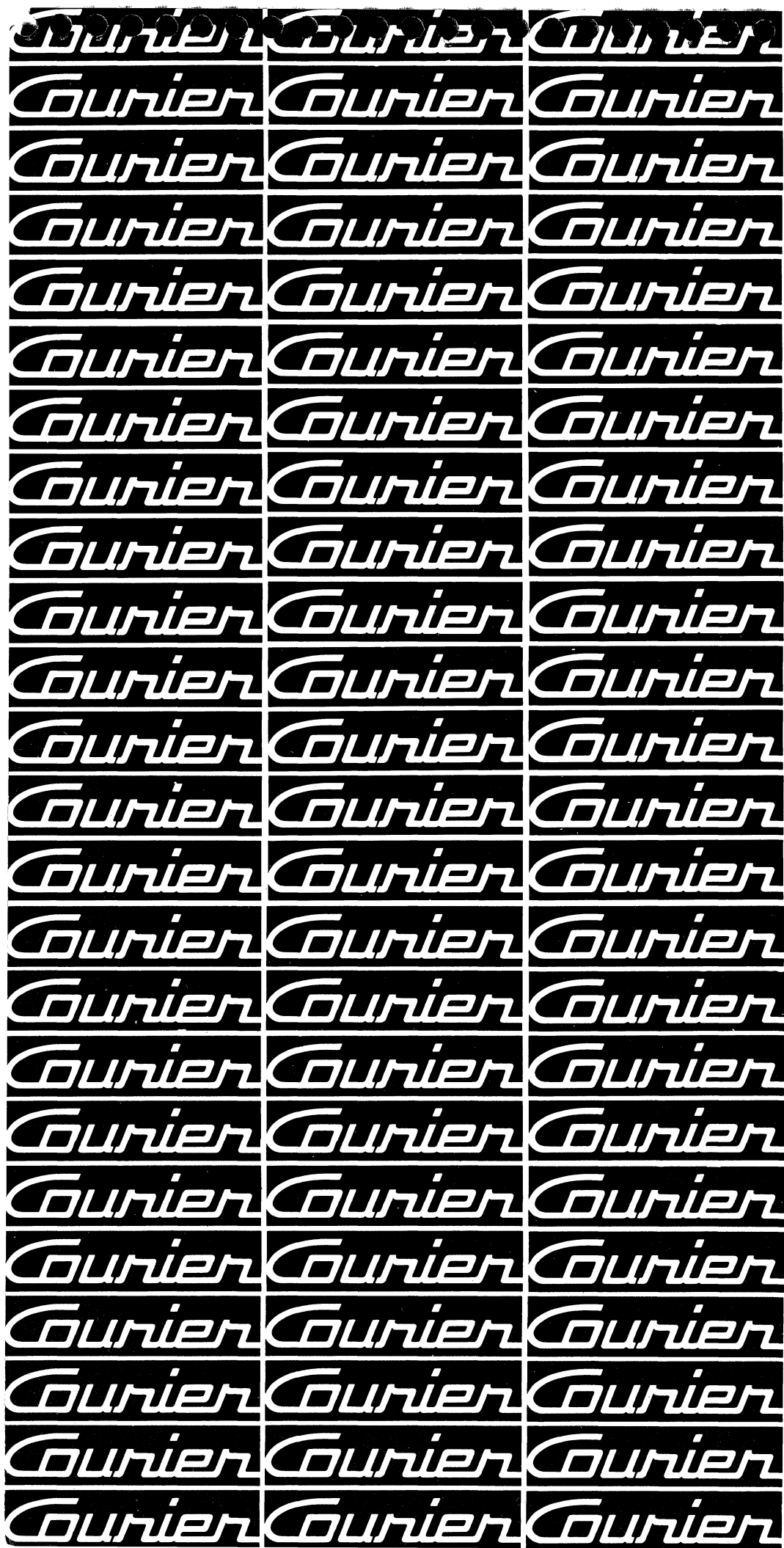


270 Information Display System

Operator's Manual

Courier



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Introduction

This manual provides basic instructions for the operation of the 270 Information Display System manufactured by Courier Terminal Systems, Inc, Phoenix, Arizona 85034.

The manual is divided into five main sections as follows:

- General Description
- Typewriter Keyboard Operation
- Data Entry Keyboard Operation
- Typewriter Keyboard With Numeric Pad Operation
- Printer Operation

Also included are instructions for operating the console keyboard (similar to the typewriter keyboard), a description of the light pen and badge

reader options, and a short discussion of operator problem determination. Each of the sections pertaining to the keyboards contains sufficient information for operators to become thoroughly familiar with their particular keyboard. Each section stands alone making it unnecessary for persons using the manual to refer to previous paragraphs or illustrations. The instructions are organized in a logical step-by-step fashion that flows easily from one procedure to the next.

Courier Terminal Systems welcomes any comments or recommendations relative to this operator's manual. Such comment should be forwarded to:

Courier Terminal Systems, Inc
2202 East University Drive
Phoenix, Arizona 85034
Attention: Senior Editor



FIGURE 1. MODEL 2700 DISPLAY TERMINAL

General Description

FEATURES

The 270 Information Display System is a family of general-purpose communication terminals and printers which provides the user with the ultimate in capability, flexibility, and reliability. Designed to be compatible with IBM display systems and computers, the 2700 Display Terminal offers features and advantages not offered by any other terminal. A terminal with detached keyboard is shown in Figure 1.

Three models of the display terminal are available:

Model 1 — 480-character display capacity (12 lines of 40 characters each)

Model 2 — 960-character display capacity (12 lines of 80 characters each)

Model 3 — 1920-character display capacity (24 lines of 80 characters each)

These terminals can be used for entry of data into, or retrieval of data from, any of several IBM computers.

Standard features available on all three models include a non-glare video screen faceplate, the ability to establish a predetermined display format (called a formatted display), dual intensity characters, a blinking square cursor (if desired in place of the dash-type cursor), a variable field underline, and field blink. In addition, the choice of one of two standard keyboards is offered as a standard feature of each of the three terminal models.

Optional features available for use with the 270 Information Display System include a light pen, an automatic badge reader, lower-case alphabetic characters, a two-position locking switch (with key), an audible alarm to alert the operator of an entry error, a keyboard numeric lock, a typewriter keyboard with a 10-key numeric pad, and a console keyboard. The operation of both the standard and optional features is described in the sections of this manual dealing with keyboard operations.

KEYBOARDS

There are four keyboard models any one of which may be used with the display terminal. These keyboards, shown in Figure 2, are briefly described as follows:

- **Standard Typewriter Keyboard**
The alphabetic and numeric keys of the typewriter keyboard are arranged just like a typical office electric typewriter. Symbols and punctuation are also arranged to be similar to a typewriter and are activated by shifting just as when operating a typewriter. This keyboard also has a 12-key pad, the keys (PF keys) of which are used to access computer application programs. The standard typewriter keyboard is shown in Figure 2a.
- **Data Entry Keyboard**
The alphabetic keys of the data entry keyboard are arranged like an office typewriter. However, the numeric keys are arranged in a keypunch-like layout just to the right of center on the keyboard (Figure 2b). When using this keyboard, numbers can be entered only when the keyboard is in the numeric or shifted mode. The punctuation marks and symbols are also arranged similar to a keypunch.
- **Typewriter Keyboard With Numeric Pad**
Offered as an option, this keyboard is essentially the same as the standard typewriter keyboard, but with two important differences. First, the PF keys used for program access are arranged in a row at the top of the keyboard. The second difference is that a 10-key numeric pad is located to the right of the keyboard. The numbers on this pad are arranged in a pattern similar to that found on calculators or adding machines used for accounting purposes. The typewriter keyboard with numeric pad is shown in Figure 2c.
- **Console Keyboard**
Also offered as an option, the console keyboard is the same as the typewriter keyboard except for the arrangement or location of several of the symbols and punctuation marks on the keys. The console keyboard is shown in Figure 2d.

One of the most important keyboard-related options is the lower-case option which provides the capability to display the 26 lower-case alphabetic characters on the terminal screen. With this optional feature installed, the L.C. pushbutton (located on the control panel) is used to activate the lower-case typing mode on the keyboard. Once activated, the alphabetic keys generate upper- or lower-case characters depending upon the use of the SHIFT keys. Again, the



FIGURE 2A. TYPEWRITER



FIGURE 2B. DATA ENTRY

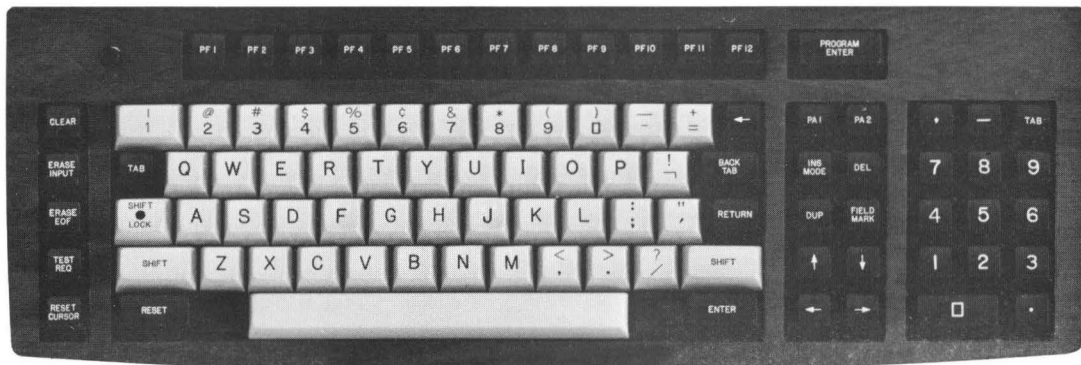


FIGURE 2C. TYPEWRITER WITH NUMERIC PAD

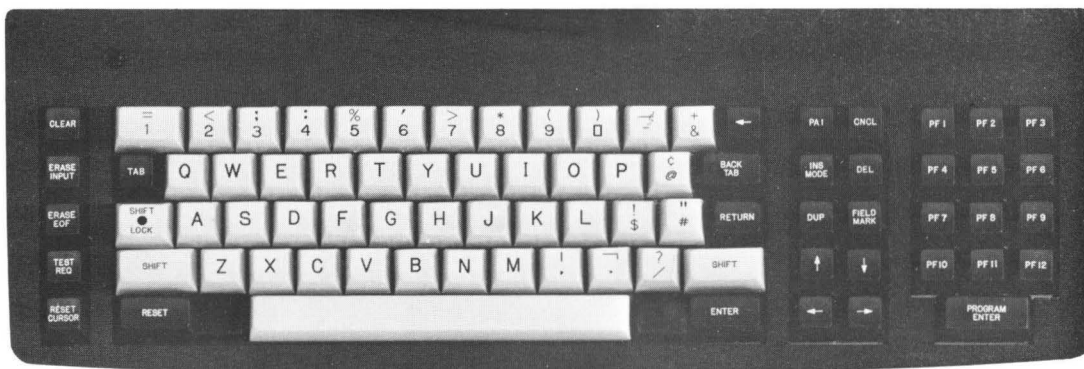


FIGURE 2D. CONSOLE

operation is similar to that of a standard electric typewriter. The lower-case option may be used on the two typewriter keyboards. It is not applicable to the data entry or console keyboard.

Another optional feature available for use with any of the keyboards is the audible alarm. This option provides a small speaker which sounds a one-half second audible tone when a character is entered into the last unprotected location on the screen. The alarm can also be activated by the computer with which the Model 2700 Display Terminal operates.

All of the keyboards have been designed with full regard to the people who will operate them. The keyboards are detached from the display terminal, and the rear legs are adjustable by the operator so that a comfortable slant can be obtained. The keys activate a mechanical "clicker" when operated. This clicking sound provides an operational feedback to the person using the keyboard, and is adjustable by the operator from full-off to normal operating levels by turning a small control which is located in the top left corner of all keyboard models.

In addition, each keyboard has appropriate homing keys, i.e., keys which have a deeper "dish." These keys are the same as those used as home keys on any office typewriter. All of the keys have a matte finish to reduce glare.

In summary, the human engineering factors incorporated into the 270 Information Display System provide optimum screen size and angle with allowances for appropriate character size, arrangement and clarity. The keyboard layout

and functions coupled with other functions such as protected format, tabbing, transaction keys, insert and delete and repeat characters, increase operator efficiency and reduce fatigue.

CONTROLS AND INDICATORS

Two control panels are incorporated in the Model 2700 Display Terminal; the layout of each is shown in Figure 3. The upright or vertical panel is located to the right of the display screen; the other panel is located underneath. A functional description of each control or indicator is explained in conjunction with the operating instructions for the individual keyboards.

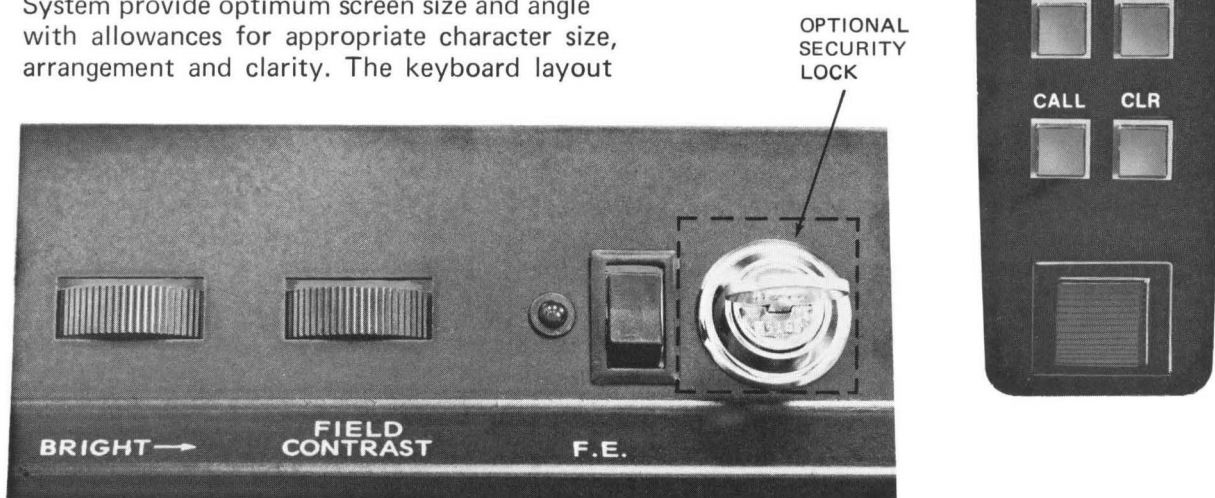


FIGURE 3. CONTROLS AND INDICATORS

OPERATING THE TERMINAL

The remainder of this instruction manual has been prepared so that each operating instruction is adjacent to an illustration of the key or group of keys being operated. The operator should sit at a terminal as the step-by-step instructions are read so the switches and keys may be used at the same time. The sequence of operation begins when the POWER pushbutton is pressed, then proceeds from adjusting and observing the display image, through explaining the indicators, to understanding all of the keys on the keyboard. The operation of each keyboard is included in a separate section. Each section is complete in itself making it unnecessary to read data about a keyboard that is not installed on the terminal or to constantly refer to other sections of the manual.

CURSOR OPERATION

Full understanding of the cursor operation is essential to a complete understanding of the operation of the 270 Information Display System. Proper use of the cursor enhances operator efficiency. For this reason, the operator, especially the new operator, should become familiar with the cursor operation even before proceeding with the remaining sections of this manual.

The cursor is a special symbol resembling an underscore (or optionally, a blinking square) which appears on the screen beneath the character position where the next character will be entered. It is not possible to begin entering data at a location other than where the cursor is located at that particular time. In addition, if it is desired to change, alter, or edit data that has been previously entered, the cursor is positioned beneath the data to be changed and then the appropriate action is initiated.

When power is first turned on, the cursor is automatically positioned at the first character location at the top of the screen. Normally, the cursor blinks on and off so that it is easily recognized, especially if the terminal screen has been filled with data.

On all keyboards, a cluster of four keys to the right of the main keyboard allows for movement of the cursor one location at a time to the left (←), right (→), up (↑), or down (↓). In addition, the backspace key (in its normal position on the keyboard) serves the same function as the move-cursor-left key and is also marked with a left arrow (←). The TAB key and the BACK TAB keys also move the cursor; the TAB key moves the cursor to the right, and the BACK TAB key moves it to the left. In addition, the RETURN key positions the cursor to the first entry position on the next row; the RESET CURSOR key positions the cursor to the first entry position in the top row. Using these keys, the cursor may be positioned to any location on the screen without disturbing the contents of the corresponding buffer locations.

The cursor positioning keys are all capable of causing the cursor to "wrap" (move off the top or bottom of the screen or move off either side and appear on the opposite side). Horizontal wrap causes the cursor to reposition to the first location of the next lower or higher row of characters. Vertical wrap causes the cursor to reposition to the top or bottom of the screen, but does not involve any horizontal movement. The cursor movement keys repeat at approximately 24 times per second for horizontal movement and approximately 12 times per second for vertical movement.

Detailed instructions about operating the cursor are contained in the sections of this manual pertaining to each keyboard.

FORMATTED AND UNFORMATTED DISPLAYS

It is important to understand that two types of displays — or modes of operation — are possible with the 270 Information Display System. These operational modes are called "formatted" and "unformatted" displays.

With a formatted display, the screen is formatted by the computer application software program.

The operator is restricted to specific fields or areas when entering data from the keyboard. An example of a formatted display is shown in Figure 4. Those areas where data already exists are called "protected" fields; the areas where it is possible to enter data are referred to as "unprotected" fields or input fields.

During operation, if the operator tries to enter data into a protected field, the keyboard becomes disabled to prevent such entry. With an unformatted display, the screen is free of prearranged

data, and the operator may enter data in a completely free form manner using all character positions on the screen. However, each job may use a different format or none at all making it essential that each operator understand each type of display. In the following discussions, the operator should proceed with the operation pertaining to the requirements of the particular job assignment. The keyboard operating instructions are arranged so that the new operator can learn either formatted or unformatted display operation, but it is not necessary to learn both at the same time.

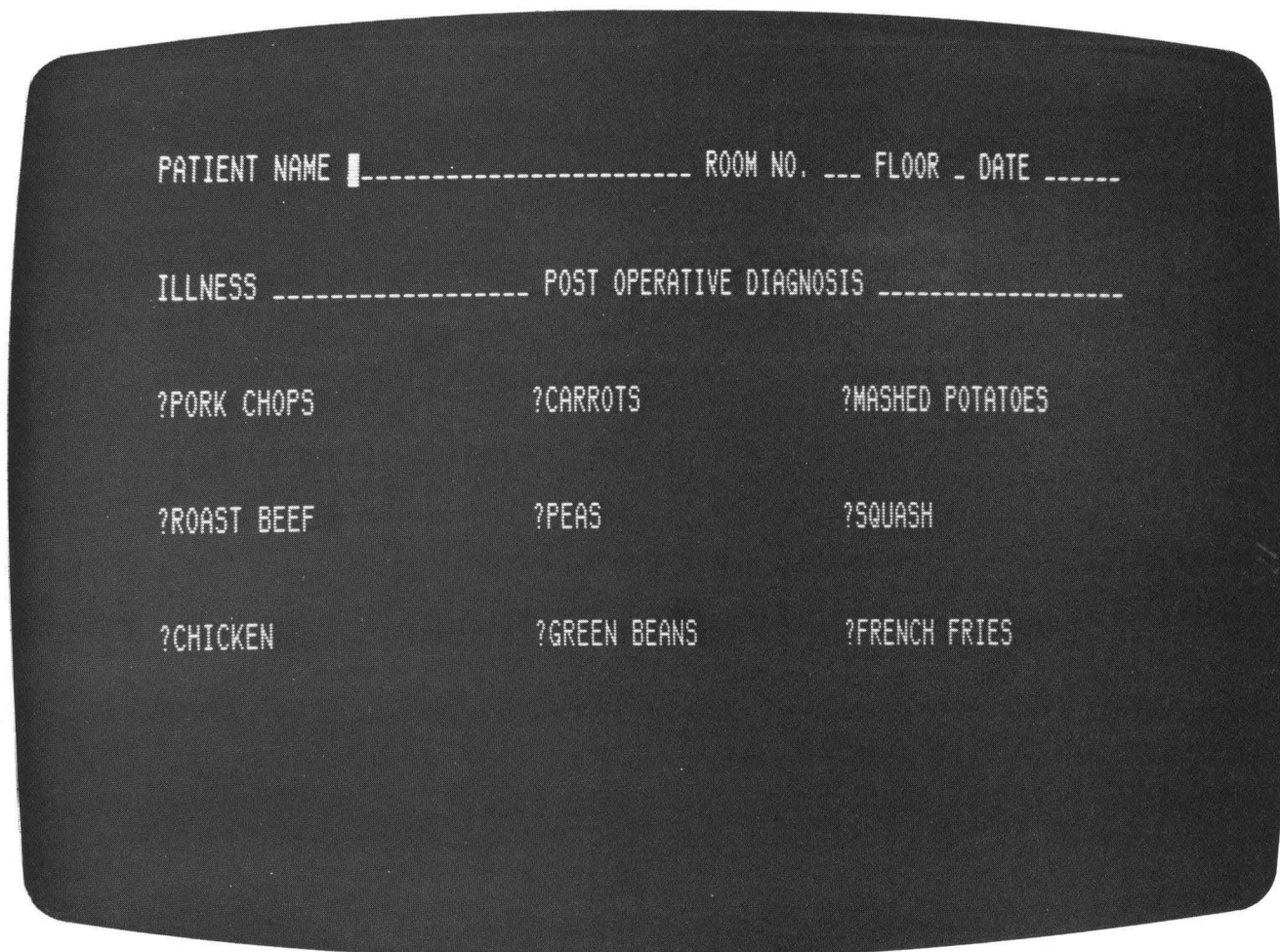


FIGURE 4. FORMATTED DISPLAY EXAMPLE

Typewriter Keyboard Operation

GENERAL OPERATION

The typewriter keyboard is similar to a standard typewriter keyboard in appearance and arrangement of keys. The majority of the keys perform the same function as the keys of the same name on a typewriter keyboard. The layout of the typewriter keyboard is shown in Figure 5.

This keyboard can generate and display 26 upper-case alphabetic characters, 10 numeric characters, and 26 symbols and punctuation marks by operation of the key that designates the desired character. The character is displayed on the screen in the position marked by the cursor. The keyboard also includes the control keys which are used to edit data and generate input messages to signal the computer.

Keys that have two designations shown on their faces can generate either designation or character, depending upon the position of the SHIFT key. The lower character is generated when the selected key is pressed and the keyboard is in the unshifted mode. To generate the upper character, the SHIFT key must be held down while the selected key is pressed. The SHIFT keys and the SHIFT LOCK key function essentially the same as they do on any standard typewriter.

