

MACHINE METHODS OF ACCOUNTING

THE TABULATING CARD

TO A casual observer passing through a room in which International Electric Bookkeeping and Accounting Machines are operating, the most impressive sight is the operation of the electric sorting and accounting machines; just as the operation of large machines, punch presses, milling machines, and various types of drills tends to be the most impressive sight to visitors in a machine shop. The punched tabulating card is generally given very little attention and is passed by unnoticed in the same manner as the tools and jigs and dies of manufacturing plants are passed by. To one who is interested in the details of operation, however, these seemingly unimportant items assume a leading role. For, just as the forms of the dies and jigs determine the shape of the finished manufactured product, so the punched tabulating cards control the electric accounting machine and cause it to produce accurate and complete accounting and statistical reports.

The tabulating card, which was first devised by Dr. Hollerith and adapted to the United States census, is called a unit record. For sales accounting, the card represents a single item on an invoice; in payroll, a single unit of work performed; in accounts receivable, it represents a single amount of indebtedness as covered by an invoice or a single item representing the liquidation of indebtedness such as a check or cash received from a customer; and in census studies, each card records the status of an individual as to age, nativity, marital condition, occupation, or other factors.

The purpose of creating a unit card is to establish a single simple record of a transaction or condition, which may be speedily sorted and re-sorted by means of automatic machines for the preparation of various analyses and reports on the electric accounting machines. Dr. Hollerith himself defined the tabulating machine method as "a means of automatically cross-indexing information."

The importance of the tabulating card in a successful tabulating installation can not be stressed too much. The tabulating card is, in reality, the basic unit in the International Electric Bookkeeping and Accounting Machine Method. It is the medium which actuates the

various machines and plays a part which is as essential and important as that of the punch, the sorter, or the tabulator. Care in the manufacture of the card must be governed by the same standards of precision as those which characterize every step in the manufacture, assembly, and inspection of the machines themselves.

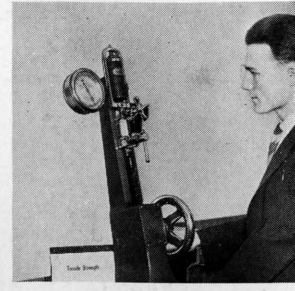
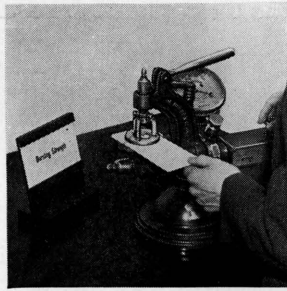
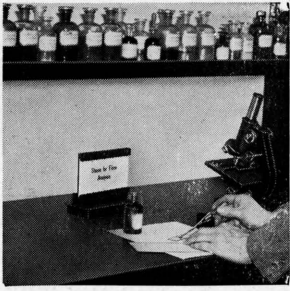
Paper Stock

Tabulating cards are manufactured from an especially prepared high-grade paper stock. Every care is taken to produce a paper strong in wearing quality and free from foreign particles which might act as conductors of electricity. Strict laboratory tests are made of samples of every shipment of paper received at the card printing plants.

Paper is a product which possesses varied characteristics depending upon its chemical composition and the processes used in the successive stages of its manufacture. The finished product is subject to many variations. Changing atmospheric conditions cause it to swell or curl to various degrees depending upon both its composition and manufacture. Paper of inferior chemical composition deteriorates rapidly with age and loses its desirable wear-resisting properties. Use of improper lengths of fibres reduces the ability of the paper to withstand repeated handling.

Careless processing may result in only partial elimination of undesirable elements—resulting in the production of a paper which contains carbon, slime, or froth spots. These defects make it undesirable for use in both mechanical and electrical machines, since any such defects may subsequently permit a weakened portion of the card to be pierced or permit the accidental completion of an electrical circuit.

Careful experimentation and development have resulted in the establishment of standard tests to insure the uniform quality of tabulating card paper stock. These have been found to be essential if maximum advantages are to be obtained at minimum cost. The methods of testing are illustrated to portray the careful selection of paper for card printing.

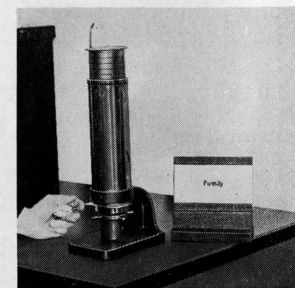
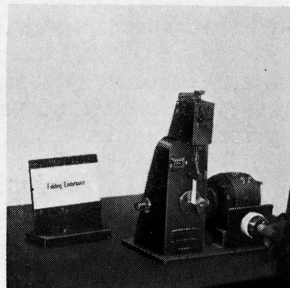
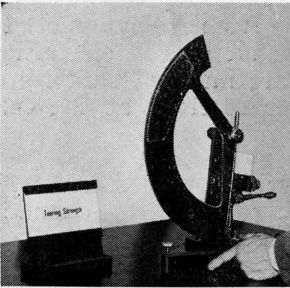


(1) **Microscopic Examination:** By microscopic examination of the fibres which make up the paper, using various stains, much valuable information is obtained. It is possible to determine the types of fibres present, their origin in nature, the pulping processes used, the degree of purification, fibre length, and degree of hydration.

(2) **Thickness:** Close adherence to the specified nominal thickness reduces mechanical difficulties which develop when extremes are encountered. The registry of printing is more uniform and the cards have a more uniform body and rigidity if the paper is of uniform thickness.

(3) **Bursting Strength:** This test is used to measure the hydraulic force required to burst a sheet of paper clamped across an opening 1.24" in diameter. This test is usually a good indication of the strength of a paper.

(4) **Tensile Strength:** In order to measure the strength of the fibres and the manner in which they have been felted together to form a sheet, the Tensile Strength Test is used. Strips of paper one inch in width are pulled apart in the Tensile Strength Tester, which is equipped with gauges to measure the breaking strength and the amount of stretch which the paper withstands.

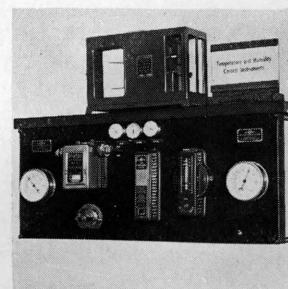
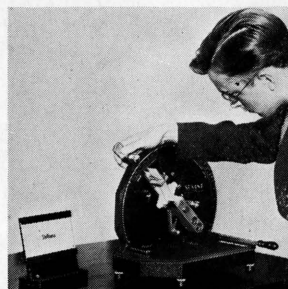
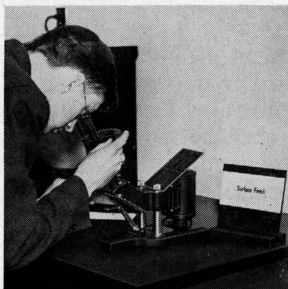


(5) **Tearing Strength:** The tearing strength of paper is measured by means of the Elmendorf Tearing Tester. This instrument registers the force required to tear one or a number of strips two and one-half inches wide.

