERRORS

Briefly, all errors of commission which are not of principle are clerical errors. They thus include postings made to a wrong account of the same class as that to which they should be posted; postings made to the wrong side of the account; postings made partially; or postings of the wrong amount, and other similar errors. In all examples but the first, the trial balance is affected.

COMPENSATING ERRORS

While many of the errors mentioned affect the accuracy of the trial balance, in certain instances the effect of such an error is offset by another error or other errors which act in the opposite direction to the original error. Such errors form a class by themselves, namely, compensating errors. For example, if the debit posting of an item of £180 is omitted and a credit of £200 is incorrectly posted as £20, then the errors are compensating and no difference occurs in the trial balance.

Errors of this type are, as a result, extremely difficult to locate, because one error may not be even remotely related to the other errors. It is impossible to indicate to what extent such errors affect the accuracy of the costs or records: it depends upon individual circumstances.

The detection of fraud

The second object of an audit is to detect fraud if it exists and, by the moral deterrent of the audit, to prevent it. Broadly, there are two classes of fraud, as follows:

MANIPULATION OF ACCOUNTS

Where the relations of a limited company and its shareholders are concerned, or where the relations of any firm or company with its creditors or prospective creditors are concerned, accounts may be manipulated in order to make the position appear different from that which in fact exists. There are many reasons for this. So far as manipulation of the balance sheet is concerned, that is a matter for the financial audit. So far as the manipulation of profits is concerned, that is a matter for the cost audit.

Accounts are sometimes manipulated by a manager who desires to make his operating results appear better than they really are for the purpose of earning higher remuneration. Such manipulation is a matter entirely for the cost audit to disclose.

In all of these cases, the manipulation of accounts is not accompanied by the misappropriation of cash or property. It is, in fact, to be found less frequently than the following class of fraud.

DEFALCATIONS

Frequently, opportunities exist in a business for employees to misappropriate cash, stores or sometimes even equipment, machinery, etc. While it is usually more easy to misappropriate stores than cash, because the latter is capable of more exact control than the former, misappropriations are generally accompanied by the manipulation of records to cover up the defalcations. Sometimes the manipulation occurs in financial records as in the case, for example, of the misappropriation of cash from a customer being hidden by writing-off the amount misappropriated as a bad debt. On the other hand, a misappropriation of cash may be covered up by the substitution of forged receipts or the inclusion of dummy employees. In these latter circumstances, the disclosure of the defalcation is within the scope of the cost audit.

Internal check

Opportunities for defalcations of this type are proportionately reduced, the greater the extent to which each section of the work is distributed among the staff, that is to say, the more collusion there must be for defalcations to occur. Where opportunities for defalcation and, indeed, for errors are reduced in this manner, 'internal check' is said to be in operation. As a result, the effectiveness of the system of internal check in operation determines to a substantial degree the extent and direction of the audit. No matter how effective the internal check may be considered to be, the audit must check to a reasonable extent that internal check is in operation to the degree planned.

The Planning of a Cost Audit

While the bulk of the planning takes place at the beginning of the audit, as time goes by, the plans must be reviewed and, if necessary, modified. The matters which require attention before and during planning are as follows:

1. The object of the audit
These have already been described.

2. The system of cost accounting employed
In this connection, the auditor should provide himself with the following:

(*a*) Organization chart, statements of responsibilities.
(*b*) Form schedule, form instructions.
(*c*) Equipment schedule.
(*d*) Routine charts, routine instructions.

From these he can build up a picture of the cost accounting system. Where the charts and statements mentioned do not exist, the information must be compiled in the most suitable form.

3. The chart and code of accounts
From these, the auditor can obtain a picture of the accounts and controls maintained in the accounting system.

4. The system of internal check in operation
From the details of the costing system and of the accounts and controls, the auditor can obtain an idea of the effectiveness of the system of internal check. In order to emphasize the internal check aspect, a separate statement should be prepared describing the system.

5. The principles of costing employed
In order to conduct a cost audit satisfactorily, the auditor must have a complete knowledge of the costing principles so that, as previously stated, he can deal effectively with errors of principle.

With these facts in his possession, the auditor can proceed to plan the audit. He should decide the following:

1. In which directions and to what extent a complete audit should be carried out
In certain circumstances, the auditor may be enabled to carry out a partial instead of a complete audit by tightening up the system of internal check in operation. Where possible this should always be done.

2. Where a partial audit can be carried out, the extent and type of test to be applied

This is entirely a matter of judgment based on experience.

3. How frequently the audit is to be carried out

The frequency of the audit depends on the extent and nature of the test; the volume of transactions; the need for audit prior to each issue of periodic cost statements; the effectiveness of the system of internal check; where several scattered offices and factories require to be visited, the travelling conditions and routes of the auditors; and other factors of particular application.

4. The number and calibre of the auditors who are required

The aspects of the audit already mentioned determine the size and type of staff required.

The ability required of each member is determined by such things as the following:

(*a*) Whether he carries out all sections of an audit.

An auditor who carries out routine checking as well as dealing with questions of principle must, obviously, be able to cope with the advanced problems of the audit.

(*b*) Whether he carries out only routine checking.

In such circumstances, he need not have such an advanced knowledge as in the previous conditions. At the same time, certain types of routine checking, such as vouching invoices, require a different degree of ability from other types, such as checking summations.

Whatever the ability required by the type of work undertaken, the auditor should be accurate, painstaking, tactful, conscientious, methodical, cautious, practical and, most of all, vigilant because, unless he is vigilant, the one false or erroneous entry in a mass of correct entries is liable to pass unnoticed, thus reducing the audit to a mere formality.

