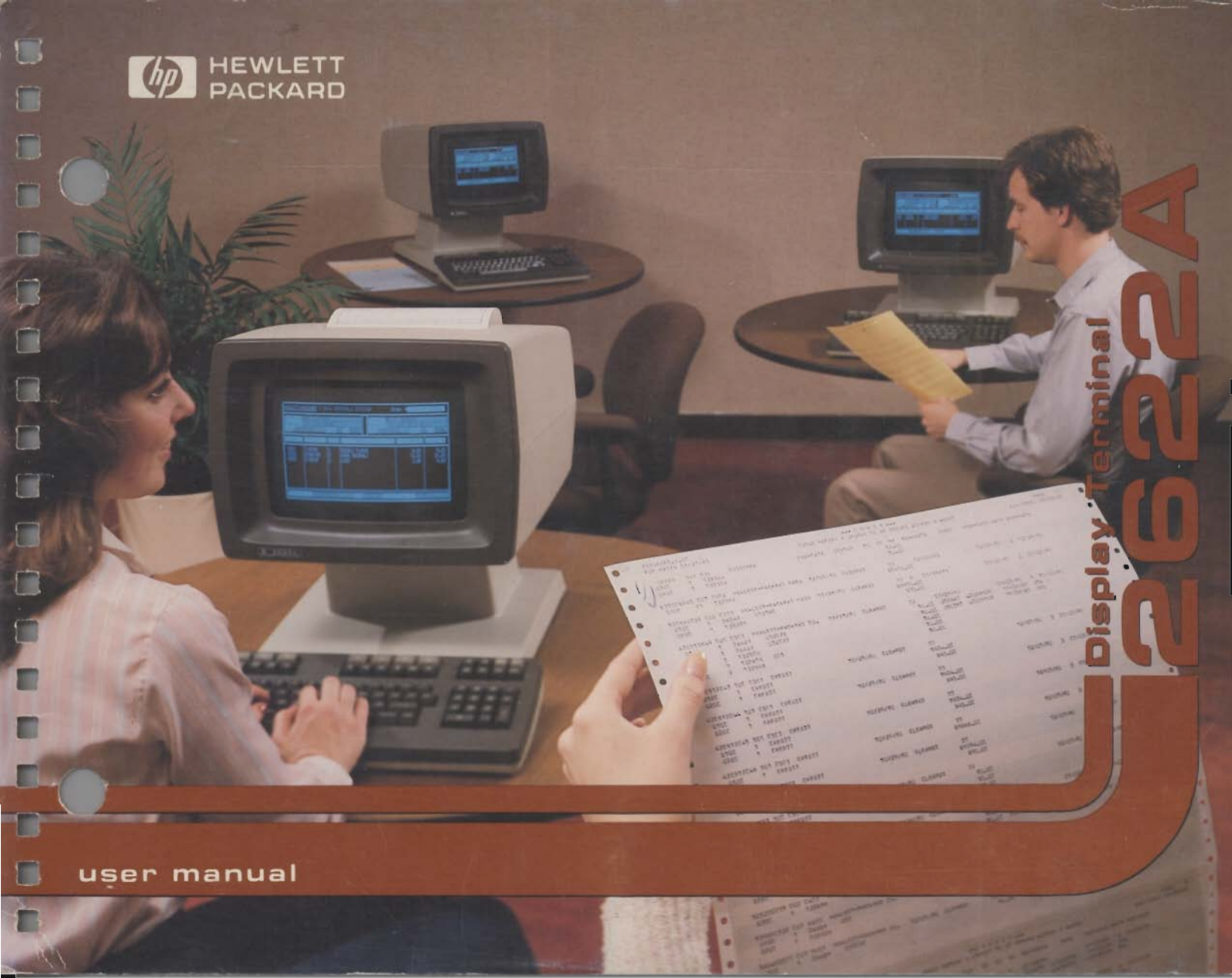
HEWLETT
PACKARD
Display Terminal
2622A
user manual

Congratulations!

You have chosen Hewlett-Packard's new 2622A Display Station, another technological advance in reliable terminals. The terminal's flexibility, extensive features, and ease of operation can save you valuable time and computer resources in a wide range of applications.

This user's manual has been prepared to acquaint you with your terminal and to serve as an aid to achieving optimum performance. This manual tells you how to install and use the terminal both off-line (by itself) and on-line (connected to a computer). It should answer most questions you have about how to use the terminal.

Detailed programming and accessory installation information is contained in the HP 2622A Reference Manual 02622-90002. The HP 2622A Service Manual 02622-90003 (ordered separately) provides information regarding troubleshooting, repair, and theory of operation.

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FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE
STATEMENT

The Federal Communications Commission (in Subpart J. of Part 15, Docket 20780) has specified that the following notice be brought to the attention of the users of this product

WARNING

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

How To Use This Manual

This manual is written as an introduction to the terminal. It describes most of the terminal's features so that you can become familiar with its capabilities without worrying about all of the functional details. Once you have become familiar with the terminal, or if you desire detailed information on specific features, you can refer to the Reference Manual. If you are already familiar with HP 2622 series terminals, you need not read the entire manual. You can use the index at the back of the manual to locate answers to specific questions you may have.

This manual consists of the following sections and appendices.

Section 1 — Introducing the HP 2622A. This section provides a general description of the terminal and briefly describes its capabilities.

Section 2 — Getting to Know Your Terminal. This section explains how to identify terminal options and accessories. In addition, it gives instructions for preparing your terminal for use.

Section 3 — The Keyboard. This section gives the location and describes the function of each of the major key groups.

Section 4 — Function Keys. This section describes and tells how to use the function keys; eight keys to which various functions can be assigned.

Section 5 — Configuring Your Terminal. This section describes how to configure your terminal to suit your needs.

Section 6 — Using Your Terminal By Itself. This section gives step-by-step examples of using the terminal in typical operations. These operations can be performed without peripheral devices or a computer system.

Section 7 — Using Your Terminal With A Computer. This section explains how to use the terminal with a computer system.

Section 8 — Using Your Terminal With the Integral Printer. This section provides information on how to use the terminal with the optional integral printer.

Section 9 — Maintaining Your Terminal. This section gives instructions for cleaning the terminal.

Section 10 — In Case of Difficulty. This section explains what to do if the terminal does not work properly.

Appendices — The appendices contain condensed programming information for all the terminal features and pictures of the foreign language keyboards which are offered as options.

Index — An index is provided for quick access to all information contained in the manual.

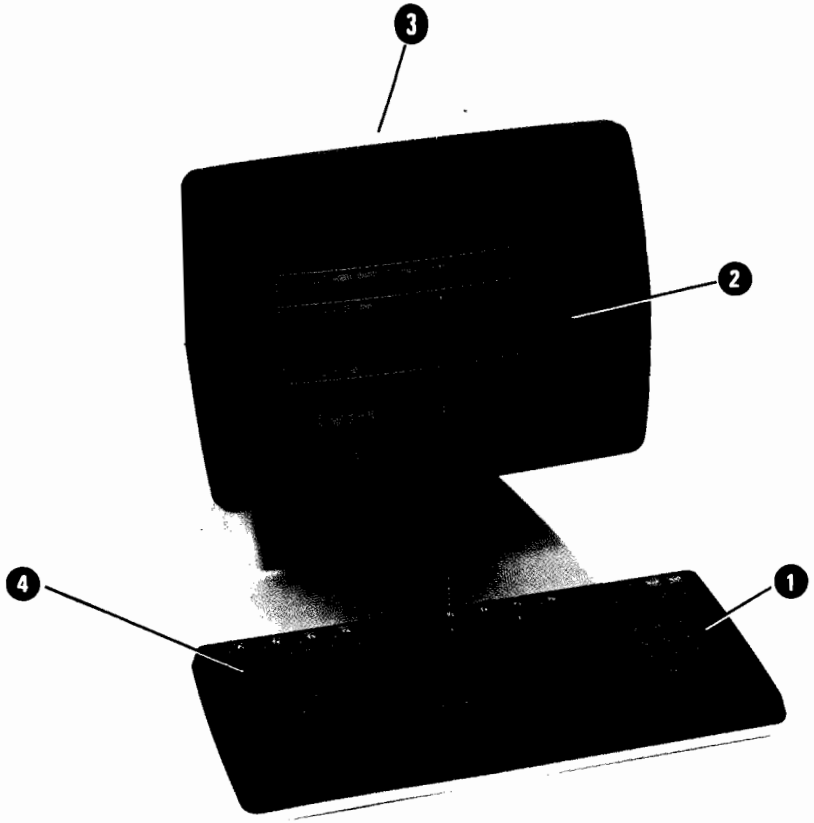
Terms Used In This Manual

A brief glossary of terms that you should know is given in the following table. Being familiar with these terms will help you to better understand the material presented in this manual.

TERM	DESCRIPTION
CURSOR	The blinking underline on the display that tells you where the next character or space will appear when entered.
DATACOMM	Abbreviation for "data communication" (transfer of data between the terminal and a computer).
DATA TRANSFER OPERATION	The process of transferring (or copying) data from one device to another.
"DESTINATION DEVICE"	The device that receives the data in a data transfer.
DEVICE CONTROL OPERATION	The process of skipping lines, moving printer paper, or transferring data between devices.
FORM FEED	Moves the printer paper to the top of the next page.
FUNCTION KEYS	Eight keys located at the top of the keyboard which are used in association with eight labels displayed along the bottom of the screen. The function of each key can be changed by changing the associated label.
LINE	A row of characters; may be thought of as a line of text in a book.
LOCAL MODE	Operating the terminal without the aid of a computer system (that is, "off-line").
PAGE	The number (24) of display memory lines which can be displayed on the screen.
REMOTE MODE	Operating the terminal with the aid of a computer system (that is, "on-line").
"SOURCE" DEVICE	The device that supplies the data in a data transfer.

1

Introducing The HP 2622A



The HP 2622A Display Terminal is a versatile character or block mode terminal. In addition to typical terminal features, the terminal has a format mode for data entry applications. Forms may be displayed and enhanced by the optional line drawing set. The terminal can display up to 80 characters and has an optional printer.

Highlights of the HP 2622A are:

❶ Versatile keyboard:

- Easy to use.
- Eight variable function keys.
- 68-key typewriter-style keyboard layout.
- Multiple character sets representing national languages.
- Calculator-style numeric key pad.
- Terminal control keys.
- Display control keys.
- Edit keys.

❷ High resolution display screen:

- Bright, clear screen display.
- Enhanced 7 × 11 dot characters in a 9 × 15 dot cell.
- 24-line by 80-character screen; 48-line by 80-character display memory.
- Display enhancements include:
  Inverse video.
  Blinking characters.
  Underline characters.
  Half bright.
- Displayable control code characters.

❸ Integral printer option:

- Can print data entry-type forms, including a line drawing set.
- Can operate in report print and metric print modes as well as standard print mode.

❹ Special function keys:

Eight multi-function keys with functions selectable using three keyboard keys:

- AIDS key—Redefinable configuration, service keys, printer operations, margin/tab/start column selection
- MODES key—Local/remote operating mode selection, block mode, modify mode, automatic line feed, memory lock, display functions, line mode, terminal test mode.
- USER KEYS key—Enables user to define functions for the function keys.

Configuration:

- Local:

  Configurable from keyboard or by computer program.

  Screen displayable configuration data.

  Redefinable configuration using function keys.

  Keyboard features selectable: caps lock.

  Configuration memory protection.

  User-programmable RETURN key.

- Remote:

  Data transfer rates up to 9,600 baud.

  Character, line or page block data transfers.

  EIA RS-232-C Data Communications interface.

Self test:

- Exhaustive terminal, data communications, and integral printer tests.

High Resolution Display

The HP 2622A Display Terminal has a screen with a 150 mm by 215 mm (6 inches by 8.5 inches) viewing area capable of displaying up to 1920 characters on 24 lines of 80 characters. Each character is formed by a 7 × 11 dot matrix within a 9 × 15 dot cell. This permits the precise formation of complex character symbols with ample separation between adjacent characters, both vertically and horizontally.

Display Memory

The HP 2622A Display Terminal display memory can store 3840 characters (48 lines of 80 characters each). In addition to this storage, 256 more bytes are available for a data communication buffer.

Keyboard

The HP 2622A keyboard is a separate unit that is linked to the display portion of the terminal by a flexible cable. The keyboard layout is similar to that used for standard office typewriters. It has 68 keys that include eight function keys and three keys for specifying the family of functions to be assigned to the function keys. Most of the remaining keys support the ASCII-coded character set. A numeric pad, similar to that used for calculators, is included.

Any one of six character sets covering eight languages and an optional Line Drawing Set ROM can be installed and assigned to the keyboard keys.

Function Keys

The function keys are the eight keys located across the top of the keyboard. These keys perform the functions indicated by screen labels assigned to each key. The screen labels are displayed in half-bright, inverse video across the bottom of the screen (rows 25 and 26).

Function Control Keys

Three additional keyboard keys are used to select the family of functions available through the function keys. The USER KEYS key allows each of the function keys to be assigned a string of up to 80 characters selected by the user. The MODES key assigns terminal operating modes to the function keys for selection by the user. The AIDS key accesses a tree of functions assignable to the function keys by user selection. This tree comprises most of the functions assignable to the functions keys.

See Section 4 for a discussion of the function and function control keys.

Configuration

The HP 2622A provides you with the ability to change the configuration of the terminal directly from the keyboard using the function keys. The current configuration can be displayed on the screen and then changed by simply pressing the appropriate function key. The portion of memory used to store this configuration is non-volatile; a battery is used to preserve it whenever the main power source is shut off.

Data Communications

You can transfer data to and from a computer in character mode (one character at a time), block line mode (one line at a time), or block page mode (the entire contents of the display). In block line or block page mode, you can compose text and edit it before sending it to the computer.

The terminal operates at a transfer rate of up to 9,600 baud and offers full-duplex, asynchronous, point-to-point communications using the EIA RS-232-C communications interface specifications. Connection to a computer is direct or through a modem.

In addition to these features, the HP 2622A provides, as an option, an integral thermal printer which can be used to produce a permanent copy of your data transactions.

Section 7 contains further information on data communications.

Self-Test

This terminal is engineered for high reliability, ease of testing, and, if required, rapid repair. By using the test function, you get a go/no-go indication of the terminals operating condition. Refer to Section 10 for further information on the terminal's self test function.

2

Getting To Know Your Terminal 2

How to Identify Options and Accessories

Any options you request when you order the terminal are delivered installed within the terminal. Accessories, such as data communication cables, are delivered with the terminal, usually in the same carton but packaged separately. Upon delivery of the terminal, verify that the options and/or accessories you ordered are included in the shipment received.

An identification label is located on the rear panel of your terminal (see figure 2-1). The first section of this label states the power requirements of the terminal. The next section states the model number and the serial number. The third section lists any options included with the terminal.

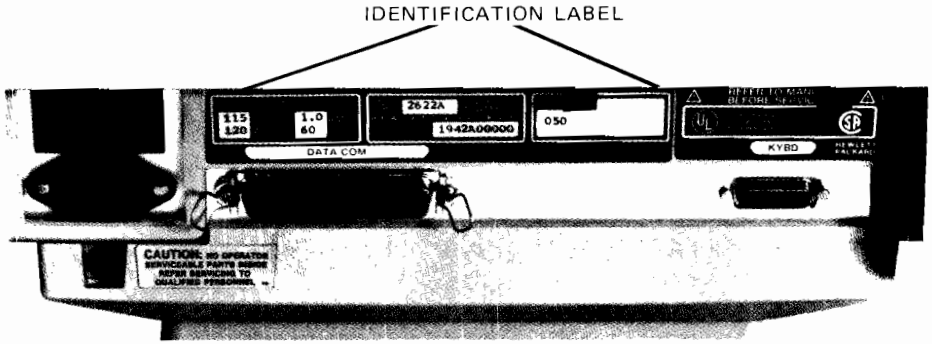


Figure 2-1. HP 2622A Identification Label, Rear Panel

Table 2-1 is a list of options available for the HP 2622A Display Station.

Table 2-1. HP 2622A Options

OPTIONS	DESCRIPTION
001	Swedish/Finnish Keyboard and ROM
002	Danish/Norwegian Keyboard and ROM
003	French Keyboard and ROM
004	German Keyboard and ROM
005	United Kingdom Keyboard and ROM
006	Spanish Keyboard and ROM
013	50 Hz, 240V Power
014	60 Hz, 100V Power
015	50 Hz, 220V Power
016	50 Hz, 100V Power
050	Integral Printer
202	Line Drawing Character Set

When communicating with Hewlett-Packard regarding your terminal, specify the model, serial, and the option numbers to ensure accurate identification by Hewlett-Packard. A list of Hewlett-Packard Sales and Service Offices is included at the back of this manual.

NOTE

If your terminal is already installed, you can ignore the following material and proceed to "Turning the Terminal On and Off."

Preparing the Terminal for Use

This terminal is designed to operate in a wide range of environments. It is self-contained and provides easy access to the operator controls so that normal installation does not require that you open the unit. The terminal should be opened only by a qualified service person (refer to the HP 2622 Service Manual, HP Part No. 02622-90007).

To install the terminal, complete the following steps.

1. Place the terminal on any sturdy, convenient surface such as a desk, table, or stand designed for such a purpose. Avoid plush or spongy surfaces that might restrict the flow of air through the vents in the base of the terminal (figure 2-2). For example, do not use a typewriter pad beneath the terminal.

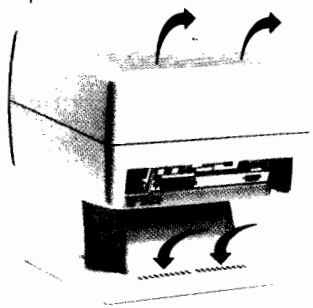


Figure 2-2. Cooling Airflow Through the Terminal

2. Connect and secure the keyboard cable hood connector to the socket connecter labeled KYBD on the terminal's rear panel (see figure 2-3).
3. This step is required to connect the terminal to an external data processing device, such as a computer. Connect and secure the data communications cable hood connector to the datacomm socket connector on the terminal's rear panel. The cable hood connector must be securely held in place by the wire clamps provided with the socket connector. Connect the other end of this cable to the appropiate external device.
4. Set the main power switch on the terminal's rear panel (see figure 2-3) to the OFF position.
5. Connect the power cord to the connector located just below the main power switch. Ensure that the voltage to be supplied matches your terminals power requirements (see the power requirements label on the rear panel of the terminal).
6. Plug the 3-prong connector into the outlet for the main power source.

WARNING

For your safety, a 3-prong grounded power outlet must always be used.

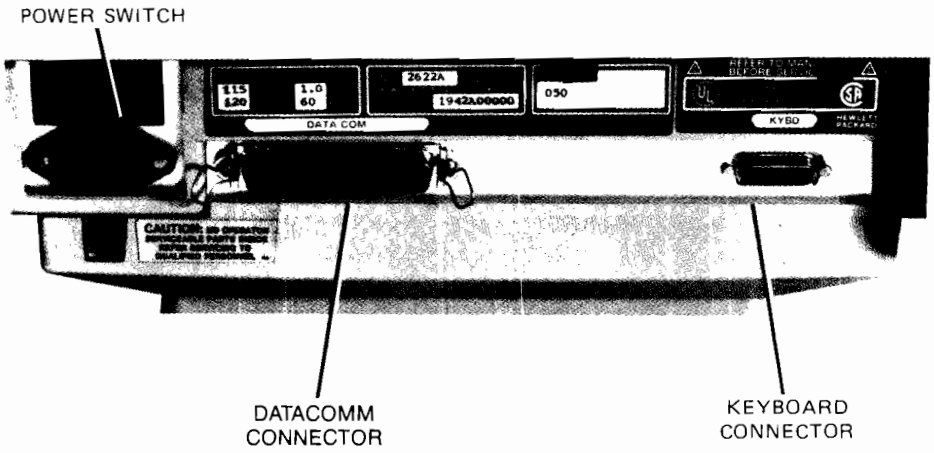


Figure 2-3. HP 2622A Power Switch and Connector Positions

Figure 2-4. HP 2622A Initial Screen Display

Turning the Terminal ON and OFF

ON

When the installation of the terminal is completed, set the main power switch on the rear panel (see figure 2-3) to the ON position. After approximately 15 seconds, the terminal is ready to use. If the terminal beeps more than once during power up, the terminal may be faulty; refer to section 10, Terminal Test to check for proper operation. Figure 2-4 illustrates the condition of the display screen as it appears following the initial application of power to the terminal.

When the terminal is ready to use, the cursor is displayed in screen column 1, row 1. In addition to the cursor, the primary level of function key labels is displayed across the bottom of the screen (figure 2-4).

If the message DEFAULT CONFIG USED is present at the bottom of the screen, the battery that protects non-volatile memory may have been accidently jarred loose during shipment or unpacking. Ensure that the battery pack is securely seated (see Section 9 for instructions about removing and replacing the battery pack) then turn off the power and turn it on again. If the message remains, perform a terminal test (refer to Section 10, Terminal Test, for instructions) to determine if the terminal is malfunctioning or if the battery is dead or missing. If the test completes successfully, replace the battery. If the message persists after the battery has been replaced, contact your nearest Hewlett-Packard sales and service office (listed at the end of this manual) for help.

OFF

To shut off your terminal, simply set the main power switch to the OFF position.

