MACHINE METHODS OF ACCOUNTING

ORGANIZATION AND SUPERVISION OF THE TABULATING DEPARTMENT

THE proper training of machine operators and the efficient organization of the tabulating department are so important to the success of any installation of electric accounting machines that a brief outline of some helps for the supervisor is presented in this booklet.

Original Documents

The basic materials with which the tabulating department has to deal are the original record of a business transaction and the tabulating card to which the data are to be transcribed by means of punched holes. The design of the card and the care which must be taken to simplify the operation of punching have already been considered. Similarly, care must be exercised in the preparation of the original record to provide the data in such form that they may be most readily transcribed.

It is obvious that production is adversely affected whenever an operator has to stop to decipher the figures on source records. The correctness and legibility of source records also have a corresponding effect on the time required for balancing and on the accuracy of the tabulated reports. Where necessary, steps should be taken to see that information to be punched is correctly and legibly recorded—such as furnishing special instructions to workmen and shop clerks, or arranging to obtain the best carbon copy of a sales invoice.

Tabulating Department Arrangement

Physical surroundings have a very definite effect on the efficiency of the personnel of any department. For this reason, the arrangement of the tabulating department should be carefully planned. The machines should be installed in a location which is well-lighted, well-ventilated, and convenient for operation and maintenance. It is especially important that ample space be provided for the necessary movements of the operator of the equipment and for easy access to all parts of the machine to facilitate periodic mechanical inspection and maintenance.

When several key punch operators are employed, it may be preferable to have a separate key punch room. This tends to minimize the need for supervision and helps to establish a definite line in the flow of work by keeping all cards, except those for current work, out of the sorting and tabulating room.

Where more than one sorter and one tabulator are to be used in a single office, they should be grouped to facilitate the simultaneous operation of two or more machines by a single operator. This can best be accomplished in the case of sorters by placing the machines parallel to and fronting each other, or in the form of a U. Two tabulators, fronting each other, ordinarily constitute a unit for operation by a single person.

A Well-Planned Installation

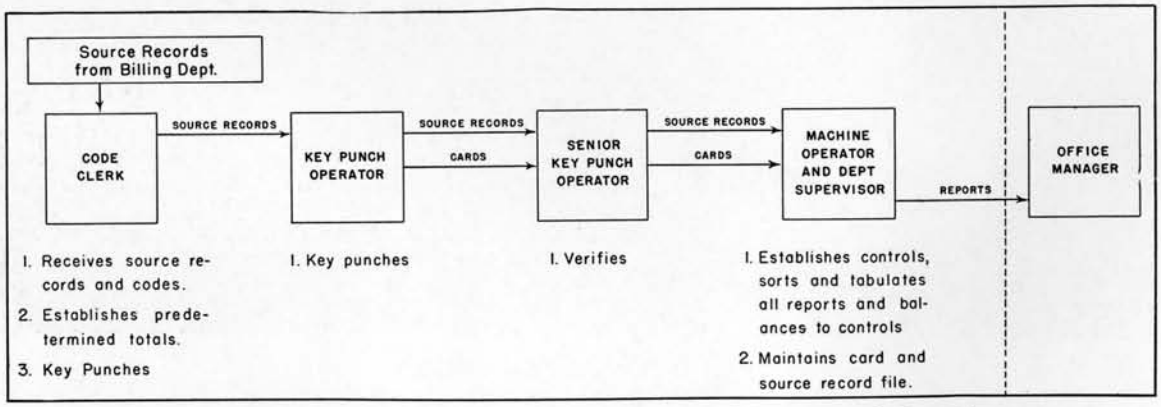
A CARELESSLY MANAGED INSTALLATION
Improvement of the Arrangement and Physical Surroundings Would Increase the Efficiency of the Department

Proper work-tables should be provided, but care should be exercised in arranging them so that they will really be useful and not become a handy filing place. Only cards currently used should be maintained in the tabulating department and special card or report forms which are seldom used should be kept in suitable cabinets. Adequate tabulating card files (the average one has twenty drawers and holds about 70,000 cards) should be provided. Each file drawer should be carefully marked as to its contents and the follow-block drawn tight to keep the cards in proper condition. Neatness of the department is important to accuracy and efficiency as it has a positive effect on the work of the operators. Miscellaneous cards lying around the department are sure signs of inefficiency.

Sequence of Work

A very important matter in developing a smoothly operating tabulating department is the proper correlation between the tabulating lay-out and the logical sequence in the flow of work. Proper correlation not only adds system to the department but also reduces steps between operations and keeps operators at their desks or machines.

In the chart shown below it may clearly be seen how the flow of records through the various operations reveals the efficiency with which the work is being performed. If needless "backtracking" is a common occurrence, the reason should be determined and the conditions corrected.



Proper Correlation Between Tabulating Lay-Out and Sequence of Operations

SOURCE RECORDS

MONTH OF July

DATE REC'D	KIND	FOR	FROM	RECEIVED IN OFFICE		NO. HELD	TABULATING DEPARTMENT			
				NUMBER	TIME		TIME REC'D	NO. REC'D	TIME CODED	TIME PUNCHED
7-1	Job Tickets	June 30th	Mfg. Dept.	all	9:10 A.M.	-	9:15 A.M.	all	-	4:00 P.M.
	Sales Invoices	June	Chgo. Br.	200	11:05 A.M.	5	3:00 P.M.	195	3:45 P.M.	7/2 9:00 A.M.
	Nat'l Req.	6/30	Stores	all	11:05 A.M.	-	11:30 A.M.	all	-	12:30 P.M.

Work Schedule

A definite schedule for the receipt of original records should be established. This includes inter-office records as well as any source records which may come from the outside. Because the tabulating department prepares the final reports and is held responsible for the date of their completion, it is very important that the supervisor recognize this responsibility and see that all original records are scheduled and received on time. It is sometimes advisable for the tabulating department to time-stamp each batch of source records when they are received.

It is to the advantage of the entire office that the flow of work follow the schedule. A record of source records, such as the one illustrated, is a valuable aid for this purpose.

Controls

Various accounting expedients have been developed to handle properly the volume of detail involved in large organizations. The most common and effective method is the use of the Control Sheet. In the majority of cases, the source records are received in groups with *predetermined control totals* (adding-machine tapes, registers, or abstracts) of the amounts of each group. These totals are recorded on a suitably ruled form. In payroll and labor accounting, a group may consist of the source records from one department or burden center. In sales accounting, a group may consist of the invoices for a given ledger, a branch office, etc. The size of each group should be small enough so that any error in the adding machine total, or any subsequent error in punching, can readily be located. This can be determined best from actual experience in punching and tabulating.