(6) **Folding Endurance:** It has been found that regardless of whether paper is put to a use where it is subjected to continued folding, the folding endurance test is of great value. It is the best indication of the toughness and wearing quality of paper of all kinds. Paper which is made of weak or brittle stock has very low folding endurance, while the highest quality of tabulating paper will fold several thousand times before breaking.

(7) **Curl Size Test:** If a piece of paper is moistened on one side, the paper immediately commences to curl with the grain toward the dry side. This curling will continue until the moisture reaches the center of the sheet. By observing the time for test strips to reach the point of maximum curl and dividing the time in seconds by the square of the thickness of the paper, a sizing factor is obtained which indicates the relative water-resisting quality of paper, regardless of the thickness of the sheet.

(8) **Porosity:** The porosity is a characteristic which affects the printing quality of the paper and depends on the length of fibre, degree of hydration, sizing, and formation of the sheet.

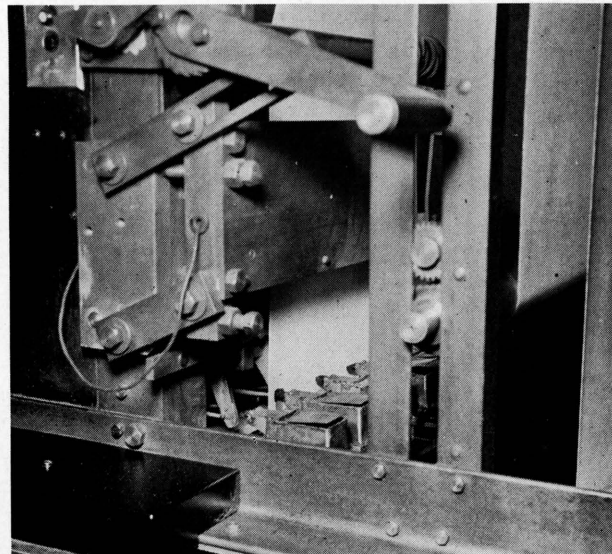
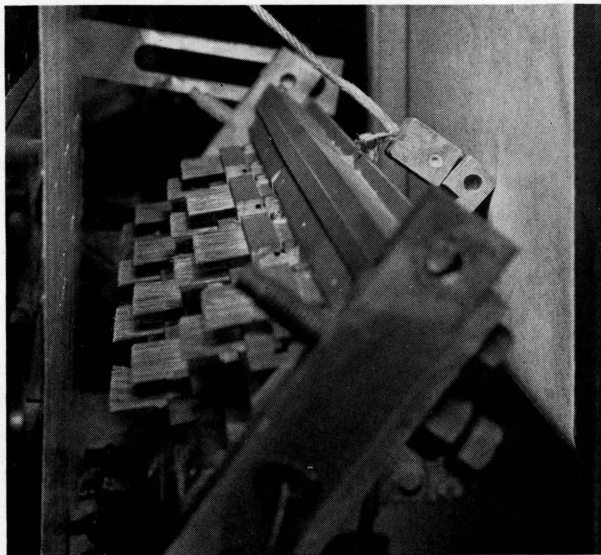


(9) **Surface Finish—Gloss:** This instrument measures the degree of polarization of light reflected from the paper surface. The gloss measurement is especially valuable in detecting two-sidedness in the finish which is a factor influencing warping and curling.

(10) **Stiffness Test:** The Stiffness Tester serves to measure definitely and accurately the rigidity and snap of paper, frequently referred to as its "card effect." A certain degree of

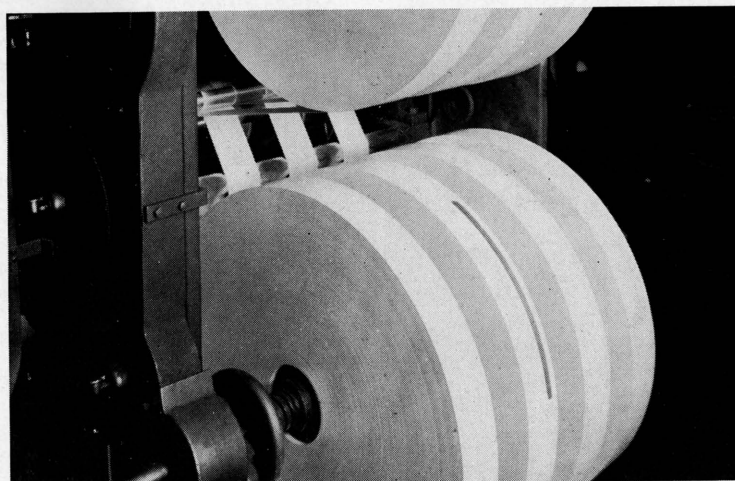
stiffness or "card effect" is very important in tabulating card stock.

(11) **Temperature and Humidity Instrument Control Panel:** This panel is connected with the air-conditioning equipment which is housed adjacent to the Paper Testing Laboratory. The temperature and humidity can be changed in the Paper Testing Laboratory on very short notice by properly setting the gauges and dials on this panel.



VIEWS OF SPECK DETECTOR

Left: Illustration of the arrangement of the brushes which subject every portion of the paper to electrical test. Right: Illustration of the electrical contact brushes in operating position against the paper, and of the striper brushes—one of which is marking the paper at a defective point.



VIEW OF SLITTING MACHINE

This picture shows the striping which distinguishes a defective section of the paper stock. The slitting and reel winding operations are also illustrated.

Electrical Testing of Paper

After the rolls of paper are received and tested at the factory they are stored for several months before being converted into tabulating cards. The next step is the complete examination of the paper stock by the speck detector, to insure the finished tabulating card from containing carbon spots, slime spots, minute perforations, or other inferiorities which would make the card a conductor of electricity. The card stock must be absolutely free of foreign particles so that the various machines will be actuated only by the holes which have been

punched in the cards. The speck detector transmits through its brushes a current of greater potential than that encountered in actual accounting machine operation. The brushes are so arranged that every section of the surface of the paper will be subjected to contact and inspection. A brush striper marks the paper for a distance of about 16 inches at any point at which an electrical contact is made, thus marking the stock to distinguish it for removal by the inspector.