3

The Keyboard 3

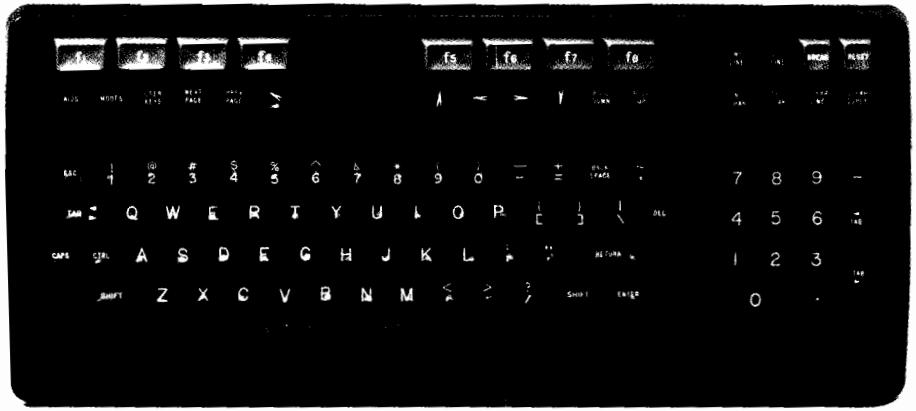
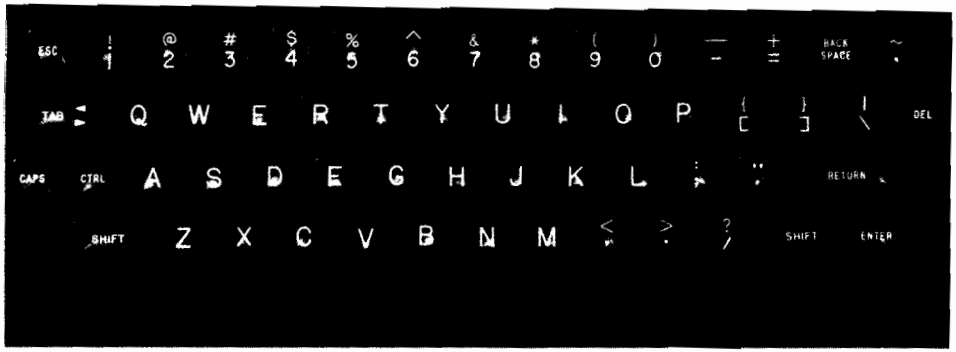


Figure 3-1. Terminal Keyboard

Before learning to control devices and transfer data, you should become familiar with the keyboard. Figure 3-1 shows the keyboard layout. The keyboard consists of the following functional groups:

- ***Character Set Group.*** This group of keys is similiar to a standard typewriter keyboard. It is used for entering data into the terminal workspaces.
- ***Display Control Group.*** This group controls movement of the display to view or operate on portions of the display memory. It also controls the cursor position.
- ***Edit Group.*** Text can be easily changed using the insert and delete functions of the edit group.
- ***Terminal Control Group.*** This group is used to initialize the terminal or interrupt data communications operations while in remote mode.
- ***Function Keys Group.*** Keys in this group can either be assigned a function from a selection of functions or be assigned a unique function by the user.
- ***Function Control Keys.*** Three keys, each used to select one of three separate families of functions to be assigned to the function keys.

The remainder of this section briefly describes each of the keyboard groups



Character Set Group

The alphabetic, numeric, and symbol keys are all located in the character set group. This is the largest group of keys on the keyboard. The basic character set is made up of 128 characters. This includes upper and lower case alphabetic characters, punctuation, and some commercial symbols. In addition, several non-displaying characters are also available. The non-displaying characters are used primarily for special applications. Refer to the Reference Manual for additional information on non-displaying characters.

The standard or base character set is indicated on the keys. The SHIFT key selects upper case or shifted characters and is also used for adding a function to several other keys (USER KEYS , TAB , AIDS , and HOME). The BACK SPACE and RETURN keys are used in the same manner as on a typewriter. Three TAB keys are available. The primary TAB key, at the left side of the keyboard, can be used to tab either left or right. When it is pressed, the cursor moves to the next tab stop to the right. SHIFT TAB moves the cursor to the next tab stop to the left. A right tab key (TAB ▸) and a left tab key (TAB ◂) are located in the numeric pad group. The CAPS key selects all capital letters, overriding the Caps Lock selection on the terminal configuration menu.

EXERCISE

Try typing a few lines of text to get used to the keyboard. Remember, this part of the terminal works very much like a typewriter. Note that, by using the BACK SPACE key, you can overwrite and change characters.

The ESC and CTRL keys are used to provide additional character codes and to generate special control codes for various terminal operations. The use of the ESC and CTRL keys is explained below.

ESC Key Operations

The ESC key is used to extend the operating functions of the terminal. Unlike the CTRL key, the ESC key is pressed first, then released, before pressing any other keys. Some functions require only that one key be pressed following the ESC key to perform the function; while other functions require a sequence of character keys be pressed following the ESC key. These sequences must always be terminated with an upper case character, rather than a lowercase character, to tell the terminal that the sequence has ended. All the escape code functions are listed in the appendix at the end of the manual.

CTRL Key Operations

The CTRL key can be used to add another function to the ASSIST key. It is also used together with other keys to generate ASCII control codes (see appendix A). Be sure to hold down the CTRL key while pressing the other key.

ENTER Key Operations

When the terminal is set for Remote (on-line) mode, the ENTER key allows you to send blocks of data to a computer. The ENTER key functions differently depending upon whether the terminal is in Format Mode (ESC W) and on the BLOCK MODE and REMOTE MODE key settings. Refer to the Reference Manual for information on use of the ENTER key in Remote mode.

In Local mode, the ENTER key can be used to produce a copy of all data in the display on the integral printer.

Numeric Group

The numeric keys at the right of the keyboard act in the same way as the keys in the alphanumeric group. These keys are arranged to make it easy to enter numeric data and use tabs. In addition to the numeric keys, the pad holds a "dash" or "minus" key, a TAB◄ key, a TAB► key, and a decimal [.] key.

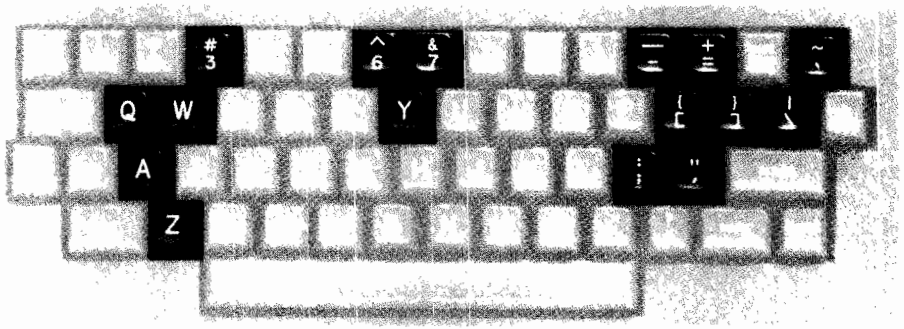


Figure 3-2. Location Of Keys Which May Change With Character Set Selection

Selectable Character Sets

USASCII is the standard character set with optional Swedish/Finnish, Danish/Norwegian, French, German, United Kingdom, and Spanish character sets. You can select either "QWERTY" or "AZERTY" French keyboard configurations. When a national language option is installed, it adds the extended Roman character set to the USASCII character set. Refer to Section 5, Configuring the Terminal, and Appendix B for information on character set selection. There are 16 keys which might be different depending on the character set selected. Figure 3-2 locates the keys and table 3-1 associates the key location, the character set, and the character produced when the key is pressed.

Several "mute" keys are used in French and Spanish character sets. These are keys used to produce certain characters which contain both the alphabetic character and a diacritic mark (such as ^ or '). When the diacritic mark is typed, it remains on the screen but the cursor remains in the same position awaiting the alphabetic character. When one of the acceptable characters (a, e, i, o, u, A, E, U) is typed in, the cursor moves on to the next character position. If the character typed in is not one of the acceptable characters, the last character typed in is displayed and the cursor moves to the next position.

Table 3-1. Characters Which Change With Character Set Selection

LANGUAGE	CHARACTERS																	
USASCII	#	^	&	-	+	~	Q	W	Y	{	}	!	A	:	"	Z	@	<	>	?
	3	6	7	-	=	`	q	w	y	[	]	\	a	;	'	z	2	,	.	/
SVENSK/SUOMI	#	&	/	?	£	*	Q	W	Y	Å	Ü	>	A	Ö	Ä	Z	"	;	:	_
	3	6	7	+	é	'	q	w	y	å	ü	<	a	ö	ä	z	2	,	.	=
DANSK/NORSK	#	&	/	?	^	~	Q	W	Y	Å	*	>	A	Æ	Ø	Z	"	;	:	_
	3	6	7	+	@	`	q	w	y	å	ì	<	a	æ	ø	z	2	,	.	=
FRANCAIS azM, az	§	+	/	?	"	£	A	Z	Y	ç	*	>	Q	è	°	W	"	;	:	_
	3	6	7	'	^	`	a	z	y	à	&	<	q	é	`	w	2	,	.	=
FRANCAIS qwM, qw	§	+	/	?	"	£	Q	W	Y	ç	*	>	A	è	°	Z	"	;	:	_
	3	6	7	'	^	`	q	w	y	à	&	<	a	é	`	z	2	,	.	=
DEUTCH	ç	&	/	?	`	^	Q	W	Z	ü	*	>	A	ö	ä	Y	"	;	:	_
	3	6	7	ß	'	£	q	w	z	ü	*	<	a	ö	ä	y	2	,	.	=
UK	£	&	^	?	/	~	Q	W	Y	{	}	>	A	@	!	Z	"	;	:	_
	3	6	7	+	'	`	q	w	y	[	]	<	a	*	\	z	2	,	.	=
ESPANOL M and ESPANOL	¿	&	¡	?	/	~	Q	W	Y	{	}	>	A	Ñ	@	Z	"	;	:	_
	3	6	7	+	'	`	q	w	y	'	#	<	a	ñ	*	z	2	,	.	=

Display Group

The display group consists of the ↑, ←, →, ↓, ROLL UP and ROLL DOWN keys, NEXT PAGE, PREV PAGE, and ↖ keys. The ↑, ←, →, ↓ and ↖ keys are used to position the cursor and the ROLL UP and ROLL DOWN keys, NEXT PAGE, and PREV PAGE keys are used to control the display.

The display screen holds up to 24 lines of 80 characters each. This is called a "page" and you can select the previous page and the next page. When the display has been filled with data, the top line rolls off the screen. As you type each line, the display will roll up to make room for the new line. This continues until display memory (which holds 48 lines) is filled. At this point, if you enter another line, one line will be lost from display memory to make room for the new line. The display group keys allow you to "page" or scroll through the display memory assigned to the workspace to display characters that have rolled off the screen.

The ROLL UP and ROLL DOWN keys allow you to scan the display memory one line at a time.

The NEXT PAGE and PREV PAGE keys allow you to move the display one page forward or backward in the workspace. When you press these keys, the information presently displayed is replaced with the next or previous page of the display memory.

Moving the Cursor

The cursor position is controlled by five keys. The ↑ and ↓ keys move the cursor in the vertical dimension, the ← and → keys move it in the horizontal dimension, and the ↖ key locates it at the left margin of the first line in the screen and displays the first page in the display memory.

Table 3-2 describes the function of each key.

Table 3-2. Cursor Control Key Functions

KEY	FUNCTION
↑	Cursor Up—Moves the cursor up one row each time the key is pressed. If the key is held down, the cursor moves up until either the key is released or it reaches the top row of the display memory where it wraps around to row 24 of the screen.
↓	Cursor Down—Moves the cursor down one row each time the key is pressed. If the key is held down, the cursor moves down until either the key is released or the last row of display memory is reached where it wraps around to row 1 of the screen.
←	Cursor Left—Moves the cursor left one column each time the key is pressed. If the key is held down, the cursor moves left until either the key is released or the first column of the display is reached. If the key is held down after the first column is reached, the cursor moves to the last column of the preceding row. This action continues as long as the key is held down or until column 1 of the first line of text in display memory is reached; then, the cursor moves to column 80 of row 24.
→	Cursor Right—Moves the cursor right one column each time the key is pressed. If the key is held down, the cursor moves right until either the key is released or the last column of the display is reached. If the key is held down after the last column is reached, the cursor moves to the first column of the following row. This action continues as long as the key is held down or until column 80 of the last line of text in display memory is reached; then, the cursor moves to column 1 of row 1.
↖	Home Cursor—The cursor is moved to the left margin of the first row of the display memory and rolls the text in display memory down as far as possible so that the first line of text in memory appears in row 1 of the screen.
SHIFT ↖	Cursor Home Down—The cursor is moved to the left margin of the row following the last used row in the display memory. If the cursor line is not displayed when the keys are pressed, the display is scrolled up until the cursor line is displayed.

Scanning the Display Memory

The display is controlled by the ROLL UP and ROLL DOWN keys, and the NEXT PAGE and PREV PAGE keys. With these keys, the contents of the display memory can be scrolled vertically past the display screen, or the next or previous set of lines (page) can be called to the display screen (figure 3-3).

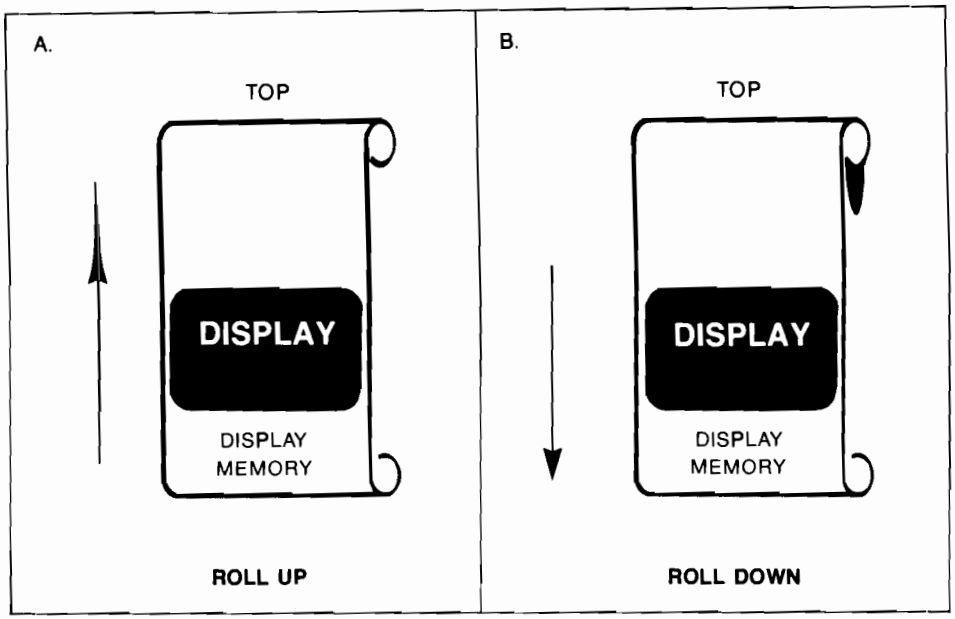


Figure 3-3. Operation of ROLL UP and ROLL DOWN Keys

Table 3-3 describes the function of the ROLL UP and ROLL DOWN, and the PREV PAGE and NEXT PAGE keys.

Table 3-3. Display Control Key Functions

KEY	FUNCTION
ROLL DOWN	Scrolls the contents of display memory down one row each time the key is pressed. If the key is held down, the contents of display memory is scrolled down until either the key is released or the first row of display memory is displayed as the first row of the display screen.
ROLL UP	Scrolls the contents of display memory up one row each time the key is pressed. If the key is held down, the content of display memory is scrolled up until either the key is released or the last row of display memory is displayed as the first row of the display screen.
NEXT PAGE	Allows you to display the next 24 lines.
PREV PAGE	Allows you to display the previous 24 lines.

Edit Group

Displayed data can be edited by inserting or deleting characters or lines, deleting the portion of a line to the right of the cursor, or deleting all data in display memory beginning at the cursor position.

Table 3-4 lists the function of each edit key.

Table 3-4. Edit Key Functions

KEY	FUNCTION
CLEAR DSPLY	Clears the display from the cursor position to the end of the workspace.
CLEAR LINE	Clears the line from the cursor to the end of the line.
INS LINE	Inserts a blank line preceding the one in which the cursor is located. The line in which the cursor is located and subsequent lines are pushed down one line and the cursor is moved to the left margin of the blank line.
DEL LINE	Deletes the line in which the cursor is located. Subsequent lines are scrolled up to take its place and the cursor is moved to the left margin.
INS CHAR	This key allows you to insert characters into a line without overwriting existing characters. The new characters are inserted at the cursor position. The existing characters are shifted right one character position for each character entered. Characters shifted past the right margin are lost. When this insert character function is enabled, the characters "IC" are displayed in the status line at the bottom of the screen. To deactivate the insert character function, press the INS CHAR key a second time. After this, any characters entered will overwrite existing characters, as usual.
DEL CHAR	This key deletes the character at the cursor position. When you press down the DEL CHAR key, characters to the right of the deleted character (up to the right margin) will be shifted left one character position for each character deleted.

Terminal Control Group

The terminal control group keys, which consist of the RESET and BREAK keys, are located in the upper right corner of the keyboard. These keys are used to reset the terminal and temporarily interrupt datacomm operations.

RESET Key

Soft Reset. Pressing the RESET key once results in a "soft reset" which unlocks the keyboard, clears any error messages, turns off Display Functions mode, stops printer operations and data communication transfers, and rings the keyboard bell.

Hard Reset. Pressing the SHIFT, CTRL, and RESET keys simultaneously produces a "hard reset." This causes the terminal to be set to the initial power-on state (reinitialization of the datacomm channel, the screen to be cleared, the user keys to be reset to the default values) and the keyboard bell to be rung. This key should not be used unless necessary to clear the terminal (refer to Section 10, In Case Of Difficulty).

BREAK Key

The BREAK key can be used to interrupt the operation of the terminal's data communication function to the computer. Refer to the Reference Manual for additional information.

Function Keys Group

The function keys group consists of keys f1 through f8. The eight function key labels along the bottom of the display are associated with keys f1 through f8 in a positional relationship. For example, the third label from the left is associated with the third key from the left (f3). When the key is pressed, the function suggested by the label is performed. By changing the functions assigned to the labels, each key can be made to perform multiple functions. The functions assigned to the labels are changed using the Function Control keys (AIDS, MODES, and USER KEYS) and certain function keys.

Many of the functions needed for routine data entry (and which are normally initiated by keyboard keys) are incorporated into the function keys on the HP 2622A terminal. Refer to Section 4, Function Keys, for information on accessing these functions.

Function Control Keys

The function control keys consist of the AIDS, MODES, and USER KEYS keys. These three keys are used to select the family of functions available to the function keys.

AIDS Key

The AIDS key accesses multiple sets of function key labels (eight labels in a set, one for each function key). Most of the terminal functions are accessed through the AIDS key.

MODES Key

The MODES key selects only one set of function labels which are used to select terminal operating modes. These are Line Modify, Modify All, Block mode, Remote mode, Terminal Test mode, Memory Lock mode, Display Functions mode, and Auto Linefeed mode. The labels for these modes are also displayed when the terminal is initialized after a power-on or hard reset.

USER KEYS Key

Pressing SHIFT USER KEYS enables you to assign up to 80 characters of data to each function key. You can also assign the labels to the function keys and specify the disposition of the data assigned to each key. The data can be specified for local use at the terminal only, for transmission to the computer only, or to be treated as data entered normally from the keyboard. Refer to "User Definable Function Keys" in Section 4 for loading and executing the user keys.

What to Do in Case of Difficulty

If the key or function you try does not work properly, or if an error message appears on the screen, refer to Section 10. A list of messages and their meanings is given there. In addition to the list of messages, Section 10 contains information about error recovery, testing the terminal, and where to get service assistance if you should require it.

4

Function Keys

4

The function keys consist of keys f1 through f8 located along the top of the keyboard. They are used in association with function key labels displayed along the bottom of the screen. The function suggested by the label is performed when the associated key is pressed. The association between the labels and the function keys is positional. For example, the third label from the left is associated with the third key from the left (f3) (see figure 4-1).

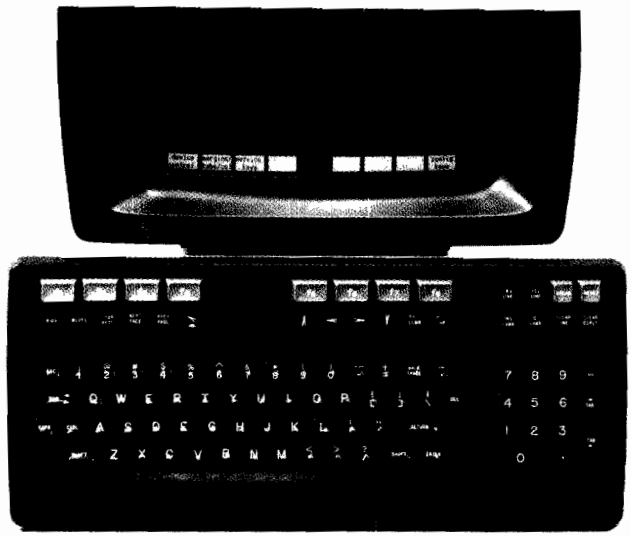


Figure 4-1. Function Keys and Labels

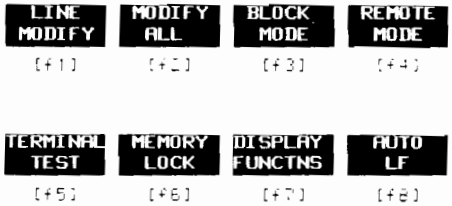
Each function key can be made to perform various functions by changing the corresponding function key label. The function key labels are changed using the MODES, AIDS, and USER KEYS keyboard keys and the function keys themselves. There are three groups of function key labels:

- Mode function key labels.
- Predefined function key labels.
- User-definable function key labels.

