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IBM

General Information Manual

IBM 1410 Tape System

for Demand Deposit Accounting

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INTRODUCTION

The IBM 1410 Data Processing System is a solid-state computer with fast input-output capabilities, powerful stored-program logic and high speed processing.

A large-capacity memory of up to 40,000 alphameric positions allows rigid accounting controls to be programmed into each run. Another significant feature of the 1410 is its compatibility with other systems in the 1400 series: most 1401 programs can be run on the 1410 without modification. This allows the medium- and larger-size bank to convert to the more powerful system when transaction volumes increase, without costly reprogramming or retraining of personnel.

The flexibility of the 1410 makes this system readily adaptable to many other banking applications, including mortgage and installment loan accounting, trust accounting, savings accounting and payroll.

Among the many advantages which the 1410 Tape System offers to the bank in demand deposit accounting are:

1. The power of the stored program gives the bank the ability to handle transactions in a uniform manner according to the ground rules laid down by bank management. This includes normal transactions as well as exceptions.

2. Reports of insufficient funds are prepared automatically.

3. Ledger and batch controls are accumulated for ease in balancing.

4. Checks are sorted to account sequence for filing while the 1410 is posting transactions to account records.

5. All statement balances are recomputed before statement preparation.

6. A complete trial balance for all accounts is prepared daily.

7. Closed-account suspects, excessive service charges, and transactions for nonexistent accounts are automatically indicated.

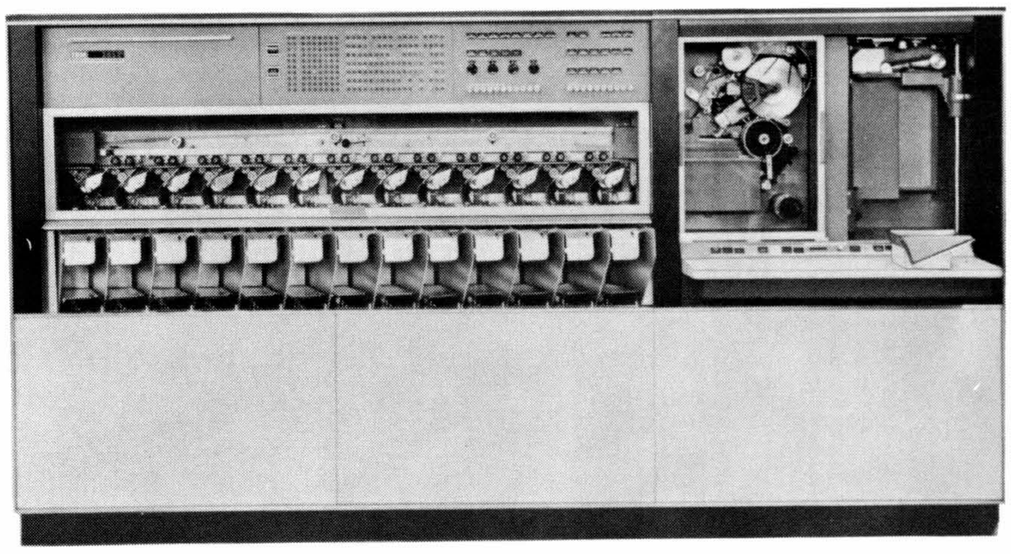
8. On the statement date, service charges are automatically charged to customer accounts and credited to income.

It is our purpose in the following pages to illustrate how the IBM 1410-1412 System can do the complete demand deposit job, from the time a deposit is made or a check received, to the preparation of the customer statement. Since there are, of course, many variations between banks in the demand deposit application, the following is general in nature and is intended only as a guide in determining a specific procedure.

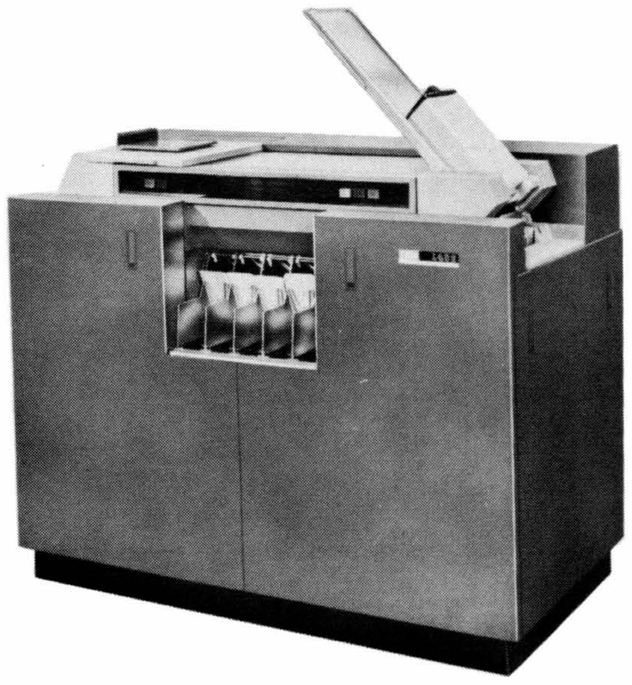
THE IBM 1410 DATA PROCESSING SYSTEM

Input

Of prime importance in a complete deposit accounting system is the rapid conversion of magnetic ink characters from checks to machine-processable language. Thus for larger banks, two IBM 1412 Magnetic Character Readers can be used simultaneously to read paper check data directly onto magnetic tape. The use of two readers increases through-put on this operation by as much as 90%, thus freeing the 1410 to perform subsequent deposit operations.

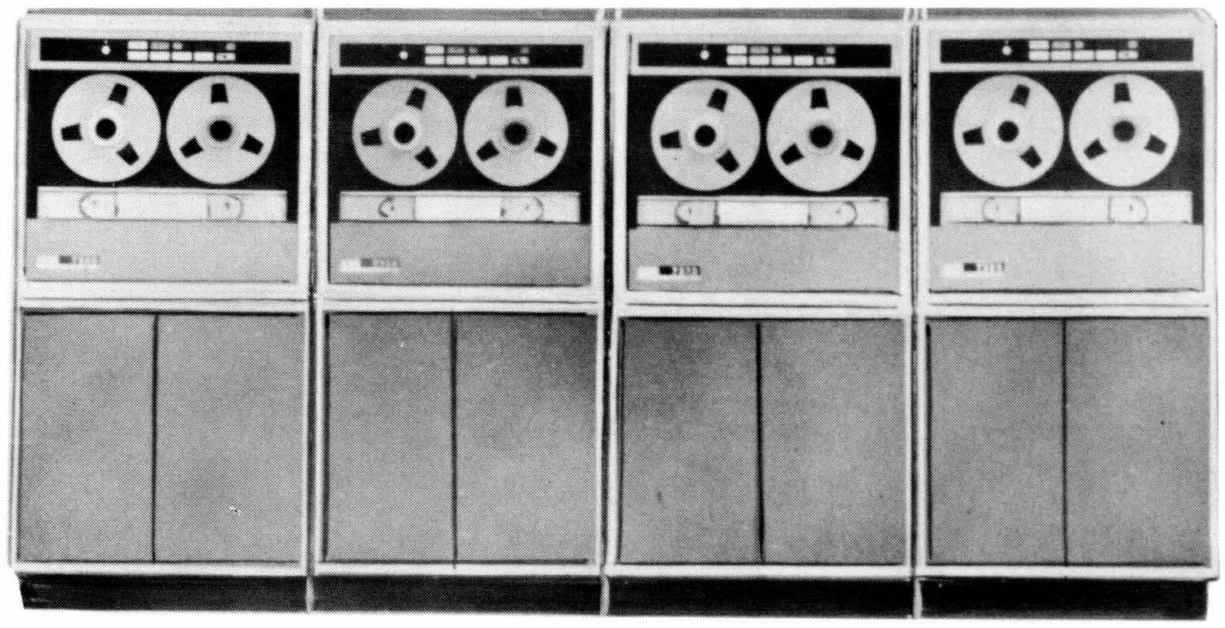


Flexibility of input is enhanced by the 1402 Card Read Punch. At rates of up to 800 cards per minute, stop-payment requests, new account data and off-cycle statement requests can be processed by the system. Thus while the 1410 continues processing, data can be added or deleted from customer records or special action can be initiated.



