

7-1-1957

# Conversion of disbursing to tabulating operation

Cecil A. Brown

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CONVERSION OF DISBURSING TO  
TABULATING OPERATION

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A Thesis  
Presented to  
the Faculty of the School of Business Administration  
The University of Richmond

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science in Business Administration

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By  
Cecil A. Brown  
December 1957

## TO THE READER

The purpose of this paper is to present to the reader the actual problems encountered, and their solutions, in converting a large check-writing operation to an "automatic" tabulating machine process. It should be noted that this paper covers a change of procedure in a Disbursing Department, other than the introduction of tabulating equipment, resulting in "automatic" machine check-writing. To do this, the function of the Disbursing Department is briefly summarized and the original system of operation prior to 1 November 1955 is described. The development of a new system of paying Accounts Payables is then explained along with the indoctrination of employees concerning operation under the converted system. An analysis and an appraisal of the new system are then offered on the basis of nine months' operation.

It is stated further that this paper incorporates procedures involving machines furnished by the International Business Machine Corporation. This is not to imply that the procedures as set forth are feasible only with machines of this particular manufacturer. Rather, other manufacturers of electronic business machines (notably Remington-Rand) make similar equipment, and the principles of system conversion and change of procedures still apply though the machine nomenclature may differ. In this particular operation IBM equipment was used as

there was machine time available on IBM machines already rented but which were not being utilized to full capacity. Furthermore, there was greater familiarity with this manufacturer's equipment on the part of several employees at the operating level.

There are comparatively few footnote references in this work because there are few instances when direct references are applicable. As for the bibliography, it is not to be considered to cover all the sources of information available to the reader. Rather, it is suggested that current information concerning a mechanized system can be gleaned from well-known management periodicals and learned from the able and cooperative representatives of punched-card electronic equipment (such as International Business Machines and Remington-Rand).

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## CHAPTER I

### DISBURSING SYSTEM PRIOR TO 1 NOVEMBER 1956

The primary function of any disbursing office is to "pay out funds" promptly to the proper individual or company in the correct amount. Various bank accounts must be maintained (in this instance over 100) in order to provide working funds when and where required. Small "plant accounts" for each local plant must be maintained to provide funds for local miscellaneous payments, payment of freight bills (within 72 hours to meet Interstate Commerce Commission requirements) and local payrolls. Larger bank accounts are required to handle normal daily payments. In addition, special "Funding" accounts are required by management to segregate funds for payments against debt, taxes and certain other obligations where reserves are required. Processing of invoices for payment must be accomplished efficiently to sustain a good credit rating, take advantage of available discounts and to insure deduction of applicable debits.

In addition to auditing approximately 24,000 invoices monthly, the following functions of the disbursing department were accomplished:

1. Processed for payment invoices of four subsidiary companies, as well as all charges on the locally based airplane. This included all the checks subsequently

outlined under procedures for the auditing section.

2. Prepared a daily cash report reflecting the previous day's cash activity, with copies to the President and Treasurer.
3. Prepared a weekly cash report reflecting all Funding and Construction accounts together with all regular accounts, with copies to the President, Treasurer, and Controller.
4. Checked and processed for local vouchering all daily reimbursement requests for petty cash funds, cashier funds, and plant accounts.
5. Maintained a list of all cashier names, address, and fund amounts.
6. Posted charges and credits to Officers and Employees Accounts Receivable.
7. Checked month-ending bank balances with bank reconciliations.
8. Purchased foreign currency when required.
9. Secured and maintained list of all authorized signers for various bank accounts.
10. Processed for payment and maintained records on



all dues and subscriptions for all Main Office and sales personnel.

11. Maintained all records covering expense reports for all personnel.
12. Processed for payment all Main Office vendors' invoices including procedures subsequently listed for the Auditing Section. In addition, open purchase order and open receiving report files were maintained, approvals were secured where required, and distribution tags were placed on invoices. The invoice distribution tags must indicate purchase order numbers, receiving report numbers, approval initials, gross amounts, discount terms and amounts, and the net amounts. The processed invoices must be transmitted to the Accounting Section daily to secure voucher numbers and account distributions.
13. Maintained records and processed for payment all Western Union and telephone bills for the Main Office and all sales offices.
14. Maintained all records and processed for payment rental invoices for the Main Office and all sales offices.
15. Maintained records for the Tax Department as to services

and expenses paid to various individuals, partnerships, and foreign concerns.

16. Maintained all records and processed for payment Accounts Payable memorandum invoices for all retainers.
17. Maintained a list of securities as to type, location, purchase date, cost, etc..
18. Maintained a complete file of all Main Office and all plant vouchers and copies of checks representing payment of those vouchers.
19. Handled all correspondence necessary to fulfill the functions listed above.

All payments at Reynolds Metals Company are made from a centralized disbursing department which not only serves all plants but also several subsidiary companies. This Disbursing Office, which is responsible directly to the Treasurer, consisted of twenty-nine people. These included an Office Manager, an Assistant Office Manager, two secretaries, an Audit Supervisor and seven auditors, a Senior Book-keeping Machine Operator and a Junior Operator, two typists, three Junior Accountants, one Semi-Senior Accountant in charge of the Expense Report Section who has four assistants, and the file clerks.<sup>1</sup>

Up to last year this staff generally completed the payment of

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<sup>1</sup>See Organizational Chart, p. 5.

GENERAL DISPENSING  
Manager:  
W. B. GRUBBS  
GENERAL CLERK (1)

Assistant Manager:  
C. A. BROWN  
GENERAL CLERK (1)

CHECK WRITING  
BOOKKEEPING MACHINE  
OPERATOR (2)  
GENERAL CLERK (1)

COOKING AND ACCOUNTING  
Accountant, Jr.  
H. L. WITT  
ACCOUNTING CLERK (1)  
GENERAL CLERK (4)

STENOGRAPHIC SECTION  
Supervisor, Jr.  
V. E. CAULFIELD  
GENERAL CLERK (5)  
FILE CLERK (2)

FILED  
FILE CLERK (3)

approximately 24,000 vouchers a month resulting in the writing of approximately 13,000 checks a month at an average cost of 10.9 cents a voucher. The primary flow of work entered the office through the office manager's secretary for initial routing as to correspondence, audit, expense report, or incoming vouchers. Incoming groups of vouchers were routed to one of the two voucher clerks for processing.

Beginning with the receipt of an invoice (or voucher) from any one of the various plants, accompanied by a transmittal sheet listing the voucher number, vendor's name, and gross amount of each invoice, the procedure employed by the two voucher clerks was as follows. Such a voucher was first "checked in" manually for verification of the amount on the voucher distribution tag and on the transmittal list<sup>2</sup> (the latter was used later on for Accounts Payable trial balance purposes). Each voucher was next checked against a hand-written list of open debits for possible clearance from the open debit list. If such a debit could be applied it was paper-clipped to the back of the applicable voucher and removed from the open debit list. In addition, this list contained instructions on the special handling of invoices from a particular vendor. For example, such invoices had to be referred to specific personnel for approval before payment; or they required reference to the Credit Department or to the Adjustment Department. As a third step, each voucher was set up for payment date by marking the plan for payment

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<sup>2</sup>See Transmittal List, p. 7.

Reynolds Metals Co., Alloys Plant  
LOCATION

MONTH OF September DATE 9-9-57 PAGE 1 of 1

VENDOR	VOUCHER NUMBER	ACCTS. PAYABLE	INTERCOMPANY	
			B-08	AMOUNT
	<del>5-9</del>	B-05-1	✓	
Container Corp.	<del>2</del>	1,110.26		
Daming Co.	<del>3</del>	22.29		
J. E. Dilworth Co.	<del>4</del>	739.53		
Epps-Fitzgerald Paper Co., Inc.	<del>5</del>	4,939.65		
Fredrickson Tire Co.	<del>6</del>	59.23		
General Electric Co.	<del>7</del>	20.33		
Kleemann Corp.	<del>8</del>	16,905.00		
" "	<del>9</del>	(3.00)		
Mathes Co., Inc.	<del>10</del>	21,167.71		
McMaster-Carr Supply Co.	<del>11</del>	9.71		
Minneapolis-Honeywell Regulator Co.	<del>12</del>	322.15		
Moore-Handley Hardware Co., Inc.	<del>13</del>	55.77		
Paper & Chemical Supply Co.	<del>14</del>	574.27		
Pittsburgh Plate Glass Co.	<del>15</del>	38.01		
" "	<del>16</del>	91.91		
" "	<del>17</del>	12.84		
Ready-Power Co.	<del>18</del>	101.00		
Republic Manufacturing Co.	<del>19</del>	57.48		
Republic Steel Corp.	<del>20</del>	2,476.95		
Southwestern Transportation Co.	<del>21</del>	115.44		
Supply & Hardware Corp.	<del>22</del>	197.93		
Sutton Engineering Co.	<del>23</del>	485.89		
Tafel Electric & Supply Co.	<del>24</del>	342.16		
Turco Products, Inc.	<del>25</del>	58.00		
		51,932.56		
		52,919.41		

APPROVED BY:

*I. J. Oster*  
PLANT ACCOUNTING OFFICIAL  
*J. J. Jr.*

in red pencil in the upper left-hand corner. Each voucher was marked "today sure" (indicating a discount in excess of one dollar); "today" (due today, but without a discount exceeding one dollar); "future" (payable at a predetermined future date); or "tenth" (special payment terms of tenth proximo). Fourth, transmittal sheets were then given to one of the Junior Accountants for checking transmittal addition and verification of all interplant transfers of vouchers to the Disbursing department on a monthly basis. Lastly, the vouchers were then routed to the Auditing section.

Up to last year, procedures for auditing vouchers were as follows: Vouchers dated "Today Sure", "Today", "Future", and "Tenth" were audited in that sequence. Applicable purchase orders were pulled from the open purchase order file. Verification of all computations was made, and each of the following was reviewed for accuracy and completeness:

Original invoice.

No. 2 copy of the purchase order.

No. 2 copy of the receiving report with manual signature.

Authorized approval in distribution stamp.

Vendor's name (voucher against purchase order).

Delivery and payment terms.

Quantities received, checked from the receiving report and posted to the purchase order.

Price, checked against the purchase order.

Authorized approvals for services, power bills, etc..

In case of any discrepancy, the auditor returned a voucher to the plant where it originated for adjustment (copy of "return" indicating the voucher number and name was retained in the Auditing Section). In the absence of any discrepancies, he posted the voucher number to the purchase order and posted the date of his audit. He then routed the vouchers to the Bookkeeping machine operator for handling.

The procedures for bookkeeping machine operators were as follows: Sort initially by payment date. Each dated group was re-sorted on the actual date of payment into order by plants (a requirement to facilitate Accounts Payable trial balance), matching vendors' invoices, and attaching debits to insure deductions from outgoing checks. Each plant's vouchers were then written on specified banks (again a requirement for an easier trial balance) on one of the two bookkeeping machines. Subsequent addition of all check copies by individual banks was required for balancing to the daily bank control ledgers. Vouchers and checks were then routed to the typists, who inserted the payee's name and address on each check. Each check had been inserted in the typewriter and extracted one at a time. The typists also assisted in sorting the vouchers for payment.

The checks were then routed to one of the file clerks who, using a Todd Protectograph, cut the check for the specified amount (signing it simultaneously if the check was under the five-thousand-dollars limit for a facsimile signature). After cutting, the checks and vouchers were re-routed to the Auditing section, where the "check auditor" verified all voucher numbers, names, amounts, check numbers, and dates. Checks and vouchers were then separated into "under five thousand dollars" and "over five thousand dollars". The "overs" were routed to authorized individuals to secure two manual signatures in accordance with check limitation requirements and then returned to the Disbursing Department.

