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5250 Information Display System
5251 Display Station
5256 Printer
Introduction

5250 Introduction

Preface

This publication describes the IBM 5250 Information Display System. The display system consists of the 5251 Display Station and the 5256 Printer. These machines are connected to System/34, yet each machine can be placed in a user's area that requires the services of the computing center.

The objective of this publication is to help the reader achieve a general understanding of the display system and how the display system can expand the capabilities of a data processing system.

This publication is divided into five chapters:

- Chapter 1 provides a general introduction to the 5250 information Display System.
- Chapter 2 describes each machine and the special features.
- Chapter 3 discusses the functional capabilities.
- Chapter 4 describes how a display system can be used in data processing applications.
- Chapter 5 provides some additional information, such as planning the installation, setting up the machines, reliability and serviceability.

The reader is expected to have a basic knowledge of data processing but prior knowledge of display systems is not a requirement.

RELATED PUBLICATIONS

- *IBM 5250 Information Display System Installation Manual-Physical Planning, GA21-9277*
- *IBM System/34 Introduction, GC21-5153*
- *Form Design Reference Guide for Printers, GA24-3488*

First Edition (April 1977)

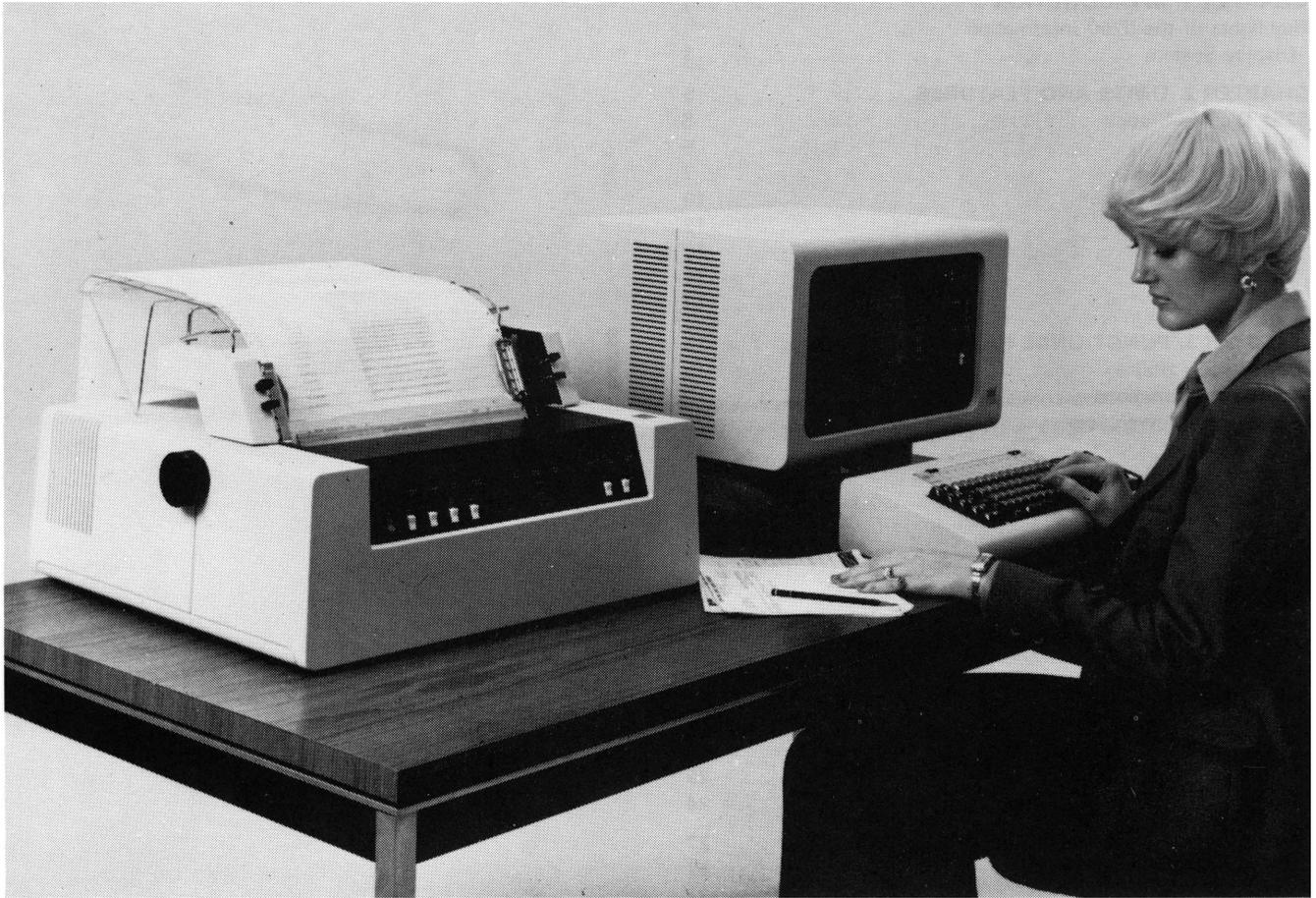
The functions and capabilities this manual describes reflect the latest information available, but it may be subject to minor changes before the IBM 5250 Information Display System is available. Subsequent editions of this manual will reflect any changes.

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The IBM 5250 Information Display System

Chapter 1. Introduction

The 5250 Information Display System consists of the 5251 Display Station and the 5256 Printer.

These machines connect to System/34. System/34 uses the 5251 for its system console and can use the 5256 for its system printer.

Also, display stations and printers can be located away from System/34. For example, a display station can be used for data entry and inquiry applications, thus enabling such areas as order entry, sales counter, shipping, and billing to enter and retrieve data concurrently from System/34.