When predetermined control totals are not available with source records, they should be established as soon as the source records are received. As a rule, this operation should be performed prior to the receipt of the records in the tabulating department.

In some forms of strictly statistical work, such as studies in health and vital statistics where no financial accounting records are involved, some form of control, such as the total number of cards, is customarily used.

DAILY CONTROL SHEET

MONTH OF July

DATE	SALES AMOUNT									RET'D SALES BRANCH 1 ONLY
	TOTAL	CHARGE				CASH				
		BRANCH 1	BRANCH 2	BRANCH 3	TOTAL CHARGE	BRANCH 1	BRANCH 2	BRANCH 3	TOTAL CASH	
1	4,100.00	1,800.00	800.00	500.00	3,100.00	510.00	290.00	200.00	1,000.00	450.00
2										

Punching

Due to the complex structure of modern business, there exist many types of original records. To facilitate the transcription of these records to cards most efficiently and economically, it was only logical that specialized machines should have been developed. IBM met this need with a varied line of punches. Different models are available: one which is operated entirely by hand; another having electrically actuated punches; one which is further equipped with punching duplicating features; a fourth which has the added feature of automatic card feeding and ejecting devices; also a machine which simultaneously prints on the card the data that are being punched; another which is designed to punch many cards from a master set-up; one which automatically prepares summary or total cards; and another which performs one or more calculations and automatically transcribes the result to the tabulating card. Some types of punching, such as gang-punching, summary punching, etc., are readily adapted to the fully automatic machines, but much of the data involved in accounting work must be originally transcribed to tabulating cards by means of key punches.

Because of the importance of speed and accuracy in business record-keeping today, every possible effort must be made to reduce fatigue of the key punch operator. Fatigue itself results in the reduction of speed and the increase of errors. Proper instruction in the use of the touch system of key punch operation during an adequate period of training, combined with the removal of the physical causes of fatigue, such as poor working posture, ignorance of motion economy principles, inadequate or obsolete machinery, and unfavorable surroundings—will inevitably result in marked improvement in the records of punching production and accuracy.

Type 1 Mechanical Key Punch

Type 11 Electric Key Punch

Type 15 Motor Drive Key Punch

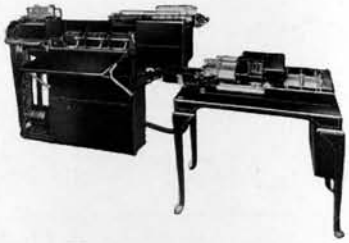
Type 12 Duplicating Key Punch

Type 34 Alphabetic Duplicating Printing Punch

Type 600 Automatic Multiplying Punch

Type 501 Automatic Numbering Gang Punch

Type 511 Automatic Reproducing Punch



Type 516 Automatic Summary Punch

Working Posture

The punch should be placed on a table of such height that when the operator's fingers rest on the keyboard, the forearm is almost at right angles to the upper arm as it falls naturally at the side. Punching will be made easier by inclining the punch slightly toward the operator at an angle of 30 degrees. Early models of key punches are equipped with adjustable bases, but automatic key punches are permanently mounted at the proper angle.

Motion Economy

The source data (unless dual cards are used) should be placed at the left of the punch and turned with the left hand. On manually-fed punches the blank cards should be placed in back of the machine, inserted in the punch with the right hand, removed with the left, and then stacked in front.

When machines equipped for the automatic feeding and ejecting of cards are being used, the left hand should turn the original documents while the right hand should be kept constantly on the keyboard.

Adequate Equipment

New machines are constantly being developed that incorporate more effective mechanisms for the reduction of the fatigue which, to a greater or less degree, is associated with all recording operations. Advantages of these newer machines should be carefully studied by the tabulating department supervisors with the object in view of continually improving equipment and performance.

Physical Surroundings

The importance of machine location, lighting, and ventilation has been previously mentioned, but is repeated here because it cannot be stressed too much. Anything that is conducive to health and reduction of physical strain will be reflected in more favorable production records.

Use of Skip Bars

To facilitate the operation of key punches, special provision has been made for skipping over fields that are not to be punched. A flat piece of metal, known as a skip bar, is especially cut to meet the requirements of a particular punching job. It is placed in the machine as shown in the illustration.

Skip bars are readily interchangeable. A skip bar may easily be detached and a second inserted by pushing out the spring lock on the left end of the rack and sliding the skip bar into place.

The presence of a skip bar in a punch in no way affects the normal operation of the machine. The depression of the X-key when the card is positioned at a column corresponding to the raised section of the bar will cause the card to move to the column corresponding to the next low point on the skip bar. If any keys other than the X-key are depressed, the machine will operate as though no skip bar were in the machine.

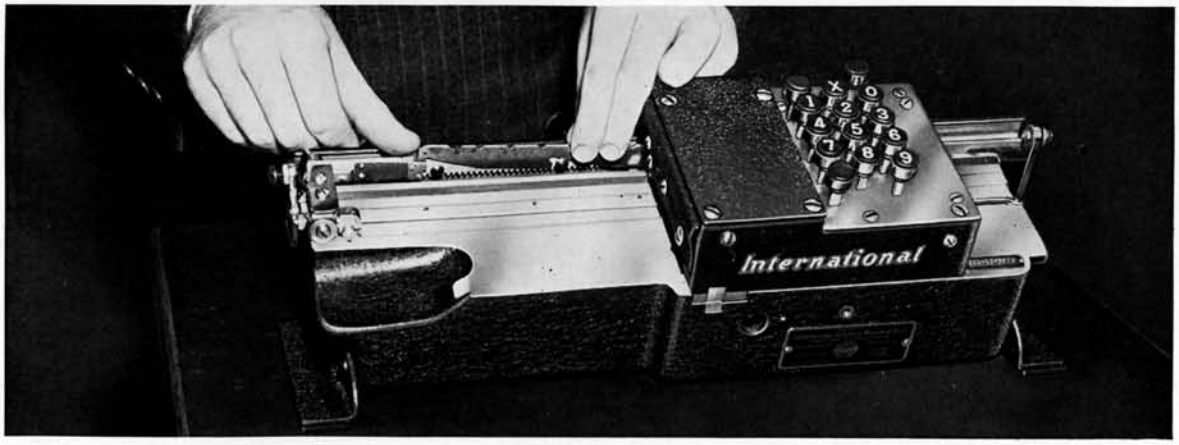
Some machines may be equipped with automatic or high skip bars, which will position the card at predetermined columns for punching or ejection without the depression of the X-key.