As a further step, checks and vouchers were then sent to one of the Junior Accountants for separation as to the check and its attachments (a copy of the invoice, invoice number, and a copy of the adjusting debit or credit), the check copy, and the voucher or vouchers. Checks were next inserted in unsealed envelopes and handed over to the Mailing Department. The Mailing Department sealed and machine-stamped the envelopes for mailing. Check copies were then returned to the book-keeping machine operators for addition and balancing to daily bank control ledger sheets. After the bank sheets were balanced, check copies were returned to a file clerk for sorting alphabetically and returned to the files. Vouchers were given to a file clerk for sorting into numerical sequence and



returned to the files.

The Accounts Payable trial balance was effected through the efforts of a full-time clerk, with some minor assistance during months when an unusual quantity of invoices were paid. As has been previously noted, all invoices of a particular plant were paid on the same bank. This facilitated the manual checking-off of payments from the check-drawn sheets against the corresponding voucher listed on the Accounts Payable transmittal sheet. A "mixed" bank was also used to cover payments from several plants to one vendor to enable a large debit to be deducted. In checking off "mixed" vouchers, the trial balance clerk was required to go from one plant's Accounts Payable transmittal to another plant's -- a practice time-consuming and prone to error. In addition, the trial balance clerk had to receive copies of all "dummy" checks to enable her to check off offsetting entries. Copies of remittance advices covering refunds to be applied against open debit charges had to be checked off monthly. Additional check-offs were required against vouchers transferred for application to accounts receivable. Because of the large volume of vouchers handled, the only feasible method of effecting an Accounts Payable trial balance was by individual plants. Without the segregation of vouchers by plants, any error incurred would have required checking an entire month's work (or approximately 24,000 vouchers)

whereas balancing by plants substantially reduced the field of error. It is self-evident that as the number of vouchers increased, personnel time was increased and the Accounts Payable trial balance became more subject to errors.

## CHAPTER II

### DEVELOPMENT OF A NEW SYSTEM FOR PAYING ACCOUNTS PAYABLES

Under the old system operations were handicapped by a "bottleneck" in the auditing of vouchers and the limited capacity of the check-writing operators and typists. In addition, the Accounts Payable trial balance was a slow and burdensome chore. An anticipated expansion of workload promised to warrant the addition of at least two auditors, one check-writing operator, one typist, and one file clerk. Aside from such an increase in personnel, the Disbursing Department faced the fact that as its activities increased, its percentage of errors tended to increase.

Acknowledging these factors, the Disbursing Manager sought assistance and guidance from the Systems Department. Exceptional rapport was established between the two departments and the present system was investigated thoroughly. The use of various modern office machines was discussed and many types of them were actually tested. While some minor improvements in methods were discovered and promptly made, there appeared to be no one machine that could afford the flexibility desired. As the company already had in operation a punched-card system for writing payroll checks and this system was generally familiar, the decision was made to investigate the practicability of converting to

a tabulating check-writing operation.

With the tabulating system of check-writing a possibility, the following "rules of thumb" as set forth by John Diebold in Applied Automation were studied carefully:

1. Define objectives broadly.
2. Select the proper personnel for accomplishing these objectives.
3. Analyze your needs to accomplish the objectives and set a time for accomplishment and a cost schedule for realization.
4. Carefully prepare material for your appropriation to be submitted to top management, emphasizing advantages and cost savings and thoroughly justifying expenditures.
5. Make certain that top management has the complete picture and a full understanding of your objectives.
6. Keep your affected personnel informed as to progress and try to get their agreement prior to the completion of your project and by all means incorporate their ideas in the project.
7. Keep all other interested divisions informed so that their thinking will keep pace with the project.

8. Set up adequate training programs.
9. Point out to all personnel the advantages to be gained from the program which is contemplated, assuring them that there is no fear for their jobs; to the contrary, prove by experience that jobs have been saved and created as a result of mechanical improvements achieved.<sup>3</sup>

Closely coordinated efforts were made through representatives of the Systems, Tabulating, and Disbursing Departments. The representatives of the Systems and Disbursing Departments attended a two-weeks training course in electronic equipment to familiarize themselves with the equipment available. Detailed job descriptions of Disbursing Department personnel were prepared, together with a flow chart of the office operation.

With a flow chart and a familiarization course and familiarity with a tabulating payroll system, the study group (the representatives from Systems, Disbursing, and Tabulating Departments) was ready to try to convert the basic disbursing system to a machine operation. Data Processing was the evident key. Punched-card machines sort, collate, calculate, reproduce cards, and perform a variety of other operations; with cards machines can communicate with each other and be used in different combinations to achieve flexibility in data processing.<sup>4</sup>

Programming was developed by taking each basic step in the

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<sup>3</sup>Diebold, John, Applied Automation (New York: Van Nostrand) p. 84.

<sup>4</sup>Nation's Business (October, 1956) p. 42, 43.

normal flow of operations and applying this to a machine operation. As each step was completed specific controls or "checks" were inserted to verify information in "input" or "output".

General procedures for processing Accounts Payable vouchers are now as follows:

- A. Processing within Disbursing Department prior to payment.
  1. Clerical distribution of Accounts Payable transmittals and vouchers to code clerks.
  2. Vouchered documents are assigned a vendor code. The code is obtained from the master code files contained in printed form and housed in two "ferris wheel" card decks. Such a code is always placed above the voucher number on the Accounts Payable distribution tag.
  3. Due date is assigned to all vouchers. Assignment is made to control date of payment.
  4. Exception coded vouchers (for pre-audit, transfer to Accounts Receivable, etc.) are deducted from transmittal total.
  5. Routing slip is attached to vouchers;

- total of the batch is noted, and the "coded" block is initialed.<sup>5</sup>
6. "Batch" vouchers are recorded and forwarded to Tabulating.
  7. Accounts Payable transmittals are filed by location and by date.
  8. Processing of vouchers through Tabulating (See B, Page No. 26).
  9. Detail Voucher Registers (listings of Detail Voucher Cards by "batch" transmittal) are checked against vouchers and routing slip for correct totals and proper codes.
  10. "Batch" vouchers are recorded for return from Tabulating.
  11. Tabulating is notified of the release of Detail Voucher Register by Transmittal Release Memo.
  12. Detail Voucher Registers are filed.
  13. Vouchers are perforated with current date to indicate that processing is completed.
  14. Vouchers are filed in numerical sequence.
- B. Processing of vouchers through Tabulating (applicable

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<sup>5</sup>Voucher Process Routing Sheet, p. 18.

<p><b>ACCOUNTS PAYABLE</b>  <b>VOUCHER PROCESS</b>  <b>ROUTING SHEET</b></p> <p>FORM R-788-3</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; height: 20px;">No</td> </tr> <tr> <td style="height: 20px;">DATE</td> </tr> </table>	No	DATE																		
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DATE																					
<p style="text-align: center;">LOCATION</p> <p style="text-align: center;">VOUCHERS NUMBERED</p> <p style="text-align: center;">FROM</p> <p style="text-align: center;">TO</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; height: 20px;">NUMBER</td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> <tr> <td style="width: 50%; height: 20px;"> </td> </tr> </table>	NUMBER																			
NUMBER																					
<ol style="list-style-type: none"> <li>1. CODED</li> <li>2. VERIFIED CODED</li> <li>3. TRANSMITTAL REGISTER POSTED</li> <li>4. KEY PUNCHED</li> <li>5. KEY VERIFIED</li> <li>6. VOUCHER REGISTER VERIFIED</li> <li>7. TRANSMITTAL REGISTER POSTED</li> <li>8. VOUCHERS FILED</li> </ol>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">DATE</th> <th style="width: 50%;">INITIALS</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>	DATE	INITIALS																		
DATE	INITIALS																				

**VOUCHER PROCESS ROUTING SHEET**



type of IBM machine is in parenthesis) is accomplished through the following steps:

1. Key punch Detail Voucher Card (60 columns per card) (024).<sup>6</sup>
2. Verify-punch Detail Voucher Cards (60 columns per card) (056).<sup>7</sup>
3. Interpret the Detail Voucher Cards (552).<sup>8</sup>
4. Sort the Detail Voucher Cards into vendor sequence (082).
5. Match and select the Detail Voucher Cards against the master name-and-address file (077).  
Detail Voucher Cards and Name and Address cards are sorted through primary and secondary feeds into four pockets -- equal names and addresses, equal vouchers, unequal vouchers (no name and address cards), unequal name and address cards (no Detail Voucher Cards).
6. Sort the Detail Voucher Cards by transmittal number (082).
7. Merge each group (transmittal) of Detail Voucher Cards into their equal name and address cards (077).
8. List the Detail Voucher Register showing all data

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<sup>6</sup>See Sample Card, p. 20.

<sup>7</sup>See Sample Card, p. 20.

<sup>8</sup>See Sample Card, p. 21.





punched in the detail voucher cards and the  
name-and-address cards (407).<sup>8a</sup>

9. Transmit the Detail Voucher Register with vouchers to Disbursing Department.
10. Separate the Detail Voucher Cards from the name-and-address cards (082).
11. Place Detail Voucher Cards in a suspense file pending release of the Detail Voucher Register by the Disbursing Department.
12. Sort the active master name-and-address cards into vendor sequence (082).
13. Sequence-check the active name-and-address cards (077).
14. Merge the active name (secondary feed) name-and-address cards into the inactive (primary feed) name-and-address cards (077).
15. Disbursing Department notifies Tabulating by Transmittal Release Memo which transmittals are to be transferred from "suspense" to "unpaid voucher file".
16. Sort the released Detail Voucher Cards by vendor number (082).

---

<sup>8a</sup> See Detail Voucher Register, p. 23.

03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85		9.85		
	ASSOCIATED TECHNICAL SERVICES P O BOX 271 EAST ORANGE N J								
1					9.85	CR	9.85	1	9.85
04572-01	23-10-0067	10/03/7	10/25/7	248B	317,401.27		317,401.27		
	28-10-0181	10/03/7	10/25/7	248B	329,993.18		329,993.18		
	ARKANSAS POWER & LIGHT CO PINE BLUFF ARK								
2					647,394.45	CR	647,394.45	2	647,404.30
03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85		9.85		
	ASSOCIATED TECHNICAL SERVICES P O BOX 271 EAST ORANGE N J								
3					9.85	CR	9.85	1	647,414.15
47496-02	29-10-0042	09/25/7	10/25/7	112B	140.00		140.00		
	29-10-0043	09/27/7	10/25/7	112B	16.95	.34	16.61		
	29-10-0307	10/10/7	10/25/7	830A	30.48	.61	29.87		
	29-10-0308	10/10/7	10/25/7	830A	1,098.69	21.97	1,076.72		
	29-10-0388	10/15/7	10/25/7	875A	10.68	.21	10.47		
	29-10-0389	10/15/7	10/25/7	875A	25.76	.52	25.24		
	MANUFACTURERS SUPPLY CO 2851 BUCHANAN AVE S W GRAND RAPIDS 8 MICH								
4					1,322.56	23.65	1,298.91	6	648,713.06
03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85		9.85		
	ASSOCIATED TECHNICAL SERVICES P O BOX 271 EAST ORANGE N J								
5					9.85	CR	9.85	1	648,722.91
47501-03	28-10-0312	10/11/7	10/25/7	828A	1,569.95	7.68	1,562.27		
	METAL GOODS CORP 1970 S LATHAM ST MEMPHIS 6 TENN								
6					1,569.95	7.68	1,562.27	1	650,285.18
03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85		9.85		
	ASSOCIATED TECHNICAL SERVICES P O BOX 271 EAST ORANGE N J								
7					9.85	CR	9.85	1	650,295.03
47501-05	10-10-0122	10/07/7	10/25/7	767A	14.86	.15	14.71		
	10-10-0209	10/14/7	10/25/7	826A	51.65	.52	51.13		
	METAL GOODS CORP 8800 PAGE ST LOUIS 14 MO								
8					66.51	.67	65.84	2	650,360.87
47589-04	01-10-4131	09/13/7	AA	10/24/7	280B	3,549.15	3,549.15		
	01-10-4139	10/07/7	AA	10/24/7	280B	40.92	40.92		
	01-10-4130	09/13/7	AA	10/24/7	280B	9.13CR	9.13CR		
						CR			

MICHIGAN BELL  
TELEPHONE CO  
P O BOX 223  
NORTH END STATION  
DETROIT 2 MICH

9 3,580.94 CR 3,580.94 3 653,941.81

9

653,973.81 32.00 653,941.81 18 653,941.81

17. Sequence-check the released Detail Voucher Cards into "unpaid voucher file" by vendor number (077).<sup>9</sup>
- C. Check writing through Tabulating (applicable IBM machine in parenthesis) is effected as follows:
1. Select the appropriate due date by use of the "due date search card", sequence checking at the same time (077).
  2. Tabulate for "preliminary cash requirements report", showing total by vendor and grand total (407).<sup>10</sup>
  3. Merge the detail voucher cards to be paid with name-and-address cards (077).
  4. Manually select the correct "header card" (header card is prepunched with name and address of bank and bank ABA number).
  5. Key punch into "header card" the date and the first check number to be used (024).
  6. Write checks -- header card to precede the detail voucher cards and the name and address cards (407).<sup>11</sup>
  7. After completion of check-writing, remove checks and take final total on "bank assignment control" (407).<sup>12</sup>

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<sup>9</sup>See Preliminary Cash Requirements Report, p. 25.