The mode function key labels, which are accessed through the MODES key, enable selection of seven modes in which the terminal can operate. These labels also appear on the screen after a hard reset or power-on operation. Most of the user-initiated operations are accessed using the AIDS key. The user-definable function key capability enables the user to assign functions and labels of his own choosing to the eight function keys. This capability is accessed through the SHIFT and USER KEYS keys.

MODES Function Key Labels

The MODES key displays the Modes set of function key labels, as follows:



Except for TERMINAL TEST, these labels are used to activate or deactivate the major terminal modes. Each of the function keys, when these labels are displayed, can activate the mode denoted by the label (the label contains an asterisk when the mode is active). Alternately pressing the function key produces and deletes the asterisk. Table 4-1 describes the functions of the function keys when the Modes labels are displayed.

Table 4-1. MODES Key Set of Function Key Labels

LABEL	FUNCTION
LINE MODIFY	Used only in Remote mode. When enabled, this mode allows editing a line of data while in Character mode, then using the ENTER or RETURN key to transmit the line to the computer as a block. Line Modify mode ends when the ENTER or RETURN key is pressed.
MODIFY ALL	Similar to LINE MODIFY except that Modify All mode is not ended by the ENTER or RETURN key. Modify All mode transmits a line to the computer as a block. When Modify All mode is active, an asterisk is present in the label. When Modify All mode is not selected, the asterisk is absent from the label.
BLOCK MODE	This label is used only in Remote mode. When active (asterisk present in the label), typed data is displayed but not sent to the computer until after the ENTER key has been pressed. Otherwise, the terminal is in Character mode and each character is transmitted to the computer as typed.
REMOTE MODE	When selected (an asterisk present in the label), the terminal is in Remote mode (prepared for communications with the computer). When not selected (asterisk is absent from label), the terminal is selected for Local mode.
TERMINAL TEST	Initiates a go/no-go test of overall terminal operation. On completion of the test, a test pattern which includes all character sets the terminal is capable of displaying are displayed on the screen.

Table 4-1. MODES Key Set of Function Key Labels (Continued)

LABEL	FUNCTION
MEMORY LOCK	Operates in two modes; overflow protect and display lock. Overflow Protect. When Memory Lock mode is activated and the cursor is in the first line of the display, data can be entered to the end of display memory. When the end of memory is reached, no more data can be entered and the bell sounds. Display Lock. Invoked by activating Memory Lock mode; deactivated by turning off Memory Lock mode. When Display Lock mode is entered, all data between the first line displayed and the line in which the cursor is located is frozen. Then, when new data is entered following the displayed data, the new data, when it is entered beyond the last line on the screen, scrolls up under the frozen data and the lines scrolled up off the screen are inserted in memory immediately preceding the first line of frozen data. When the ROLL UP key is pressed in Display Lock mode, the lines succeeding the frozen lines roll up under the frozen lines.
DISPLAY FUNCTNS	When ON, the action normally produced by any keyboard control key, such as RETURN, TAB, or any of the display or edit groups of keys, is not performed. Instead, an ASCII character or escape sequence representing the function is displayed on the screen.
AUTO LF	When on, generates a line feed with every carriage return, (pressing the RETURN key).

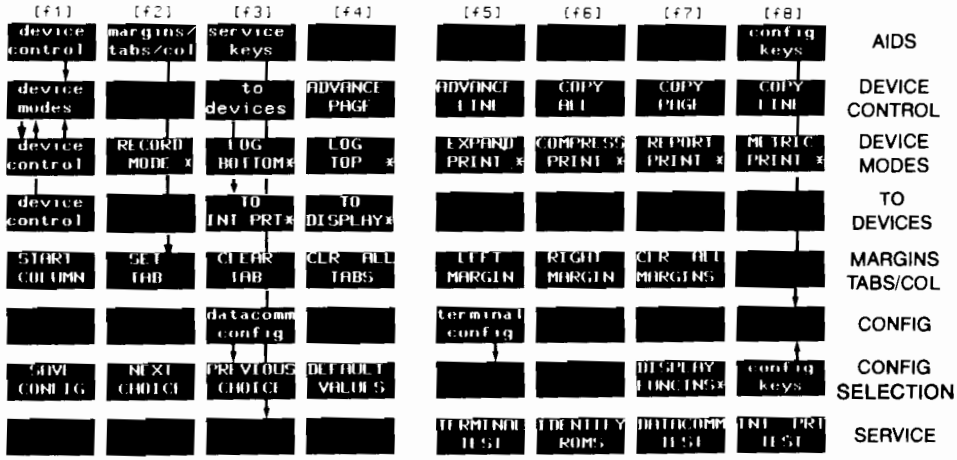
Aids Function Key Labels

Most of the terminal capabilities are accessed, directly or indirectly, through the Aids key. Some of these capabilities are listed below:

- Set or clear margins.
- Set or clear tabs.
- Send data to the internal printer.
- Select the start column for data transmissions.
- Select either of two types of configuration menus for configuration changes.
- Execute terminal tests.

There are four predefined function key labels which are accessed by pressing the Aids key. These function key labels are shown below:

The remaining sets of labels are accessed, directly or indirectly, through the Aids set. Figure 4-2 illustrates how to access each set of labels.



NOTE: Those labels which include an asterisk (*) signify functions which, when enabled, include the asterisk to indicate that the function is enabled.

Figure 4-2. Function Key Labels Accessed Through the Aids Key

Labels—Upper And Lower Case

The titles in the function key labels are written in both upper- and lower-case letters. Those written in lower-case letters are used only to change to another set of function key labels. Those written in upper-case letters perform the function suggested in the label.

Labels With An Asterisk

Two types of function key labels might contain an asterisk; those which can be changed from on to off ("toggled"), and those which are mutually exclusive with another label. Alternate presses of keys that can be "toggled" display an asterisk in the associated label. The asterisk indicates that the function displayed in the label is selected; absence of the asterisk indicates the function is not selected.

Other function keys which have an asterisk capability can not be toggled but have a mutually exclusive nature. Such keys exist as a group in which only one label can contain an asterisk at a given time. The `EXPAND PRINT`, `COMPRESS PRINT` set of labels and the `REPORT PRINT` and `METRIC PRINT` set of labels are two such groups in that only one type of print can be selected at a given time.

To return the terminal to normal operation after using the predefined function keys, simply press the AIDS key. Any selections you have made using toggling function keys will still be in effect, and the Aids set of labels will be displayed.

Aids Set

The Aids set of labels is used only to access other sets of labels. Each label in the Aids set names another set of labels. Some sets of labels are not directly accessible from the Aids set. In such cases, several such sets form a group; with one of the sets accessible from the Aids set. The other sets in the group are then accessible through the key that was pressed in the Aids set. There are two such groups: the Device Modes group, and the Config group. (The Config group will not be covered in detail in this manual; see the Reference Manual.) Table 4-2 describes the functions of the Aids set.

Table 4-2. AIDS Key Set of Function Key Labels

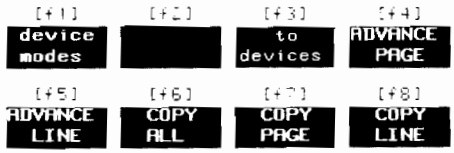
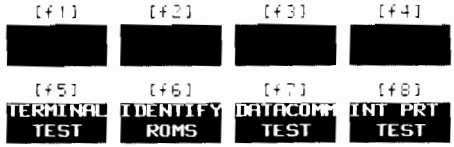
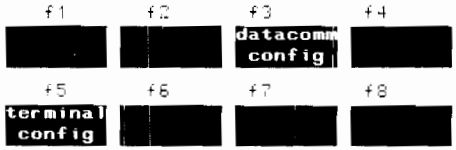
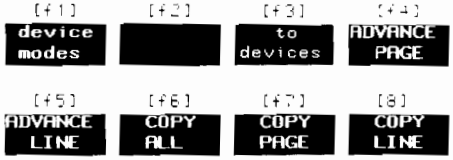
LABEL	FUNCTION
device control	Displays the following set of labels which are used to control the transfer of data to the integral printer: 
margins/ tabs/col	Displays the following set of labels which enable control of margins, tabs, and selection of the start column for transmission of data to a computer in Remote mode: 
service keys	Displays the following set of service labels which allow for a terminal test, identification of all ROMs used in the terminal, a datacomm test, and an integral printer test: 

Table 4-2. AIDS Key Set of Function Key Labels (Continued)

LABEL	FUNCTION
config keys	Displays the following set of key labels for selecting the datacomm or terminal configuration menus: 

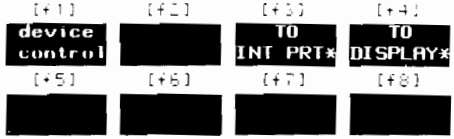
DEVICE CONTROL SET. The Device Control set of keys is accessed by pressing

and consists of the following set of labels:



The Device Control set of keys is used to select the amount of data to be copied (all, page, or line) to the internal printer and allows skipping one page or one line on the internal printer. Table 4-3 describes the functions of the Device Control set.

Table 4-3. Device Control Set of Function Key Labels

LABEL	FUNCTION
device modes	Displays the following Device Modes set of labels: 
to devices	Displays the following To Devices set of labels: 
ADVANCE PAGE	If the integral printer has been selected as the destination device, and METRIC or REPORT MODE is selected, this key causes the printer to skip to the top of the next page. If not in METRIC or REPORT MODE, then the printer advances one line.
ADVANCE LINE	If the integral printer has been selected as the destination device, this key causes the printer to skip the next line, leaving it blank.
COPY ALL	If the integral printer has been selected as the destination device, all contents of the display memory, starting with the line in which the cursor is positioned, are copied to the printer.
COPY PAGE	If the integral printer has been selected as the destination device, all lines in the display memory which are displayed on the screen, starting with the line in which the cursor is positioned, are copied to the printer.
COPY LINE	If the integral printer has been selected as the destination device, the line in which the cursor is positioned is copied to the printer.

DEVICE MODES SET. The Device Modes set of keys is accessed by pressing in sequence

and consists of the following set of labels:

This set enables copying the entire screen, transferring a line of data to the internal printer using either the "log top" or "log bottom" method (refer to Section 7 for details on top and bottom logging), printing in expanded or compressed form, and printing in report or metric format. Table 4-4 describes the functions of the Device Modes set.

Table 4-4. Device Modes Set of Function Key Labels

LABEL	FUNCTION
device control	Displays the following Device Control set of labels: [f1] device modes; [f2] (blank); [f3] "to" devices; [f4] ADVANCE PAGE; [f5] ADVANCE LINE; [f6] COPY ALL; [f7] COPY PAGE; [f8] COPY LINE
RECORD MODE *	In Record mode while in Remote mode, data from the computer is sent directly to the selected "to device", bypassing the terminal's display memory. If the terminal isn't in Remote mode, the contents of the terminals display memory is sent to the "to device". While in record mode, the keyboard is disabled except for the BREAK, RESET, and RECORD MODE keys. Record mode can be terminated by pressing the RECORD MODE or RESET keys or by pressing the SHIFT, CTRL, and RESET keys simultaneously.
LOG BOTTOM*	When log bottom is selected, a line feed (whether produced directly or from an end-of-line wraparound) results in the line the cursor leaves being copied to the integral printer (provided it has been selected). The data in display memory is not changed. The LOG BOTTOM and LOG TOP labels are mutually exclusive; if one is selected while the other is selected, the one previously selected is automatically deselected.

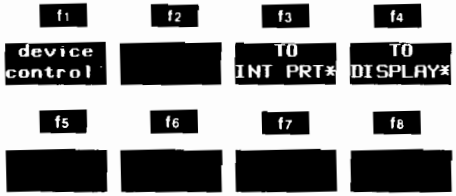
Table 4-4. Device Modes Set of Function Key Labels (Continued)

LABEL	FUNCTION
LOG TOP	If a line is added after the display memory is filled with data, the line which is scrolled off the top of the display memory is copied to the integral printer (provided it has been selected). The LOG TOP and LOG BOTTOM labels are mutually exclusive; if one is selected while the other is selected, the one previously selected is deselected.
EXPAND PRINT	The integral printer will print 5 characters per inch (approximately double the normal width). The vertical height remains the same (40 characters per line). EXPAND PRINT and COMPRESS PRINT are mutually exclusive; if one is selected, the other is deselected.
COMPRESS PRINT	The integral printer will print characters which are compressed horizontally (16.2 characters per inch which is 132 characters per line). The vertical height remains the same. EXPAND PRINT and COMPRESS PRINT are mutually exclusive; if one is selected, the other is deselected.
REPORT PRINT	Report format is selected for the integral printer and produces an 11-inch page. Report format is a three-line top margin, 60 lines of text, and a three-line bottom margin with a small tic mark to indicate the end of one page and the start of a new one. REPORT PRINT and METRIC PRINT are mutually exclusive; if one is selected, the other is automatically deselected.
METRIC PRINT	Metric format is selected for the integral printer. Metric format is a three-line top margin, 64 lines of text, and a three-line bottom margin with a small tic mark to indicate the end of one page and the start of a new one. REPORT PRINT and METRIC PRINT are mutually exclusive; if one is selected, the other is automatically deselected.

To Devices Set

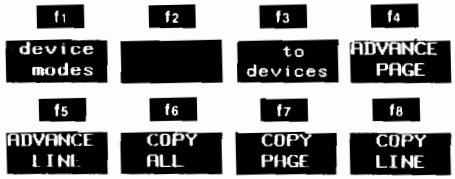
The To Devices set of keys is accessed by pressing the following keys in sequence:

and consists of the following set of labels:



This set enables selection of the integral printer, or the display as the destination device for data transfers. Table 4-5 describes the functions of the To Devices set of keys.

Table 4-5. To Devices Set Of Function Key Labels

LABEL	FUNCTION
device control	Displays the following set of labels which are used to control the transfer of data to the integral printer: 
TO INT PRT*	Selects the integral printer as the destination device. When on, an asterisk is displayed in the label.
TO DISPLAY*	Selects the display as the destination device. When on, an asterisk is displayed in the label.

Margins/Tabs/Col Set

The margins/tabs/col set of keys is accessed by pressing

and consists of the following set of labels:

This set is used to set or clear tabs and the left and right margins and to set Start Column. Table 4-6 describes the functions of the Margin/Tab/Col set.

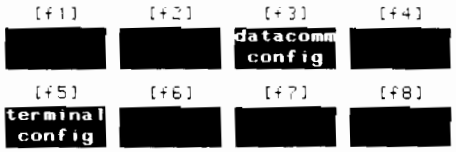
Table 4-6. Margins/Tabs/Col Function Key Labels

LABEL	FUNCTION
START COLUMN	Sets the start column to the column that the cursor is in when the key is pressed. This value is stored in non-volatile memory. The start column feature is used only in Line Modify or Modify All mode. In Remote mode (provided the terminal is not in Format or Block mode), for the last line in the display memory on which text is entered, a logical start of text pointer is set at the column of the line in which the user types the first character. Then, when the user presses the ENTER or RETURN key, the terminal starts transmitting from the column indicated by the logical start of text pointer. If the line on which data was entered was not the last line in memory or if the line is entered by the computer, no logical start of text pointer is generated by the terminal. In this case the terminal starts transmitting text from the column indicated in the Start Col field of the Terminal Configuration menu.
SET TAB	Sets a tab in the column in which the cursor is located.
CLEAR TAB	Clears any tab set in the column in which the cursor is located.
CLR ALL TABS	Clears all tabs.
LEFT MARGIN	Sets the left margin at the column in which the cursor is positioned.
RIGHT MARGIN	Sets the right margin at the column in which the cursor is positioned.
CLR ALL MARGINS	Sets the left margin at column 1 and the right margin at column 80 (the default left and right margins).

Config Set

The Config Set of keys consists of two sets of labels; the first set is accessed by pressing

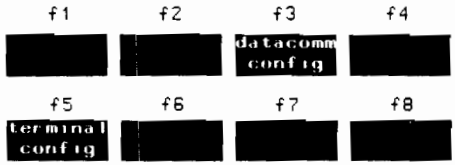
and consists of the following set of labels:



Once the above set of key labels is accessed, pressing either f3 or f5 will access the following set of labels:

The first set of labels above is used to select two configuration menus: datacomm config and terminal config. The second set of labels above is used to set values in the specific configuration menu. Refer to Section 5 and the Reference manual for more information on configuration. The functions of the Configuration set are described in Table 4-7.

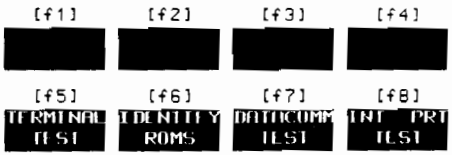
Table 4-7. Configuration Set of Key Labels

LABEL	FUNCTION
datacomm config	Displays the datacomm configuration menu, which is then used to select the datacomm parameters.
terminal config	Displays the terminal configuration menu, which is then used to select the terminal operating characteristics for both local and remote operation.
SAVE CONFIG	Saves the current configuration in non-volatile memory, and removes the menu from the screen.
NEXT CHOICE	Used with the configuration menus. If the cursor is positioned in one of the menu fields, the **NEXT CHOICE** key selects the next parameter of the list for that field.
PREVIOUS CHOICE	Selects the previous parameter of a field in the config menu.
DEFAULT VALUES	Displays the configuration menus default values.
DISPLAY FUNCTNS*	When on, the action normally produced by any keyboard control key, such as RETURN, TAB►, or any of the display or edit groups of keys, is not performed. Instead, an ASCII character or escape sequence representing the function is displayed.
config keys	Displays the following configuration key labels: 

Service Set

The Service Set of keys is accessed by pressing

and consists of the following set of labels:



This set is used to run the self-tests shown above. Table 4-8 describes the functions of the service set of keys.

Table 4-8. Service Set of Function Key Labels

LABEL	FUNCTION
TERMINAL TEST	Performs a test of the terminal.
IDENTITY ROMS	Displays a list of the ROM's installed in the terminal, supplying their part numbers and data codes (a code identifying the version of firmware code contained in the ROM).
DATACOMM TEST	Initiates the data communications test. Requires the Data Comm Self Test Hood, part no. 02620-60056 mounted on the DATA COMM connector at the rear of the terminal.
INT PRT TEST	Initiates the integral printer test.

User Definable Function Keys

Each function key can be programmed with a character string of up to 80 characters. A type character (L, T, or N) is assigned to the character strings. The type can be defined for local use only (with the letter "L" assigned to it), for transmission to the computer only (with the letter "T" assigned to it), or to act as data entered normally from the keyboard (with the letter "N" assigned to it). Programmed this way, the function keys are useful for entering (with only a couple of keystrokes) any often-used character string of up to 80 characters.

Each of the eight function keys can be assigned a label of up to 16 characters. The label can serve as a reminder of the content of the character string when the character string is not displayed.

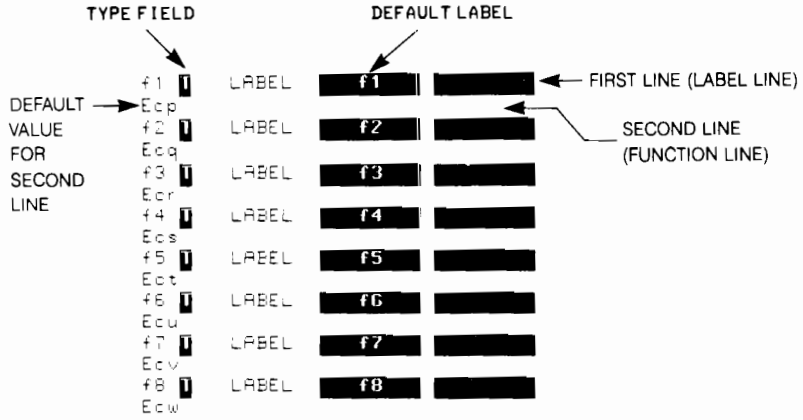


Figure 4-3. User Definable Function Key Menu with Default Values

The function keys have default assignments which become effective whenever the terminal is turned on, a hard reset is performed, or the DEFAULT VALUES function key is pressed. These assignments are shown in figure 4-3. The default character string assignments for the eight function keys consist of two characters each (the ESC character and one lower-case letter). The default type character for all function keys is "T," as shown in the figure. The default character strings have no preassigned meanings. One use for them is to transmit them to a computer where they can be interpreted by a program. The program can apply any desired interpretation to the character string, thus accomplishing a complex operation with a couple of keystrokes. For example, the program might be designed to output a complex data entry form to the terminal when prompted by receipt of the character string from one of the function keys.

User Key Modes

The function keys are associated with user-definable functions in two modes: Definition mode and Use mode. In Definition mode, the function keys are assigned labels, type characters, and character strings. In Use mode, the keys are made active so that, when the key is pressed, the character string assigned the key will be printed out on the display (provided the type character assigned to the key is "L" or "N" and the terminal is in Local mode). (If the type character is "T" and the terminal is in remote mode, the character string will be transmitted to the computer. However, the character string will not be displayed on the terminal screen.) When Use mode is entered (by pressing USER KEYS), the labels assigned to the keys appear along the bottom of the screen in the normal label position.

Definition Mode

INITIATING DEFINITION MODE. To initiate Definition Mode, press the USER KEYS key while holding down the SHIFT key. This causes the current key assignments to be displayed. Use the tab keys or cursor-positioning keys to position the cursor for making entries on the User Keys menu.

DEFINING A FUNCTION KEY. To define a function key, first choose the type character (L for local use only, T for transmit only, and N for treatment as though it was entered from the keyboard). Use either the PREVIOUS CHOICE or the NEXT CHOICE function key to select your choice of entry. The default field type is T.

Next, enter the label to be assigned to the function key. The label appears on the definition menu as two 8-character blocks. The first block appears on the screen located above the second block when the label is displayed at the bottom of the screen in Use mode. The default labels for the keys are the labels f1 through f8.