Highlights of the 5250 Information Display System

The 5250 Information Display System offers:

- A display station and printer that can be placed in the user's area and connected up to 5,000 feet (1,524 meters) away from System/34
- The capability to display and print uppercase and lowercase alphabetic characters
- A CableThru feature for connecting display stations and printers in series
The display station has these characteristics:
- A display screen that displays 1,920 characters.
- A movable keyboard with key arrangement similar to a typewriter.
- A cluster of numeric keys for rapid entry of numeric data.
- A keyboard command key for selecting up to 24 additional, programmable, command functions.
- A security Keylock feature. Also, under program control, the capability to enter data without the data being displayed.

The printer has these characteristics:

- A printing speed of 40, 80, or 120 characters per second
- Bidirectional printing to improve throughput
- A maximum print line of 132 characters
- The capability of using individual or continuous forms
- Print position spacing of 10 characters per inch
- Selectable line spacing of 6 or 8 lines per inch
- The capability to print on continuous forms that have one to six parts
- An Audible Alarm feature

Advantages of a Display System

The IBM 5250 Information Display System can be located away from System/34 in areas that often require the services of the computing center. A display system brings the system to the user, which enables the user to enter data directly into the system, eliminating unnecessary transcribing and transferring forms and documents. As a result, current information is available when and where it is needed.

The display system reduces errors in the handling of data. The area operator who first enters the data can more easily discover data entry errors and is more qualified to correct them than personnel in the computing center. This concept also reduces the clerical activities at the computing center.

Display stations and/or printers can be added to System/34 as the data processing needs of your business change and grow. These machines can be located as far away as 5,000 feet (1,524 meters) from System/34.

A Sample Configuration

Display stations and printers can be located throughout your organization to provide maximum efficiency for each function the computing center must serve. Figure 1 illustrates one of the many configurations for the 5250 Information Display System. The machines in this figure that have two cables attached have the Cable Thru feature. This feature is described in the *Features* section of this manual. The *Applications* section of this manual further describes the uses for a display system.