When the stock has been checked by this test, it is cut by slitting knives into strips $3\frac{1}{4}$ "

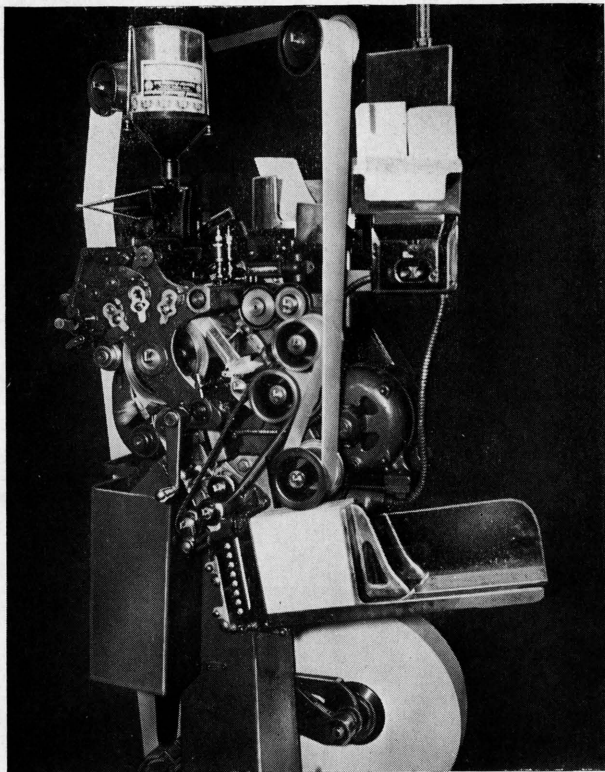
wide and wound on reels. The reels of paper are then stored in special racks which prevent damage to the edges of the cards which are to be printed.

Printing

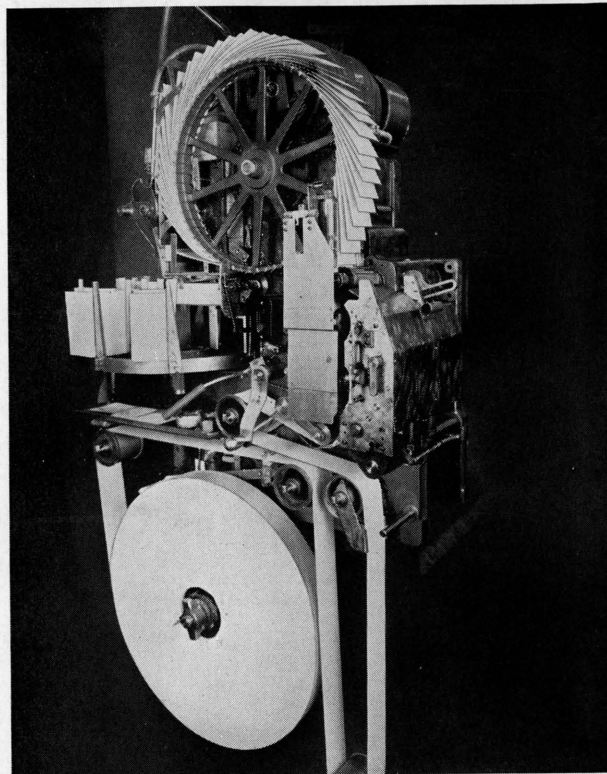
The printing of tabulating cards is unique. Present card-printing presses are essentially of two distinct types. The flat plate press was the first of these to be developed. Several models

operation at a high rate of speed. Earlier models of the Carroll press operate at a speed of 460 cards a minute while the most recently developed model performs the printing operation at the remarkable speed of 850 cards a minute. Despite this exceptionally high speed, absolutely perfect and uniform accuracy is maintained.

These cylinder type printing presses are unique. They have been developed in the company's engineering laboratory after many years



Standard Cylinder Type Printing Press



Newest Model Cylinder Type Press

CYLINDER TYPE PRESSES

of these presses operating at varying speeds average only about 150 cards a minute. Despite the comparatively slow speed of the flat bed press it is still used because it is especially adapted to collating, scoring, pre-punching, pre-numbering, and tinting cards, in addition to performing the normal printing operation. It is also especially designed to print cards with detachable stubs.

The cylinder type printing press, or Carroll press, is designed to perform only the printing

of experimental work. The presses incorporate many distinctive features which are far in advance of ordinary commercial printing press developments.

The "electros" or cylinder type which accomplish the printing are prepared in the IBM etching department. The preciseness of manufacturing, which is essential to proper card printing and subsequent accounting machine operation, can not be attained except by specially developed processes.

Every operation from the preparation of the original card layout to the final packing of cards in shipping containers has been specifically designed to attain the essential accuracy of the finished product. In addition, all operations are subjected to continuous careful inspection to insure the quality of the finished cards.

All characters imprinted on the cards are readily legible, but the pressure used in printing is so governed that no impression is sufficient to indent the card under any circumstances. The surface on neither side of the card is pushed out of its normal plane. Any such indentations would increase the thickness and give rise to difficulties in feeding the card through the accounting machines. Printed matter also is so placed that columnar figures will accurately and uniformly coincide with predetermined positions when tested with appropriate registration gauges.

Both the flat plate and the cylinder type presses are equipped with knives which automatically cut the card ribbon to the proper card length. The preciseness in the dimensions of tabulating cards which is absolutely essential to insure their accurate functioning in accounting machines is constantly maintained. Cards may not vary from standard lengths—5.625" or 7.375"—by more than .005"; nor vary more than $-.003''$ to $+.008''$ from their standard width of 3.25"; nor vary more than .0005" from their standard thickness of .0065".

As the cards are taken from the stacker of the press, they are examined by an inspector, who checks the printing, the accuracy of the dimensions, the alignment of the card, and the quantity. The cards are then packed in boxes containing 2,000 or 10,000 cards. Unless a customer specifies otherwise, the cards are packed in moisture-proof corrugated containers holding 10,000 cards. The 2,000-card capacity cases are made of wood. When cards are packed in the small wooden boxes an extra charge is made for each box. In many installations these small boxes serve the useful purpose of supplementing the regular metal card-filing cabinets.

Additional Indirect Services

The IBM maintains at its printing plants special reserves of paper stock sufficient to meet all card demands for a period of more than three months. This extra investment in inven-

tory is carried to insure a continuous supply of cards for the use of its customers in event of any interruption of transportation from the paper mills. In addition, two card-printing plants are operated at distant points—one in Washington and the other in Endicott—to offset any natural hazards such as fire or flood which might possibly interrupt the normal printing routine of a single plant.

Special care has also been taken to provide special storage vaults for the matrices of flat plates and negatives of cylinder type, so that if for any reason the facilities of one plant were partially or completely destroyed, the other plant would be able to produce promptly the cards required for customer use.