Greater input speeds are attained through use of magnetic tape units. For example, the IBM 7330 provides a reliable, low-cost, high speed reading device for entry of daily transactions and customer account information into the central processing unit of the 1410. These tape units read high-density (556 characters per inch) or low-density (200 characters per inch) tape, and are therefore compatible with other IBM tape systems. The 7330, which reads magnetic tape at rates up to 20,000 characters per second,

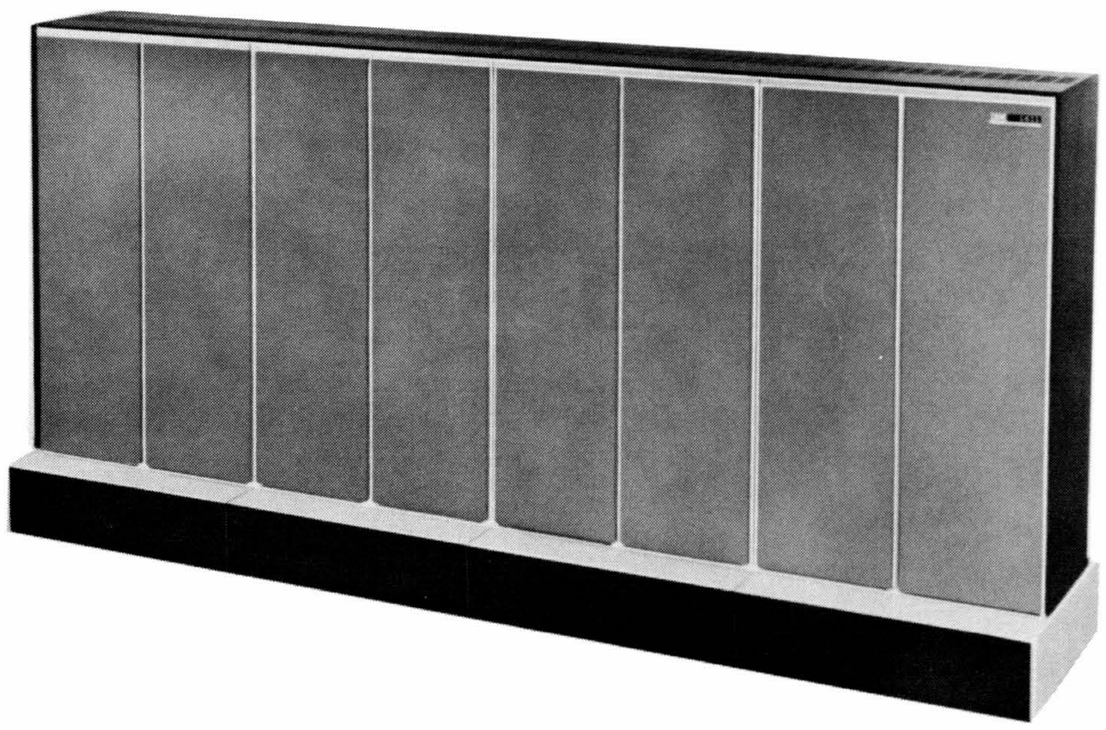
is complemented by the IBM 729 II and IV Magnetic Tape Units, which offer speeds up to 62,500 characters per second. As many as ten tape units may be attached to each of two data channels on the 1410.



These many, varied types and speeds of input assure banks that a machine configuration is available which is best suited to the needs of their job.

Processing

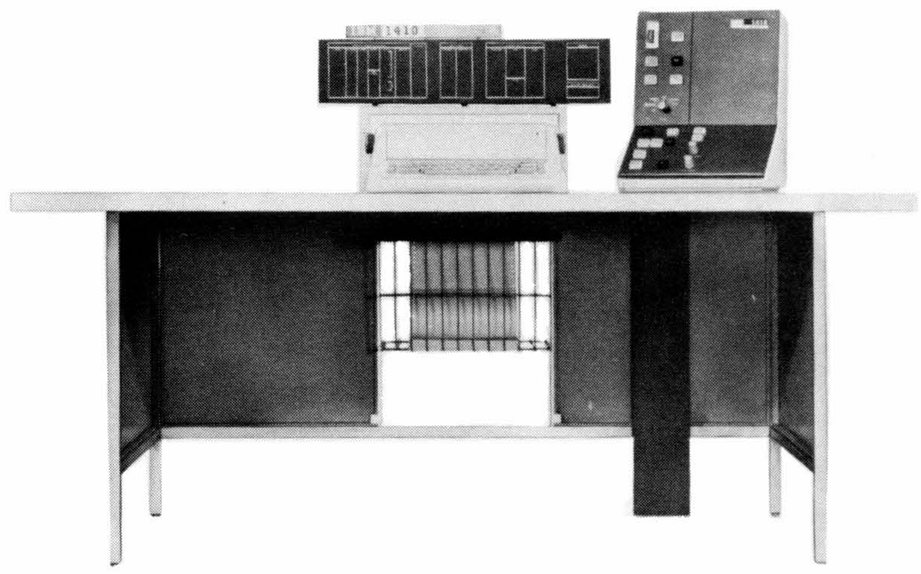
The 1411 Processing Unit is available with 10,000, 20,000 or 40,000 positions of core storage, each position accessible in only 4.5 microseconds. This large capacity makes fewer processing runs necessary, thus reducing total processing and setup time. In addition, complete control throughout processing is assured by programming the accumulation of ledger and batch totals during subsequent runs through the 1410. In this way, any out-of-balance conditions are immediately recognized and isolated to small control groups for easy reconstruction.



Other important features on the 1410 include 15 five-position index registers for increased flexibility of address modification, variable length instruction and data field, table search, and the ability to completely overlap tape reading, writing and computing.

Output

The 1415 Console, with a typewriter and indicator panel, provides operator communication with the system for monitoring computer operations, program checking or inquiry. Exception transactions can be automatically printed by the console typewriter for subsequent investigation.



For statement preparation, the 1403 Printer operates at a rate of 600 lines per minute. Numerical listings, however, such as journals, package-post and proof listings, can now be prepared at more than double this rate. This increased printing speed of up to 1,285 lines per minute is accomplished by using the Numerical Print feature on the 1403.

Magnetic tape output, with writing speeds ranging to 62,500 characters per second, records processed results. Automatic checking of each character written is provided by the two-gap head on all 729 and 7330 tape units.

Random Access Storage

Many banks have found that use of random access storage has allowed major benefits in procedures and operations of demand deposit accounting and other applications. The 1410 extends this principle by allowing the attachment of up to five 20,000,000-character 1405 Disk Storage units, for a total disk storage capacity of 100,000,000 characters. The procedures described in this manual, however, are based on the use of magnetic tape rather than disks for the storing of customer data.

MAGNETIC INK CHARACTER RECORDING

The mechanization of the demand deposit accounting application is based on the ability of the 1412 to rapidly read and sort various-size documents encoded with magnetic ink characters. The information inscribed on these documents is of two types — prequalified and postqualified. Prequalified information includes the customer account number and a transit number which identifies the bank. Postqualified data includes the amount and process control information placed on checks and deposits when they are received by the bank.