Finally, type in the character string on the line below the label blocks. Use the DISPLAY FUNCTNS function key to enter keystrokes from the Edit and Display groups of keyboard keys. When entered in Display Functions mode, the keystroke operation will not be performed until the function key to which it is assigned is pressed. For example, if a ↖ keystroke is assigned to one of the function keys in Display Functions mode, the cursor will be homed when the function key is pressed in Use mode.

LEAVING DEFINITION MODE. Definition mode can be terminated by pressing any one of three keys: f1, MODES, or USER KEYS. The f1 or MODES key returns the terminal to the normal screen display. To enter Use mode, refer to the following paragraph.

Use Mode

INITIATING USE MODE. To initiate Use mode, press the USER KEYS key once.

EXAMPLE

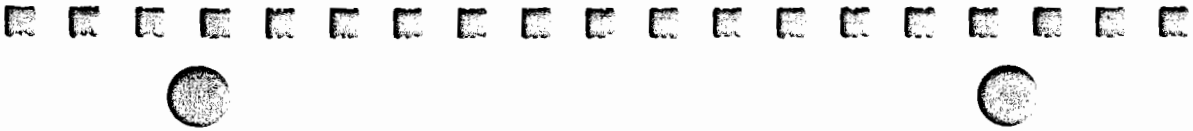
This example assigns a company name and address to key f1 to appear as follows:

```
ACME Co.
1000 Star Rt.
New York, NY
```

- Press the MODES key and check whether an asterisk is present in the AUTOLF label. If so, press the associated function key to remove the asterisk.
- Press the USER KEYS key while holding down the SHIFT key. This initiates Definition mode and displays the User Key menu.
- Locate the cursor under the type field for f1 and press the NEXT CHOICE function key until an "L" appears in the field. This indicates the character string is for use at the terminal only.
- Move the cursor to the label line and type in your choice of label for the function key.
- Move the cursor to the left margin of the character string field.

- Press the DISPLAY FUNCTNS function key to produce an asterisk in the DISPLAY FUNCTNS label.
- Type "ACME Co. RETURN 1000 Star Rt. RETURN New York, NY RETURN."
- Press the DISPLAY FUNCTNS function key to remove the asterisk from the label. (This turns off Display Functions mode.)
- Press the MODES key, then press the AUTO LF function key to add an asterisk to the label. (This turns on Auto LF mode.)
- Press the USER KEYS key, note that your label has replaced the "f1" label. Press the function key with your label on it. The data you typed into the function line on the User Keys menu should appear on the screen. Note that because AUTO LF is selected, a line feed is added following each RETURN when the function key is pressed in Use mode.

LEAVING USE MODE. To leave Use mode and display the formerly displayed set of labels, simply press the USER KEYS key.



5

Configuring The Terminal 5

Introduction

The method provided for making terminal configuration changes is a configuration menu. A menu is a list of configuration parameters which are displayed on the screen. Each parameter has an associated space for a value which you select. Many of the parameters have a system-defined list of values. For others, you must enter the value from the keyboard. For parameters with system-defined values, two function key labels are displayed with the menu to enable you to scroll forward (NEXT CHOICE) or backward (PREVIOUS CHOICE) through the list of values.

Sufficient information is supplied in this section to enable you to configure the terminal provided you know the function or purpose of the menu fields on the datacomm and terminal configuration menus. This information is available in the Reference Manual if you should wish to configure the terminal and do not have the information.

The terminal contains a battery-powered portion of memory called non-volatile memory in which the set of configuration values are stored to save them when power to the terminal is shut off. The set saved is the one last stored by the user. If none has been stored by the user, the default set is stored. When a menu is called to the display screen, the values currently in use are displayed. When power to the terminal is turned on, the set of configuration values stored in non-volatile memory becomes the active set.

The sequence for changing a set of configuration values is to display the menu, make the desired changes, and store the values in non-volatile memory. The act of storing the values in non-volatile memory also makes them the active set.

Configuration Menus

All configuration requirements for the terminal are contained in two menus; the terminal configuration menu for enabling selection of terminal characteristics and the datacomm configuration menu for selecting datacomm protocol.

How to Print a Menu

If the terminal is equipped with an integral printer, the configuration menus can be printed by displaying the menu on the screen; then, pressing the ENTER key. (The terminal must be in local mode.)

How To Display A Menu

To display a menu, perform the following:

1. Press the AIDS key to display the Primary set of function key labels.
2. Press the `config keys` function key to display the configuration set of function key labels shown below.

3. Press `datacomm config` (f3) or `terminal config` (f5) key to display the next set of function key labels shown below.

Table 5-1 lists the function key labels and their functions.

Table 5-1. Configuration Mode Function Key Labels

LABEL	FUNCTION
SAVE CONFIG	Saves the displayed configuration parameters in non-volatile memory, makes the set of parameters the active configuration set, and returns to normal operating mode with the Modes set of function key labels displayed.
NEXT CHOICE PREVIOUS CHOICE	Most of the fields on the menus have a list of acceptable values (some have only two). These keys scroll forward or backward through the list.
DEFAULT VALUES	Displays the default values for the configuration.
DISPLAY FUNCTNS	When on, the action normally produced by any keyboard control key, such as RETURN, TAB, or any of the display or edit groups of keys, is not performed. Instead, an ASCII character representing the function is displayed on the screen. Also used to define the Return BLK Terminator field and Record Separator fields.
config keys	Ends Configuration mode without saving the displayed values. Any changes made on the menu are lost if they have not been saved. Returns to normal operating mode with the Configuration set of function key labels displayed.

Configuring

To change a selection on a menu, perform the following steps:

1. Place the cursor at the character position to be changed. This can be done using the TAB key or the cursor-positioning keys. The TAB key moves the cursor to the next selection field each time the key is pressed.
2. If the choices are restricted to a system-defined list of selections (such a field is underlined), use either the NEXT CHOICE or PREVIOUS CHOICE function key to cycle through the list of selections until the desired one is displayed.
3. If the choices are not restricted to a system-defined list (not underlined), enter the desired value from the keyboard, using display functions mode, if needed.
4. To store the new menu values in non-volatile memory after you have made all desired changes, press the SAVE CONFIG function key.

To Return to Normal Operation

Pressing the SAVE CONFIG key will return the previous display contents to the display and save the displayed configuration values in non-volatile memory. However, if you wish to return the previous display contents to the display without saving the displayed configuration values, you can press the AIDS, MODES, or USER KEYS keyboard keys or the `config keys` function key to do so.

Terminal Configuration

Figure 5-1 illustrates the terminal configuration and the default values. Refer to the Reference Manual for a description of the menu fields.

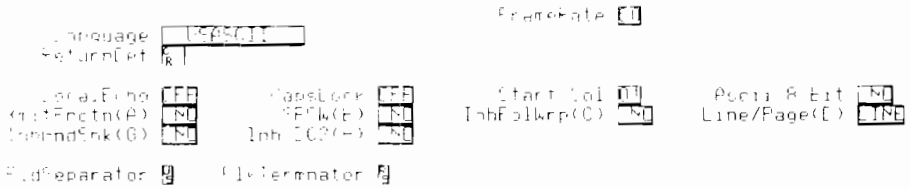


Figure 5-1. Terminal Configuration Menu

Datacomm Configuration

The datacomm configuration menu is shown in figure 5-2. The values shown are default values. Refer to the Reference Manual for a description of all menu fields.

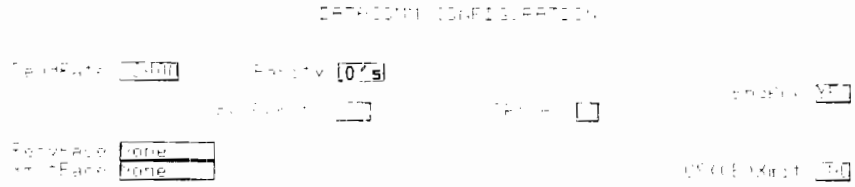


Figure 5-2. Typical Default Datacomm Configuration Menu

6

Using The Terminal By Itself 6

Introduction

The terminal can store up to 3,840 characters (48 lines of 80 characters each) and can be used without being connected to a computer (Local mode). It can be used alone when first learning to use it or when preparing data for printing or later transmission to the computer.

We will use the terminal in Local mode to learn how to enter and correct data. Once you have been introduced to the basic terminal, later sections will describe how to use the terminal with a computer and with the integral printer.

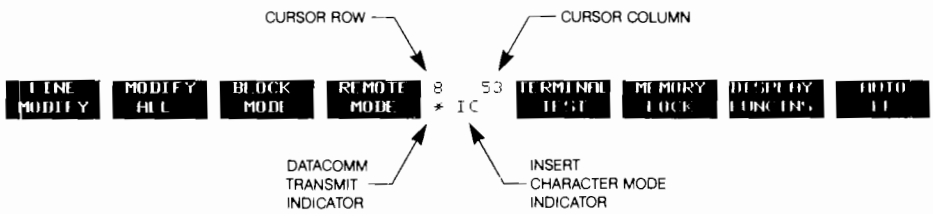


Figure 6-1. Status Indicator Locations

Screen

The display screen is capable of displaying up to 24 contiguous lines of display memory data. These 24 lines of data are considered to be one page of data.

The screen actually provides 26 rows of 80 character positions each for the display. Rows 1 through 24 are used to display the content of one page of display memory. Rows 25 and 26, at the bottom of the screen, are used to display the currently active set of function key labels, a current cursor position column and row indicator, datacomm transmit indicator, and IC for indicating Insert Character Mode. The status indicator locations are shown in figure 6-1.

Entering Data

One of the most important uses of the terminal is data entry. Data is entered using the keyboard. The data can then be sent to a computer, printed out on the integral printer, or both.

As an example, enter the following name and data:

```
John Doe                    June 7, 1980
```

Correcting Data

If you make an error or wish to change an entry you have made, you can use any of the cursor or edit keys discussed earlier. For example, to add the middle initial "L" to the entry in the previous example, move the cursor under the "D", press the INS CHAR key (the characters "IC" are displayed in the status line at the bottom of the screen), and type "L."

```
John L. Doe                 June 7, 1980
```

Type the correction; then, press the INS CHAR key again to return to normal overwrite mode.

Techniques Of Data Entry

To simplify data entry, you can use tabs, margins, specially defined data fields, and data forms. The following text describes how to use tab stops and margins; refer to the Reference Manual for information on specially defined data fields and data forms.

Tabs

SETTING TABS. To set a tab, move the cursor to the desired column and press the AIDS key to display the Aids set of function key labels. Then press the `margins/tabs/col` function key to display the Margin/Tab/Col set of function key labels. Now press the SET TAB function key. Once a tab is set, the TAB keys (one located on the left side of the keyboard and the other two in the numeric pad) can be used to move the cursor to the next tab setting.

USING TABS. Once tab positions have been set, you can tab using the TAB keys in the same manner that you would on a typewriter. You can tab backwards to the previous tab position by pressing the TAB key at the left of the keyboard while holding down the SHIFT key. When you are at the first tab position in a line and you backtab, the cursor moves to the last tab position in the previous line. Once the cursor has reached the first tab position in the first line of memory, no further backtabbing movement is made. The left margin is always treated as a tab.

CLEARING TABS. You can clear individual tabs by moving the cursor to the tab position, accessing the Margin/Tab/Col set of labels, and pressing the CLEAR TAB function key. All of the tab stops can be cleared at once without having to position the cursor. Simply press the CLR ALL TABS function key.

Margins

You can set the left and right margins to make the entry of data easier. When the terminal is turned on or a hard reset is performed, the margins are set at columns 1 and 80. You can set new margins as described below.

LEFT MARGIN. Move the cursor to the desired left margin setting. With the Margin/Tab/Col labels displayed, press the LEFT MARGIN key.

RIGHT MARGIN. Move the cursor to the desired right margin setting. With the Margin/Tab/Col labels displayed, press the RIGHT MARGIN key.

If the cursor is moved as a result of hitting an alphanumeric character key or the space bar, the following events will occur. The terminal will beep when you are eight characters from the right margin. When the right margin is reached, the cursor will move to the left margin of the next line if end-of-line wraparound is selected (InhEolWrp (C) NO in terminal config menu).

If the cursor is moved using the →, the terminal will not beep when you are near the right margin. When column 80 is reached, the cursor will move to the left margin of the new line whether or not end-of-line wraparound is selected.

The left margin cannot exceed the right margin. An invalid margin setting will not be accepted and will cause the terminal to beep.

EXAMPLE

Set the margins for a 40 column page centered on the screen.

With the Margin/Tab/Col labels displayed, move the cursor to column 20 and press the LEFT MARGIN function key. Then move the cursor to column 59 and press the RIGHT MARGIN function key.

Place the cursor back at column 20 by pressing RETURN and begin typing.

Margins are changed by setting new margins (or restored to the default left margin at column 1 and the right margin at column 80 by a hard reset). They are cleared by pressing the CLR ALL MARGINS function key. Also, the margins are set to their default values when format mode is entered.

```
column numbers
2         3         4         5         6
0         0         0         0         0

This is an example using margins to control data
entry.
```

Moving A Block Of Text To Another Location On The Display

You can move blocks of text using Memory Lock mode.

For example, in the following text, move the paragraphs into the proper order.

Initial order:

(Top of screen)

```
3. This is paragraph 3. It
   should be last in this
   group.
2. This is paragraph 2. It
   should be second.
1. This is paragraph 1. It
   should be first.
   (blank line)
```

1. Press the ↖ key and type in the paragraphs as shown. Be sure to press RETURN following the last line.
2. Position the cursor in the first line of paragraph 2.
3. Press the MODES key, then press the MEMORY LOCK function key to turn on Memory Lock mode.
4. Use the ROLL UP key until the remaining paragraphs have rolled up under the cursor position and off the screen.
5. Turn off Memory Lock mode by pressing the MEMORY LOCK function key so the asterisk disappears from the label.

6. Press the ↖ key.

The display should appear as follows:

(Top of screen)
```
2. This is paragraph 2. It
   should be second.
1. This is paragraph 1. It
   should be first.
3. This is paragraph 3. It
   should be last in the
   group.
```

7. Now move paragraph 1 by positioning the cursor in the first line of paragraph 1 and turning on Memory Lock mode as described in step 3.
8. Use the ROLL UP key until the cursor is in the first line of paragraph 3.
9. Turn off Memory Lock mode as described in step 5, and press the ↖ key. The paragraphs should now be in order.

The display should appear as follows:

(Top of screen)
```
1. This is paragraph 1. It
   should be first.
1. This is paragraph 2. It
   should be second.
3. This is paragraph 3. It
   should be last in the
   group.
```

Note that if the data is not on the first page of memory, the ROLL UP key can be used instead of the ↖ key to view the newly ordered text.

Record Mode

If in local mode, record mode copies the contents from display memory to the selected "to" device. To initiate record mode, press

AIDS, device control, device modes, RECORD MODE.

An asterisk will appear in the Record Mode label to indicate that record mode is enabled. While in record mode, the keyboard is disabled except for the BREAK, RESET, and "RECORD MODE" keys. Pressing RESET, or SHIFT, CTRL, RESET, or "RECORD MODE" function key will terminate record mode.

Display Features

The terminal provides the following display features:

- DISPLAY ENHANCEMENTS—Parts of the display can be underlined, blinking, inverse video, or half bright or any combination of these.
- LINE DRAWING CHARACTER SET—The keyboard can be used to select characters from Line Drawing character set if the line drawing option is present.

The following features are available in Format mode:

- PROTECTED FIELDS—Data cannot be entered and changed. Data will not be sent to the computer.
- UNPROTECTED FIELDS—Data can be entered and changed. Data will be sent to the computer.

Forms can be created with these features to make data entry easier. The forms used are similar to paper forms except that they are displayed on the terminal screen. Forms are made by defining "fields" of one or more characters. Each character can be given one or more of the display features. Once a form is created, it can be stored in the computer and displayed as needed. Refer to the Reference Manual for information on using these features.

Using Display Enhancements

The terminal includes as a standard feature the following display enhancement capabilities:

- **Half Bright**—characters are displayed at half intensity (grey).
- **Underline**—an underline is displayed below the normal character.
- **Inverse Video**—the screen is white and characters are black.
- **Blinking**—characters including the inverse video, underline, and half bright features blink.

The display enhancements are used by assigning one or more of them to a field. The selection sequence is ESC & D <enhancement character>. The enhancement character (@, A through O) is used to select the combination of display enhancements to be assigned to the field. The following table lists the enhancement character for each of the combinations. The field is ended by ESC & D @ (end enhancement), by selecting another enhancement, or by the end of the current line.

NOTE

In the above selection sequences (ESC & D and ESC & D @), the enhancement character "D" should be a lowercase "d" character.

	enhancement character															
	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Half Bright									x	x	x	x	x	x	x	x
Underline					x	x	x	x					x	x	x	x
Inverse Video			x	x			x	x			x	x			x	x
Blinking		x		x		x		x		x		x		x		x
End Enhancement	x															

EXAMPLE

Define columns 10 through 14 of line 5 to be inverse video and blinking.

Step 1. Position the cursor at column 10 in line 5.

Step 2. Type ESC & D SHIFT C.

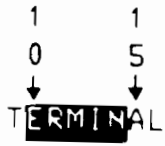
Step 3. Move the cursor to column 15 in line 5.

Step 4. Type ESC & D @ (this ends the enhancements). The field should be white, and if you type in the field, the characters should blink.

NOTE

In the above example, use a lowercase "d" keycap (enhancement character) instead of an uppercase "D" keycap in steps 2 and 4.

Step 5. Type the word TERMINAL beginning in column 9 of line 5. It should appear as shown below:



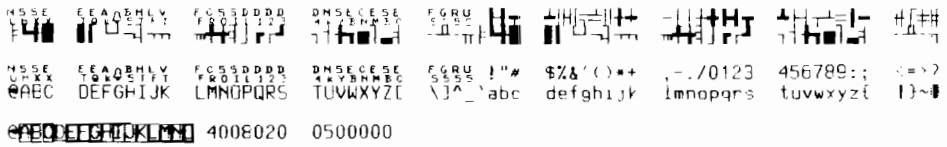
Using the Alternate Character Set

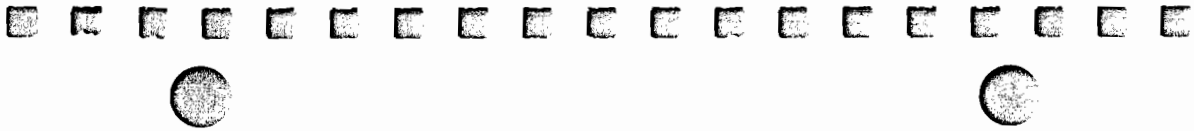
If your terminal has the line-drawing set option 202 (options 001 through 006 also contain the line-drawing set option), it can display 128 line-drawing set characters in addition to the standard ASCII set.

Switching from the base character set (the set selected on the Terminal Configuration menu) to the line-drawing set can be done on a character-by-character basis. For example, a line-drawing character can be displayed next to characters in the base set. This is done by selecting the line-drawing set as the active alternate character set and then selecting the alternate character set as the keyboard set (the set displayed when the keys are struck).

Either the line-drawing set or the extended Roman character set may be selected as the active alternate character set. The selection is made with an escape sequence which may be entered either from the keyboard or from a program. ESC) B or ESC) C selects the line-drawing set as the active alternate character set. Then pressing, simultaneously, the CTRL and N keys connects it to the keyboard. (A keyboard layout for the line drawing characters is shown in Appendix B.)

To return to the base character set from the alternate character set, press the CTRL and O keys simultaneously. To find out if the line drawing set is present in your terminal, press MODES ; then, TERMINAL TEST (f5). If the line drawing set is present, the pattern will look like this:





7

Using the Terminal With A Computer 7

Introduction

The HP 2622A can be connected to a computer system either directly or through a modem.

Preparing The Terminal For Use On-Line

Preparing the terminal for use on-line consists of reconfiguring the datacomm, if necessary, and selecting the operating modes. The following procedures are not complete; they consist only of those procedures most likely to be needed. For complete information on configuring the terminal/computer link, refer to the Reference Manual.

Reconfiguring The Datacomm Port

Following is a suggested procedure for selecting the configuration values to be associated with the datacomm port on the HP 2622A terminal.

- Display the Config set of function key labels by pressing

- Display the datacomm menu by pressing the `datacomm config` key (f3).
- Make any necessary changes to the menu, then save the values in non-volatile memory by pressing the SAVE CONFIG key.

Selecting Operating Modes

The MODES key is used for selecting Remote, Block, Modify All, and Auto LF modes.

REMOTE. For the terminal to communicate with the computer, Remote mode must be selected. To select Remote mode, press the MODES key to display the Modes labels, then, if no asterisk is present in the REMOTE MODE label, press the associated function key to produce an asterisk in the label.

BLOCK MODE. Block mode is used to select whether data will be sent to the computer character-by-character or in blocks of characters. When Block mode is not selected, the characters are sent to the computer as they are typed. This mode of operation is used for conversational exchanges with the computer. In Block mode, the characters are stored in the terminal as they are typed. They are not sent to the computer until the ENTER key is pressed. This enables you to edit your data before sending it to the computer. The block is sent by pressing the ENTER key. The block can be one of two sizes; a line or a page. The block size selection is made on the terminal configuration menu.

To select the block size, display the terminal configuration menu by pressing in sequence

Then place the cursor in the Line/Page field and use the NEXT CHOICE key to display your choice of block size. With your choice displayed, press the SAVE CONFIG key to store the displayed configuration values in non-volatile memory.

AUTO LF. Normally, automatic line feed is not selected when communicating with a computer. To select it, display the Modes labels by pressing the MODES key, then, if no asterisk is present in the AUTO LF label, press the associated function key once to produce an asterisk in the label.