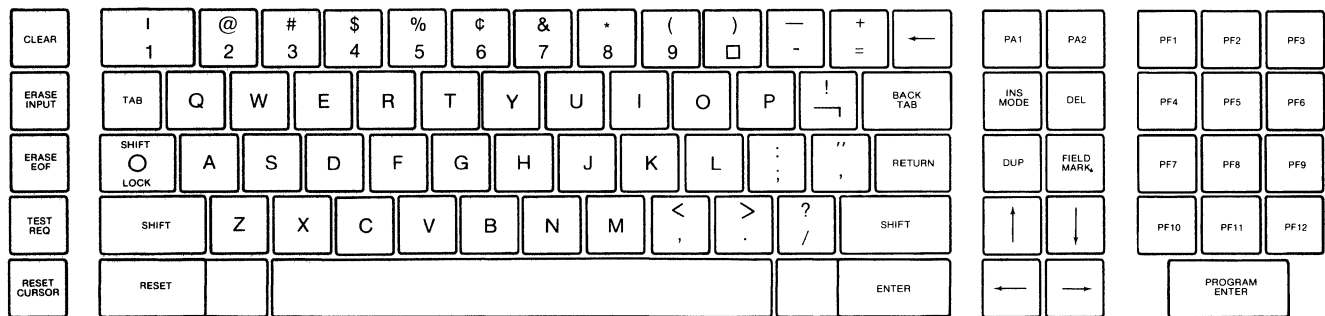


FIGURE 5. TYPEWRITER KEYBOARD

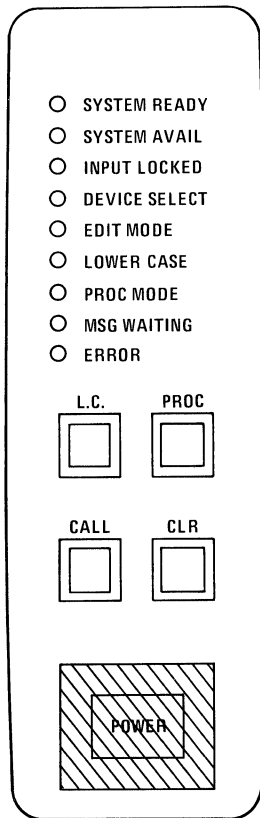
OPERATION OF TYPEWRITER KEYBOARD

To operate the typewriter keyboard, observe the following procedural steps:

NOTE

If your company has a sign-on procedure and your terminal is not signed-on, you can operate any key without affecting the program or the computer. A sign-on procedure allows the program to ignore any signals received from a terminal that is not signed-on.

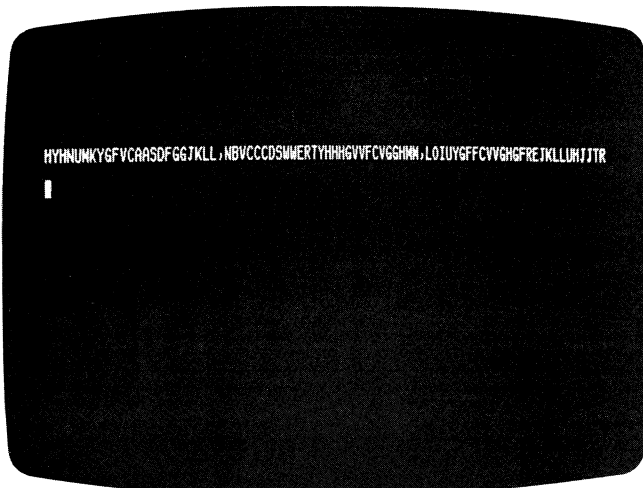
FIGURE 6. POWER PUSHBUTTON



Press the POWER pushbutton to apply power to your terminal. When the power is on, the pushbutton lights. A delay of a few seconds is built in to allow the cathode ray tube (screen) to warm up. After this delay, a short horizontal bar or blinking square appears in the upper left portion of the screen (in the first character position on line 1). This symbol is the cursor.

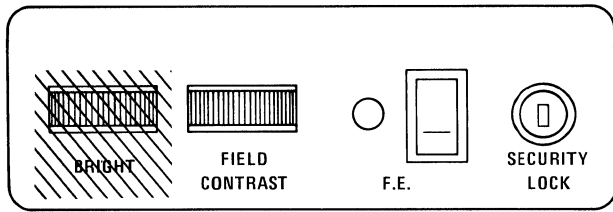
Observe the control panel (Figure 6) to the right of the screen. The SYSTEM READY and the SYSTEM AVAIL lights should be on. If the INPUT LOCKED light comes on, press the RESET key. If the INPUT LOCKED light remains on, check the position of the key in the SECURITY LOCK (if one is installed in your unit). The key should be turned to the left. Place the key in that position, and press the RESET key again. The INPUT LOCKED light should go out.

FIGURE 7. LINE OF CHARACTERS



Now enter a line of characters (Figure 7) using any combination of letter and/or number and symbol keys. Note that the cursor travels along as you type this data. Also note that if a character key is held down, its operation is automatically repeated. Observe these characters on the screen.

FIGURE 8. BRIGHT CONTROL

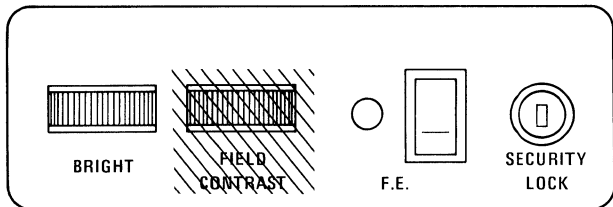


Adjust the brightness of the displayed characters using the BRIGHT CONTROL (Figure 8). Experiment with this control until a setting is found that is most convenient and comfortable for viewing. There is no correct setting for the brightness of the image.

NOTE

Use of a formatted test display is essential to understanding and accomplishing the following instructions which pertain exclusively to formatted display operations and are clearly labeled as such. In this case, it is also necessary to understand the difference between a protected and an unprotected field.

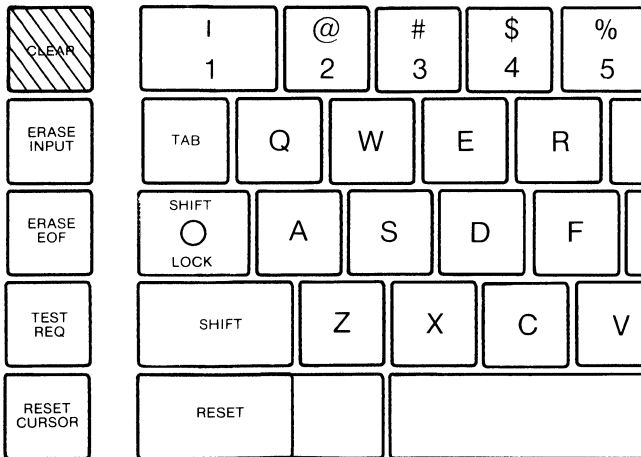
FIGURE 9. FIELD CONTRAST



UNFORMATTED DISPLAY: Use of the FIELD CONTRAST control for unformatted displays is not necessary.

FORMATTED DISPLAY: Adjust the FIELD CONTRAST control (Figure 9). Note that the protected fields of the formatted display have a different intensity than the unprotected fields.

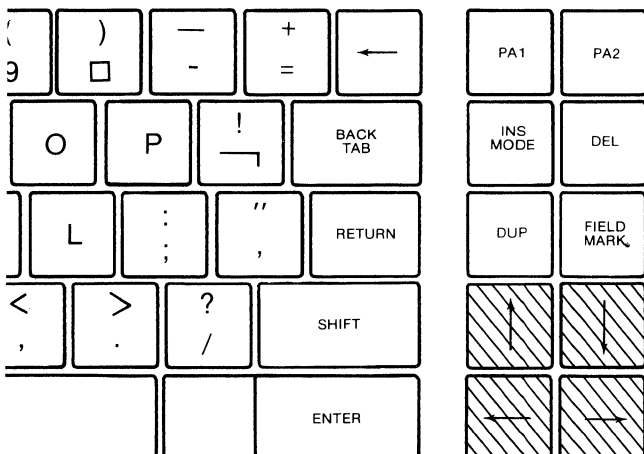
FIGURE 10. CLEAR KEY



UNFORMATTED DISPLAY: Press the CLEAR key. Note that pressing the CLEAR key blanks every character on the face of the screen and positions the cursor to the first character position on line 1. The SYSTEM AVAIL light (Figure 6) goes out momentarily, and the INPUT LOCKED light and DEVICE SELECT light come on momentarily. If the INPUT LOCKED light does not go out, press the RESET key to unlock the keyboard.

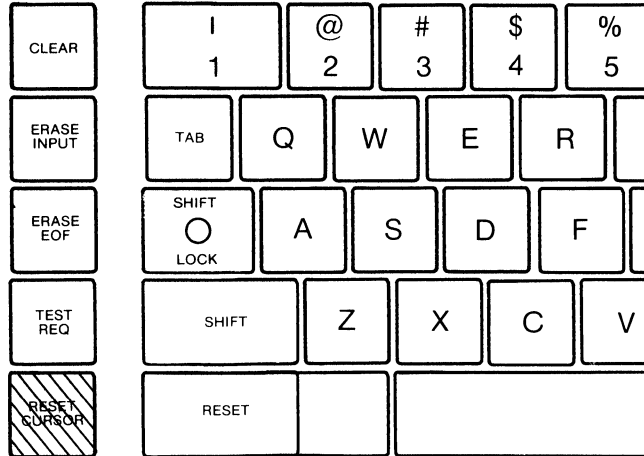
FORMATTED DISPLAY: Do not press the CLEAR key when using a formatted display. Pressing this key blanks the screen and establishes an unformatted display.

FIGURE 11. CURSOR CONTROL KEYS



Move the cursor by pressing each of the cursor control keys in turn. Observe the operation of the cursor. Make the cursor wrap. Note that the cursor control keys move the cursor automatically if the keys are held down.

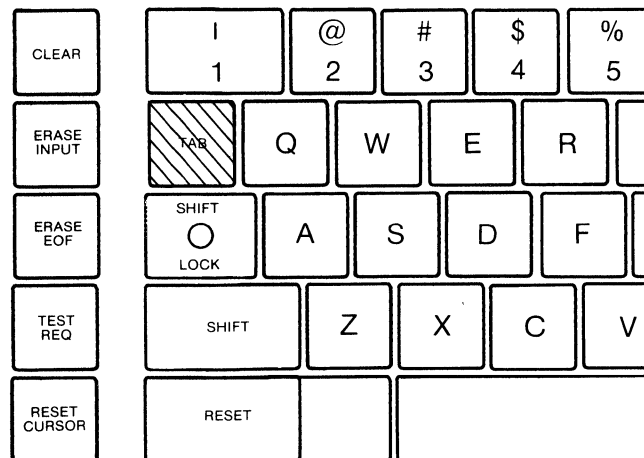
FIGURE 12. RESET CURSOR KEY



UNFORMATTED DISPLAY: Press the RESET CURSOR key. Note that the cursor is positioned to the upper left-hand corner of the screen.

FORMATTED DISPLAY: Press the RESET CURSOR key. Note that the cursor returns to the first character position of the first unprotected field.

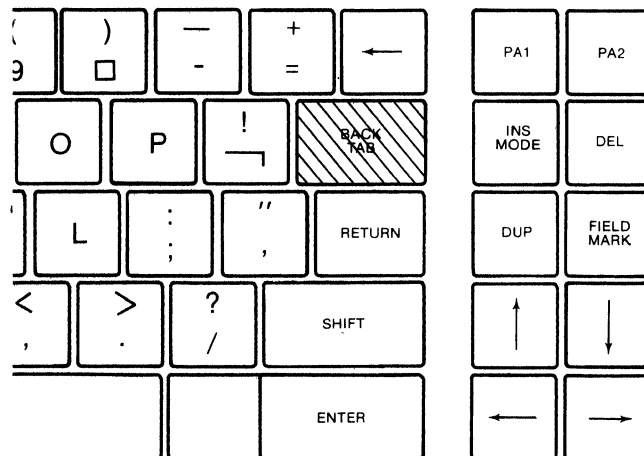
FIGURE 13. TAB KEY



UNFORMATTED DISPLAY: Press the TAB key. Note that the cursor does not move to a new position.

FORMATTED DISPLAY: Press the TAB key several times. Note that the cursor always moves to the right to the next position where it is possible for the operator to enter data. Using the TAB key, position the cursor to the farthest and lowest right-hand position possible.

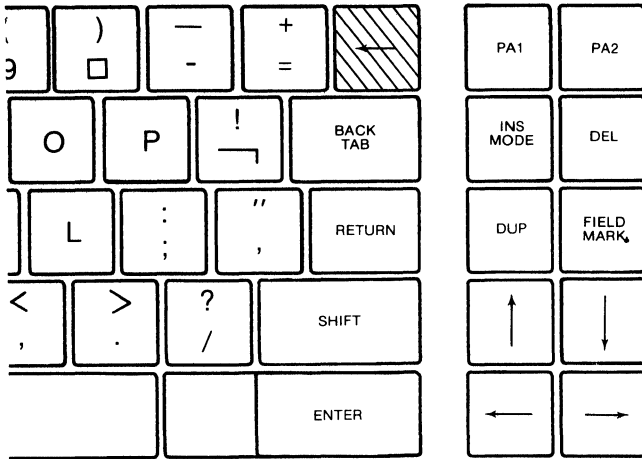
FIGURE 14. BACK TAB KEY



UNFORMATTED DISPLAY: Position the cursor near the center of the screen. Press the BACK TAB key. Note the cursor is repositioned to the first character position on line 1.

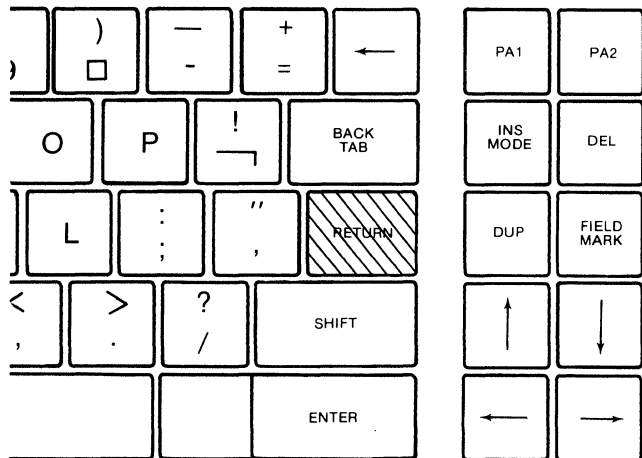
FORMATTED DISPLAY: Press the BACK TAB key, and note the operation of the cursor. Move the cursor at random with the cursor control keys or TAB key while alternately pressing the BACK TAB key. When the cursor is in an input field at a location other than the first character position, the BACK TAB key repositions the cursor to the first character position in that field. When the cursor is in the first character position of an input field, the BACK TAB key repositions the cursor to the first character position of the first preceding input field.

FIGURE 15. BACKSPACE KEY



Using the cursor control keys, position the cursor near the center of the screen. Now press the backspace key several times. Note that the cursor moves one character space to the left each time the key is pressed. (Operation of this key is identical to the operation of the move-cursor-left key.)

FIGURE 16. RETURN KEY



UNFORMATTED DISPLAY: Move the cursor, using the cursor control keys, to a position about halfway across the screen and several lines down. Press the RETURN key. The cursor is positioned to the first character location on the next line.

FORMATTED DISPLAY: Using the cursor control keys, position the cursor at or near the center of the screen. Press the RETURN key. Note that the cursor is positioned to the first character location of the first unprotected field on the next line.

FIGURE 17. SPACE BAR

Reset the cursor, and enter random data on the screen. Reset the cursor, and press the space bar until the cursor travels over the characters previously entered. Note that the characters appear to be deleted; however, unlike a typewriter or a key-punch, a space is considered an actual character that occupies a position on the face of the screen. When the space bar is pressed, a space is entered on the screen; this space character replaces whatever character is presently in that position. Do not use the space bar to position the cursor for that reason.

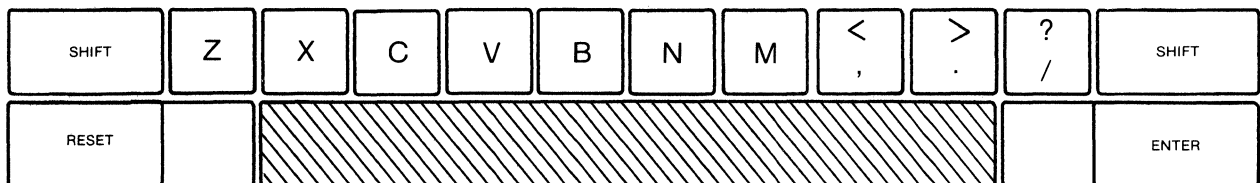
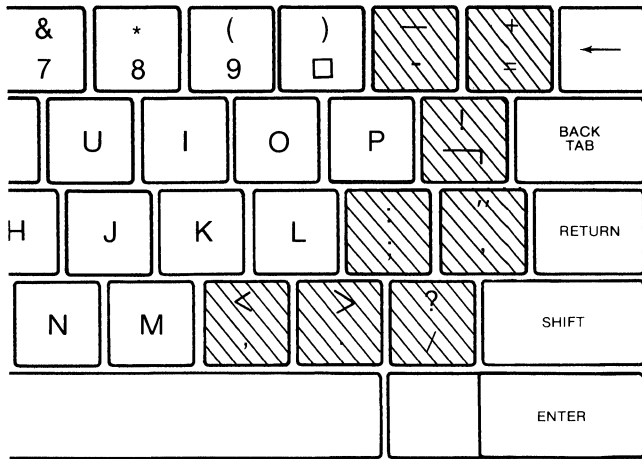
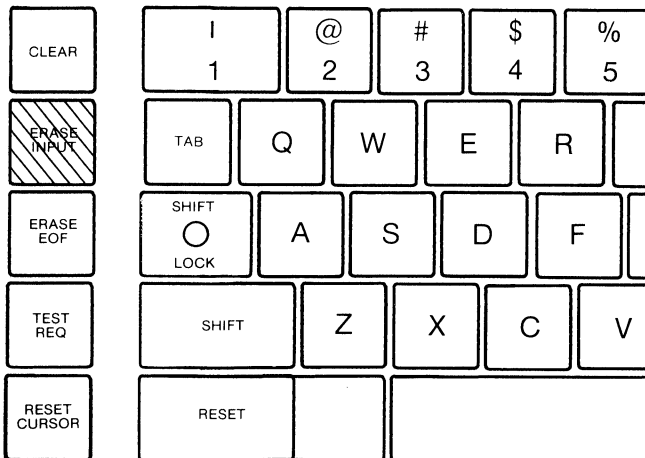


FIGURE 20. SYMBOLS AND PUNCTUATION MARK KEYS



Operate the symbol and punctuation mark keys with no shift. Observe that the symbol shown on the lower half of the key is displayed. Press the SHIFT key. Note that the symbol shown on the upper half of the key is displayed. Clear the display by pressing the ERASE INPUT key.

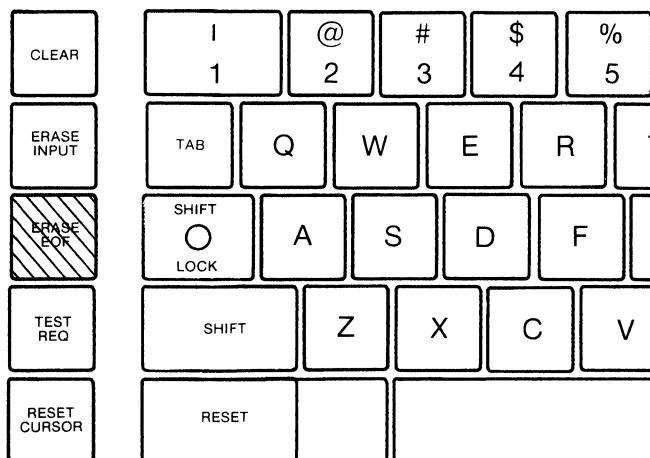
FIGURE 21. ERASE INPUT KEY



UNFORMATTED DISPLAY: Enter any amount of data on the screen. Press the ERASE INPUT key. Note that the inputted data is removed from the screen. Note that the cursor moves to the first character location on line 1.

FORMATTED DISPLAY: Enter data in the unprotected fields. Press the ERASE INPUT key. Note that all areas where data was entered are erased. Note also that the cursor moves to the first character location in the first field in which input data may be keyed.

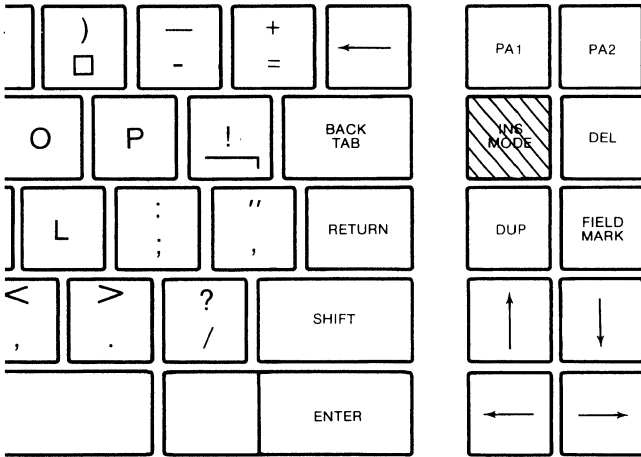
FIGURE 22. ERASE EOF (END OF FIELD) KEY



UNFORMATTED DISPLAY: Enter any amount of data on the screen. Press the backspace key several times to move the cursor back. Press the ERASE EOF key. Note that all characters from the cursor location to the end of the screen are erased. The cursor, however, does not move.

FORMATTED DISPLAY: Enter any amount of data into the unprotected fields. Position the cursor in the middle of one of the completely filled unprotected fields. Press the ERASE EOF key. Note that all characters from the cursor location to the end of the field are erased. The cursor, however, does not move.

FIGURE 23. INS MODE KEY



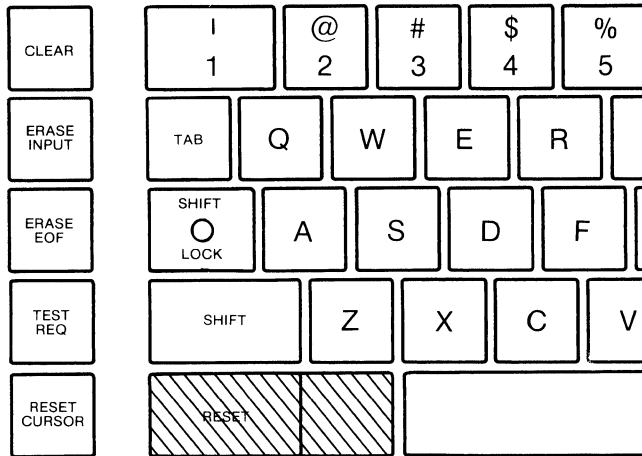
The purpose of the insert mode is to allow the operator to insert a character or characters into the middle of a field without disturbing the information that is already displayed there. Pressing the INS MODE key places the keyboard in the insert mode of operation.

UNFORMATTED DISPLAY: Enter data on the display screen. A social security number (168-22-5451) is a good example, leaving out the two digits in the middle of the number, i.e., enter 168-5451. Move the cursor to the first "5" in that number, and press the INS MODE key. The EDIT MODE light (Figure 6) comes on. Now enter "22-", and observe that the numbers "5451" move to the right to accommodate the insertion.

If an entry is a large one and covers more than one line during the insert operation, characters shift from the end of one line to the beginning of the next line.