Skip Bar Orders

For most efficient recording in tabulating cards, properly cut skip bars must be obtained for each of the various skipping arrangements on the cards. They are furnished from the Endicott factory upon the receipt of regular specifications and orders.

The illustration which follows shows the method of writing the specification order for an X-skip bar (Part No. 114702). The sales card for which the bar is designed is presented also to indicate the skipping effected by successive depressions of the X-key.

The automatic or high skip bar (Part No. 114706) is ordered on the same standard specification order card. This type of bar may be designed for automatic skipping or for a combination of automatic and X-skipping, as shown in the accompanying illustrations.



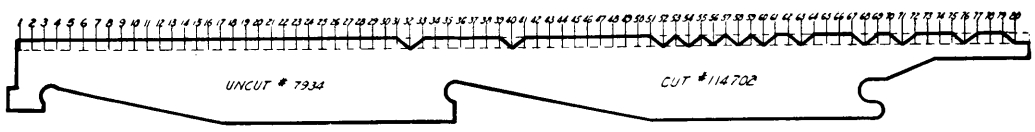
Inserting Skip Bar

9319

SALES ANALYSIS

DATE MO. YR. | INVOICE | CUSTOMER: STATE, COUNTY, CITY, NO. | PROP CLASS | CLASS OF TRADE | WAREHOUSE | BRANCH | COMMISSION RATE | SALESMAN | PRODUCT: NO., CLASS | QTY. | SALES | COST OF SALES | KIND OF ORDER

MAIL ALL SKIP BAR ORDERS DIRECT TO ENDICOTT



T-2568 A SEPARATE **SKIP BAR ORDER** MUST BE USED FOR EACH SET OF BARS.

SHIP TO
COMPANY: National Mfg. Co.
ATTENTION OF: C. F. Crowell
STREET AND No.: 45 State St. CITY: Kansas City

DATE ORDERED: 6/8/36
ORDER NUMBER OR REFERENCE: P-4110
STATE: Mo.

QUANTITY: 2 PART No.: 114702

☒ 80 Col., X Skip Bar
☐ 80 Col., Automatic Skip Bar
☐ 80 Col., Pred. Col. Cutout Bar

APPROVED: R.L.D. SALES OFFICE
FACTORY

NAME TO BE ETCHED ON BAR: SALES ANALYSIS

CHECK MACHINE BAR WILL BE INSTALLED ON
☒ Mech. or Elec. Punch ☐ Multiplying Punch
☐ Electric Duplicator ☐ Summary Card Punch
☐ M. D. Ver., Punch, Duplicator, ☐ Reproducing Punch
☐ ☐

FACTORY ORDER | DATE SHIPPED | SHIPPED VIA: | INSPECTOR

Printed in U. S. A.

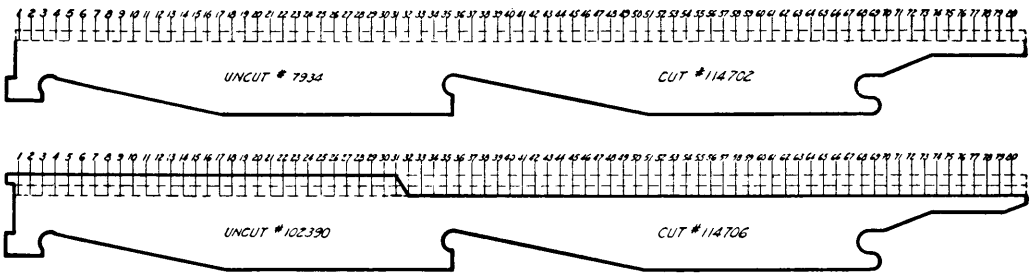
X-Skip Bar

9319

SALES ANALYSIS

DATE MO. YR. | INVOICE | CUSTOMER: STATE, COUNTY, CITY, NO. | PROP CLASS | CLASS OF TRADE | WAREHOUSE | BRANCH | COMMISSION RATE | SALESMAN | PRODUCT: NO., CLASS | QTY. | SALES | COST OF SALES | KIND OF ORDER

MAIL ALL SKIP BAR ORDERS DIRECT TO ENDICOTT



T-2568 A SEPARATE **SKIP BAR ORDER** MUST BE USED FOR EACH SET OF BARS.

SHIP TO
COMPANY: National Mfg. Co.
ATTENTION OF: C. F. Crowell
STREET AND No.: 45 State St. CITY: Kansas City

DATE ORDERED: 6/8/36
ORDER NUMBER OR REFERENCE: P-4110
STATE: Mo.

QUANTITY: 2 PART No.: 114706

☐ 80 Col., X Skip Bar
☒ 80 Col., Automatic Skip Bar
☐ 80 Col., Pred. Col. Cutout Bar

APPRO.ED: R.L.D. SALES OFFICE
FACTORY

NAME TO BE ETCHED ON BAR: SALES ANALYSIS

CHECK MACHINE BAR WILL BE INSTALLED ON
☐ Mech. or Elec. Punch ☐ Multiplying Punch
☐ Electric Duplicator ☐ Summary Card Punch
☒ M. D. Ver., Punch, Duplicator, ☐ Reproducing Punch
☐ ☐

FACTORY ORDER | DATE SHIPPED | SHIPPED VIA: | INSPECTOR

Printed in U. S. A.

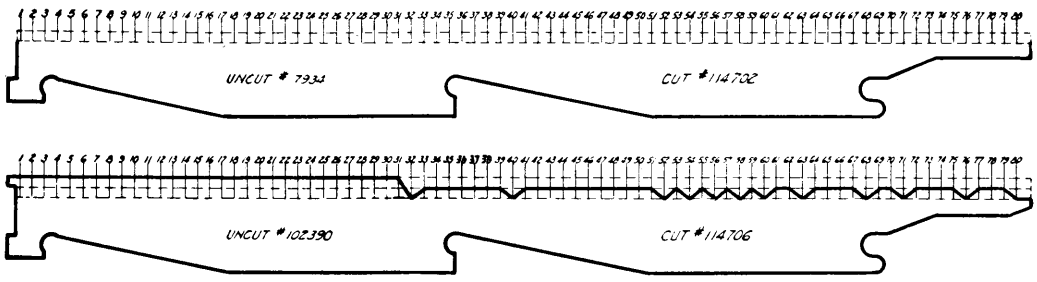
Automatic Skip Bar

3319

SALES ANALYSIS

DATE MO. YR | INVOICE | CUSTOMER STATE COUNTY CITY NO. | POP. CLASS OF TRADE | WAREHOUSE | BRANCH | COMMISSION RATE | SALESMAN | PRODUCT NO. CLASS | QTY. | SALES | COST OF SALES | CANCEL ORDER

MAIL ALL SKIP BAR ORDERS DIRECT TO ENDICOTT



T-2568 A SEPARATE **SKIP BAR ORDER** MUST BE USED FOR EACH SET OF BARS.