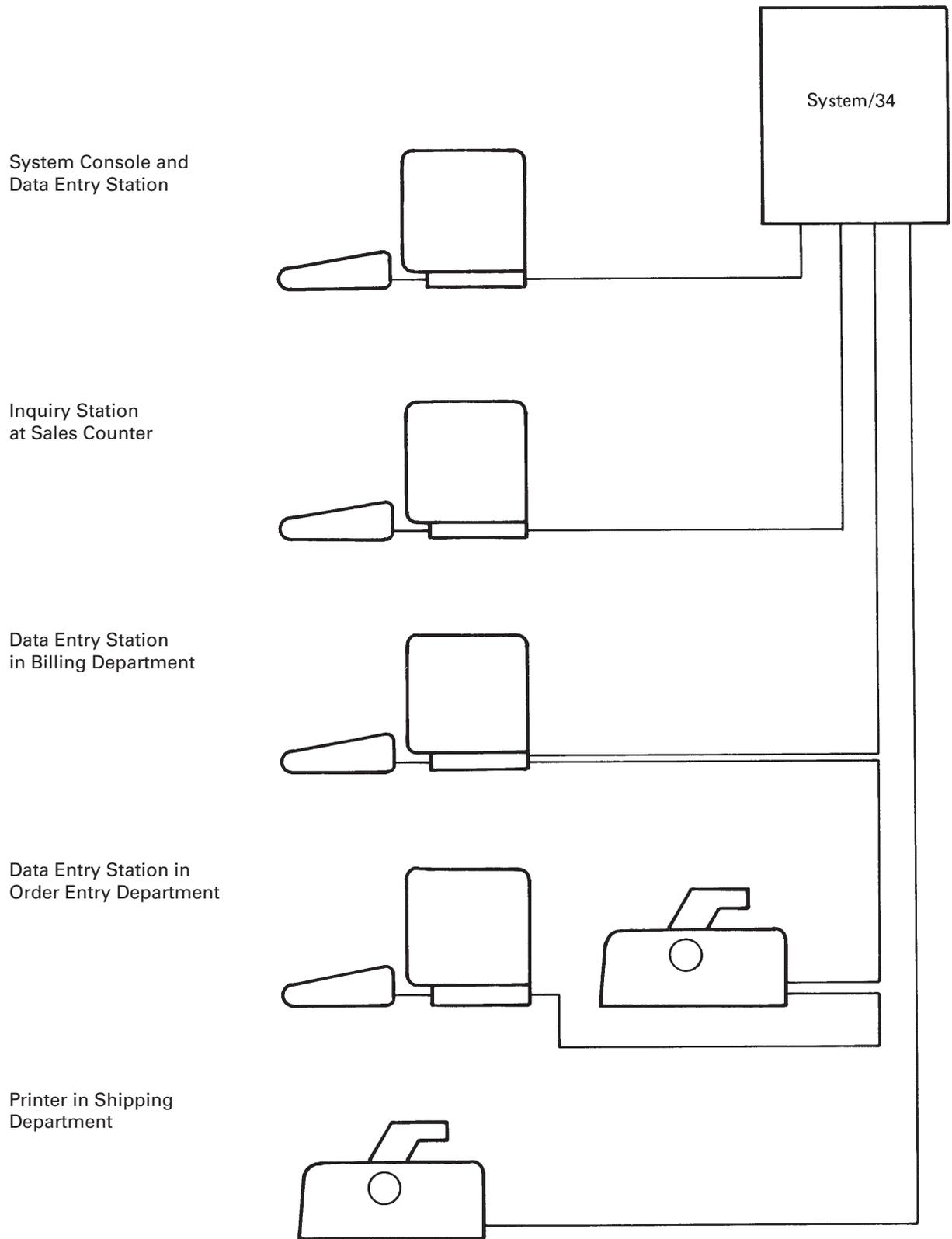


Figure 1. A Sample Configuration for the IBM 5250 Information Display System

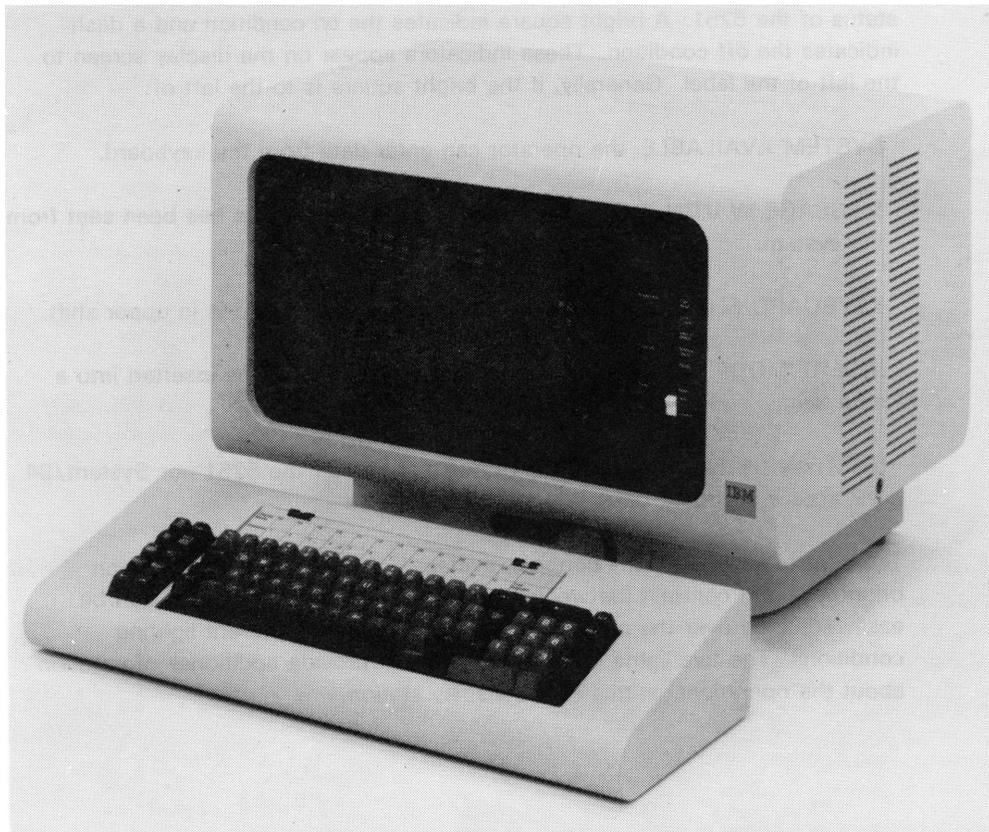
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Chapter 2. Units and Features

A general description of the IBM 5250 Information Display System, its advantages, and some of the uses of the display station and printer were discussed in the previous chapter. This chapter gives detailed descriptions of the 5251 and 5256 and discusses the available features.

5251 DISPLAY STATION

The 5251 Display Station, shown in Figure 2, is a fully buffered keyboard/display for inquiry and data entry applications. The display station attaches directly to System/34 or attaches in series with other display stations or printers using the Cable Thru feature. The major components of the 5251 are the display unit and keyboard.



5250-035

Figure 2. IBM 5251 Display Station

Display Unit

The display unit is made up of:

- Display screen
- Display indicators
- Control panel

The 1920-character display screen is arranged so that data is displayed in 24 rows with 80 characters in each row. Uppercase and lowercase alphabetic characters, numerics, and special symbols are displayed in an 8 by 16 dot matrix.

A cursor is normally displayed on the display screen when the power is on. The cursor resembles an underscore and can be positioned anywhere on the display screen either manually by the operator or automatically by the system program. The cursor indicates where the next character will be entered.

Five display indicators keep the operator constantly informed of the operational status of the 5251. A bright square indicates the *on* condition and a dash indicates the *off* condition. These indicators appear on the display screen to the left of the label. Generally, if the bright square is to the left of:

SYSTEM AVAILABLE, the operator can enter data from the keyboard.

MESSAGE WAITING, the operator knows that a message has been sent from the system.

KEYBOARD SHIFT, the operator knows that the keyboard is in upper shift.

INSERT MODE, the operator knows that characters can be inserted into a data field.

INPUT INHIBITED, the operator knows that neither the 5251 nor System/34 will accept keyboard data.

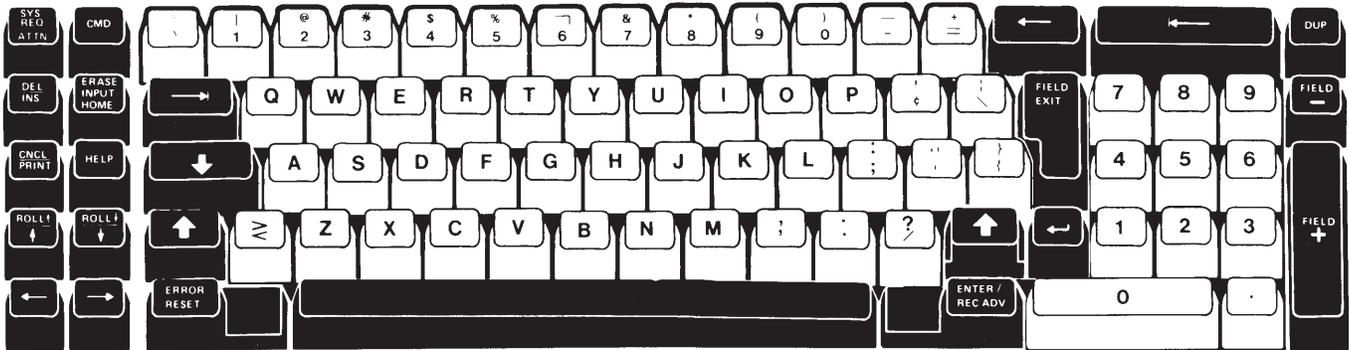
The control panel contains controls, switches, and lights. Display screen brightness and contrast (between normal and high-intensity fields) can be easily adjusted over the range commonly required for different lighting conditions. The five lights on the control panel provide additional information about the operational status of the display station.