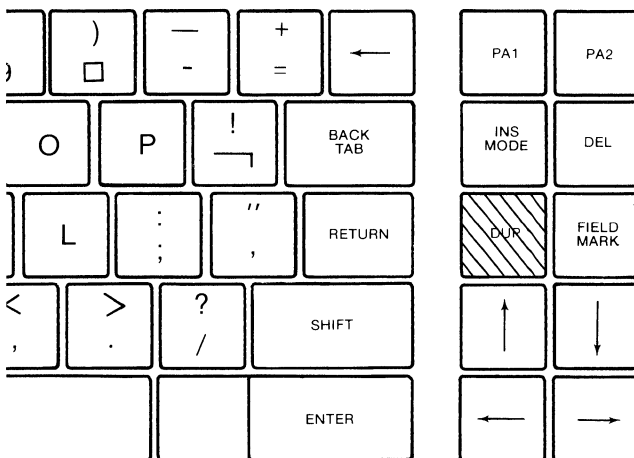
FORMATTED DISPLAY: Enter data into an unprotected field. A social security number is a good example (168-22-5451), leaving out the two digits in the middle of the number, i.e., enter 168-5451. Move the cursor to the first "5" in that number, and press the INS MODE key. The EDIT MODE light (Figure 6) comes on. Now enter "22-", and observe that the numbers "5451" move to the right to accommodate the insertion. If more characters are inserted than the field will hold, the keyboard is disabled. The number of characters that can be inserted into a field is limited to the number of blanks remaining in the field. If the field is a large one and covers more than one line, it is possible in some instances for an insert operation to shift characters from the end of one line to the beginning of the next line.

FIGURE 24. RESET KEY



Press the RESET key to reset the EDIT MODE light (Figure 6). However, note that the RESET key does not change the status on the indicator panel during the short period of time when the display station is sending data to or receiving data from the computer. Thus, it may be possible to press the RESET key and not accomplish the desired reset. If this happens, press the RESET key again.

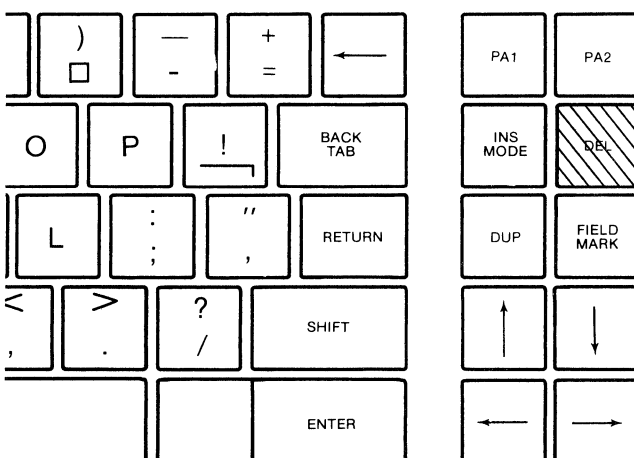
FIGURE 25. DUP KEY



UNFORMATTED DISPLAY: Operation of the DUP key is generally not applicable.

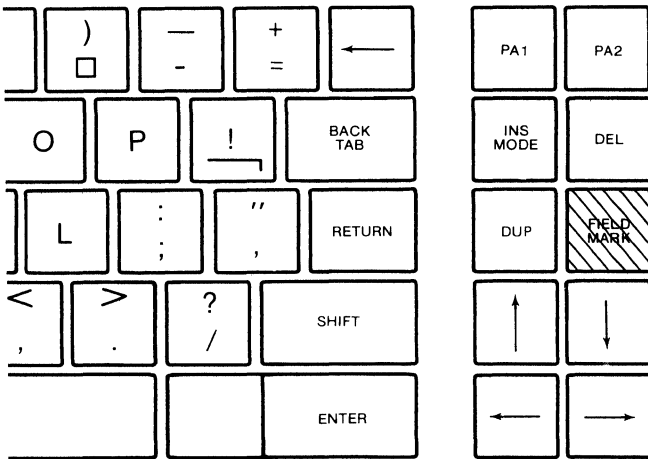
FORMATTED DISPLAY: The DUP key is used in some applications to duplicate information previously entered. Additional information must be supplied by your supervisor for its use; however, to observe the operation press the DUP key. A special character in the form of an asterisk is displayed in the position occupied by the cursor. Note that the cursor moves to the first character location of the next unprotected field.

FIGURE 26. DEL (DELETE) KEY



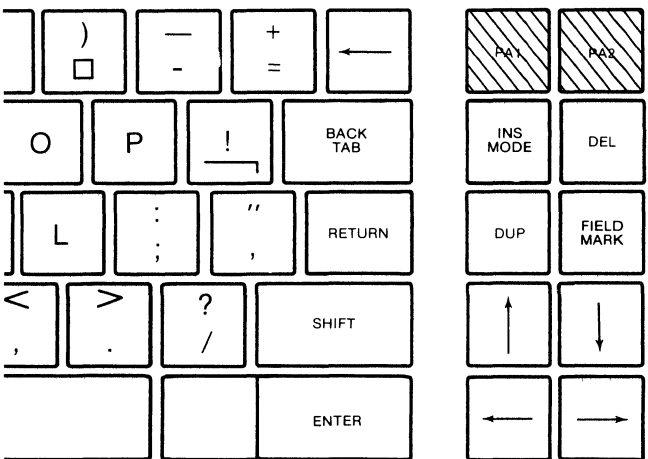
To simulate the use of the DEL key, enter incorrect data on the screen, for example: "Decemember 22, 1974". Move the cursor to the position of the extra "m". Press the DEL key. Note that the character occupying the position underlined by the cursor is deleted, and that all characters to the right of that position are shifted left one position. Note that the cursor does not move. The correction made, move the cursor to the next character position where data will be entered.

FIGURE 27. FIELD MARK KEY



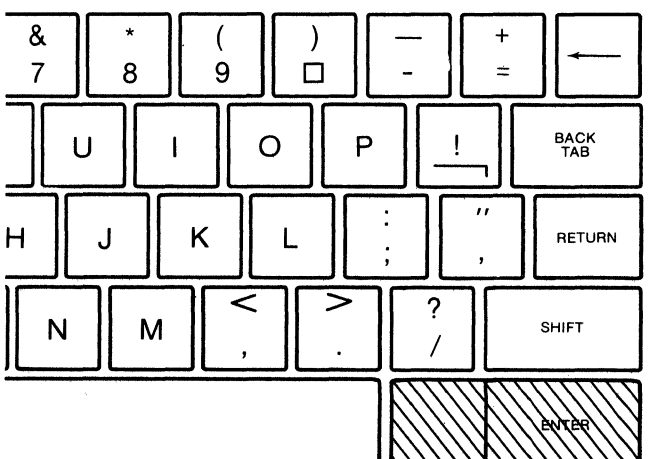
The FIELD MARK key is used primarily when operating with an unformatted display. It indicates the end of a data field to the program. Press the FIELD MARK key, and note that a special character in the form of a semi-colon is displayed. The cursor moves to the next character position.

FIGURE 28. PA1 AND PA2 KEYS



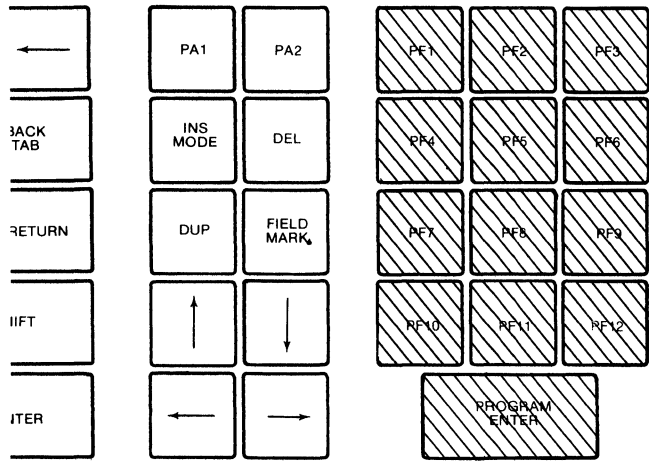
PA1 and PA2 are program access keys; they perform the function that their name implies and provide a means of signaling the program or obtaining access to it. While the terminal is signaling the program, the INPUT LOCKED light (Figure 6) comes on, making the keyboard inactive. Most programs, when replying to these keys, turn off this light; however, this decision is made by the program. The program that is operating in the computer at the time also determines how these keys are used. To determine their exact function, refer to the appropriate application procedure. If the INPUT LOCKED light remains on for an abnormally long period after one of the PA keys is pressed, press the RESET key to turn it off.

FIGURE 29. ENTER KEY



Pressing the ENTER key tells the program that the message has been completed, and it is time for the information on the screen to be entered into the computer. While the terminal is signaling the program, the INPUT LOCKED light comes on, making the keyboard inactive. Most programs, when acting on an ENTER key signal, turn off this light; however, this decision is made by the software program. If the INPUT LOCKED light remains on for an abnormally long period after use of the ENTER key, press the RESET key to turn it off.

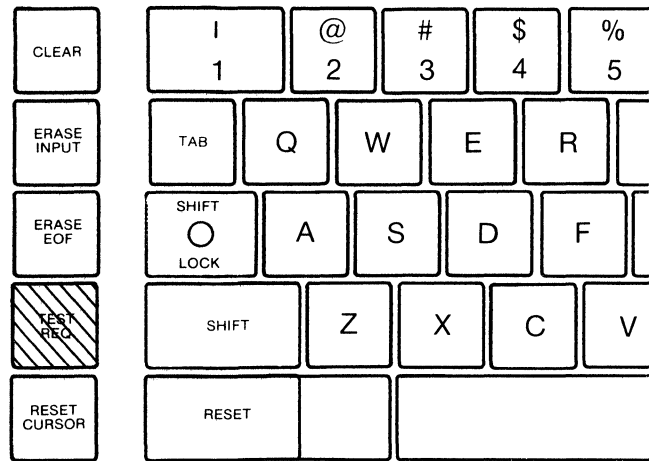
FIGURE 30. PF1 THROUGH PF12 KEYS AND PROGRAM ENTER KEY



In addition to the functions permanently assigned to other keys (such as backspace, tab, back tab, etc), application programs can assign other programmable functions to the Program Function (PF) keys. To determine the use of each key and the corresponding action, refer to the appropriate application instructions.

In some applications, an optional use of the PROGRAM ENTER key may be desired to prevent sending unsolicited requests to the computer. For these applications, the PROGRAM ENTER key is used in conjunction with the PF keys. The PROGRAM ENTER key must be pressed following the operation of any one of the 12 PF keys before a request is sent to the computer.

FIGURE 31. TEST REQ KEY



The function of the TEST REQ key is determined by the computer system. As such, this key may be ineffective. Pressing the TEST REQ key sends a unique signal to the computer telling the program that a test message is desired. While this signaling is taking place, the INPUT LOCKED light (Figure 6) turns on, making the keyboard inactive. The program, replying to the signal, normally turns off the light and displays a message on the screen that advises what procedure should be followed. You should request specific instructions for use of this key.

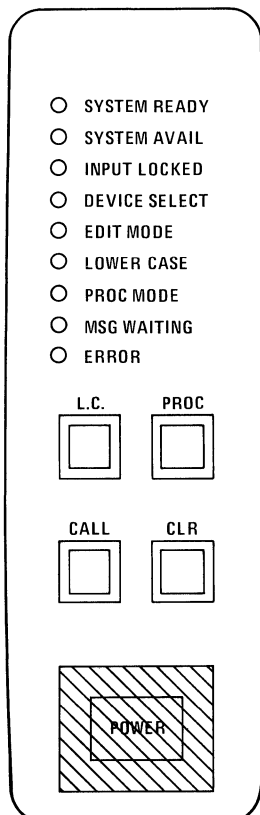
OPERATION OF DATA ENTRY KEYBOARD

To operate the data entry keyboard, observe the following procedural steps:

NOTE

If your company has a sign-on procedure and your terminal is not signed-on, you can operate any key without affecting the program or the computer. A sign-on procedure allows the program to ignore any signals received from a terminal that is not signed on.

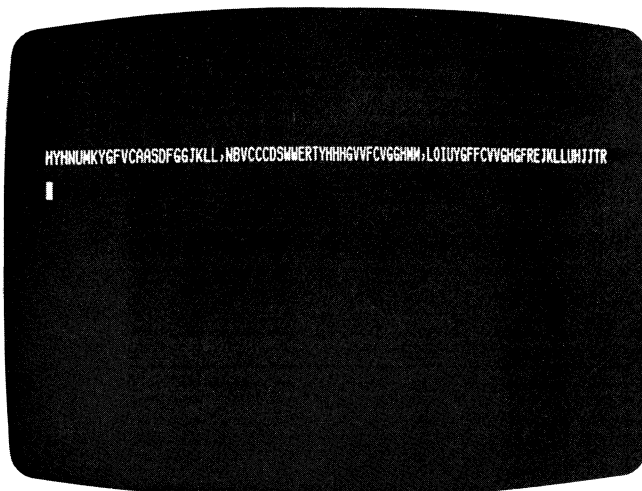
FIGURE 33. POWER BUSHBUTTON



Press the POWER pushbutton to apply power to your terminal. When the power is on, the pushbutton lights. A delay of a few seconds is built in to allow the cathode ray tube (screen) to warm up. After this delay, a short horizontal bar or blinking square appears in the upper left portion of the screen (in the first character position on line 1). This symbol is the cursor.

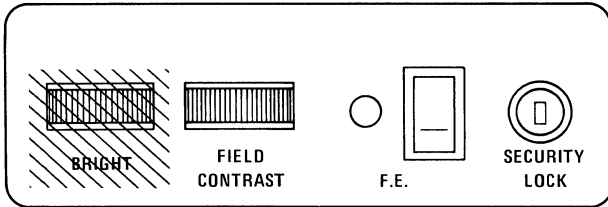
Observe the control panel (Figure 33) to the right of the screen. The SYSTEM READY and the SYSTEM AVAIL lights should be on. If the INPUT LOCKED light comes on, press the RESET key. If the INPUT LOCKED light remains on, check the position of the key in the SECURITY LOCK (if one is installed in your unit). The key should be turned to the left. Place the key in that position, and press the RESET key again. The INPUT LOCKED light should go out.

FIGURE 34. LINE OF CHARACTERS



Now enter a line of characters (Figure 34) using any combination of letter and/or number and symbol keys. Note that the cursor travels along as you type this data. Also note that if a character key is held down, its operation is automatically repeated. Observe these characters on the screen.

FIGURE 35. BRIGHT CONTROL

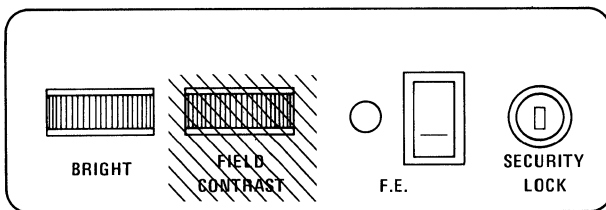


Adjust the brightness of the displayed characters using the BRIGHT CONTROL (Figure 35). Experiment with this control until a setting is found that is most convenient and comfortable for viewing. There is no correct setting for the brightness of the image.

NOTE

Use of a formatted test display is essential to understanding and accomplishing the following instructions which pertain exclusively to formatted display operations and are clearly labeled as such. In this case, it is also necessary to understand the difference between a protected and an unprotected field.

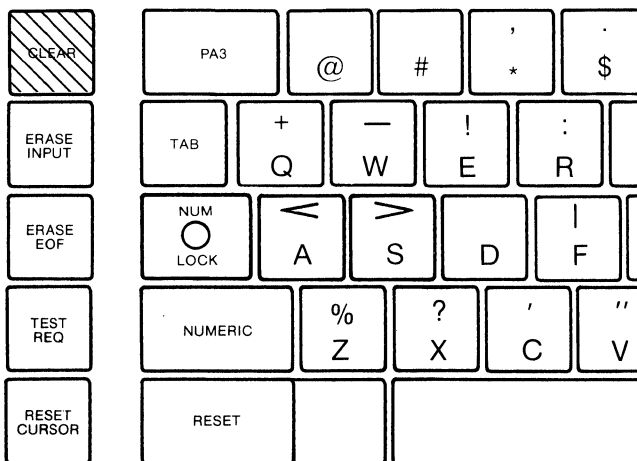
FIGURE 36. FIELD CONTRAST



UNFORMATTED DISPLAY: Use of the FIELD CONTRAST control for unformatted displays is not necessary.

FORMATTED DISPLAY: Adjust the FIELD CONTRAST control (Figure 36). Note that the protected fields of the formatted display have a different intensity than the unprotected fields.

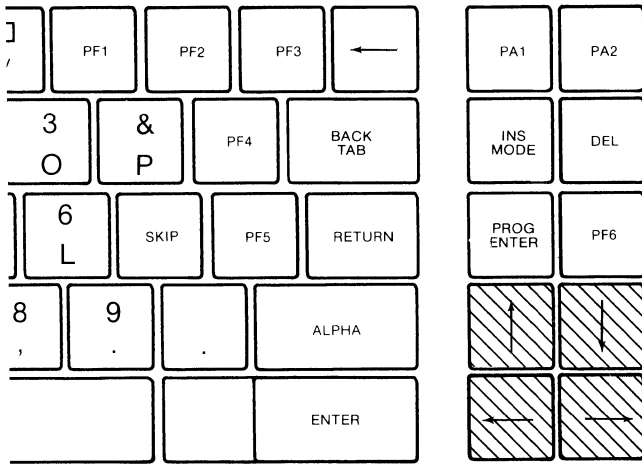
FIGURE 37. CLEAR KEY



UNFORMATTED DISPLAY: Press the CLEAR key. Note that pressing the CLEAR key blanks every character on the face of the screen and positions the cursor to the first character position on line 1. The SYSTEM AVAIL light (Figure 33) goes out, and the INPUT LOCKED light and DEVICE SELECT light come on momentarily. If the INPUT LOCKED light does not go out, press the RESET key to unlock the keyboard.

FORMATTED DISPLAY: Do not press the CLEAR key when using a formatted display. Pressing this key blanks the screen and establishes an unformatted display.

FIGURE 38. CURSOR CONTROL KEYS

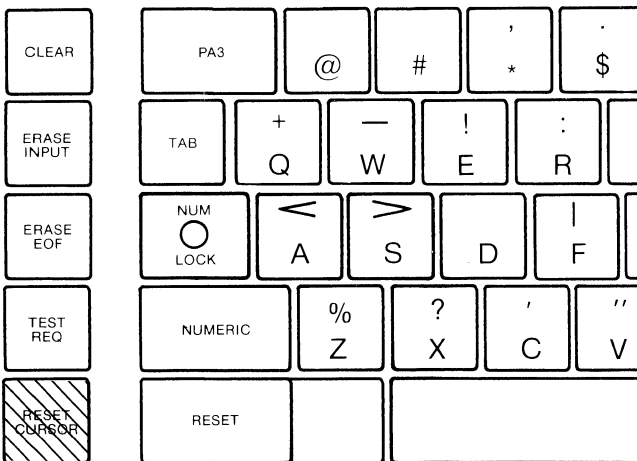


Move the cursor by pressing each of the cursor control keys in turn. Observe the operation of the cursor. Make the cursor wrap. Note that the cursor control keys move the cursor automatically if the keys are held down.

FORMATTED DISPLAY: If the cursor enters a program-defined numeric input field, the terminal automatically shifts the keyboard into the numeric mode of operation. When the cursor leaves the numeric field and enters an alphabetic or mixed input field, the terminal automatically downshifts the keyboard to the alphabetic mode. This capability is called "auto-shift"; it frees the operator from shifting modes when entering alphabetic and numeric data into a properly planned format.

Press and release the NUMERIC key. Enter data into the formatted display using the letter and number keys as appropriate. Note that the keyboard automatically shifts from one mode to another.

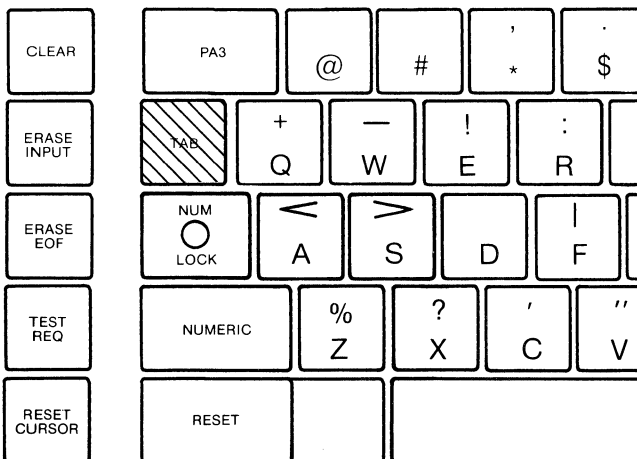
FIGURE 39. RESET CURSOR KEY



UNFORMATTED DISPLAY: Press the RESET CURSOR key. Note that the cursor is positioned to the upper left-hand corner of the screen.

FORMATTED DISPLAY: Press the RESET CURSOR key. Note that the cursor returns to the first character position of the first unprotected field.

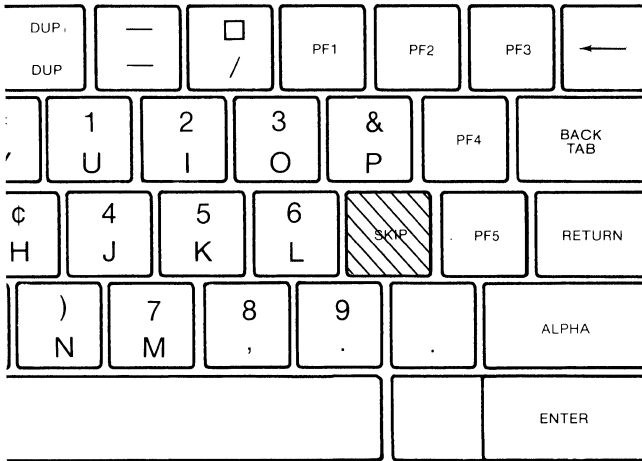
FIGURE 40. TAB KEY



UNFORMATTED DISPLAY: Press the TAB key. Note that the cursor does not move to a new position.

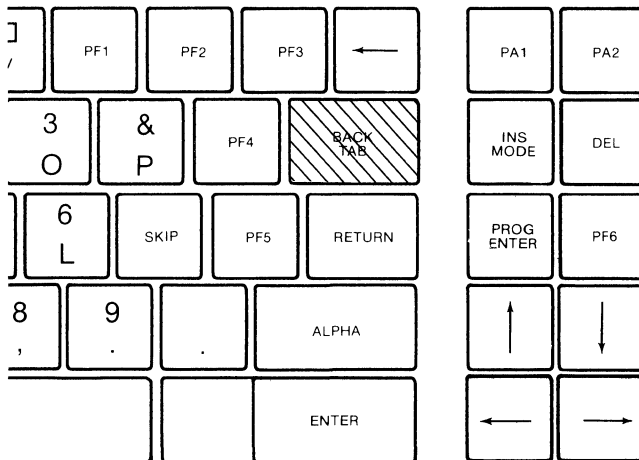
FORMATTED DISPLAY: Press the TAB key several times. Note that the cursor always moves to the right to the next position where it is possible for the operator to enter data. Using the TAB key, position the cursor to the farthest and lowest right-hand position possible.

FIGURE 41. SKIP KEY



The purpose and operation of the SKIP key are identical to those of the TAB key.

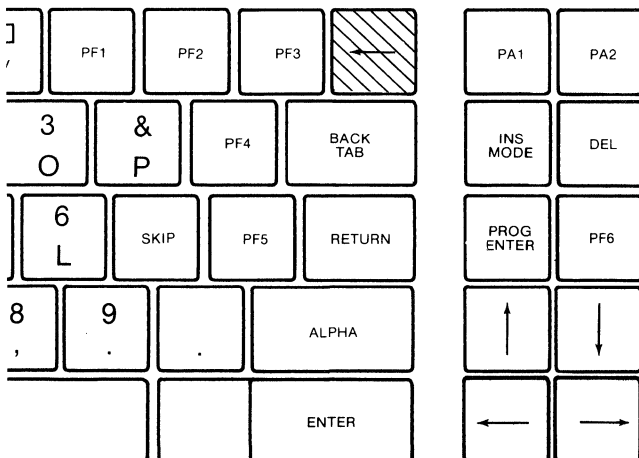
FIGURE 42. BACK TAB KEY



UNFORMATTED DISPLAY: Position the cursor near the center of the screen. Press the BACK TAB key. Note that the cursor is repositioned to the first character position on line 1.

