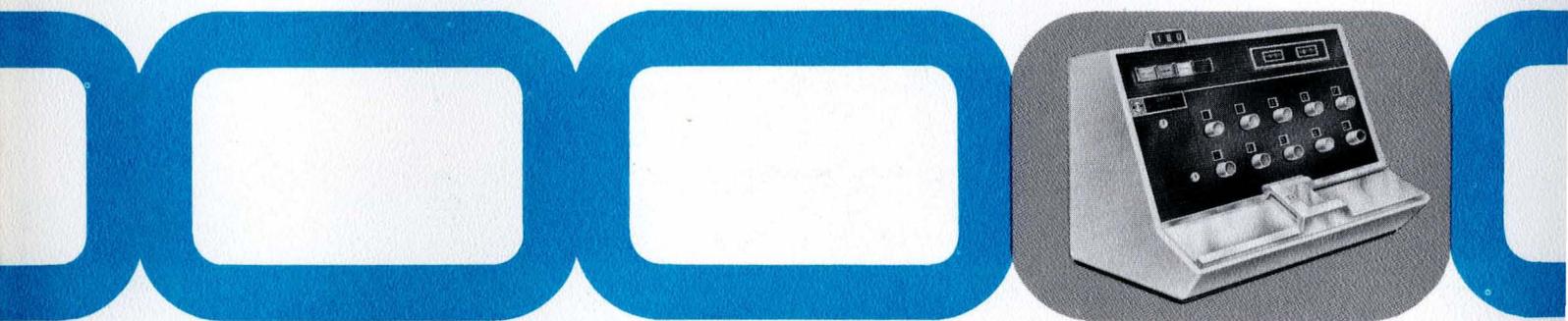


THE MISSING LINK IN DATA PROCESSING

RELIABILITY
AT THE SOURCE



NOW PROVIDED BY
THE 180 DATA COLLECTOR

THE 180 DATA COLLECTOR will help you exercise more effective management control from the very first step in any operation, the gathering of facts.

It provides you with instantly available, on-the-spot information—for production scheduling, machine loading, schedule and incentive payroll planning, cost and inventory control, and many other areas of executive responsibility.

THE 180 DATA COLLECTOR does this by preparing a record while work is being performed—a *combined* record which includes time, standard job information, employee identification, and other facts which you may desire. This on-the-job record is instantly recorded so that it may be taken without delay to the data processing department.

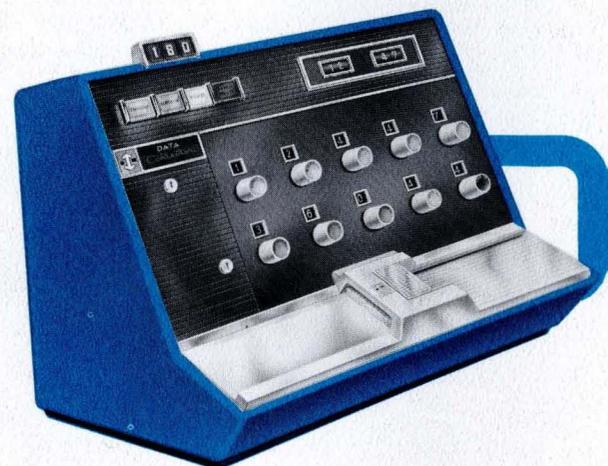
THE 180 DATA COLLECTOR is the most efficient data gathering device known. It is fast, simple to operate, tamper-proof, and low in cost. Here is a quick summary of advantages:

- enables you to make faster decisions
- eliminates handwriting errors in reporting
- cuts paper work
- increases accuracy
- reduces the number of reporting personnel needed
- easily operated . . . requires no special training
- does not "lock out" . . . no waiting to transmit
- operates on regular plant voltages . . . no facility changes needed
- features multiple card transmission per cycle . . . far faster than single card systems



