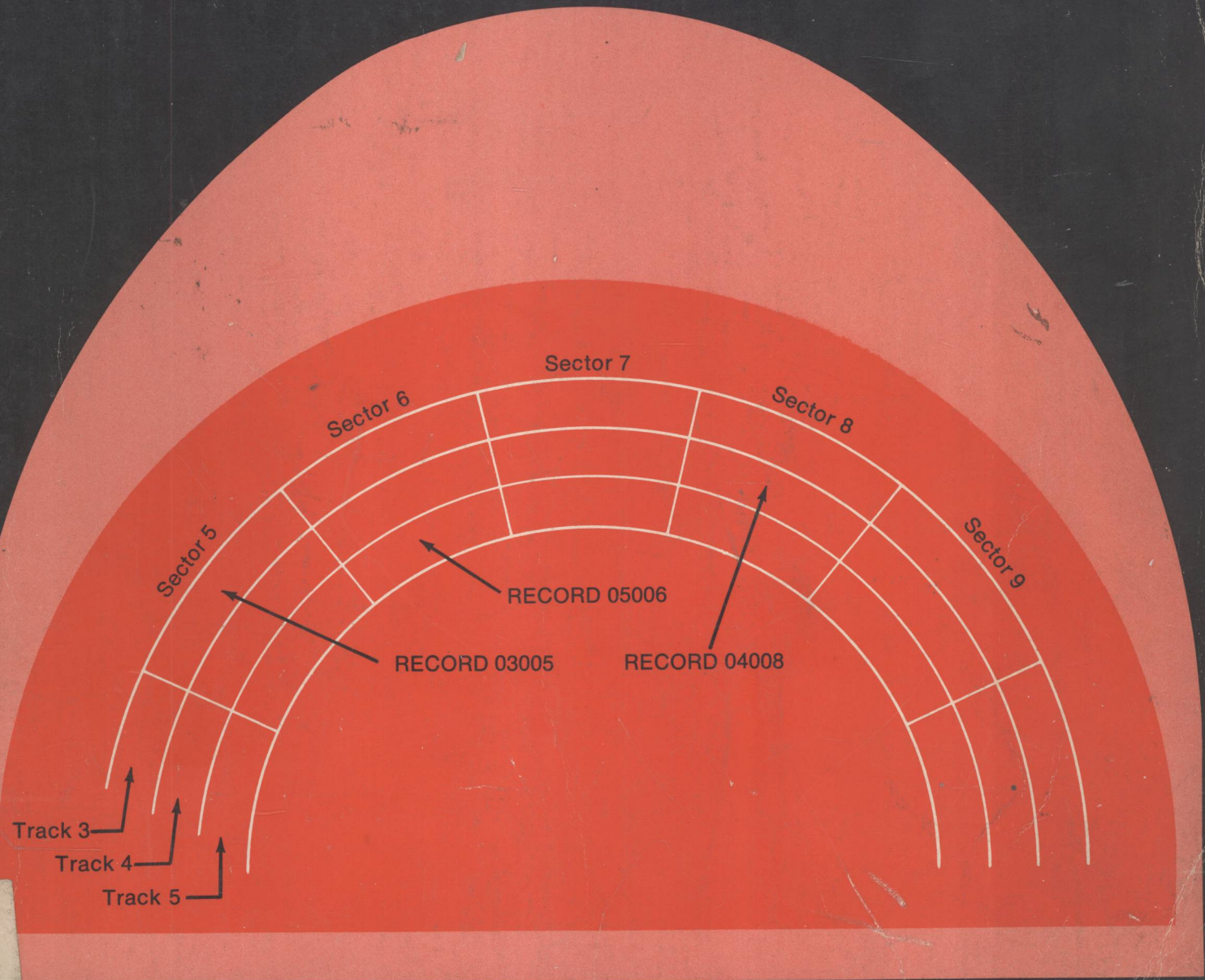


Peggy Hanson

OPERATING DATA ENTRY SYSTEMS



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DATA ENTRY SYSTEMS**

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**For
Michael and Patricia**

PREFACE

Rapid storage and retrieval of necessary data is a primary requirement of business and government at all levels. Keeping up with the flow of that data is an awesome task. Every day the volume of information to be collected, processed, and stored grows. And grows.

The current data processing equipment market offers a wide variety of information processing systems, all of which incorporate display terminals. They are by far the least expensive way of handling large amounts of data. Direct access display systems can handle a wide range of on-line applications, either locally or remotely. Key-to-tape and key-to-diskette systems bridge the gap between punched card systems and on-line systems.

This textbook is designed to acquaint the new operator with basic instructions to operate an IBM 3270 Information Display System (an on-line CRT), the IBM 50 Magnetic Data Inscrber (key-to-tape), the IBM 3741 Data Entry Station (key-to-diskette), and the IBM 3760 Key Entry Station (direct-access key-to-disk). An operator who can use one of these machines will be able to operate any other unit of the same type, regardless of manufacturer.