The following explains each field of a fully inscribed check:

Amount — This is the dollar amount and is always printed as ten numerical digits plus the amount prefix and suffix symbol, for a total of twelve positions.

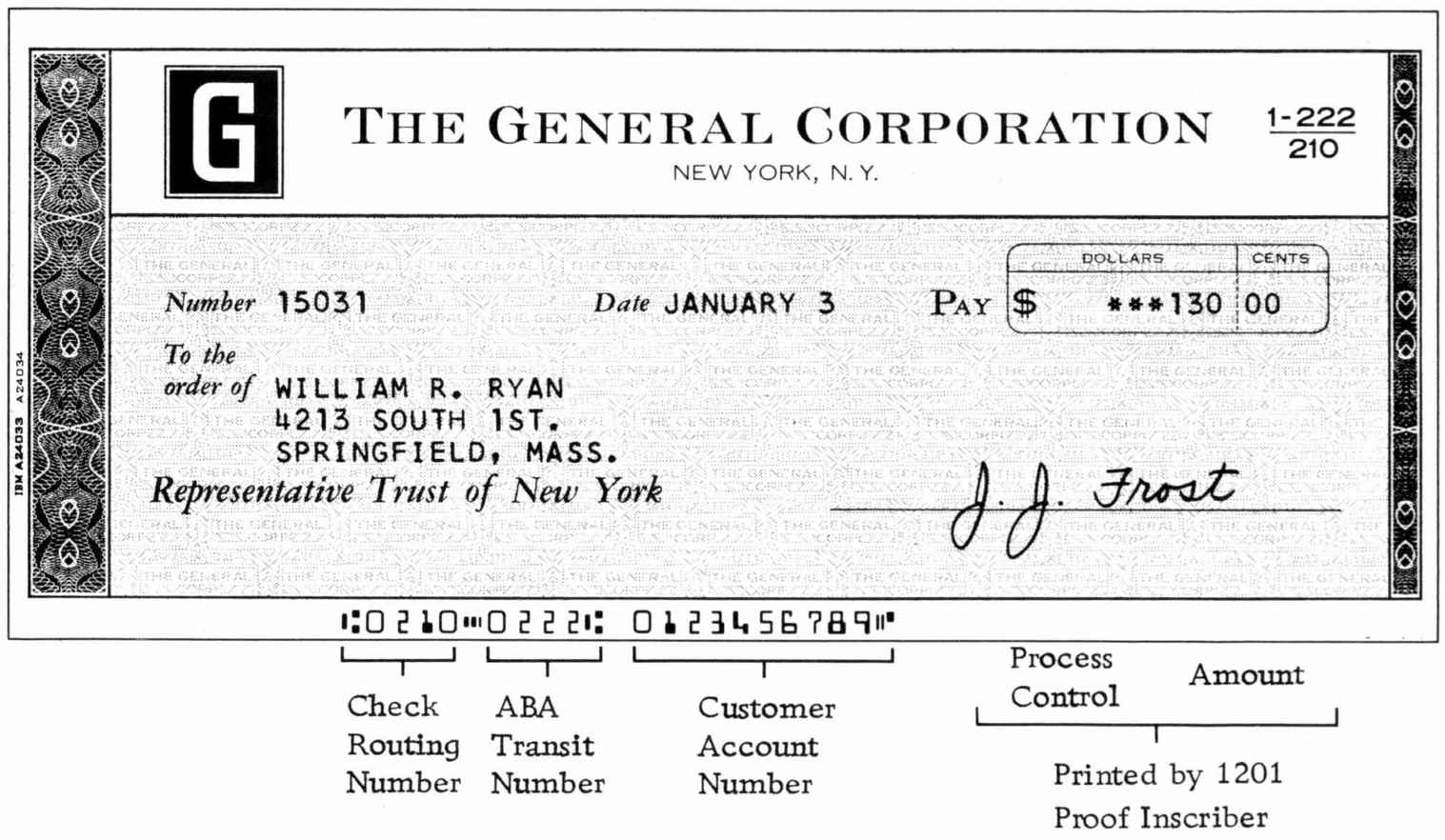
Process Control — This field is used for batch number, source code or other identification.

Account Number — This field identifies the customer account and is of fixed length for each bank. A maximum of ten numerical digits, excluding intervening dash symbols or blank spaces, plus the on-us symbol, may be used.

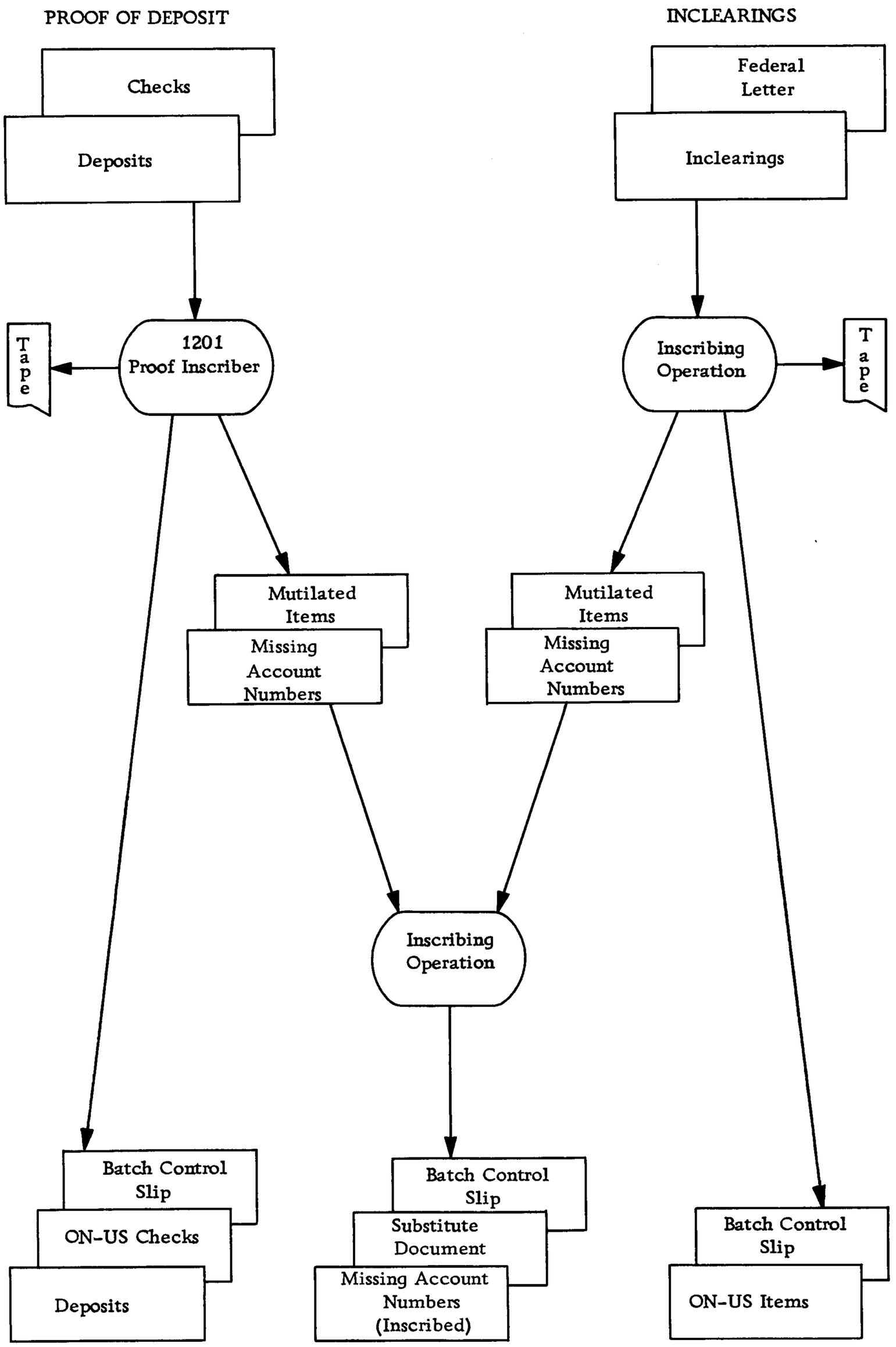
Routing and Transit Number — The data recorded here identifies each bank in order to facilitate the handling and routing of transit items. It consists of a four-digit routing number on the left and a four-digit transit number on the right, separated by a dash symbol. This information is bracketed by the transit number symbol, for a total of eleven printing positions.