SHIP TO

COMPANY: National Mfg. Co.

DATE ORDERED: 6/8/36

ATTENTION OF: C. F. Crowell

ORDER NUMBER OR REFERENCE: D-4110

STREET AND No.: 45 State St.

CITY: Kansas City

STATE: Mo.

QUANTITY: 2

PART No.: 114706

☐ 80 Col., X Skip Bar
☒ 80 Col., Automatic Skip Bar
☐ 80 Col., Pred. Col. Cutout Bar

APPROVED: R.L.B.

SALES OFFICE

FACTORY

NAME TO BE ETCHED ON BAR: SALES ANALYSIS

CHECK MACHINE BAR WILL BE INSTALLED ON
☐ Mech. or Elec. Punch
☐ Electric Duplicator
☒ M. D. Ver., Punch, Duplicator,
☐ Multiplying Punch
☐ Summary Card Punch
☐ Reproducing Punch
☐ .....
☐ .....

FACTORY ORDER | DATE SHIPPED | SHIPPED VIA: | INSPECTOR

Printed in U. S. A.

Automatic Skip Bar with Provision for X-Skipping

Records of Cards

Due to the fact that the speed of card punching is dependent upon the number of holes to be punched, the legibility of the original record, whether the sequence of the fields on the card is the same as that of the items on the record or whether the operator has to make extensions, etc., a standard hourly punching production should be determined for *each* type of work. This may be based upon the record of quantities of cards punched and verified that is kept by the supervisor for the purpose of grading operators and insuring desired production. The comparison of actual and standard punching production for each individual will be valuable in determining the relative efficiency of operators as a basis for the adjustment of wages, and will also reveal those operators who have not proved themselves adapted to tabulating department work.

In addition, the supervisor should maintain a record of the cards of each form and color consumed and on hand, to insure an adequate card supply at all times. It is advisable to have available a reserve supply of tabulating cards. The most satisfactory way to solve the card inventory problem is to issue a standing order for the monthly delivery of the average number of cards used. Such an order can be increased or decreased as conditions demand.

When new card forms are designed, requiring engraving of an electrotype or master plate, sufficient time should be allowed for their manufacture. This should include time for the approval of card proofs by the customer and for the regular card printing operations. A period of slightly more than three weeks is ordinarily required for the making of an electrotype and the printing of cards. Re-orders for cards can usually be filled in about three weeks.

Incentive Plans

Standards of performance may be advantageously used as a basis of setting up an incentive system for key punching operations. Once such a standard has been determined, it can be used

to estimate minimum production quantities for determining efficient and inefficient operators. The supervisor can then devote personal attention to correcting the cause of individual inefficiency or to replacing operators who have proved themselves unsuitable for key punching work.

Incentive plans for wage payment have been in use for many years, but the application of these plans to tabulating machine operators has not, as yet, become common practice. There are several reasons why this condition exists: one is a lack of proper knowledge of the subject, and another is a lack of appreciation of the value of wage incentives to many employees and employers.

Wage incentive plans vary according to the nature of the industry and the ideas and wishes of the management. Consequently, no one plan can be presented which will be a "cure all" for every problem. Furthermore, any plan, regardless of how perfectly it is worked out, fails to secure the maximum output and the maximum stimulation of the operators if not intelligently supervised.

Wage incentive plans for tabulating machine operators can be grouped under the six general classifications listed below:

Quota Plus Plan.—Bonus paid on all production over and above a set quota. Suitable for any size of installation. Involves very little clerical work and is employed principally for this reason. This type of plan is not a fully developed incentive plan since many phases are neglected. Especially suitable for transition to a more complete incentive plan.

Efficiency Rating Plan.—Bonus paid on the efficiency attained over a standard set efficiency. Most complete and best developed incentive plan. Suitable for any size of installation but only where proper rates can be set and constantly followed. Involves considerable clerical work which is more than offset in savings.

Piece-Work Plan.—Usual piece-work incentive with bonus paid according to actual production. Suitable for any installation where work can easily be placed on a piece-work basis. Does not have all the phases of a real incentive plan but can be applied where there is a large volume of one type of work. Very simple to operate.

Point Plan.—Suitable where the point system is used throughout the plant because of the volume of clerical work. This is a good incentive plan and may be applied to any size installation.

Salary Grade Plan.—Production governs the salary grade attained by the operator. Suitable only for large installations. Not a complete incentive plan but does keep a certain goal before the operators. Very simple to operate and successful in the larger installations.

Group Bonus Plan.—Bonus paid on total production of the group, pro-rated to individuals. Suitable for medium and large size installations. Not particularly good as an incentive plan but successful in coordinating the efforts of a group. Involves considerable clerical work.

There are, of course, some plans which are combinations of the above, but in general, the class heading designates the key to the plan used. The principles of the wage incentive system may also be extended to the sorting and tabulating routines by the payment of a bonus for each day that final reports are prepared in advance of a predetermined date.