<sup>10</sup>See Processing of Vouchers Chart, p. 26, 26a.

<sup>11</sup>See Sample Check and Check Copy, p. 27.

<sup>12</sup>See Check-Writing Chart, p. 28.

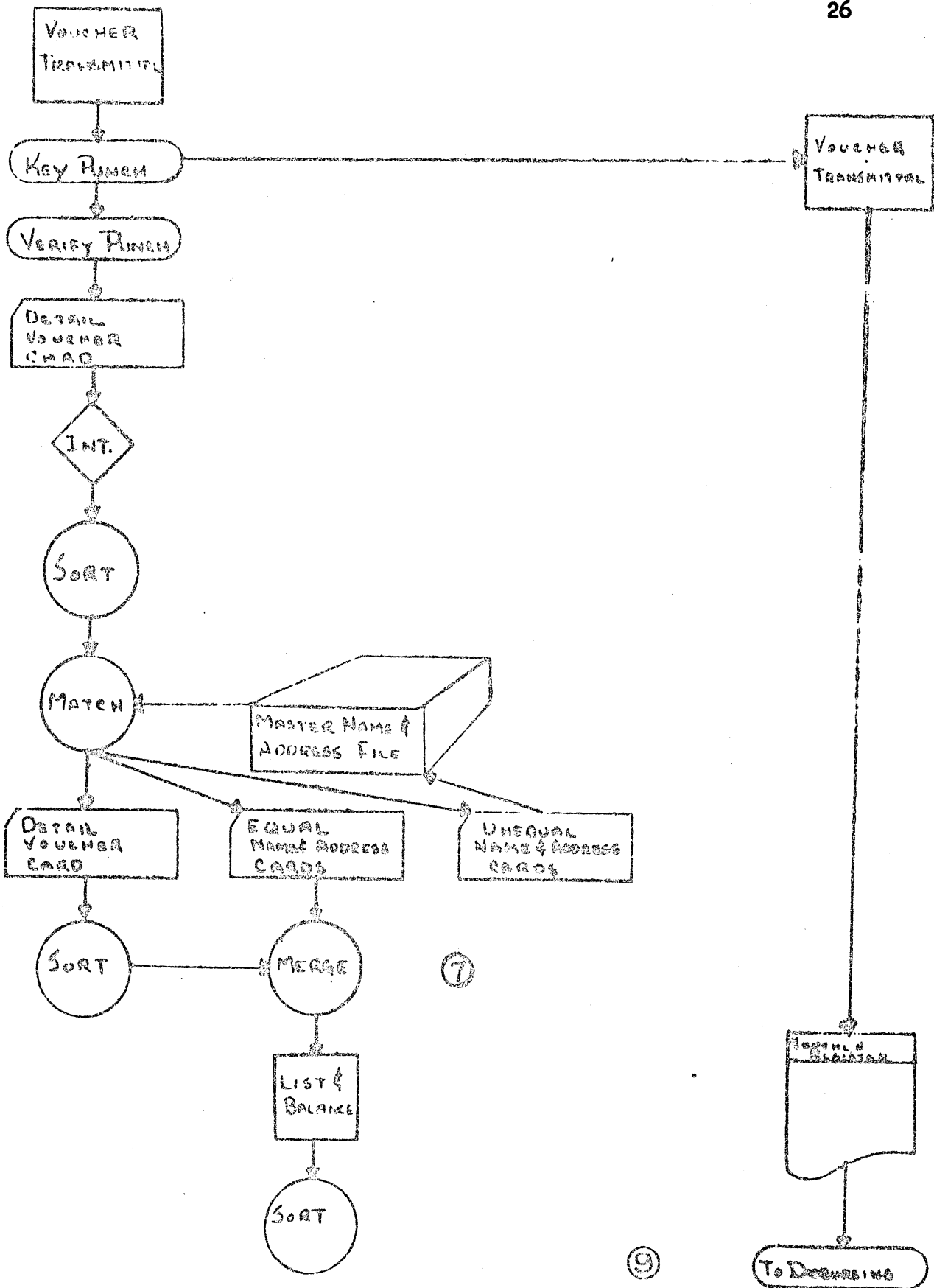
03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85
1					9.85
04572-01	23-10-0067	10/03/7	10/25/7	248B	317,401.27
2	28-10-0181	10/03/7	10/25/7	248B	329,993.18
					647,394.45
03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85
3					9.85
47496-02	29-10-0042	09/25/7	10/25/7	112B	140.00
	29-10-0043	09/27/7	10/25/7	112B	16.95
	29-10-0307	10/10/7	10/25/7	830A	30.48
	29-10-0308	10/10/7	10/25/7	830A	1,098.69
	29-10-0388	10/15/7	10/25/7	875A	10.68
4	29-10-0389	10/15/7	10/25/7	875A	25.76
					1,322.56
03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85
5					9.85
47501-03	28-10-0312	10/11/7	10/25/7	828A	1,569.95
6					1,569.95
03303-01	27-10-0834	10/08/7	11/05/7	959A	9.85
7					9.85
47501-05	10-10-0122	10/07/7	10/25/7	767A	14.86
8	10-10-0209	10/14/7	10/25/7	826A	51.65
					66.51
47589-04	01-10-4131	09/13/7	AA	10/24/7	280B
	01-10-4139	10/07/7	AA	10/24/7	280B
9	01-10-4130	09/13/7	AA	10/24/7	280B
					9.13CR
					3,580.94
71070-04	05-07-1119	07/31/7	AA	8/06/7	952A
10					132.00CR
					132.00CR

	9.85			
CR	9.85	1	9.85	
	317,401.27			
	329,993.18			
CR	647,394.45	2	647,404.30	
	9.85			
CR	9.85	1	647,414.15	
	140.00			
	16.61			
.34	16.61			
.61	29.87			
21.97	1,076.72			
.21	10.47			
.52	25.24			
23.65	1,298.91	6	648,713.06	
	9.85			
CR	9.85	1	648,722.91	
	7.68			
	1,562.27			
7.68	1,562.27	1	650,285.18	
	9.85			
CR	9.85	1	650,295.03	
	14.71			
.15	14.71			
.52	51.13			
.67	65.84	2	650,360.87	
	3,549.15			
	40.92			
	9.13CR			
CR	9.13CR			
CR	3,580.94	3	653,941.81	
	132.00CR			
CR	132.00CR			
	132.00CR	1	653,809.81	

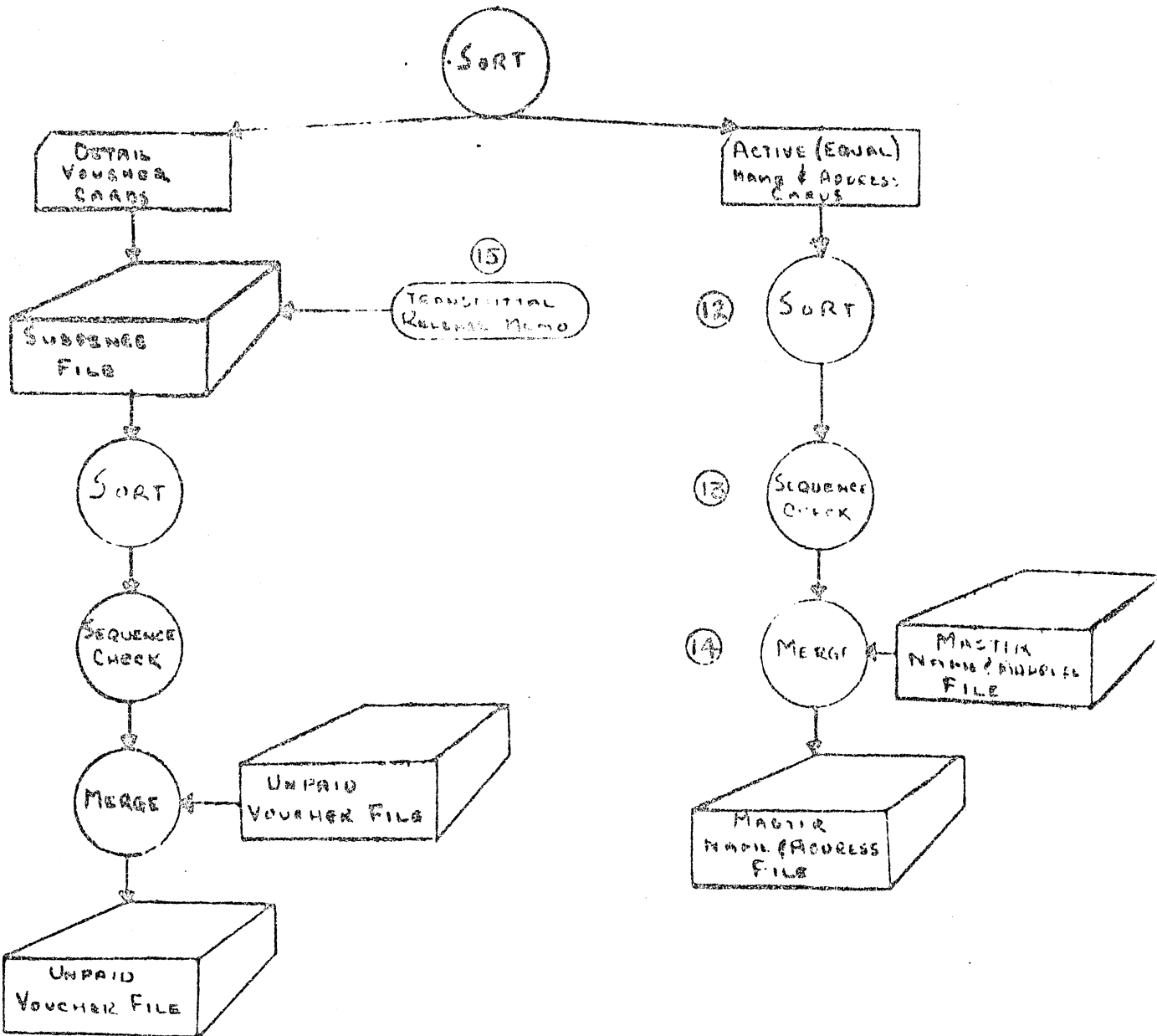
653,841.81	32.00	653,809.81	19	653,809.81
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# PROCESSING OF VOUCHERS - [1.F]



# PROCESSING OF VOUCHERS - AP 1



REYNOLDS METALS COMPANY — RICHMOND, VIRGINIA

64640

CODE	DATE OF INVOICE	OUR NUMBER	AMOUNT OF INVOICE	DISCOUNT	NET AMOUNT
VOID					



REYNOLDS METALS COMPANY  
RICHMOND 18, VIRGINIA

64640

THIS CHECK IS TENDERED IN FULL PAYMENT OF INVOICES LISTED ON ATTACHED STATEMENT. KINDLY DETACH BEFORE DEPOSITING - NO RECEIPT NECESSARY.