Various units of special printing equipment have been designed and built to perform unusual printing jobs peculiar to International Electric Bookkeeping and Accounting Machine routines. A typical illustration is the printing and checking of serially pre-numbered and pre-punched cards. Such cards are tabulated and balanced to control totals immediately after the printing operation to insure accuracy and completeness of each lot of cards shipped from the factory.

Another important feature of the IBM card printing is the specialized experience of its personnel. Most of the key men have been continuously employed in similar capacities in the printing department for more than fifteen years. Some individuals have as much as thirty-five years of service in the manufacture of tabulating cards. This accumulation of years of practical experience, combined with the experience gained from the technical laboratories, gives added assurance to the manufacture of highest quality tabulating cards.

Assurance of Quality

All these precautions contribute to the manufacture of tabulating cards that must meet the standard requirements of customers and the refinements of the automatic machines which they are required to actuate. It can readily be appreciated that the manufacture of tabulating cards is not primarily a printing job. Tabulating cards are not stationery in the true sense of the word, but an essential part of a machine system which requires the attainment of standards of precision which can not be met in the ordinary printing establishment.

Early Freight Accounting Cards

The success encountered in the tabulation of the census proved the basic merit of the punched card method. When progressive industrial concerns started to investigate the possibilities for the commercial use of this type of equipment, the New York Central Railroad Company was the first to apply the electric accounting machine principle to the compilation of freight statistics. This use of machines was delayed until an adding tabulator called the "integrating machine" was developed. The original census machines were simple counters which added "1" in a clock-like accumulator for any hole punched in any position of the card.

The integrating machine, on the other hand, was equipped with several accumulating devices similar in operation to a battery of desk adding machines. The analysis of freight statistics based upon tabulating cards similar to the two shown above soon developed into one of the major phases of the early business of the company.

Early Industrial Accounting Cards

The facility with which analyses of freight were prepared indicated the possibility of adapting machines to analyses of sales and manufacturing costs. Representative card forms illustrating the early ventures into these phases of industrial accounting are shown.

12	10	12	Customer	Town	County	State	Ledger	Territory	Received	Unit	Kind	Quantity	Amount	Stk	Acct.
11	11	13													
10	0	0	0 0 0	0 0 0	0 0 0	0 0	A	0 0	B1	0 0	0 0	0 0 0 0 0	0 0 0 0 0 0	St	0 0
1	1	1	1 1 1	1 1 1	1 1 1	1 1	A	1 1	B1	1 1	1 1	1 1 1 1 1	1 1 1 1 1 1	A	1 1
2	2	2	2 2 2	2 2 2	2 2 2	2 2	B	2 2	B2	2 2	2 2	2 2 2 2 2	2 2 2 2 2 2	B	2 2
3	3	3	3 3 3	3 3 3	3 3 3	3 3	C	3 3	B3	3 3	3 3	3 3 3 3 3	3 3 3 3 3 3	C	3 3
4	4	4	4 4 4	4 4 4	4 4 4	4 4	D	4 4	B4	4 4	4 4	4 4 4 4 4	4 4 4 4 4 4	D	4 4
5	5	5	5 5 5	5 5 5	5 5 5	5 5	Pt	5 5	B5	5 5	5 5	5 5 5 5 5	5 5 5 5 5 5	E	5 5
6	6	6	6 6 6	6 6 6	6 6 6	6 6	Sp	6 6	B6	6 6	6 6	6 6 6 6 6	6 6 6 6 6 6	F	6 6
7	7	7	7 7 7	7 7 7	7 7 7	7 7	Pa	7 7	B	7 7	7 7	7 7 7 7 7	7 7 7 7 7 7	G	7 7
8	8	8	8 8 8	8 8 8	8 8 8	8 8	Adv	8 8	M	8 8	8 8	8 8 8 8 8	8 8 8 8 8 8	H	8 8
9	9	9	9 9 9	9 9 9	9 9 9	9 9	Kn	9 9	D	9 9	9 9	9 9 9 9 9	9 9 9 9 9 9	I	9 9

Sales Analysis Card

0	2	4	0	2	4	6	8	Order No.	Quantity Pieces	Machine No.	PIECE WORK Operation No.	Rate	Amount	Hours	DAY WORK Rate per Hour	Amount
1	3	5	1	3	5	7	9									
0	0	0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
1	1	1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1
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3	3	3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3
4	4	4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4
5	5	5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5
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9	9	9	9 9 9	9 9 9	9 9 9	9 9 9	9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9	9 9 9	9 9 9	9 9 9	9 9 9	9 9 9	9 9 9

Cost Card

PAYROLL AND COST RECORD

Insurance companies, too, adopted tabulating machines as a means of reducing the tremendous clerical jobs which confronted them, as indicated by the accompanying card forms.

with the company when it began to investigate the possibilities of going more deeply into the accounting functions of business. As a result of the investigations into these new fields, new

										Age at Issue	Kind	Div. Class	Y Y Y X X X	Y Y Y X X X	Y X	Gen. Agent	Yr. of Birth	Date of Iss. 11	Date of Tm. 11	Duration	Mode of Tm.	Ch								
0 0 0 0 0 0 0 0 0 0										0	0	0	0	0	0	0	0	10	0	10	0	0	0							
1233 1482	Number	Stock	Birth	Exp.	Occ.	Number	Res.	Yr.	Age	Kind	Amount																			
	Name											0	0	0	0	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Amount	Premium	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
	Original State		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	Changed to		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	City or County		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	

Early Insurance Cards

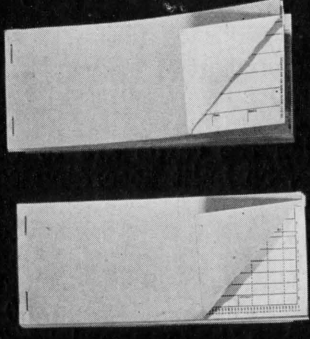
Dual Cards

Originally Dr. Hollerith looked upon the tabulating machine method as a procedure best adapted to statistical analysis, but later some of the more adventurous customers cooperated

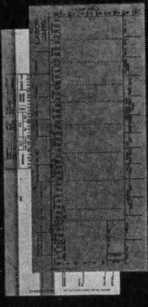
applications of tabulating cards were developed. Instead of punching the tabulating card from some other original document, the tabulating card was modified to permit recording of data directly upon the card itself. In this way the

11226	Floor	Member's No.	Quantity	Brand	Size	Waiter's No.	Amount	CIGARS				STAND 1	WAITER
	1 2 8	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	QUANTITY	BRAND	SIZE	AMOUNT	STAND 2	DATE
	A J S	1	1	1	1	1	1	1	1	1	1	1	1
	B K T	2	2	2	2	2	2	2	2	2	2	2	2
	C L U	3	3	3	3	3	3	3	3	3	3	3	3
	D M V	4	4	4	4	4	4	4	4	4	4	4	4
	E N W	5	5	5	5	5	5	5	5	5	5	5	5
	F O X	6	6	6	6	6	6	6	6	6	6	6	6
	G F Y	7	7	7	7	7	7	7	7	7	7	7	7
	H Q Z	8	8	8	8	8	8	8	8	8	8	8	8
I R	9	9	9	9	9	9	9	9	9	9	9	9	
								TOTAL					
								SIGNED					
								MEMBER'S NUMBER					