CAPS LOCK. Unless the computer system to which your terminal is connected accepts lower-case letters, Caps Lock mode should be selected. Caps Lock is selected on the terminal configuration menu. To access the menu, press in sequence

With the menu displayed, position the cursor at the Caps Lock field and use the NEXT CHOICE key to display your choice of ON or OFF; then press the SAVE CONFIG key to store the configuration values in non-volatile memory.

When Caps Lock mode is enabled, the terminal generates only Teletype-compatible codes: upper case ASCII (00-5F, hex) and DEL (7F, hex). Unshifted alphabetic keys (a-z) generate the codes for their uppercase equivalents, the <, |, and > keys generate the codes for [, \, and] (respectively), and the / and ~ keys are ignored.

Caps Lock mode is different than Caps Mode. Caps Mode is enabled by pressing the CAPS key. When caps mode is enabled, all unshifted alphabetic keys generate uppercase letters and all shifted alphabetic keys generate lowercase letters. This mode is used primarily as a typing convenience and only affects the 26 alphabetic keys.

If A Modem Is Used

If a modem is used, it may be necessary to turn on the modem, make modem speed and parity settings, or dial a telephone number. Baud rate and parity settings should be the same values used for the terminal. These settings can be observed by displaying the datacomm configuration menu.

Sending Data To The Computer

Data can be sent to the computer from the keyboard in either Character or Block mode. Block mode enables editing the data before sending it. Modify mode is available for editing data before transmission while operating in Character mode.

Character Mode

NORMAL OPERATION. In Character mode, each character is sent to the computer, automatically, as it is typed into the keyboard.

MODIFY MODE. While operating in Character mode, two Modify modes can be used to edit data already displayed on the screen before sending it to the computer. These modes are Line Modify and Modify All. For example, if you have transmitted to the computer a string of data which contains an error and the computer returns an error message, instead of retyping the data you can enter Line Modify mode, correct the error using the keyboard edit keys, and retransmit the string by pressing the RETURN or ENTER key.

Modify All mode is used in the same manner as Line Modify mode except that, unlike Line Modify mode, Modify All mode does not end when the RETURN or ENTER key is pressed. To enter Line Modify mode, press

[MODES] [f1]

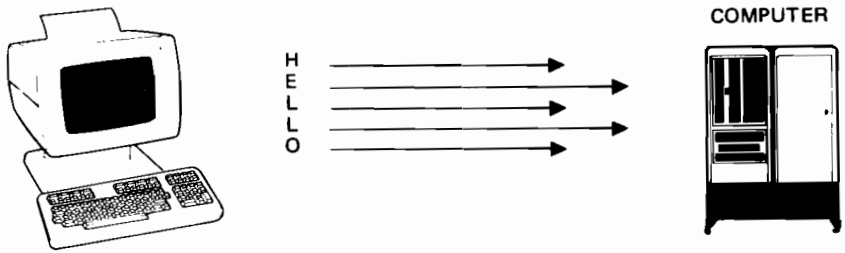
LINE MODIFY

The mode is ended when the ENTER or RETURN key is pressed. To enter Modify All mode, press

[MODES] [f2]

MODIFY ALL

An asterisk is present in the MODIFY ALL label when the mode is activated. Pressing the MODIFY ALL key while in Modify All mode ends the mode and removes the asterisk from the label.



USING START COLUMN. The start column feature is used only in Line Modify or Modify All mode. Provided certain conditions are met, the start column feature can be used to transmit data to the computer, ignoring any data to the left of a selected column.

Here is a description of how the start of column feature works. Under the following conditions, the terminal firmware sets a "logical start of text" pointer for each line of text.

1. The terminal must be in Remote mode, and may be in Block or Format mode when the line is entered.
2. The character to which the pointer applies must be entered from the keyboard (not from the computer).
3. At the time the line is entered, it must be the bottommost, non-blank line in the workspace.

This logical start-of-text pointer is set at the leftmost column in which a character is typed from the keyboard. Then, when you press the ENTER or RETURN key to transmit the text to the computer, transmission starts at the column indicated by the pointer. However, if no pointer exists for the line, transmission starts at the column specified in the Start Col field of the Terminal Configuration menu or the START COLUMN set in tabs/margins level of the function keys.

EXAMPLE

Assume that the computer prompts you with a colon (:) on the terminal and that you enter a BUILD command to this prompt:

```
:BUILD TF;REC=128,1,F,BINARY;NOCCTL;DEV=DISC;CODE=0;DISC=1023,8,1
└Computer Prompt          └──────Your Response
```

The logical start-of-text point for this line (at the bottom of memory) does not exist until you enter the B in the BUILD command, at which time the pointer is set to column 2.

When Line Modify or Modify all are enabled in character mode, the logical start-of-text pointer is used as the starting point for data transmission when the RETURN key or ENTER is pressed. If the line has no logical start-of-text pointer, the Configuration Start Column value is used to determine the starting point of the data transmitted.

If you are in character mode, there may be times you will find yourself transmitting a command string to the host computer and receive an error message in response. To correct this command string without retyping the whole line again, you simply enable the Line Modify mode.

Line Modify mode permits you to switch temporarily to Modify All mode, select any line of display memory, edit that line, and transmit it.

EXAMPLE

Assume you entered a BUILD command, pressed RETURN and the system came back wih an error message.

```
:EUILD TF;REC=128,1,F,DINARY;NOCCTL;DEV=DISC;CODE=0;DISC=1023,8,1
                              ^
EXPECTED "ASCII" OR "BINARY".      (CIERR 274)
```

To correct this statement, simply enter Line Modify mode and position the cursor to the appropriate line and character on the screen. Retype BINARY and press ENTER or RETURN. The BUILD command is transmitted to the computer and there was no need to retype the whole line.

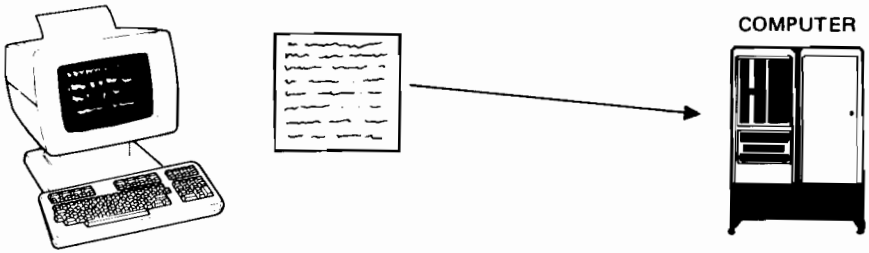
To free the start-of-text pointer, simply home the cursor above the line you want to begin the deletion and clear display. This will remove the pointer from all the lines below the character marked by the cursor through the last character in memory.

Block Mode

In Block mode, data is stored in the terminal until the ENTER key is pressed, then it is transmitted as a block of data. The block size can be either a line or a page, as selected on the terminal configuration menu for the terminal connected to the computer. To enter Block mode, press

MODES [f3] BLOCK MODE

An asterisk is present in the BLOCK MODE label while Block mode is active. To return to Character mode, remove the asterisk from the label by pressing the BLOCK MODE key again.



Receiving Data From The Computer

To The Display

No special action is required to receive data from the computer other than making sure that the baud rate and parity match that of the computer system. When the terminal is in Remote mode, data is normally displayed on the screen as it is received.

To The Integral Printer

The terminal can be set to perform on-line data logging—automatically routing data, when it is received from the computer, to the integral printer. You can do this using two methods; logging from the top of display memory or logging from the bottom (figure 7-1). When data is logged from the top, the top line in display memory is routed to the integral printer when it is crowded off the top of display memory by lines added at the bottom. When bottom logging is used, a line is routed to the printer when the cursor leaves the line to begin a new line. If top logging is used, the data remaining in display memory when communication with the computer is completed is left uncopied to the printer. To perform either top or bottom logging, proceed as follows:

- Display the `device control` label by pressing

  AIDS [f1] device control

- Display the Device Modes set of labels by pressing

  device modes

- Select either `LOG BOTTOM` (f3) or `LOG TOP` (f4).

Record Mode

If in Remote Mode, record mode copies data from the datacomm line to the selected "to" device. To initiate record mode, press

AIDS , device control , device modes , RECORD MODE .

An asterisk will appear in the Record Mooe label to indicate that record mode is enabled. While in record mode, the keyboard is disabled except for the BREAK, RESET, and `RECORD MODE` keys. Pressing RESET, or SHIFT, CTRL, RESET, or `RECORD MODE` function key will terminate record mode.

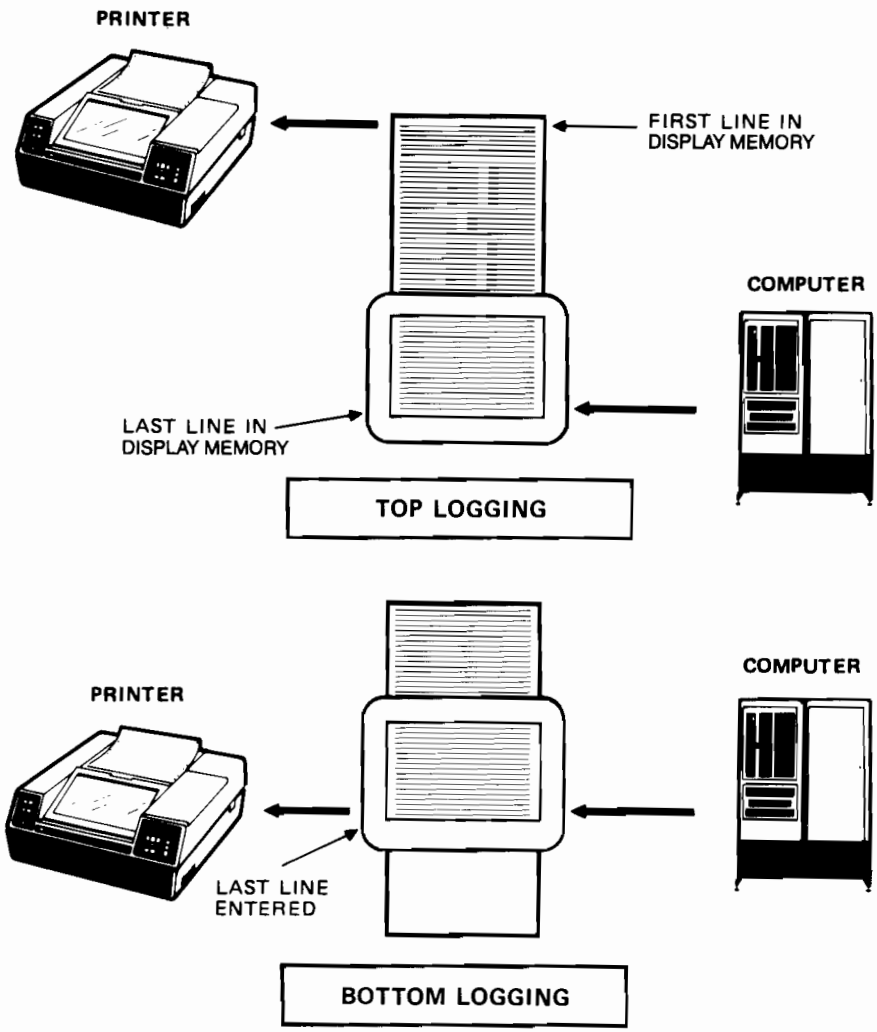


Figure 7-1. Data Logging

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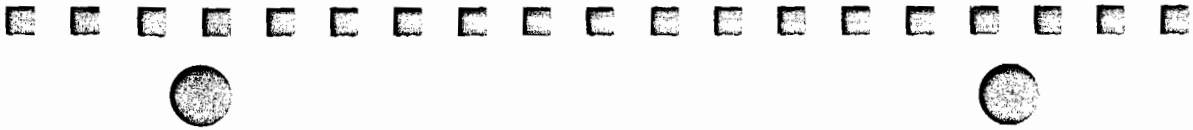


Using Your Terminal With The Integral Printer 8

Introduction

You can copy data from the display to the integral printer. Two copy methods can be used: copying data after all data entry has been completed or copying while data is being entered into display memory (data logging). The procedure is similiar for both methods.

NOTE

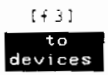
The blinking, half-bright, and inverse video enhancements are printed as boxes. The underline enhancement prints as an underline.

Procedure

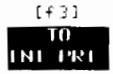
The steps for copying data by either method are as follows:

- Display the Device Control labels by pressing

- Select the Destination Devices set of labels by pressing



- Select the integral printer by pressing the TO INT PRT key.



- If data logging is to be used, display the Device Modes set of labels by pressing

Then select either

For the data logging method, this completes the setup procedure; at this point, you can begin to enter data.

To disengage the printer after you have completed your data entry, press either

a second time.

This will remove the asterisk from the softkey label and disengage the printer.

- If data logging is not used, display the Device Control set of labels (if they are not already displayed) by pressing the `device control` key.

If you wish to skip a line or a page on the integral printer before beginning printing, you can do so by pressing the ADVANCE LINE or ADVANCE PAGE key. (ADVANCE PAGE works only in Report or Metric mode.) Then select the amount to be printed by pressing the COPY ALL, COPY PAGE, or COPY LINE key. COPY ALL copies all data in display memory between the line containing the cursor and the end of display memory.

Once the specified amount of data has been printed, the integral printer automatically disengages itself.

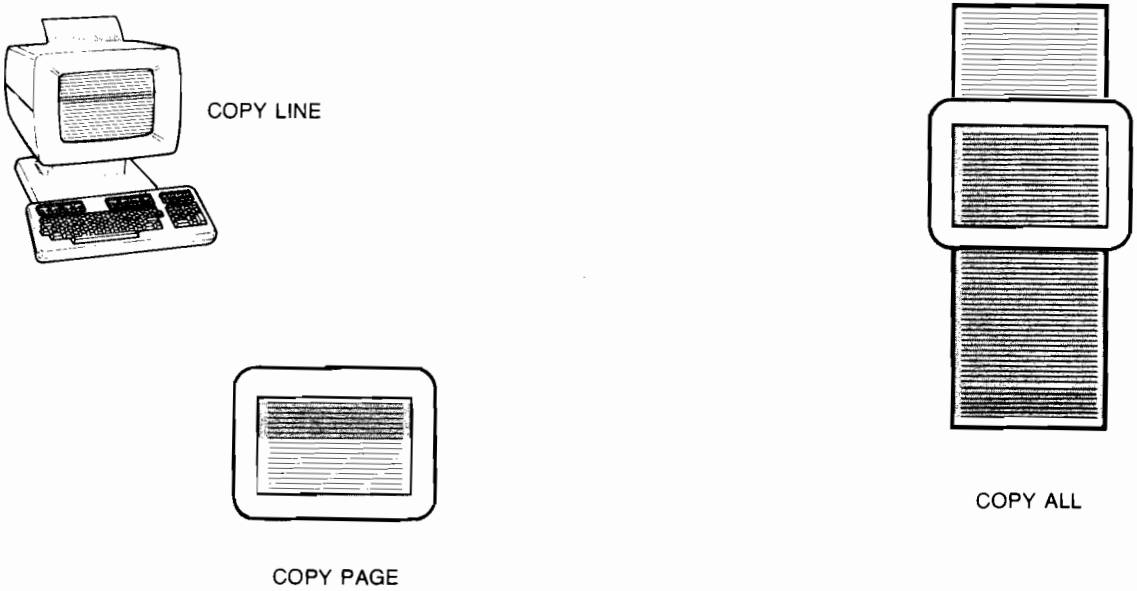


Figure 8-1. Copy Operations

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Maintenance 9

Introduction

Maintenance of the terminal consists of loading paper into the integral printer (for terminals containing one), replacing the battery which powers non-volatile memory under power off conditions, and cleaning the screen, plastic housing, and keyboard to remove dust and grease.

Loading Printer Paper

The integral printer uses a thermal printing paper produced specifically for use in the integral printer. Printer paper can be purchased through your local HP Sales and Service office using the following nomenclature and part number:

1 box (24 rolls) Thermal Paper (blue), HP part no. 9270-0638.

1 box (24 rolls) Thermal Paper (black), HP part no. 9270-0656.

CAUTION

It is recommended that you always use the HP thermal paper in your integral printer because use of non-HP paper can shorten the life of the print head and the print quality might be affected. Also, if you have an HP Warranty Service Contract, you must use HP Thermal Paper to maintain a valid contract.

Load printer paper according to the following instructions:

1. Lift the top cover of the printer mechanism (figure 9-1). An illustration of the correct paper position and flow is embossed on the underside of the cover.

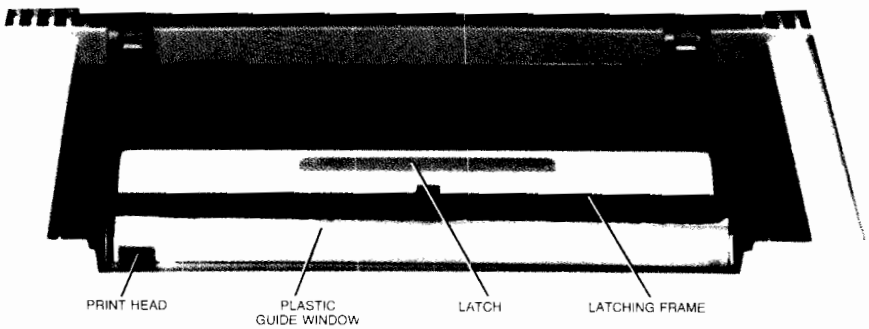


Figure 9-1. Printer Mechanism.

2. Press the latch toward the front of the terminal to release the latching frame. Lift the hinged latching frame to its forward position.
3. Remove any paper remaining in the printer.
4. The cardboard cylinder on which the paper is rolled is held in place by a metal rod which passes through the cylinder. Lift the cylinder upward and forward along the guide slots to remove the cylinder and rod.
5. Remove the rod from the cylinder and insert it in the new roll of paper.

NOTE

The paper is coated with print material on one side only and must be inserted correctly in the printer to produce print. The paper must feed toward the front of the terminal from the underside of the paper roll. See the embossed illustration on the underside of the top cover.

6. Place the ends of the metal rod in the guide slots on either side of the print mechanism and press down and toward the rear until the rod snaps into place.

CAUTION

The print head (figure 9-1) is relatively fragile and susceptible to damage; be careful not to strike it while loading paper.

7. Feed the leading edge of the paper through the latching frame between the latching frame and the clear plastic guide window.
8. Lower the latching frame into place without locking it.
9. Align the sides of the paper with the guide lines embossed on each side of the guide window.

NOTE

Each new roll of paper has a glue spot, used to hold the roll intact, near the leading edge of the roll. The print head should not be allowed to pass over this glue spot during print operations.

10. Feed approximately 12 inches of paper through the latching frame so that the glue spot is beyond (outside) the print head and guide window.
11. Press down the latch until it locks into place with an audible click. If the latch is not locked, a printer error will be printed at the bottom of the screen when a printer operation is attempted.
12. Tear off any excess paper using the guide window as a cutting edge.
13. Close the top cover.

NOTE

If subsequent print operations appear normal except that no print image appears, the paper may have been installed backwards. An image can be printed on only one side of the paper.

Battery Replacement

Configuration data stored in non-volatile memory is protected from destruction by a storage battery located above the rear panel of the terminal (figure 9-2). The battery should be replaced every 12 months. A new battery can be obtained through commercial sources by requesting Mallory Battery, Type TR133. In addition to commercial sources, you can order batteries through your local HP Sales and Service Office using the following nomenclature and part number:

HP 2622A Battery, HP Part No. 1420-0259.

You may want to record the configuration data on paper before removing the old battery in case the configuration data should be destroyed when the battery is removed (although, normally, data will not be lost if terminal power is left on while the battery is replaced).

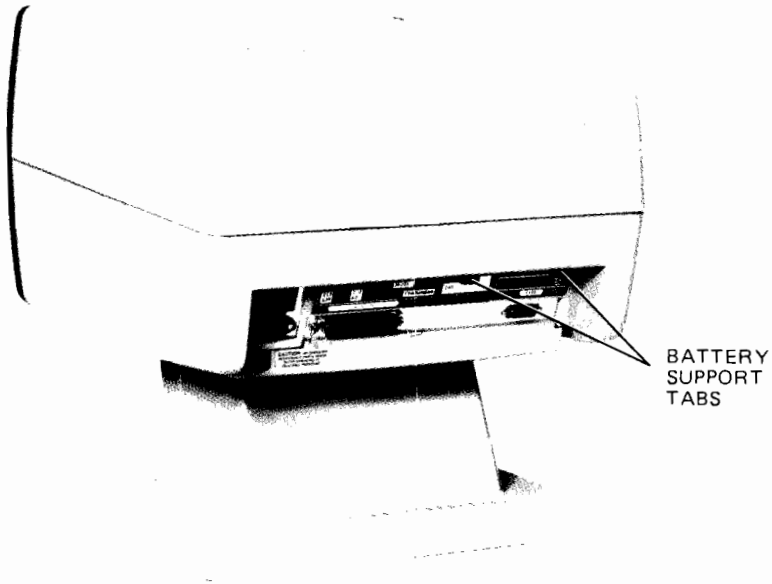


Figure 9-2. Battery Support Location.

To replace the battery, perform the following procedures:

1. If the terminal power is off, turn it on and wait until the terminal is ready to operate. (This will prevent loss of data in the Configuration Menus.)
2. Squeeze the tabs (figure 9-3) toward the center of the battery support with enough pressure to disengage the flanges which hold the battery support in the terminal, and pull down to free the battery support from the terminal.
3. Remove the old battery from the support.
4. Insert the new battery in the support making sure the positive end of the battery is located at the positive end of the support (+ to + and − to −).
5. Reinsert the battery support in the terminal. A slotted guide in the outward-facing side of the support ensures that the battery support is inserted with the right polarity.

