
HP700/44

USER'S MANUAL



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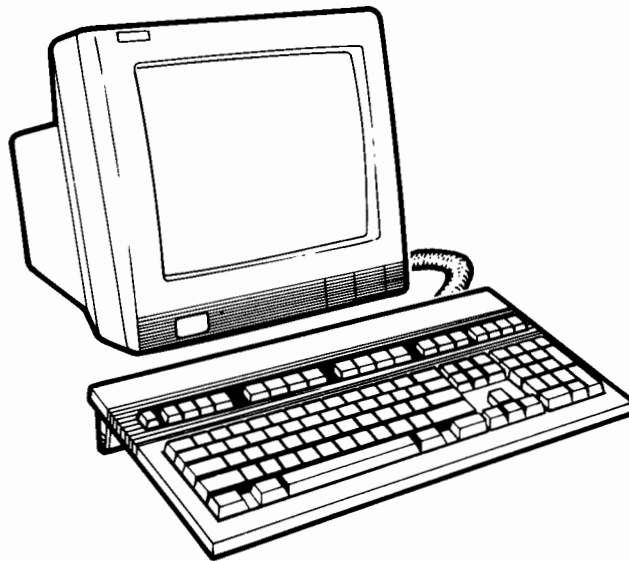
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Preface

The HP 700/44 Display Terminal is a versatile, high-performance, low-cost, PC- and ANSI-compatible terminal. Designed and built in the Hewlett-Packard tradition of quality, the HP 700/44 offers ergonomic features, powerful functionality and exceptional display quality.

The HP 700/44 is designed for use in a multiuser PC environment. The terminal includes the IBM PC character set, IBM-PC/AT2-compatible keyboard and PC key-scanning codes. With these features and proper application support, the 700/44 user will have the same display and keyboard as a monochrome alpha/numeric PC.

Additionally, the HP 700/44 is functionally compatible with the DEC VT220 terminal, supporting both the VT220's 7-bit and 8-bit control modes. It is also compatible with the DEC VT100 and DEC VT52 terminals.



Ergonomic Features

- Tilt and swivel display screen
- Etched/dark anti-glare screen
- Brightness and contrast controls
- Detached, slant adjustable, low-profile keyboard

Compatibility Modes

- VT220, 7-bit controls
- VT220, 8-bit controls
- VT100
- VT52
- HP-PC Terminal

Display Screen

- 14 inch; choice of flicker-free soft white, green or amber phosphor
- Screen can be set for 24 data lines/2 message lines, or 25 data lines/1 message line
- 80 or 132 columns
- 7 x 11 dot matrix in a 9 x 14 cell with half dot shift (equivalent to a 14 x 11 character matrix in an 18 x 14 cell for most characters)
- Superior character formation with true descenders
- CRT screen saver
- Single and double height/width characters

Keyboard

- 105-key, IBM-PC/AT2-compatible enhanced keyboard with tactile feedback
- 21 application-assignable keys in VT220 modes, 99 in HP-PC Term Mode
- 30 programmable keys in VT220 Modes, 75 in HP-PC Term Mode
- Keyboard available in national layouts
- Repertoire of DEC-compatible character sets
- User-definable character set
- Three PC character sets (code pages 437, 850 and 865)

Communications

- EIA Standard RS-232C or 20mA current loop standard
- Data communication baud rates up to 38400
- DEC-compatible, 9-pin bidirectional serial printer port with baud rates from 75 to 38400

Additional Features

- Easy-to-use Setup menus
- Smooth scroll
- Non-volatile RAM for saving setup specifications
- Display memory can be set to single or multipage modes (up to four pages)
- Erasable characters attribute
- Block/underline cursor
- Keyclick enable/disable
- Selectable refresh rates of 50, 60 or 72 Hz
- Compose character capability

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Installation

This chapter tells you how to install the terminal, turn it on and off and adjust the terminal for your comfort.

Getting Ready

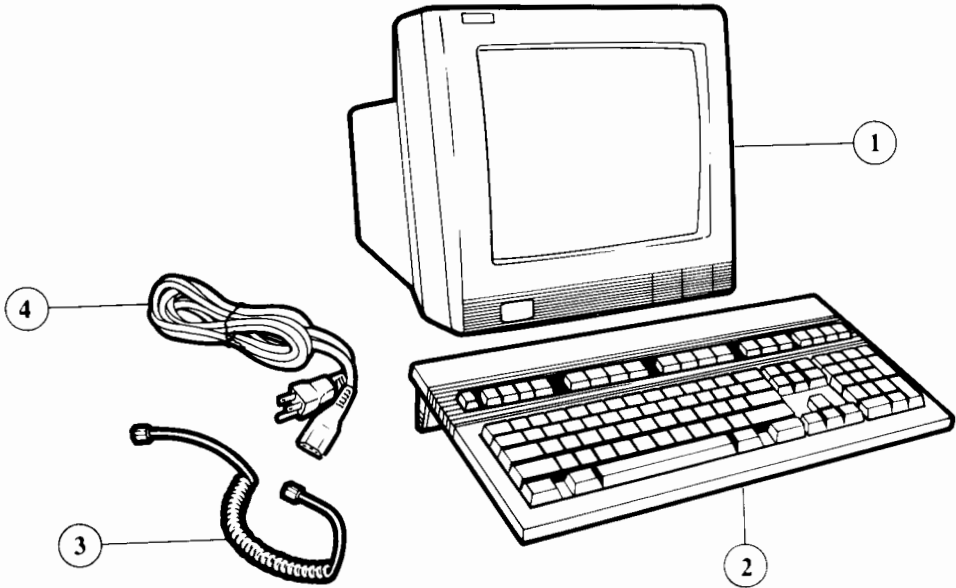
If the terminal is still in its shipping container, unpack the terminal. You should have the display unit, keyboard, keyboard cable, power cord and a keyboard overlay template. Keep the container and other packing material in case the terminal has to be repacked at a later date.

Visually inspect the contents. If any of the components are missing or appear damaged in any way, do not install the terminal. Instead, contact an HP Sales and Service Office.