Practice material is included. Students working on the 50 and the 3741 are taught to create the program cards needed to perform the practice exercises. But because the programs controlling screen formats and data files for the 3270 and the 3760 are stored within a computer or control unit, students of these machines must be provided with the formats by the data center in which they are working.

The exercises which constitute the practice material have been created to acquaint the student with many basic types of work. In all cases, the exercises are designed to teach more than simple mechanical proficiency. A prime consideration was to acquaint the student not only with correct machine procedures, but also to give practical experience in analyzing and solving problems and in performing tasks with a minimum of supervision. By following the sequence of exercises, a student will develop manual dexterity and accuracy, and also learn to handle progressively more complex programs. Exercises 9 through 14 place special emphasis on using program chaining techniques.

I wish to thank the IBM Corporation for their generous assistance in the preparation of this manual. All photographs are provided by them.

Peggy Hanson

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OPERATING DATA ENTRY SYSTEMS

SOME DATA PROCESSING TERMS YOU SHOULD KNOW

A	Alpha. The symbol for alphabetic characters.
ACCUMULATOR	A counter set aside to add or <u>accumulate</u> special totals from each record as it is processed.
ADDRESS	A name or number representing the location of a record in a magnetic file or in computer core storage.
A/N	Alpha-Numeric. An alpha-numeric field may be filled with either alphabetic or numeric characters or symbols. This type of field in a program should be coded for alphabetic keying and the Numeric Shift key depressed to key in numeric characters and symbols.
APPLICATION	The type of job being performed, such as a payroll application, an inventory application, or a billing application.
∅	The symbol for a blank. Indicates the position of a blank space in a record.
BUFFER	A temporary storage area between two parts of a system, such as between a keyboard and the storage medium. Data is passed from one part of the system to the buffer and held temporarily while certain operations take place, then transferred from the buffer to another part of the system.
CHAINING	A means of connecting or linking different programs by use of special program codes.
CHARACTER	A number, letter, or symbol.
CURSOR	The underline mark that appears on a display screen. The cursor indicates the position of the <u>next</u> character to be entered from the keyboard.
DATA SET	A related set of records; one complete job.
EXTENT	The length of a record.
FIELD	Any specified number of character positions in a specific location within a record, as designated by the program format, which holds specific information. For example, in the record shown here, four fields are specified: a Customer Name field of 20 positions, a Customer Number field of 5 positions, a field to be left blank (skipped), and a Division Number field of 2 positions.

	21	25	36	37	
Customer Name	Cust #	Skip	Div #	(one record)	
1	20	26	35		

A field can be of any size, from 1 position to the entire extent of a record.

FILE

A collection of related records treated as a unit. For example, one line of an invoice constitutes an item record; one entire invoice constitutes a data record; and the complete set of records is a file.

FORMAT

The design or specification of a record. There are as many formats as there are jobs to do. Each is different. The format is used by the operator to create the program for performing a job, and as a visual reference to indicate the size and location of each field in a record.

HASH TOTALS

Control figures that are used to balance computer runs. Sometimes called batch or field totals. Hash totals can be created by counting the number of records processed, the number of batches of documents processed, or by accumulating a total on a major field which appears in every record.

HEX

Hexidecimal. A numbering and coding system based on multiples of 16.

INDEX

The first track or groove on a magnetic record. The index track contains information about the system and the data sets.

LABEL

A code name that identifies a document, data set, or file.

LEFT JUSTIFY

(LJ) Characters are usually entered in alphabetic fields beginning at the left margin of the field and skipping any unused spaces at the end of the field. Numeric fields may also be left-justified but usually are not.

LEFT ZERO

(LZ) In a numeric field only, the numbers are usually entered against the right margin of the field, and the preceding unused spaces to the left may be filled with zeros. Also called Right Adjust.

Example:

0	0	0	0	0	0	1	0	9	5
└──────────┘									
v									
left zeros									

MASK	An exact copy of data in a record field which is used to match against those data characters when searching for a record in a file.
MODE	The status or condition of a machine. The mode of a machine determines what functions it will perform (Read, Write, Verify, Search, etc.)
0	The symbol for zero.
Ø	The symbol for the alphabetic letter "oh."
OFF-LINE	Equipment that is not linked to a computer.
OFF-SITE	Equipment that is located at a place other than the central data processing area and is connected to the computer by means of telephone lines. Remote terminals.
ON-LINE	Equipment that is linked directly to the computer.
ON-SITE	Equipment that is located in the central data processing area.
PARITY	A condition of equality. Used to internally machine-check the validity of characters recorded on tape or disk.
PROGRAM	The means by which the automatic functions of a machine are controlled, i. e., shifting from alpha to numeric and vice versa, automatic skipping and duplication, defining the length of the record, automatic left zero fill, and program chaining, to name a few. The program consists of special codes stored in a program area in the machine.
PZ	Precede with Zeros. Fill the leftmost unused positions in numeric fields with zeros. Same as left zero (LZ) or right adjust (RA).
RECORD	A complete unit of data. A set of consecutive related fields comprising a single subject, treated as a single unit. The size of the record is determined by the job format.
RIGHT ADJUST	(RA) Same as left zero. Also called right justify.
SEARCH	To machine-scan a tape or disk to locate a specific record, group of records, or the end of data.
SECTOR	On disk, one section of a track.
SIGNIFICANT DIGIT	Any number 0 - 9. The zero is a significant digit <u>only</u> when it is included in a number: for example, <u>105</u> or <u>20010</u> . Preceding zeros are not significant digits.
STATUS	The current operating condition/mode of a machine.