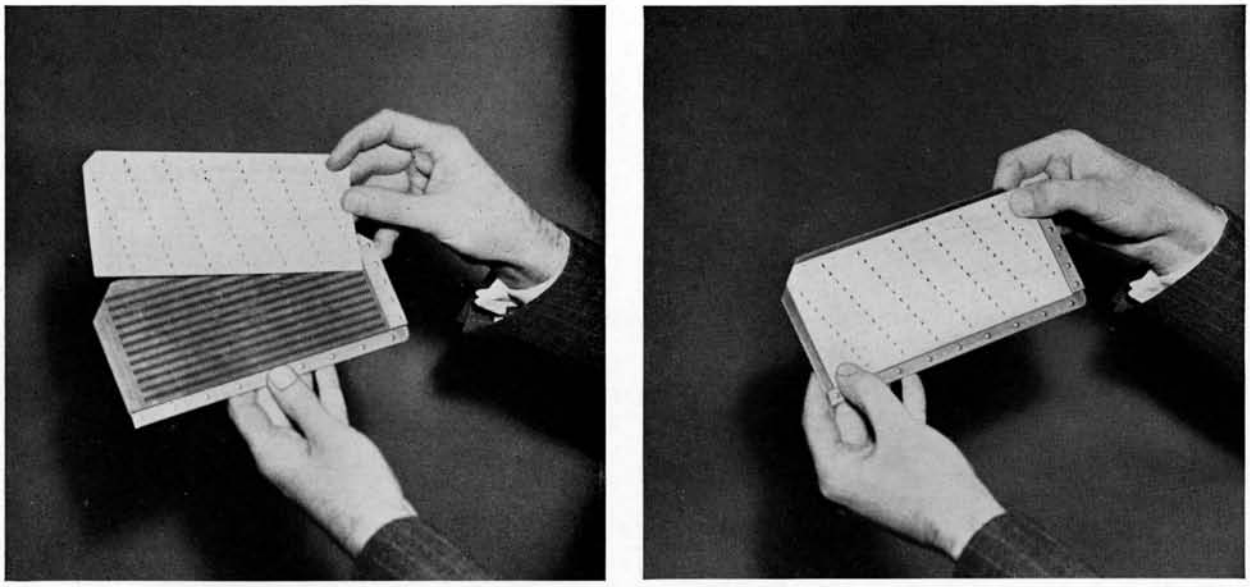
The experience with various plans has been favorable. In one instance the average efficiency rating of the employees has increased from 57.5 per cent to 90 per cent. The savings that have been effected are shared by the employees and the employer on a basis which is mutually satisfactory and equitable.

A report submitted by another company stated: "The present plan has provided for a much lower cost per card and at the same time the average monthly income of an operator has materially increased. The plan practically eliminates any supervision of a disciplinary character. The individuals of the department are more than anxious to keep busy. So far as the employees are concerned, we believe that without question, if the matter were put to them for a vote, they would almost unanimously adopt the incentive compensation plan."

Daily Checking of Punching Equipment

The registration of all punches should be checked daily as follows: Have each operator punch a card diagonally from the first to the last columns, operating all keys, and write upon this card the machine number. These cards can then be checked by placing them individually upon the card registration gauge. Off-registration of punching equipment is a rare occurrence and develops very slowly even with constant use of the equipment. The file of test cards will be of considerable assistance to the permanent correction of the condition causing off-registration. Such cards should be retained as a checking record.

A machine that is not registering accurately should be adjusted before any cards are improperly punched. This method, if followed closely, will eliminate the possibility of errors caused by off-registration of the holes in the card.



Use of Card Gauge

Care of Punches

It is important for each operator to know a few simple rules regarding the proper care of the punching equipment. The card bed surface should be kept clear and free from rust, dust, and dirt. During the summer months, or a period of damp weather, the surface should be wiped with an oily cloth daily. At other times twice weekly should suffice. The rack rollers should be oiled (a few drops) semi-monthly. Keep the rack guide clean and free from dirt, card punchings, etc., cleaning with kerosene or gasoline if necessary. The punches must be properly oiled twice weekly as follows: Insert a card in the machine and spread some oil from side to side across the surface of the card, push the carriage forward so that the oiled portion is under the punches, then operate all the punches through the oiled portion of the card. Use only a light, non-gumming oil. Too much oil is as objectionable as too little. Any piece of machinery will give maximum service and a minimum of trouble only when given proper care.

On the duplicating key punches the master card table must be kept clean and free from dirt, rust, etc. The master card contact roll should be cleaned by wiping with a clean, soft cloth daily. The master card bed should *not* be oily. The Customer Service Representative will gladly give further instructions relative to the cleaning and oiling of this device.

Sorting and Tabulating

The sorting and tabulating operations in the International Electric Accounting Machine Method are practically automatic. The many models of these machines are capable of performing a wide variety of highly specialized work and specialized instruction for each type of equipment is necessary. Other sections of this book are devoted to detailed descriptions concerning their operation.

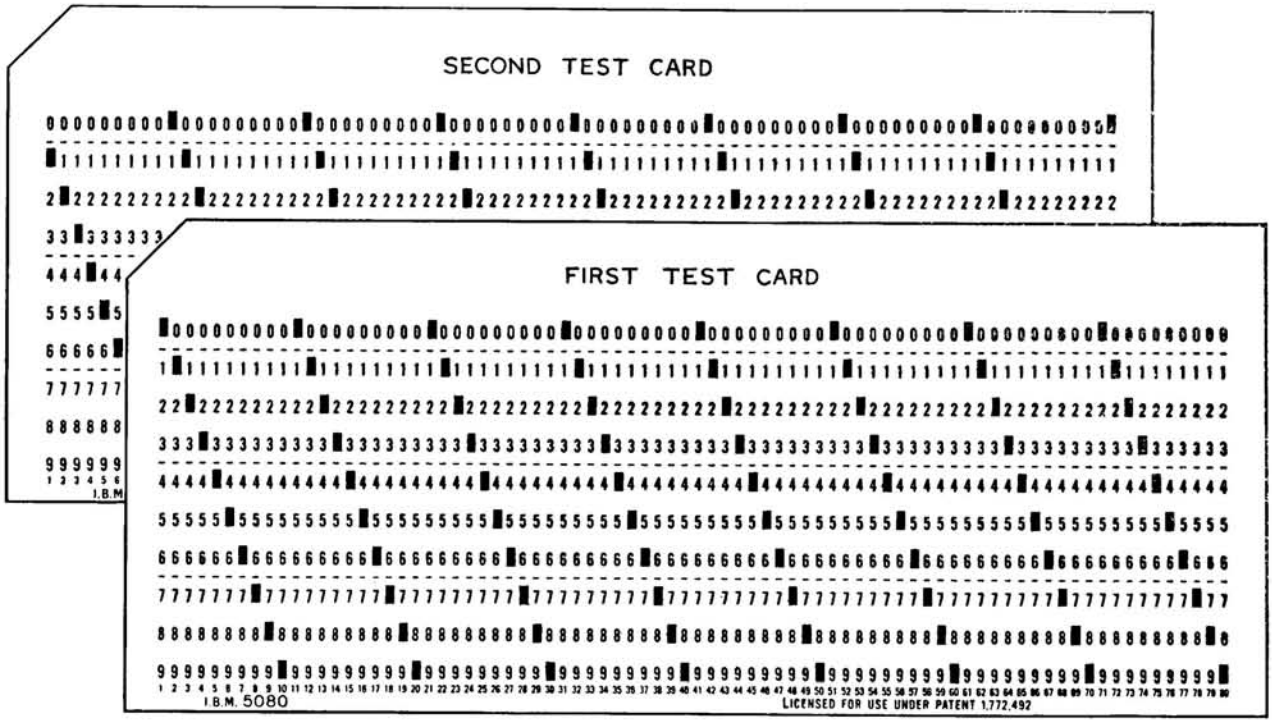
Whenever possible operators should be selected who have had some experience with the principles of accounting, a general knowledge of office routines, and an understanding of the important part played by the machines which they are assigned to operate. They should be given instruction in the proper care of the machines and the correct method of handling and caring for cards before beginning actual work. Later training and supervision should be devoted to developing short-cuts and improved methods of operation.