CAUTION

Under no circumstances should you open your terminal to expose its internal circuitry. Only a qualified service engineer should perform maintenance procedures that require opening the terminal case.

Figure 1-1. Terminal Components



1) Display Unit 2) Keyboard 3) Keyboard Cable 4) Power Cable

1-2 Installation

The terminal can be connected to a host computer via EIA RS-232C or current loop interfaces. Only one of these interfaces can be used at a time. (Note that connection to a personal computer or modem is typically via EIA RS-232C interface.)

- If you are going to connect the terminal to a computer or modem via RS-232C interface, you will need a 25-pin female RS-232C cable.
- If you are going to connect the terminal to a computer via the current loop port, you will need an 8-pin female 20mA cable.

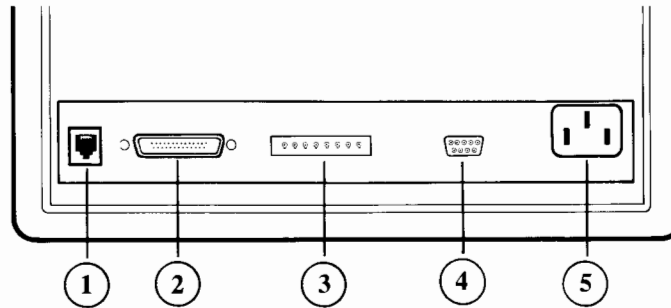
In addition, if you are going to connect the terminal to a printer or serial input device, you will need a 9-pin female cable for that purpose, as well.

The cable(s) must match the pin assignments specified in Appendix A; otherwise, the terminal will not work properly. If the cables supplied to you do not match the terminal's requirements, contact your computer department manager or an HP Sales and Service Office.

You will have to plug the power cord into a grounded power outlet. The HP 700/44 Display Terminal works with any voltage rating from 100 to 240 VAC. There is no voltage setting for you to adjust on the terminal.

Air ventilation for the HP 700/44 is through the top, back and bottom. Do not obstruct its ventilation. Don't set anything on top of the terminal or close to its rear panel.

Figure 1-2. Terminal Rear Panel Connections



- 1) Keyboard Connector 2) RS-232 Port 3) 20mA Port**
4) Printer Port 5) Power Connector

Preparing the Terminal for Use

Follow these steps to connect the HP 700/44 Display Terminal to your computer or modem, and if applicable, to a printer or serial input device.

- 1.** Make sure the power on/off button on the front left of the terminal is set to off (pushed in is on, flush with the panel is off). Make sure the power cord is not connected to the terminal.
- 2.** Connect the keyboard cable. Both ends are identical. Plug one end into the receptacle on the rear of the keyboard (see the illustration at the end of this chapter). Plug the other end into the keyboard cable receptacle on the left rear of the terminal.
- 3.** Connect the terminal to a computer or modem using either the RS-232C port or the 20mA port. Only one interface port can be used at a time.

If you are using an RS-232C interface: Connect the cable to the port labeled RS-232 on the terminal's rear panel. The other end of the cable must be connected to an RS-232C computer port or modem. If you are connecting to a modem, follow the installation instructions in its manual.

If you are using a current loop interface: Connect the cable to the port labeled 20mA on the terminal's rear panel. The other end of the cable must be connected to the host current loop connector.

- 4.** If you have a printer or serial input device, connect its interface cable to the printer port on the right rear of the terminal. Make sure the other end of this cable is correctly fastened to the printer.
- 5.** Make sure the cables are fastened securely. To do this, use a 1/8th-inch flat blade screwdriver to tighten down the screws on the cable connectors.
- 6.** Now connect the power cord. Plug the slotted end into the AC socket on the right rear of the terminal. Plug the three-pronged end into the electrical power outlet.

Turning the Terminal On and Off

After following the installation steps, you're ready to turn on the terminal. Press the power button on the front left of the terminal. The button remains recessed while the terminal is on.

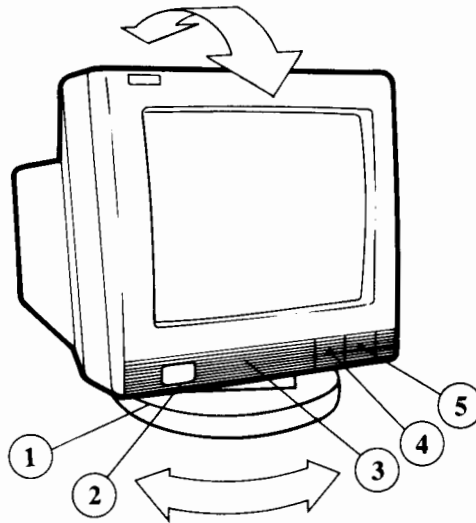
You'll hear two beeps when you turn on the terminal. The terminal performs a quick self-test every time it's powered on. If there are any problems, refer to Chapter 4, "Troubleshooting".

After the self-test is done, the screen display comes on. In Chapter 3, "The Display Screen" section provides an illustration of what the screen may look like when it comes on.

To turn the terminal off, push the power button again so that it is flush with the front panel.

Adjacent to the power button is an entry door to the front of the display unit. Unobtrusive in appearance, this door is provided for terminal service functions. Pushing down lightly on the door opens it. Moving it gently back into place closes it.

Figure 1-3. Terminal Controls



- 1) Tilt and Swivel Pedestal 2) Power Switch 3) Service Door
4) Contrast Control 5) Brightness Control

Adjusting for Comfort

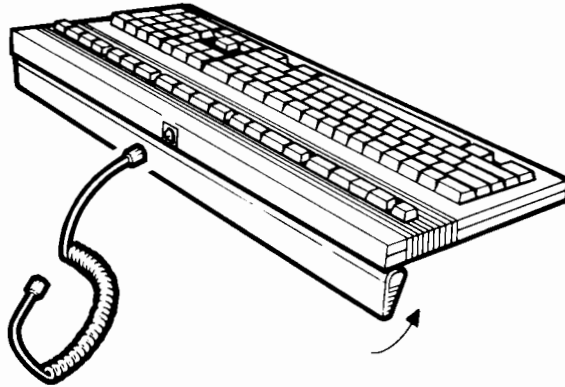
The brightness and contrast controls are slide switches under the front right corner of the terminal. You can slide these switches to the left and right to adjust screen brightness and contrast.