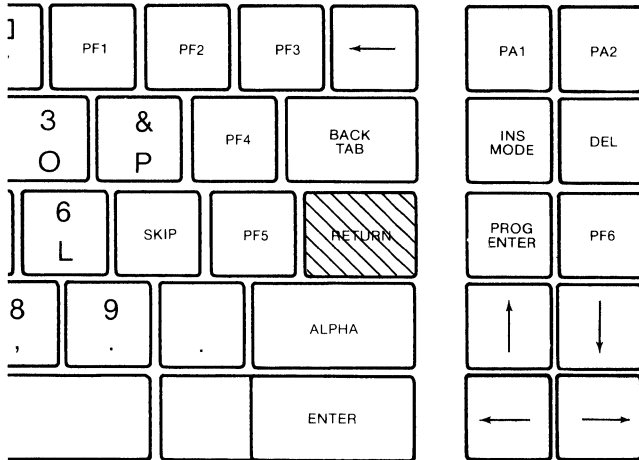
FORMATTED DISPLAY: Press the BACK TAB key, and note the operation of the cursor. Move the cursor at random with the cursor control keys or TAB key while alternately pressing the BACK TAB key. When the cursor is in an input field at a location other than the first character position, the BACK TAB key repositions the cursor to the first character position in that field. When the cursor is in the first character position of an input field, the BACK TAB key repositions the cursor to the first character position of the first preceding input field.

FIGURE 43. BACKSPACE KEY



Using the cursor control keys, position the cursor near the center of the screen. Now press the backspace key several times. Note that the cursor moves one character space to the left each time the key is pressed. (Operation of this key is identical to the operation of the move-cursor-left key.)

FIGURE 44. RETURN KEY



UNFORMATTED DISPLAY: Move the cursor, using the cursor control keys, to a position about halfway across the screen and several lines down. Press the RETURN key. The cursor is positioned to the first character location on the next line.

FORMATTED DISPLAY: Using the cursor control keys, position the cursor at or near the center of the screen. Press the RETURN key. Note that the cursor is positioned to the first character location of the first unprotected field on the next line.

FIGURE 45. SPACE BAR

Reset the cursor, and enter random data on the screen. Reset the cursor, and press the space bar until the cursor travels over the characters previously entered. Note that the characters appear to be deleted; however, unlike a typewriter or a key-punch, a space is considered an actual character that occupies a position on the face of the screen. When the space bar is pressed, a space is entered on the screen; this space character replaces whatever character is presently in that position. Do not use the space bar to position the cursor for that reason.

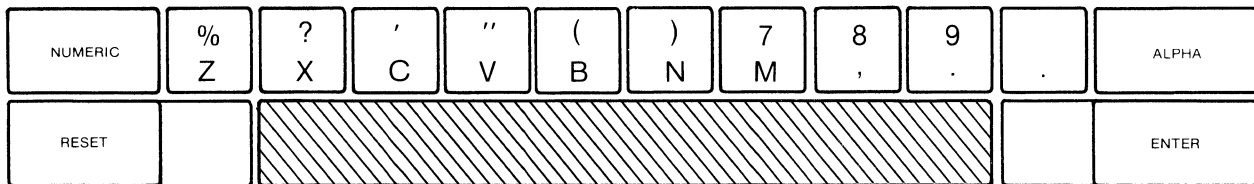
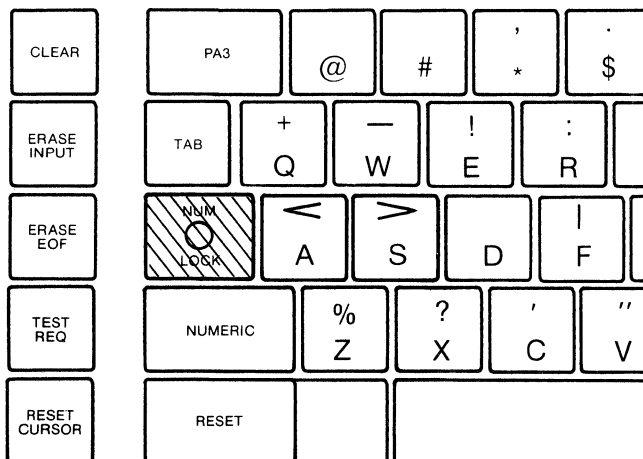


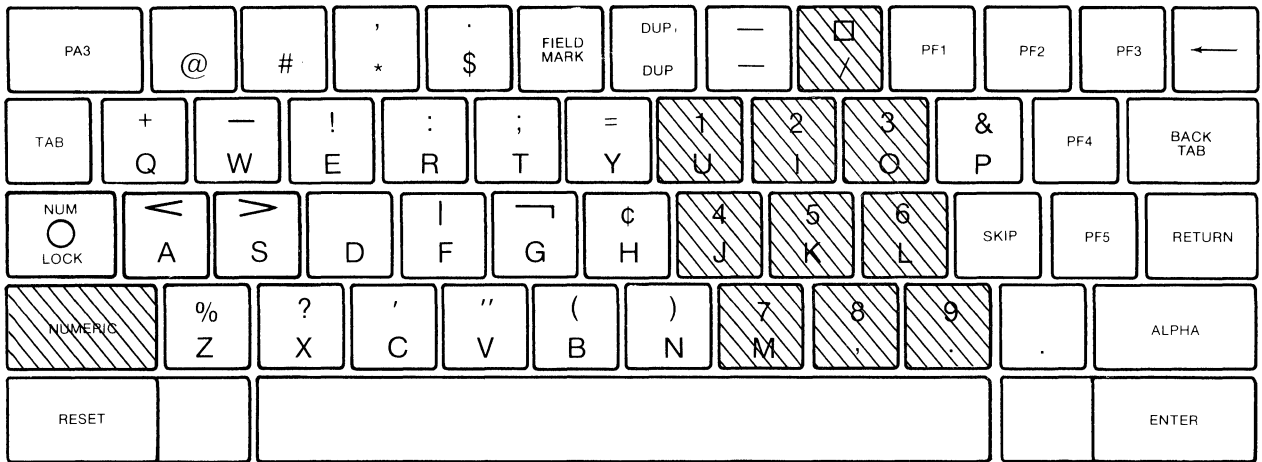
FIGURE 46. NUM LOCK KEY



Press the NUM LOCK key to shift the keyboard into the numeric shift mode. Enter data on the screen. The keyboard remains locked in numeric shift mode until the NUM LOCK key is pressed again, or the NUMERIC key is pressed.

FIGURE 48. NUMERIC AND NUMBER KEYS

UNFORMATTED DISPLAY: Press and release the NUMERIC key to cancel the numeric mode established in the previous procedure. Enter data on the screen; note that it is alpha data. Press and hold down the NUMERIC key, and enter numeric data using the numeric key cluster. Practice entering numeric data using the first three fingers of the right hand. Note that the numeric shift mode causes the top character on each key to be displayed when that key is pressed. Pressing the NUMERIC key shifts the keyboard into the numeric shift mode for as long as the key is held down. The NUMERIC key is non-locking.



FORMATTED DISPLAY: Press the NUMERIC key and enter numeric data into appropriate unprotected fields. Practice entering numeric data using the first three fingers of the right hand. If program-defined numeric fields are used, observe the auto-shift function again.

FIGURE 49. SYMBOLS AND PUNCTUATION MARK KEYS

Press the NUMERIC key, and enter the various symbols and punctuation marks, which appear on the upper half of the keys, on the screen. Press the ALPHA key, and enter the remaining symbols and

punctuation marks, which appear on the lower half of some keys, on the screen. Practice entering symbols and punctuation marks by alternately shifting with the NUMERIC and ALPHA keys. Clear the display by pressing the ERASE INPUT key.

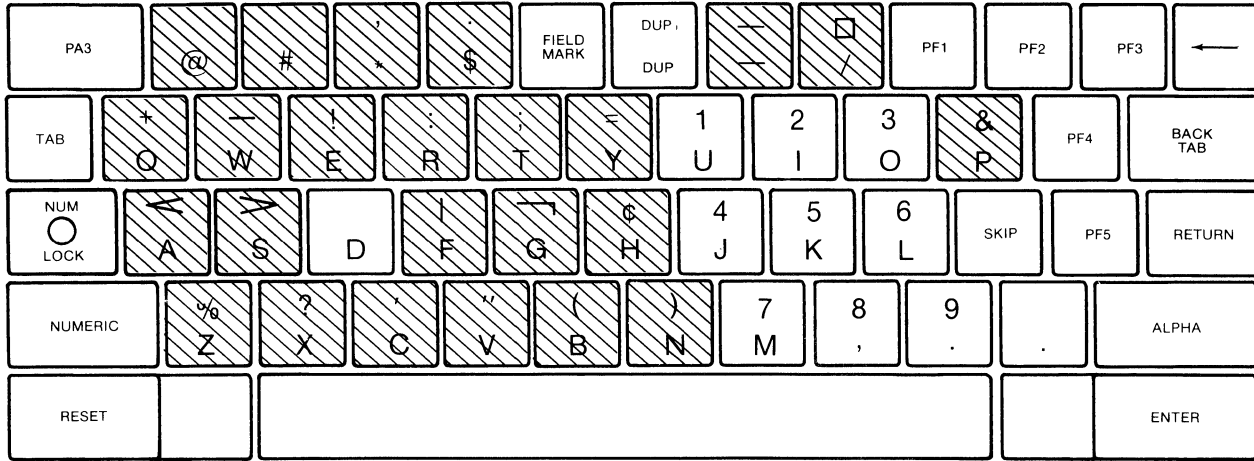
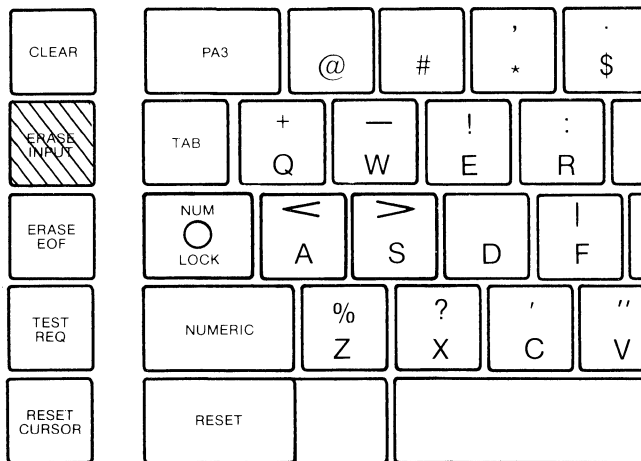


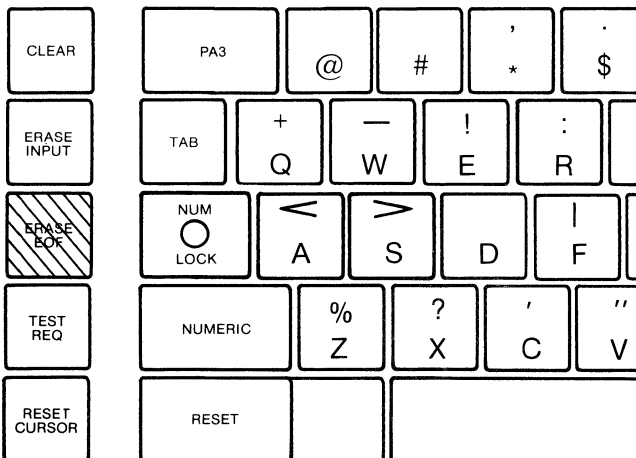
FIGURE 50. ERASE INPUT KEY



UNFORMATTED DISPLAY: Enter any amount of data on the screen. Press the ERASE INPUT key. Note that the inputted data is removed from the screen and that the cursor moves to the first character location of line 1.

FORMATTED DISPLAY: Enter data in the unprotected fields. Press the ERASE INPUT key. Note that all areas where data was entered are erased. Note also that the cursor moves to the first character location in the first field in which input data may be keyed.

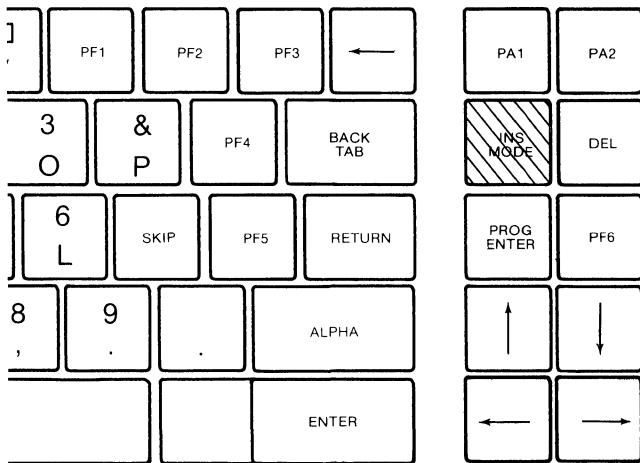
FIGURE 51. ERASE EOF (END OF FIELD) KEY



UNFORMATTED DISPLAY: Enter any amount of data on the screen. Press the backspace key several times to move the cursor back. Press the ERASE EOF key. Note that all characters from the cursor location to the end of the screen are erased. The cursor, however, does not move.

FORMATTED DISPLAY: Enter any amount of data into the unprotected fields. Position the cursor in the middle of one of the completely filled unprotected fields. Press the ERASE EOF key. Note that all characters from the cursor location to the end of the field are erased. The cursor, however, does not move.

FIGURE 52. INS MODE KEY



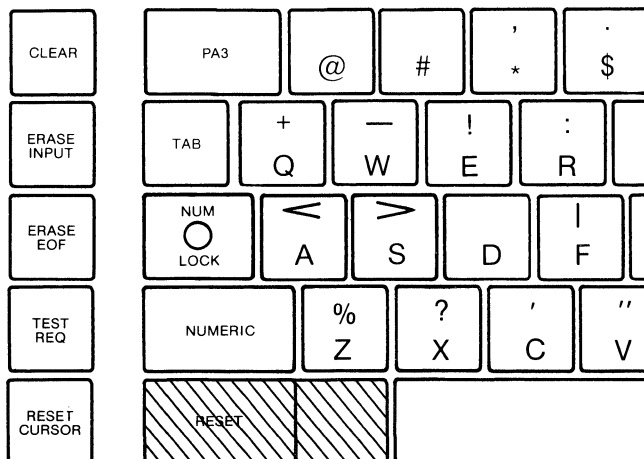
The purpose of the insert mode is to allow operator to insert a character or characters into the middle of a field without disturbing the information that is already displayed there. Pressing the INS MODE key places the keyboard in the insert mode of operation.

UNFORMATTED DISPLAY: Enter data on the display screen. A social security number is a good example (168-22-5451), leaving out the two digits in the middle of the number, i.e., enter 168-5451. Move the cursor to the first "5" in that number, and press the INS MODE key. The EDIT MODE light (Figure 33) comes on. Now enter "22-", and observe that the numbers "5451" move to the right to accommodate the insertion.

If an entry is a large one and covers more than one line during the insert operation, characters shift from the end of one line to the beginning of the next line.

FORMATTED DISPLAY: Enter data into an unprotected field. A social security number is a good example (168-22-5451), leaving out the two digits in the middle of the number, i.e., enter 168-5451. Move the cursor to the first "5" in that number, and press the INS MODE key. The EDIT MODE light (Figure 33) comes on. Now enter "22-", and observe that the numbers "5451" move to the right to accommodate the insertion. If more characters are inserted than the field will hold, the keyboard is disabled. The number of characters that can be inserted into a field is limited to the number of blanks remaining in the field. If the field is a large one and covers more than one line, it is possible in some instances for an insert operation to shift characters from the end of one line to the beginning of the next line.

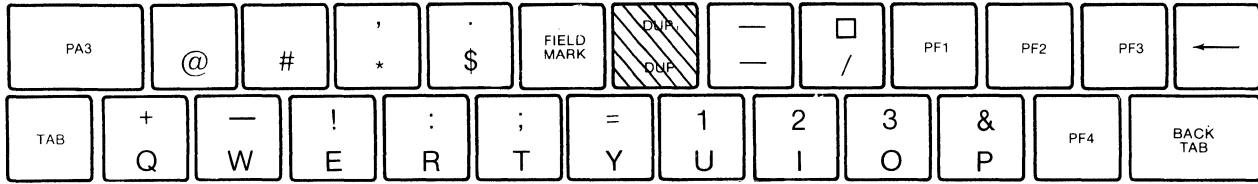
FIGURE 53. RESET KEY



Press the RESET key to reset the EDIT MODE light (Figure 33). However, note that the RESET key does not change the status on the indicator panel during the short period of time when the display station is sending data to or receiving data from the computer. Thus, it may be possible to press the RESET key and not accomplish the desired reset. If this happens, press the RESET key again.

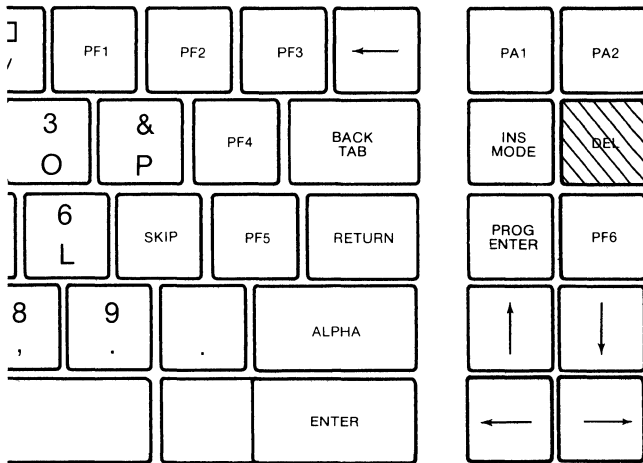
FIGURE 54. DUP KEY

UNFORMATTED DISPLAY: Operation of the DUP key is generally not applicable.



FORMATTED DISPLAY: The DUP key is used in some applications to duplicate information previously entered. Additional information must be supplied by your supervisor for its use; however, to observe the operation, press the DUP key. Observe that a special character in the form of an asterisk is displayed in the position occupied by the cursor. Note that the cursor moves to the first character location of the next unprotected field.

FIGURE 55. DEL (DELETE) KEY



To simulate the use of the DEL key, enter incorrect data on the screen, for example: "Decemmmber 22, 1974". Move the cursor to the position of the extra "m". Press the DEL key. Note that the character occupying the position underlined by the cursor is deleted, and that all characters to the right of that position are shifted left one position. Note that the cursor does not move. The correction made, move the cursor to the next character position where data will be entered.

FIGURE 56. FIELD MARK KEY

The FIELD MARK key is used primarily when operating with an unformatted display. It indicates the end of a data field to the program. Press the FIELD MARK key and note that a special character in the form of a semi colon is displayed. The cursor moves to the next character position.

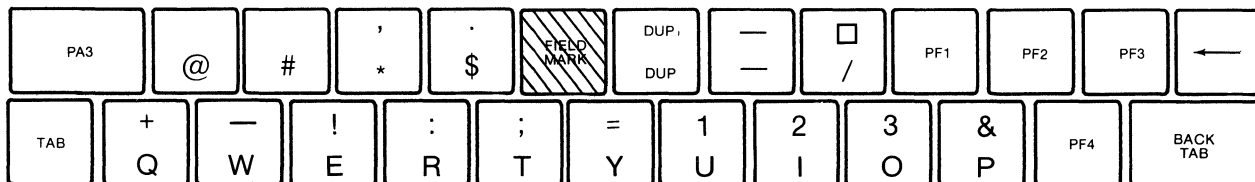
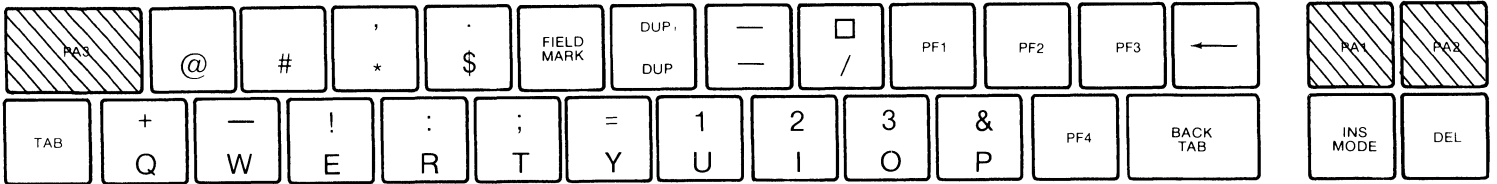


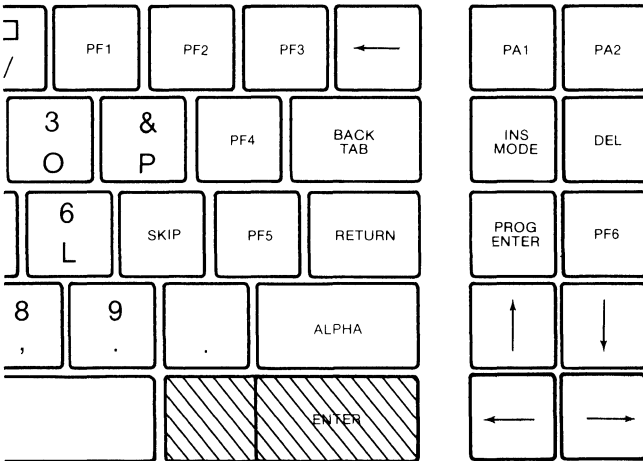
FIGURE 57. PA1, PA2, AND PA3 KEYS

PA1, PA2 and PA3 are program access keys; they perform the function that their name implies. They provide a means of signaling the program or getting access to it. While the terminal is signaling the program, the INPUT LOCKED light (Figure 33) comes on, making the keyboard inactive. Most programs, when replying to these keys, turn off this light; however, this decision is made by the program. The program that is operating in the



computer at the time also determines how these keys are used. To determine their exact function, refer to the appropriate application procedure. If the INPUT LOCKED light remains on for an abnormally long period after one of the PA keys is pressed, press the RESET key to turn it off.

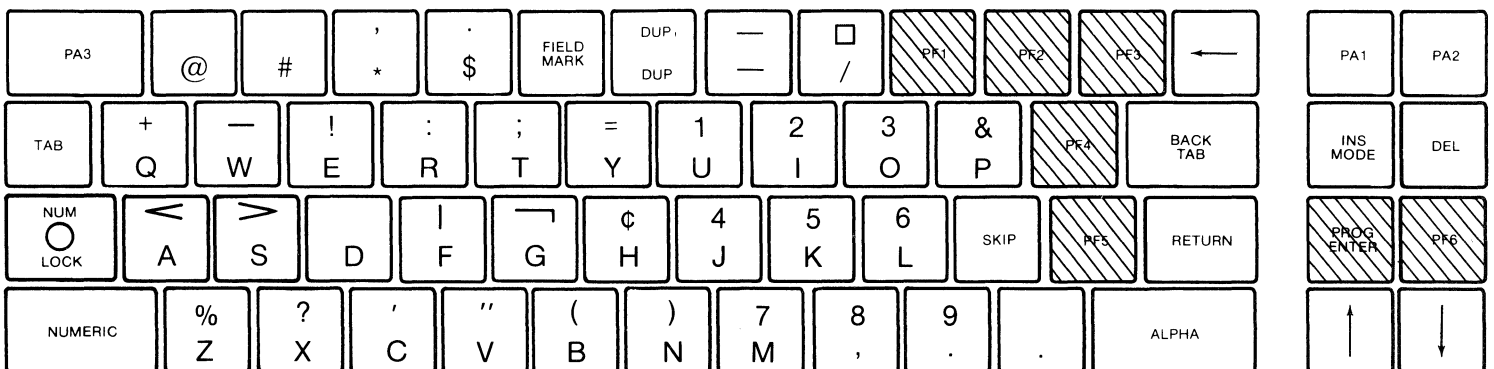
FIGURE 58. ENTER KEY



Pressing the ENTER key tells the program that the message has been completed, and it is time for the information on the screen to be entered into the computer. While the terminal is signaling the program, the INPUT LOCKED light comes on, making the keyboard inactive. Most programs, when acting on an ENTER key signal, turn off the indicator; however, this decision is made by the software program. If the INPUT LOCKED indicator remains on for an abnormally long period after use of the ENTER key, press the RESET key to turn it off.