Auxiliary On-Us — Though not shown below, this field is generally used to serially number on the checks for a particular customer. The serial number allows the automatic sequencing of checks for account reconciliation as well as providing a reliable method of identifying a specific stop-payment or hold transaction.

Checks may vary in size from 6 to 8-3/4 inches in length and from 2-3/4 to 3-2/3 inches in width.



PROOF INSCRIBING AND DISTRIBUTION



TO BALANCE AND CONVERSION RUN

PROCEDURES

Proof Inscribing and Distribution

The transactions received from the tellers, which include deposit tickets, on-us checks drawn on the bank's own accounts, clearinghouse checks drawn on other local banks, and transit items drawn on out-of-town banks, are forwarded to the proof inscriber section. All transactions are processed through the IBM 1201 Proof Inscriber, where the amount is printed in magnetic ink. For on-us items, process control data is also recorded in magnetic characters. Outgoing checks are also endorsed during this operation.

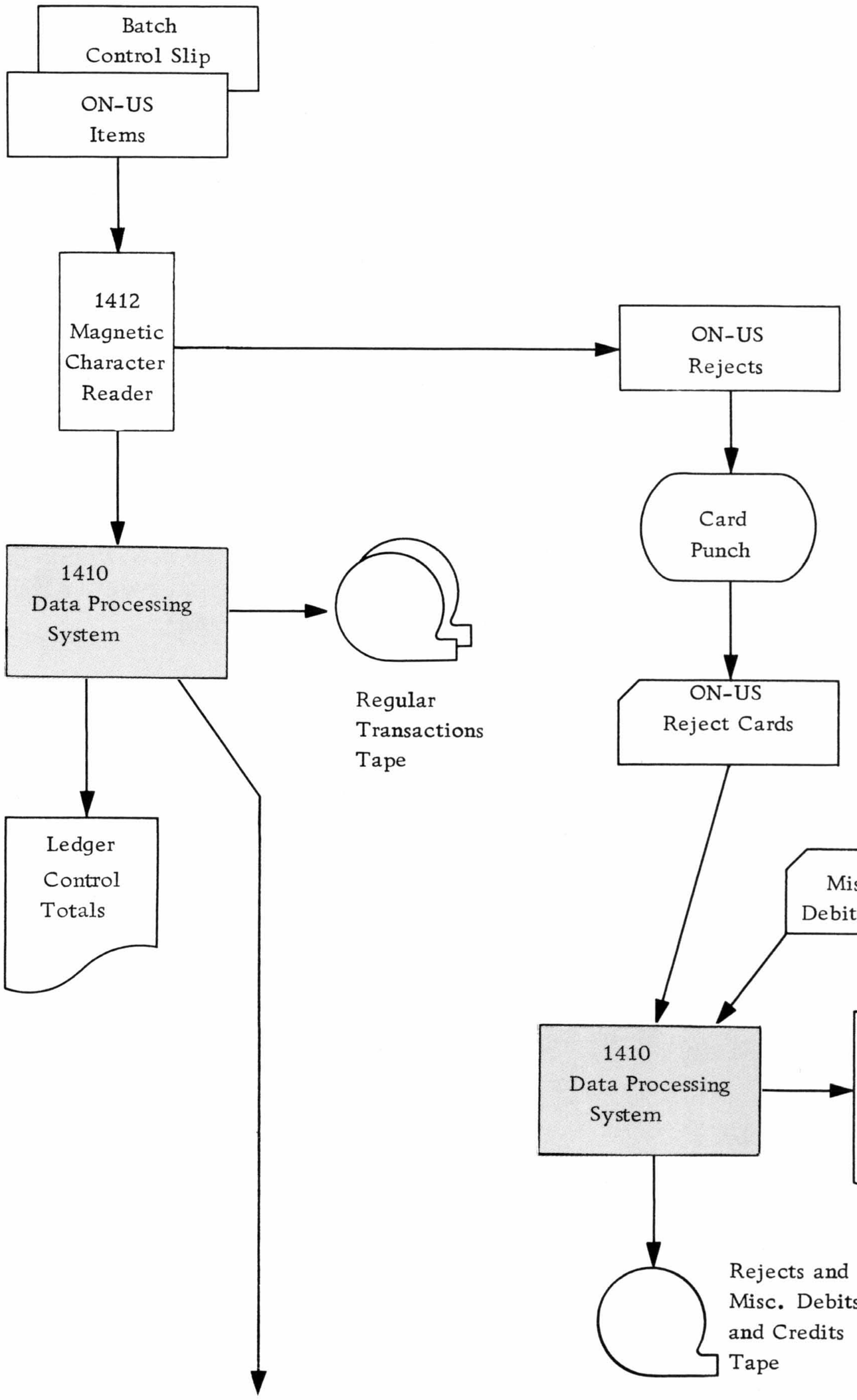
As checks feed through the inscriber, the operator selects a distribution pocket for each debit or credit item to separate these into as many as 32 different classifications. Thus in one operation all on-us checks can be grouped by ledger account, clearinghouse items by local bank, and transit items by federal reserve or correspondent bank.

Control slips are placed in the check chute, where the compartment total and process control data are printed in magnetic ink. These slips feed into the proper compartment behind related items and will be used in a later operation for control purposes.

Incoming clearings from the other banks and the Federal Reserve Bank are also inscribed with amount. At such time as a bank determines that sufficient items are coming in with check amount inscribed, these can be directly entered into the 1412 reader for automatic proof. This method of high speed proof results in substantial time and cost savings.

Those items which have been mutilated, have missing account numbers, or do not meet size requirements may be processed through the IBM 1202 Utility Inscriber for completion of the inscribing or for preparation of substitute documents or carrier envelopes. In other cases IBM cards are punched to act as a substitute document.