To adjust the tilt, move the top of the display unit gently up or down until the angle is most comfortable for you. The display unit remains tilted at the angle in which you leave it.

The base of the display unit allows you to swivel the unit freely to the right and left.

The keyboard can either lie flat or be raised at an angle. To raise the keyboard at an angle, flip down the bar on the rear underside of the keyboard.

Figure 1-4. Keyboard Angle Adjustment



2

Terminal Setup

Introduction

This chapter tells you how to use the HP 700/44's Setup Mode.

Setup Mode consists of a series of menus which let you adjust the terminal so that it can communicate properly with your computer, application programs and peripherals. You can also use Setup Mode to choose the features that make using the terminal most convenient.

You won't use Setup Mode very often. For instance, you'll use Setup Mode when you first set up your terminal to work with a computer or printer. And occasionally you may want to use Setup Mode to make minor adjustments to specific features of the terminal.

Ask your EDP department or consult your system software documentation regarding the parameter values that should be entered in Setup Mode to ensure the terminal communicates correctly with your computer. If there's a printer connected to the terminal, look up its communication requirements in its manual.

Using Setup Mode

There are three Setup Mode menus. Fields for the terminal's operation are grouped by functional categories in these menus. Table 2-1 lists the fields in each of the Setup menus.

Table 2-1. Fields in the Setup Menus

General Setup Menu	
Clear Display	Status Line
Clear Communications	Pref PC Char Set
Reset Terminal	EM100 ID
Recall	Interpret Control Codes
Save	User Features Locked
Default	User Defined Keys Locked
Setup= English	Numeric Mode Keypad
Terminal Mode	Normal Mode Cursor Keys
On Line	National Character Set
Columns	Frame Rate
Smooth Scroll	Display Off After (min)
Block Cursor	PC Character Set
Cursor Off	Twenty-five Line Mode
Light Background	Terminal Test
Inhibit Auto Wrap	Port 1 Test
New Line	Port 2 Test
Multipage	

Communications Setup Menu			
Host:	Xmit Baud Rate	Printer:	Baud Rate
	Recv Baud Rate		DataBits/Parity
	DataBits/Parity		Stop Bits
	Check Parity		Printer Type
	Port Selection		Print Mode
	XON/XOFF		Print Scroll Region
	Disconnect Delay		Terminator
	Stop Bits		XON/XOFF
	Local Echo		
	Unlimited Xmit		

Keyboard Setup Menu	
Keyboard Language	Key Code Mode
Keyclick	Backspace Key
Margin Bell	Answerback =
Warning Bell	Auto Answerback
Destructive Backspace	Conceal Answerback
Shift Lock	Clear All Tabs
Break	Set 8 Column Tabs
Auto Repeat	Tabs Ruler

2-2 Terminal Setup

Entering and Exiting Setup Mode

To enter Setup Mode, press the **[Setup]** key. The first Setup menu temporarily replaces whatever data had been on the screen. The screen contents will be redisplayed when you exit Setup Mode (unless you use a field in Setup Mode that clears the display).

If Xon/Xoff handshaking is enabled (it is by default), the computer stops sending data to your terminal until you exit Setup Mode. Thus, no incoming data will be lost.

To exit Setup Mode, press the **[Setup]** key again. The display reverts back to how it had been when you entered Setup Mode.

Changing Setup Mode Values

The terminal is shipped from the factory with default values ready for power-on use. The labels displayed at the bottom of each Setup menu indicate the keys that you will use to change your terminal's setup.

[Page Down]=Next Setup <arrows> [Num Enter]=Select [Setup]=Exit

1. Access a menu that contains fields you want to change. The General Setup Menu is the first Setup menu displayed. You can cycle through the Setup Menus by pressing the **[Page Down]** key.
2. Select the field you want to change by pressing the arrow (cursor movement) keys. A field is highlighted when it is selected.
3. Press the **[Enter]** key on the Auxiliary Keypad to change a highlighted value or to perform a Setup action. (This **[Enter]** key is near the lower right hand corner of the keyboard.)
4. When finished making changes and performing functions in the Setup menus, press the **[Setup]** key to exit Setup Mode.

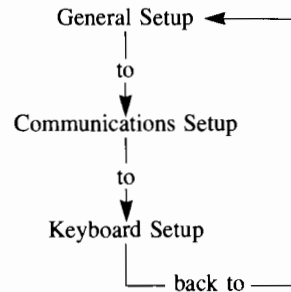
Table 2-2 explains the use of these keys in more detail.



Table 2-2. Setup Mode's Controlling Keys

[Page Down]=
Next Setup

Press the [Page Down] key when you want to display the next Setup menu. [Page Down] lets you cycle through the three Setup menus as shown below:



<arrows>

Press the arrow keys to move the highlight up, down left or right.

[Num Enter]=Select

Press the [Enter] key on the Auxiliary Keypad to perform the function indicated or to change the value in a highlighted field.

All of the fields that are in inverse video perform functions. These fields are **Clear Display**, **Clear Channel Labels**, **Reset Terminal**, **Reset**, **Save**, **Default**, **Setup Engine**, **Terminal Test**, **Port 1 Test**, **Port 2 Test**, **General Answerback**, **General Test** and **Setup Channel Labels**. Pressing the [Enter] key on the Auxiliary Keypad when one of these fields is highlighted causes the indicated function to be performed. For instance, when **Reset** is highlighted, pressing [Enter] causes that function to be performed.

All the other Setup fields (except **Answerback =**) let you choose from a list of possible selections. Often, there are just two choices, for instance, YES or NO. Pressing [Enter] for these fields will change the highlighted value.

[Setup]=Exit

When finished making Setup changes, press the [Setup] key to exit Setup Mode.

2-4 Terminal Setup

Saving Changes for Power-On Use

Changes of Setup values can be temporary, lasting only until you turn off or reset your terminal. Or you can save changes for ongoing use.