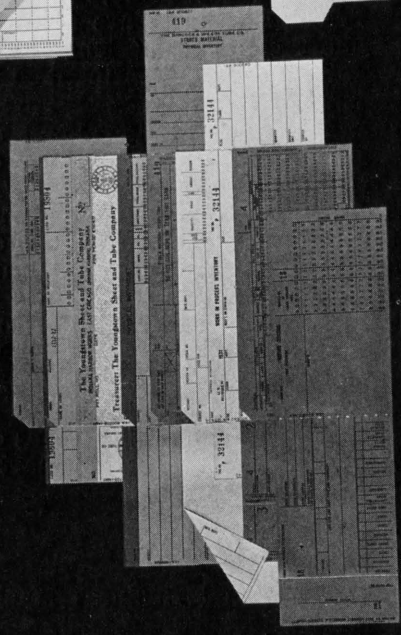
A Dual Card in Use in an Athletic Club—1912



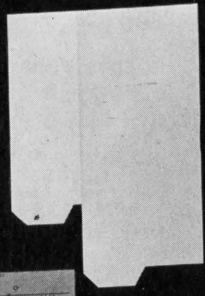
PADE OF CARDS



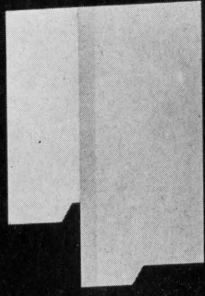
CORNER SCORING



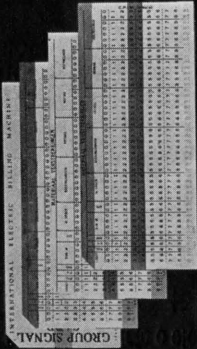
VARIABLE-SIZED STUBS



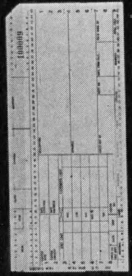
STOP CARDS



INDEX B INDEX STOP CARDS



STRIPING



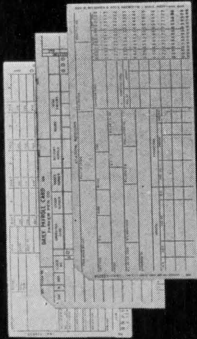
PRE-NUMBERING



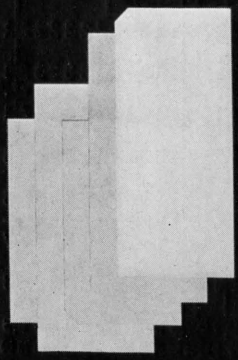
PRE-NUMBERING & PRE-PUNCHING



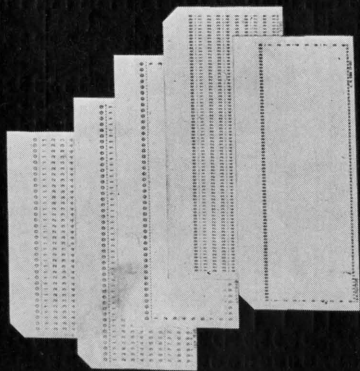
PRE-PUNCHED "MISSING NUMBER" CONTROL



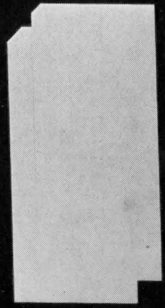
COLOR-INK PRINTING



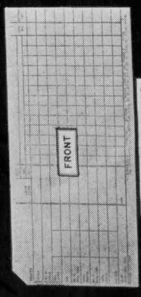
BLANK CARDS



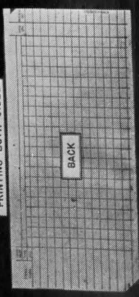
PRINTING ONE SIDE



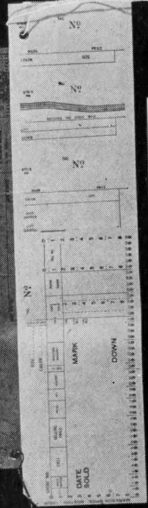
1/8" CORNER CUTS



PRINTING BOTH SIDES



BACK



FILING-HOOK HOLE — STRINGING—BRASS EYELETTING



FOURFOLDING

THE STATE UNIVERSITY CLASS CARD

DATE _____

PRINT _____ (LAST NAME) _____ (FIRST NAME) _____ (MIDDLE NAME)

DEPARTMENT _____ COURSE NO. _____ SEC. _____ CREDIT FR. SR. UNCL.

INSTRUCTOR _____ COLLEGE _____ JR.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	MEMO	
M.																				
T.																				
W.																				
TH.																				
F.																				
S.																				

TO THE INSTRUCTOR: THE STUDENT NAMED ABOVE IS HEREBY CERTIFIED AS OFFICIALLY REGISTERED FOR THE COURSE NOTED AND IS ENTITLED TO ATTEND THIS CLASS. STUDENTS ATTENDING THIS CLASS AFTER THE FIRST WEEK FOR WHOM YOU HAVE NOT RECEIVED A CLASS CARD SHOULD BE EXCLUDED FROM THE CLASS AND ASKED TO REPORT AT ONCE TO THE REGISTRAR.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

YR. NAME CL. REMARKS

PLEASE DO NOT FOLD, ROLL OR CRUSH THIS CARD

CHECKER COPY SERIAL NUMBER FROM DIRECTORY MASTER CARD OR COUPON 2

DEPT.	00	0000	00	00	00	00	00	00	00000
CRSE. NO.	11	11	11	11	11	11	11	11	11111
ALPHABET SECTION	22	22	22	22	22	22	22	22	22222
GENERAL SECTION	33	33	33	33	33	33	33	33	33333
CR.	44	44	44	44	44	44	44	44	44444
	55	55	55	55	55	55	55	55	55555
	66	66	66	66	66	66	66	66	66666
	77	77	77	77	77	77	77	77	77777
	88	88	88	88	88	88	88	88	88888
	99	99	99	99	99	99	99	99	99999

SERIAL NUMBER

THIS CARD NOT VALID WITHOUT REGISTRAR'S STAMP

REGISTRAR'S STAMP

I.B.M. 524732

Dual Card

Dual Cards

The dual card, as previously described, is one which serves the double function of providing space for the original information as well as fields to which this information may be transcribed by punching holes. This dual arrangement is effective in increasing punch production, in eliminating subsequent reference to a source record, and in making the card more readable.