The Cost Audit Programme

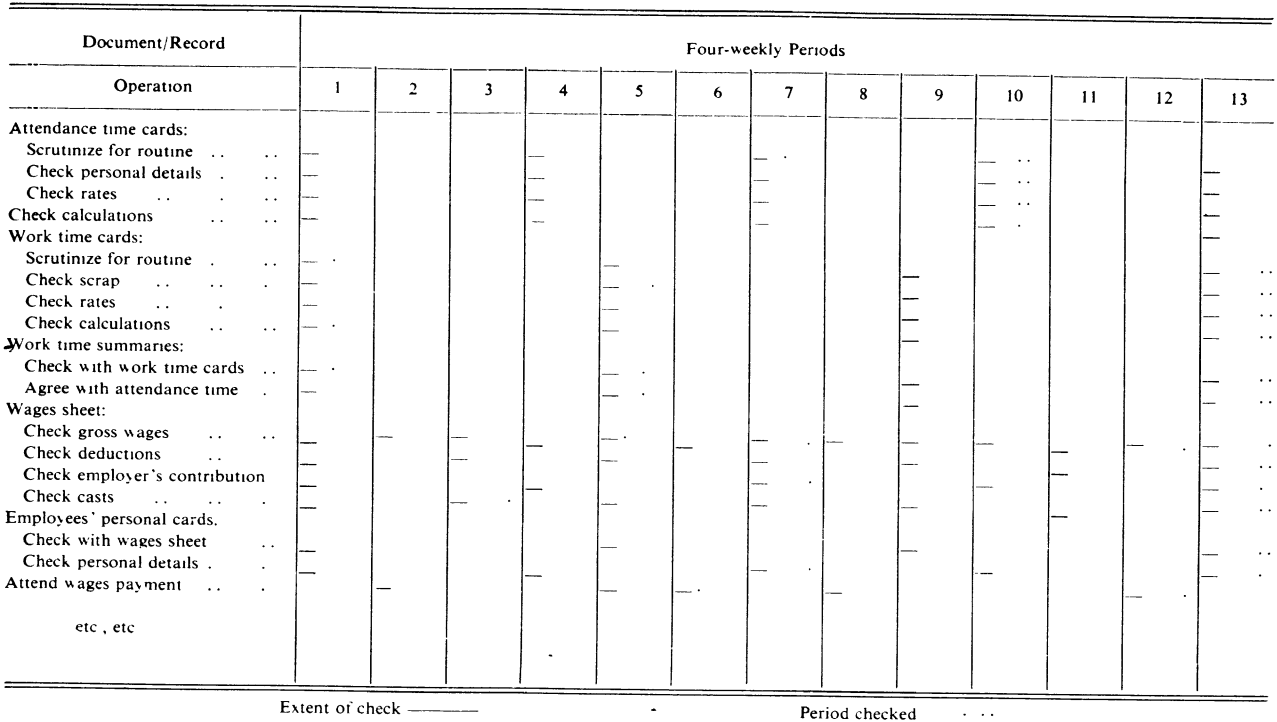
Having decided these various matters, the audit programme can be formally drawn up. The most suitable way in which this can be done is to chart the programme on the following forms.

Cost audit checking programme

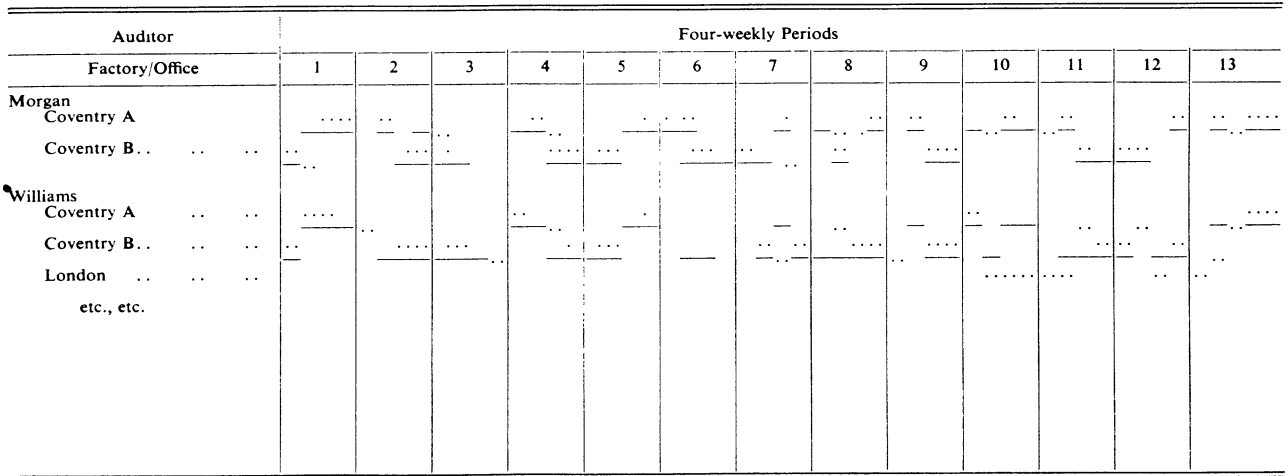
This form contains details of all the audit checking to be carried out during a year. The solid lines show the extent of the check and not the actual period to be checked. For example, attendance time cards are

THE MANUFACTURING CO LTD
COST AUDIT CHECKING PROGRAMME AND RECORD
for Year ending December 31st, 19—

COVENTRY B FACTORY



THE MANUFACTURING CO LTD
COST AUDIT ATTENDANCE PROGRAMME AND RECORD
for the Year ended December 31st, 19—



Planned visits ———— Actual visits .....

checked one week in every twelve, while gross wages are checked one week in four.

Cost audit attendance programme

From the checking programme, the attendance programme is planned as far in advance as possible. The planned periods of attendance of each auditor at each location are indicated by the solid lines.

The Control of a Cost Audit

While a cost audit proceeds, it is essential to record a number of details and, for this purpose, the following records are employed:

Cost audit checking record

The cost audit checking programme is used as a checking record. The periods which are in fact checked are indicated by dots. For example, the attendance time cards for weeks 3, 16, 26, 39 and 49 were checked, while the payment of wages was supervised in weeks 6, 20, 22, 32 and 48. This record is compiled by the auditor who conducts the audit.

This document is useful, not only as a record of what checking has been done, but as an aid to planning future audit programmes. In fact, the first checking record compiled after the commencement of a new cost audit is more useful than the original programme of checking, because the way of finding out the best checking programme is actually to conduct a cost audit.

While it is advisable and useful to programme the work of a cost audit, it should be understood that this programme must not be followed inflexibly if the auditor on the job thinks that it should be varied in any respect. He must be allowed to be the sole arbiter on this point, otherwise there is a danger of important matters being missed if the use of the auditor's initiative is prevented.