BALANCING AND CONVERSION RUN



BATCH PROOF LISTING

REJECT CODES
POCKET A
1 ON-US MISSORTS
2 INVALID CHARACTER
POCKET B
3 INVALID CHARACTER IN AMOUNT FIELD
POCKET R
4 BATCH CONTROL SLIPS
5 NOT ON US
6 OTHER REJECTS

BATCH NUMBER	ACCOUNT NUMBER	AMOUNT	TRANS CODE	POCKET	REASON CODE	ACCOUNT NUMBER	AMOUNT	TRANS CODE	POCKET	REASON CODE	ACCOUNT NUMBER	AMOUNT	TRANS CODE	POCKET	REASON CODE	ACCOUNT NUMBER	AMOUNT	TRANS CODE	POCKET	REASON CODE	ACCOUNT NUMBER	AMOUNT	TRANS CODE	POCKET	REASON CODE
1	7121650	5.60	1	A	1	7421300	11.81	1	1		7352106	123.45	1	1		7256124	1235.40	1	1		7266641	1.56	1	R	6
1	7265101	10.00	1	1		7361245	156.80	1	R	5	7352161	681.31	1	1		7210532	566.01	1	1		7482131	54.20	1	R	6
1	7032101	340.00	1	1		7048213	21.40	1	1		7821654	568.59	1	1		7410435	13.91	1	1		7143126	15.05	1	1	

ON-US MISSORTS	INVALID CHAR.		INVALID CHAR AMT		NOT ON US	OTHER REJECTS		TOTAL		BATCH BALANCE	CONVERTED BATCH BALANCE
POCKET A			POCKET B		POCKET R						
5.60					342.81	101.51	=	449.92		23456.81	23006.89

Balancing and Conversion Run

All on-us items are placed in the 1412 Magnetic Character Reader. As each document is read, it can be directed to one of 13 pockets as determined by the 1410 stored program.

A typical distribution would be as follows:

Pockets 0-9 — All on-us items which have been correctly read are sorted according to the digit contained in the units position of the account number. (Some banks prefer, however, that the proof inscriber tapes and the batch proof listing be in strict balance before sequence is disturbed.)

Pocket A — On-us missorts and documents containing an invalid character (i.e., a character other than 0 through 9 or one of the four special symbols) in any field except the amount field. A field length check can also be performed to insure that all characters in a field have been read, and items which do not pass this test can also be placed in pocket A.

Pocket B — Items containing an invalid character in the amount field.

Reject Pocket — All batch control slips, not-on-us documents, and any other rejects not previously covered.

As documents are read, a batch proof listing is prepared with five items per line showing batch number, account number, dollar amount, transaction code and pocket designation for each item. All documents directed to the A, B or reject pocket are further identified by a reason code. To facilitate balancing, items in the A, B and reject pockets are accumulated by reason code and printed at the end of the batch listing. When the totals on this report are not in agreement with original batch totals, the proof inscriber tape is compared with the batch proof listing to locate missing items, items processed through the 1410 but not through the proof machines, or missing batch control slips. The on-us nonreadable documents are removed and the data they contain is punched into cards. These items are balanced and entered in batch sequence on magnetic tape.

Miscellaneous debit and credit transactions and reversal entries for previously posted transactions are punched into IBM cards and entered into the 1410, where they are edited, balanced and recorded on magnetic tape.

As recorded data is read from all on-us documents, it is written in the same sequence on the regular transactions tape. New batch totals are recorded on tape at the end of each batch.

Because of the large memory capacity of the 1410, ledger and batch control totals are accumulated within the system for all debits and credits. When positive balance to original totals is assured, all on-us items in pockets 0-9 are fine-sorted to account-number sequence and filed until statements are prepared.

Transit Function

The 1410 Data Processing System with the 1412 Magnetic Character Reader will also perform the transit function. In this operation checks drawn on various banks are read by the 1412 and the information is passed to the 1410. The powerful logic of the 1410, through its stored program, makes the decisions as to what sending point the item should go to, and into which pocket of the 1412 the item should be sorted. During this operation the 1403 is printing a listing of the items which is balanced against controls. In subsequent runs, transit letter listings are prepared for each sending point, either from the segregated checks themselves or from magnetic tape prepared when the items were segregated into sending point groupings.

Sort and Merge Run

As items from the three input tapes are sorted to account-number sequence, batch and ledger controls are printed and checked to insure that no items have been excluded from the sorted transaction tape.

After all transaction tapes are sequenced, they are read into the 1410 to merge all transactions into account-number sequence and to prepare a package-post listing.

The choice of which accounts to package-post depends on the requirements of the individual bank. For example, a bank may package-post when eight or more checks are drawn on an account on any given day. Thus all accounts with over eight checks would require only one posting transaction. This significantly reduces processing time during statement preparation. The format of the package-post listing shown below for illustration purposes will vary according to the needs of the bank.

As an alternate method, cards can be punched for accounts with more than eight items. When interpreted, these cards are used as finder cards for pulling the fine-sorted checks from file. The package-post listing is then prepared directly from the checks, to assure that the checks are in the same sequence as the listing.