Keyboard

The keyboard, shown in Figure 3, has the basic key arrangement found on a standard typewriter. A cable connects the keyboard to the display unit, allowing the keyboard to be placed in the most convenient work position.

The keyboard has several types of keys to accomplish specific purposes:

- The standard alphanumeric keys (letters, numbers, and special characters) to enter data
- Cursor movement keys to position the cursor
- Function control keys to communicate with System/34
- A command key that permits selection of 24 additional, programmable, command functions, assigned to the top row of keys
- An extra set of numeric keys arranged like a calculator keyboard

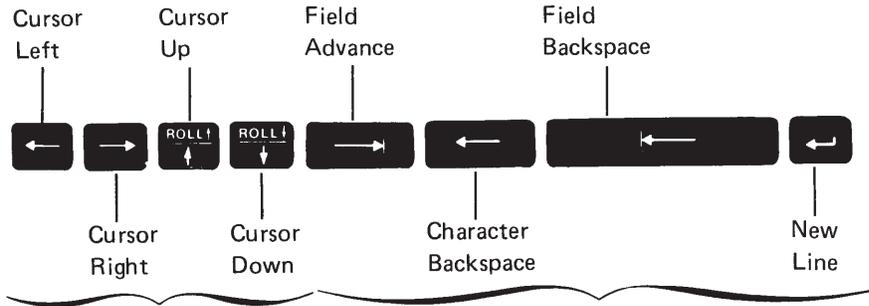


5250-039

Figure 3. Keyboard

The alphabetic keys, special symbol keys, numeric keys, space bar, and cursor control keys repeat their function. The operator simply keeps the desired key pressed and the display station performs the action once, pauses, then automatically repeats the function at the rate of approximately 10 repetitions per second.

Cursor movement keys permit rapid positioning of the cursor to any character position on the display screen. These keys cause the cursor to move in the direction indicated by the arrows on the keytop.



These keys move the cursor to any location.

These keys move the cursor only to locations programmed to accept operator input.

The numeric 10-key cluster is convenient to use when entering numeric data.

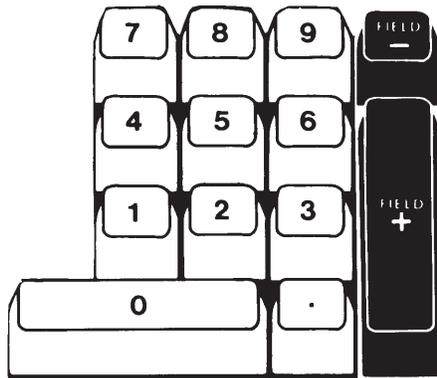


Figure 4 shows the function control keys. These keys perform system-related functions as well as operations on the display station.

	Function	Description
 	System Request	Used to sign-on the system.
	Attention	Used to signal the system.
	Command	Assigns the alternative functions for the top row of keys.
 	Delete	Causes the character above the cursor to be deleted and shifts to the left, one position, all characters that are to the right of the cursor and in the same field.
	Insert	Used to select insert mode. Insert mode allows characters to be inserted into a field while the character above the cursor and all following characters in the field are shifted to the right.
 	Erase Input	Blanks all operator entered data and fields that the operator has modified.
	Home	Returns the cursor to the first input position of the first input field.
	Print	Used to print the displayed information at the 5256 Printer.
	Help	Used to request additional information about an error or request help from the system.
  	Roll	Used to move the displayed information up or down to increase the effective viewing area.

Figure 4. Function Control Keys

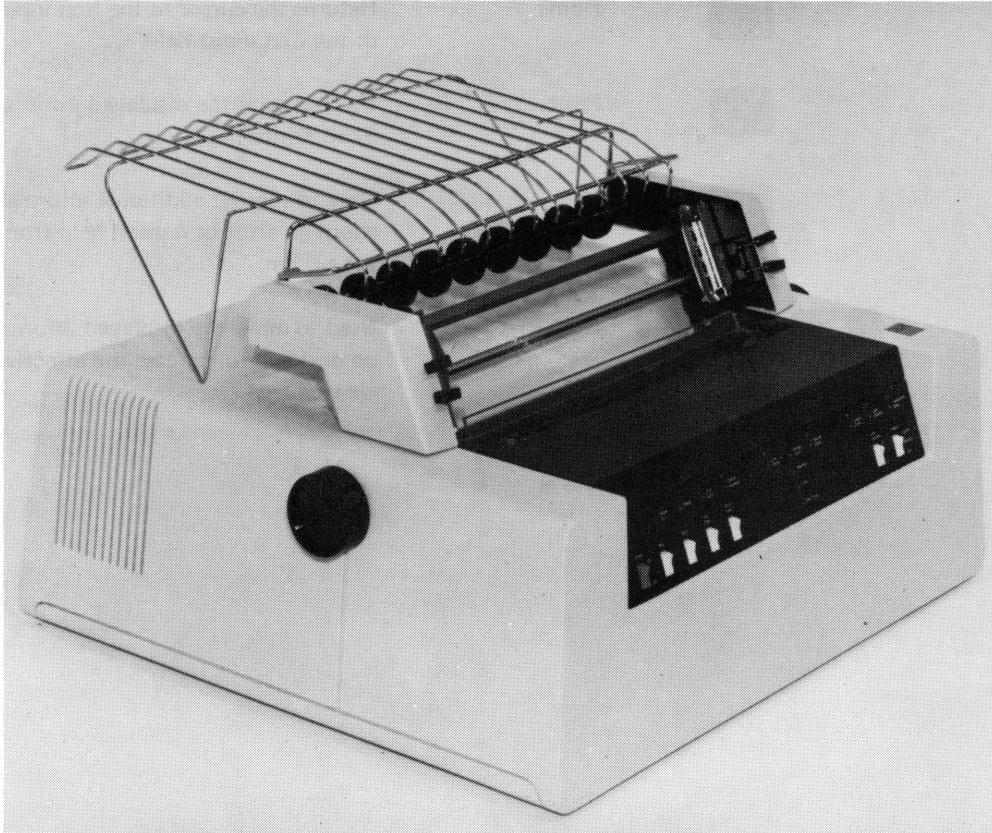
5256 PRINTER

The 5250 Information Display System can use the 5256 Printer to print information that is displayed at the 5251 Display Station, or information written from a system program. The 5256 Printer, shown in Figure 5, is a fully buffered, 132-position, serial matrix printer with front panel controls and an easy-to-remove forms tractor. The printer attaches directly to System/34 or attaches in series with other printers or display stations using the Cable Thru feature.