Cost audit attendance record

For an attendance record, the attendance programme is employed. The periods during which each auditor attends is indicated by the rows of dots. As the week is the shortest period of time, this record cannot be completely accurate where a period of attendance is less than a week. To compile this record, which is kept at the chief auditor's office, it is necessary for each auditor to complete the record shown opposite.

Weekly work record

Each auditor completes this record weekly and sends it to the chief auditor's office, where it is used to enter details on the attendance record and the time summary. So that these entries can be made

correctly, it is essential that the same work should always be described in the same way on all control records.

THE MANUFACTURING CO LTD
WEEKLY WORK RECORD

Auditor: *Morgan* Week ending: *March 7th*, 19—

Factory/Office / Work Done	Entd. Prog.	Time								Entd. Summ'y.
		Mon.	Tue.	Wed.	Thur.	Fri.	Sat.	Sun.	Total	
Coventry A:										
Checking gross wages February 18th, 19 -		8	8						16	
Coventry B:										
Checking personal details on time cards, February 25th, 19— ..				5					5	
Checking rates on ditto .				3	8				11	
Checking gross wages February 25th, 19- -						8	2		10	
Miscellaneous notes							2		2	
Total .. .		8	8	8	8	8	4		44	

Job time summary

The job time summary takes the same form and is drawn up in the same way as the cost audit checking record. The only difference is that, instead of lines, times are inserted in the weekly columns. Any number of intermediate total columns may be inserted to give monthly, quarterly or half-yearly time totals.

Like the checking programme and record, the job time summary is of advantage in planning future cost audits.

Auditor time summary

This time summary takes the same form as the cost audit attendance record. The total weekly time of each auditor is entered in place of lines. The periodic totals of time on this summary provide a cross-check on the accuracy of the periodic totals on the job time summary.

Audit note sheets

While note taking on audits can be carried to extremes, it is nevertheless essential to do so, so that the auditor does not have to rely on his memory for queries which arise and have to be settled at each stage of the audit, for matters which must be carried forward from one stage to the next, or for information of a permanent or semi-permanent nature which must be available for anyone who subsequently takes up the audit.

As inadmissible and admissible items of cost and other items figure to such a great extent in the computation of tax liabilities, one of the

responsibilities of the cost auditor is to check, if already compiled, or to compile records of these items. These form part of the audit notes.

For this purpose, sheets of the following type may be used:

THE MANUFACTURING CO LTD
COST AUDIT NOTES
for year ending December 31st, 19—
Coventry B Factory

Item	Note	Initial	Answer	Initial

THE CONDUCT OF A COST AUDIT

The manner of conducting a cost audit depends largely upon the training and experience of the auditor. It is something which cannot be learned from text-books but from actual experience. In any case, it is impossible in a general work of this sort to cover all the aspects of a cost audit in sufficient detail to give the reader even the broadest idea of the many problems which are met in auditing the many varied cost records to be found in business. To the text-books which deal entirely with auditing, the reader is referred for assistance. However, a summary of the methods of conducting a cost audit are given.

Check marks

Each auditor may be provided with an audit stamp which bears the word 'audited', the year and the auditor's initials. He may also be provided with a stamp which forms a letter of the alphabet or a sign which identifies its user. He may also be provided with an inking pad, which is changed as often as required in order to distinguish between checks made at different periods of time. The audit stamp is used to cancel documents, while the other stamp is used when checking figures. This latter stamp is used to make marks in different positions. Each position represents a particular checking operation. The meaning of each position should be known only to the audit staff. A different position should be used to denote the primary vouching of an item, the secondary vouching of an item, casting, carrying forward, posting, *contras*, and erasures or alterations.

Condition of work checked

No work should be checked which is incomplete and is not in an indelible condition. Where pencil figures are checked, they can be easily erased and other figures inserted without the knowledge of the auditor. At the same time, only complete periods which have been totalled and posted or balanced should be checked. Otherwise, many loose ends are left until the next audit. Any items which have been altered or erased prior to audit should be specially marked so that the auditor's attention may be drawn to any erasures or alterations to work already checked. Care must always be taken to ensure that no document is produced to support more than one transaction of the same type. To this end, care must be taken to stamp all documents used for vouching entries.

Nature of test checks

The work to be checked may be selected in three ways. A period such as, for example, a week or month in every four may be selected for a particular check. All the entries which fall within that period are then checked. For example, one month per quarter may be chosen for checking the postings from the purchase invoice book to the stores ledger cards, in which case the postings of all the items in the selected months are checked.