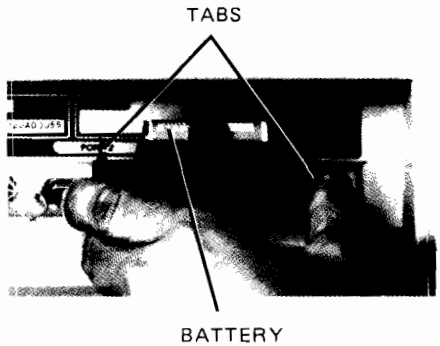


Figure 9-3. Battery Replacement.

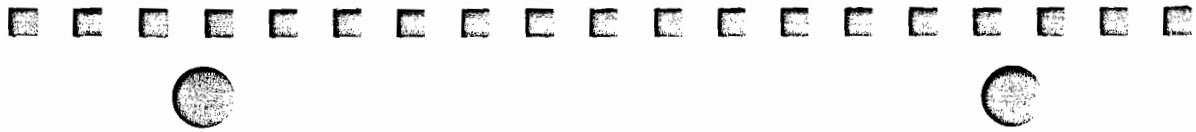
Cleaning

First, dust lightly using a damp, lint-free cloth. The cloth should not be wet, but just damp enough to pick up dust. Paper towels are fine. Avoid wiping dust or lint into the keyboard area.

CAUTION

Do not use petroleum-based cleaners, such as lighter fluid, or cleaners containing benzene, trichloroethylene, dilute ammonia, ammonia, or acetone. These cleaners could harm the plastic surfaces. Also, avoid spraying cleaner between the keyboard keys.

Smudges and fingerprints can be removed using most conventional cleaners (such as "SNAP" glass and plastic cleaner, manufactured by Mist Products Inc., 16 Watch Hill Rd., Croton-on-Hudson, N.Y. 10520).



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In Case of Difficulty 10

Introduction

This section contains explanations of error messages, instructions for determining if a malfunction has actually occurred, error recovery instructions, and testing information. Once you have determined that the terminal is not functioning properly, procedures for requesting service are included at the end of this section under the heading "How to Get Help".

Error Messages

The terminal generates two kinds of error messages of concern to the user; user error messages and printer test error messages. User error messages occur when the user makes an error while using the terminal and printer test error messages occur while the integral printer is being tested. The messages appear on lines 25 and 26, replacing the function key labels. To clear an error message and restore the labels, press the RETURN key. User error messages and their meanings are listed in table 10-1. Printer test error messages and their meanings are listed later under the heading "PRINTER TEST".

Table 10-1. User Error Message Meanings

MESSAGE	MEANING
`Default configs used` `Press RETURN to clear`	This message occurs whenever non-volatile memory is found to be malfunctioning or cannot be read for any reason. In this case, a default set of configuration parameters is used. See Reference Manual for more detailed information.
`Integral printer error` `Press RETURN to clear`	Something is wrong with the integral printer. It may just be out of paper or the metal latch (under the plastic printer lid) may not be pressed down securely.
`No ''to'' device` `Press RETURN to clear`	You attempted to perform a device-to-device data transfer without having first defined a "to" device.

Malfunction at Power-On

When the power switch is set to ON, the terminal should beep once. Then, a power-on test should be performed for about 15 seconds. After a successful test, it should beep once and bring up initial screen display as shown in figure 2-4.

However, if the terminal fails to beep at all, make sure that the keyboard is connected properly.

If the terminal beeps continuously 1 to 14 times (after the initial beep), and the primary level of function key labels do not come up, refer to "How to Get Help".

Configuration Checking

Sometimes what appears to be a terminal malfunction may be caused by incorrect configuration for the job you are trying to do. When the terminal appears to malfunction, the usual procedure is to reset the terminal, then, if the problem isn't corrected, a terminal test is performed and a call for service is made if the test fails. However, resetting the terminal disrupts printer and datacomm operations and resets (hard reset only) some of the configurable items to the values stored in non-volatile memory. Check the configurable items to ensure that the configuration is compatible with the task you are trying to perform. Refer to Section 5 for configuration instructions.

Resetting the Terminal

It may be necessary to use the RESET key to clear the terminal of an error condition. There are two types of reset: a soft reset and a hard reset. Either type resets printer and datacomm operations. In addition, a hard reset resets the active configuration values to the values stored in non-volatile memory, and all data in display memory is destroyed. For these reasons, you may not wish to hard reset the terminal unless you are quite certain it is necessary.

Soft Reset

A soft reset is performed by pressing the RESET key. The effects are listed below. Configuration values are preserved during a soft reset.

- The keyboard bell rings.
- The keyboard is unlocked.
- If the Display Functions capability is active, it is turned off.
- Line Modify Mode is turned off.
- Operations of all devices controlled by the terminal are stopped.
- All datacomm transfers are cancelled and any data stored in the datacomm buffer is cleared out.
- The screen is not cleared.

Hard Reset

A hard reset is performed by simultaneously pressing the CNTL, SHIFT, and RESET keys. A hard reset has the following effects:

- User keys (f1 - f8) are reset to default values.
- All data in display memory is destroyed.
- All configurations are reset to the values stored in non-volatile memory.
- The keyboard, if disabled, is enabled.
- CAPS mode is turned off.
- Screen displays MODES level softkeys.
- The left margin is set to column 1 and the right margin is set to column 80.
- All tabs are cleared.
- The following capabilities, if on, are turned off:
  1. Display functions.
  2. Line Modify mode.
  3. Insert character.
  4. Memory Lock mode.
- The following functions are turned off for terminals containing an integral printer:
  1. Report mode selection.
  2. Log top or log bottom selection.
  3. Record Mode.

Self-Tests

Two tests are available to the user: a terminal test, for checking the terminal for proper operation; and a datacomm test, for checking the datacomm configuration.

Terminal Test

The terminal test will tell whether or not the terminal is operating correctly. The test can be initiated by either one of the procedures listed below.

1. Press the following keys, in sequence:

2. Press, in sequence:

If the test is successful, indicating the terminal is operating correctly, a test pattern (figure 10-1) will appear on the screen. If the test pattern does not appear, or an error message appears in the softkey rows, refer to the "How to Get Help" paragraph at the end of this section.

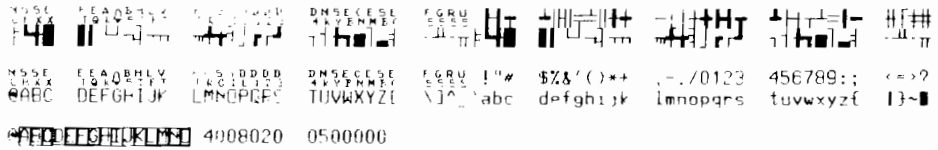


Figure 10-1. Terminal with Line Drawing Set Option Test Pattern

Printer Test

The printer test checks out only the integral printer. To initiate the test, press the following keys, in sequence:

If the test results are satisfactory, a printer test pattern which includes all the characters the terminal can produce is printed out (figure 10-2). If the test is unsatisfactory, an error message, **INTEGRAL PRINTER ERROR**, will be printed out. This means the printer latch is not locked, the printer is out of paper, or the printer self-test has failed.

Figure 10-2. Printer Test Pattern

How to Get Help

If the terminal doesn't complete the terminal test correctly, the terminal is probably malfunctioning. At this point you can either perform further tests, as described in the Reference Manual, or contact your nearest Hewlett-Packard service office. A list of service offices is supplied at the end of this manual.

A

TERMINAL CONTROL FUNCTION

KEY(S)			CODE	FUNCTION
ENTER	(as used in Local mode)		↯ 0	Copy memory to destination(s)
AIDS	margins / tabs / col	SET TAB	↯ 1	Set tab
AIDS	margins tabs / col	CLEAR TAB	↯ 2	Clear tab
AIDS	margins / tabs / col	CLR ALL TABS	↯ 3	Clear all tabs
AIDS	margins / tabs / col	LEFT MARGIN	↯ 4	Set left margin
AIDS	margins / tabs / col	RIGHT MARGIN	↯ 5	Set right margin
AIDS	margins / tabs / col	CLR ALL MARGINS	↯ 9	Clear all margins
			↯ :	Delay one second
∧			↯ A	Cursor up
∨			↯ B	Cursor down
>			↯ C	Cursor right
<			↯ D	Cursor left

KEY(S)		CODE	FUNCTION
CTRL SHIFT RESET		↯ E	Hard reset (power on reset)
SHIFT ↖		↯ F	Cursor home down
RETURN	(with Auto LF disabled)	↯ G	Move cursor to left margin
↖		↯ H	Cursor home up
TAB◀ or TAB▶		↯ I	Horizontal tab
CLEAR DSPLY		↯ J	Clear display from cursor to end of memory
CLEAR LINE		↯ K	Clear line from cursor to end of line
INS LINE		↯ L	Insert line
DEL LINE		↯ M	Delete line
DEL CHAR		↯ P	Delete character
INS CHAR		↯ Q	Start insert character mode
INS CHAR		↯ R	End insert character (↯ Q)
ROLL UP		↯ S	Roll up
ROLL DOWN		↯ T	Roll down
NEXT PAGE		↯ U	Next page
PREV PAGE		↯ V	Previous page

KEY(S)	CODE	FUNCTION
TERMINAL CONTROL FUNCTION (continued)		
	↯ W	Format mode on
	↯ X	Format mode off
MODES , DISPLAY FUNCTION	↯ Y	Display Functions mode on
MODES , DISPLAY FUNCTNS •	↯ Z	Display Functions mode off
	↯ [	Start unprotected field
	↯]	End unprotected field
	↯ ^	Primary terminal status request
	↯ \	Sense cursor position (relative)
	↯ a	Sense cursor position (absolute)
	↯ b	Unlock keyboard
	↯ c	Lock keyboard
	↯ d	Transmit a block of text to computer
	↯ f	Modem disconnect
RESET	↯ g	Soft reset

KEY(S)	CODE	FUNCTION
\	↯ h	Cursor home up
TAB◄ SHIFT TAB►	↯ i	Backtab
SHIFT USER KEYS	↯ j	Begin User Key Definition mode
USER KEYS or AIDS or MODES	↯ k	End User Keys Definition mode
MODES MEMORY LOCK	↯ l	Begin Memory Lock mode
MODES MEMORY LOCK •	↯ m	End Memory Lock mode
f1	↯ p	Default definition for user definable function key f1
f2	↯ q	Default definition for user definable function key f2
f3	↯ r	Default definition for user definable function key f3
f4	↯ s	Default definition for user definable function key f4
f5	↯ t	Default definition for user definable function key f5
f6	↯ u	Default definition for user definable function key f6
f7	↯ v	Default definition for user definable function key f7
f8	↯ w	Default definition for user definable function key f8

KEY(S)		CODE	FUNCTION
TERMINAL CONTROL FUNCTION (continued)			
AIDS	service keys . TERMINAL TEST	ESC z	Initiate terminal self test
MODES	TERMINAL TEST	ESC ^	Primary terminal status request
		ESC ~	Secondary terminal status request

CURSOR CONTROL OPERATIONS

NOTE

Columns and rows are numbered starting with 0 as the leftmost column and the top row.

ESC &a <col>c <rows>Y	Moves the cursor to column "col" and screen row "row" or the screen (screen relative addressing).
ESC &a <col>c <row>R	Moves the cursor to column "col" and row "row" in memory (absolute addressing).
ESC &a ± <col>c ± <row> Y	Moves the cursor to column "col" and row "row" (on the screen) relative to its present position ("col" and "row" are signed integers). A positive number indicates right or downward movement and a negative number indicates left or upward movement.
ESC &a ± <col>c ± <row> R	Moves the curso r to column "col" and row "row" relative to its present cursor position in memory ("col" and "row" are signed integers). A positive number indicates right or downward movement and a negative number indicates left or upward movement.

CONFIGURATION OPERATIONS

ESC &q 0L	Unlock configuration.
ESC &q 1L	Lock configuration.

ESCAPE SEQUENCE	MENU FIELD	ENTRY VALUE	X
ESC &k <x>A	AUTO LF	OFF	x=0
		ON	x=1
ESC &k <x>B	BLOCK	OFF	x=0
		ON	x=1
ESC &k <x>C	Caps Lock	OFF	x=0
		ON	x=1
ESC &k <x>J	FrameRate	60	x=0
		50	x=1
ESC &k <x>L	LocalEcho	OFF	x=0
		ON	x=1
ESC &k <x>M	MODIFY ALL	OFF	x=0
		ON	x=1
ESC &k <x>N	SPOW		
ESC &k <x>P	Caps Mode	OFF	x=0
		ON	x=1
ESC &k <x>R	REMOTE	OFF	x=0
		ON	x=1
ESC &s <x>A	XmitFnctn(A)	NO	x=0
		YES	x=1
ESC &s <x>B	SPOW(B)	NO	x=0
		YES	x=1
ESC &s <x>C	InhEolWrp(C)	NO	x=0
		YES	x=1
ESC &s <x>D	Line/Page(D)	LINE	x=0
		PAGE	x=1
ESC &s <x>G	IndHndShk(G)	NO	x=0
		YES	x=1
ESC &s <x>H	Inh DC2(H)	NO	x=0
		YES	x=1

DATA OPERATIONS

The following escape sequences control data transfer to and from the integral printer and display memory. Only effective if printer present.

`ESC &p <a>d <b>d <c>d <Y>`

Copies "Y" amount of data to destination devices "a", "b", and "c". As many destinations as desired can be specified.

a, b, and c	DEVICE
3	Display.
4,6	Integral printer.

y	ACTION
B	Copy the Line in which the cursor is located.
F	Copy the display screen from the line in which the cursor is located (cursor line) to the last displayed line.
M	Copy the contents of display memory from the cursor line to the end of memory.

`ESC &p <x>^`

Requests the status of device "x".

x	DEVICE
4,6	Integral printer.

`ESC &K <x>S`

Enables Expanded, Compressed, or Normal Character mode for the integral printer as designated by the character "X".

x	ACTION
0	Disable both Expanded and Compressed Character modes.
1	Initiate Expanded Character mode.
2	Initiate Compressed Character mode.

`ESC &p <y>u <z>C`

Performs the action specified by "z" on device "y".

z	ACTION
0	Generates 1 form feed.
1	Space "x" lines.
2-10	Generates 1 form feed.
11	Turn on Log Bottom mode.
12	Turn on Log Top mode.
13	Turn off any logging mode.
14	Print normal characters.
15	Print expanded characters.
16	Print compressed characters.
17	Turn on Report mode.
18	Turn on Metric Report mode.
19	Turn off any Report mode.

y	DEVICE
4,6	Integral printer.
3	Display.

`ESC &p <num>p 20C`

Turn on Record Mode.
< num > p is optional.
< num > is the decimal equivalent of an ASCII character that will turn off Record mode.

DATA OPERATIONS (continued)

ESC &p <x>W <data string>	Transfers "x" bytes of the data string from the computer to the selected destination device in binary form.
ESC &p W <data string>	Transfers the data string, in ASCII form, from the computer to the printer selected as the destination device. The string is terminated either by the 256th byte or by an ASCII line feed character.

FORMAT MODE

ESC [	Starts a field
ESC]	Ends the field

FUNCTION KEY AND ERROR MESSAGE OPERATIONS

To enable and disable the function keys (F1 thru F8), use the following escape sequence.

ESC &j <x>

x	MEANING
A	**Display the Modes set of function key labels.**
B	**Enable the User function keys. (The user key labels are displayed.)**
C	**Clears the message from the screen and returns the last displayed level of function key labels.**
@	**Remove the function key labels from the screen. However, they are still enabled.**

To enable or disable the Function Control Keys:

S **Disable the** AIDS , MODES, **and** USER KEYS **keys.**

R **Enable the** AIDS , MODES, **and** USER KEYS **keys.**

To replace the function key definition with your own message:

ESC &j <string length>L <message>

"String Length" — a number (up to 160) indicating the number of characters in the string.

"Message"" — the content of the message.

To define functions for the function keys:

ESC &f <attribute>a <key>k <label length>d <string length>L <label><string>

TERM	SYMBOL	MEANING	DEFAULT
Attribute	0	Normal (N)	0
	1	Local only (L)	
	2	Transmit only (T)	
Key	1	f1 function key	
	2	f2 function key	
	3	f3 function key	
	4	f4 function key	
	5	f5 function key	
	6	f6 function key	
	7	f7 function key	
	8	f8 function key	
Label length	0 thru 16	Number of characters in the label	0
String length	0 thru 80	Number of characters in the string.	1
	1	Clears the content of the string.	
Label	(none)	The label is entered at this point in the sequence.	
String	(none)	The character string is entered at this point in the sequence	

DISPLAY ENHANCEMENTS OPERATIONS

To start and end display enhancements:

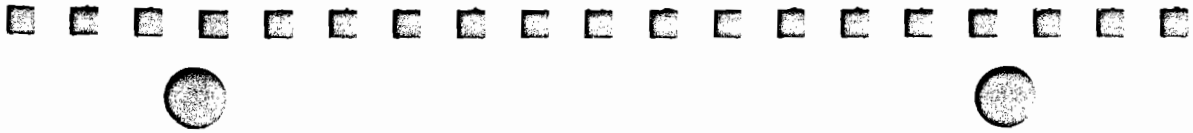
`esc & d <char>` Selects the display enhancement indicated by "char" to begin at the present cursor position.

	"char"														
	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Half-Bright									X	X	X	X	X	X	X	X
Under-line					X	X	X	X					X	X	X	X
Inverse Video			X	X			X	X			X	X			X	X
Blinking		X		X		X		X		X		X		X		X
End Enhance-ment	X															

ALTERNATE CHARACTER SET SELECTION

`esc ) B` Selects line drawing as alternate character set.

B



Keyboards and Character Sets

Depending on the option selected, a terminal comes with one of three types of character ROM installed, as shown below:

OPTION	CHARACTER SET(S)
Standard	USASCII
001-006	USASCII, Extended Roman, and Line-Drawing sets
202	USASCII and Line-Drawing sets

Figures B-1 through B-7 show the national keyboards which are available as options 001 through 006. These options also include the extended Roman character set ROM. This ROM contains many characters used in the languages represented in options 001 through 006 but not found in the USASCII character set (see tables B-1 and B-2).

Figure B-1. Swedish/Finnish Keyboard (Option 001)

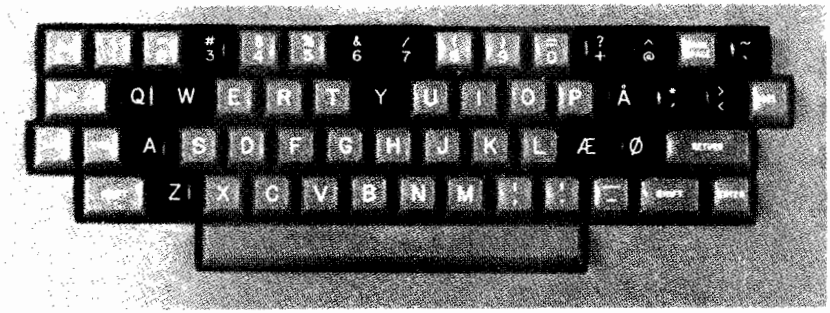


Figure B-2. Danish/Norwegian Keyboard (Option 002)

The French keyboard (option 003), when delivered, is physically arranged in the AZERTY layout; a keycap extraction tool comes with it. To change the keyboard to the QWERTY layout, the A, Z, Q, and W keys must be rearranged to be as shown in figure B-4.

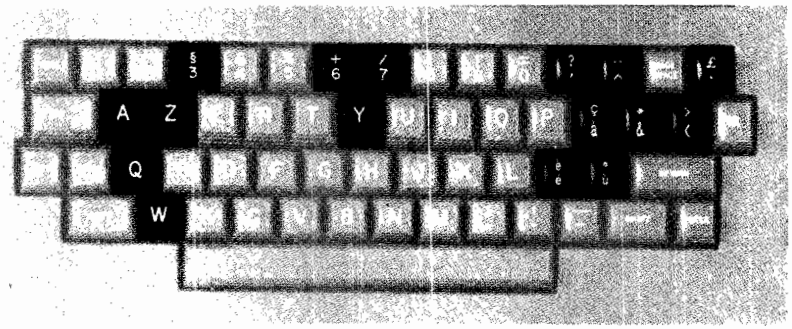


Figure B-3. French Keyboard (Option 003), AZERTY Layout

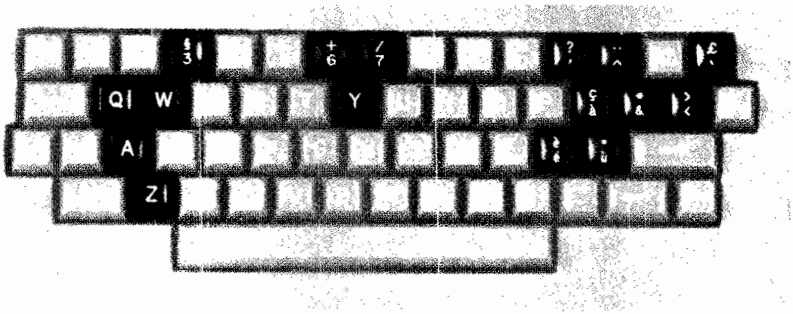


Figure B-4. French Keyboard (Option 003), QWERTY Layout

7-Bit vs. 8-Bit Operation

The terminal can operate in 7-bit or 8-bit mode. It is configured for 7-bit operation by setting the ASCII 8 Bit field of the Terminal Configuration menu to "NO". If this field is set to "YES", the terminal is configured for 8-bit operation. Parity operation is allowed only in 7-bit mode; in 8-bit mode. the Parity field (on the Datacomm Device menu) must be set to "NONE" for communication with the computer or external device.