Dual cards, in general, have the space for writing to the left so that when a card is positioned in the punch, the written information is visible to the operator.

Card Checks

Tabulating card checks are considered as a separate class on account of their specialized function. In type they are an illustration of a dual card, as they combine the functions of the written bank check and of the tabulating card in which some of the written information is recorded by means of punched holes.

The printing of a tabulating card bank check involves special operations to produce a form which will compare favorably with the usual lithographed or engraved check. After several years of experimenting, a tabulating bank check has been produced which is entirely in keeping

R

DATE JUL 11 1935

CHECK NUMBER **13261**

REPRESENTATIVE COMPANY
NEW YORK, NEW YORK

PAY *** * * * 65 DOLLARS 34 CENTS**

TO THE ORDER OF **Robert D Morrison**

TO **STANDARD NATIONAL BANK** 19-719
OF THE CITY OF NEW YORK I-NY

John J. Jackson
W. Sorenson

PAYROLL ACCOUNT

CHECK NUMBER	MAN NUMBER	AMOUNT
999999	999999	999999

IBM 12345

Tabulating Card Check

at different periods. Dual cards may also be designed for multiple use, although it is generally true that in practice, dual cards, being original records, must be kept permanently and are, therefore, not available for re-use.

One form of multiple-use card is the "tumble card." This card is so designed that the portion reserved for its second or subsequent use is inverted. The position of the corner cut then assures that all cards are correctly turned. A tumble card usually permits the use of a single skip bar in the punch and a single plugboard set-up in the tabulator.

Another form of multiple-use card is the

"sectional card," which may be chosen where more than two uses are to be made of the same card.

Multiple-use cards are designed in the same manner as transcript cards, except that one or more sections may be inverted. Their only purpose is to reduce the cost of cards, when a small number of columns will suffice. They can be employed only where no permanent card file is to be maintained.

Master Cards

These cards are required only to actuate a punch mechanism to transfer information to

CUSTOMER NO.	CUSTOMER CODE CARD								CUSTOMER
	CUSTOMER NO.	KIND OF INDUSTRY	STATE	CITY	DISTRICT	SEC. NO.	CLASS		
	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0			KIND OF INDUSTRY
KIND OF INDUSTRY	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1			
STATE CODE	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2			CITY
CITY CODE	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3			STATE
DISTRICT NO.	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4			DISTRICT
SECTION NO.	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5			SECTION
CLASS-JOBBER, DIRECT, ETC.	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6			CLASS-JOBBER, DIRECT, ETC.
	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7			REMARKS:
	8 8 8 8 8	8 8 8 8 8	8 8 8 8 8	8 8 8 8 8	8 8 8 8 8	8 8 8 8 8			
	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9			

Duplicator Master Card

EXTENSION AND STATISTICS CARD				IRREGULAR BILLING			
SCHEDULE _____	ROOMS _____						
NO. OF DAYS _____							
CONSUMPTION <u>25</u>	DEMAND CHARGE _____						
AMOUNTS		GROSS		NET			
		9.60		9.31			
U. S. TAX		GROSS		NET			
		.29		.28			

1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1	1 1 1 1 1
2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2
3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3	3 3 3 3 3
4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4	4 4 4 4 4
5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5	5 5 5 5 5
6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6	6 6 6 6 6
7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7	7 7 7 7 7
CON -	AMOUNT	U S TAX					
SUMPTION:	GROSS	NET	GROSS	NET			
9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9	9 9 9 9 9

INTERNATIONAL PUBLIC SERVICE CORP.

500

Gang Punch Master Card

the active cards. Usually they are in the form of dual cards for convenience in filing and sometimes contain a provision for written information on the face.

One type of master card is the "duplicator master card," which is used to transfer certain predetermined data to active detail cards in the duplicator, to facilitate coding, punching, and verification.

A "set-up master card" performs the same functions in the gang punch, differing from the duplicator master card principally in its application.

Master cards are usually designed with the punched information at, or near, the left end, although those columns must always be used

be specifically defined or termed because of their miscellaneous nature.

The design of any indicating card is definitely determined by the design of the detail cards which it supplements.

Summary Cards

Any card designed for the purpose of recording totals secured from tabulations of other cards is termed a "summary card." When this type of card represents the result of a balancing operation it is also called a "balance card."

In many cases the same summary card form may be used for recording the totals of intermediate tabulations from different sources,

ORDER NO.		DEPT.		ACC'T. NO.	
02857					
Is to be charged to					
23	70-385				
DEPT.	ACCOUNT NO.				
Approved:					
CWL					
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9
27	28	29	30	31	32

TABULATING DEPARTMENT

This card is to be used in tabulating the Monthly Summary of Charges to indicate the department and account to which this order is charged.

399

Indicating Card

which are necessary to produce agreement with the corresponding active card forms.

Indicating Cards

Any card designed to be inserted with active cards for the purpose of producing a special type of report is termed an "indicating card." When this card is designed to provide special spacing, such as insuring proper alignment with preprinted forms, it is called a "space card."

"Coding cards" are indicating cards which are inserted to identify groups or to amplify the descriptive information beyond that normally supplied by the cards with which they are used.

Other forms of indicating cards may be employed to aid in special sorting operations, to influence automatic control, or to perform special functions in filing. These cards can not

so that final consolidated reports may be secured.

Prepunched Cards

"Prepunched cards" are cards which are wholly or partially punched with data in advance of their use as detail transaction cards.

They are usually gang-punched and stored in files from which they are withdrawn as needed for current work. Where it is necessary for these cards to be identified in the files such identification becomes an important factor in card design.

Prepunched cards, in general, are used in one of three ways. In the first case they are the original and only cards in the routine and become active cards when pulled from the file. In the second case they are again the only cards in the routine but must be completed by subse-

quent punching. In the third case they become the first transaction cards and act as the master cards for the detail cards that follow.