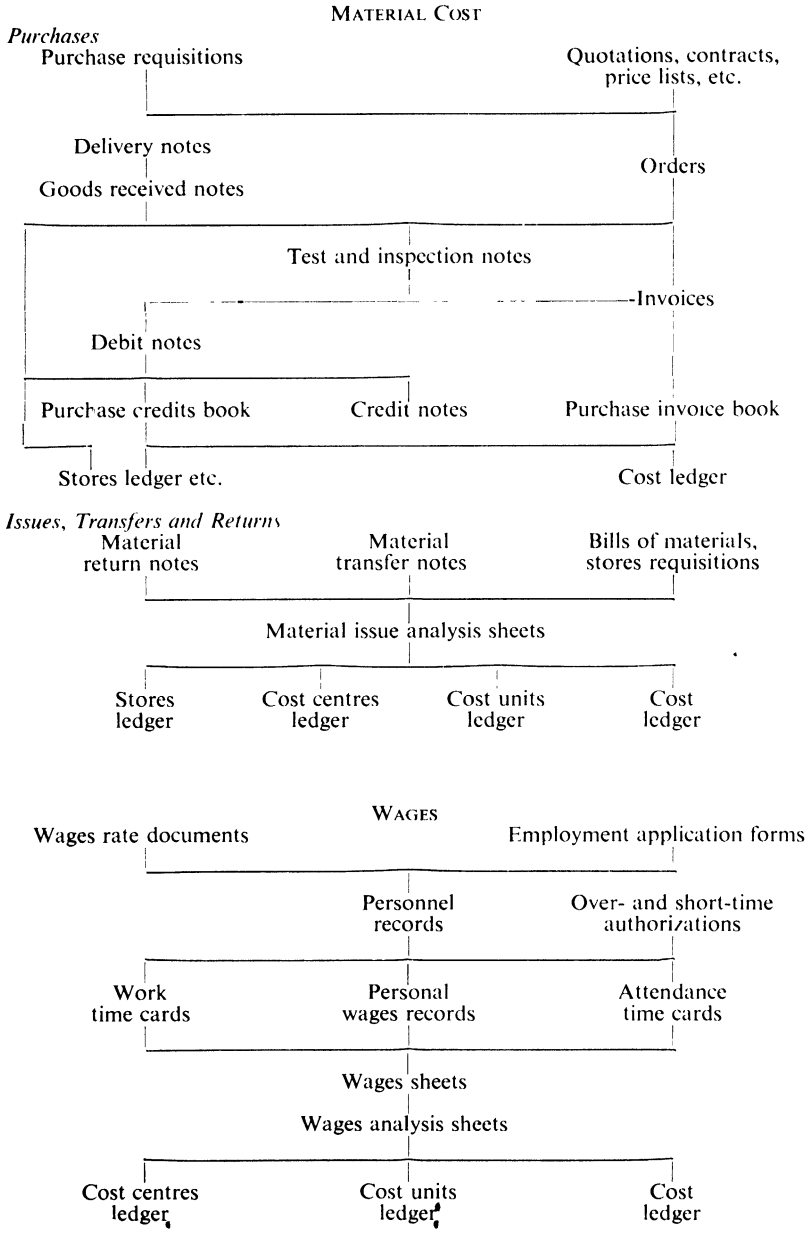
A group of records is selected in rotation or at random. They may or may not be selected in such a way as to cover all records in the course of a year. All the entries on the selected records, calculations, casts, etc., are then checked completely. For example, one-thirteenth of the personnel records may be selected every four weeks for checking the personal details on time and wages records.

A number of records (as distinct from a group of records) is selected at random. The records may or may not be chosen so that all records are covered in the course of a given period. In the same way as a group of records, all calculations etc. are checked. For example, a number of stores ledger cards or bin cards may be selected each day, week or month for the purpose of checking the physical quantity of materials in stock. They are selected in such a way as to check all items of stock at least once, if not two, three or four times a year. This check is known as a perpetual inventory.

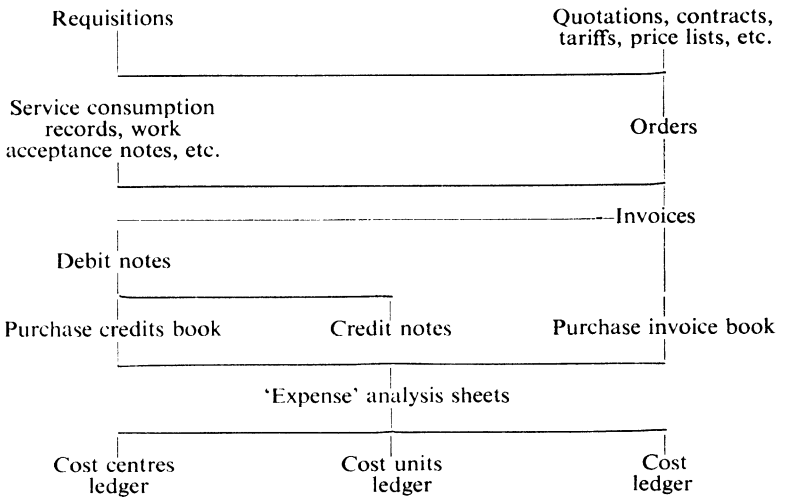
The Extent of a Cost Audit

A cost audit should cover every routine from the inception of the basic documents to the balancing of the cost ledger accounts which terminate the routine. It is unnecessary to check with equal intensity all stages of a single routine. The extent of the check may vary from as little as one day per annum to, in the case of the cost ledger itself, a complete check

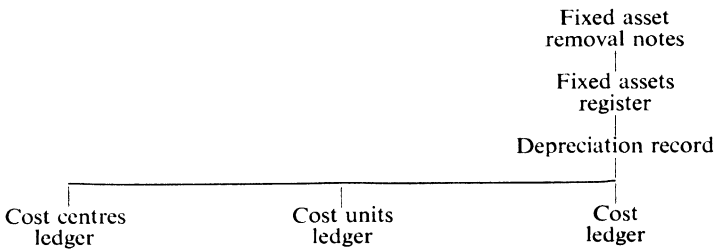
As an indication of the audit routines, the following outlines are provided.



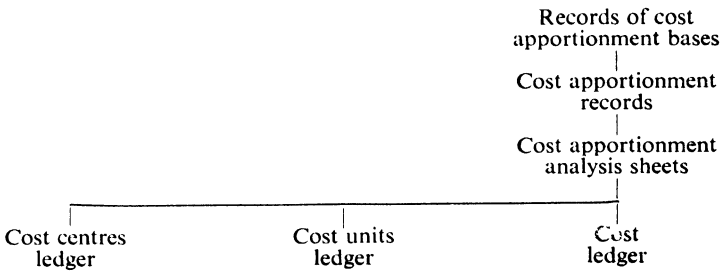
'EXPENSE'