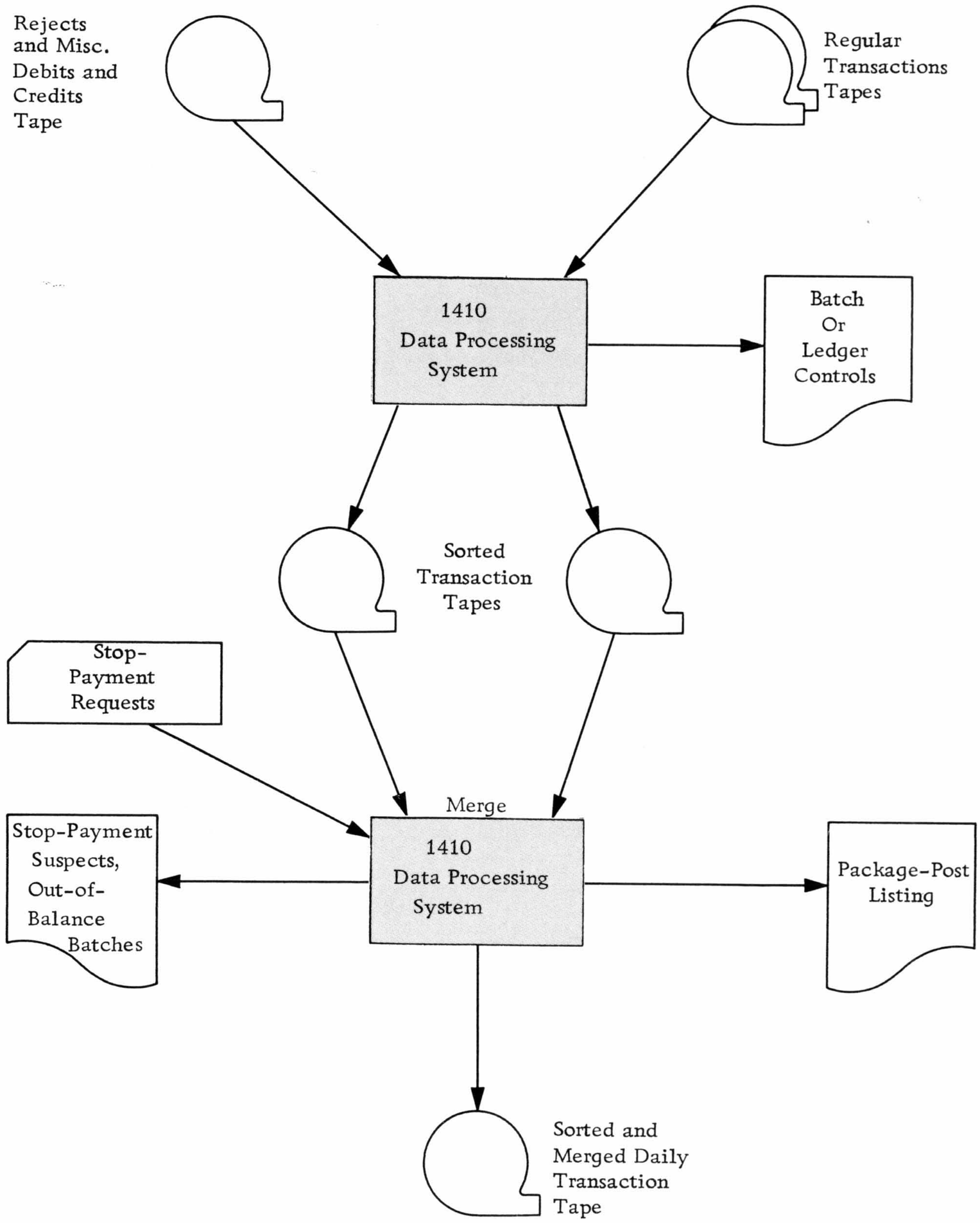
PACKAGE POST LISTING

AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
18.56	21.87	97.00	10.11	81.16	21.48	99.77	28.45	44.66	2000.56	128.18	10.98	12.11
158.21	32.00	81.50	8.05	25.40	899.55	199.00	31.80	210.13	65.10	61.10	18.60	14.00
9834.40	41.55	14.18	6.65	95.80	16.25	404.50	585.60	88.00	41.01	9.09	67.70	665.10
836.01	22.88	123.10	4.01	106.20	81.80	621.20	988.00	41.44	55.10	8.00	18.75	95.80
5.80	10.00	15.15	83.88	1156.41	25.40	66.15	400.20	118.00	91.40	4.50		
ACCOUNT	NUMBER	*8561234**							ITEM COUNT	63	TOTAL	$21,230.34*
41.00	156.91			1.81								

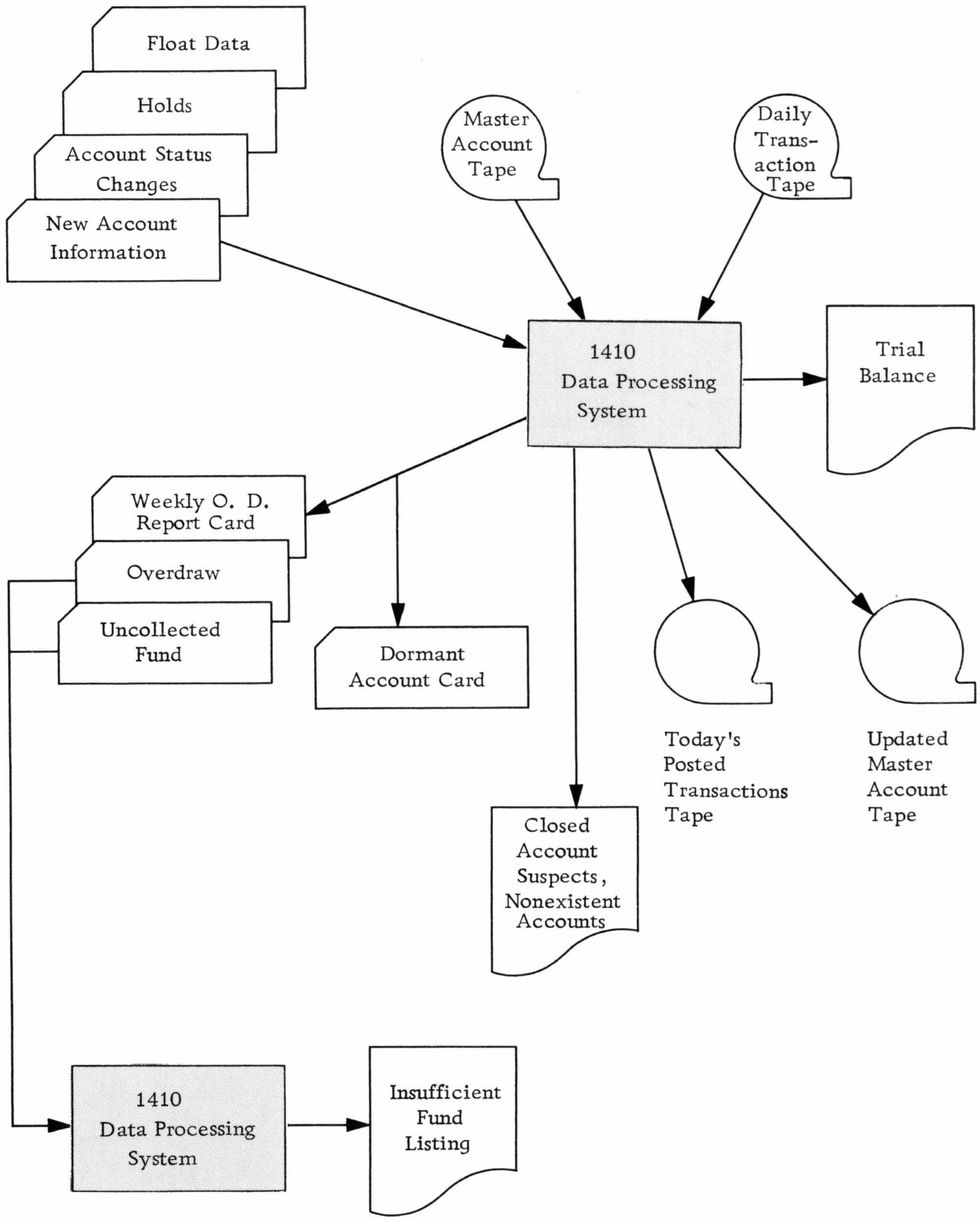
In either case, all transactions are merged by account, with the exception of package-post items. Only the total of these items is recorded on the merged transaction tape.

When requests for stop-payment are received from customers, this data is punched into cards and entered into the system via the 1402 Card Read Punch. As the tapes are merged, accounts are inspected to determine whether any of the transactions appear to be stop-payment suspects. If so, the 1415 Console typewriter prints these suspect amounts for investigation.

SORT AND MERGE RUN



POSTING RUN


Float Data
Holds
Account Status Changes
New Account Information
Master Account Tape
Daily Trans-action Tape
1410 Data Processing System
Trial Balance
Weekly O. D. Report Card
Overdraw
Uncollected Fund
Dormant Account Card
Today's Posted Transactions Tape
Updated Master Account Tape
Closed Account Suspects, Nonexistent Accounts
1410 Data Processing System
Insufficient Fund Listing

Posting Run

The fast internal processing speed of the 1410 system, in combination with the high speed printing ability of the 1403, permits the posting of all daily transactions and the simultaneous preparation of a trial balance in one run.

During this run the master account tape is updated, overdrafts and non-existent accounts are signaled, and service charge data is accumulated and recorded on the updated master tape.

Input to the 1410 consists of the daily transaction tape and the master account tape which contains all necessary indicative and balance information.

Punched cards representing new account information, account status changes, holds, and float information enter the system through the 1402 Card Read Punch.

In this run the detail transactions for each account are accumulated and the account balance is updated. Other fields in the updated master account tape, such as date of last activity or deposit, amount of deposit, dollar sum and number of debits and credits, etc., are posted.

As items are accumulated and posted, the 1410 produces:

1. The trial balance. Current balance, period low balance in hundreds of dollars, and date of last deposit and activity are printed. In addition, the account number, short account name, and statistical data are also shown. At the end of each ledger, control totals are printed representing the totals of today's opening balances, the sum of today's debits and credits, and the total closing balance. These ledger totals are compared against original controls.