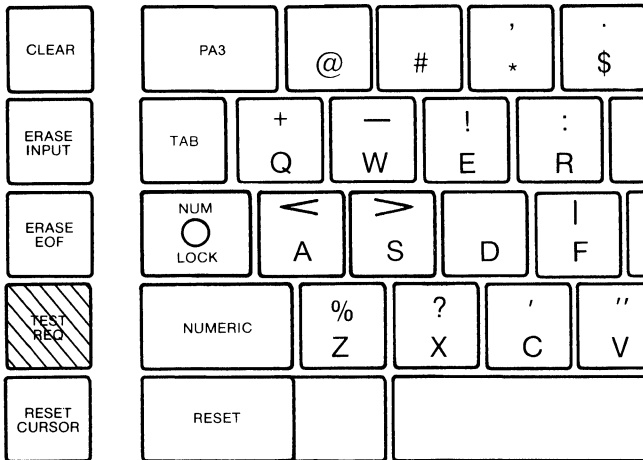
FIGURE 59. PF1 THROUGH PF6 KEYS AND PROG ENTER KEY

In addition to the functions permanently assigned to other keys (such as, backspace, tab, back tab, etc), application programs can assign other programmable functions to the Program Function (PF) keys. To determine the use of each key and the corresponding action, refer to the appropriate application instructions.



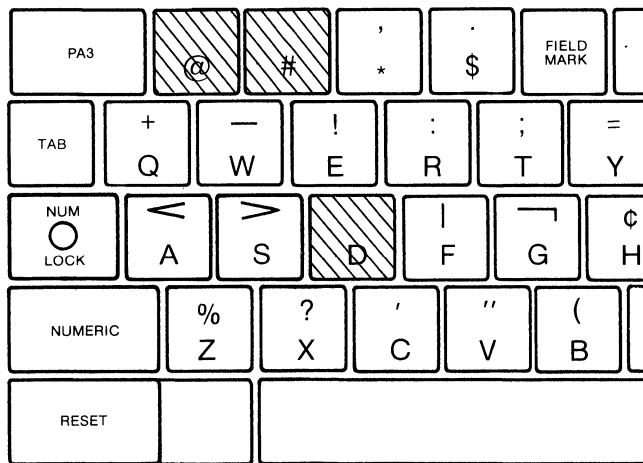
In some applications, an optional use of the PROGRAM ENTER key is desired to prevent sending unsolicited requests to the computer. For these cases, the PROGRAM ENTER key is used in conjunction with the PF keys. The PROGRAM ENTER key must be pressed following the operation of any one of the 6 PF keys before a request is sent to the computer.

FIGURE 60. TEST REQ KEY



The function of the TEST REQ key is determined by the computer; accordingly, the key may be ineffective. Pressing the TEST REQ key sends a unique signal to the computer telling the program that a test message is desired. While this signaling is taking place, the INPUT LOCKED light (Figure 33) turns on, making the keyboard inactive. The program, replying to the signal, normally turns off the light and displays a message on the screen that advises what procedure should be followed. You should request specific instructions for the use of this key.

FIGURE 61. BLANK KEYS



On the data entry keyboard, three keys generate a space character when the keyboard is in the numeric mode of operation. The top portion of these keys is blank.

Typewriter Keyboard With Numeric Pad Operation

GENERAL OPERATION

The typewriter keyboard with numeric pad is similar to a standard typewriter keyboard in appearance and arrangement of keys. The majority of the keys perform the same function as the keys of the same name on a typewriter keyboard. The layout of the typewriter keyboard with numeric pad is shown in Figure 62.

This keyboard can generate and display 26 uppercase alphabetic characters, 10 numeric characters, and 26 symbols and punctuation marks by operation of the key that designates the desired character. The character is displayed on the screen in the position marked by the cursor. The keyboard also includes the control keys which are used to edit data and generate input messages to signal the computer.

Keys that have two designations shown on their faces can generate either designation or character depending upon the position of the SHIFT key.

The lower character is generated when the selected key is pressed and the keyboard is in the unshifted mode. To generate the upper character, the SHIFT key must be held down while the selected key is pressed. The SHIFT keys and the SHIFT LOCK key function essentially the same as they do on any standard typewriter.

The 14-key numeric pad conveniently located on the right side of the keyboard is particularly useful in accounting operations where entry of quantities of numeric data is required. The operation of this numeric pad is similar to the operation of an adding machine or calculator. The additional numeric and punctuation keys provide a comfortable and expedient arrangement for the operator. The TAB key is included in the numeric pad to allow the operator to move from field to field without an inefficient movement to the TAB key provided on the opposite side of the keyboard.

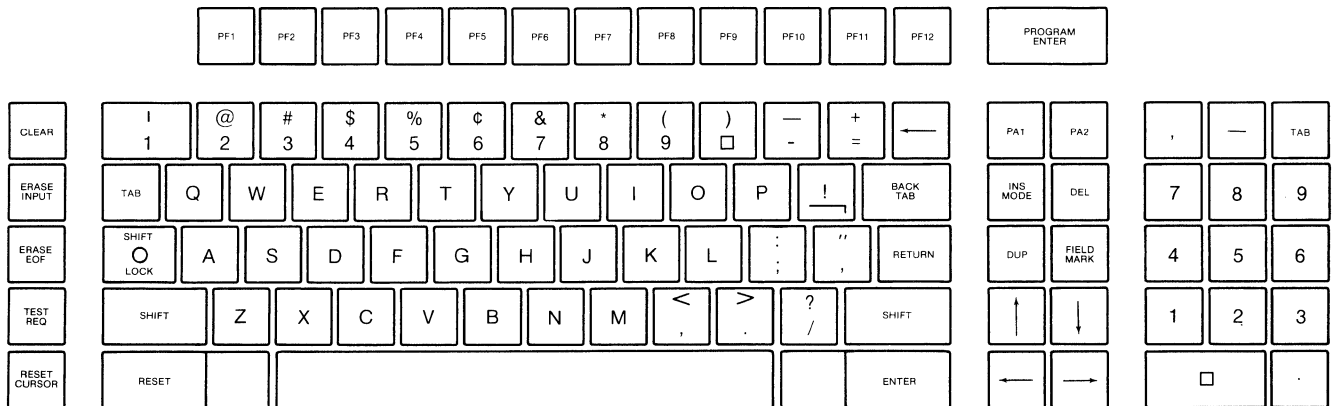


FIGURE 62. TYPEWRITER KEYBOARD WITH NUMERIC PAD

OPERATION OF TYPEWRITER KEYBOARD WITH NUMERIC PAD

To operate the typewriter keyboard with numeric pad, proceed with the following steps:

NOTE

If your company has a sign-on procedure and your terminal is not signed-on, you can operate any key without affecting the program or the computer. A sign-on procedure allows the program to ignore any signals received from a terminal that is not signed on.

Press the POWER pushbutton to apply power to your terminal. When the power is on, the pushbutton lights. A delay of a few seconds is built in to allow the cathode ray tube (screen) to warm up. After this delay, a short horizontal bar or blinking square appears in the upper left portion of the screen (in the first character position on line 1). This symbol is the cursor.

Observe the control panel (Figure 63) to the right of the screen. The SYSTEM READY and the SYSTEM AVAIL lights should be on. If the INPUT LOCKED light comes on, press the RESET key. If the INPUT LOCKED light remains on, check the position of the key in the SECURITY LOCK (if one is installed in your unit). The key should be turned to the left. Place the key in that position, and press the RESET key again. The INPUT LOCKED light should go out.

FIGURE 63. POWER PUSHBUTTON

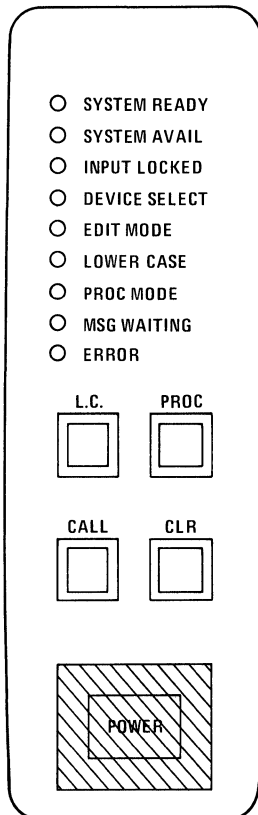
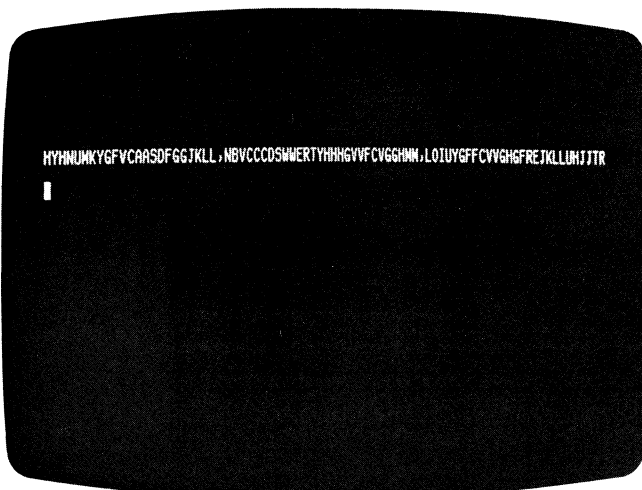
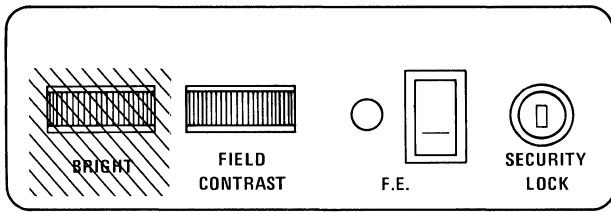


FIGURE 64. LINE OF CHARACTERS



Now enter a line of characters (Figure 64) using any combination of letter and/or number and symbol keys. Note that the cursor travels along as you type this data. Also note that if a character key is held down, its operation is automatically repeated. Observe these characters on the screen.

FIGURE 65. BRIGHT CONTROL

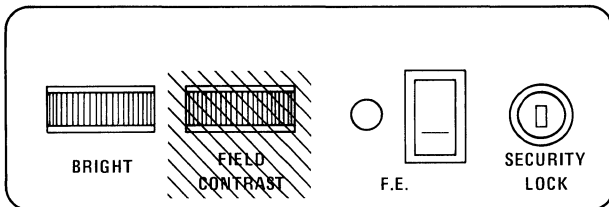


Adjust the brightness of the displayed characters using the BRIGHT CONTROL (Figure 65). Experiment with this control until a setting is found that is most convenient and comfortable for viewing. There is no correct setting for the brightness of the image.

NOTE

Use of a formatted test display is essential to understanding and accomplishing the following instructions which pertain exclusively to formatted display operations and are clearly labeled as such. In this case, it is also necessary to understand the difference between a protected and an unprotected field.

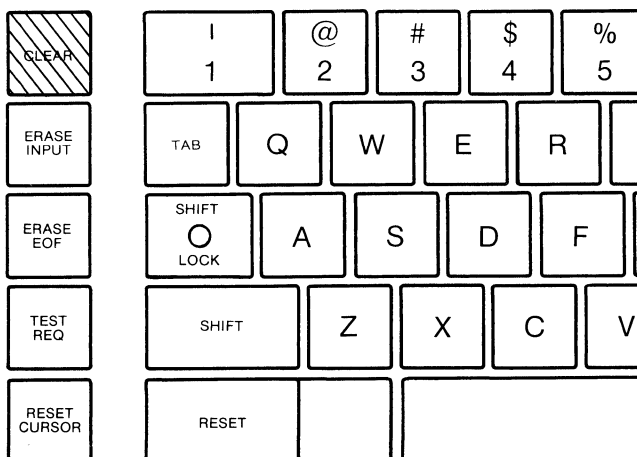
FIGURE 66. FIELD CONTRAST



UNFORMATTED DISPLAY: Use of the FIELD CONTRAST control for unformatted displays is not necessary.

FORMATTED DISPLAY: Adjust the FIELD CONTRAST control (Figure 66). Note that the protected fields of the formatted display have a different intensity than the unprotected fields.

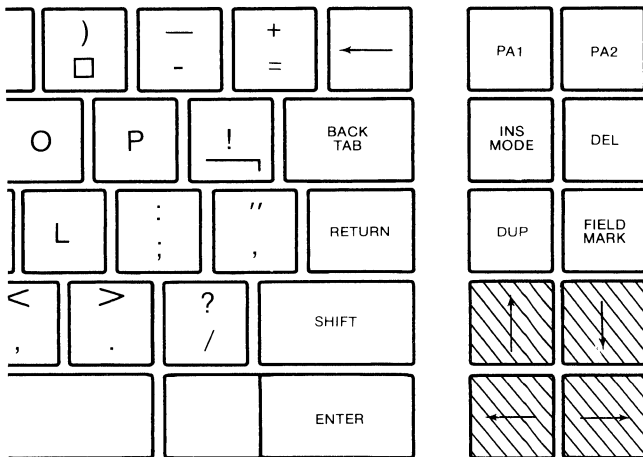
FIGURE 67. CLEAR KEY



UNFORMATTED DISPLAY: Press the CLEAR KEY. Note that pressing the CLEAR key blanks every character on the face of the screen and positions the cursor to the first character position on line 1. The SYSTEM AVAIL light (Figure 63) goes out momentarily, and the INPUT LOCKED light and DEVICE SELECT light come on momentarily. If the INPUT LOCKED light does not go out, press the RESET key to unlock the keyboard.

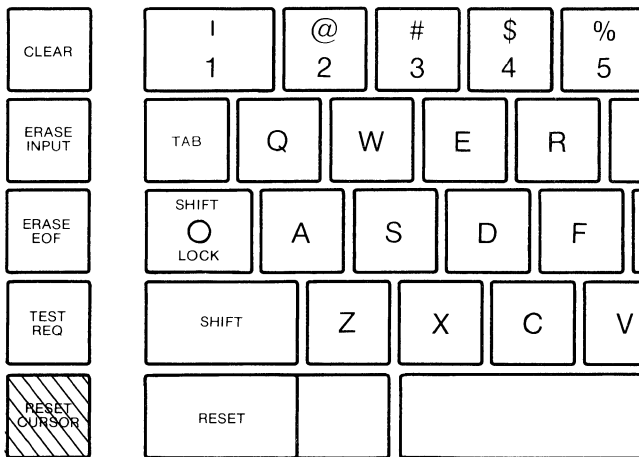
FORMATTED DISPLAY: Do not press the CLEAR key when using a formatted display. Pressing this key blanks the screen and establishes an unformatted display.

FIGURE 68. CURSOR CONTROL KEYS



Move the cursor by pressing each of the cursor control keys in turn. Observe the operation of the cursor. Make the cursor wrap. Note that the cursor control keys move the cursor automatically if the keys are held down.

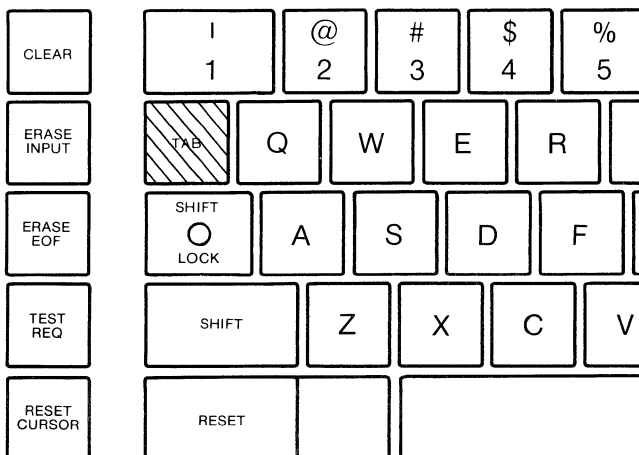
FIGURE 69. RESET CURSOR KEY



UNFORMATTED DISPLAY: Press the RESET CURSOR key. Note that the cursor is positioned to the upper left-hand corner of the screen.

FORMATTED DISPLAY: Press the RESET CURSOR key. Note that the cursor returns to the first character position of the first unprotected field.

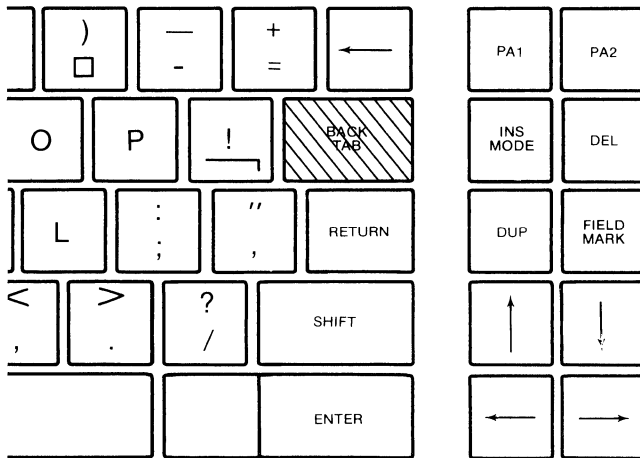
FIGURE 70. TAB KEY



UNFORMATTED DISPLAY: Press the TAB key. Note that the cursor does not move to a new position.

FORMATTED DISPLAY: Press the TAB key several times. Note that the cursor always moves to the right to the next position where it is possible for the operator to enter data. Using the TAB key, position the cursor to the farthest and lowest right-hand position possible.

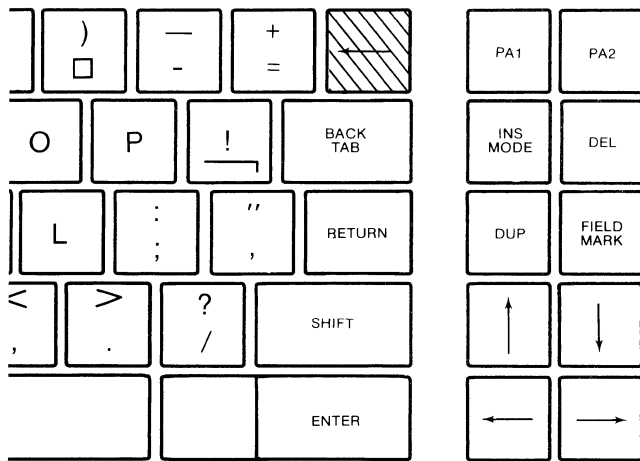
FIGURE 71. BACK TAB KEY



UNFORMATTED DISPLAY: Position the cursor near the center of the screen. Press the BACK TAB key. Note the cursor is repositioned to the first character position on line 1.

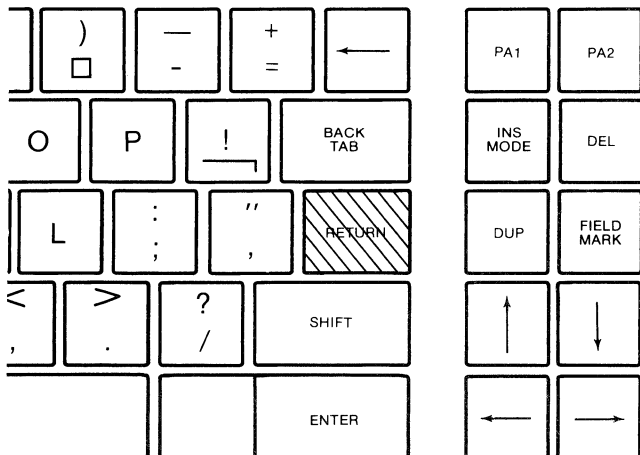
FORMATTED DISPLAY: Press the BACK TAB key, and note the operation of the cursor. Move the cursor at random with the cursor control keys or TAB key while alternately pressing the BACK TAB key. When the cursor is in an input field at a location other than the first character position, the BACK TAB key repositions the cursor to the first character position in that field. When the cursor is in the first character position of an input field, the BACK TAB key repositions the cursor to the first character position of the first preceding input field.

FIGURE 72. BACKSPACE KEY



Using the cursor control keys, position the cursor near the center of the screen. Now press the backspace key several times. Note that the cursor moves one character space to the left each time the key is pressed. (Operation of this key is identical to the operation of the move-cursor-left key.)

FIGURE 73. RETURN KEY



UNFORMATTED DISPLAY: Move the cursor, using the cursor control keys, to a position about halfway across the screen and several lines down. Press the RETURN key. The cursor is positioned to the first character location on the next line.

FORMATTED DISPLAY: Using the cursor control keys, position the cursor at or near the center of the screen. Press the RETURN key. Note that the cursor is positioned to the first character location of the first unprotected field on the next line.

FIGURE 74. SPACE BAR

Reset the cursor, and enter random data on the screen. Reset the cursor, and press the space bar until the cursor travels over the characters previously entered. Note that the characters appear to be deleted; however, unlike a typewriter or a key-punch, a space is considered an actual character that occupies a position on the face of the screen. When the space bar is pressed, a space is entered on the screen; this space character replaces whatever character is presently in that position. Do not use the space bar to position the cursor for that reason.

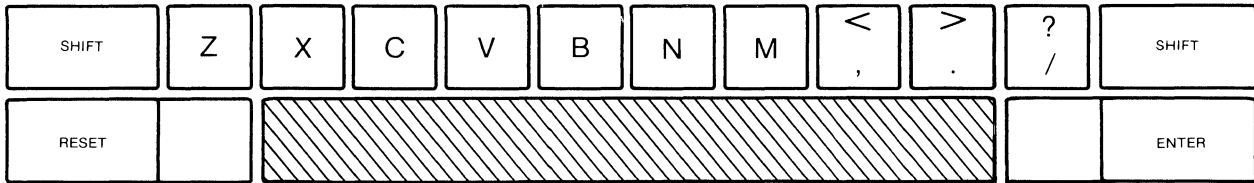
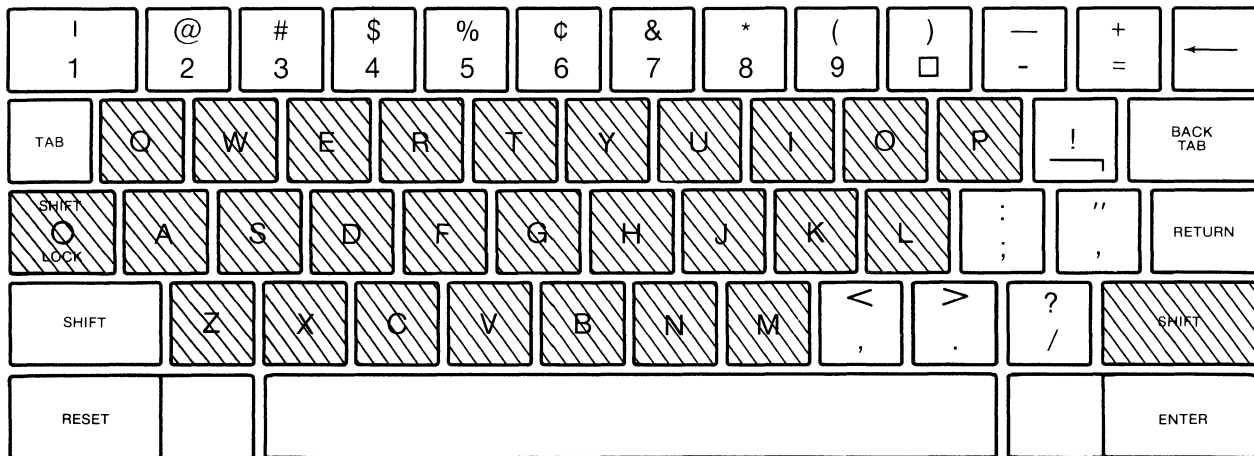


FIGURE 75. SHIFT, SHIFT LOCK AND LETTER KEYS

The SHIFT keys, SHIFT LOCK key and letter keys (A through Z) operate the same as on a standard typewriter keyboard, assuming, of course, that the lower-case option is installed on the terminal. If the lower-case option is not installed, then the letters are always displayed as upper case.