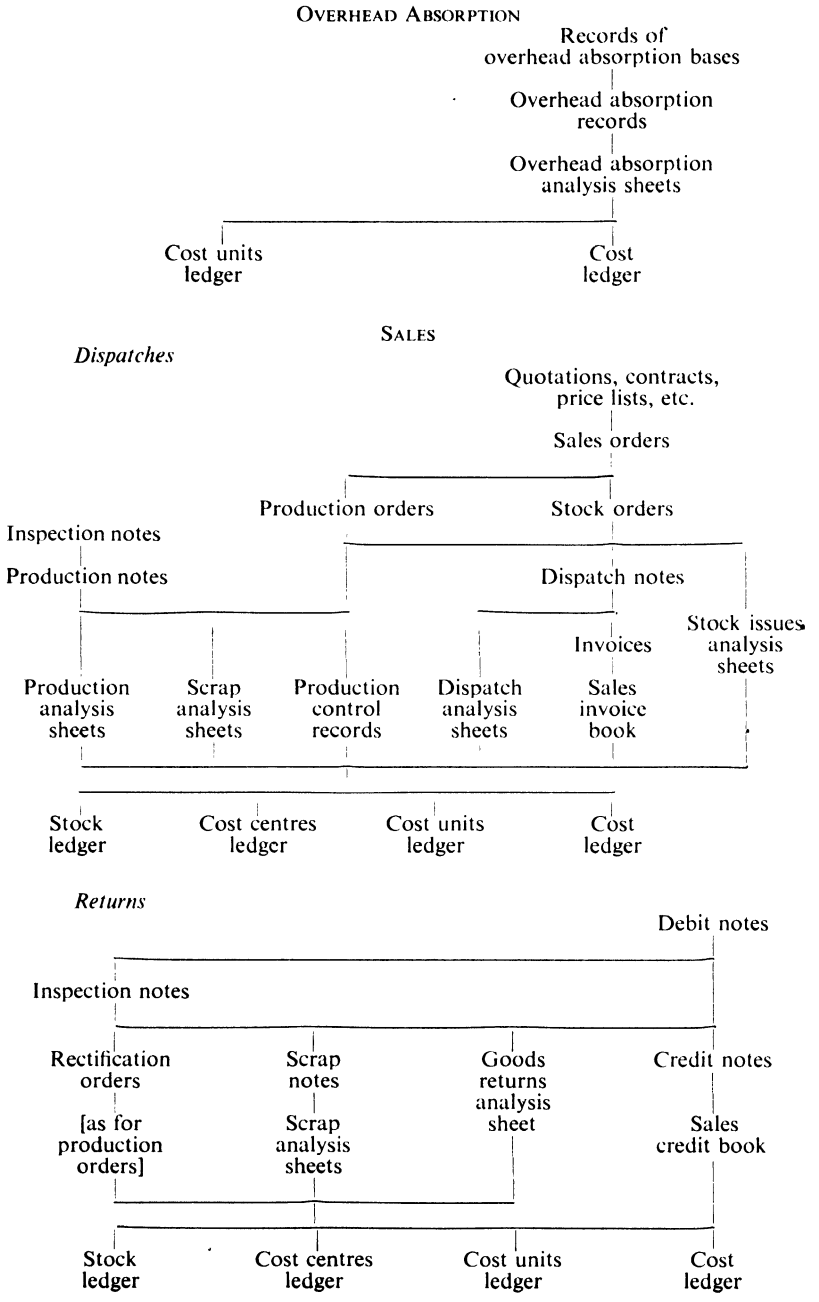


DEPRECIATION



COST APPORTIONMENT

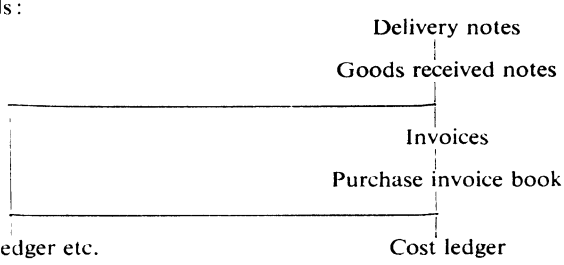



OVERHEAD ABSORPTION
Records of overhead absorption bases
Overhead absorption records
Overhead absorption analysis sheets
Cost units ledger
Cost ledger
SALES
Dispatches
Quotations, contracts, price lists, etc.
Sales orders
Production orders
Stock orders
Inspection notes
Production notes
Dispatch notes
Invoices
Stock issues analysis sheets
Production analysis sheets
Scrap analysis sheets
Production control records
Dispatch analysis sheets
Sales invoice book
Stock ledger
Cost centres ledger
Cost units ledger
Cost ledger
Returns
Debit notes
Inspection notes
Rectification orders
[as for production orders]
Scrap notes
Scrap analysis sheets
Goods returns analysis sheet
Credit notes
Sales credit book
Stock ledger
Cost centres ledger
Cost units ledger
Cost ledger

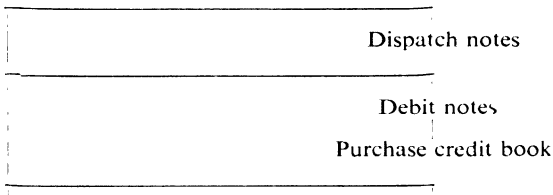
CONTAINERS

Suppliers'

Inwards:

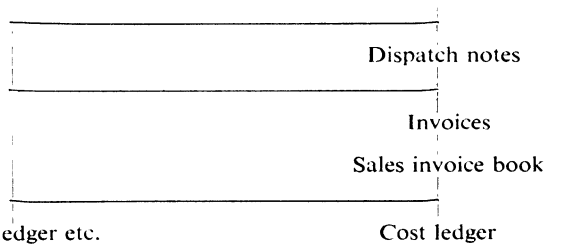


Outwards:

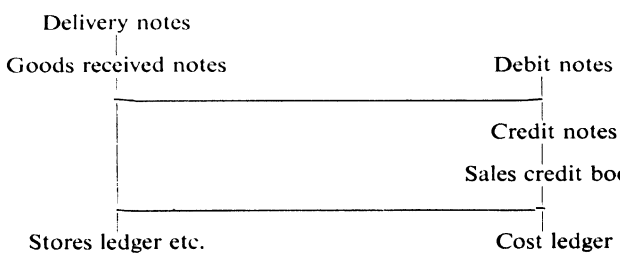


Own

Outwards:



Inwards:



The foregoing skeleton charts mention the principal basic documents, intermediate records and ledgers in the principal routines. No attempt is made to describe the checking operations which are carried out on each document, as its purpose is to show how one record provides a cross-check upon another and, at the same time, fits into the whole routine.

The Organization of the Internal Cost Audit Department

Cost audit is a staff function which must, because of the nature of the work and responsibilities attached to it, be completely separate from any other function. The chief auditor must, therefore, be responsible only to a high-level official, preferably a controller who is in no way engaged directly in cost accounting. In this way, the status of the auditor is kept requisitely high and his independence is assured. Only in such conditions can he discharge his responsibilities adequately and be on an equal footing with an external auditor engaged on the same task.