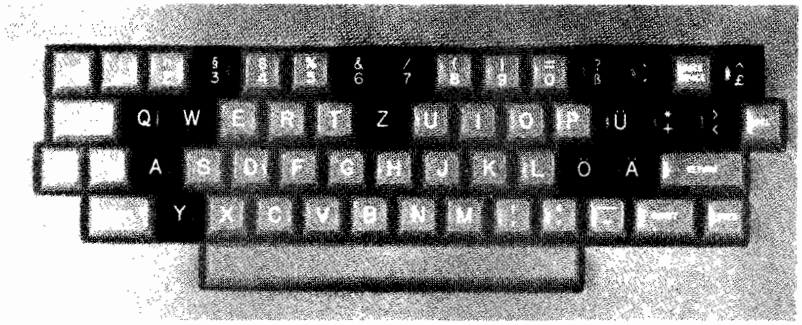


Figure B-5. German Keyboard (Option 004)

Figure B-6. United Kingdom Keyboard (Option 005)

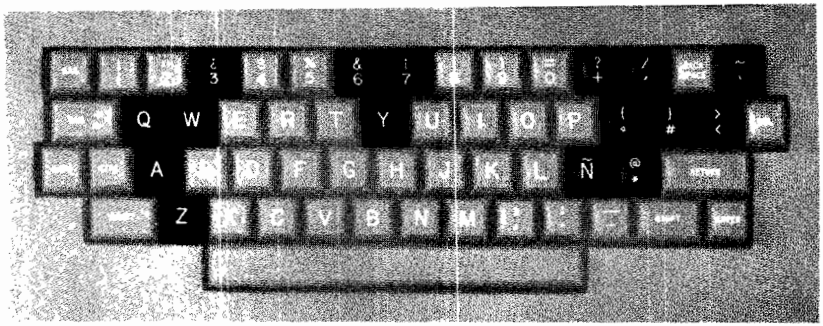


Figure B-7. Spanish Keyboard (Option 006)

Alternate Character Set Selection

The "base" language for the terminal is the language selected on the Terminal Configuration menu; the alternate character set can be the line-drawing set (which comes with options 001 through 006 and option 202) or the extended Roman character set (which comes with options 001 through 006). One of these two sets is selected as the "active" alternate character set using an escape sequence, which can be entered from either a program or the keyboard. Provided the terminal is in 8-bit mode, ESC) A selects the extended Roman character set as the active alternate character set. If the terminal is in 7-bit mode, ESC) B selects the line-drawing set as the active alternate character set. At power-up time or after a hard reset, the terminal defaults to the extended Roman character set as the active alternate character set if the terminal is configured for 8-bit operation and to the line-drawing set if the terminal is configured for 7-bit operation.

Pressing the CTRL and N keys simultaneously selects the active alternate character set as the character set accessed by the keyboard keys. Pressing the CTRL and O keys simultaneously returns the terminal to the base language.

When the terminal is in 7-bit mode and the active alternate character set is selected as the character set accessed by the keyboard, it remains as the character set accessed by the keyboard to the end of the current line. The alternate character set must be selected anew for each line.

When the active alternate character set is selected as the keyboard character set in 8-bit mode, it remains in effect until the base set is reselected with a CTRL O.

When the terminal is in 8-bit mode, they can also be displayed by selecting the alternate character set as the character set accessed by the keyboard. This can be done by pressing simultaneously the CNTL and N keys. This cannot be done in 7-bit mode.

USASCII Character Set

If the terminal is equipped with the ROM containing the extended Roman character set (table B-2), and is configured for 7-bit operation, the characters #, @, [, \,], ^, `, {, |, }, and ~ in table B-1 are replaced on the screen with one of the following sets of characters, depending on the national language selected on the Terminal Configuration menu.

	KEYBOARD	DECIMAL VALUE										
LANGUAGE	OPTION #	35	64	91	92	93	94	96	123	124	125	126
USASCII	(standard)	#	@	[	\	]	^	`	{	|	}	~
Swedish/Finnish	001	#	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Danish/Norwegian	002	#	@	Æ	Ø	Å	^	`	æ	ø	å	~
French	003	£	à	°	ç	§	^	`	é	ù	è	
German	004	£	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
United Kingdom	005	£	@	[	\	]	^	`	{	|	}	~
Spanish	006	#	@	¡	Ñ	¿	^	`	{	ñ	}	~

Table B-1. Standard USASCII Character Codes

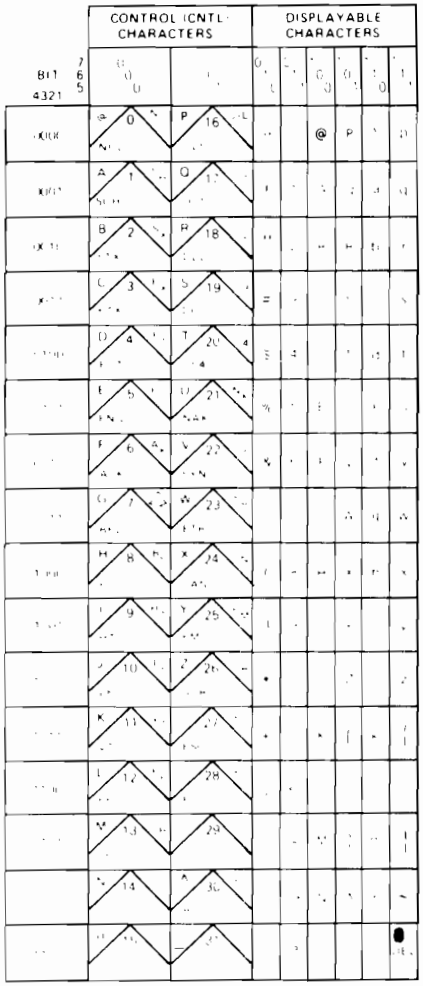
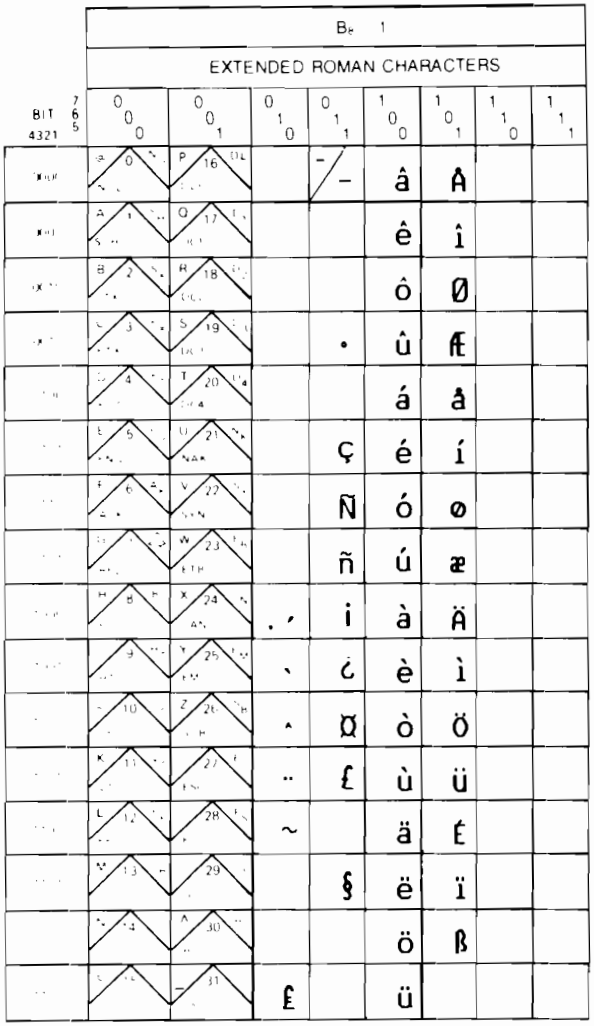
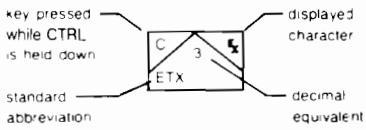


Table B-2. Extended Roman Character Codes



— ACKNOWLEDGE
— BELL
— BACKSPACE
— CANCEL LINE
— CARRIAGE RETURN
— DATA LINK ESCAPE
— DEVICE CONTROL 1
— DEVICE CONTROL 2
— DEVICE CONTROL 3
— DEVICE CONTROL 4
— DELETE
— END OF MEDIUM
— ENQUIRY
— END OF TRANSMISSION
— ESCAPE
— END OF BLOCK
— END OF TEXT
— FORM FEED
— FILE SEPARATOR
— GROUP SEPARATOR
— HORIZONTAL TAB
— LINE FEED
— NEGATIVE ACKNOWLEDGE
— RECORD SEPARATOR
— SHIFT IN
SP — SHIFT OUT
— SPACE
— START OF HEADING
— START OF TEXT
— SUBSTITUTE
— SYNCHRONOUS IDLE
— UNIT SEPARATOR
— VERTICAL TAB

Control Character Legend



Extended Roman Character Set

All USASCII (table B-1) and extended Roman characters (table B-2) are accessible using the keyboard keys under the following conditions:

a. The terminal is configured for 8-bit operation.

b. The extended Roman character set is selected as the active alternate character set.

c. The active alternate character set is selected as the keyboard set (by pressing the CTRL and N keys).

In 8-bit mode, the eighth data bit is used by the firmware code to select either the USASCII or extended Roman character set. If the terminal is configured for 8-bit mode but does not include the 8K ROM which contains the extended Roman character set, the eighth bit is still used for selection of the USASCII character set, but any keystrokes, which would access the extended Roman characters if the appropriate ROM was present, display spaces.

If the terminal is configured for 7-bit operation, the extended Roman character set is selected as the active character set, and the active alternate character set is selected as the keyboard set (by pressing the CTRL N keys), the terminal defaults to the base character set.

Line-Drawing Set

The line-drawing set consists of various line segments. Using it, you can construct data entry forms by combining different line segments. Each line segment is associated with one of the keyboard keys as shown in figures B-8 and B-9.

The line-drawing set line segments are accessed by selecting the line-drawing set as the active alternate character set using the escape sequence ESC) B and then selecting it as the character set accessed by the keyboard keys by pressing the CTRL and N keys, simultaneously.

Figure B-8. Line-Drawing Set Elements

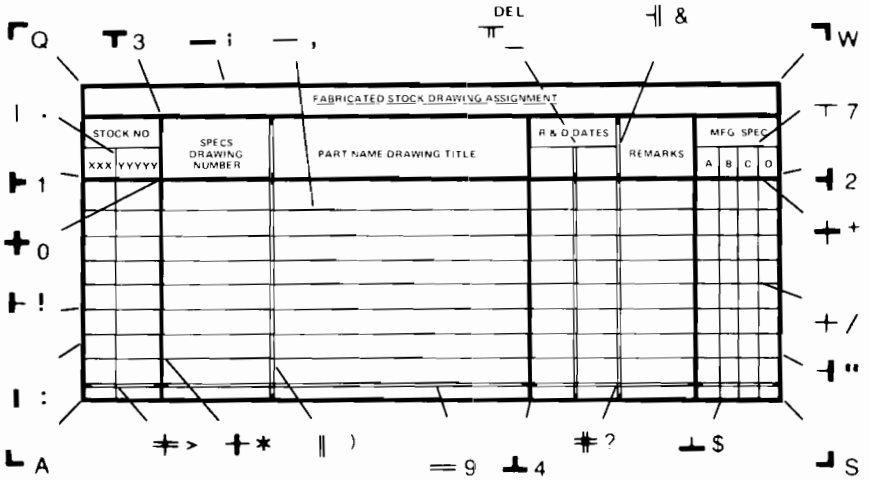


Figure B-9. Sample Data Entry Form

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ANGOLA
Telectra
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R. Barbosa Rodrigues, 41-1° DT.°
Caixa Postal, 6487
Luanda
Tel: 35515/6
Cable: TELECTRA Luanda

AUSTRALIA
Hewlett-Packard Australia Pty. Ltd.
31-41 Joseph Street
Blackburn, Victoria 3130
P.O. Box 36
Doncaster East,
Victoria 3109
Tel: 896351
Telex: 31-024
Cable: HEWPARD Melbourne

Hewlett-Packard Australia Pty. Ltd.
31 Bridge Street
Pymble
New South Wales, 2073
Tel: 4496566
Telex: 21561
Cable: HEWPARD Sydney

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153 Greenhill Road
Parkside, S.A., 5063
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141 Stirling Highway
Nedlands, W.A. 6009
Tel: 3865455
Telex: 93859
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121 Wollongong Street
Fyshwick, A.C.T. 2609
Tel: 804244
Telex: 62650
Cable: HEWPARD Canberra

Hewlett Packard Australia Pty. Ltd.
5th Floor
Teachers Union Building
495-499 Boundary Street
Spring Hill, Queensland 4000
Tel: 2291544
Cable: HEWPARD Brisbane

BANGLADESH
The General Electric Co. of Bangladesh Ltd.
Magnet House 72
Dilkusha Commercial Area
Motijheil, Dacca 2
Tel: 252415, 252419
Telex: 734
Cable: GECDAC Dacca

ETHIOPIA
Abdella Abdulmalik
P.O. Box 2635
Addis Ababa
Tel: 11 93 40

GUAM
Guam Medical Supply, Inc.
Suite C, Airport Plaza
P.O. Box 8947
Tamuning 96911
Tel: 646-4513
Cable: EARMED Guam

HONG KONG
Hewlett-Packard Hong Kong Ltd.
Room 105, Austin Centre
1st Floor
21 Austin Avenue
TST P.O. Box 98524
Kowloon
Tel: 3-697446 (5 lines)
Telex: 36678 HX
Cable: HEWPACK Hong Kong

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Wing On Centre, 28th Floor
Connaught Road, C.
Hong Kong
Tel: 5-455644
Telex: 74766 SCHMX HX

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Prabhadevi
Bombay 400 025
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Telex: 011-4093
Cable: FROSTBLUE

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Band Box House
Prabhadevi
Bombay 400 025
Tel: 45 73 01
Telex: 011-3751
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Ahmedabad 380 014
Tel: 43922
Telex: 012-234
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Calcutta 700 001
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Telex: 021-7655
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Bangalore 560 025
Tel: 55668
Telex: 0845-430
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Meeakshi Mandiram
XXXXV/1379-2 Mahatma Gandhi Rd.
Cochin 682 016
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Telex: 085-514
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Blue Star Ltd.
1-1-117/1 Sarojini Devi Road
Secunderabad 500 033
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133 Kodambakkam High Road
Madras 600 034
Tel: 82057
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Cable: BLUESTAR

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P.O. Box 496/Jkt.
Jln. Abdul Muis 62
Jakarta
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BERCA Indonesia P.T.
P.O. Box 174/Sby.
23 Jln. Jimerto
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JAPAN
Yokogawa-Hewlett-Packard Ltd.
29-21, Takaido-Higashi 3-chome
Suginami-ku, **Tokyo** 168
Tel: 03-331-6111
Telex: 232-2024 YHP-Tokyo
Cable: YHPMARKET TOK 23 724

Yokogawa-Hewlett-Packard Ltd.
Chuo Bldg., 4th Floor
4-20, Nishinakajima 5-chome
Yodogawa-ku, Osaka-shi
Osaka, 532
Tel: 06-304-6021
Telex: 523-3624

Yokogawa-Hewlett-Packard Ltd
Sunitomo Seimei Nagaya Bldg.
11-2 Shimosasajima-cho,
Nakamura-ku, **Nagoya,** 450
Tel: 052 571-5171

Yokogawa-Hewlett-Packard Ltd.
Tanigawa Building
2-24-1 Tsuruya-cho
Kanagawa-ku
Yokohama, 221
Tel: 045-312-1252
Telex: 382-3204 YHP YOK

Yokogawa-Hewlett-Packard Ltd.
Mito Mitsui Building
105, 1-chome, San-no-maru
Mito, Ibaragi 310
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Yokogawa-Hewlett-Packard Ltd
Inoue Building
1348-3, Asahi-cho, 1-chome
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Kumagaya Asahi
Hachijuni Building
4th Floor
3-4, Tsukuba
Kumagaya, Saitama 360
Tel: 0485-24-6563

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Nairobi
Tel: 331955
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Nairobi Airport
Nairobi
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Telex: 034-8300, 034-8493

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Winnipeg R3H 0Y1
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London N6E 2S5
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TWX: 610-352-1201

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Tel: (514) 697-4232
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Telex: 122443 AR CIGY
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Avda. Paseo Colon 221
9 piso
1399 **Buenos Aires**
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34-9356/0460/4551
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06400 **Barueri** SP
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Hewlett-Packard do Brasil I.e.C. Ltda.
Av. Epitacio Pessoa, 4664
22471-**Rio de Janeiro**-RJ
Tel: 286-0237
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Arturo Burhle 065
Casilla 16475
Correo 9, **Santiago**
Tel: 220222
Telex: JCALCAGNI

COLOMBIA
Instrumentación
Henrik A. Langebaek & Kier S.A.
Carrera 7 No. 48-75
Apartado Aéreo 6287
Bogotá, 1 D.E.
Tel: 269-8877
Telex: 44400
Cable: AARIS Bogotá

Instrumentación
H.A. Langebaek & Kier S.A.
Carrera 63 No. 49-A-31
Apartado 54098
Medellín
Tel: 304475

COSTA RICA
Científica Costarricense S.A.
Avenida 2, Calle 5
San Pedro de Montes de Oca
Apartado 10159
San Jose
Tel: 24-38-20, 24-08-19
Telex: 2367 GALGUR CR
Cable: GALGUR

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P.O. Box 6423 CCI
Av. Eloy Alfaro 1749
Quito
Tel: 450-975, 243-052
Telex: 2548 CYEDE ED
Cable: CYEDE-Quito

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IPESA
Bulevar de los Heroes 11-48
Edificio Sarah 1148
San Salvador
Tel: 252787

GUATEMALA
IPESA
Avenida Reforma 3-48
Zona 9
Guatemala City
Tel: 316627, 314786, 66471-5, ext. 9
Telex: 4192 Teletro Gu

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Hewlett-Packard Mexicana, S.A. de C.V.
Av. Periférico Sur No. 6501
Tepepan, Xochimilco
Mexico 23, D.F.
Tel: 905-676-4600
Telex: 017-74-507

Hewlett-Packard Mexicana, S.A. de C.V.
Ave. Constitución No. 2184
Monterrey, N.L.
Tel: 48-71-32, 48-71-84
Telex: 038-410

PANAMA
Electrónico Balboa, S.A.
Aparatado 4929
Panama 5
Calle Samuel Lewis
Edificio "Alfa," No. 2
Ciudad de Panama
Tel: 64-2700
Telex: 3483103 Curundu, Canal Zone
Cable: ELECTRON Panama

PERU
Compañia Electro Médica S.A.
Los Flamencos 145
San Isidro Casilla 1030
Lima 1
Tel: 41-4325
Telex: Pub. Booth 25424 SISIDRO
Cable: ELMED Lima

SURINAM
Surtel Radio Holland N.V.
Grote Hofstr. 3-5
P.O. Box 155
Paramaribo
Tel: 72118, 77880
Cable: Surtel

TRINIDAD & TOBAGO
CARTEL
Caribbean Telecoms Ltd
P.O. Box 732
69 Frederick Street
Port-of-Spain
Tel: 62-53068

URUGUAY
Pablo Ferrando S.A.C.e.l.
Avenida Italia 2877
Casilla de Correo 370
Montevideo
Tel: 40-3102
Telex: 702 Public Booth
Para Pablo Ferrando
Cable: RADIUM Montevideo

VENEZUELA
Hewlett-Packard de Venezuela C.A.
P.O. Box 50933
Caracas 105
Los Ruices Norte
3a Transversal
Edificio Segre
Caracas 107
Tel: 239-4133 (20 lines)
Telex: 25146 HEWPACK
Cable: HEWPACK Caracas

FOR AREAS NOT LISTED, CONTACT:
Hewlett-Packard Intercontinental
3495 Deer Creek Road
Palo Alto, California 94304
Tel: (415) 856-1501
TWX: 910-373-1260
Cable: HEWPACK Palo Alto
Telex: 034-8300, 034-8493

EUROPE, NORTH AFRICA, MIDDLE EAST

AUSTRIA
Hewlett-Packard Ges.m.b.H.
Wehlistrasse 29
P.O. Box 7
A-1205 **Vienna**
Tel: 35-16-21-0
Cable: HEWPACK Vienna
Telex: 13582 135066

Hewlett-Packard Ges.m.b.H.
Wehlistrasse, 29
A-1205 **Wien**
Tel: 35-16-21
Telex: 135066

BAHRAIN
Medical Only
Wael Pharmacy
P.O. Box 648
Bahrain
Tel: 54886, 56123
Telex: 8550 WAEL GJ
Cable: WAELPHARM

Al Hamidiya Trading and Contracting
P.O. Box 20074
Manama
Tel: 259978, 259958
Telex: 8895 KALDIA GJ

BELGIUM
Hewlett-Packard Benelux S.A./N.V.
Avenue du Col-Vert, 1, (Groenkraaglaan)
B-1170 **Brussels**
Tel: (02) 660 50 50
Cable: PALCBEN Brussels
Telex: 23-494 paloben bru

CYPRUS
Kypronics
19 Gregorios Xenopoulos Street
P.O. Box 1152
Nicosia
Tel: 45628/29
Cable: Kypronics Pandehis
Telex: 3018

CZECHOSLOVAKIA
Hewlett-Packard
Obchodni zastupitelstvi v CSSR
Pisemny styk
Post. schranka 27
CS 118 01 **Praha** 011
CSSR