*To make temporary changes, exit Setup Mode without using the **Save** field in the General Setup menu. This activates all the current field values but does not change the terminal's non-volatile memory. The Setup values stored in non-volatile memory will become active the next time that the terminal is powered on or reset.*

*To save changes so that they will be in effect when the terminal is next powered on or reset, highlight the **Save** field in the General Setup Menu and press **Enter** on the Auxiliary Keypad. This stores the current Setup values in non-volatile memory. These values become active when you exit Setup Mode, and will be active the next time that the terminal is powered on or reset.*

You can use the **Save** field to save all Setup values in non-volatile memory except for these two fields: Numeric Mode Keypad and Normal Mode Cursor Keys. These two fields always revert to their default values when the terminal is powered on or reset.

General Setup Menu

Table 2-3 describes the possible values for the General Setup Menu. Default values are listed first. A dash (—) in the Choices column indicates that the field performs a function.

The number centered above the bottom line of the screen is the part number of the firmware within the terminal.

```
GENERAL SETUP

Clear Display  Clear Communications  Reset Terminal

Recall  Save  Default  Setup = English

Terminal Mode  EM200, 7 Bit Strls  EM100 ID  EM220
On Line       YES
Columns       80
Smooth Scroll YES
Block Cursor  YES
Cursor OFF    NO
Light Background NO
Inhibit Auto Wrap YES
New Line      NO
MultiPage     NO
Status Line   None
Pref PC Char Set U.S.

Interpret Control Codes YES
User Features Locked    NO
User Defined Keys Locked NO
Numeric Mode Keypad     YES
Normal Mode Cursor Keys YES
National Character Set  NO
Frame Rate (Hz)         72
Display OFF After (min) 15
PC Character Set         NO
Twenty-five Line Mode   NO

Terminal Test  Port 1 Test  Port 2 Test

1818-xxxx 28xx

[Page Down]=Next Setup  <arrows>  [Num Enter]=Select  [Setup]=Exit
```

2-6 Terminal Setup

Table 2-3. Fields of the General Setup Menu

Field	Choices	Description
<code>Clear</code> <code>Display</code>	—	Clears the terminal's screen when you exit Setup Mode. Whatever data that had been on the screen when you entered Setup Mode is lost.
<code>Quit</code> <code>Return to Host</code>	—	Aborts all communications and print operations currently in progress and clears all of the terminal's buffers. Sends Xon to the host computer. Turns off Print Controller Mode. Resets Xoff flags for the ports.
<code>Reset</code> <code>Terminal</code>	—	Resets many of the terminal's operating parameters to their defaults. These are settings expected by most applications. Does not alter non-volatile memory, character set selection or user defined keys. Does not cause a disconnect. (Is equivalent to the terminal's "soft" reset escape sequence.)
<code>Recall</code>	—	Restores (recalls) the Setup values last saved in non-volatile memory. Causes a communications disconnect. Clears volatile memory (that is, erases the display screen's contents). Is equivalent to turning the terminal off and on again. (Is also equivalent to the terminal's hard reset escape sequence.)
<code>Save</code>	—	Saves in non-volatile memory the current Setup values from all the Setup menus. The only values not saved are those for the Numeric Mode Keypad and Normal Mode Cursor Keys fields which always revert to their default values when the terminal is powered on or reset.
<code>Default</code>	—	Restores the default values for all the Setup fields. Clears volatile memory. After exiting Setup Mode, the cursor is placed at the top left of the screen.
<code>Setup</code>	<code>English</code> <code>French</code> <code>German</code>	Selects the language used in the Setup menus.

Table 2-3. Fields of the General Setup Menu (continued)

Field	Choices	Description
NOTE		
<p>The Terminal Mode field sets the compatibility mode for the terminal. For VT220 compatibility, select EM200, 7 Bit Ctrls if your application programs expect the terminal to send 7-bit control characters. Select EM200, 8 Bit Ctrls if the applications expect the terminal to send 8-bit control characters. Note also that EM200, 7 Bit Ctrls supports most VT100 application programs.</p> <p>Select HP-PCTerm if the terminal is connected to a personal computer (PC), and you want to use the terminal to run PC applications.</p> <p>HP-PC Term Mode allows:</p> <ul style="list-style-type: none"> ■ the top row function keys to be assigned or programmed with extra capabilities, ■ the edit keys on the middle keypad to be assigned extra capabilities, ■ the Auxiliary Keypad to act as a PC-style numeric keypad, ■ and use of the terminal's PC character sets and PC scan codes as necessary (selectable in Setup Mode or via programmatic command). <p>In HP-PC Term Mode, the terminal sends 7-bit controls, not 8-bit controls.</p>		
Terminal Mode	EM200, 7 Bit Ctrls EM200, 8 Bit Ctrls EM52 EM100 HP-PCTerm	— VT200 Mode, 7-bit controls — VT200 Mode, 8-bit controls — VT52 Mode — VT100 Mode — HP-PC Terminal Mode
Online	YES NO	YES enables, NO disables communication with the host computer.
Columns	80 132	Sets the screen display to be 80 columns or 132 columns.
Smooth Scroll	YES NO	YES provides a slower, smoother scrolling of data from the computer. NO causes jump scrolling at the speed in which data is received from the computer. YES requires that Xon/Xoff be enabled.

2-8 Terminal Setup

Table 2-3. Fields of the General Setup Menu (continued)




Field	Choices	Description
Block Cursor	YES NO	YES selects a block-style cursor. NO selects an underline-style cursor.
Cursor OFF	NO YES	Controls whether or not the cursor will be displayed.
Light Background	NO YES	NO sets the terminal to display light text against a dark background. YES sets for dark text on a light background.
Inhibit Auto Wrap	YES NO	YES : When the cursor reaches the right margin and a new character is received, the last character in the line is overwritten. NO : Allows the cursor to automatically wrap to the beginning of the next line.
New Line	NO YES	Determines whether or not a line feed is sent in addition to a carriage return when the Enter key is pressed.
MultiPage	NO YES	NO sets the terminal to a single page (24 or 25 lines) of display memory. YES sets the terminal for multiple pages (up to four) of display memory.
Status Line	None Indicator Host Writable	In 25-line mode, sets the screen's bottom line as follows: None = the line is blank; Indicator = displays the terminal's Status Line; Host Writable = reserved for messages from the application program. In 24-line mode, the Status Line is always displayed, but the User Message Line can be displayed only if Host Writable is selected.