Checking of Sorting and Tabulating Equipment

The operation of the sorting machine may be readily checked by removing the cards from each pocket, joggling them to make the edges even, and sighting through the corresponding punched position of the column being sorted. If the cards have not been properly sorted it will be impossible to see light through the punched position. The same checking may be accomplished by the use of a sorting needle instead of by sighting.

A special file of test cards should be used each morning to check the operation of the tabulating machine, to make sure that it is in perfect operating condition. The file of test

cards usually is composed of 100 or 200 cards. Ten cards must be punched diagonally across successive fields. The first card is punched starting from 0, the second starting from 1, the third starting from 2, and the fourth starting from 3, etc. These may be duplicated to obtain ten or twenty of each, which will then provide the full test set.



Test Cards

Every position of each counter of the tabulator should be wired to a column of the card. The counter totals for the set of 100 cards, when fully tabulated, should all read 9999999-50; and for 200 cards the totals should be 999999900. To insure the accuracy of the check, a part of one counter should be used for card counting to insure that all the test cards are in the pack being tabulated.

Care of Sorting and Tabulating Equipment

Tabulating equipment represents a large investment and an item of considerable importance in the management of a business. Normal care, such as would be accorded any other valuable machine, will do much to insure its economical and accurate performance.

Each machine should be covered when not in use. It should be oiled regularly to prevent rust or excessive wear of moving parts. Dust and dirt should not be allowed to accumulate on exposed mechanisms.

Efficient Handling of Cards

Although tabulating cards are made of paper stock which is specially prepared to withstand wear and usage, they should be given proper care to attain most efficient machine operation. Careful supervision must be exercised over the storage of new cards and the filing and handling of punched cards. Damaged edges may result in unnecessary delays and difficulties.

Storage.—The boxes or cases in which cards are received should not be opened until the cards are to be punched. Cards should be stored in a dry location, away from steam pipes, radiators, etc., which will subject the paper to excessive dampness or temperatures. Any cards remaining in small boxes should be left firmly packed by means of blocks. When cards shipped in large cases are opened, they should be placed in suitable filing cabinets.

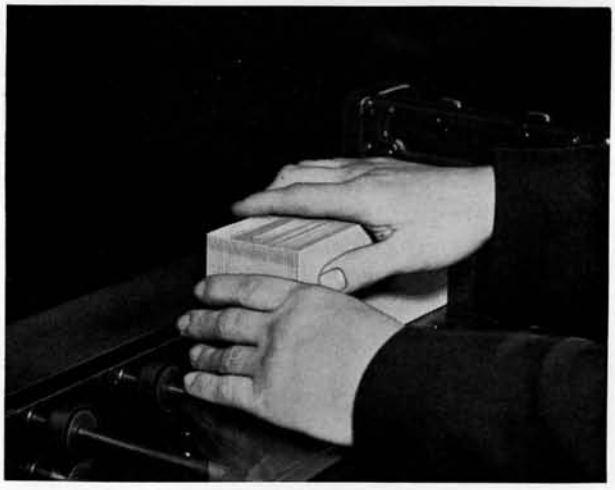
Filing.—Punched cards for current use may be filed in several ways, depending upon the purpose for which they are to be used. Cards to be held for month-end analyses are usually placed in standard tabulating card files. These units each contain about twenty drawers with a capacity of 3,500 cards, or a total of approximately 60,000 to 70,000 cards, in the entire cabinet.

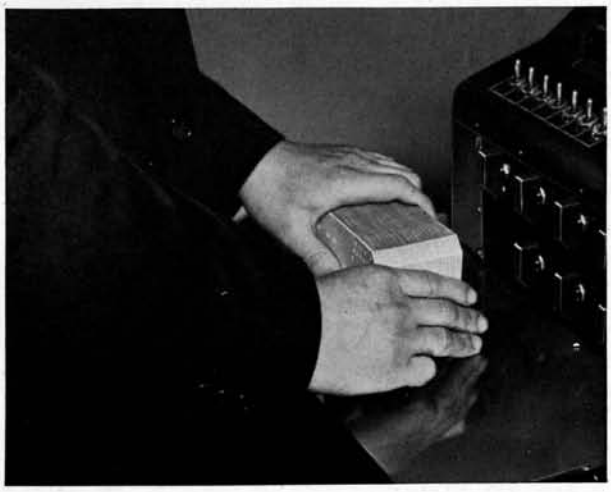
Vertical File

Tub and Wall Files

Cards used for unit control of inventory and billing, and other types of prepunched cards, are usually placed vertically in tub files. This arrangement facilitates "pulling" of cards for the billing operation and also simplifies the visual checking of stocks for merchandise control. The above illustration of the method of filing prepunched cards for labor accounting shows a combination of such a tub file with wall racks.

Handling.—Joggle plates are furnished on machines to simplify the evening up of cards preliminary to inserting them in the feed magazine. Enough cards to fill the magazine to two-thirds of its capacity should be held loosely in the one hand, with one end against the joggle plate. The other end should be gently tapped with the other hand until all four edges of all cards are even. This will prevent damage to the edges of the cards while they are being fed into the machine. Feeding knives of all machines should be checked at periodic intervals to make sure that the feeding knives are in proper adjustment, for if the edges of the cards are damaged, difficulty may be experienced in their subsequent feeding.





Joggling Cards

Mounted Sorting Tray

Sorting Trays.—Trays are frequently used for convenience of handling large batches of cards during sorting and tabulating operations. One such tray may be attached to the rear of the sorting machine. Another model consists of a tray mounted on a low stand equipped with casters to facilitate the transfer of cards between various machines.