THE 180

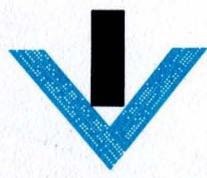
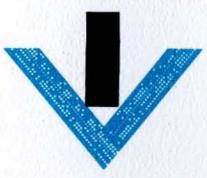
ELIMINATES ERRORS—The 180 Data Collectors gather information at the point of origin—for example, you may station Collectors at control points, on production lines, in warehouses, or in offices. You eliminate handwritten reports—often illegible, or inaccurate and incomplete. You also eliminate the need for transferring handwritten data to punched cards. The 180 Data Collector automatically converts data into a form which can be fed directly into computers or tabulating equipment. In other words, data is entered and converted for you in one simple operation.



DATA COLLECTOR

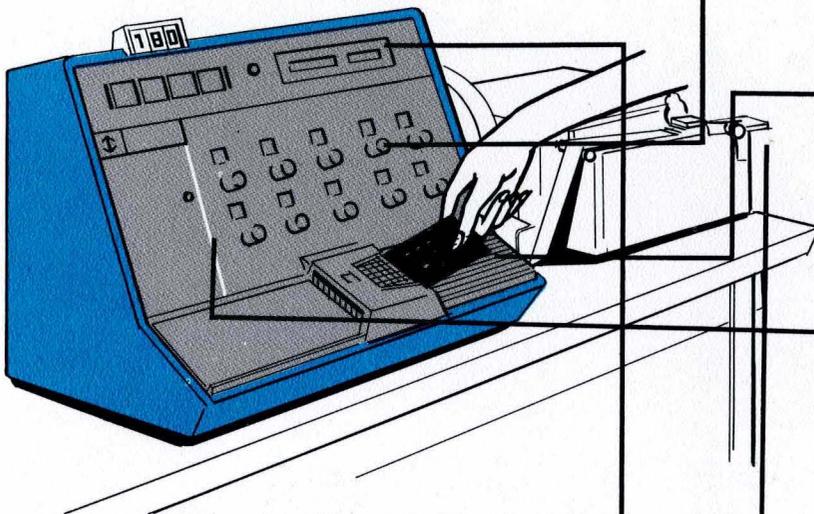
SPEEDS REPORTING—Because data is both entered and converted at the point of origin, it can be taken directly from the Collector to the data processing department. There it can be fed into computers and tabulating equipment for further processing.

MAKES DECISIONS EASIER—The 180 Data Collector helps you exercise more effective management control because you act on *current* information, swiftly obtained, and accurately reported. You can act more rapidly, more decisively, and with greater assurance that your decision is correct.





NO INSTALLATION COST— The 180 Data Collector is a modular, self-contained unit. It can be wall mounted or placed upon a table or desk. You can move it wherever needed, and there are no installation costs to pay . . . no expensive communication, power, or central system changes to make. Should your needs grow, it is as simple to add more 180 Data Collectors as it is to place more typewriters in your office.



FASTER TRANSMISSION, NO LOST TIME— The 180 Data Collector saves time and patience. It has its own data output unit, which means that the operator does not have to wait to enter his data. With other collection systems, it is often necessary to stand by while a single recording station clears to receive the data. The 180 Data Collector eliminates this time consuming, troublesome bottleneck. Furthermore, since there are no communication lines, there can be no communication line failure, and error cannot be introduced in transits.

FUNCTION

VARIABLE DATA

The operator enters this data by dial settings. For example, job lot number, shrinkage, amount produced.

IDENTIFICATION DATA

The operator enters this data from pre-punched cards. For example, employee number, machine number, material identification.

FIXED DATA

This data is contained in the internal memory of the Collector. For example, department number, plant location, collector station number.

REAL-TIME CLOCK

Time is read out and automatically combined with each recorded transaction.

DATA OUTPUT

The combined output record length can vary from a few characters to several hundred characters for each operation.

VARIABLE INPUTS are manually set by 10 multi-position rotary switches, provided for the insertion of count and process information. This information is automatically entered in the output record.