SYSTEM	A related set of operations, machines, or applications which perform specific tasks.
TRACK	On disk, a complete circle or recording groove.
UNIT RECORD	A single record.
WRAP	The term that signifies the way a cursor moves from the end of one display line to the beginning of another.

IBM 3270 INFORMATION DISPLAY STATION

All data processing systems consist of input, processing, and output equipment. Information (data) that is to be processed in a computer, or stored in computer core or on magnetic files for later use by the computer, must be translated from our language of letters and numbers into a "language" of electrical impulses that the computer can "read" and understand. Translating data into machine-readable form and entering it is the job of input equipment. The 3270 is both an input and an output device. It can transmit data straight to computer core, or it can store data on magnetic tape or disk. It can also receive messages and data from the computer and print out copy on a printer attachment.

The 3270 consists of a keyboard and a TV-type display screen. These units are commonly called CRTs, RJE's, stations, or terminals.

There are three types of display screens. They come in two sizes. One type of screen has five more indicators than the other two, but the operation of all three types is almost the same. There are also three types of keyboards which may be attached to a display screen. One closely resembles a standard typewriter keyboard, one a keypunch keyboard, and one a computer operator's console keyboard.

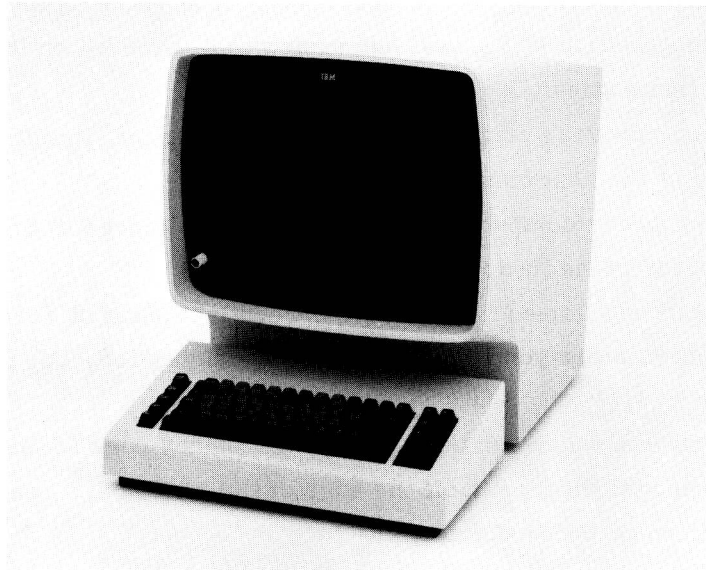


Fig. 1. 3270 display screen with keyboard attached.
(Photo courtesy of IBM.)

BASIC FEATURES

Sit at a display station and as you read about each feature, locate it, and if possible, press the key and watch the action that occurs. Most computer systems are protected by requiring a sign-on procedure from their terminals. This prevents the programs running from being interrupted or altered by incorrect use of a terminal. If your terminal is not signed on, you may press any key without affecting the system's operation in any way.

ON/OFF SWITCH

Located in the lower left corner of the screen. Pull the switch to turn the power on. A red band visible at the base of the switch when it is pulled out serves as a reminder to turn the device off when you are finished. By turning the on/off switch to the right or left, you can adjust the brightness of the display screen for the most comfortable viewing level. After the terminal has been turned on (activated), you must wait a few seconds for the station to warm up. When it is ready, a small line will appear in the upper left corner of the screen in the first character position on the first line. This mark is called the cursor.

CURSOR

The cursor makes operating a 3270 very easy. It appears on the screen as an underline to mark the position of the next character to be entered on the screen. The cursor is moved in three ways:

1. If the station is under the control of a computer program, it automatically advances to the position of the next character to be entered.
2. On a station not under computer program control, it moves to the right one space as each character is entered.
3. It may be selectively moved about on the screen by means of several cursor control keys. These keys allow you to move the cursor right, left, up, or down, as you wish.

Cursor wrap occurs whenever the cursor reaches any edge of the screen. This means that the cursor will disappear off the edge of the screen and reappear back at the first character position on the next line.