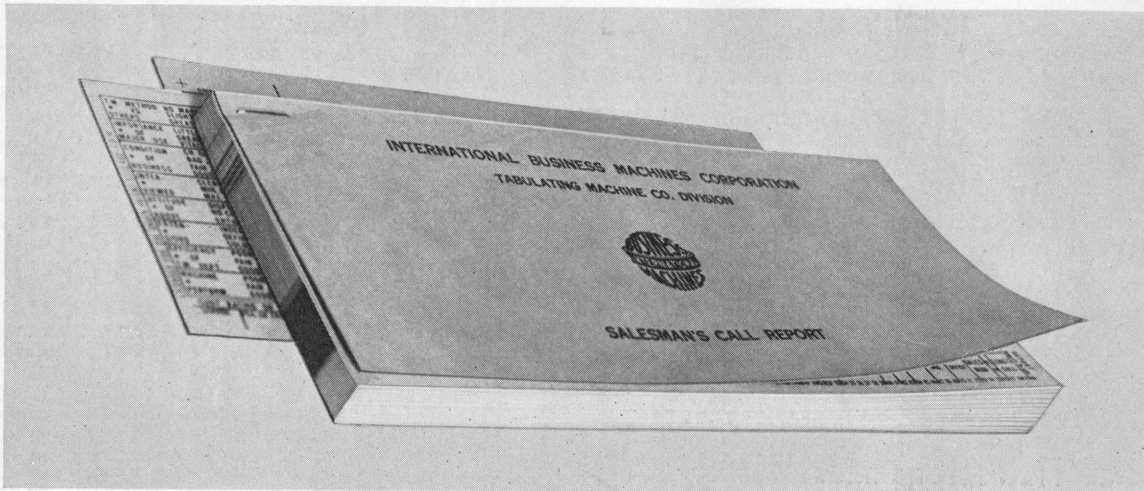
Stub Cards

Any type of card which is used originally with a stub attached is termed a "stub card." Since the stubs are detached before the cards are put in any machines, the card proper may be designed according to the requirements of any card type, dual cards being most popular in practice.

Stub cards are used whenever it is desired to leave some identification of work, material, or transaction at an originating point from which the cards have been removed. They are also used extensively to provide a binding margin when it is desired to assemble card forms in pads, interleaved with paper forms or carbons.

perform certain functions. The most common card of this type is the stop card which is used on some of the units of non-printing tabulating machines to cause the machine to stop at the end of a group of cards of like classification. The stop card is characterized by a cut in the lower left corner. Some stop cards are also made with an index tab along the upper margin to facilitate reference to the file. The use of stop cards has been gradually diminishing because of the wider use of fully automatic equipment.

In industries of the type of the chain and wholesale grocery where tabulating cards are prepared to serve not only as a unit control record of inventory but also as a basis of billing, the tabulating machine is equipped with a special form of group control device to cause the machine to increase to a higher speed for the



Padded Cards

Tabulating Cards in Padded Form

It is possible to assemble tabulating stub cards into pads by stapling the stubs, as previously described. The most common method, however, is to bind the pad by a single staple in the upper left corner. The cards are scored to permit their convenient detachment when they are used. These pads may be collated so that one or two bond paper copies follow or precede each card in the pad.

Covers of padded forms may be printed in any manner desired.

Machine Control Cards

Special types of tabulating equipment which are not commonly used require specially prepared tabulating cards to cause the machine to

tabulation of quantitative information when several cards of like classification are about to pass through the machine. This device is actuated by a specially prepared group control tabulating card.

Eyeletting and Stringing

Stub cards may be designed to permit eyeletting of the stub in any desired position or simply punching with a plain hole without any reinforcement. Occasionally, when necessity demands, it may be advisable to attach a string of cord or wire.

Numbering and Prepunching

Standard cards may be numbered repetitively or consecutively, in any one position on the card, provided no other printed matter is de-

sired in the space occupied by the numbering head. This space is one inch wide and the length is dependent upon the number of digits. If, however, the space referred to is not available, any cards (including stub cards) can be numbered in any one or two places on the card. This requires an extra operation in the printing process for which an extra charge is made. Serial number prepunching can be done only within nine consecutive columns.

Tabulating Cards in Connected Strips

A method for obtaining duplicate tabulating cards from one writing, through the medium of a typewriter or billing machine, has recently been developed. This method requires the furnishing of tabulating cards in connected strips, manifold style.

By specially adapting a printing machine and using a double perforation it is possible to furnish these manifold cards in endless strips, literally "by the mile." The printed cards, in perforated strips, come from the printing press with a $\frac{1}{4}$ " connector between the cards. This connector carries the hinge portion of the special perforations on the sides of each card. When the cards are torn away from the connec-

tor strips, each tabulating card has a good, clean edge at each end.

As the printed and perforated strip of tabulating cards comes from the delivery of the printing press it is folded accordion style, back and forth into card lengths, so that it can be packed in boxes for safe transit.

The boxes for shipping these manifold cards are so designed that they open at the end. This permits the typing of duplicates in the customer's office in the following manner. Two boxes filled with the manifold cards—as received from our factory—are placed in proper position behind the typewriter or billing machine. The endless strip of tabulating cards is started from each box and fed to the correct position in the writing machine, with the automatically fed carbon between. The operator proceeds to type the required data on the card strips and feeds the double strip on through the machine. The individual cards, now filled out by the writing machine, are torn away from the endless strips and the connectors and there are two perfect tabulating cards—one a carbon duplicate of the written data on the other. The feeding through to the tear-off position of the first pair of cards brings the next pair into position for writing. This may continue until the two boxes of strip manifold cards are used up.

Ordering Tabulating Cards

Orders for cards should contain complete information so that there will be no opportunity for misunderstanding the order when it is received at the factory. All card orders should contain the following information:

- (a) Quantity, in multiples of two thousand. Orders for less than 2,000 cards of any one form or color are not accepted.
- (b) Serial number of electrotype from which cards are to be printed.
- (c) Color of stock to be used, by letter and name of color or stripe.
- (d) Whether standard corrugated, continuous, or small boxes are to be used in packing.
- (e) How to be shipped—freight, express, or parcel post—together with routing instructions, if any.
- (f) Location of corner—cut. State whether upper or lower—right or left.

In order to enable our factories to meet the requirements of our customers for cards, three weeks from date of receipt of orders at factories should be allowed for printing the cards, exclusive of time required for transportation.

Color

A great variety of cards is made in the tabulating card printing departments. Cards are printed on plain manila, white, or solid colored stock, as follows:

Color A—Manila	Color E—Green
Color B—Red	Color F—Brown
Color C—Salmon	Color G—Yellow
Color D—Blue	Color H—White
	Color J—White

The H—white cards are made of a special grade of "IBM" watermarked card stock.

Manila and white cards are furnished with half-inch colored stripes across the top in the following colored stripes:

Color K—Red Color S—Brown
 Color L—Salmon Color T—Yellow
 Color M—Blue Color V—Violet
 Color P—Green Color W—Rose
 Color X—Gray

Solid colored cards are furnished with half-inch colored stripes across the top in the combinations of colors indicated in the table below.

Certain of the colored stripes will not show satisfactorily on some of the solid colored cards. The good, fair, and poor combinations of colors are indicated in the following table. Responsibility is assumed only for the combinations

Orders for Special Cards

In ordering stub cards or cards of any special nature, the following information also should be noted on the order:

If cards are to be numbered, state where numbering is to be printed; also style of figure to be used in numbering. When prepunching is wanted, state columns to be prepunched or gang-punched. If cards are to be printed on both sides and numbered, state whether numbering is to appear on back or front.