The 5256 is available in three models:

- Model 1 prints at a maximum rate of 40 characters per second (cps).
- Model 2 prints at a maximum rate of 80 cps.
- Model 3 prints at a maximum rate of 120 cps.

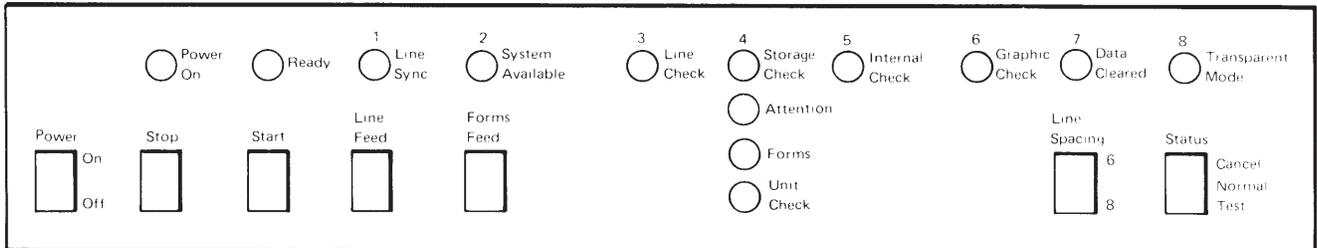
The average printing rate depends on the format of the printed data on the page. The 5256 prints bidirectionally and has a full look-ahead capability. This capability reduces the print head movement by not requiring the print head to move to a margin before printing. Instead, the print head continues to print while moving in either direction, thus increasing throughput.



5256-037

Figure 5. IBM 5256 Printer

The switches and lights are on the front of the printer. There are 13 lights, a Power switch, a Status switch, and five functional switches including a Line Spacing switch to select either six or eight lines per inch. When the Status switch is set to Test, the lights numbered 1 through 8 take on alternative meanings and are used for problem determination.



5256-038

Continuous or individual forms can be used on the 5256 Printer. The printer accepts forms of up to six parts, but forms consisting of more than four parts should be tested under operating conditions to determine suitability of feeding and legibility.

Continuous forms can be 3 to 15 inches (75 to 380 millimeters) wide and individual forms can be 6 to 14.5 inches (150 to 370 millimeters) wide. Refer to the *Form Design Reference Guide for Printers, GA24-3488*, for general form-design information, such as, form length, weight, fastenings, and other form-related items that should be considered when forms are designed.

The forms tractor is required for continuous forms, but can be easily removed when the printer is being used for individual forms. A forms stand feature permits stacking of continuous forms above floor level.

FEATURES

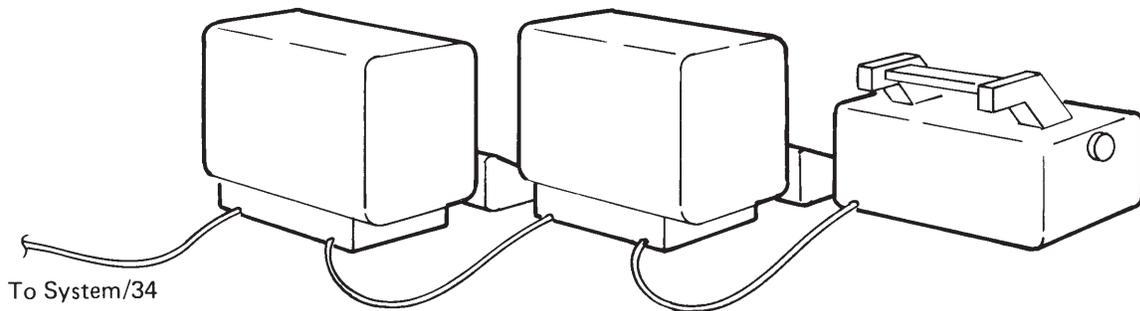
This section describes the special features for the 5250 Information Display System. A special feature is one that provides added capability but is not required to make the display system functional. The following features are available:

5251 Display Station

- CableThru feature
- Keylock feature 5256 Printer
- CableThru feature
- Audible Alarm feature

Cable Thru

The CableThru feature provides the capability of attaching a combination of seven display stations or printers in series. A maximum length of 5,000 feet (1,524 meters) of cable is allowed between System/34 and the last station in the series. The CableThru feature is not required on the last station.



Display stations and printers with the CableThru feature have an additional cable connector and station address switches. The address switches are used to assign a unique address to each station in the series. Station addresses must be assigned when the display system is set up.

Keylock

The Keylock feature provides a lock and key that can be used to disable the display station whenever it is to be left unattended. When the key is in the locked position or is removed from the display station, only the Ready light will remain on, the display is blank, and the operator is unable to input data. When the key is in the unlocked position, data entry is allowed. The key cannot be removed when it is in the unlocked position.

Audible Alarm

The Audible Alarm feature alerts the operator to problems that require attention. For example, the alarm sounds if the printer detects an error which would stop printing or if the 5256 Attention light comes on. The alarm can also be programmed in the application program for specific situations.

The audible alarm can be effectively used when operator intervention is required, for example, either during a wait or when the printer is unattended. There is a manual volume control for this alarm at the rear of the printer.