DAY	MO.	YR.
-----	-----	-----

DOLLARS

CENTS

AMOUNT

TO THE ORDER OF BANK OF AMERICA NATIONAL TRUST AND SAVINGS ASSOCIATION SAN FRANCISCO, CALIFORNIA

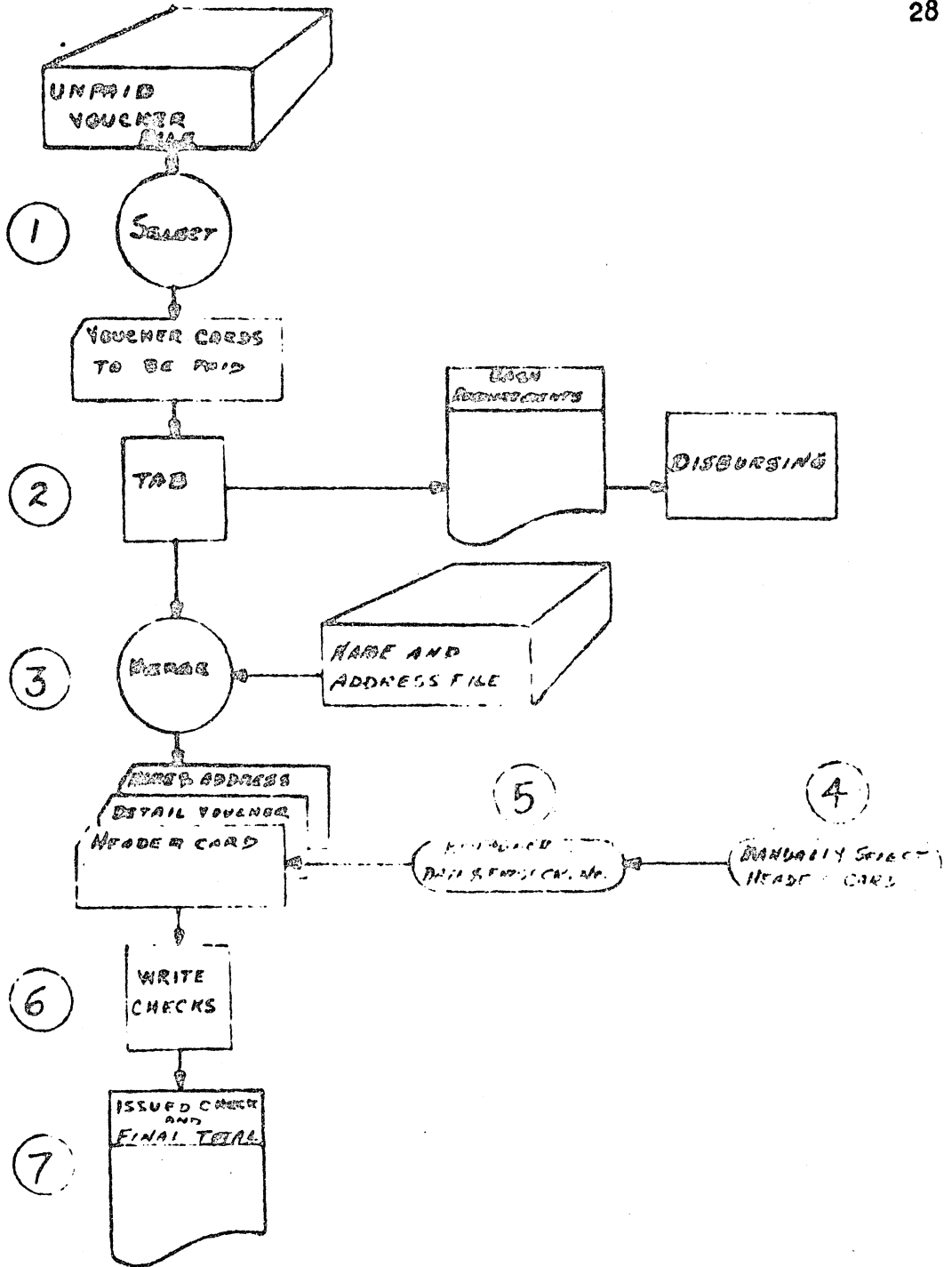
11-35  
1210

REYNOLDS METALS COMPANY

AUTHORIZED SIGNATURE

AUTHORIZED COUNTERSIGNATURE

MUST BE COUNTERSIGNED IF DRAWN FOR MORE THAN FIVE THOUSAND DOLLARS



("Bank assignment control" is furnished by Disbursing. This indicates the break-down of checks to be written on two or three banks as chosen, and the total for each bank. "Bank assignment control" is prepared by Disbursing Department from "preliminary cash requirements report").

- D. Formation of a check register is accomplished (with applicable IIM machine in parenthesis) as follows:
1. Write the check register and the summary punch check issue cards using the original "header card". Make separate check register for each bank (407 and 523).<sup>13</sup>
  2. Tabulate the check issue cards for comparison with check register totals (407).
  3. Interpret the check issue cards (552).
  4. Burst the checks -- Select "Voids".
  5. Release to the Disbursing Department the checks, check copies, check register and control sheet containing final total of checks.
  6. Disbursing acknowledges receipt of the checks and check register.

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<sup>13</sup> See Check Register, p. 30.

3/04/58

•NATIONAL BK OF DETROIT

			VOID - -	142420
ACME BRICK CO	P O BOX 286	LITTLE ROCK ARK	438-03	1,007.67 142421
AETNA OIL CO	P O BOX 391	ASHLAND KY	591-02	468.67 142422
AIR-DRAULICS CO	3135 29TH AVE	PHOENIX ARIZ	669-01	22.86 142423
AIR REDUCTION PACIFIC CO DIV AIR REDUCTION CO	1485 PARK AVE	EMERYVILLE 8 CALIF	697-02	142.60 142424
AIR REDUCTION SALES CO DIV AIR REDUCTION CO	P O BOX 319	HOUSTON 1 TEX	697-07	490.91 142425
PURE CARBONIC CO DIV AIR REDUCTION CO	39 MCCLELLAN ST	NEWARK 12 N J	697-16	16.80 142426
ADDRESSOGRAPH-MULTIGRAPH CORP	BOX 3001 EUCLID BRANCH	CLEVELAND 17 OHIO	822-01	37.00 142427
ALABAMA AIR COOLED MOTORS	725 GRAYMONT AVE BIRMINGHAM 4 ALA	NORTH	825-01	6.27 142428
ALEMITE CO OF ALABAMA INC	516 N 9TH ST	BIRMINGHAM 4 ALA	965-01	82.12 142429
ALLIED-ARKANSAS BEARING CO	410 SPRING ST	LITTLE ROCK ARK	1119-01	1,243.65 142430
ALLIED PRODUCTS CORP RICHARD BROS PUNCH DIV	12677 BURT RD	DETROIT 23 MICH	1159-01	45.60 142431
SOL ALMAN CO	1300 EAST NINTH ST	LITTLE ROCK ARK	1235-01	170.00 142432
A S ALOE CO OF WASHINGTON D C	1501 14TH ST N W	WASHINGTON 5 D C	1251-02	93.11 142433
AMERICAN ASSN FOR THE ADVANCEMENT OF SCIENCE	1515 MASSACHUSETTS AVE WASHINGTON 5 D C	NORTH WEST	1439-01	3.00 142434
AMERICAN CARBIDE CO	4100 PALISADE AVE	UNION CITY N J	1575-01	218.25 142435
AMERICAN CERAMIC SOCIETY INCORPORATED	4055 N HIGH ST	COLUMBUS 14 OHIO	1583-01	5.00 142436
AMERICAN INSTITUTE OF MINING METALLURGICAL & PETROLEUM ENGINEERS INC	29 WEST 39TH ST	NEW YORK 18 N Y	1891-01	20.00 142437
				4,073.51

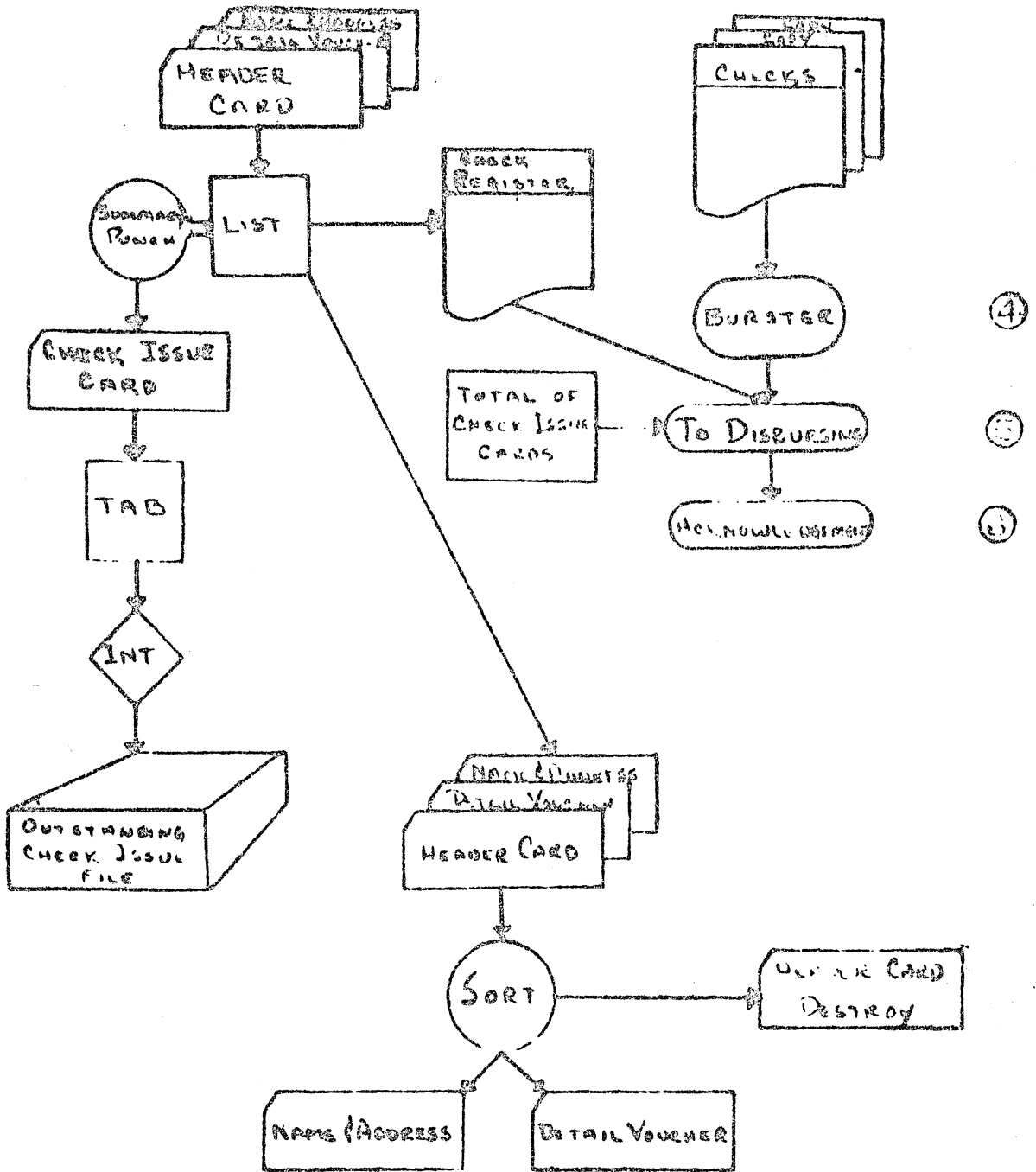
7. Transfer the check issue cards into appropriate banks' outstanding check issue file.
  8. Separate the name-and-address cards from the Paid Detail Voucher Cards (082).
  9. Match and merge the active name-and-address cards into the master name-and-address file (sequence-check actives - select equals) (077).
  10. Gang punch dates paid into the Paid Detail Voucher Cards (0523).
  11. Match and merge the Paid Detail Voucher Cards into the current month's records retention paid vouchers in vendor number sequence (077).<sup>14</sup>
- E. Code -- a master vendor name and address code file has been established through use of a ten-digit code. This code is illustrated as follows:

46632	01	8
Name	Address	Control Digit

A compatible code for both vendors and customers has been established. This provides for possible expansion into Accounts Receivable. Assigning code numbers to new vendors is accomplished through these steps:

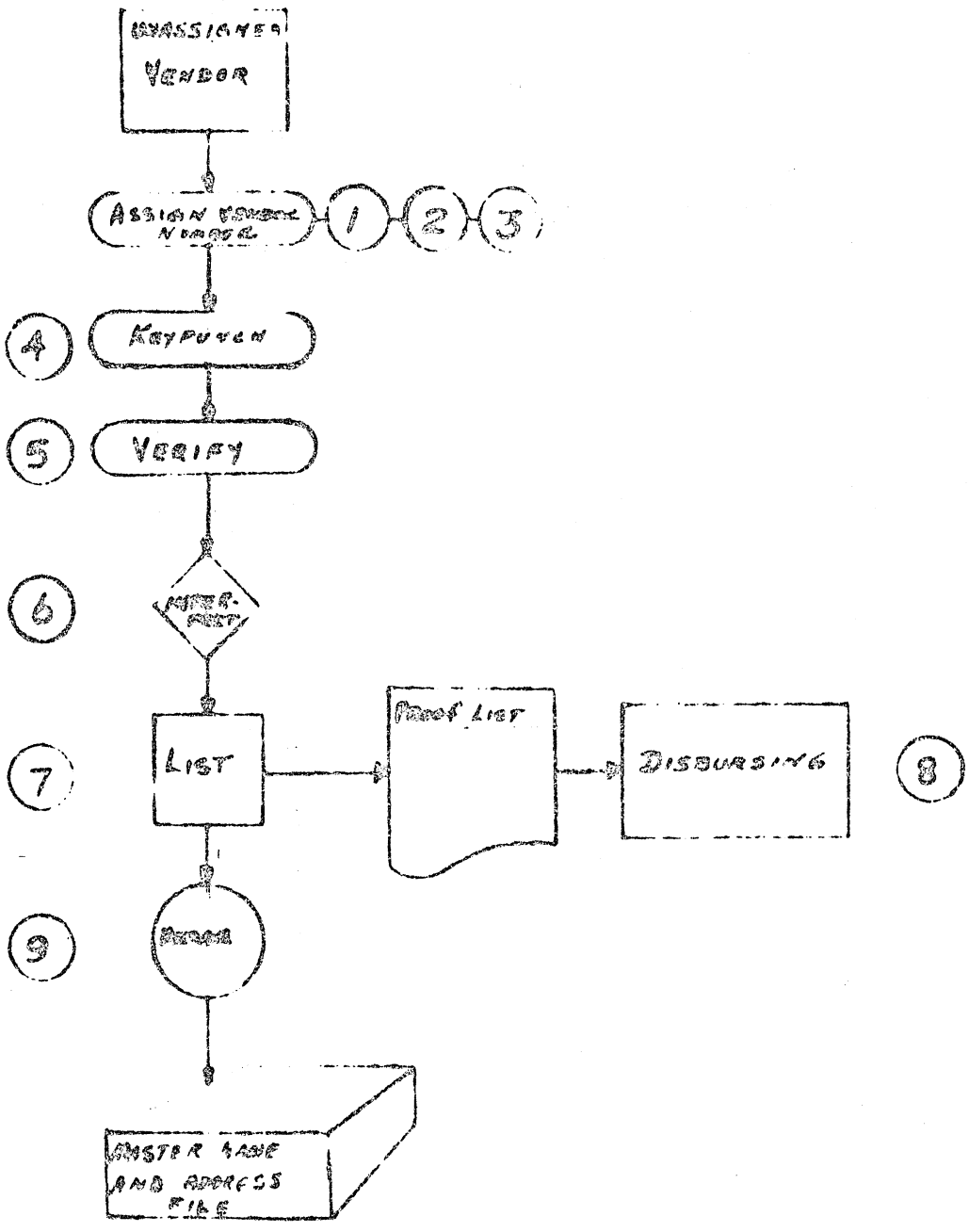
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<sup>14</sup> See Check Register Chart, p. 32.





1. Search both the vendor master file and the customer master file to determine if the vendor is recorded.
  2. If new vendor is also a customer, assign the customer number as the vendor number (to effect a compatible vendor-customer code).
  3. If new vendor is not a customer, assign an unused number within the prescribed alphabetic sequence.
  4. Key punch the master name-and-address cards.
  5. Verify the punched master name-and-address cards.
  6. Interpret the new name-and-address cards.
  7. List the new name-and-address cards.
  8. Transmit the list to Disbursing for verification and inclusion with its wheel deck.
  9. Merge (or manually file, depending upon volume) the new name-and-address cards into the master name-and-address file.<sup>15</sup>
- F. Exception Routines -- after converting the basic steps and their controls to a machine program, "exception routines" for coding have been established as follows:
- 01 - Code signifies the special handling of pre-audit for "scrap" or "power" vouchers as required or as



experience dictates.

- 02 - This code identifies the voucher card after key punching and key punch verification as a suspense voucher for payment action.
- 03 - Such a special coded voucher is not to be paid until notice is received from the Disbursing department; i.e. until "pre-audit" is accomplished. After notification, coded suspended voucher cards are to be "decoded" from suspense status.
- 04 - Transfer to Receivables - noted through initial coding. Journal voucher is to be issued and dummy check effected through tabulating system. A paid voucher card is prepared to indicate the application to Accounts Receivable and for vendor analysis purposes.
- 05 - Cash Receipts - remittance advice is applied against specific vouchers in unpaid file. Dummy check indicating voucher numbers and amounts to enable cash receipt and voucher clearance is to be included on trial balance.
- 06 - Offsets - "dummy" check created indicating voucher numbers and amounts, enabling clearance of off-setting

items from Accounts Payable trial balance.

Rush Payments - use present manual procedure and then create paid voucher card indicating vouchers and amounts from original check copy, completing trial balance and vendor analysis requirements.

Accounts Payable Journal Tickets - journal ticket is issued by Disbursing department and then handled as offset code (06).

Check Cancellation - check is cancelled on Check-Drawn Sheets. If not re-written, notification is to be given to Tabulating to suspend as an open item.

The Accounts Payable Trial Balance Control Sheet is to be posted in accordance with the flow chart indicating Accounts Payable controls.<sup>16</sup> The trial balance consists of totals of voucher transmittals (plus previous month's open balance) plus total of cash receipts less journal transfers and paid check registers. This trial balance of open Accounts Payable is manually compared by Disbursing Department with the General Ledger Balance transcript (obtained from Accounting).

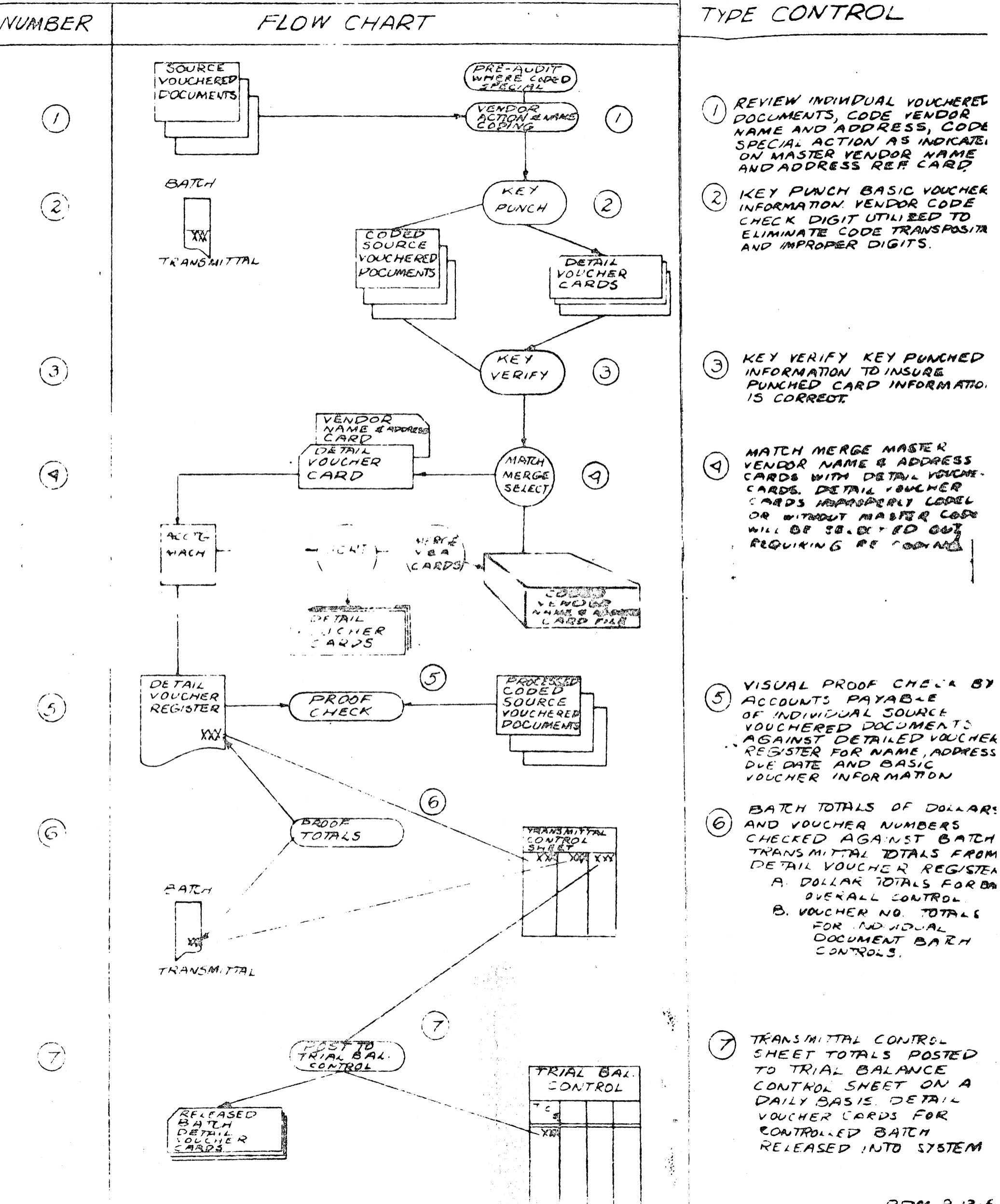
To eliminate a timing bottleneck, a post-audit of vouchers has been established as follows:

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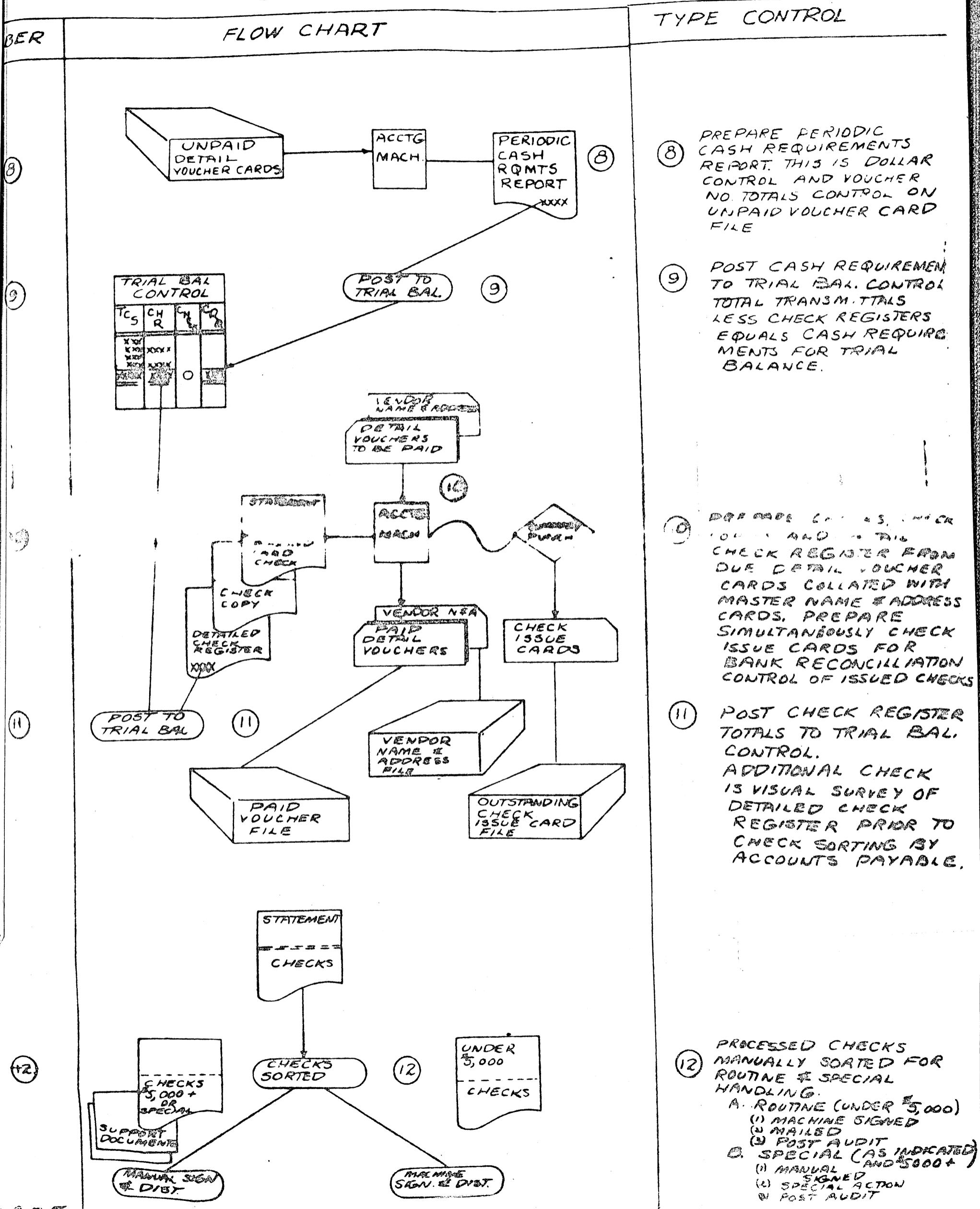
<sup>16</sup> See Accounts Payable Control Sheet, p. 37, 37a, 37b.

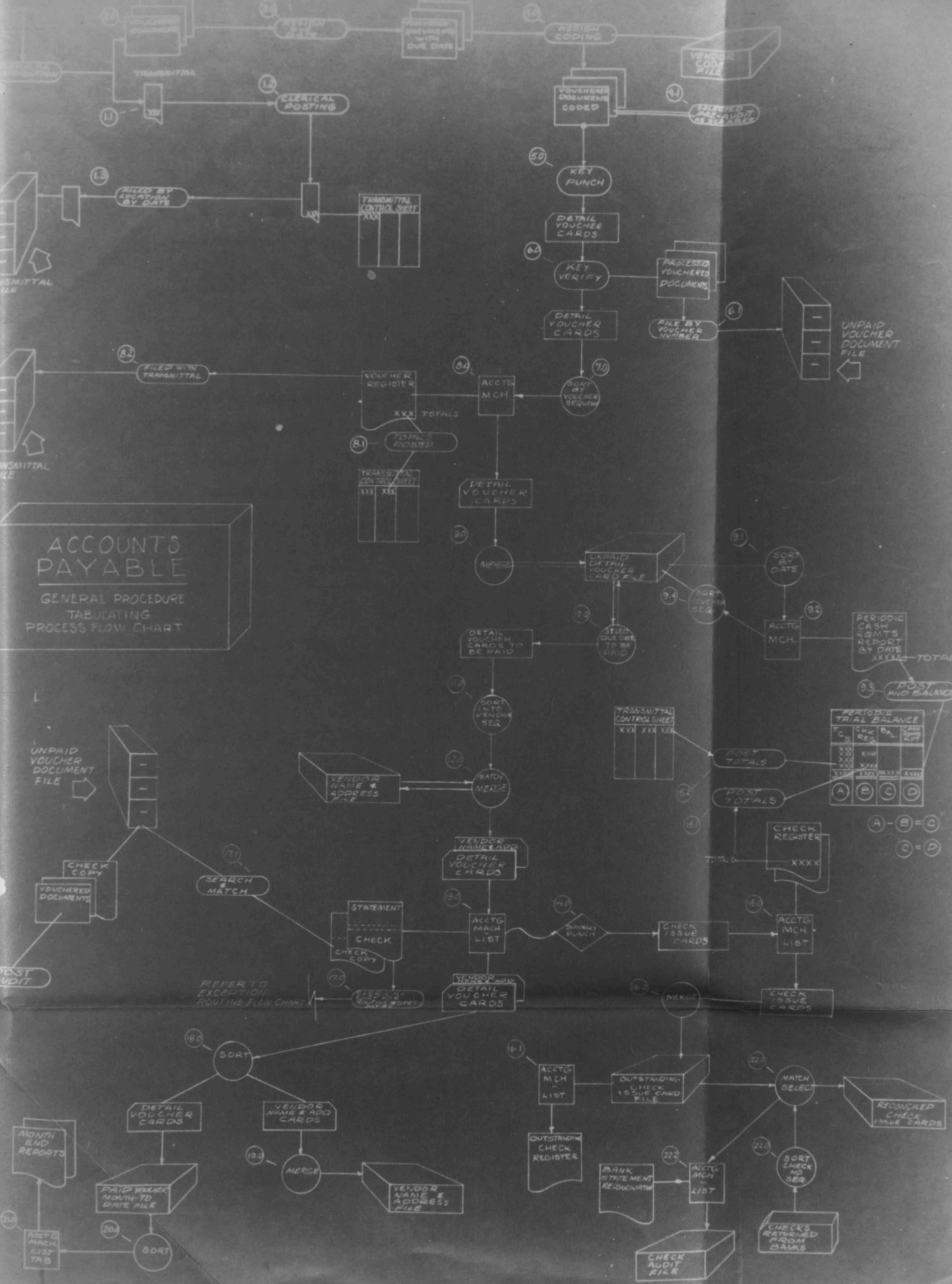
# ACCOUNTS PAYABLE CONTROLS

P 1 OF 2



# ACCOUNTS PAYABLE CONTROLS





1. Month's vouchers and transmittal in batch plant order.
2. Sample verification of computations as to extensions, discount and distribution stamp.
3. Audit stamp and initial placed on face of each voucher.
4. Distribution tag indicates applicable purchase order or special purchase arrangement. These are pulled from purchase order file and attached to respective vouchers by file clerk.
5. All vouchers are verified.<sup>17</sup>
6. Audited voucher and purchase order transmitted to Traffic department for freight charge verification where required.
7. Post-audit completed -- returned to permanent files.
8. Transmittals with auditing posting retained in permanent files.

A definite time-saver and advantage of the proposed system would be automatic machine reconciliation of bank accounts. Job instructions for bank reconciliation have been prepared; however, an IBM check satisfactory for our purposes has not been found. Consequently, machine reconciliation of cancelled checks has not been effected.

In accordance with the proposed procedure, the matching of checks to vouchers is handled as follows: Controls previously established (as key-punch verification, transmittal totals checked, comparison of vouchers to voucher register, "processed" perforation of vouchers, etc.)

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<sup>17</sup> See Voucher Verification, p. 39.



## VOUCHER VERIFICATION

Original invoice.

No. 2 copy of Purchase Order.

No. 2 copy of receiving report with manual signature.

Authorized approval in distribution stamp.

Vendor's name (voucher against purchase order and receiving report).

Delivery and payment terms.

Quantities received checked from receiving report and posted to purchase order.

Price checked against purchase order.

Proper approvals for services, power bills, etc..

Return voucher to plant if questioned or for adjustment (copy of return retained indicating voucher number and name).

Post voucher number to purchase order and post date handled.

Post to transmittal for completed audit.

makes matching of all vouchers to checks unnecessary (and an involved clerical process would only shackle an otherwise clean system). Checks requiring attachments and checks over \$5,000.00 requiring special handling are matched with corresponding vouchers. This means that approximately 15 per cent of the checks written are physically matched with corresponding vouchers prior to mailing. Such a percentage of matched vouchers and checks is thought to provide an effective sample control on the question whether proper vouchers are being included on checks.

Checks had been cut previously as to amount through use of a Todd Protectograph. However, the Todd Protectograph was eliminated to reduce handling. Excellent results concerning check protection have been secured by the United States Treasury and several large companies (including Reynolds Metals Company as far as payroll is concerned) without using a check protectograph. Check protection is accomplished as follows:

1. Use of IBM protective paper designed specifically to show bleach marks and erasures.
2. Use of asterisks preceding and succeeding dollar amounts.
3. Amount written twice as:

xxxxx 630 Dollars 40 Cents      \$xxxx630x40

After meeting with management and securing the required approvals,

we established November 1, 1956 as our operational target date.

Card forms for vendor code reference were printed from the punched code cards.<sup>18</sup> Two "ferris wheel" decks were set up in alphabetical order for vendor coding. Each deck (thirteen trays of cards in a ferris wheel type of machine) can handle approximately 14,000 code cards.

Beginning on the first of October, 1956, after the received vouchers were checked against the transmittals, the vouchered documents were forwarded to the Tabulating Section for purpose of system conversion pickup. The Tabulating Department coded the vendor name-and-address (during conversion only and reverted to Disbursing on November 1, 1956), and key-punched and verified the Detail Voucher Cards. This open voucher file was not used to write Disbursing checks other than blank form practice runs. The processed vouchers were returned to Disbursing for manual processing. Effective October 1st, check copies were also routed through the Tabulating Section for purpose of creating a voucher paid search card to be used for relieving the open detail voucher file. Effective November 1st, Tabulating incorporated mechanized check writing. All vouchers picked up prior to the first of November were paid out manually. Check copies were used as the means for relieving the conversion file. The use of the conversion pickup file facilitated an orderly transfer from the manual to

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<sup>18</sup> See Vendor Code Card, p. 42.

DURHAM AIRCRAFT  
ASSOCIATES  
56-15 NORTHERN BLVD  
WOODSIDE N Y

21813-01-9

SAMPLE CODE CARD

a mechanized system, and also permitted us to test check-writings under several types of payment-period conditions. A daily payment, twice-weekly payment and a weekly payment check-writing period were tried during the conversion. Twice-weekly payment was found to satisfy the policy of prompt payment best (including earned discount privileges) and to effect multiple payments on one check.

During the conversion period, each of our general fund banks was formally notified of the operational date of November 1, 1956. Each bank was furnished full information as to size and color of the new IBM check, location of the bank name, and the ABA code, along with a sample check. During the same period (October) each plant was cautioned concerning certain practices which would help or hinder the transfer to mechanized check-writing.

On November 1, 1956, two hundred forty-six (246) checks were written on the Tabulating system. All controls had been performed and the checks were mailed by five o'clock. Confusion reigned that day in the Disbursing Department, primarily because a trial run to include pulling vouchers to match with checks (requiring a manual signature, attachments, or identification) had been overlooked. The file clerks requested an earlier cash requirements report (which lists voucher numbers and amounts to be paid) and this, plus familiarization, solved the time element on matching checks and vouchers.

To reiterate, International Business Machines were used in setting up the tabulating check-writing system because of general employee familiarity (already using this equipment in the writing of payroll checks) and the availability of machine time on presently leased equipment. It is possible to purchase the equipment involved. However, such a purchase was not considered because of the high cost and the inflexibility involved. Rental of the equipment (though admittedly a high cost factor) made possible a less expensive initial outlay (only an additional 024 keypunch machine and 056 keypunch verifier machine were required) and the remaining machine time required was obtainable from machines already rented for another operation. Rental of the two additional machines is \$90.00 monthly, as opposed to the purchase price for both machines of \$4,611.00 plus \$26.75 for a monthly maintenance contract.