IDENTIFICATION DATA is entered through the card sensing unit, which reads a predetermined sequence of pre-punched cards. A built-in card sequence control prevents cards from being entered improperly. The card reader is a unique development of Control Data Corporation. It employs a pneumatic principle, proved more reliable and rugged. Variable length cards may be used; bent or wrinkled cards can be read reliably. Optional decimal or alphanumeric available.

FIXED DATA inputs are provided by 6 multi-position rotary switches, which provide for the insertion of location, position, and collector station numbers. These switches are behind a locked panel. They are set by supervisory personnel.

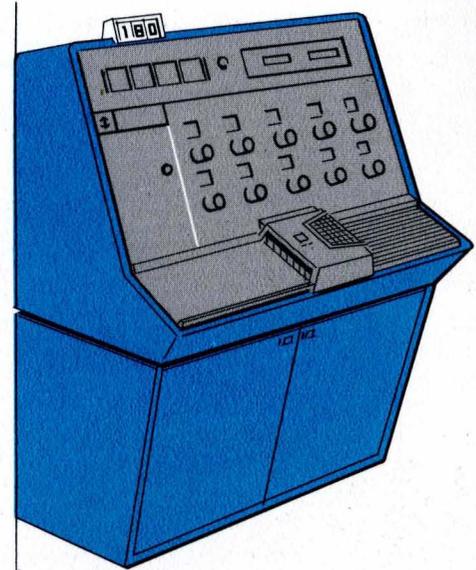
AN ELECTRIC CLOCK automatically records the time of each transaction, to the nearest 0.01 of an hour. The clock reset is behind a locked panel—only supervisory personnel can set it. The time can be read from a decimal display on the front of the Collector. It is a 24 hour clock, operating on 115v, 60 cycles, AC. Battery-driven or spring wound clocks are available.

THE DATA OUTPUT UNIT punches 16 characters per second on 8-level paper tape. Units of 5, 6 or 7-level tape are available.

SEQUENCE CONTROL is automatic. A distributor scans the input cards, clock, variable inputs, and fixed inputs, and translates from card code to output record code. It also controls output punch.

ERROR SAFEGUARDS include a push button which "voids" the preceding transaction, interlocks which assure proper card sequence, and a locked "on-off" switch which prevents accidental or illegal introduction of data. Also, a locked cover plate guards the clock and the interior of the Collector.

AUTOMATIC CLOCK-IN MODE is provided to permit employees to use the Collector as a time clock at the beginning and end of a shift. The internal clock automatically shifts from the *transaction mode* to the *clock-in mode* and vice versa.



WALL MOUNTED

No wiring—Facility wiring not required because each Collector has its own recorder