Table 2-3. Fields of the General Setup Menu (continued)

Field	Choices	Description
Pref PC Char Set	U.S. Multilingual Danish/ Norwegian	For this field to take effect, the terminal must be in HP-PC Term Mode <i>and</i> the PC Character Set field must be set to YES. This field specifies the PC character set that will be used when those conditions are met. Otherwise, this field is ignored. Generally, select U.S. (the default) if you are using the USASCII keyboard, or Multilingual if you are using a non-U.S. keyboard other than Danish/Norwegian. Select Danish/Norwegian for that keyboard. The U.S. character set contains more line drawing characters and is suited specifically for U.S. English. The Multilingual set has fewer line drawing characters but supports a variety of languages.
EM100 ID	EM220ID EM100ID EM101ID EM102ID	Determines which terminal ID is sent in response to a Device Attributes request. This field is applicable only when the Terminal Mode field is set to EM100 .
Interpret Control Codes	YES NO	YES: Control codes perform their functions. NO: Control codes are displayed but not performed.
User Features Locked	NO YES	When locked, settings for the following operating parameters cannot be altered by the computer: Tab Stops, Light/Dark Background, Auto Repeat, Smooth/Jump Scroll and Keyboard Lock. If your computer applications require control of these features, then this field should be set to NO .
User Defined Keys Locked	NO YES	When locked, the computer cannot reprogram the terminal's function keys.
Numeric Mode Keypad	YES NO	YES: The auxiliary keypad functions in numeric mode, sending the ASCII characters that match its keypads. NO: This keypad finds escape sequences which can be assigned customized functions by applications.
Normal Mode Cursor Keys	YES NO	YES: The cursor (arrow) keys send escape sequences that move the cursor. NO: The cursor keys send escape sequences which can be assigned customized functions by applications.

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Table 2-3. Fields of the General Setup Menu (continued)

Field	Choices	Description
National Character Set	NO YES	This field is alterable only if the Keyboard Language field (in the Keyboard Setup Menu) is NOT set to North American . NO : Sets the terminal to use the Multi-national Character Set and enables use of the 8-bit Supplemental character set. YES : Selects the character set that is appropriate for the keyboard specified in the Keyboard Language field. (See the Keyboard Setup Menu.)
Frame Rate	72 Hz 60 Hz 50 Hz	Specifies the screen refresh rate. Select the rate that provides the clearest display quality for your terminal.
Display OFF After (min)	15 NO '5 10	Specifies in minutes how long the CRT remains on in the absence of any input from the computer or keyboard. Any keystroke or computer input turns the display back on without loss of data. NO disables this feature.
PC Character Set	NO YES	Select YES if the PC application requires the terminal to send PC characters (not all PC applications require this). YES is ignored if the terminal is not in HP-PC Term compatibility mode.
Twenty-five Line Mode	NO YES	NO : The user area of the screen is 24 lines with two lines for the message area. YES : The user area is 25 lines with one line for the message area. A soft reset of the terminal is performed when the setting of this field is changed. This field can be changed by applications.
	—	Exits Setup Mode and starts the terminal test. When the test is completed, the terminal's test pattern is displayed.
	—	Requires additional equipment to be run. Do not select this field.
	—	Requires additional equipment to be run. Do not select this field.



Communications Setup Menu

The Communications Setup Menu lets you make whatever setup changes are necessary for communicating with your computer. If a printer is connected to your terminal, this menu also lets you set your terminal for proper communications with the printer.

Table 2-4 describes the fields in the Host section (communications with the computer) of the menu. Table 2-5 describes the fields for the Printer communications section of the menu. Default values are shown in the illustration below and listed first in the tables.

COMMUNICATIONS SETUP

Host

Xmit Baudrate	4800	XON/XOFF	@ 64
Recv Baudrate	=Xmit	Disconnect Delay	2 s
DataBits/Parity	8/None	Stop Bits	1
Check Parity	NO	Local Echo	NO
Port Selection	E[A, Data Leads Only]	Unlimited Xmit	NO

Printer

Baudrate	4800	Print Mode	Normal
DataBits/Parity	8/None	Print Scroll Region	NO
Stop Bits	1	Terminator	None
Printer Type	HP	XON/XOFF	@ 64

[Page Down]=Next Setup <arrows> [Num Enter]=Select [Setup]=Exit

2-12 Terminal Setup

Table 2-4. Communications Setup Menu: Host Fields

Field	Choices	Description
Xmit	4800	Transmit baud rate (from the terminal to the computer).
Baud Rate	9600	The terminal's transmit baud rate should be set to match the host computer's receive baud rate.
	19200	
	38400	The terminal can be set at different transmit and receive rates (so long as the rates match those of the host computer).
	75	
	110	
	134.5	
	150	
	300	
	600	
	1200	
	1800	
	2400	
	Recv Baudrate		= Xmit	Receive baud rate (incoming to the terminal from the computer). The terminal's receive rate should be set to match the host computer's transmit baud rate.
75		= Xmit sets the terminal's receive baud rate to match the terminal's transmit baud rate.
110		
134.5		In general, we recommend that Xon/Xoff handshaking be enabled if you select any of the faster listed baud rates.
150		
300		
600		
1200		
1800		
2400		
4800		
9600		
19200		
38400		

Table 2-4. Communications Setup Menu: Host Fields (continued)

Field	Choices	Description
DataBits/ Parity	8/None 8/Even 8/Odd 7/None 7/Space 7/Odd 7/Mark 7/Even	Selects the number of serial data bits and the parity bit configuration.
Check Parity	NO YES	Selects checking or ignoring parity for each received data byte.
Port Selection	EIA Port, Data Leads Only EIA Port, Modem Control 20mA Port EIA, DTR Handshake	Sets the terminal for: — 3-wire RS-232C interface — Modem using the RS-232C Port — Current loop interface — DTR handshaking
XON/XOFF	@ 64 @ 128 Never	The first two choices specify that Xoff will be sent when the terminal's Receive Buffer is filled to the level of either 64 or 128 characters. Never disables Xon/Xoff handshaking. You should choose @ 64 or @ 128 for most applications.
Disconnect Delay	2 s 60 ms	Specifies the length of time the DTR line is kept low when the terminal disconnects from the computer over a modem. 22 s is for all countries except the U.K. Set at 60 ms only if your terminal is in the United Kingdom.
Stop Bits	1 2	Selects the number of stop bits sent and expected by the terminal.
Local Echo	NO YES	When YES is selected, keys pressed are echoed on the screen as well as transmitted to the computer.
Unlimited Xmit	NO YES	NO : Data transmission is limited to no more Xmit than 180 characters per second. This may reduce interrupt processing overhead on some systems. YES : Allows unlimited transmit speed.