In this chapter, the cost audit has been dealt with in the broadest outline only in order to give the reader an overall picture of what is involved. The details, as has been said previously in this chapter, should be obtained from the specialist text-books and from practice and experience.

ACKNOWLEDGMENTS

The assistance given by the following suppliers of office appliances in providing the illustrations which appear on the pages undernoted, is acknowledged with thanks:

Addressograph-Multigraph Ltd (Multilith, Multigraph), 107, 127, 135
Adrema Ltd (Bradma), 126, 133, 134
George Anson & Co Ltd, 110
Art Metal Construction Co (Postindex), 175, 179, 187, 189
Blick Time Recorders Ltd, 109, 122
Block & Anderson Ltd (Banda, Victor, Brunsvega, Facit, Marchant) 104, 136, 138, 141, 142
The British Tabulating Machine Co Ltd (Hollerith), 129, 130, 132, 146, 147, 148, 149, 152, 153, 157, 161, 165
British Olivetti Ltd, 140
Carter-Parratt Ltd (Vistem, Admindex), 175, 176, 188, 189
Copycat Associated (Marketing) Ltd, 168
Fanfold Ltd, 109, 131, 135, 170
Gestetner Ltd, 105
I.B.M. (United Kingdom) Ltd, 112, 122, 123, 127, 128, 133, 136, 146, 148, 152, 155, 163, 165
Imperial Typewriter Co Ltd, 105, 113, 127
Kalamazoo Ltd, 111, 166, 182, 183, 187
Kodak Ltd, 169
Lamson Paragon Supply Co Ltd (Paragon, Parabar, Formaliner), 108, 109, 115, 130, 131, 132
The Magneta Time Co Ltd, 124, 125
Monroe Calculating Machine Co Ltd, 141, 144
Moore's Modern Methods Ltd (M.M.M.), 170, 181, 185
The Muldivo Calculating Machine Co Ltd (Add-Master, Brittanic, Madas), 138, 141, 143
The National Cash Register Co Ltd, 116, 118, 119, 137
National Loose Leaf Co Ltd (Saxon), 170, 187
Percy Jones (Twinlock) Ltd (Twinlock), 111, 170, 179, 182, 186
Powers-Samas Accounting Machines (Sales) Ltd, 129, 132, 139, 145, 147, 149, 150, 151, 153, 154, 162, 164, 165
Remington Rand Ltd (Kardex), 117, 188
Roneo Ltd (Roneodex), 106, 174, 177, 178, 180, 183, 184, 186, 190
The Shannon Ltd (Shannoleaf, Shannograph), 111, 172, 175, 176
The Sortergraf Co, 158, 159
The Stolzenberg Patent File Co Ltd, 157, 160, 171, 173
Underwood Business Machines Ltd (Elliott Fisher), 113, 114, 115, 119, 120, 121, 138
Unifold Mailing Machines Ltd, 191

Acknowledgment is also made to Kayser Bondor Ltd for the illustration on page 164.

INDEX

Account, Administration cost centres control, 82
Assets, 75–76
Capital, 75
Capital expenditure, 84
Cost ledger control, 74–75, 78–79
Cost of sales, 83
Distribution cost centres control, 81
Expenditure, 75–76
'Expense', 79–80
Finished goods control, 83
Fixed asset, 72–73
Income, 75–76
Liabilities, 75–76
Material cost, 79
Over- or under-absorbed costs, 82
Production cost centres control, 80–81
Profit and loss, 84
Sales, 84
Selling cost centres control, 81
Service cost centres control, 80
Stock ledger control, 73–74
Trade creditors' ledger control, 75
Trade debtors' ledger control, 73
Wages, 79
Work in progress control, 82–83
Accounts, Chart and code of, 226
Control, 46–47
Cost ledger, 78–84
General ledger, 72–76
Plan of, 47–50
Accounting, Cost, 12–13
Fundamentals of, 12–13
Application of, 13
System of, employed 226
systems, Elements of cost, 12–13
Add-Master adding listing machine, 138
Adding, 137–140
Addressograph-Multigraph machines:
Addressograph addressing machine, Model 300, 127
Model 1900 with suction feed, 135
Multigraph, Model 250, duplicating machine, 107
Multilith machine, Model 50, 107
Agreement of totals, Verifying by, 153–154
Analysing, 164–167
Anson P.A.Y.E. machine, 110
Areas, Comparable, 35
Art Metal Postindex book, 187
posting tray and trolley, 179
punched-card cabinet, 175
rollindex unit, 189
Assets, 24–25
Audit, Classes of, 219–223
Complete, 220, 226
Continuous, 221

Audit, Cost, 13, 219–238, 222–223
Cost, Conduct of a, 232–233
Control of a, 230–232
Extent of a, 233–238
Planning of a, 226–227
External, 222
Final, 221–222
Financial, 222
Frequency of an, 227
Interim, 221
Internal, 222
Non-statutory, 220
Objects of an, 223–225, 226
Partial, 221, 227
Statutory, 219–220
Auditors, Number and calibre of, 227
Averages, 37

Banda Duplex line-posting machine, 136
spirit duplicator, 104
Binders, Ledger posting, 180
Loose-leaf, 173–174
Blick portable 'Stafsine', 109
sideprinting time and cost recorder, Model 521, 122
Book, Bank cash, 65
payments, 66–67
receipts, 65–66
Cash, 67–69
Purchase credits, 62
invoice, 59–62
Sales credits, 65
invoice, 62–63
Books, Bound, 173
Cost, 76–84
Financial, 59–76
Loose-leaf, 185
of original entry, 54–55, 59–72, 76–78
Book-keeping, Cost, 12, 44–45
Example of, 59–84
Double-entry, 44–46
Financial, 44
Scope of, 44
Bradma embossing machine, 134
'NEB Plus' electric printer, 133
WHB hand addressing machine, 121
Brittanic 2 BT calculating machine, 141
Brunsvega, Model 20 calculating machine, 141
Business, Activities of, 20–21

Carbons, 167
Cards, consecutive, 167
Card-wheels, 188
Carter-Parratt appliances:
Admindex double-tray visible record cabinet, 189
visible record cabinet, 188
Vistem single pedestal desk, 175
trolley, 176
Cash register, 108–109, 114
Centralization, Advantages of, 199
Disadvantages of, 199–200