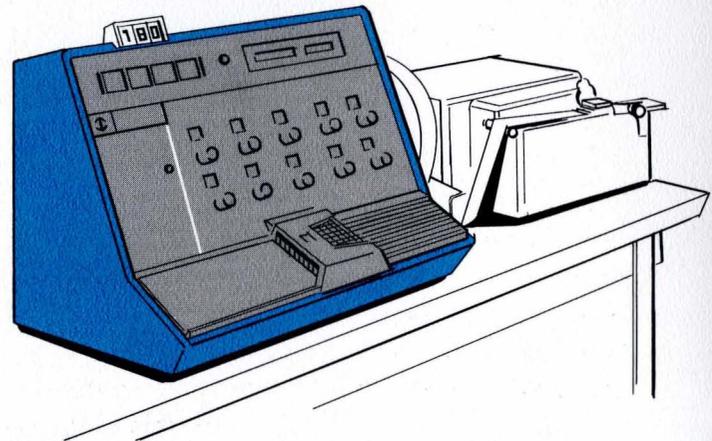
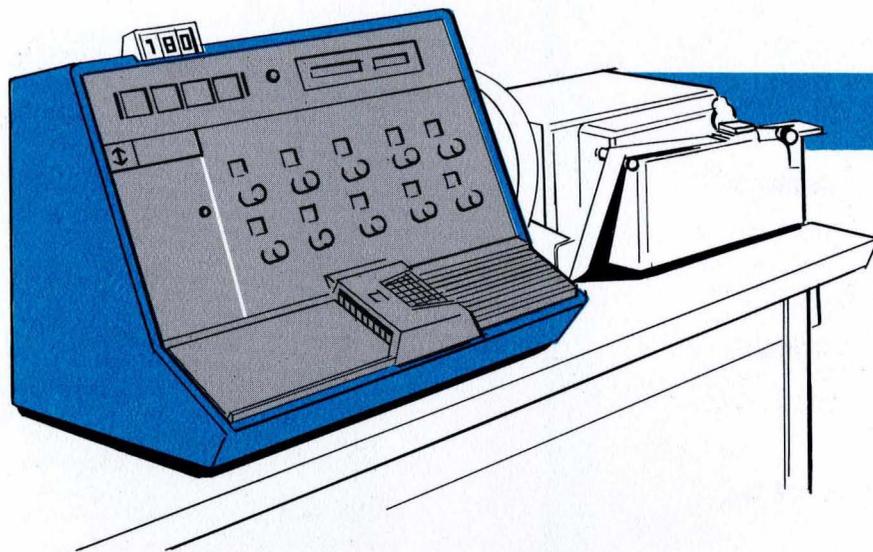


TABLE MOUNTED

No waiting—Each Collector has its own recorder

INTEGRATED DATA PROCESSING



MANAGEMENT

INTEGRATED DATA PROCESSING

PRESET

- (1) Fixed data entered prior to sequence of recording operations

SEQUENCE OF OPERATIONS

- (1) Operator sets variable data source dials
- (2) First identification card is inserted and "transmit" button pressed
- (3) Remaining identification cards inserted

DATA PROCESSING

- (1) Output data tapes are taken to the data processing department
- (2) Tape is fed into memory of computer or into tabulating equipment and processed
- (3) Processed results are prepared for management

MANAGEMENT

- (1) Reports read and analyzed
- (2) Decisions made and action taken

APPLICATIONS

Production scheduling • Incentive payroll
• Hotels • Cost control systems • Inventory control • Retailing • Quality control • Wholesaling
• Billing operations • Finance company records • Sales statistics • Banks • Purchasing
• Airlines • Hospital patient charges

SPECIFICATIONS

INPUTS

IBM cards: Up to four 80-column card inputs (320 characters) can be read. Also, stub cards can be read. Alphanumeric optional.

Fixed data: Six multi-position rotary switches for insertion of fixed information.

Variable data: Ten multi-position rotary switches for pre-setting variable information by operator.

Internal clock: 24 hour clock with .01 hour increments automatically recorded with each transaction.

OUTPUTS

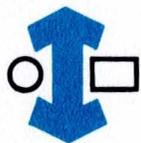
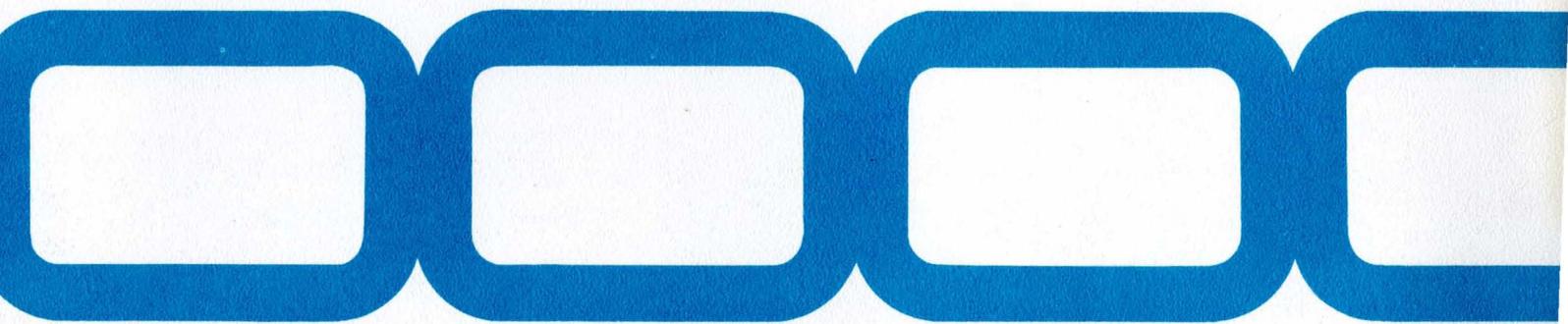
Data Output Unit: 8-level punched paper tape, recorded at 16 characters per second. (5-, 6-, or 7-level tape optional).