2-14 Terminal Setup

Table 2-5. Communications Setup Menu: Printer Fields

Field	Choices	Description
<hr/> NOTE <hr/>		
The HP 700/44 Display Terminal's printer port supports Xon/Xoff handshaking. <hr/>		
Baud Rate	4800 9600 19200 38400 75 110 134.5 150 300 600 1200 1800 2400	Specifies the rate at which data is transmitted from the terminal to a connected printer. Select the rate that matches your printer's receive baud rate.
DataBits/ Parity	8/None 8/Even 8/Odd 7/None 7/Space 7/Odd 7/Mark 7/Even	Specifies the number of serial bits and the parity bit configuration for communications with an attached printer. Select the choice that matches the printer's communications requirements.
Stop Bits	1 2	Sets the number of stop bits sent and expected by the terminal.

Table 2-5. Communications Setup Menu: Printer Fields (continued)

Field	Choices	Description
Printer Type	HP Other	HP: The terminal sends ASCII codes and HP escape sequences to a connected local printer. Other: The terminal sends ASCII codes but no escape sequences to the printer.
NOTE		
The <code>Print Mode</code> field specifies the print modes that will be used with a printer that is attached to the terminal.		
Print Mode	Normal Auto Controller	— Print functions can be invoked from the keyboard or via escape sequences. — The cursor line is printed whenever a linefeed, vertical tab or form feed character is received by the terminal. — Data is passed on to the printer without being displayed on the screen.
Print Scroll Region	NO YES	If NO , the <code>Print Screen</code> key or command prints the entire display contents; if YES , just the region between the top and bottom margins is printed.
Terminator	None FF	Selects whether Print Page operations are terminated with no character (None) or by a form feed character (FF).
XON/XOFF	@ 64 @128 Never	The first two choices specify that Xoff will be sent when the terminal's Receive Buffer is filled to the level of either 64 or 128 characters. NEVER disables Xon/Xoff handshaking. You should choose either @ 64 or @ 128 for most applications.

Keyboard Setup Menu

Table 2-6 describes the possible values for the Keyboard Setup Menu. Default values are listed first. A dash (—) in the Choices column indicates that the field performs a function. The Answerback = field is a fill-in field.

KEYBOARD SETUP

Keyboard Language	North American	Shift Lock	NO
Keyclick	YES	Break	YES
Margin Bell	YES	Auto Repeat	YES
Warning Bell	YES	Key Code Mode	NO
Destructive Backspace	NO	Backspace Key	DEL
Answerback =		Auto Answerback	NO

Conceal Answerback Clear All Tabs Set 8 Column Tabs

```

      T      T      T      T      T      T      T      T
1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890
      T      T      T      T      T      T      T      T
1234567890 1234567890 1234567890 1234567890 1234567890

```

[Page Down]=Next Setup <arrows> [Num Enter]=Select [Setup]=Exit



Table 2-6. Fields in the Keyboard Setup Menu

Field	Choices	Description
Keyboard Language	North American British Belgian Danish German Italian Swiss Swedish Norwegian French Spanish	Tells the terminal which keyboard version you are using. This allows the terminal to use characters that match the characters on the keyboard.
Keyclick	YES NO	Enables or disables the keyclick sound when keys are pressed.
Margin Bell	YES NO	Enables or disables the bell sounding when the cursor nears the right margin.
Warning Bell	YES NO	Specifies whether or not the bell sounds for operator error and Ctrl-G.
Destructive Backspace	NO YES	NO: ASCII backspace (BS) moves the cursor left one space at a time without erasing characters. YES: ASCII backspace overwrites with SP characters as the cursor moves left.

Table 2-6. Fields in the Keyboard Setup Menu (continued)

Field	Choices	Description
NOTE		
<p>The Shift Lock field specifies the function of the [Caps Lock] key. When [Caps Lock] is pressed, Lock is displayed on the Status Line, and either Caps Lock Mode or Shift Lock mode is enabled. Pressing [Caps Lock] again turns off the Lock mode.</p>		
Shift Lock	NO	— Caps Lock Mode is active. When the [Caps Lock] key is pressed, alphabetic keys send uppercase characters; all other keys on the main keypad send the lower characters displayed on their keycaps.
	YES	— Shift Lock Mode is active. When the [Caps Lock] key is pressed, all alphabetic keys send uppercase characters and all other keys on the main keypad send the upper characters displayed on the keycaps. This mode can be disabled by pressing the [Shift] key.
Break	YES NO	YES enables, NO disables the [Break] key.
Auto Repeat	YES NO	YES enables, NO disables Auto Repeat . When enabled, most keys will repeat automatically if held down longer than 1/2 second.
Key Code Mode	NO YES	When set to NO the terminal operates normally and does not send scan codes. When set to YES the terminal sends a scan code each time a key is pressed, and sends another scan code each time a key is released. Set this field to YES if your PC application requires scan codes from terminals. Applications may set this field. YES is ignored if the terminal is not set to the HP-PC Term compatibility mode .
Backspace Key	DEL/BS BS/DEL DEL BS	If DEL/BS is selected, the terminal sends a DEL character when the [↵] key is pressed alone, and sends a BS character when it's pressed with the [Shift] key. If BS/DEL is selected, the terminal sends a BS character when the [↵] key is pressed alone, and sends a DEL character when it's pressed with the [Shift] key. If DEL is selected, the terminal sends a DEL character when the [↵] key is pressed (either alone or shifted). If BS is selected, the terminal sends a BS character when the [↵] key is pressed (alone or shifted).