Purchase of two additional machines - or others already being rented - tends also to limit the flexibility of a tabulating operation. Renting this equipment enables the company to change readily to more rapid and efficient machines in keeping with technological advances and to change systems and procedures as the need may arise. In addition, should the volume of work decrease, then rented machines could be released to maintain operational costs consistent with the workload. In the case of the more expensive machines (as an alphabetical accounting machine (407) ), if the workload de-

creased sufficiently the procedures still would be valid through utilization of the IBM Service Center which is less expensive than the \$800.00 monthly rental charge. On the other hand, the two ferris wheels used to house the vendor card code decks were purchased at a cost of \$2,360.00 (rental terms were not available). We reasoned that these wheel decks could be used by the Purchasing Department in maintaining their vendor reference file, if they were no longer required for the check-writing operation.

## CHAPTER III

### INDOCTRINATION OF EMPLOYEES

From the start we notified all Disbursing Department personnel that we were considering a mechanized system of check-writing. Each employee was assured of his personal job security, and his cooperation was requested in the work and planning ahead. In addition, recognizing that the individual knows the various facets of his work better than his supervisor, we encouraged him to ask questions and offer suggestions. The policy of prompt dissemination of information to department employees was adhered to continuously. This greatly facilitated the initial planning for conversion to check-writing with a tabulating system.

"Flip" charts reflecting planned programming, controls, and exception routines were prepared for presentation to Management. A controlled meeting with Management was effected by furnishing a note pad and pencil to each of the conference participants. Each participant was requested to make notations on questions he wished to raise on the various points covered at the presentation, and a question-and-answer period was held at the conclusion of the meeting. Controlling the meeting prevented flagrant digression and enabled us to present the complete program at one session. A "go-ahead" was obtained at this meeting and



shortly afterwards the final announcement was made to Disbursing and Tabulating personnel, together with a presentation of the proposed system. Progress reports were furnished interested personnel as well as Management during the final planning, the conversion period, and the operational period.

After the initial presentation to personnel of the Disbursing Department, and beginning one month prior to conversion, informal training periods were conducted with various functional groups. The greatest number of persons contacted at any one time was seven -- these comprised the audit group, whose work was similar and would reflect the least change.

The company does not have a specific formula for preparing job descriptions. Consequently, unformulated job descriptions were prepared for each position. The ones most greatly affected by the conversion are given in part below:

A. General Code Clerks

1. Check Accounts Payable Transmittals usually as to number of vouchers (daily).
2. Search vendor file (ferris wheel deck) for code and "special codes" (daily).
3. Assign code number to top of distribution tag (daily).

4. Assign "special" code number in approval by box of distribution tag (daily).
5. Assign due date in account number box of distribution tag (daily).
6. Initiate Voucher Process Routing Sheet in numerical sequence listing date, voucher numbers and dollars total (daily).
7. Initial coded box 1 on Voucher Process Routing Sheet (daily).
8. Forward vouchers and Voucher Process Routing Sheet to Accounting Machine Operator (daily).
9. Forward transmittals and intercompany vouchers to Accounting Clerk Junior - 1 (daily).
10. Prepare "debit letters" - requests for payments of debits not cleared after sixty days (monthly).
11. Compute discount lost on individual plant basis.

B. Bookkeeping Machine Operator

1. General - Instructions to cover payment of "special" or "rush" payments of Reynolds Metals Company, payments by subsidiaries and intercompany payments to subsidiaries by Reynolds Metals Company.
2. Subsidiary Payments (daily basis).

- a. Sort vouchers in subsidiary order and numerical sequence.
- b. Write in normal order on each subsidiary account against respective check drawn sheets.
- c. Type names and addresses.
- d. Balance to individual subsidiary control sheet (by totalling check copies and comparison with machine total on check drawn control sheet).
- e. Prepare disbursements records of subsidiaries.
- f. Transmit subsidiary disbursement record to Accountant Junior - 3 for posting to daily cash report.

3. Reynolds Metals Company Payments:

- a. Place in plant and vendor sequence.
- b. Write vendor's code number on first line of check statement in voucher number column.
- c. Write check on bookkeeping machine in normal fashion (Central National Bank unless otherwise specifically noted).
- d. Type names and addresses on checks, check copies

and check drawn sheets (on electric typewriter) in normal fashion.

- e. Balance to check drawn control sheet (by totalling check copies).
- f. Sort check copies into vendor and intercompany payments.
- g. Post vendor check copies dollars total to Check Transmittal Register.
- h. Transmit vendor check copies to Tabulating (for creation of paid voucher and paid check register).
- i. Transmit intercompany check copies to File Clerks for filing.
- j. Transmit bank disbursement record to Accountant Junior - 3 for posting to Daily Cash Report.
- k. Post to Check Transmittal Sheet return of previous day's check copies.
- l. Transmit check copies to File Clerks for filing.
- m. Post to Transmittal Register the following:
  1. Voucher Processing Routing Sheet number.
  2. Date.
  3. Dollar total.

- n. Initial box 3 (Transmittal Register Posted) on the Voucher Processing Routing Form.
- o. Transmit to Tabulating the vouchers and Voucher Processing Routing Sheet.
- p. Initial box 7 (Transmittal Register Posted) of Voucher Processing Routing Sheet after vouchers and IBM printed register returned from Tabulating.
- q. Check printed voucher register against actual voucher for proper name and address, voucher number, gross amount, discount and net amount.
- r. Initial box 8 (Voucher Register Audit) of Voucher Processing Routing Sheet.
- s. Forward vouchers to file clerk for date processed perforating and subsequent filing.
- t. File Voucher Processing Sheets in numerical order and retain for sixty days.

G. Accountant - Junior - 1

- 1. Process for payment invoices for aircraft and various subsidiaries (per detailed list) (daily).
- 2. Audit clerical postings of General Clerks' special purchase arrangements.

3. Assist Manager and Assistant Manager - Disbursing.
4. Act as cashier. Audit approvals on petty cash tickets and arrange for reimbursement check as required.
5. Act as Tabulating "traffic cop".
  - a. See that coding of vouchers is properly executed.
  - b. Maintain error control for errors noted through checking the vouchers against printed voucher register.
  - c. See that necessary corrections are made and verify accuracy of correction.
  - d. Arrange voucher split from preliminary cash report; sorting vouchers to effect approximately even disbursements from each bank used on an IBM payment date.
  - e. Follow "rush payments" for completion.
6. Effect offset against cash receipts.
  - a. Remittance advice received from cash receipts department.
  - b. Pull IBM voucher detail card from O2 debit suspense to Suspense file.

- c. Pull debit voucher from file.
  - d. Apply debit voucher to remittance advice noting voucher number, amount, date, and account number.
  - e. Place "dummy" stamp on voucher and complete stamp as to remittance advice information.
  - f. Forward "dummy" voucher to clerk for typing of "dummy check".
7. Notify Tabulating of any change in payment schedule.
  8. Audit Transmittal of Main Office Vouchers effected as follows:
    - a. All invoices forwarded from Disbursing to Accounting once daily, excepting "rush" payments transmitted as required. Vouchers returned to Accountant Junior - 1 in the Disbursing department in the following manner:
      - (1) (Main Office Series) Vouchers and copy of bookkeeping voucher register indicating voucher numbers, names and amounts transmitted by bookkeeper in Accounting.
      - (3000) (Credit Series) Credit vouchers transmitted by Manager - Accounting Department with adding machine

tape noting voucher numbers and total amounts.

- (4000) (Communications Series) Western Union and telephone bills transmitted by bookkeeper with voucher numbers and amounts noted.
- (5000) (Freight Series) Freight bills transmitted by bookkeeper with transmittal noting voucher numbers and amounts.
- (39) (Cashier Series) Petty Cash and Cashier Funds transmitted by bookkeeper with voucher numbers and amounts noted.
- (33) (Expense Series) Expense reports and copy of bookkeeping voucher register indicating voucher numbers, names and amounts transmitted by bookkeeper in Accounting.

D. Accountant Junior - 3

1. Prepare Daily Cash Report. Prepared in three copies each morning to reflect the previous day's cash activity. (Form R-654, R-654-3 and ditto forms for Funding and Construction reports). Extra copy of Funding and Construction reports are prepared on Friday to be



included with copy of Weekly Cash Report. Data for Daily Cash Report obtained from Cash Receipts report, Disbursing report (from bookkeeping machine operator), memoranda from Disbursing Manager and IBM check register (daily).

2. Transmit Daily Cash Report to Disbursing Manager, Treasurer, and President (daily).
3. Prepare Weekly Cash Report. Prepare three copies early each week to reflect balances as of previous Friday (weekly).
4. Transmit Weekly Cash Report to Controller, President, and Treasurer. Controller's copy is returned and filed (weekly).
5. Transmit copies of Funding and Construction Reports to Assistant Treasurer (daily).
6. Check and process for payment reimbursement requests for petty cash and cashier funds (daily).
7. Maintain list of cashier names, addresses, and fund amounts (daily).
8. Post charges and credits to A-03-10 account, Officers and Employees Accounts Receivable (daily).
9. Prepare Employees Accounts Receivable report indicating

individual balances (daily).

10. Transmit Employees Accounts Receivable report to Accounting (monthly).
11. Check bank balances (from month-ending Daily Cash Report) with bank reconciliation (from Auditing) (monthly).
12. Process freight invoices for vouchering (assure approval of General Traffic Department is indicated) (daily).
13. Prepare for vouchering invoices for British Guiana as follows:

Retain No. 3 copy of Purchase Order (Form R-380-D). Invoices from domestic vendors are received from Export Traffic Department. This copy of transmittal letter is used as authority for payment; no receiving report received. Invoices are checked against Purchase Order as to quantity, price, delivery terms and payment terms. Assistant Purchasing Agent approves invoices in advance of ocean bill of lading where cash discount is involved or unusual delay encountered in payment. Invoices from foreign vendors are received directly by Assistant Purchasing Agent who forwards

approved copies of foreign invoices for payment (daily).

14. Purchase foreign currency from First and Merchants National Bank. Prepare Accounts Payable Memorandum (Form R-133) payable to First and Merchants National Bank with pertinent data as to payee, note of exchange, etc.. Immediate payment by messenger to bank. Bank will send check in exchange for transmittal to vendor (daily).
15. Prepare Western Union bills for vouchering and maintain Special Purchase Arrangement records for each location (daily).
16. Transmit approved Western Union bills (together with IEM toll tickets) to Accounting (daily).

Job descriptions were compiled by the writer through analysis of each individual job. Flow charts of work as it involved each of the above jobs were utilized in this process. Equipment to be used, promotion to and from each job, supervision, and working conditions were also noted. Job requirements were established as follows:

General Code Clerks -- Pay category, Clerk-Junior "B"; Education, high school graduate or better; Experience required, familiarity with general disbursing procedure or one year general business experience; Personal qualities, reliability,

accuracy, neatness, speed; Intelligence, average or better; no age requirement.

Bookkeeping Machine Operator -- Pay category, Bookkeeping Machine Operator - Senior; Education, high school graduate or better; Experience required, one year as bookkeeping machine operator or graduate of qualified school plus six months on-the-job training; Personal qualities, reliability, accuracy, speed; Intelligence, average or better; no age requirement.

Accountant Junior I -- Pay category, Accountant Junior I; Education, two years of accounting or equivalent in business experience; Experience, one year with two years educational specialization in accounting or three years practical experience; Personal qualities, reliability, accuracy, neatness; Intelligence, high average; no age requirement.

Accountant Junior 3 -- Pay category, Accountant Junior - 3; Education, high school graduate; Experience, one year as accounting clerk-senior or equivalent; Personal qualities, reliability, accuracy, neatness; Intelligence, average; no age requirement.

Each job description was reviewed with the person involved.