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Chapter 3. Functional Capabilities

The 5250 Information Display System offers a wide range of functional capabilities that enhance both system and operator control over data flow and application performance.

5251 DISPLAY STATION

This section describes the functional capabilities of the display station.

Command Functions

Twenty-four additional functions can be assigned to the top row of keys. This capability allows unique adaptability of the display station to your own applications. The additional functions can be written on a template and the template placed in the recessed area above the top row of keys. Extra templates are provided with each display station making it convenient to use a separate template for each application.

The command key (CMD) is used to select the command functions.

Display Mode	13	14	15	16	17	18	19	20	21	22	23	24	Clear
	1	2	3	4	5	6	7	8	9	10	11	12	Test Request

5250-040

Pressing CMD and then pressing one of the top row keys selects command functions 1 through 12, or Test Request. Pressing CMD, then holding down the shift key and pressing one of the top row of keys selects Display Mode, command functions 13 through 24, or Clear.

- *Clear* is used to blank every character position on the display screen and position the cursor to the first character position on line one. Clear must be specified in the application program.
- *Test Request* is used to select an interactive procedure for checking communication between the display station and System/34.
- *Display Mode* allows the operator to select the display mode best suited for the light level. Light characters can be displayed on a dark background or dark characters can be displayed on a light background.

Uppercase/Lowercase

The 5251 Display Station displays alphabetic characters in either uppercase or lowercase.

Character Set

The 5251 character set consists of alphabets, numerics, special symbols, a negative signed asterisk, and a solid rectangle. Keyboards and displayable character sets are provided for the following countries: Austria/Germany, Belgium, Brazil, Canada (French), Denmark, Finland, France, Italy, Japan (English), Japan (Katakana), Norway, Portugal, Spain, Spanish-speaking countries, Sweden, United Kingdom, and the United States. An international character set is also available.

Display Control and Highlighting

The 5251 Display Station, with System/34, provides data entry control by data field. Each data field is established by a field attribute control code preceding the first position of the field. The field attribute control code, which is written by the system program, uses a single nondisplayed character position and serves as a visual separation between successive fields. A field may be started at any character position of the display and is variable in length. The following characteristics are controlled by the field attribute control code.

Column Separator: Causes all characters in the field to be preceded by a vertical bar. Column separators at the same column position on successive rows will appear as a continuous, vertical line on the display.

High Intensity: Causes the characters in a field to be displayed at a brighter intensity than other data on the screen. The brightness of high intensity fields is adjustable with the Contrast control on the operator's panel.

Nondisplay: Allows data to be entered without it being displayed. This attribute is beneficial in applications where there are security restrictions. An identification can be entered in nondisplay fields to prevent unauthorized viewing.

Blink: Causes all characters in the field to blink repeatedly. The entire field is blinked at the rate of approximately one and one-half times per second.

Underscore: Places a continuous line under all positions of the field.

Reverse Image: Causes the characters in the field to be displayed as a dark graphic on a light background or light characters on a dark background if Display Mode had been previously selected by the display operator.

Additional display capabilities are available under program control. For example, blink cursor and blink screen can be used to alert the display operator to an error or that a specified action must be performed.

Format Control

The following field edit and control functions are provided by System/34.

Right Adjust

A field may be specified as right adjust with either zeros or blanks used as fill to the left of the significant characters. A field defined in this manner will, when the FIELD EXIT key is pressed, shift the data entered by the operator to the right until the rightmost character keyed is aligned with the right boundary of the field. The positions to the left of those characters entered by the operator are filled with the specified fill characters.

Mandatory Entry/Mandatory Fill

Fields can be specified such that at least one character must be entered for the field, or, that if one character was entered the entire field must be filled. If both attributes are specified, the field must be filled.

Field Exit Required

A field specified as field exit required, requires that a field exit key be used to exit the field. When the operator attempts to leave a field defined as field exit required without using a field exit key, an error will be displayed.

Alpha Only

Fields specified as alpha only allow only the characters A through Z, comma, period, hyphen, apostrophe, and blank to be entered.

Signed Numeric

Signed numeric fields reserve the units position of that field for display of the sign; minus for negative, and blank for positive. For example, a six-position signed numeric field can use only five positions for operator entered data with the sixth position reserved for the sign. Use of the FIELD EXIT key results in the positive indication. In addition, a signed numeric field allows only 0 through 9 to be entered and the numbers are automatically right-adjusted with zero or blank fill.

Alphameric Entry

A field specified as alphameric allows the operator to enter all characters on the keyboard. Manual shift is required to enter uppercase and symbols on the upper part of the key.

Monocase

A field specified as monocase causes all alphabetic entry to be uppercase only.

Auto Enter

A field specified as auto enter causes the same function as if the operator pressed the ENTER key at the conclusion of entering information for that field.

Dup Enable

A field specified as duplicate enable allows the DUP key to be pressed by the operator. DUP typically is interpreted by the application program to mean duplicate this field from the previous field.

Help Function

If an error code is not understood by the operator, the HELP key can be used to request additional information about the error. The HELP function can also be implemented in an application program to provide help that is not error condition related.

Audible Alarm

A keyboard signal can be programmed to operate for approximately one second, thus producing an audible tone. The audible alarm can be effectively used as a ready signal during a wait.

5256 PRINTER

This section describes the functional capabilities of the printer.

Uppercase/ Lowercase

The 5256 Printer prints alphabetic characters in either uppercase or lowercase.

Character Set

The 5256 character set consists of alphabetic, numeric, and special symbols. Character sets are provided for the following countries: Austria/Germany, Belgium, Brazil, Canada (French), Denmark/Norway, Finland/Sweden, France, Italy, Japan (English), Japan (Katakana), Portugal, Spain, Spanish-speaking countries, United Kingdom, the United States and Canada. An international character set is also available.

Bidirectional Printing

Bidirectional printing is the ability to print from left to right and right to left. Bidirectional printing and concurrent tabbing with high-speed line feeding makes the average printing rate dependent on the length of the printed line, the amount of tabbing within the printed line and the amount of line feeding between printed lines. Bidirectional printing and dual print buffers increase the throughput of the printer.