Centralization, versus decentralization, 199–200
Chart, Bar, 32
Circular, 32–33
Organization, 204–205
of the cost accounting division, 200, 201
Outline organization, 198
Pie, 32–33
Routine, 210–211
Space, 33
Check marks, 232
Cheque-book counterfoil, 51
Closing entries, 70
Collating, 163–164
Collator, Mechanical, 164
Containers routine chart, 237
Contras, 71–72
Copier, Roller, 168
Copy-writer, 110
Copycat standard model, 168
Copying, 167–169
Direct, 167
Correlation, 33
Cost apportionment routine chart, 238
of clerical methods, 191–193
Costing, Method of, 30
Principles of, employed, 226
Credit note, Sales, 50
Suppliers, 50
Customers, Geographical location of, 25–26
Type of, 26

Data, Comparative, 35–36
Debit advice, Banker's, 51
note, 50
Customer's, 50
Decentralization, Advantages of, 200
Disadvantages of, 200
versus centralization, 199–200
Defalcations, 228
Demand, Variability of, 26–27
Depreciation provisions, 72
routine chart, 235
Digiting, 154–156
Dispersion, 37
Dividing, 140–145
Documents, Basic, 50–53
External transaction, 50–51
Internal transaction, 51–53
Volume of, 202
Drawers, Large, 177–178
Small, 174–177
Duplicator, Spirit, 104
Stencil, 104–106

Electronic computer, 144–145
Error corrections, 71
Errors, clerical, 224
of commission, 223–224
Compensating, 224
Complete, 223–224

Errors, Detection of, 223
of omission, 223
of principle, 224
Partial, 223–224
'Expense' routine chart, 235
Extractive business, 20

Facit ESA-O calculating machine, 142
Fanfold combinder sets, 170
conformulator feed unit, 135
portable register, 109
tabuliner 'B' feed, 131
Filing, 173–181
Files, Box, 174
Concertina, 160
Financial business, 21
Flat surface, 157, 163
Folding, 188–190
Form design, Aspects of, 87–98
Forms, Advantages of properly designed, 86–87
Application and design of, 86–98
Carbon backing of, 96
Cutting of, 96
Make-up of, 95–96
Perforating of, 96
Punching of, 96
Scoring of, 96
Fraud, Detection of, 224–225
Frequency distributions, 33

Gestetner stencil duplicating machine, Model 280, 105
Graphs, 33–34

Hollerith alpha-numerical tabulator, 130
automatic verifying punch, 157
balancer, 129
collator, 165
electronic computer, 146
gang summary punch, 149
hand punch, 147
interpreter, 132
'Keystor' automatic punch, 148
mark-sensing reproducing punch, 152
reproducing punch, 152
sorting machine, 161
verifying punch, 153

I.B.M. alphabetical interpreter, 122
collator, 165
electric card-punching machine, 148
punched-card accounting machine, 128
verifying machine, 155
sorting machine, 163
time stamp, 127
typewriter, 112
electronic card-programmed calculator, 146
Facsimile posting machine, 136
job time recorder, 122
reproducing punch, 152
'Superelectric' attendance time recorder, 123
Illustrations, Pictorial, 32–34

Imperial address stencil card machine, 127
106 dual-feed machine, 113
hectograph carbon roll machine, 105
Index, Book, 181
Card, 181, 185–188
Strip, 181–185
numbers, 37
Indexing, 181–188
Information, Cost, 12, 17–41
Cost of cost, 41
Discussion of, 40–41
External, 18
Form of cost, 31–37
Group discussion of, 41
Individual discussion of, 40
Internal, 18–19
Interpretation of, 39–40
Monetary and associated quantitative, 19
prepared generally, 18–19
for individual businesses, 19–30
managers, 30–31
Presentation of, 31–35
Provision of cost, 38–41
Purpose of Cost, 17–18
Quantitative, 19
Scope of cost, 18–31
Sources of cost, 38
Timing of cost, 38–39
Inserting, 188–190
Instruction, Form, 214–215
Purchase invoice routine, 213–214
Routine, 211–214
Internal check, 225, 226
cost audit department, Organization of, 238
Interpolator, Mechanical, 164
Interpreter, Punched-card, 125–126
Invoice, Sales, 50
Supplier's, 50

Journal, Cost, 76–78
General, 70–72

Kalamazoo copywriter, 111
double-fast posting equipment, 182
strip index book, 183
summarizer, 166
visible loose-leaf book, 187
Kodak 'Recordak' desk model micro-filmer, 169

Labour, 22–23
Lamson-Paragon Appliances:
'Formaliner' continuous form feed, 131
Parabar, continuous form feed, 115
Paragon continuous form burster, 132
decollator, 130
security register, 108
summary register, 109
Ledgers, 55
Cost, 55
Financial, 55

Locations, number of organizational, 202
Losses, 71

Machine, Accounting, 139
Keyboard, 115–121, 143–144
Adding listing, 114, 137–139
Addressing, 123, 126–128
Calculating listing, 143
High-speed adding, 139–140, 149
Manually operated, 110–124
Mechanically operated, 124–136
Non-listing adding, 137, 142
Offset litho, 106
Posting, 128–130
Punched-card tabulating, 124–125
Rotary calculating, 143
Tape to card, 148
Type-set, 107
Madas, 20 AZV calculating machine, 143
Magneta job coster, 124
M15 time recorder, 125
Manifold register, 108
Manipulation of accounts, 225
Manuals of instruction, 215
Manufacturing business, 20
Marchant 'Figurematic' calculating machine, 142
Market, Characteristics of, 25–28
Material, 21–22
cost routine chart, 234
Mental arithmetic, 137, 140
Methods, Clerical, Factors which affect choice of, 190–193
Manual, 103, 107–108
Mechanical, Extent of employment of, 202
Microphotography, 169
M.M.M. fleet rail machine equipment, 181
improved four-post binder, 170
minor visible record, 185
Monroe calculating machine model CAA-10, 144
L.200-X, 141
Multiplying, 140–145