DIMENSIONS

Collector unit: 16" high by 17" wide by 13" deep. Weight, 60 lbs.

POWER

115v, 60 cycle, AC



CONTROL DATA CORPORATION

501 PARK AVENUE • MPLS. 15, MINN. • FEderal 9-0411

A DESCRIPTION OF THE
180 SOURCE DATA COLLECTOR
SYSTEM OPERATING AT
CEDAR ENGINEERING DIVISION
CONTROL DATA CORPORATION

Cedar Engineering Division of Control Data Corporation has wide experience in the design and manufacture of miniature electrical and electro-mechanical devices. A cross-section of Cedar's product line includes miniature Rotary Devices, Linear Acceleration devices, Control Amplifiers, complete Servo and Time-Function Assemblies, and supporting activities related to missile programs and other military applications.

One of the Division's newest developments is the 180 Source Data Collector which provides more efficient management control from the very first step in any operation--the collection of facts. Truly integrated data processing depends on an efficient, automatic method of collecting on-the-spot information. The 180 provides the method of collecting information which provides management control of operations such as production, scheduling, inventory control, incentive payroll, job recording, job costing, and so on. Such a system, built around the 180 Source Data Collector, has been installed in Cedar's operation to collect at the point of origin the necessary information on payroll, inventory, job costing, and accounting.

The Cedar Engineering Division, conducts its manufacturing operation with some 2000 different part numbers. The 180 Data Collector collects data on these varied part numbers and the derived finished products so that timely management reports can be made.

Five 180 Data Collectors will supply the input data for final resolution--four 180's monitor the production process and the fifth is used for inventory control. The full operation, with all the complex data involved, actually presents a rather simple and thus highly efficient step-by-step procedure.

The specification profile of the 180 Source Data Collector is recorded here as an easy reference point for the system description:

INPUTS

IBM cards: Up to four 80-column card inputs (320) characters can be read. Also, stub cards can be read.

Fixed data: Six multi-position rotary switches for insertion of fixed information.

Variable data: Ten multi-position rotary switches for presetting variable information by operator.

Internal clock: 24 hour clock with .01 increments automatically recorded with each transaction.

OUTPUTS

Data Output Unit: 8-level punched paper tape, recorded at 16 characters per second. (5-, 6-, or 7-level tape optional).

DIMENSIONS

Collector unit: 16" high by 17" wide by 13" deep. Weight, 60 lbs.

POWER

115V, 60 cycle, AC

ON THE SPOT DATA COLLECTION

The 180 Data Collector begins the cycle with the real-time clock set in the clock-in mode. An employee clocks in by passing his employee card through the 180 and pressing the transmit button. The employee card is pre-punched with the employee name, clock number, and department number.

At Cedar, only two card types are used for recording information: the employee card and a production or job card. When the employees have clocked-in, the 180 automatically shifts from the clock-in mode to the production recording mode.