TRIAL BALANCE

ACCOUNT NUMBER	ACCOUNT NAME	CURRENT BALANCE	PERIOD LOW BAL-ANCE 100'S	LAST DEPOSIT MO	DAY	AMT.	STOP & HOLD OVER	1-DRAFT OFFICER	LAST ACTIVITY MO	DAY	REMARKS	ACCOUNT NUMBER	ACCOUNT NAME	CURRENT BALANCE	PERIOD LOW BAL-ANCE 100'S	LAST DEPOSIT MO	DAY	AMT.	STOP & HOLD OVER	1-DRAFT OFFICER	LAST ACTIVITY MO	DAY	REMARKS
11001039	ADAMS J.R.	635.47	5	6	22	3	S	1	9	6	22	7.50	11005021	DRAYSON P.	274.05	1	6	23	4		5	6	23	
11012011	GRANTHAM J	4366.81	31	6	01	18			1	6	15		11016954	HALTOM W.H	39.95	1	6	15	1	1	7	6	15	O/DRAFT
11301189	KINGSTON T	1845.00	7	6	20	9			1	6	21		11332099	RATH W.L.	817.55	2	5	30	2		5	6	18	
11386140	STOREY L.	8303.80	50	6	23	25	H		4	6	23	12.55	11619170	WILSON A.R	483.03	3	6	08	2		7	6	15	

This trial balance insures that accounts are in balance daily and is further used as a basis for answering bank and customer inquiries.

2. Today's posted transactions tape. This tape includes all of today's posted transactions and is used in the next run to prepare the transaction journal.

3. An updated master account tape. This tape now contains updated account data, an analyzation of uncollected fund accumulations, and service charge information.

For control of overdrafts, the following exception cards are created by the 1402 Card Read Punch:

Overdrawn Report Card — Once each week cards are punched containing account number, balance, short name, date opened, date overdrawn, date of last activity, number of days and number of times overdrawn. These cards are listed for analysis.

Overdraw Card — Overdraw cards are punched for each account having nonsufficient funds. Uncollected fund cards are punched when an item is drawn on uncollected funds. These and the overdraw cards are used to prepare an insufficient fund listing.

Dormant Account Card — Cards are punched when a dormant account has become active so that this unusual activity can be investigated.

Other exceptions are printed for reference purposes by the 1415 Console typewriter. These are:

1. Closed account suspect. The short name and account number are printed when today's transactions result in a zero balance.

2. Nonexistent accounts. An account number and amount are printed for any item drawn against a nonexistent account.

EXCEPTION LISTING

ACCOUNT NUMBER	NAME	BALANCE LAST STATEMENT	PRESENT BALANCE	YEAR OPEN	AMOUNT THIS TRANSACTION	REMARKS
12000098	GOLLIHAR E.L.	222.19	***	55	222.19	CLOSED
12204619					55.10	NON EXISTENT
12205160					40.31	NON EXISTENT
12305100	ANDREW R.L.	85.20	***	60	85.20	CLOSED

Journal Run

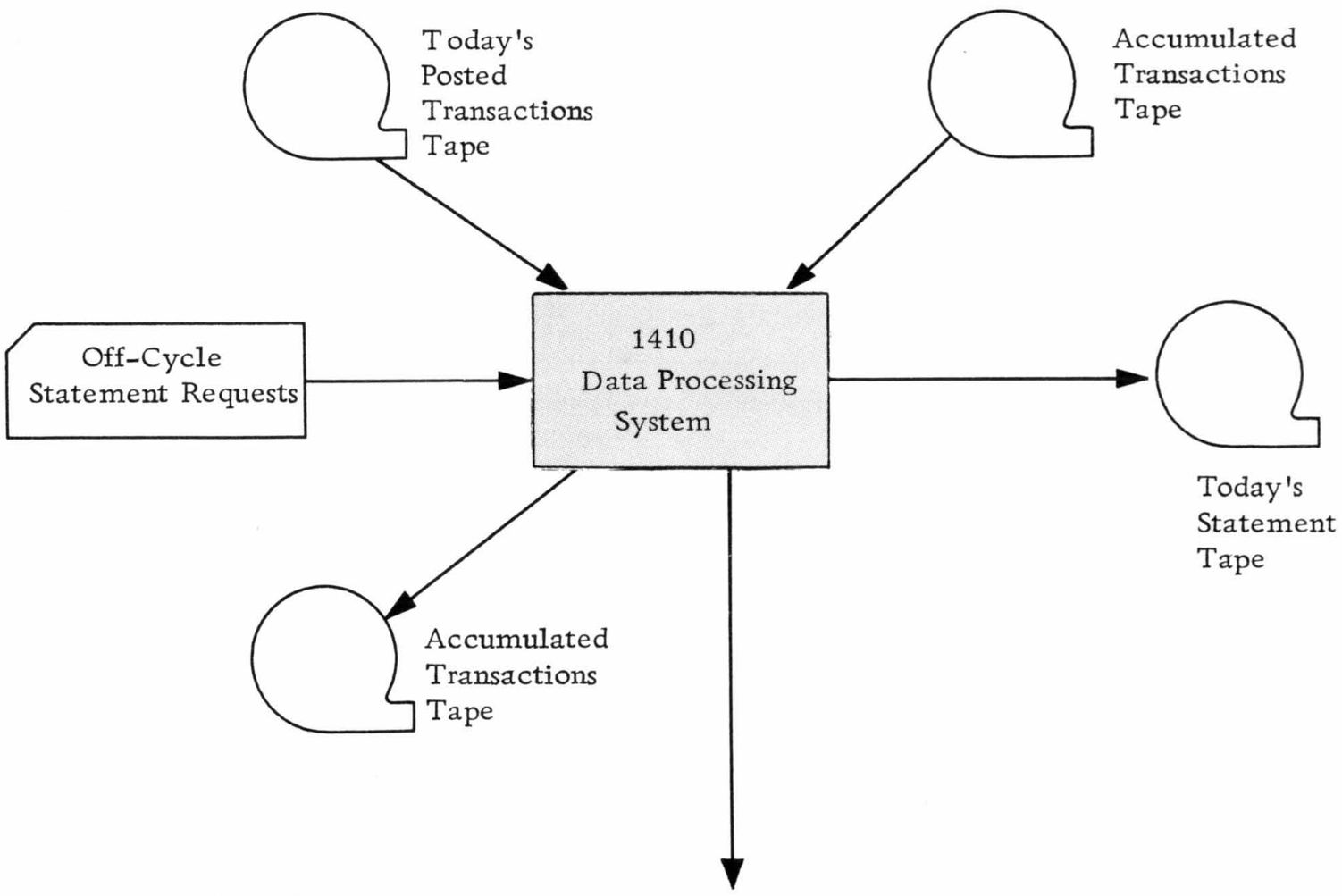
In this run the 1410 merges today's transactions with all transactions accumulated since the last cycle statement date, while the 1403 Printer prepares the transaction journal at rates of up to 1, 800 accounts per minute.

Input to the run is today's posted transaction tape and the accumulated transactions tape — both in account-number sequence. One output tape contains the account number, date, process control data, and amount for all accumulated transactions. The second output tape records all transactions for statements which are prepared today. This tape becomes input to the statement run which follows.

When special requests for statements are received, finder cards are punched and entered into the card reader. This off-cycle statement request card causes the 1410 to select and record transactions for these accounts on the today's statement tape.

The transaction journal is prepared three accounts to the line. Ledger totals are again accumulated and balanced back to previous controls.