Table 2-6. Fields in the Keyboard Setup Menu (continued)

Field	Choices	Description
Answerback =	(fill-in)	This field lets you enter a message of up to 30 characters that is sent to the computer when Ctrl + Break is typed at the keyboard or when an ENQ character is received from the computer. The first character typed in this field clears the old message and starts a new message.
Auto Answerback	NO YES	If YES , the answerback message (if one has been created) is automatically sent to the computer after a communications line is established. NO disables this function.
Conceal Answerback	—	This field lets you prevent the answerback message from being displayed again in this menu. Once concealed, you cannot change this feature except by filling in the Answerback = field again. The message <Concealed> indicates that the current answerback message has been concealed.
Clear All Tabs	—	Causes all tabs to be cleared.
Set 8 Column Tabs	—	Causes a tab to be set in every eighth column. This is the default tab setting.
Tab Ruler	—	The tabs ruler field lets you set tab stops. The top ruler line is for columns 1–80. The bottom line is for columns 81–132. Use the arrow keys to highlight a column. Press Enter to set a tab stop (marked by a T) or clear a tab stop. Tab settings are saved in non-volatile memory when the Save field is selected.

3

Using the Terminal

This chapter describes how to use the keyboard and display screen. It also describes how the terminal can be used with a connected printer.

NOTE

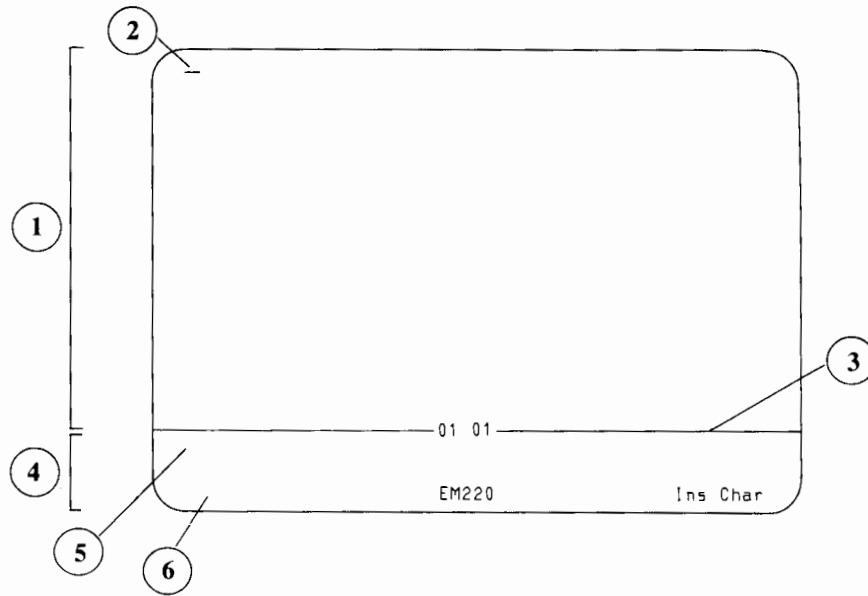
If you don't know how to turn the terminal on and off or adjust its controls, refer to the last two pages of Chapter 1.

The Display Screen

The terminal's screen can display light characters on a dark background (default), or dark characters on a light background. This feature is selectable in Setup Mode.

Also selectable in Setup Mode is the terminal's screen-saver feature. You can set the terminal so that the display screen automatically turns off if there has been no use of the keyboard or input from the computer during a specified amount of time. This helps preserve the display unit. Pressing the `[Shift]` key, or receiving any input from the computer, automatically turns the screen back on without loss of data.

Figure 3-1. The HP 700/44 Display Screen



- 1) User Area: 24 or 25 Lines; 80 or 132 Columns 2) Cursor 3) Separator Line
4) Message Area 5) User Message Line 6) Status Line**

3-2 Using the Terminal



The Screen Areas and Cursor

The top 24 or 25 lines of the screen are the **user area (1)**. The application you're running sets the user area at either 24 or 25 lines.

The user area is a single page of display memory. The terminal can contain single or multiple (up to four) pages of display memory. This feature is selectable in Setup Mode.

The display can consist of 80 or 132 columns. This feature is also selectable in Setup Mode.

The **cursor (2)** indicates where the next character you type will appear on the screen. The cursor style is a blinking block or blinking underline, selectable in Setup Mode.

The **Separator Line (3)** separates the user area from the message area.

Also, the Separator Line states the cursor's current position by line number followed by column number. For example, 01 01 indicates that the cursor is at the top left of the screen in first line and first column.

The **message area (4)** may be blank, or it may consist of one or both of the following message lines, depending upon the application program:

- The **User Message Line (5)** which may be used by a computer application to display messages.
- The terminal's **Status Line (6)** displays brief messages regarding the operating status of the terminal.

When the user workspace is 24 lines, the message area always displays the Status Line at the bottom of the screen. Additionally, the next to bottom line is reserved for the User Message Line if the "Status Line" field in Setup is set to "Host Writable"; otherwise, it is blank.

When the user workspace is 25 lines, the message area consists of one line only, the bottom line of the screen. This can be either the Status Line or the User Message Line, or it may be blank. You can specify this in the "Status Line" field in Setup. Application programs, though, can change this field to determine the use of the message area.

Status Line Messages

The terminal's status messages, which are displayed on the bottom line of the screen, are summarized in Table 3-1.

Where the messages will appear on the status line are illustrated below. Table 3-1 summarizes all the possible status line messages.