As each employee completes an assigned job, he returns to the 180 and, by dialing various manual controls, he enters such variable information as the operation number, amount produced, number of rejects, etc. Then he inserts his employee identification card followed by his pre-punched production job card. The job recording transaction is now automatically completed. The production job card holds such data as the lot quantity, part number, starting date, due date, etc.

The employee then moves to another assignment, which, when completed, is recorded by the same procedure. At the end of a normal day's shift, or at a pre-set collection period, the paper tape record generated by the 180 is taken either to the data processing center, the tabulating department, or service bureau for final processing. The Cedar Engineering Division uses a Control Data Model 1604 Computer to process the data collected on the paper tape record.

HIGH-SPEED DATA PROCESSING

The routine used in processing this paper tape consists of a series of six passes (see attached flow chart), each determining a component part of the complete processed result.

During pass one, the routine first sorts and derives the on-time information and the production times. All transactions involving operation and person are now resolved into various times spent on any one particular job.

The production cards that result from pass one are totaled as to the amount of time spent by each person on a job and then by job for all persons. Thus all data and production are summarized into one card by type which will be produced for all transactions. The generation of these summary times for each job by employee is termed as pass two.

Pass three computes the pay of each employee from the information supplied on the payroll or on-time cards used with the 180. Other data, such as master file, year-to-date records, etc. are also produced in this pass. Once the payroll is computed, new up-to-date year-to-date records are generated along with a current earning card and all miscellaneous deductions. Thus, pass three has produced the complete payroll of any given time element in the Cedar Division operation.

Parts and costs of the distribution reports are generated in pass four. This report uses only the production cards derived from pass two for its input. Such items as hours, cost, quantity produced, and cost per piece make up the report. Each item is controlled by part number or by operation number or summarized into a major source by each individual employee. Therefore, accurate results from the costing procedures involved in the operation are derived from pass four.

Pass five is concerned only with the labor distribution report. The input here is supplied by the production cards from pass two and the payroll cards from pass three. From this information various cost ratios can be computed by part number, operation number, and person involved in each operation. Thus all desired management reports related to labor, costing, and distribution of employees are obtained.

Pass six provides a running, up-to-date inventory of all items used in the various operations at Cedar Engineering Division. The source data used are the production cards, again taken from pass three, as well as the pre-punched material cards. The Cedar inventory system encompasses some six distinct types of inventory:

1. Stores inventory
2. Work-in-process inventory
3. Sales inventory
4. Sub-contractor inventory
5. Reject inventory
6. Scrap inventory

The average inventory cost for each item in each of the above accounts is now updated daily through the use of the 180 Data Collector's daily input. Each inventory account is sorted down into three or four main groups--such as raw material, purchased part, subcontracted portion, and the customer-furnished material. The extreme flexibility and accurate management records obtained from the data punched out on the 180 paper tape make accurate cost-records and current inventory of each account by type easily updated and maintained at a moment's notice. This reliability of input is assured by built-in controls in the 180 Data Collector.