Continuous Forms

International Electric Accounting Machines prepare printed summary reports and detailed lists automatically. The information may be printed on plain sheets, rolled paper, ruled sheets, or continuous forms. The use of ruled sheets present no unusual problems; but care must be exercised to insure proper spacing. A proof of each proposed printed form should be placed in the machine for an actual tabulation to check the relative position of figures printed by the accounting machine with the horizontal and vertical ruling of each form. After this check has been satisfactorily completed, the regular supply of ruled forms may be ordered. Continuous forms present a more recent development in report preparation, and consequently they are explained in somewhat greater detail.

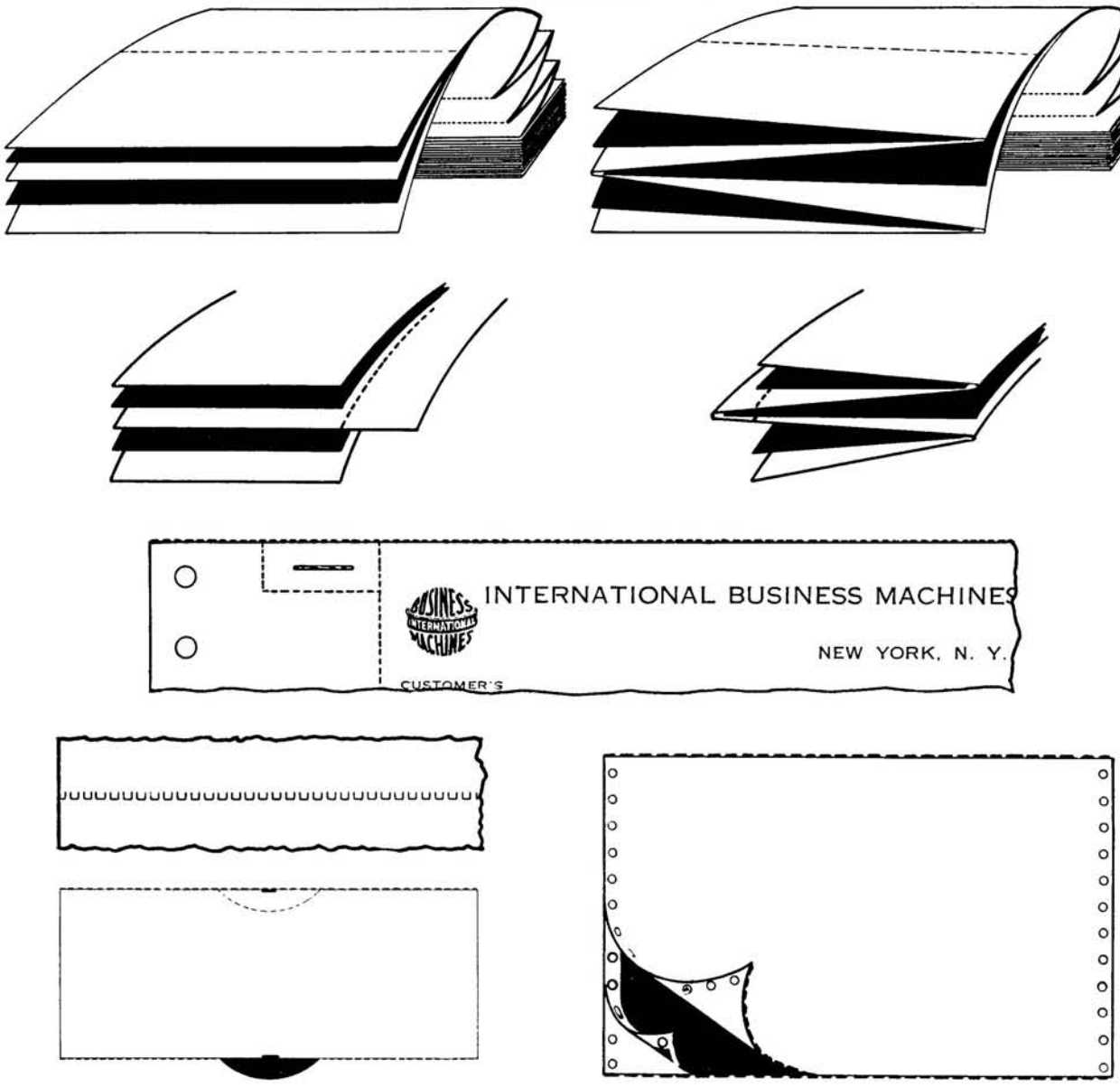
The use of continuous forms may effect the same general operating economies in the preparation of tabulated reports as are effected in other kinds of writing and printing mechanisms.

The use of continuous forms in business has been increasing at a rapid pace in recent years due to the perfection of more and better mechanical devices for handling such forms. Among the users of International Electric Accounting Machines the increase has been greater than the increase in general, because of the automatic nature of this equipment. The greatest efficiency in machine production can be obtained only when it is not necessary to make frequent stops for the changing of report forms. Continuous forms permit this continuity of operation. Continuous-form manufacturers, noting the increasing demand from Electric Accounting Machine users, have been particularly active in developing new things for use in connection with International equipment.

Types of Continuous Forms

Although the varieties and types of continuous forms appear at first glance to be rather numerous, a little study shows that there are actually only two basic types—the "strip" and the "fanfold." All continuous forms can be classed under these headings, their differences existing merely in the type of perforation, the type of carbon, and in certain means for procuring better alignment or cohesion of the parts.

Sorting Tray and Truck



Specimens of Continuous Forms

Continuous-Form Feeding Devices

The standard carriages of International Electric Accounting Machines feed continuous forms, although no special features are incorporated for this purpose. To facilitate ordinary semi-automatic continuous form work, the Line Finding Insert Device, together with a stand arranged with shelves and paper guides, is available.

The insert device is furnished in two sizes, one of which will accommodate any length form up to 11″, and the other up to 18″. The length of the form must be a multiple of 1/6″ in either case.

For fully automatic continuous-form operation the International Automatic Carriage is available. With this type of carriage all operations including form skip, heading skip, first-line skip, second-sheet continuation, etc., are accomplished automatically without the attention of an operator. The detail operations of this carriage are fully described in a separate section.

Bill Feed Device

The feeding of individual page forms may be effected by the use of the Automatic Bill Feed. This device is used to insert, advance,

and remove automatically single sheets of various sizes up to 5 x 18 inches—the latter dimension being the distance from left to right of the form.

Forms are placed in the bill feed hopper face down with the top edge of the form toward the feed throat. The bottom form is fed into the printing position after which it is advanced to a scanning position where it is visible to the operator in the event that sight-checking is required. From this position it is automatically passed to the eject stacker. Should the supply of forms in the feed hopper become exhausted, or if for any reason a form fails to feed, the accounting machine automatically stops.