If the lower case option is installed, press the L.C. pushbutton (Figure 63) on the control panel to the right of the screen. Note that the LOWER CASE light comes on. Press the SHIFT keys, alternately, and type data as appropriate using the other hand. Press the SHIFT LOCK key, and type data using both hands. Note the data appearing on the screen. Clear the display by pressing the ERASE INPUT key. Press the CLR button on the control panel to remove the lower-case function.

FIGURE 76. NUMBER KEYS

Operate the number keys (0 through 9) with no shift. Observe that the digit shown on the lower half of the key is displayed. Press the SHIFT key, and operate the number keys. Note that the symbol shown on the upper half of the key is displayed.

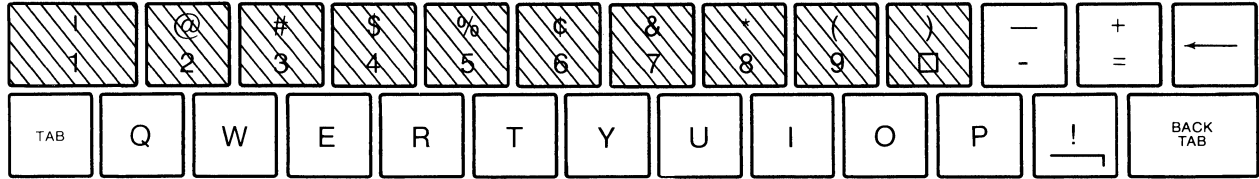


FIGURE 77. SYMBOLS AND PUNCTUATION MARK KEYS

Operate the symbol and punctuation mark keys with no shift. Observe that the symbol shown on the lower half of the key is displayed. Press the SHIFT key. Note that the symbol shown on the upper half of the key is displayed. Clear the display by pressing the ERASE INPUT key.

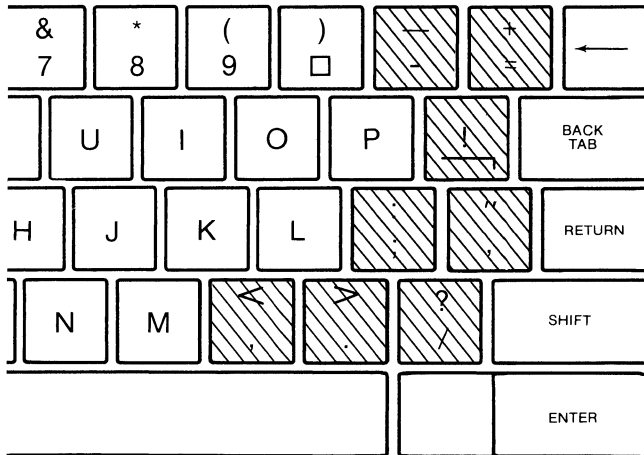


FIGURE 78. ERASE INPUT KEY

UNFORMATTED DISPLAY: Enter any amount of data on the screen. Press the ERASE INPUT key. Note that the inputted data is removed from the screen. Note that the cursor moves to the first character location on line 1.

FORMATTED DISPLAY: Enter data in the unprotected fields. Press the ERASE INPUT key. Note that all areas where data was entered are erased. Note also that the cursor moves to the first character location in the first field in which input data may be keyed.

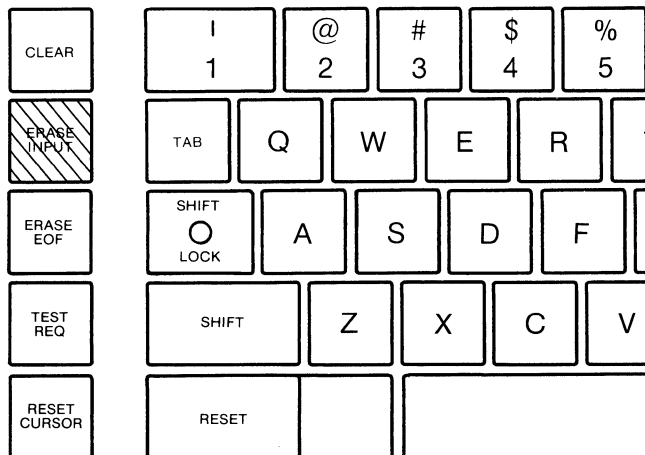


FIGURE 79. ERASE EOF (END OF FIELD) KEY

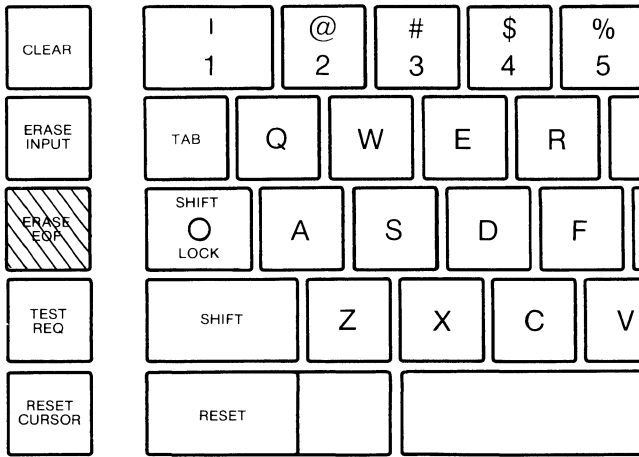
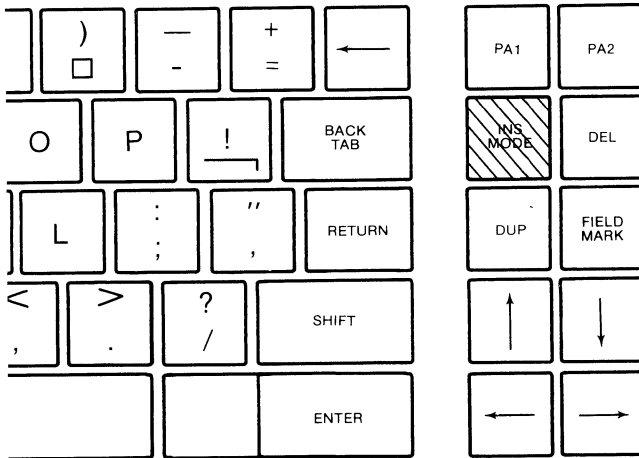


FIGURE 80. INS MODE KEY



UNFORMATTED DISPLAY: Enter any amount of data on the screen. Press the backspace key several times to move the cursor back. Press the ERASE EOF key. Note that all characters from the cursor location to the end of the screen are erased. The cursor, however, does not move.

FORMATTED DISPLAY: Enter any amount of data into the unprotected fields. Position the cursor in the middle of one of the completely filled unprotected fields. Press the ERASE EOF key. Note that all characters from the cursor location to the end of the field are erased. The cursor, however, does not move.

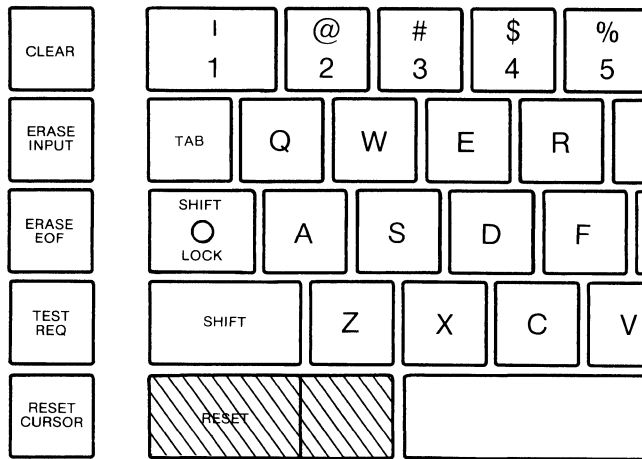
The purpose of the insert mode is to allow the operator to insert a character or characters into the middle of a field without disturbing the information that is already displayed there. Pressing the INS MODE key places the keyboard in the insert mode of operation.

UNFORMATTED DISPLAY: Enter data on the display screen. A social security number (168-22-5451) is a good example, leaving out the two digits in the middle of the number, i.e., enter 168-5451. Move the cursor to the first "5" in that number, and press the INS MODE key. Note that the EDIT MODE light (Figure 63) comes on. Now enter "22-", and observe that the numbers "5451" move to the right to accommodate the insertion.

If an entry is a large one and covers more than one line during the insert operation, characters shift from the end of one line to the beginning of the next line.

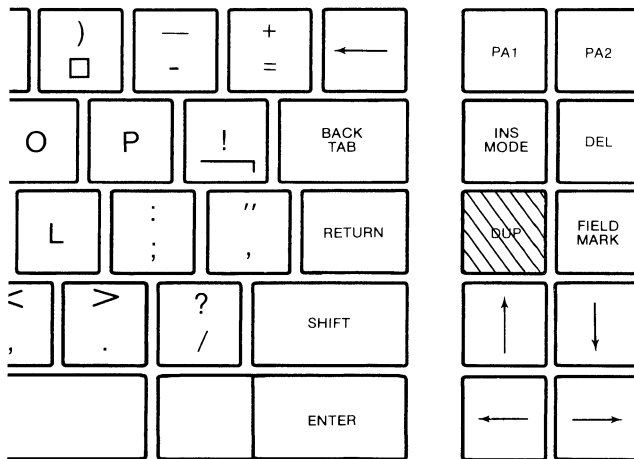
FORMATTED DISPLAY: Enter data into an unprotected field. A social security number is a good example (168-22-5451), leaving out the two digits in the middle of the number, i.e., enter 168-5451. Move the cursor to the first "5" in that number, and press the INS MODE key. The EDIT MODE light (Figure 63) comes on. Now enter "22-", and observe that the numbers "5451" move to the right to accommodate the insertion. If more characters are inserted than the field will hold, the keyboard is disabled. The number of characters that can be inserted into a field is limited to the number of blanks remaining in the field. If the field is a large one and covers more than one line, it is possible in some instances for an insert operation to shift characters from the end of one line to the beginning of the next line.

FIGURE 81. RESET KEY



Press the RESET key to reset the EDIT MODE light (Figure 63). However, note that the RESET key does not change the status on the indicator panel during the short period of time when the display station is sending data to or receiving data from the computer. Thus, it may be possible to press the RESET key and not accomplish the desired reset. If this happens, press the RESET key again.

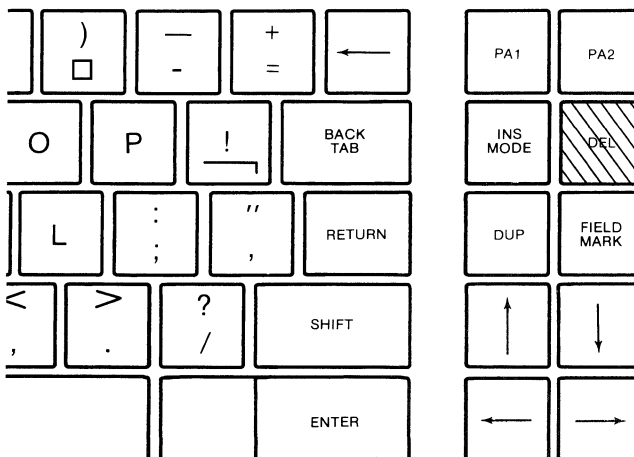
FIGURE 82. DUP KEY



UNFORMATTED DISPLAY: Operation of the DUP key is generally not applicable.

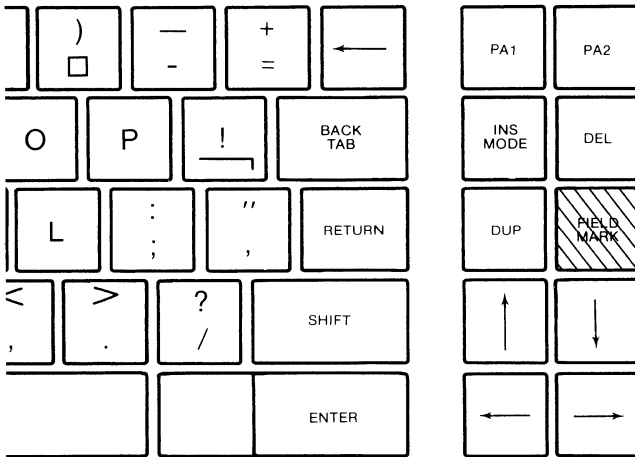
FORMATTED DISPLAY: The DUP key is used in some applications to duplicate information previously entered. Additional information must be supplied by your supervisor for its use; however, to observe the operation, press the DUP key. Note that a special character in the form of an asterisk is displayed in the position occupied by the cursor. Note that the cursor moves to the first character location of the next unprotected field.

FIGURE 83. DEL (DELETE) KEY



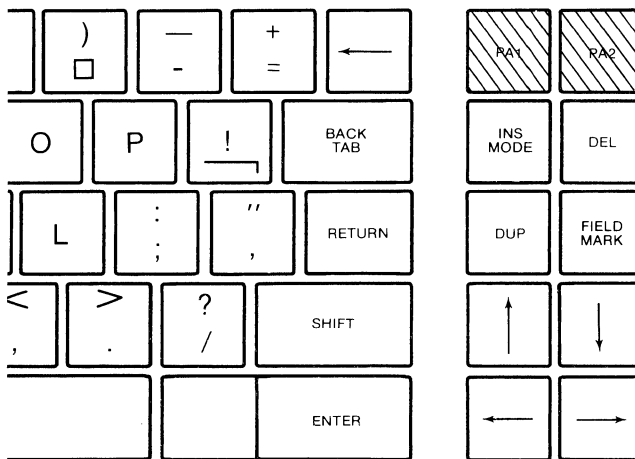
To simulate the use of the DEL key, enter incorrect data on the screen, for example: "Decem~~m~~ber 22, 1974". Move the cursor to the position of the extra "m". Press the DEL key. Note that the character occupying the position underlined by the cursor is deleted, and that all characters to the right of that position are shifted left one position. Note that the cursor does not move. The correction made, move the cursor to the next character position where data will be entered.

FIGURE 84. FIELD MARK KEY



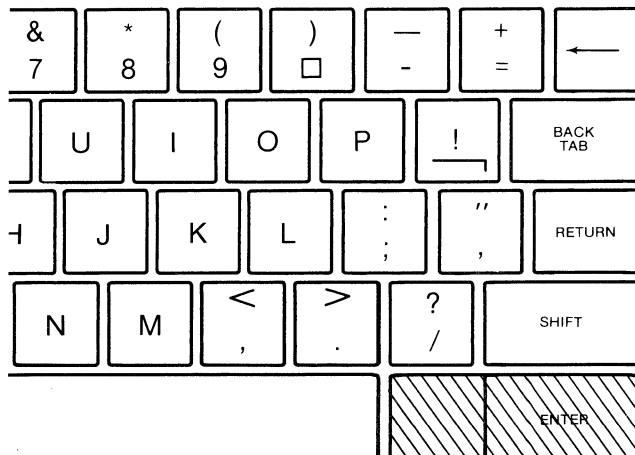
The FIELD MARK key is used primarily when operating with an unformatted display. It indicates the end of a data field to the program. Press the FIELD MARK key and note that a special character in the form of a semi-colon is displayed. The cursor moves to the next character position.

FIGURE 85. PA1 AND PA2 KEYS



PA1 and PA2 are program access keys; they perform the function that their name implies. They provide a means of signaling the program or obtaining access to it. While the terminal is signaling the program, the INPUT LOCKED light comes on (Figure 63), making the keyboard inactive. Most programs, when replying to these keys, turn off this light; however, this decision is made by the program. The program that is operating in the computer at the time also determines how these keys are used. To determine their exact function, refer to the appropriate application procedure. If the INPUT LOCKED light remains on for an abnormally long period after one of the PA keys is pressed, press the RESET key to turn it off.

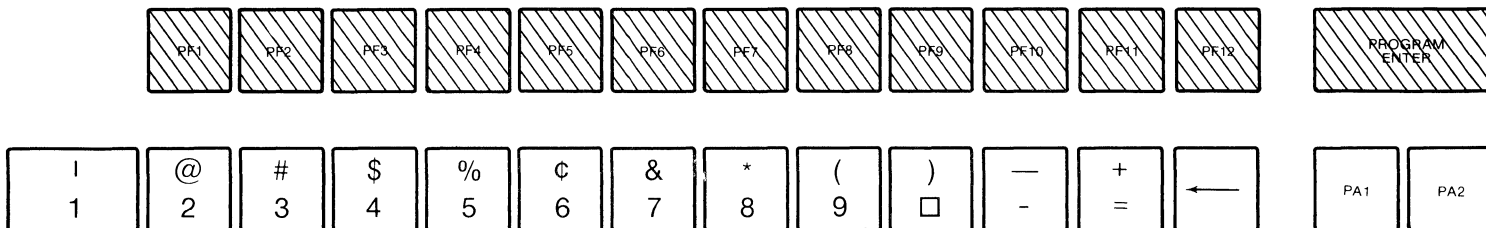
FIGURE 86. ENTER KEY



Pressing the ENTER key tells the program that the message has been completed, and it is time for the information on the screen to be entered into the computer. While the terminal is signaling the program, an INPUT LOCKED light comes on, making the keyboard inactive. Most programs, when acting on an ENTER key signal, turn off this light; however, this decision is made by the software program. If the INPUT LOCKED light remains on for an abnormally long period after use of the ENTER key, press the RESET key to turn it off.

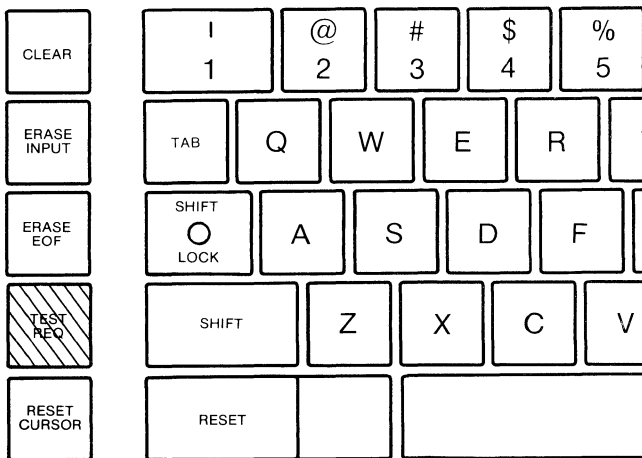
FIGURE 87. PF1 THROUGH PF12 KEYS AND PROGRAM ENTER KEY

In addition to the functions permanently assigned to other keys (such as backspace, tab, back tab, etc), application programs can assign other programmable functions to the Program Function (PF) keys. To determine the use of each key and the corresponding action, refer to the appropriate application instructions.



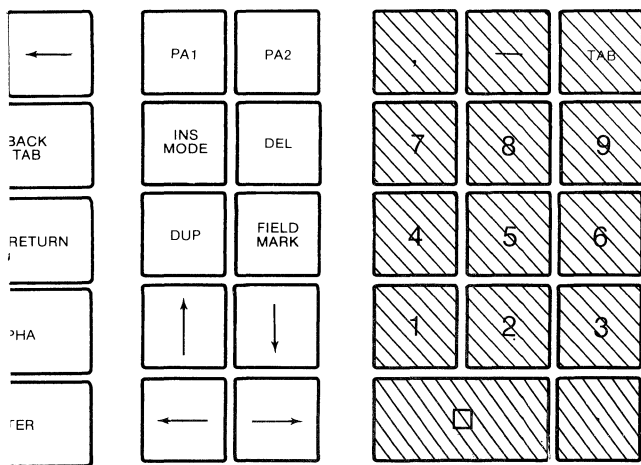
In some applications, an optional use of the PROGRAM ENTER key is desired to prevent sending unsolicited requests to the computer. For these applications, the PROGRAM ENTER key must be used in conjunction with the PF keys. The PROGRAM ENTER key must be pressed following the operation of any one of the 12 PF keys before a request is sent to the computer.

FIGURE 88. TEST REQ KEY



The function of the TEST REQ key is determined by the computer. As such, this key may be ineffective. Pressing the TEST REQ key sends a unique signal to the computer telling the program that a test message is desired. While this signaling is taking place, the INPUT LOCKED light turns on (Figure 63) making the keyboard inactive. The program replying to the signal, normally turns off the light and displays a message on the screen that advises what procedure should be followed. You should request specific instructions for use of this key.

FIGURE 89. NUMERIC PAD



The numeric pad is a convenience for those operations where personnel are familiar with operating calculators or adding machines. The numeric pad is laid out very much like such calculators and is normally used where quantities of numeric data must be entered. The TAB key functions identically to the TAB key on the main keyboard. Practice entering data using all of the keys on the numeric pad.

Console Keyboard Operation

GENERAL OPERATION

The console keyboard is similar to a standard typewriter keyboard in appearance and arrangement of keys. The majority of the keys perform the same function as the keys of the same name on a typewriter keyboard.

This keyboard can generate and display 26 uppercase alphabetic characters, 10 numeric characters, and 26 symbols and punctuation marks by operation of the key that designates the desired character. The character is displayed on the screen in the position marked by the cursor. The keyboard also includes the control keys which are used to edit data and generate input messages to signal the computer.

Keys that have two designations shown on their faces can generate either designation or character depending upon the position of the SHIFT key. The lower character is generated when the selected key is pressed and the keyboard is in the unshifted mode. To generate the upper character, the SHIFT key must be held down while the selected key is pressed. The SHIFT keys and the SHIFT LOCK key function essentially the same as they do on any standard typewriter.

ESSENTIAL DIFFERENCES FROM TYPEWRITER KEYBOARD

The overall layout of the console keyboard is shown in Figure 90. As is clearly evident from this illustration, this keyboard is nearly identical to the typewriter keyboard, except for the layout of the punctuation marks and symbols. Those keys that are different are highlighted. The other difference from the typewriter keyboard is the key labeled CNCL which is also highlighted. The CNCL key performs the same function as the PA2 key which is described on page 40.

OPERATION OF CONSOLE KEYBOARD

The console keyboard is not generally used in data entry operations; it is intended primarily for use by computer operators, systems personnel or machine room supervisory personnel.

Since operation of the console keyboard is nearly identical to the operation of the typewriter keyboard, detailed operating instructions are not included in this manual. If operating instructions for this keyboard are required, refer to the section of this manual entitled "TYPEWRITER KEYBOARD OPERATION".