ERROR-FREE INPUT

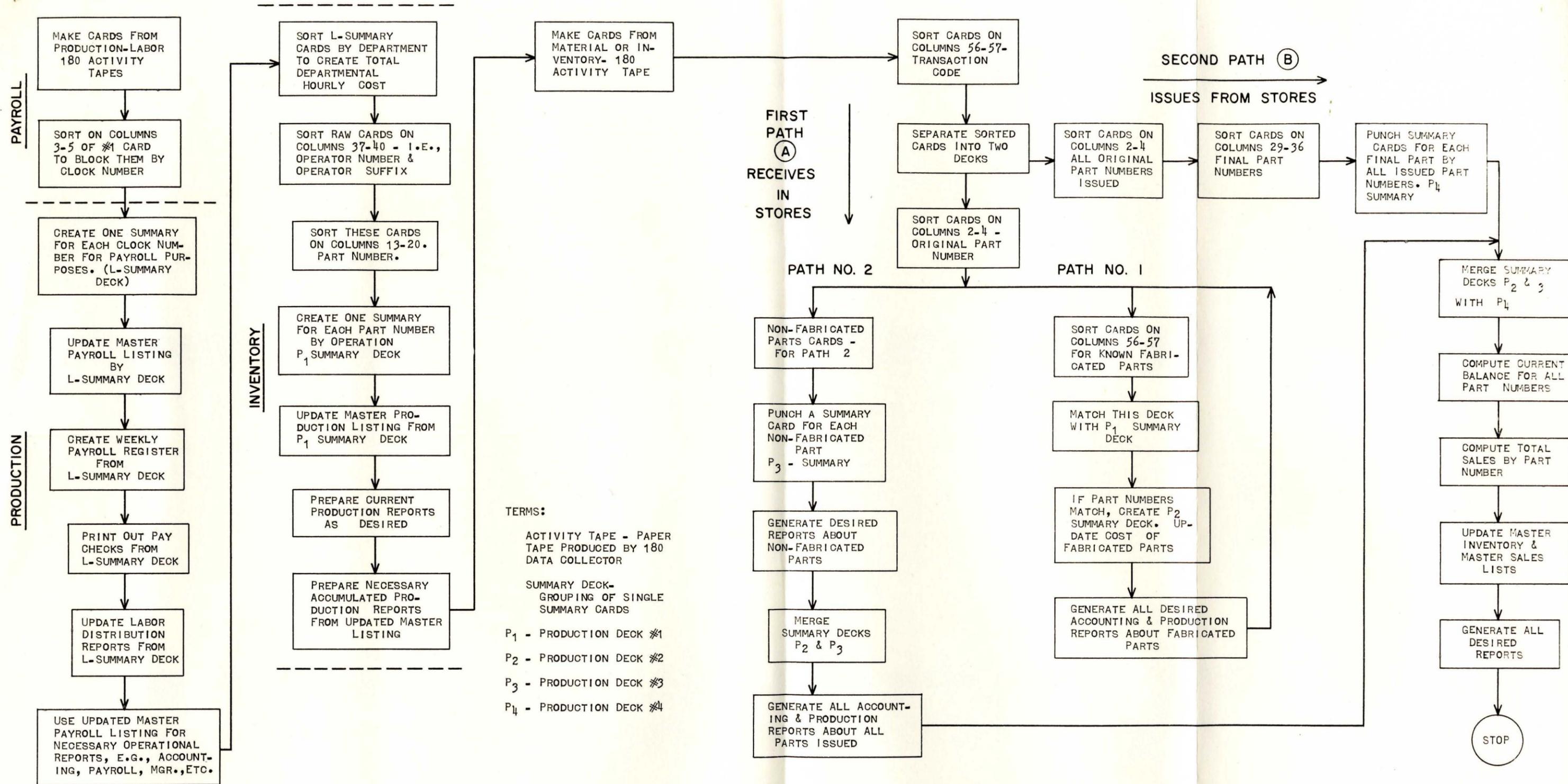
Each input card, clock-in or production type, is notched in a specified manner. It cannot be inserted incorrectly during the clock-in or production mode. The 180 Data Collector simply will not accept a production card during the clock-in mode. After the employee card has been inserted and read, the production card and the dialed variable information set are passed through the Data Collector. It is this kind of "watch-dog" control that assures a foolproof system of recording data.

In addition, there is an error switch that oversees the accuracy of the dialed information. If an error is made in dialing the variables, the error button is pressed, and an "error punch" appears on the paper tape. Thus, when the 1604 Computer's executive routine processes the data, it automatically tests for errors and will not process an inaccurate message.

From start to finish, from clock-in to final management report, this data gathering system using the 180 Data Collector produces swift, sure, completely reliable, and error-free management control when and where it is needed most.



MODEL 180 DATA COLLECTOR



GENERALIZED FLOW DIAGRAM OF 180 DATA COLLECTOR SYSTEM, CEDAR ENGINEERING DIVISION, CONTROL DATA CORPORATION