Department Analysis

A careful review of the departmental activities at the time of installation of machines is especially important to insure efficiency right from the start. The illustrated sheet, Form T-3575, should be of great assistance to those responsible for the efficient supervision of the tabulating department.

Periodically, it is advisable to take inventory of the work and progress of the tabulating department. As has been pointed out, conditions and requirements are constantly changing and more improved methods must be adopted from time to time to keep the department up to date. Upon the request of certain executives, from time to time, additional information will be introduced on various reports. Repetitions of such practice may lead to the duplication of data to the extent that the tabulating of certain reports should be occasionally revised.

IBM Service

Systems.—In addition to the machines, IBM furnishes the advice and counsel of its local sales representatives. Assistance is given to the users of Electric Accounting Machines to develop an efficient accounting routine through the recommendation of suitable equipment and improved methods, and by the supervision of the training of the personnel.

Machine Maintenance.—The Customer Service Division maintains the equipment in excellent operating condition through its organization for making minor adjustments and scheduled periodic inspection and reconditioning of equipment.

Service Bureau.—It is to the advantage of tabulating users to know that an IBM Service Bureau operates in connection with each of its local offices. This bureau places at the service of its customers the company's complete line of tabulating equipment. This has proven a real convenience for customers throughout the country and at the same time has effected substantial savings for them. When peak-loads occur or when special reports or analyses are necessary the Service Bureau will, for a reasonable charge, save a customer the expense and unsatisfactory arrangement of organizing an extra shift of clerks.

Customer Administrative Schools.—These schools are conducted at the IBM Schoolhouse in Endicott, N. Y. Executives and supervisors of IBM Customers are eligible to attend these conferences, which are of two weeks' duration. The classes are divided into a regular and an advanced group. In the former the fundamental principles of the electric accounting machines and method are discussed. In the advanced group, the time is devoted largely to the study of the basic applications of IBM machines. These schools are conducted with the thought in mind that the mutual exchange of ideas is beneficial to both IBM customers and the IBM itself.

Customers Operators Schools.—In addition to the schools held at Endicott for supervisors, the IBM local offices conduct Customers Operators Schools. IBM stresses the importance of having all operators trained before the machines are installed. For this reason facilities have been provided for Customers Operators to receive the necessary instruction in the local offices. Arrangements for operators to attend these classes are made by the salesman handling the account.

T-3575

INTERNATIONAL BUSINESS MACHINES CORPORATION

PREPARING FOR AND SERVICING AN INSTALLATION

(CHECK EACH ONE OF THE POINTS LISTED TO MAKE CERTAIN EVERYTHING IS IN READINESS FOR THE START OF THE INSTALLATION)

Salesman ..... System Service Representative .....

Customer ..... Dept. .....

CONTACTS

Mr. ..... Title ..... Mr. ..... Title ..... Mr. ..... Title .....

Date of Contract ..... Delivery Date Promised .....

I. ORDERS:

1. PROPER SPECIFICATIONS MADE FOR ALL MACHINES:
   - (A) Current—D.C. .....
     - A.C. ..... Cycles ..... Phase
     - Motor Generator if Needed .....
   - (B) Voltage .....
   - (C) X Bars .....
   - (D) Special Features .....
2. ELECTROTYPES .....
3. CARDS .....
   - (A) Quantity .....
   - (B) Color .....
   - (C) Electro. No. .....
   - (D) Packing .....
   - (E) Shipping .....
4. CUSTOMER'S APPROVAL OF CARD PROOFS .....
5. SPECIAL PRINTING WORK: .....
   - (A) Padding and Stapling .....
   - (B) Carbon Paper .....
   - (C) Local Imprinting .....
6. PAPER OR REPORT FORMS .....
7. FOLLOW UP ON DELIVERIES .....

II. THE TABULATING DEPARTMENT — LOCATION OF:

Floor Plan To Scale Indicating

- (A) Machines .....
- (B) Punches .....
- (C) Filing Cabinets .....
- (D) Electrical Connections .....
- (E) Sorting Trays and Trucks .....
- (F) Tables .....
- (G) Key Punch Chairs .....
- (H) Light, Ventilation, Partitions .....

III. SOURCE RECORDS:

- (A) Availability .....
- (B) Legibility .....
- (C) Accuracy .....

IV. CODING:

- (A) Preparation of Code Cards .....
- (B) Are Codes Properly Constructed? .....

V. PUNCHING:

- (A) Operators (Experienced or to be trained) .....
- (B) Training .....
- (C) Relation of Punching to Balancing .....
- (D) Bonus Plans .....

VI. VERIFICATION:

- (A) What Fields need Verification? .....
- (B) What Methods are to be Used? .....
- (C) What Provision for being Sure Corrections are Made Correctly? .....
- (D) How File Spoiled Dual Cards? .....
- (E) What Arrangements for Balancing? .....
  - (1) Predetermined Totals .....
  - (2) Size of Card Groups .....

VII. CONTROLS:

- (A) Established While Cards and Source Records are in Same Sequence .....
  .....
- (B) Adequate .....
- (C) Use of Controls for Other Than Accounting Purposes .....

VIII. REGISTERS:

- (A) For Auditing Purposes .....
- (B) For Cross-Reference Purposes

IX. REPORT FORMS:

(A) For Fast Preparation.....

(B) Clear.....

(C) Final.....

X. MACHINE OPERATION:

(A) Operators.....

(B) Training.....

(C) Location.....

(D) Plugboard Diagrams.....

(E) Test Cards.....

XI. WORK SCHEDULES AND PROGRESS RECORDS:

(A) Source Records.....

(B) Operations.....

(C) Reports.....

XII. PROCEDURE:

(A) Details.....

(B) Responsibility Centered.....

XIII. PERSONNEL:

(A) Supervisor.....

(B) Training.....

(C) Interest and Cooperation.....

(D) Visits to Other Installations.....

XIV. INTERNATIONAL SERVICE BUREAU:

(A) Knowledge of.....

(B) Peak Loads.....

(C) Special Reports.....

XV. APPLICATIONS:

(A) Basic or Starting..... Estimated Card Volume.....

(B) Completeness.....

(C) Extensions..... Estimated Card Volume.....

(D) Check on Changing Conditions.....

XVI. SUMMARY:

(A) Economy.....

(B) Speed.....

(C) Accuracy.....

(D) Flexibility.....

(E) Simplicity.....

(F) Efficient Service.....

REMARKS:.....