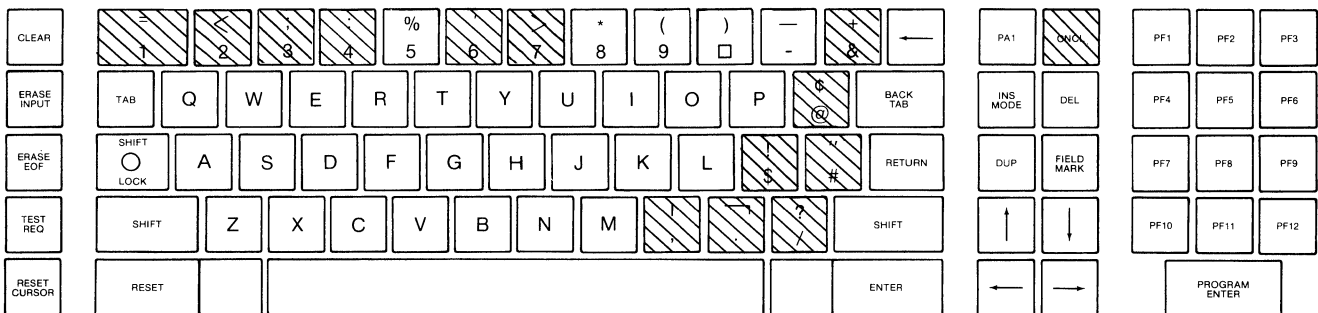


FIGURE 90. OPERATOR CONSOLE KEYBOARD

Printer Operation

In addition to the Model 2700 Display Terminal, Courier provides a family of impact printers as part of the 270 Information Display System to meet the output printing requirement of many applications. The three most popular printer models (2740, 2742 and 2744) are shown in Figures 91, 92 and 93. Notice that each of the printer mechanisms is attached to the same printer cabinet. This unit, the 2730 Printer Controller, provides storage for data and contains control functions required to operate one of the printers with an information system. The important features of the different printer models are compared in Table I for your convenience.

This section of the manual contains information necessary to operate the various printer models of the Courier 270 Information Display System. Each of the functions listed below is described in this section.

- Loading Paper Forms
- Forms Thickness Adjustment
- Ribbon Replacement
- Vertical Format Tape Generation

TABLE 1
PRINTER FEATURE COMPARISON

FEATURE	2740 PRINTER	2742 PRINTER	2744 PRINTER
Print Positions (maximum per line)	80	132	132
Print Rate (lpm, lines per minute)	60	40	60
Horizontal Character Spacing (characters per inch)	10	10	10
Vertical Line Spacing (lines per inch)	6	6	6
Forms Tractor Width Range (inches)	4 to 9-1/2	4 to 14-7/8	4 to 14-7/8



FIGURE 91. 2740 PRINTER



FIGURE 92. 2742 PRINTER



FIGURE 93. 2744 PRINTER

INDICATORS AND CONTROLS

Each different printer model has a slightly different arrangement of indicators and controls. However, each arrangement provides identical functions. The operator indicators and controls for the 2740, 2742 and 2744 Printers are shown in Figure 94, 95 and 96, respectively. You should become familiar with the controls and indicators for the particular model used in your application.

In addition, each printer also contains the following features:

- A bell alarm consisting of a 2-second audible tone sounded in response to a BELL code or a paper-empty condition.
- A form thickness control knob (and lock knob) located on the print head carriage, adjusts the penetration of the print wires on to the paper.
- A platen knob used to manually adjust paper in the printer. The knob operates by pulling it out and rotating it in either direction.
- A Vertical Format Unit (VFU) which provides control of vertical paper movement for preprinted forms.
- An automatic motor control feature which automatically shuts off the printer motor when it is not in use.

LOADING PAPER FORMS

1. Make sure the printer ON/OFF switch is in the OFF position.
2. Remove access cover.
 - For the 2740 and 2742 Printers, remove the top access cover by lifting it up and off.
 - For the 2744 Printer, open the front access cover.

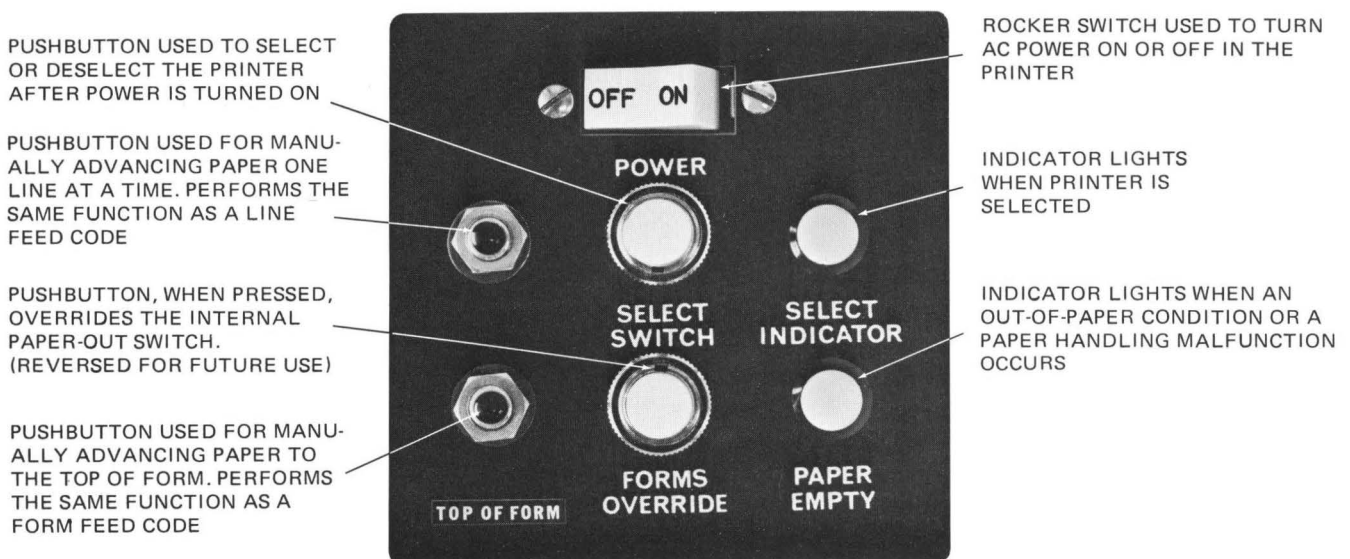
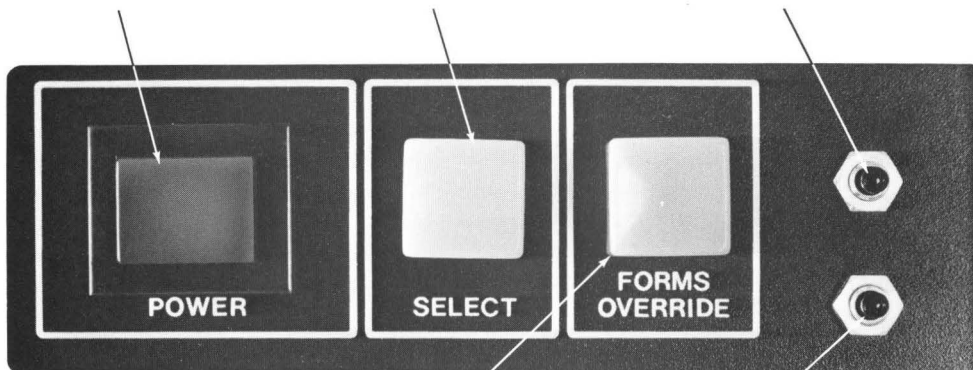


FIGURE 94. 2740 PRINTER CONTROLS AND INDICATORS

PUSHBUTTON SWITCH USED TO TURN AC POWER ON AND OFF IN THE PRINTER

PUSHBUTTON/INDICATOR USED TO SELECT OR DESELECT THE PRINTER AFTER POWER IS TURNED ON. LIGHTS WHEN PRINTER IS SELECTED

TOP-OF-FORM PUSHBUTTON USED FOR MANUALLY ADVANCING PAPER TO THE TOP OF FORM



PUSHBUTTON/INDICATOR USED TO OVERRIDE THE INTERNAL PAPER-OUT SWITCH. LIGHTS WHEN PAPER-EMPTY CONDITION EXISTS. (RESERVED FOR FUTURE USE)

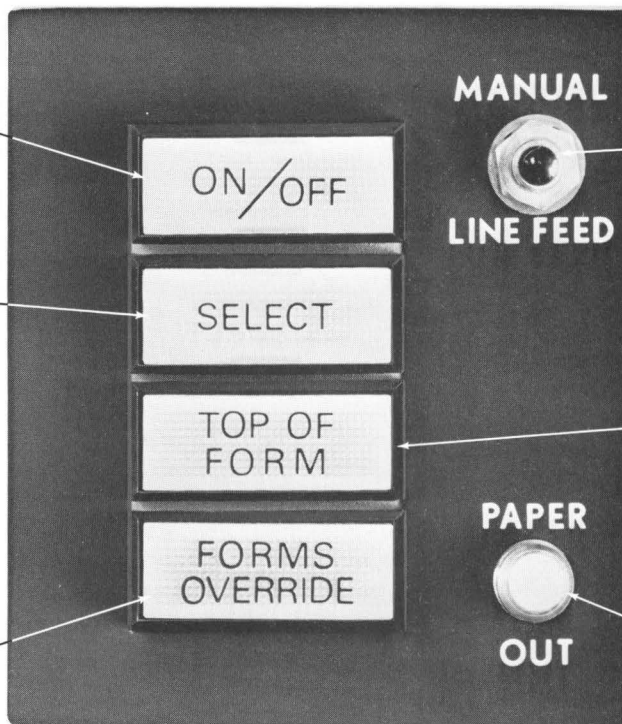
MANUAL LINE FEED PUSHBUTTON USED FOR MANUALLY ADVANCING PAPER ONE LINE AT A TIME

FIGURE 95. 2742 PRINTER CONTROLS AND INDICATORS

PUSHBUTTON USED TO TURN AC POWER ON OR OFF IN THE PRINTER. LIGHTS WHEN THE PRINTER IS ON

PUSHBUTTON USED TO SELECT OR DESELECT THE PRINTER AFTER POWER IS TURNED ON. LIGHTS WHEN PRINTER IS SELECTED

PUSHBUTTON, WHEN PRESSED, OVERRIDES THE INTERNAL PAPER-OUT SWITCH. (RESERVED FOR FUTURE USE)



PUSHBUTTON USED FOR MANUALLY ADVANCING PAPER ONE LINE AT A TIME. PERFORMS THE SAME FUNCTION AS A LINE FEED CODE

PUSHBUTTON USED FOR MANUALLY ADVANCING PAPER TO TOP OF FORM. PERFORMS THE SAME FUNCTION AS A FORM FEED CODE

INDICATOR LIGHTS WHEN AN OUT-OF-PAPER CONDITION OR PAPER HANDLING MALFUNCTION OCCURS

FIGURE 96. 2744 PRINTER CONTROLS AND INDICATORS

3. Open the guide plates on the left and right pin feed tractor units. Make sure the left pin feed unit is locked in place at the extreme left margin.
4. Place the new paper supply on a surface or forms stand (not on the floor) at the rear of the printer.
5. Thread the paper through the slot in the rear of the printer and up to the pin feed tractors.
6. Place the top sheet in the paper feed tractors. Make sure the holes are aligned so that the top of the sheet is parallel with the top of the printer. If necessary, loosen the fixing knob on top of the right pin feed unit, and move the unit to accommodate the width of the paper. When properly adjusted, tighten the fixing knob.
7. Close the guide plates on the pin feed units.
8. Replace access cover.
 - For the 2740 and 2742 Printers, replace and close the top access cover.
 - For the 2744 Printer, close the front access cover.
9. Set the printer ON/OFF switch in the ON position.
10. Press the TOP OF FORM pushbutton once to advance the vertical format tape to the top-of-form position.
11. Use the platen knob to adjust the paper so that the desired top line on the form is aligned vertically with the print head. This adjustment is performed by pulling out the platen knob and rotating it in either direction. Once aligned, each time a FORM FEED command is received or the TOP OF FORM pushbutton is pressed, the paper slews to this same line at the top of the next form.
12. Press the TOP OF FORM pushbutton once to check that the new paper feeds correctly.
13. Press the SELECT pushbutton to enable the printer mechanism to receive data.

FORMS THICKNESS ADJUSTMENT

At initial installation or when the thickness of the paper forms is changed, the print head must be adjusted according to the thickness of the forms being used. To adjust the print head for optimum printing quality perform the following steps.

1. Make sure the printer ON/OFF switch is in the OFF position.
2. Remove access cover.
 - For the 2740 and 2742 Printers, remove the top access cover by lifting it up and off.
 - For the 2744 Printer, open the front access cover.
3. Load printer with the desired paper forms.
4. Loosen the lock knob on the left side of the print head (Figure 97).
5. Set the penetration control knob on the right side of the print head to a setting of 5.

NOTE

The numbers on the penetration control knob do not correspond to the number of copies used in the paper form.

6. Manually move the print head across the paper and increase the penetration (turn penetration control to a lower number) until the ribbon smudges the paper.
7. Turn the penetration control knob to a higher number until the smudging just disappears.
8. Tighten the lock knob to secure the print head in position.
9. Replace the access cover.
 - For the 2740 and 2742 Printers, replace and close the top access cover.
 - For the 2744 Printer, close the front access cover.
10. Set the printer ON/OFF switch in the ON position.
11. Press the SELECT pushbutton to enable the printer mechanism to receive data.

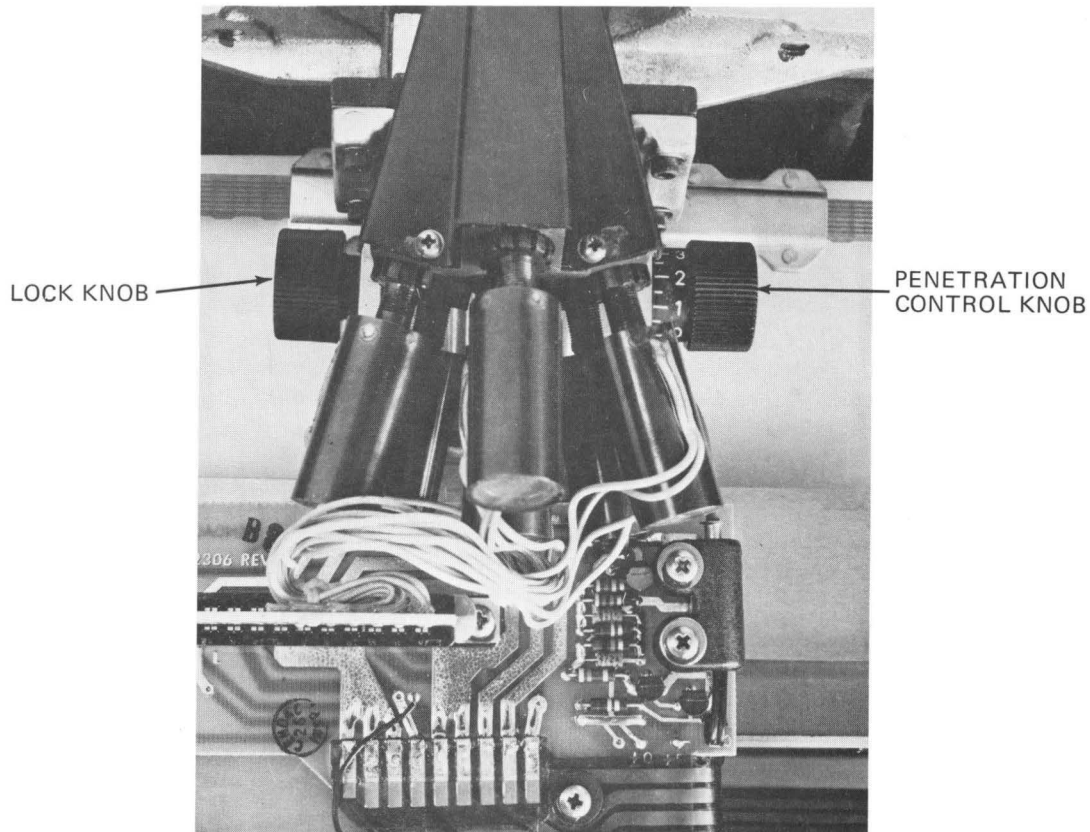


FIGURE 97. FORMS THICKNESS CONTROLS

RIBBON REPLACEMENT

To replace a worn ribbon, refer to Figure 98 for the 2740 and 2742 Printers or Figure 99 for the 2744 Printer and perform the following steps.

1. Make sure the printer ON/OFF switch is in the OFF position.
2. Remove access cover.
 - For the 2740 and 2742 Printers, remove the top access cover by lifting it up and off.
 - For the 2744 Printer, open the front access cover and both end access covers.
3. Note the setting of the penetration control knob so that it can be restored to this setting after the ribbon is changed.
4. Loosen the lock knob on the left side of the print head. Set the penetration control knob on the right side of the print head to a setting of 5.
5. Remove the plastic caps from the left- and right-hand ribbon reversing guides. Pull cap straight up to remove.
6. Swing the left- and right-hand ribbon tension arms clear of the spools.
7. Remove both spools and the used ribbon from the printer.
8. Remove used ribbon from one of the spools to obtain an empty spool.
9. Wind the new ribbon around the empty spool about four times.
10. Place the partially wound spool on the right-hand axle.
11. Starting on the right side, insert the ribbon in the right-hand reversing guide, and thread the ribbon through the idler and ribbon guide rollers as shown in Figure 98 for the 2740 and 2742 Printers or Figure 99 for the 2744 Printer.
12. Place the full spool on the left-hand axle, and insert the ribbon in the left-hand ribbon reversing guide.
13. Replace the plastic caps on both ribbon reversing guides.
14. Reset the penetration control knob on the right side of the print head to its original setting (noted in Step 3).
15. Tighten the lock knob on the left side of the print head.
16. Replace access cover.
 - For the 2740 and 2742 Printers, replace and close the top access cover.
 - For the 2744 Printer, close the front access cover and both end access covers.
17. Set the printer ON/OFF switch in the ON position.
18. Press the SELECT pushbutton to enable the printer mechanism to receive data.

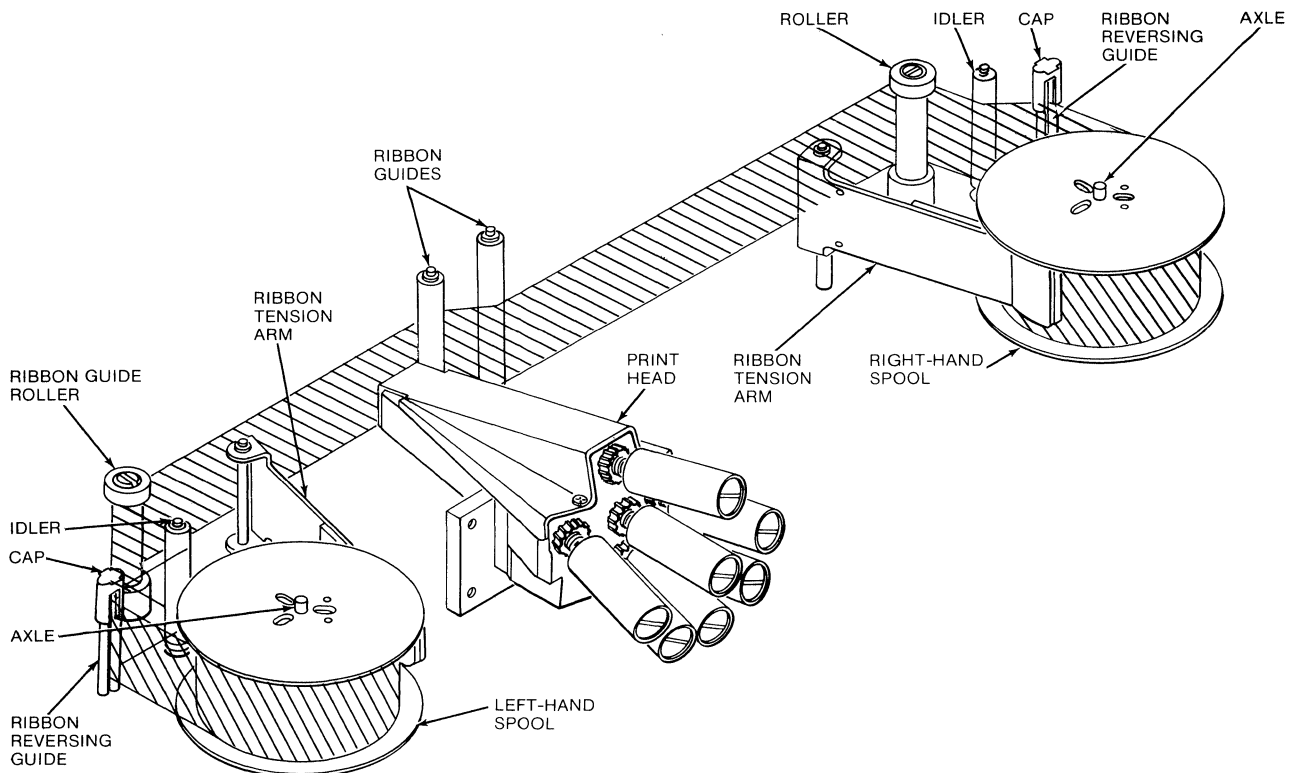


FIGURE 98. 2740 AND 2742 PRINTERS, RIBBON REPLACEMENT DIAGRAM

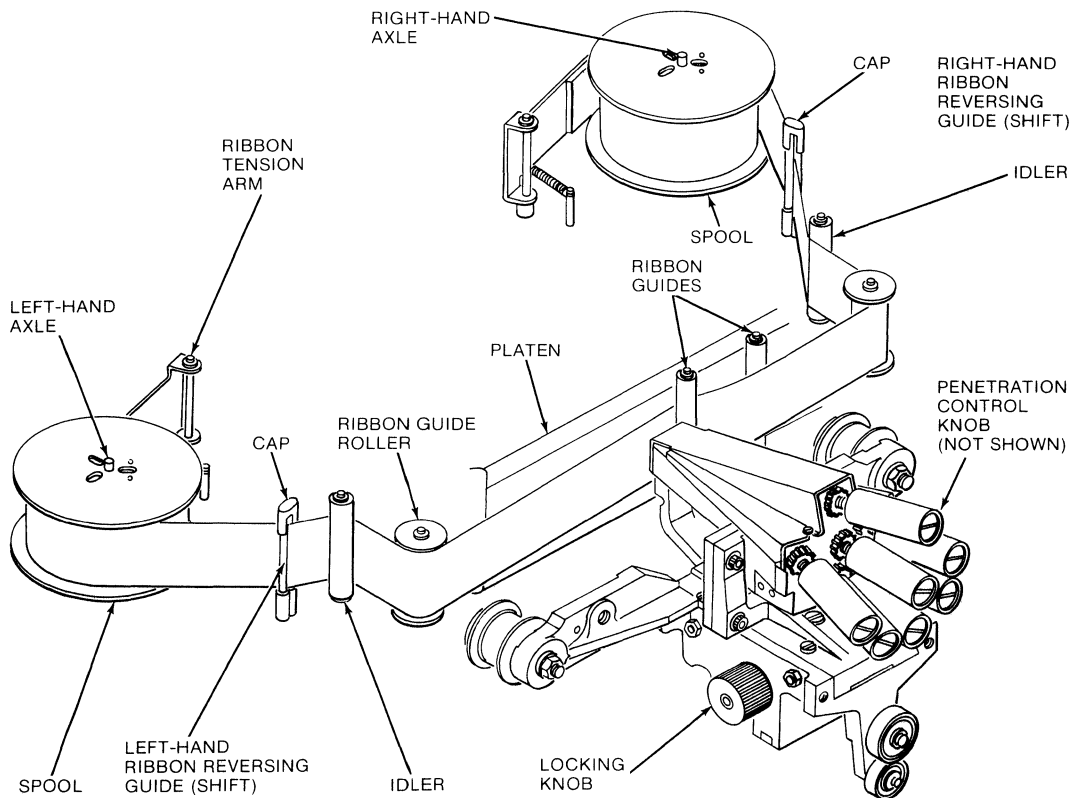


FIGURE 99. 2744 PRINTER, RIBBON REPLACEMENT DIAGRAM

RIBBON SPECIFICATIONS

Each printer uses a 1-inch nylon ribbon mounted on 3-inch diameter spools. The following four colors are available:

<u>Color</u>	<u>No.</u>
Black	1401
Red	1402
Green	1403
Blue	1404

PAPER SPECIFICATIONS

Each printer uses continuous form paper with standard feed holes on each edge. Using a multiple-part form, one original and up to four copies can be printed. Paper weight specifications are as follows:

Single-Part Forms:	15 to 20 lb
Multiple-Part Forms:	Original — 12 to 15 lb
	Copies — 9 to 12 lb, last copy 15 lb (maximum of five parts)
Carbon Paper:	7-1/4 lb with medium hardness

VERTICAL FORMAT UNIT

Vertical formatting for all printers is controlled by a paper tape in the Vertical Format Unit (VFU). This unit is located on the upper left side of the printer just under the left cover (Figure 100).