Vyvojova a Provozni Zakladna
Vyzkumnych Ustavu v Bechovicich
CSSR-25097 **Bechovice u Prahy**
Tel: 89 93 41
Telex: 12133

Institute of Medical Bionics
Vyskumny Ustav Lekarskej Bioniky
Jedlova 6
CS-88346 **Bratislava-Kramare**
Tel: 44-551
Telex: 93229

DENMARK
Hewlett-Packard A/S
Datavej 52
DK-3460 **Birkerod**
Tel: (02) 81 66 40
Cable: HEWPACK AS
Telex: 37409 hpas dk

Hewlett-Packard A/S
Navervej 1
DK-8600 **Silkeborg**
Tel: (06) 82 71 66
Telex: 37409 hpas dk
Cable: HEWPACK AS

EGYPT
I.E.A.
International Engineering Associates
24 Hussein Hegazi Street
Kasr-el-Aini
Cairo
Tel: 23 829
Telex: 93830
Cable: INTENGASSO

SAMITRO
Sami Amin Trading Office
18 Abdel Aziz Gawish
Abdine-Cairo
Tel: 24932
Cable: SAMITRO CAIRO

FINLAND
Hewlett-Packard Oy
Revontulentie, 7
SF-02100 **Espoo** 10
Tel: (90) 455 0211
Cable: HEWPACKOY
Telex: 121563 hewpa sf

FRANCE
Hewlett-Packard France
Zone d'activites de Courtaboeuf
Avenue des Tropiques
Boite Postale 6
91401 **Orsay**-Cédex
Tel: (1) 907 78 25
TWX: 600048F

Hewlett-Packard France
Chemin des Mouilles
B.P. 162
69130 **Ecully**
Tel: (78) 33 81 25
TWX: 310617F

Hewlett-Packard France
20, Chemin de La Cépière
31081 **Toulouse**
Le Mirail-Cédex
Tel: (61) 40 11 12

Hewlett-Packard France
Le Ligoures
Place Romée de Villeneuve
13100 **Aix-en-Provence**
Tel: (42) 59 41 02
TWX: 410770F

Hewlett-Packard France
2, Allee de la Bourgonette
35100 **Rennes**
Tel: (99) 51 42 44
TWX: 740912F

Hewlett-Packard France
18, rue du Canal de la Marne
67300 **Schiltigheim**
Tel: (88) 83 08 10
TWX: 890141F

Hewlett-Packard France
Immeuble péricentre
rue van Gogh
59650 **Villeneuve** D'Ascq
Tel: (20) 91 41 25
TWX: 160124F

Hewlett-Packard France
Bâtiment Ampère
Rue de la Commune de Paris
B.P. 300
93153 **Le Blanc Mesnil**-Cédex
Tel: (01) 931 88 50
Telex: 211032F

Hewlett-Packard France
Av. du Pdt. Kennedy
33700 **Merignac**
Tel: (56) 97 01 81

Hewlett-Packard France
Immeuble Lorraine
Boulevard de France
91035 **Evry**-Cédex
Tel: 077 96 60
Telex: 692315F

Hewlett-Packard France
23 Rue Lothaire
57000 **Metz**
Tel: (87) 65 53 50

GERMAN FEDERAL REPUBLIC
Hewlett-Packard GmbH
Vertriebszentrale Frankfurt
Berner Strasse 117
Postfach 560 140
D-6000 **Frankfurt** 56
Tel: (06011) 50041
Cable: HEWPACKSA Frankfurt
Telex: 04 13249 hpffm d

Hewlett-Packard GmbH
Technisches Büro Böblingen
Herrenberger Strasse 110
D-7030 **Böblingen**, Württemberg
Tel: (07031) 667-1
Cable: HEWPACK Böblingen
Telex: 07265739 bbn

SALES OFFICES (Continued)

EUROPE, NORTH AFRICA, MIDDLE EAST

Hewlett-Packard GmbH
Technisches Büro Düsseldorf
Emanuel-Leutze-Str 1 (Seestern)
D-4000 **Düsseldorf**
Tel (0211) 5971-1
Telex 085-86 533 hpdd d

Hewlett-Packard GmbH
Technisches Büro Hamburg
Kapstadtring 5
D-2000 **Hamburg** 60
Tel (040) 63804-1
Cable HEWPACKSA Hamburg
Telex 21 63 032 hphh d

Hewlett-Packard GmbH
Technisches Büro Hannover
Am Grossmarkt 6
D-3000 **Hannover** 91
Tel (0511) 46 60 01
Telex 092 3259

Hewlett-Packard GmbH
Technisches Büro Nürnberg
Neumeyerstrasse 90
D-8500 **Nürnberg**
Tel (0911) 52 20 83
Telex 0623 860

Hewlett-Packard GmbH
Technisches Büro München
Eschenstrasse 5
D-8021 **Taufkirchen**
Tel (089) 6117-1
Telex 0524985

Hewlett-Packard GmbH
Technisches Büro Berlin
Kaithstrasse 2-4
D-1000 **Berlin** 30
Tel (030) 24 90 86
Telex 018 3405 hpbln d

GREECE

Kostas Karayannis
6 Omirou Street
Athens 133
Tel 32 30 303/32/37 731
Telex 21 59 62 RKAR GR
Cable RAKAR ATHENS

ICELAND

Medical Only
Elding Trading Company Inc.
Hafnarhvoli - Tryggvagötu
P.O. Box 895
IS-**Reykjavik**
Tel 1 58 20/1 63 03
Cable ELDING Reykjavik

IRELAND

Hewlett-Packard Ltd.
King Street Lane
Winnersh, Wokingham
Berkshire, RG11 5AR
GB-England
Tel (0734) 78 47 74
Telex 847178
Cable Hewpie London

Hewlett-Packard Ltd.
Kestrel House
Clanwilliam Place
Lower Mount Street
Dublin 2, Eire
Tel 76 93 01

Hewlett-Packard Ltd.
2C Avongberg Ind. Est.
Long Mile Road
Dublin 12
Tel 514322/514224
Telex 30439

Medical Only
Cardiac Services (Ireland) Ltd.
Kilmore Road
Artane
Dublin 5, Eire
Tel (01) 315820

Medical Only
Cardiac Services Co.
95A Finaghy Rd. South
Belfast BT10 0BY
GB-Northern Ireland
Tel (0232) 625566
Telex 747626

ISRAEL

Electronics Engineering Div.
of Motorola Israel Ltd.
16, Kremenetski Street
P.O. Box 25016
Tel-Aviv
Tel 38973
Telex 33569, 34164
Cable BASTEL Tel-Aviv

ITALY

Hewlett-Packard Italiana S.p.A.
Via G. Di Vittorio, 9
20063 **Cernusco Sul Naviglio** (MI)
Tel (2) 903691
Telex 334632 HEWPACKIT

Hewlett-Packard Italiana S.p.A.
Via Turazza, 14
35100 **Padova**
Tel (49) 664888
Telex 430315 HEWPACKI

Hewlett-Packard Italiana S.p.A.
Via G. Armellini 10
I-00143 **Roma**
Tel (06) 54 69 61
Telex 610514
Cable HEWPACKIT Roma

Hewlett-Packard Italiana S.p.A.
Corso Giovanni Lanza 94
I-10133 **Torino**
Tel (011) 659308
Telex 221079

Hewlett-Packard Italiana S.p.A.
Via Principe Nicola 43 G/C
I-95126 **Catania**
Tel (095) 37 05 04
Telex 970291

Hewlett-Packard Italiana S.p.A.
Via Nuova san Rocco A
Capadimonte, 62A
80131 **Napoli**
Tel (081) 710698

Hewlett-Packard Italiana S.p.A.
Via Martin Luther King, 38/111
I-40132 **Bologna**
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Telex 511630

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Mousher Cousins Co.
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Telex SABCO JO 1456
Cable MOUASHERCO

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Al-Khaldiya Trading & Contracting
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Kuwait
Tel 42 4910/41 1726
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Hewlett-Packard Benelux S.A./N.V.
Avenue du Col-Vert, 1
(Groenkraaglaan)
B-1170 **Brussels**
Tel (02) 660 5050
Cable PALOBEN Brussels
Telex 23 494

MOROCCO

Dolbeau
81 rue Karatchi
Casablanca
Tel 3041 82
Telex 23051/22822
Cable MATERIO

Gerep
2, rue d'Agadir
Boite Postal 156
Casablanca
Tel 272093/5
Telex 23 739
Cable GEREP-CASA

NETHERLANDS

Hewlett-Packard Benelux N.V.
Van Heuven Goedhartlaan 121
P.O. Box 667
1181KK **Amstelveen**
Tel (20) 47 20 21
Cable PALOBEN Amsterdam
Telex 13 216

NORWAY

Hewlett-Packard Norge A/S
Ostendalen 18
P.O. Box 34
1345 **Osteraas**
Tel (02) 17 11 80
Telex 16621 hpnas n

Hewlett-Packard Norge A/S
Nygaardsgaten 114
P.O. Box 4210
5013 Nygaardsgaten,
Bergen
Tel (05) 21 97 33

POLAND

Biuro Informacji Technicznej
Hewlett-Packard
Ul Stawki 2, 6P
PL00-950 **Warszawa**
Tel 39 59 62, 39 51 87
Telex 81 24 53

PORTUGAL

Telectra-Empresa Técnica de
Equipamentos Eléctricos S.a.r.l.
Rua Rodrigo da Fonseca 103
P.O. Box 2531
P-**Lisbon** 1
Tel (19) 68 60 72
Cable TELECTRA Lisbon
Telex 12598

Medical Only
Mundinter
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S.a.r.l.
P.O. Box 2761
Avenida Antonio Augusto
de Aguiar 138
P-**Lisbon**
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Telex 16691 munter p
Cable INTERCAMBIO Lisbon

QATAR

Nasser Trading & Contracting
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Doha
Tel 22170
Telex 4439 NASSER
Cable NASSER

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Hewlett-Packard Reprezentanta
Bd.n. Balcescu 16
Bucuresti
Tel 15 80 23/13 88 85
Telex 10440

SAUDI ARABIA

Modern Electronic
Establishment (Head Office)
P.O. Box 1226, Baghdadiah Street
Jeddah
Tel 27 798
Telex 40035
Cable ELECTA JEDDAH

Modern Electronic Establishment
(Branch)
P.O. Box 2728
Riyadh
Tel 82596/66232
Telex 202049

Modern Electronic Establishment
(Branch)
P.O. Box 193
Al-Khobar
Tel 44678-44813
Telex 670136
Cable ELECTA AL-KHOBAR

SPAIN

Hewlett-Packard Española, S.A.
Calle Jerez 3
E-**Madrid** 16
Tel (1) 458 26 00 (10 lines)
Telex 23515 hpe

Hewlett-Packard Española S.A.
Colonia Mirasierra
Edificio Juban
c/o Costa Brava, 13
Madrid 34

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Milanesado 21-23
E-**Barcelona** 17
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Telex 52603 hpbe e

Hewlett-Packard Española, S.A.
Av Ramón y Cajal, 1
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E-**Sevilla** 5
Tel 64 44 54/58

Hewlett-Packard Española S.A.
Edificio Albia II 7° B
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C/Ramon Gordillo 1
(Entlo.)
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SWEDEN

Hewlett-Packard Sverige AB
Enighetsvägen 3, Fack
S-161 **Bromma** 20
Tel (08) 730 05 50
Telex 10721
Cable MEASUREMENTS
Stockholm

Hewlett-Packard Sverige AB
Frötallsgatan 30
S-421 32 **Västra Frölunda**
Tel (031) 49 09 50
Telex 10721 via Bromma office

SALES OFFICES (Continued)

EUROPE, NORTH AFRICA, MIDDLE EAST

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Zürcherstrasse 20
P.O. Box 307
CH-8952 **Schlieren-Zürich**
Tel: (01) 7305240
Telex: 53933 hpag ch
Cable: HPAG CH

Hewlett-Packard (Schweiz) AG
Château Bloc 19
CH-1219 **Le Lignon-Geneva**
Tel: (022) 96 03 22
Telex: 27333 hpag ch
Cable: HEWPACKAG Geneva

SYRIA
General Electronic Inc.
Nuri Basha-Ahnaf Ebn Kays Street
P.O. Box 5781
Damascus
Tel: 33 24 87
Telex: 11215 ITIKAL
Cable: ELECTROBOR DAMASCUS

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Place Azmé
B.P. 2308
Damascus
Tel: 16 367-19 697-14 268
Telex: 11304 SATACO SY
Cable: SAWAH, DAMASCUS

Suleiman Hilal El Mlawi
P.O. Box 2528
Mamoun Bitar Street, 56-58
Damascus
Tel: 11 46 63
Telex: 11270
Cable: HILAL DAMASCUS

TUNISIA
Tunisie Electronique
31 Avenue de la Liberte
Tunis
Tel: 280 144

Corema
1 ter Av. de Carthage
Tunis
Tel: 253 821
Telex: 12319 CABAM TN

TURKEY
TEKNIM Company Ltd.
Riza Sah Pehlevi
Caddesi No. 7
Kavaklidere, **Ankara**
Tel: 275800
Telex: 42155

Teknim Com., Ltd.
Barbaros Bulvari 55/12
Besiktas, **Istanbul**
Tel: 613 546
Telex: 23540

E.M.A.
Muhendislik Kollektif Sirketi
Mediha Eldem Sokak 41/6
Yuksel Caddesi
Ankara
Tel: 17 56 22
Cable: EMATRADE Ankara

Yilmaz Ozyurek
Milli Mudafaa Cad 16/6
Kizilay
Ankara
Tel: 25 03 09 - 17 80 26
Telex: 42576 OZEK TR
Cable: OZYUREK ANKARA

UNITED ARAB EMIRATES
Emitac Ltd. (Head Office)
P.O. Box 1641
Sharjah
Tel: 354121/3
Telex: 8136

Emitac Ltd. (Branch Office)
P.O. Box 2711
Abu Dhabi
Tel: 331370/1

UNITED KINGDOM
Hewlett-Packard Ltd.
King Street Lane
Winnersh, Wokingham
Berkshire RG11 5AR
GB-England
Tel: (0734) 784774
Telex: 84 71 78/9

Hewlett-Packard Ltd.
Fourier House,
257-263 High Street
London Colney
St. Albans, Herts
GB-England
Tel: (0727) 24400
Telex: 1-8952716

Hewlett-Packard Ltd.
Trafalgar House
Navigation Road
Altrincham
Cheshire WA14 1NU
GB-England
Tel: (061) 928 6422
Telex: 668068

Hewlett-Packard Ltd.
Lygon Court
Hereward Rise
Dudley Road
Halesowen,
West Midlands, B62 8SD
GB-England
Tel: (021) 501 1221
Telex: 339105

Hewlett-Packard Ltd.
Wedge House
799, London Road
Thornton Heath
Surrey, CR4 6XL
GB-England
Tel: (01) 684-0103/8
Telex: 946825

Hewlett-Packard Ltd.
14 Wesley St
Castleford
Yorks WF10 1AE
Tel: (0977) 550016
TWX: 5557335

Hewlett-Packard Ltd.
Tradax House
St. Mary's Walk
Maidenhead
Berkshire, SL6 1ST
GB-England

Hewlett-Packard Ltd.
Morley Road
Staplehill
Bristol, BS16 4QT
GB-England

Hewlett-Packard Ltd.
South Queensferry
West Lothian, EH30 9TG
GB-Scotland
Tel: (031) 331 1188
Telex: 72682

Hewlett-Packard Ltd.
Kestrel House
Clanwilliam Place
Lower Mount Street
Dublin 2, Eire

Hewlett-Packard Ltd.
2C Avonberg Ind. Est.
Long Mile Road
Dublin 12
Tel: 514322/514224
Telex: 30439

USSR
Hewlett-Packard
Representative Office
USSR
Pokrovsky Boulevard 4/17-kw 12
Moscow 101000
Tel: 294.20.24
Telex: 7825 hewpak su

YUGOSLAVIA
Iskra Commerce, n.sol.o.
Zastopstvo Hewlett-Packard
Obilicev Venac 26
YU 11000 **Beograd**
Tel: 636-955
Telex: 11530

Iskra Commerce, n.sol.o.
Zastopstvo Hewlett-Packard
Miklosiceva 38/VII
YU-61000 **Ljubljana**
Tel: 321-674, 315-879
Telex: 31583

SOCIALIST COUNTRIES NOT SHOWN, PLEASE CONTACT:
Hewlett-Packard Ges.m.b.H.
Handelskai 52
P.O. Box 7
A-1205 **Vienna,** Austria
Tel: (0222) 35 16 21 to 27
Cable: HEWPAK Vienna
Telex: 75923 hewpak a

MEDITERRANEAN AND MIDDLE EAST COUNTRIES NOT SHOWN, PLEASE CONTACT:
Hewlett-Packard S.A.
Mediterranean and Middle East
Operations
35, Kolokotroni Street
Platia Kefallariou
GR-Kifissia-**Athens,** Greece
Tel: 8080359/429
Telex: 21-6588
Cable: HEWPACKSA Athens

FOR OTHER AREAS NOT LISTED, CONTACT:
Hewlett-Packard S.A.
7, rue du Bois-du-Lan
P.O. Box
CH-1217 Meyrin 2 - **Geneva**
Switzerland
Tel: (022) 82 70 00
Cable: HEWPACKSA Geneva
Telex: 2 24 86

UNITED STATES

ALABAMA
P.O. Box 4207
8290 Whitesburg Dr.
Huntsville 35802
Tel: (205) 881-4592

8933 E. Rcebuck Blvd.
Birmingham 35206
Tel: (205) 836-2203/2

ARIZONA
2336 E. Magnolia St.
Phoenix 85034
Tel: (602) 244-1361

2424 East Aragon Rd.
Tucson 85706
Tel: (602) 889-4661

*ARKANSAS
Medical Service Only
P.O. Box 5646
Brady Station
Little Rock 72215
Tel: (501) 376-1844

CALIFORNIA
1579 W. Shaw Ave.
Fresno 93771
Tel: (209) 224-0582

1430 East Orangethorpe Ave.
Fullerton 92631
Tel: (714) 870-1000

3939 Lankershim Boulevard
North Hollywood 91604
Tel: (213) 877-1282
TWX: 910-499-2671

5400 West Rosecrans Blvd.
P.O. Box 92105
World Way Postal Center
Los Angeles 90009
Tel: (213) 776-7500
TWX: 910-325-6608

***Los Angeles**
Tel: (213) 776-7500

3200 Hillview Av
Palo Alto, CA 94304
Tel: (408) 988-7000

3003 Scott Boulevard
Santa Clara 95050
Tel: (408) 988-7000
TWX: 910-338-0518

***Ridgecrest**
Tel: (714) 446-6165

646 W. North Market Blvd
Sacramento 95834
Tel: (916) 929-7222

9606 Aero Drive
P.O. Box 23333
San Diego 92123
Tel: (714) 279-3200

***Tarzana**
Tel: (213) 705-3344

COLORADO
5600 DTC Parkway
Englewood 80110
Tel: (303) 771-3455

CONNECTICUT
47 Barnes Industrial Road
Barnes Park South
Wallingford 06492
Tel: (203) 265-7801

FLORIDA
P.O. Box 24210
2727 N.W. 62nd Street

SALES OFFICES (Continued)

UNITED STATES

Ft. Lauderdale 33309
Tel (305) 973-2600

4080 Woodcock Drive #132
Brownett Building
Jacksonville 32207
Tel (904) 398-0663

P O Box 13910
6177 Lake Ellenor Dr
Orlando 32809
Tel (305) 859-2900

P O Box 12826
Suite 5, Bldg 1
Office Park North
Pensacola 32575
Tel (904) 476-8422

Computer Systems Only
110 South Hoover Blvd
Suite 120
Tampa 33609
Tel (813) 872-0900

GEORGIA

P O Box 105005
450 interstate North Parkway
Atlanta 30348
Tel (404) 955-1500
TWX 810-766-4890

Medical Service Only
***Augusta** 30903
Tel (404) 736-0592

P O Box 2103
1172 N Davis Drive
Warner Robins 31098
Tel (912) 922-0449

HAWAII

2875 So King Street
Honolulu 96826
Tel (808) 955-4455

ILLINOIS

5201 Tollview Dr
Rolling Meadows 60008
Tel (312) 255-9800
TWX 910-687-2260

INDIANA

7301 North Shadeland Ave
Indianapolis 46250
Tel (317) 842-1000
TWX 810-260-1797

IOWA

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2622A User Manual

Part No. 02622-90001 Printed 4-82

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Please complete the questionnaire, fold it up and return it to us. Feel free to mark more than one box to a question and to make any additional comments. If you prefer not to give us your name just leave the last part, name and address, blank. All comments and suggestions become the property of HP.

Thank you for your help.

1. Did you have any difficulty in understanding or applying the material presented in this manual?

   ☐ None ☐ Minimal Difficulty ☐ Difficulty ☐ Considerable Difficulty

   If so:

   a. What were the "difficult" areas?

      ☐ Indexing? ☐ Depth of coverage? ☐ Examples?
      ☐ Organization? ☐ Omitted information? ☐ Other (Please explain)

   b. How could we clarify these areas? _____

      _____

2. What errors or misleading information have you found in the manual? (*Please give page numbers.*)

   _____

3. What was your level of programming knowledge before you started using this manual?

   ☐ None ☐ Beginner ☐ Intermediate ☐ Expert

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   ☐ Business Adminstration ☐ Interfacing ☐ Medicine
   ☐ General Computation ☐ Education What kind?
   ☐ Engineering ☐ Data Entry ☐ Other
   What kind? ☐ Control

5. What best describes how you use the terminal?

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