Dual Print Buffers

The 5256 Printer uses two, 132-byte print buffers. When a block of data is received, the printer formats the data into print lines. Then as each print line is formatted, printing is started and formatting of the next print line is initiated. Two print buffers are used to ensure that the formatting is one line ahead of the printing.

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This chapter describes the display system environment, discusses two general areas where display systems can be used, and then describes a sample application.

Display System Environment

Business firms of varying sizes and branch locations of larger companies are considering display systems because they:

- Increase productivity through system/operator interaction.
- Provide fast update and visual verification of system files.
- Extend system data files to using departments.
- Provide fast system console response.

Two or more display stations can be used at the same time. For example, a purchasing agent can use a display station for inventory control while a clerk is using another display station to fill customer orders. Figure 6 shows a typical display system environment.



5250-041

Figure 6. Display System Environment

The display operator can treat the displayed information as if it were in a book; like turning the pages, looking at one page at a time, making additions and corrections to the data in the format displayed on the screen, checking each page for accuracy, and extracting the needed information.

Operators will find the display station easy to use. The keyboard has a layout similar to a typewriter. Information can be entered in free or formatted form. The sequence of items entered is important in free form but the location of the items on the display screen is not. In formatted form, the operator usually enters information opposite a prompting message.

The 5251 Display Station has capabilities that make selected data fields easily identified. High intensity, reverse image, blink, underscore, and the column separator are useful capabilities in an application where exceptions must be apparent. These capabilities are also useful for inquiry and data entry applications.

Inquiry

A display station used for inquiry allows the operator to have access to a computer data file. The operator typically asks one or more short questions (inquiries) by keying in a specified code. The system responds by displaying information. The response might be lengthy and require the operator to read and interpret the information returned. Based on the first system response, the operator might key in another question. While the operator is reading the returned information, the system addresses other display stations or does other work until the operator again requests more information.

Upon completion of an assignment, an operator can sign off and return to other work. Meanwhile, someone else can use the display station. In this way, the display station can be shared by people with different work requirements.

The number of display stations to be shared depends on the number and frequency of questions, the duration of an inquiry session, and the locations of departments or persons needing access to System/34.

Inquiry with Update

The ability to find and change a record, called inquiry with update, is a natural follow-on to inquiry. Changes sometimes must be made to records being referred to by inquiry. For example, a hospital patient's medication orders may have to be changed quickly according to changes in the patient's condition or a hotel guest's bill may have to be updated just before checkout.

Data Entry

There are two common types of data entry applications; both involve continuous operation of the display station. In the first type, the operator can be preparing a document such as a sales order. The system guides the preparation of the order and supplies some of the data to be printed. The operator keys in the customer number, item numbers, and quantities. The system can be programmed to supply the customer name and address, unit prices, description, and price extensions for the items ordered.

The second type of data entry application provides for data recording in much the same way as an offline key entry device is used to punch cards or write diskettes. With a display station, the information is entered directly into System/34 as data files.

Sample Application

An order from a customer initiates many activities in the business cycle. An order enters the data processing cycle in written form, on what is called a source document. How this source document is written and who writes it will vary, of course, from company to company. In many cases, an order form is filled out by the salesman and delivered directly. In other businesses, salesmen or customers may phone in orders, which are written down by an order clerk as they come in.

The 5250 Information Display System offers a display station and printer for performing the functions related to entering information into the system and printing reports. For example, the display station is used for creating the customer order file and the printer is used for printing invoices and picking slips. The following description of the order entry application is simplified to show the role of the display station.

The operator begins the daily activity by entering the sign-on command, with or without a password. If a password is requested by the program, the display station's nondisplay capability can be used to retain confidentiality of the code. The Keylock feature can also be used to prevent unauthorized use of the display station.

Next, the system displays an application menu, which is a list of jobs that may be performed. A menu simplifies the operator's duties by displaying a code corresponding to the job; this eliminates the need for the operator to know procedures and commands. The operator simply enters a code corresponding to the job and enters a password if one is required. From the following display, assume the operator selected the code for the order entry application.

```
COMMANDD1
                                     MENU: MENU1
1. STOCK STATUS INQUIRY           13.
2. ORDER ENTRY                     14.
3. INQUIRY OF ORDER STATUS        15.
4. WORK ORDER RELEASE             16.
5. WORK ORDER INQUIRY            17.
6. PRODUCT STRUCTURE INQUIRY     18.
7. WHERE USED INQUIRY            19.
8. ROUTING INQUIRY               20.
9. WORK IN PROCESS UPDATE        21.
10.                               22.
11.                               23.
12.                               24.

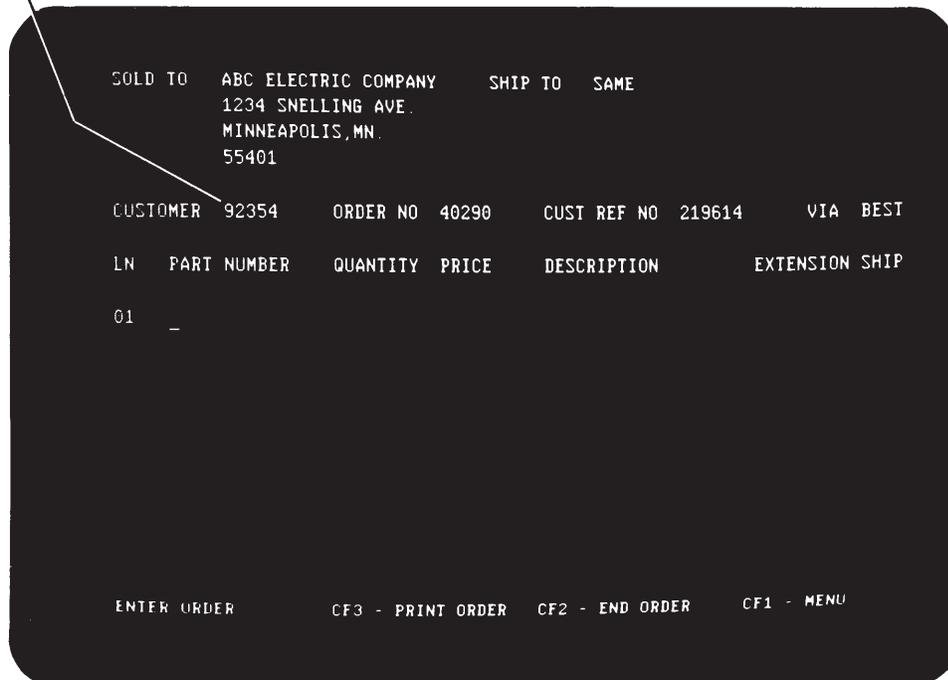
ENTER NUMBER, COMMAND, OR OCL.

←- READY
```