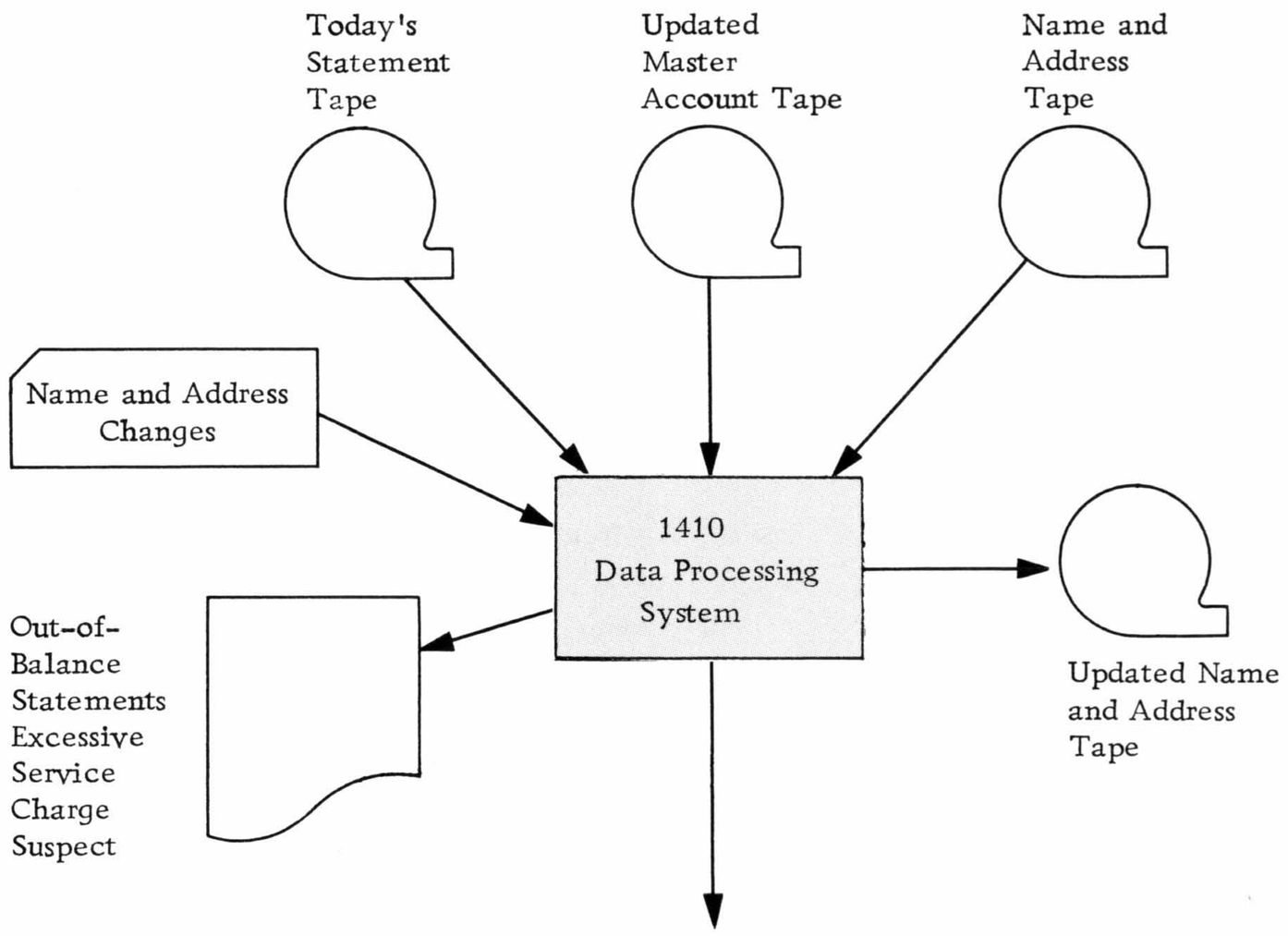
JOURNAL RUN



TRANSACTION JOURNAL

ACCOUNT NUMBER	TRAN CODE	AMOUNT	TRAN CODE	AMOUNT	TRAN CODE	AMOUNT	ACCOUNT NUMBER	TRAN CODE	AMOUNT	TRAN CODE	AMOUNT	TRAN CODE	AMOUNT	ACCOUNT NUMBER	TRAN CODE	AMOUNT	TRAN CODE	AMOUNT	TRAN CODE	AMOUNT
1258321	1	10 55	1	105.63	1	21.99	1258321	1	98.00	1	6.41	1	10.61	1258323	2	1000.00				
1258324	1	8300.00					1258380	2	325.00	1	18.25			1259516	1	40.30	1	50.80		
1259888	1	104.41					1259971	1	9.91	1	8.40			1260055	2	105.61				
1260103	2	3.00					1260108	1	100.00					1260115	1	25.00				

STATEMENT RUN



Linden National Bank

Philadelphia, Pa.

IN ACCOUNT WITH

ACCOUNT NUMBER 002-460-0
DATE 1/29/--

PAUL W. PAGE
2014 DELANCY PLACE
SWARTHMORE PA

STATEMENT OF ACCOUNT

BALANCE FORWARD	TOTAL CHECK AMOUNT	NUMBER	NO OF DEP.	TOTAL DEPOSIT AMT.	SERVICE CHARGES	BALANCE THIS STATEMENT
7,300.53	6,431.63	27	5	2,272.97	.00	3,141.87

CHECKS AND OTHER DEBITS			DEPOSITS AND OTHER CREDITS	DATE	BALANCE
					7,300.53
507.77			49.50	1/05/	6,842.26
45.00	10.15			1/07/	6,787.11
200.00	8.83	99.00	100.00	1/08/	6,579.28
300.00				1/09/	6,279.28
13.50				1/12/	6,265.78
1,696.30				1/13/	4,569.48
2,239.84				1/16/	2,329.64
200.00	17.15			1/19/	2,112.49
200.00	274.09			1/20/	1,638.40
500.00				1/27/	1,138.40
40.00				1/28/	1,098.40

NATIONAL BANK of COMMERCE

STATEMENT OF ACCOUNT

ON THE DATE OF:	YOUR BALANCE WAS:	WE HAVE ADDED NO	DEPOSITS TOTALING	AND SUBTRACTED NO	CHECKS TOTALING	WITH HANDLING COST OF:	RESULTING IN A BALANCE OF:
12/31/--	294.91	2	140.00	23	401.91	2.30	30.70

MR. OR MRS CHARLES GURIO
27 EAST MORALES ST.
DALLAS, TEXAS

ACCOUNT NO. 5612341

STATEMENT DATE 1/31/--

* SEE THE REVERSE SIDE FOR EASY METHOD OF RECONCILIATION.

Statement Run

Statements are prepared on a cycle basis, although this may be modified to meet individual requirements. For example, it may be necessary to prepare statements for commercial accounts at month end. Statements are detailed for commercial and regular checking accounts, while special checking customers receive a more simplified statement.

Input to this run includes the master account tape, updated with all changes, a today's statement tape from the previous run, and a name and address tape. Recorded for each customer on the master tape is opening balance, current balance, number and sum of debits and credits, service charge data, etc. Name and address cards for new accounts are entered through the 1402 Card Read Punch for recording on the updated name and address tape.

The 1410, as it prepares each statement, crossfoots the balance as of the last statement with the debits and credits of the statement period and compares the result with the current balance. It also counts the number of the debit and credit items and compares these with the totals on the today's statement tape. Statements therefore reflect every item debited or credited to an account during the statement period.

The detailed statement shown here is designed so that detail transactions follow the data necessary to produce a simplified statement. Should a bank decide that a simplified statement is advisable, the change may be made without any major revision. Though not shown here, the wide printing span of the 1403 permits preparation of two statements side by side, thus doubling printer output.

The console typewriter will type out an exception list for any out-of-balance accounts. An excessive service charge warning is typed if the service charge exceeds a pre-established amount. This is caused by large fluctuations in account balances or in account activity.

Ledger totals are again accumulated and balanced to controls, and service charges are computed and credited to income.

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International Business Machines Corporation
Data Processing Division
112 East Post Road, White Plains, New York