The tape is a standard 1-inch wide, 8-channel, black opaque paper tape. The sprocket holes, located between Channels 3 and 4, have a 1/10-inch pitch between holes. Channel 5 defines the vertical tab format, and Channel 7, the top-of-form format. The tape reader and paper feed mechanisms are mechanically linked so that each line feed advances both the paper by one line and the paper tape by one sprocket hole.

Reception of a vertical tab code advances the paper (and tape) to the next hole in Channel 5. For example, if the holes in Channel 5 are spaced six sprocket holes apart, each vertical tab advances the paper six lines (1 inch).

Similarly, reception of a form feed code or pressing the TOP OF FORM pushbutton advances the paper (and tape) to the next hole in Channel 7.

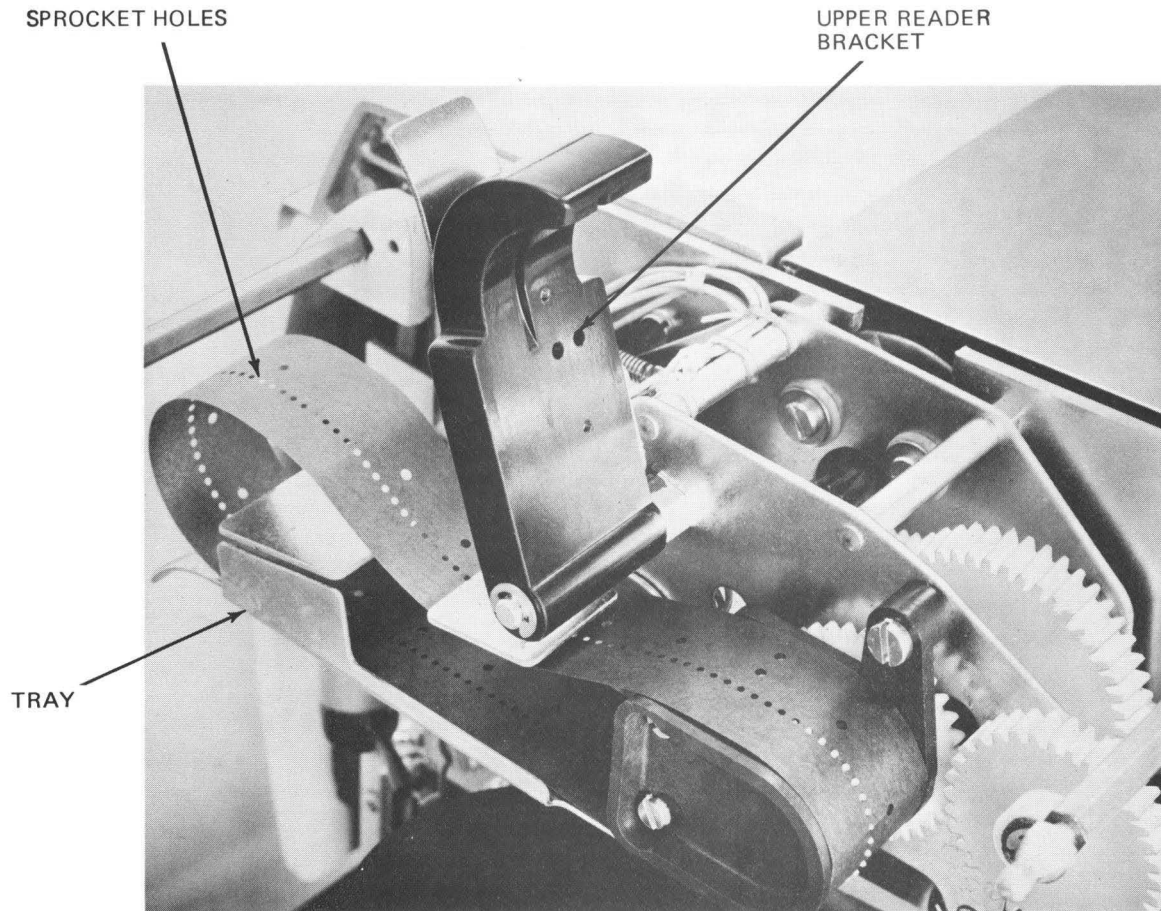


FIGURE 100. VERTICAL FORMAT UNIT

On the standard paper tape shipped with the printer, vertical tab holes are spaced six sprocket holes apart in Channel 5 (corresponding to a 1-inch tab), and top-of-form holes are spaced 66 sprocket holes apart in Channel 7 (corresponding to an 11-inch form). Special paper tapes can easily be generated to meet any vertical formatting requirements desired by the user.

TAPE INSTALLATION

To change the tape in the Vertical Format Unit, perform the following steps.

1. Make sure the printer ON/OFF switch is in the OFF position.
2. Remove access cover.
 - For the 2740 and 2742 Printers, remove the VFU access cover (left side of printer) by lifting it up and off.
 - For the 2744 Printer, open the left end access cover.
3. Raise the upper reader bracket (Figure 100).
4. Slip the old tape out through the slot in the side of the tray.
5. With the sprocket holes nearer to the left edge of the new tape, insert the new loop through the slot and into the tray.
6. Carefully position the sprocket holes over the drive sprocket, and close the upper reader bracket.
7. Replace access cover.
 - On the 2740 and 2742 Printers, replace and close the VFU access cover.
 - On the 2744 Printer, close the left end access cover.
8. Set the printer ON/OFF switch in the ON position.
9. Press the TOP OF FORM pushbutton once to advance the new tape loop to the top-of-form position.
10. Pull the platen knob out, and rotate it in either direction to adjust the paper so that the desired top line on the form is aligned vertically with the print head.
11. Press the TOP OF FORM pushbutton once to check that the unit feeds the forms correctly.
12. Press the SELECT pushbutton to enable the printer mechanism to receive data.

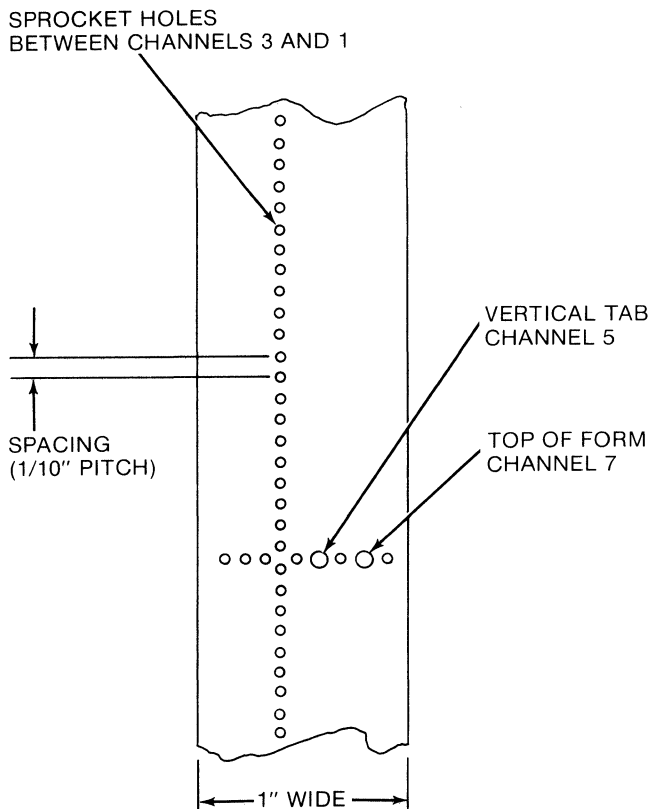


FIGURE 101. TAPE MATERIAL

TAPE MATERIAL

The tape reader operates with commonly available, opaque, 1-inch wide, 8-channel tape (Figure 101). The color of the tape is not important, but the material must be opaque so that light is blocked where there are no punched holes. Either mylar or black paper that is not oil impregnated is acceptable. In general, oil-impregnated paper in any color reduces the opaqueness of the material.

TAPE PREPARATION

Computer-Driven or Manual Punch

Vertical format tape can be prepared on any suitable 8-channel punch capable of punching ten holes per inch in a 1-inch wide tape. If a computer-driven or a manual punch is used, the three VFU functions and corresponding punchings are as follows:

<u>VFU Function</u>	<u>Punch</u>
Top-of-Form	Channel 7
Vertical Tab	Channel 5
Line Feed	Sprocket Only

To prepare vertical format tape on a computer-driven or manual punch, perform the following steps.

1. Measure the length of the new or existing form. Multiply the length in inches by six (lines per inch) to determine the total number of lines on the form.
2. Starting with the first printed line, determine which lines will be located by use of the vertical tab function.
3. Place a suitable blank tape in the punch, and punch one top-of-form function (Channel 7) to begin the tape.
4. Punch either one line feed function (sprocket only) or one vertical tab function (Channel 5) for each line position on the form until one full section is completed.
5. Punch enough full sections (starting with a top-of-form function again) until the tape length exceeds 13 inches. Punch 15 more line feed functions (sprocket only) to aid in splicing the tape.
6. Remove the punched tape from the punch, and refer to the SPLICING INSTRUCTIONS on page 55.

Teletype Tape Reader/Punch Unit

The paper tape reader/punch unit on a Model 33 or 35 Teletype can also be used to prepare vertical tapes. The three VFU functions and the corresponding keys used to punch these functions are shown below. Note that it is not possible to punch Channel 7 only or Channel 5 only by using the Teletype keyboards. However, the additional channels punched do not affect the operation of the VFU.

<u>VFU Function</u>	<u>Teletype Key</u>	<u>Punch</u>
Top-of-Form	@ (P) P	Channels 7 and 5
Vertical Tab	CTRL and Q	Channels 5 and 1
Line Feed	CTRL, SHIFT and @ (@) P	Sprocket Only

To prepare a VFU tape by using a Model 33 or 35 Teletype, perform the following steps.

1. Measure the length of the new or existing form. Multiply the length in inches by 6 (lines per inch) to determine the total number of lines on the form.
2. Starting with the first printed line, determine which lines will be located by use of the vertical tab function.
3. Make sure that a suitable blank tape is loaded in the punch unit. Turn the punch on, and make sure that the Teletype is in the local mode.
4. Hold down the CNTL and SHIFT keys, and press the (@_P)-key several times to generate a tape leader.
5. Punch one top-of-form function by pressing only the (@_P)-key.
6. Punch either one line feed function or one vertical tab function for each line position on the form until one full section is completed. The line feed function is punched by holding down the CNTL and SHIFT keys and pressing the (@_P)-key. The vertical tab function is punched by holding down the CNTL key and pressing the Q-key.
7. Punch enough full sections (starting with a top-of-form function again) until the tape length exceeds 13 inches. Punch 15 more line feed functions to aid in splicing the tape.
8. Remove the punched tape from the punch, and refer to the SPLICING INSTRUCTIONS on page 55.

The paper tape reader/punch unit on a Model 33 or 35 Teletype can be used to duplicate an existing vertical format tape by performing the following steps.

1. Make sure that a suitable blank tape is loaded in the punch unit.
2. Turn the punch on, and make sure that the Teletype is in the local mode.
3. Insert the tape to be duplicated in the reader unit, and lock it in.
4. Turn the reader switch to START; a duplicate tape is punched automatically.
5. Remove the punched tape, and refer to the SPLICING INSTRUCTIONS on page 55.

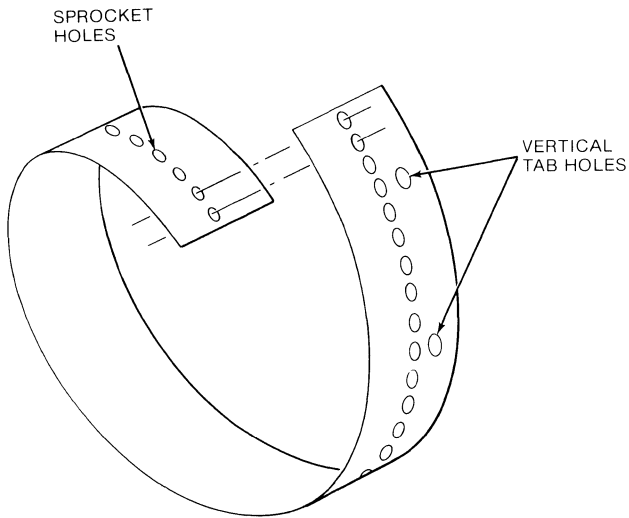


FIGURE 102. TAPE SPLICING

SPLICING INSTRUCTIONS

To splice a new vertical format tape into a tape loop perform the following steps.

1. As shown in Figure 102, overlap the two ends of the tape (X and Y), and place the sprocket holes over one another to properly align the two ends. Arrange the splice so that the distance between consecutive form feed holes is the same all around the tape.
2. Use perforated splicing tape to hold both ends of the tape together.

Light Pen and Badge Reader

This section of the manual describes two optional features available for use with the Courier 270 Information Display System: the Light Pen and the Badge Reader. The operator should be familiar with these options and know and understand how they affect the basic operation of the terminal.

LIGHT PEN OPERATION

In some applications, the operator is required to select one or more items from a list displayed on the screen. The light pen (Figure 103) offered as an optional feature of the Courier 270 Information Display System, facilitates this selection. Many applications are basically similar; however, your company's application could be unique. Therefore, if the light pen feature is installed in your terminal, you should check with your supervisor for specific instructions for use of the light pen.

The point of the light pen contains a device that is sensitive to the light of a character on the display. This device is activated by placing the point of the pen on the screen over the designator character and pushing the barrel of the pen toward the screen.

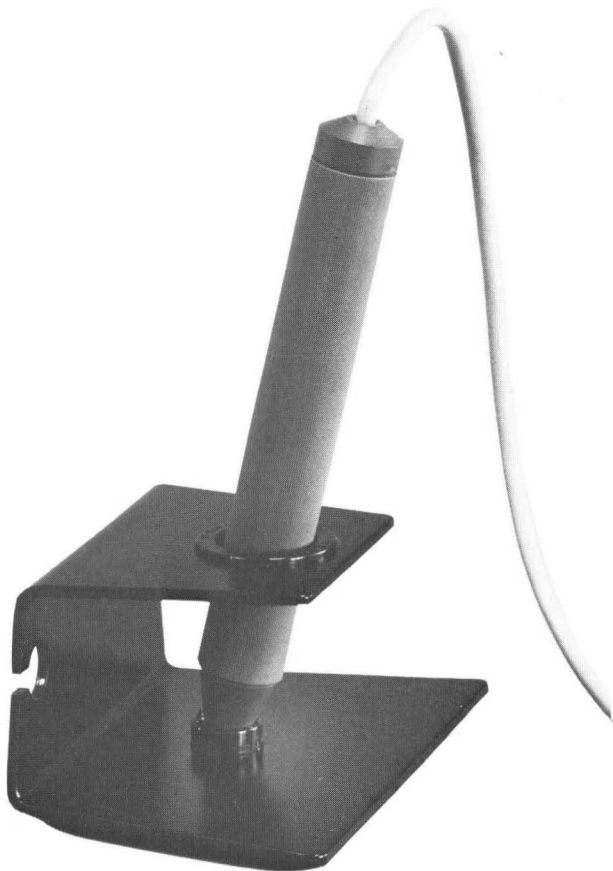


FIGURE 103. LIGHT PEN

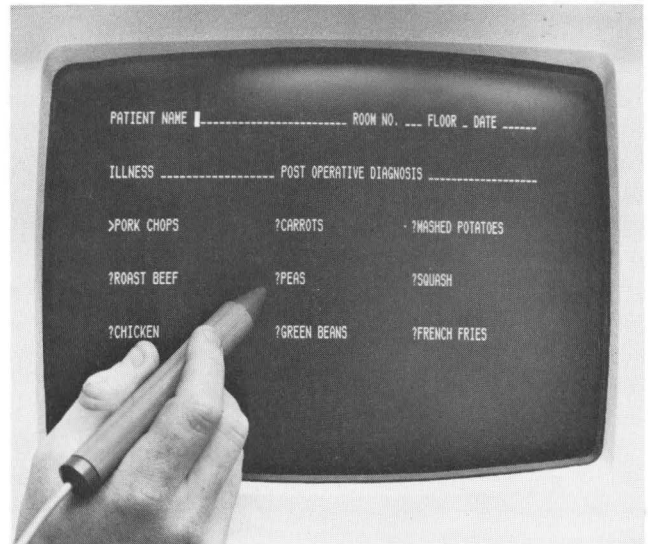


FIGURE 104. SAMPLE LIGHT PEN DISPLAY BEFORE SELECTION

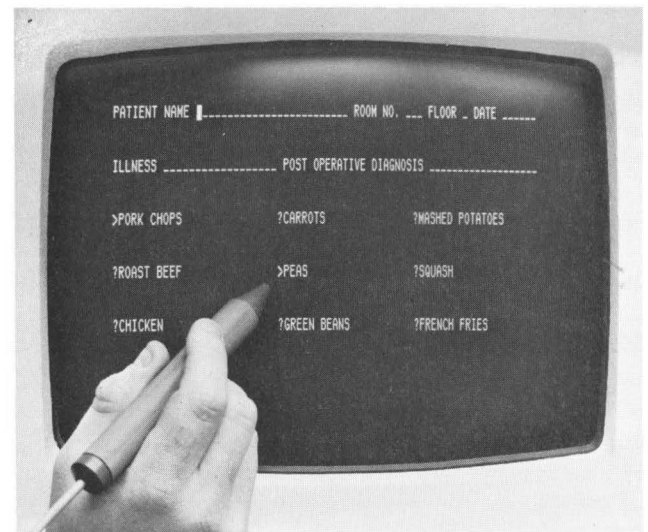


FIGURE 105. SAMPLE LIGHT PEN DISPLAY AFTER SELECTION

The first character of each selectable field on the screen is called the "designator character". This character is either a question mark(?) or a greater than sign (>). Before selection of an item, the designator character is a question mark (Figure 104). After selection, the designator character is automatically changed to a greater than sign (Figure 105) to visually indicate that the item has been selected. If a mistake is made in selecting an item, the selection can be corrected by pressing the light pen against the designator character of that item. The designator character is automatically changed back to a question mark, and the item is de-selected. The correct item can then be selected.

After an item is selected, the operator can continue to select other items displayed on the screen. When the selection of items is completed, the operator can transmit this information to the computer by pressing the point of the light pen over an attention field (appropriate word, e.g. EXIT or ENTER, that is not preceded by a designator character, but is still light pen detectable). In applications where attention fields are not used, the operator can transmit data to the computer by pressing the appropriate enter key on the keyboard. Immediately after the attention field is selected, or an appropriate enter key is pressed, the INPUT LOCKED indicator lights and the keyboard is disabled. If the computer determines that the information transmitted is correct, the computer response resets the keyboard and changes all designator characters of the selected items to question marks, making the display available to the operator for another transaction.

In some applications the operator is required to select only one item from a list or menu. In this instance the light-pen-detectable field may be defined as an immediate selector-pen-detectable field. The designator character for this type of field is a space; when the operator presses the light pen on this field an enter condition occurs, the keyboard is locked, and the INPUT LOCKED indicator lights. The operator must then wait for a response from the computer before continuing operation.

BADGE READER OPERATION

The badge reader (Figure 106) may be used in applications for identification or security purposes. This device reads numeric data encoded on the American National Standards Institute credit card in the badge reader, the data encoded on the magnetic stripe that appears on the back of the card is read into the display memory at the location indicated by the cursor. As the data is read into a non-display field and transferred to the computer for verification, the cursor advances across the screen.

The credit card must be inserted in the badge reader lengthwise with the magnetic stripe at the lower left-hand side of the card. The motor of the badge reader is activated when the operator in-

serts the credit card. The card is pulled into the unit over the mechanism that reads the encoded data from the magnetic stripe to the computer. The card should not be pushed into or pulled out from the badge reader at any time during the read operation. This could result in an inaccurate "read" and could possibly damage the unit. The card is returned automatically when this operation is completed. A typical read operation takes less than 2 seconds to complete. If the credit card becomes jammed in the badge reader, the unit will attempt to eject the jammed card. If the badge reader cannot eject the jammed card, the unit will automatically shut down. At this time, technical assistance should be requested.

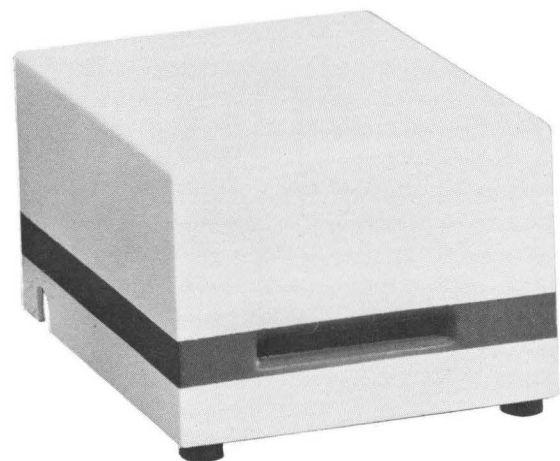


FIGURE 106. BADGE READER

Operator Problem Determination

PROBLEM	REASON
A. Power Failure	<ol style="list-style-type: none">1. Unit not plugged into AC outlet.2. POWER pushbutton not pressed.
B. Display Failure	<ol style="list-style-type: none">1. Unit not plugged into AC outlet.2. POWER pushbutton not pressed.3. BRIGHTNESS control not properly adjusted.
C. Keyboard Disabled	<ol style="list-style-type: none">1. Security key lock (optional) not turned on.2. INPUT LOCKED indicator illuminated.
D. INPUT LOCKED Indicator Lights	<ol style="list-style-type: none">1. RESET key not pressed.2. Attempt to enter data in a protected field.3. Attempt to erase in a protected field.4. Attempt to enter too many characters in a field.5. Attempt to enter alpha characters in a numeric field.
E. No Response from Computer (SYSTEM AVAIL Indicator Not Illuminated)	<ol style="list-style-type: none">1. Computer system not operating.2. F.E. switch turned ON.3. PROC indicator illuminated.
F. Cursor Does Not Appear on Screen	<ol style="list-style-type: none">1. Unit not plugged into AC outlet.2. POWER pushbutton not pressed.3. BRIGHTNESS control not properly adjusted.

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