Job descriptions are to be reviewed periodically (at least every four

months). In addition, each position has at least one other qualified person (in the case of coding, there are four qualified persons besides the two regular code clerks). "Keeping employees informed" was a by-word of the program. Every effort was made to "sell" the conversion program as it progressed. Suggestions were encouraged, questions were answered as fully as possible and each person was encouraged to become a part of the new system. Progress reports were furnished interested personnel as well as Management during final planning, conversion period and operational period. Generally speaking, by November everyone wanted to "try and make it work" rather than to assume the attitude of "it's new, it's different and besides, we don't need a change". Individual attention, planned information meetings, and instructions were in large measure responsible for this cooperative attitude.

## CHAPTER IV

### ANALYSIS AND APPRAISAL OF NEW SYSTEM

After nine months under the new mechanized system, the Disbursing department has twenty-seven employees as opposed to an estimated thirty-three had the conversion not taken place.<sup>18a</sup> Additional time will be saved in Disbursing shortly as the checking of vouchers against a name-and-address list is to be eliminated. A calculated risk of error is being taken to save approximately  $1\frac{1}{2}$  hours collating time and  $\frac{1}{2}$  hour tabulating time, as well as approximately ten hours clerical time in checking the name-and-address list. A small saving per check has been effected though monetary savings were never the prime factor considered in the conversion.

Comparative costs of the check writing function are:

#### In Disbursing Department

<u>Before</u>	<u>After</u>
57 hours/day	42 hours/day
\$1,980.00/month	\$1,995.00/month
\$ 1.65/hour	\$ 2.16/hour
23,700 vou./month	28,000 vou./month

"Before" system at "After" cost x volume =

$$1,980 \times \frac{2.16}{1.65} \times \frac{28,000}{23,700} = \$3,060.00/\text{month}$$

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<sup>18a</sup> Nine months' operation is considered sufficient time for the new procedure to prove its value as accurate costs are obtainable, reports are prepared as scheduled, and estimated results have been accomplished.

In Tabulating Department

	<u>Before</u>	<u>After</u>
Code Maintenance, labor, rental and overhead	<u>-0-</u>	<u>\$1,869.00</u>
Total - Disbursing	\$3,060.00	\$3,864.00
Cost per voucher	10.9¢/vo.	13.8¢/vo.

After Transition Cost

	<u>Before</u>	<u>After</u>
Code Maintenance		\$ 320.00
80% of cost of placing code on vouchers		<u>610.00</u>
Total adjusted cost:	\$3,060.00	\$2,934.00
Cost per voucher @ 28,000 vo/mo.	10.9¢	10.4¢

The disadvantages accompanying the conversion are:

1. Bottleneck at the coding point -- only two ferris wheel card decks are available for use regardless of peak loads. The two ferris wheels are overflowing because of the number of single payments made, each of which warrants a vendor code number and a corresponding code card. Since accuracy in coding is so important, the rate of coding does not exceed an average of 100 vouchers per hour per individual code clerk. This has been circumvented somewhat by the addition of a printed code list which, though awkward to use, does alleviate the peak-load slowdown. As another means of coping

with this bottleneck, it is planned to effect an alphabetical division between the two ferris wheels in the immediate future. One ferris wheel will contain the code cards for A through K only (approximately 50 per cent of the work volume) and the second ferris wheel will contain the code cards for L through Z. The second alphabetical deck will be housed in open-top cardboard boxes arranged alphabetically on a work table. This will provide easier physical handling (less crowded trays) of the vendor code cards in the two ferris wheels, and will also provide a practical working code deck for a third code clerk.

2. Delay of one-and-a-half to three-and-a-half days between receipt of voucher and payment. Special rush payments are requested by Management and must still be made on a manual basis, in which cases the check copy is processed through the Tabulating system for trial balance and analysis purposes.
3. Delay in processing remittance advices against debits as the open debit file must be checked with Tabulating.
4. Incorrect coding as to vendor's name or address creates some additional correspondence. We are aware that human errors will always be present to a certain degree. Similar errors



were made in payment under the old system of check writing. Although the incidence of error has increased, the total percentage of errors is still less than 1/10 per cent by volume.

5. Matching vouchers to checks creates a general feeling of confusion on Tabulating system paydays, though familiarization with the process of voucher pulling continues to reduce this confusion.

The advantages derived from converting check payment to a Tabulating system are:

1. Elimination of the "bottleneck" in the auditing of vouchers.
2. Reduction in bank transfers (we write on only two or three banks twice weekly, which reduces transfers to payee banks from depositing bank by about fifty per cent).
3. Longer use of our funds (10th proximo payments can now be paid on the 10th -- we previously started writing these payments five working days before the 10th because of the volume). This is not an advantage of the new system alone, in that the checks could have been written, signed, separated, sealed and stamped, and then held for mailing on the tenth of the month under the prior system. However, retention of funds is a by-product more easily realized under the new system and

it is felt, accordingly, that it should count as a conversion change.

4. The ratio of checks has increased from 1.6 to 2.3.
5. Vendor analysis can be processed within hours, rather than months.

6. Flexible operation -- volume of work can expand greatly without substantially increasing personnel.
7. Ground work accomplished for expansion of machine work -- i.e. account distribution.
8. Cost savings will increase as volume increases.
9. Basic ground work has been laid for an Integrated Data Processing system.

These advantages, and particularly that of flexibility, lead to the thought of an Integrated Data Processing system. The punched tape is the language link between data and subsequent data processing to:

1. Record data at point of origin on office machines which create punched tapes or cards as the automatic by-product of the recording operation.
2. Process original and subsequent data on office machines which read and punch tapes or cards, so that all data are self-perpetuating. This concept is the fundamental of Integrated Data Processing, puts dynamic life into data at its inception and its use is the self-perpetuation of data during the useful life of those data.<sup>19</sup>

One of the most obvious steps in expanding the program of payment through a Tabulating system is that of providing automatic accounting.

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<sup>19</sup> American Management Association, Automation, Personnel, (September, 1955).

The basic system now provides for payment only of a vouchered invoice, and records obtained are solely total amounts paid per vendor without any breakdown as to the type of expenditure. Since the source information for coding a voucher and subsequent payment is the Accounts Payable Distribution ticket, it is a logical step to include in the Tabulating structure account distribution information.

Account distribution through Tabulating would entail first a decision in favor of a centralized accounting system, as opposed to the decentralized or plant accounting system now in use. Additional cards for each voucher could be cut reflecting exact account distribution as is already indicated on the Accounts Payable Distribution ticket.<sup>20</sup> A summary card would be used for disbursing. These individual cards could then be automatically sorted and totalled according to account number. Listings of each individual type of expenditure could be effected automatically and promptly thus furnishing immediate cost figures on a company-wide basis.

A secondary step would be in assigning the vendor's code number at inception, rather than as a tail-end assignment as is now done. Since the purchase order is the normal beginning of an accounts payable voucher, it would appear profitable to have the code number assigned when the purchase order is first written. This is a logical position, since the Purchasing department is already required to maintain

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<sup>20</sup> See Distribution Tag, p. 62.

FOLD HERE

Form R-788

<b>VOUCHER NUMBER</b>			
VENDORS INVOICE DATE			
PUR. ORDER NO.			
REC. REPORT NO.			
PRICE OK EXT.		AUTH. NO.	
ORDER: COMPLETE <input type="checkbox"/>		INCOMPLETE <input type="checkbox"/>	
APPROVED BY			
DATE APPROVED			
ACCT. NO. DISTRIBUTION		AMOUNT	
<b>GROSS AMOUNT</b>			
CASH DISCOUNT			
\$      DAYS      PROX.			
<b>NET AMOUNT</b>			
ADJUSTING DEBIT OR CREDIT			
MEMO. NO.		ISSUED	

DISTRIBUTION TAG

card files on vendors listing their names, addresses, delivery terms, payment terms, and other pertinent data. It would be simple to add the assigned vendor code numbers to these reference cards.

Furthermore, purchase requests could be made on punched cards. From these the orders could be prepared on the accounting machine (407) with copies available for the vendor, Receiving Department, Accounts Payable Section, stock-room, Planning and other people concerned. While the purchase order was being written on the accounting machine, on-order cards could be produced by summary-punching the data required for Accounts Payable. As shipments are checked in the Receiving Department the clerks prepare receiving reports showing the description, vendor number, quantity, condition of the merchandise, and any other pertinent information. In large operations, it is practical to use dual-purpose cards or mark-sense cards to record receipts. When these have been punched and verified, they can be used to process the on-order cards, and produce the accounts payable cards and the distribution cards automatically and at machine speeds. The receipt cards, sorted by account number, can be matched against the on-order cards in the collator. Any discrepancies are brought out, so that appropriate action can be taken immediately. Furthermore, daily printed reports are available which are valuable to many depart-

ments.

Accounts Payable history records can supply the answers to many questions. Typical ones are:

What was the total volume of purchases from each vendor?

Who are our largest suppliers of merchandise?

How much of each class of merchandise have we purchased this year?

Which vendors had the largest volume of returns?

Are we receiving the maximum in anticipation discounts?

What cash discounts have we lost, and why?

What are the average daily cash requirements to meet payables?

What is our expense for each dollar of gross or net sales?

How much does each of our departments cost us?

What are our entertaining expenses?

Detailed and documented answers to all these questions can be coded and punched in the cards in the paid file. Each question can be rapidly answered by locating the factor with which to change the sequence of the cards in the file.

## CHAPTER V

### SUMMARY AND PERSONAL CONCLUSIONS

The change of procedure in a Disbursing Department has been presented above, including the introduction of tabulating equipment, which results in "automatic" machine check-writing. An endeavor has been made to present the problems incurred in the check-writing conversion system as well as the solutions or possible solutions to these problems. The indoctrination of affected employees has been discussed briefly and a brief analysis has been offered of the new system.

There still remain certain pertinent factors concerning the conversion system which have not been covered, as well as certain personal opinions which may be of interest to the reader.

I feel that recognition should be made of the connection between IBM machine costs and the volume of operations. In talking with representatives from companies which manufacture electronic machines, it is easy to acquire the impression that the representatives' particular machines can readily handle check-writing and its related functions economically, and with more rapid by-product information, without particular reference to the volume of work to be handled. The emphasis appears to be rested upon ever-increasing volume (which is not always the situation as it naturally develops) without too much con-



sideration of the volume of work then being handled on a manual basis. The writer's personal opinion is that the monthly volume of operations should equal or exceed ten thousand checks if the installation of a tabulating system of check writing is to be particularly advantageous. An exception to this would be the addition of check-writing to a tabulating accounting system already in operation, whereby check-writing is easily effected from information obtained through summary cards bearing data previously acquired. In line with this, when considering a tabulating check-writing operation one should also consider the flexibility of operation costs when using a tabulating system and when paying on a manual basis. As was noted in Chapter II, operational costs may be raised or lowered with some ease (though perhaps not so readily as increasing or decreasing employees when writing checks under a manual system). If the volume of checks exceeds ten thousand monthly, I personally recommend the installation of a tabulating system with immediate consideration of supplementary employment of the machines for tasks such as accounting and the writing of payrolls. I do not recommend a tabulating check-writing system unless some other use is planned for the equipment.

I do, and have, recommended the additional use of tabulating equipment for other departments of our company. We are presently programming a number of operations for machine accounting beginning with the Expense Section of Accounting, rather than with Capital Equipment. In addition, we have emerged from the preliminary planning stages in placing

Consigned Inventory and Pension Payments on tabulating equipment.

In considering a tabulating operation, I do favor the rental of the machines required in preference to their purchase. Purchase of the equipment requires a considerable capital outlay and limits the buyer to the use of present machines, whereas rental enables him to change to faster and more versatile machines as they are developed. In addition, rental provides more flexible operating costs and does not require so stringent a savings in costs as is generally the consideration in outright purchase of the machines.

The acid test for the tabulating check-writing system should be the question: would you do it over again? My answer is a definite and positive yes. This opinion is confirmed by management's decision to expand the use of tabulating equipment to other departments.

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