Narrative form, 31–32
National Class 31 accounting machine, 118
11 EN adding listing machine, 137
Class 2000 analysing machine, 119
17 EN desk model book-keeping machine, 118
Class 6000 cash register, 116
Loose Leaf visible record binder, 187
'Saxon' endlock binder, 170
Needling, 154, 160, 162
Note, Material return, 52
Transfer, 52

Olivetti 'Divisumma' calculating listing machine, 140
Opening entries, 70
Organization, Characteristics of good, 203–204
Cost accounting, 196–208
Cost of running, 202
Factors which determine form and size of, 201–203
Formal statement of, 204–208

Organization, Internal, 200–201
Place of cost accounting organization in business, 196–199
The small, 203
Overhead absorption routine chart, 236

Paper, 93–95
Colour of, 95
Columnar, with parallel total column, 164–166
without parallel total column, 166
Quality of, 94–95
Quantity of, 95
Size of, 93–94
Thickness of, 94
Pay-in book counterfoil, 51
Pegboard, 166–167
Percentages, 37
Percy Jones' (Twinlock) billing board, 111
'Rapidref' visible record binder, 186
revolving posting unit, 182
'Sentinel' thong binder, 170
'Vetromobil' trolley, 179
Personnel, Availability of, 202
Photo-copying, reflex, 168–169
Pigeon holes, 158
Posting, 169–173
bulk, 171
from documents, 171–172
Dodge, 172
Dual-run, 171
Exhaust, 172–173
Multiple, 171
from records, 172–173
Slip, 172
Powers-Samas automatic key punch, 149
verifier, 154
cross-adding punch, 150
electronic multiplying punch, 145
hand punch, 147
verifier, 153
high-speed adding machine, 139
interpolator, 165
interpreter, 132
invoice item cards, Selecting pre-punched, 164
printing machine, 129
reproducing punch, 151
sorter, 162
tape to card machine, 150
Powers 'forty' tabulator, 129
Procedure records, 210–215
Procedures, clerical, 103–193
Producing, 103–107
Product, Bulk and weight of, 28–29
Characteristics of, 28–30
Complexity of, 29
Durability of, 29
Repetitiveness of, 29
Value of, 28
Production, Utilization of factors of, 21–25
Profit, Appropriations of, 72
Programme, Cost audit, 227–230

Programme, Cost, audit attendance, 230
checking, 227–230
Provisions, 70
Punch, Cross-adding, 140–149
Hand, 146
Automatic duplicating, 147
key, 138
Hand-operated gang, 147
key, 146
Mark-sensing reproducing, 149–151
Multiplying, 144, 148
Reproducing, 149
Summary card, 149
Tabular skipping key, 146–147
Treadle operated gang, 147
Punching, 146–151
Purchase invoice routine chart, 212

Rates, 37
Ratios, 37
Receipt, Payee's, 51
Record, Cost audit attendance, 230
checking, 230
rate basis, 52
'Expense', 52
Intermediate, 53–54
Labour time, 52
Machine time, 52
Weekly work, 230–231
Recording, 107–136
device, 108–110
Remington 'Foremost' accounting machine, 117
Kardex visible record cabinet, 188
Repetition, Verifying by, 151–153
Requisition, Material, 51
Roneo 3000 series card filing cabinets, 177
'A' grade card index cabinets, 174
flyweight posting trays and trolley, 180
portable duplicator, Model 150, 106
visible '80' filing system, 178
strip index desk stand, 183
revolving stand, 184
Roneodex desk wallets, 186
visible card recording units, 190
Ruling, 92–93
Application of, 92
Layout of, 93
Type of, 92

Sales, Method of effecting, 27–28
routine chart, 236
Scatter, 33
Schedule, Equipment, 193
of forms, 97–98
Operation, 193
of personnel, 208
of posts, 205
Sectional balancing, 46
Selecting, 162–162
Service business, 20–21

Shannon card index sections, 175
visicopier, 111
Shannograph filing cabinet, 176
Shannoleaf bureau, 172
Sheet, Audit note, 231–232
'Expense' analysis, 54
Machine time analysis, 54
Material issue analysis, 54
Salaries, 53
Wages, 53
analysis, 53–54
Sheets, consecutive, 161
Skewness, 37
Slide rule, 142
Sorter, Fan, 160
Flap, 157–158
Mechanical, 160, 162
Sortergraf mobile sorter, 158
sorting installation, 159
Sorting, 157–161
Spacing, 89–91
Application of, 90
Layout of, 90–91
Size of, 90
Speed of obtaining final results, 191
Stand, collating, 163–164
Standards, 35
Statements of responsibility, 205–207
Tabular, 34–35
Stationery, Carbon-backed, 167–168
Statistical measures, 37
Stock movements, 72
Stolzenberg collapsible transfer case, 173
collator sorter, 160
double wing file, 171
ready sorter, 157
spring-clip box file with index, 173
Subjects, Comparable, 35
Subtracting, 137–140
Summarizer, 166–167
Summary, Auditor time, 231
Intermediate, 53–54
Job time (audit), 231
Wages sheet, 53

Tables, 142
Targets, 35
Technical sales service, 28
Test checks, 233
Time, Comparable periods of, 35
recorder, Card, 121–123
Key, 123
Radial, 121
Signature, 109
recording, 121–123
series, 33
stamp, 124
Trading business, 20
Transfers, 72
Trays, 174–177, 178, 185–188

Trial balance, 46
Type face, 88–89
Typewriter, 110–114
Electric, 104
Standard, 103–104

Underwood all-electric typewriter, 113
'Fanfold' continuous form machine – electric, 115
Sundstrand Class D accounting machine, 119
adding listing machine, manual, 138
portable accounting machine, 120
Elliott Fisher simplex accounting machine, 121
writing machine, 114
Unifold folding machine, Model K, 191
mailing machine, Model L, 191
Units of measurement, 36–37

Values, 36
Variations, 37
Verifier, Automatic, 154
Hand-operated key, 154
Verifying, 151–157
Victor portable adding listing machine, 138
Visual inspection, 161–162
Volume of documents handled, 191
Voucher, Cash received, 50–51
Cost journal, 52

Wages, 71
routine chart, 234
Wording, 88–89
Application of, 88
Form of, 88
Layout of, 89
Work checked, Condition of, 233