In case cards are to be printed in other than

COLOR OF PAPER		STRIPED									
		K-RED	L-SAL.	M-BLUE	P-GREEN	S-BROWN	T-YEL.	V-VIOLET	W-ROSE	X-GRAY	
B-RED	CONTRAST	GOOD	FAIR	GOOD	FAIR	POOR	FAIR	GOOD	POOR	GOOD	
	COLOR	GOOD	FAIR	FAIR	POOR	POOR	POOR	GOOD	POOR	FAIR	
C-SALMON	CONTRAST	GOOD	POOR	FAIR	FAIR	POOR	FAIR	GOOD	GOOD	GOOD	
	COLOR	GOOD	POOR	POOR	POOR	POOR	POOR	GOOD	GOOD	FAIR	
D-BLUE	CONTRAST	GOOD	POOR	POOR	FAIR	POOR	FAIR	GOOD	FAIR	FAIR	
	COLOR	FAIR	POOR	POOR	GOOD	POOR	POOR	GOOD	FAIR	FAIR	
E-GREEN	CONTRAST	GOOD	POOR	GOOD	POOR	POOR	FAIR	GOOD	FAIR	GOOD	
	COLOR	FAIR	POOR	GOOD	POOR	POOR	POOR	GOOD	POOR	GOOD	
F-BROWN	CONTRAST	GOOD	POOR	GOOD	GOOD	POOR	POOR	GOOD	FAIR	FAIR	
	COLOR	GOOD	POOR	FAIR	GOOD	POOR	POOR	GOOD	FAIR	FAIR	
G-YELLOW	CONTRAST	GOOD	FAIR	GOOD	GOOD	FAIR	POOR	GOOD	FAIR	GOOD	
	COLOR	GOOD	GOOD	POOR	GOOD	GOOD	POOR	FAIR	FAIR	GOOD	

where both color and contrast are marked "Good."

The purpose of the stripings and the various color combinations is to provide the customer with an easy means of identifying the cards used for various classes of work.

Correspondence Regarding Card Orders

All letters, telegrams, etc., pertaining to orders for cards, electrotypes, etc., should be addressed to the Card Order Department, International Business Machines Corporation, Endicott, N. Y., provided no formal acknowledgment of order has been previously issued. If an acknowledgment has been received, the symbol letter or letters appearing to the left of the order number indicate at what factory the cards are to be printed—"W" is indicative of Washington and "C. E." of Endicott. When such information is available, considerable expense and time can be saved if correspondence is addressed directly to the shipping point. Therefore, correspondence pertaining to card orders already issued, if "W" orders, should be directed to the Card Order Department, 1054 31st St., N. W., Washington, D. C., or if "C. E." orders, to the Card Order Department at Endicott.

black ink, mention the color (blue, green, brown, red, or violet) desired.

If padded forms are required, show how they are to be arranged. Also include copy for cover if printing on cover is desired.

If a file hole is desired in the stub, state where it is to be located. If stub is to be looped with a string or wire, give length of loop desired.

Rush Orders

Telegraphic orders for cards from either the branch offices or customers should contain proper order reference or billing authority. Considerable confusion may be caused and duplicate shipments made because of the lack of this information.

Sales representatives should note, and customers be informed, that in telegraphing for small shipments of cards (portion of order) to tide them over periods due to lack of cards, full quantities covered by original request should be stated, in order to avoid misunderstandings through billing such small quantities of cards at higher prices.

TABULATING CARDS IN FOREIGN LANDS

Comptables, 29, Boulevard Maeshorbat, PARIS-8^e

Deutsche Hollerith Maschinen G. m. b. H., Berlin W35, 10. 11. 32

Comptables, 29, Boulevard Maeshorbat, PARIS-8^e

Deutsche Hollerith Maschinen G. m. b. H., Berlin W35, 10. 11. 32

Code	Temps alloué partiel	Décompte M.-O.	Atelier	Date	Equipe	Pointage	Temps passé	N° de Commande	Opération	Atelier débiteur
Temps alloué ou reliquat		Comptabilité de l'Atelier 87 "DÉPENSES"								
Date de lancement		<i>Description du travail à effectuer</i>								
Equipe										
Pointage										
Temps passé										

Periode	Butik	Faktura	Vare Nr.	Kvantum	Uds. Pris	Indk. Pris	Indk. Beleb	Uds. Beleb	Periode	Butik	Faktura	Vare Nr.	Kvantum	Uds. Pris	Indk. Pris	Indk. Beleb	Uds. Beleb
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

ファンシー入貨カード									
日附	11	品番	生地番	画番	工番	入貨	生地代	画代	

Nepoškozujte okraj! Se štítkem zacházejte šetrně a nepřekládejte je!									
Mzd. obd.	Pol.	Ob.	Zaměstnanec číslo jméno:			Označení práce:			
Provád. odděl.	Pracovní hodiny celkem		Zaučtované hodiny		Zaučt. mzda bez přes času	1. týd. celkem přes c.		2. týd. celkem přes c.	

Traction électrique - Primes et Statistiques (Services de Route et de Manœuvres de Gare)																						
Jour	No du Train	Ligne ou Gare	Nature du train	Dépôt	No du locomoteur	No du Roulement	Matricule		Relevé pour temps perdu	Parcours Kilométrique				Tonnage du Matériel en voitures lances		Tonnage des locomotives et autres machines		Services spec. de Manœuvres		Marche traction		Roulement Aide-Conducteur
							du Conducteur	de l'Aide-Conducteur		Total	Trains	Hu Ren-forts	Ml Di	non chauffé électrique-ment	chauffé électrique-ment	non chauffé électrique-ment	chauffé électrique-ment	durée en minutes	Perdu en minutes			
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Kommissions-Nr.			Motor- oder Wagen-Nr.			Reihenbestell-Nr.			Karosserie-Nr.			berechnet am		Rechnungs-Nr.	
2															
Typ	Art	V.Stelle	T y p									Kunde			
3	4	5	PS { Fahrgestell Motor												
Rechnungsbetrag			Aufbau von												
Brutto			Ausstattung: mit } Schnellgang												
Rabatt															
Netto															
Selbstkosten															
Material			an Karosserie-Aufbau						Als Lagerwagen an						
Karosserie			Tag		zurück		SI. oder fremd		Tag		Vertreter oder Verkaufsstelle				
Lohn			193.....						193.....						
11															

Fertigfabrikate										
Monat	2	3	4	5	6	7	8	9	10	11
20	22	24	26	28	30	32	34	36	38	40