5250-042

The order entry process is an interactive procedure, with the operator entering information and the system responding with information from the customer master file and the item master file. To begin the order entry process, the operator enters the customer number. The system then compares this number to the customer master file and responds by displaying an order format with the SOLD TO name and address and the customer number, or an error message when an invalid customer number is entered.

Customer
Number
Entered
by Operator



```
SOLD TO  ABC ELECTRIC COMPANY  SHIP TO  SAME
          1234 SNELLING AVE.
          MINNEAPOLIS, MN.
          55401

CUSTOMER 92354  ORDER NO 40290  CUST REF NO 219614  VIA BEST

LN  PART NUMBER  QUANTITY PRICE  DESCRIPTION  EXTENSION SHIP

01  _

ENTER ORDER  CF3 - PRINT ORDER  CF2 - END ORDER  CF1 - MENU
```

5250-043

After confirming the customer name and address and entering other heading information (if required), the operator is ready to begin entering line item information. The operator would normally enter the part number and quantity and then press ENTER. Mandatory entry could be specified for the part number field whereas the quantity field, if not entered, would default to one. After the system validates these entries, the price and description will be displayed, the system calculates and displays the price extension, and the operator can visually verify the line. The high intensity or blink field attributes could be used to get the operator's attention if an incorrect part number was entered.

Part Number and
Quantity Entered
by Operator

```

SOLD TO  ABC ELECTRIC COMPANY   SHIP TO  SAME
          1234 SNELLING AVE.
          MINNEAPOLIS, MN.
          55401

CUSTOMER 92354   ORDER NO 40290   CUST REF NO 219614   VIA BEST

LN  PART NUMBER  QUANTITY  PRICE  DESCRIPTION  EXTENSION  SHIP
01   2890         2      1.46  INSULATOR   2.92       2
02   214          1     12.30  RELAY        12.30      1
03   1478         6      6.06  BATTERY     36.36      6

                                TAX      2.06
                                FREIGHT  5.16
                                TOTAL    58.80

ENTER ORDER      CF3 - PRINT ORDER  CF2 - END ORDER  CF1 - MENU
  
```

5250-044

Three options are available to the operator while entering the order. The command function keys can be programmed to print the order (CF3), end the order (CF2), or return to the application menu (CF1). These functions are displayed at the bottom of the display.

After the entire order has been entered, the system calculates the taxes and shipping charges, and then compares the total amount of the order with the customer's credit limit in the customer master file. The total amount is displayed or a message is displayed indicating the order exceeded the credit limit. The message could be displayed in reverse image or blinked to emphasize the error condition.

After all orders are entered, the operator uses CF1 to return to the application menu and selects another job. The system retains the order information for updating the item master file and for printing invoices and management reports.

Chapter 5. Additional Considerations

Planning the Installation

You should read the *IBM 5250 Information Display System Installation Manual—Physical Planning, GA21-9277*, to determine how to best prepare your site for arrival of the equipment.

Some of the topics discussed in the manual are:

- Space requirements
- Environment
- Furniture
- Electrical requirements
- Cable specifications
- Unit specifications

Careful advance planning and scheduling makes it possible for you to set up the equipment with little interruption of the daily work routine.

Setting Up the System

After planning and preparing the location, you will be ready to set up the display system.

When the equipment arrives, plan to have two people available to lift the machines from the cartons and set them in place. Then set up the equipment by following the step-by-step instructions provided with each machine.

No tools or access to the inner parts of the machine will be required. The complete process consists of unpacking the machines, locating the machines in the prepared areas, connecting the cables, and performing a checkout procedure to verify that they operate properly.

The instructions should be used if the machines are subsequently moved to other areas.

Reliability and Serviceability

Both the 5251 and 5256 incorporate some of the latest technological advancements in the industry and utilize high quality components to increase reliability of the machines. Should a problem occur, IBM has included procedures that allow the operator to either correct the problem or to accurately describe the problem to the service representative.

Error Codes

Error codes tell the operator that an incorrect operation was attempted or that System/34 is not responding properly. These error codes are often displayed or printed with a message that explains the situation and how to correct the situation.

Basic Testing Routines

Basic testing routines can be used by the operator to periodically check out all operations of the machines. On the display station, the operator selects Test Request; on the printer, the operator moves the Status switch to Test.

The operator manuals will tell the operator what to expect from the basic testing routines and what to do if the routines should detect a problem.

Problem Determination

When a problem is suspected, the operator should determine the operational status of the machine before calling the service representative. This can be done using the problem determination procedures in the operator manuals. These procedures are designed for use by an operator who has little or no data processing experience. They will guide the operator step-by-step in determining whether the problem was caused by an incorrect operating procedure or a machine failure. For example, the procedures suggest that the operator verify the operating procedure used when the problem occurred. If the problem is within the display station or printer, the procedures assist the operator in gathering pertinent information and inform the operator what to report when calling the service representative. The operator's description of the problem will speed the repair action by the service representative.

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