KB Lockd Compose Num Lock EM220 Lock Ins Char HOLD L1L2L3L4

Table 3-1. Status Line Messages

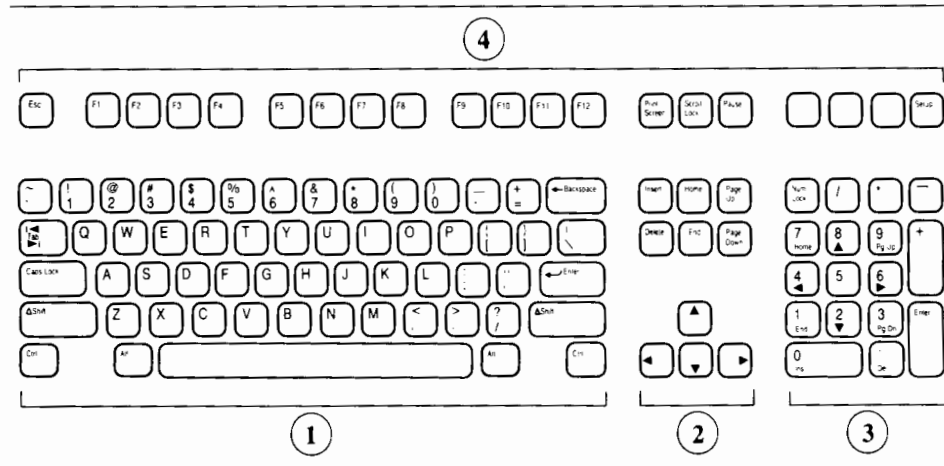
Message	Description
KB Lockd	The keyboard is in a locked state. Refer to Chapter 4 Troubleshooting if the condition persists.
Compose	Indicates you have started a compose character sequence. See the "Compose Character" section of this chapter. Not available in HP-PC Term Mode.
Num Lock	You've turned on Num Lock Mode by pressing the Num Lock key. You can use the Auxiliary Keypad to enter numbers. Num Lock Mode is possible only when the terminal is in HP-PC Term compatibility mode. Pressing Num Lock again turns off Num Lock Mode so that the numeric keys on the Auxiliary Keypad are set for their other functions.
EM200 EM100 EM52 HP-PCTerm	This area of the Status Line states the terminal's current emulation. HP-PCTerm = HP-PC terminal emulation; EM200 = VT220 emulation; EM100 = VT100 emulation; EM52 = VT52 emulation.
Lock	The terminal is in Caps Lock or Shift Lock Mode. Alphabetic keys will display only uppercase characters. Additionally in Shift Lock Mode, numeric/symbol keys will display only the upper symbols on their keycaps. Press the Lock key to clear.
Ins Char	The terminal is in Insert Character Mode. Inserts characters you type. Any characters to the right of the cursor are moved right. Any characters that pass the right margin are lost. Pressing Insert again turns off this mode.
HOLD	The Scroll Lock key has been pressed preventing data from reaching the screen. Press Scroll Lock to clear.
L1 L2 L3 L4	The meanings of these symbols depend on the application program. These correspond to the four indicator lights on the VT100 keyboard.

3-4 Using the Terminal

The Keyboard

There are 105 keys on the HP 700/44 USASCII keyboard.

Figure 3-2. The HP 700/44 Keyboard



- 1) Typewriter Keypad 2) Middle Keypad 3) Auxiliary Keypad
4) Top Row Keys

Typewriter Keys

The typewriter keys let you type letters, numbers and symbols just as you would with a typewriter.

Most keys are repeated if held down for more than a half second. You can turn off this feature in Setup mode.

Control Keys

The terminal control keys located on the typewriter keypad are described in Table 3-2.

Table 3-2. Control Keys

Key	Description
Ctrl	This key is used with certain keys to provide predefined functions. Press the indicated key while holding down Ctrl .
Alt	<p>In EM200, EM100 and EM52 modes, the Alt key functions as the first (initiating) key in the three-key compose character sequence. In HP-PC Term Mode, Alt can be used with other keys to provide application-dependent functions. For these, press the specified key while holding down Alt.</p> <p>Also in HP-PC Term Mode, the Alt key can be used with the Auxiliary Keypad to enter extended characters. For these, hold down Alt and type a sequence of numbers on the Auxiliary Keypad, then release Alt. The sequence of numbers is from 000 to 255, depending on the character's decimal value. See Appendix C.</p>
Backspace	Online effects depend on the application. Usually the cursor moves left one space, may or may not erase characters, and will stop at the left margin. Sends either BS or DEL according to the setting of the "Backspace" field in Setup. When the terminal is offline, erases characters when Backspace = BS, does not erase when Backspace = DEL.
Caps Lock	When the Caps Lock key is pressed, Lock is displayed on the Status Line and either Caps Lock or Shift Lock is enabled (as specified in Setup). Both Caps Lock and Shift Lock set the alphabetic keys to uppercase only. Shift Lock also sets the numeric/symbol keys for the upper characters on their keycaps. Press Caps Lock again to turn off either of these modes. Shift Lock can also be turned off by pressing the Shift key.
Enter	<p>Moves the cursor to the beginning of the next line when the New Line field in Setup Mode is set to YES; to the beginning of the same line if this field is set to NO. Some applications assign a line feed to this key automatically. In some applications Enter indicates that you have completed an operation.</p> <p>The Enter key on the Auxiliary Keypad is used to select values in Setup Mode.</p>
Shift	Selects a key's upper symbol and capitalizes alphabetic keys. Turns off Shift Lock. Is used in conjunction with some keys for additional functions. For these, you hold down Shift while pressing the other key.
Tab	The cursor moves to the next tab stop or to the right margin if no tabs are encountered.

3-6 Using the Terminal

Middle Keypad

The middle keypad contains keys for cursor movement and editing functions.

In most applications, the *cursor movement keys* move the cursor in the direction indicated by their arrows.

It is possible for applications to assign the cursor movement keys specialized functions. For these, it may require setting the “Normal Mode Cursor Keys” field in Setup to NO. Your applications’ manuals should explain any specialized uses of these keys.

The cursor keys have the following shifted functions (that is, pressing a key while holding down the **Shift** key) in EM200, EM100 and EM52 modes:

- **▲** + **Shift** causes data on the screen to scroll up. **▼** + **Shift** causes data on the screen to scroll down.
- **◀** + **Shift** moves the cursor to the top left corner of the screen (home up). **▶** + **Shift** moves the cursor to the bottom left corner of the screen (home down).

The above functions are also available in HP-PC Term Mode using the **Alt** key instead of the **Shift** key.

The *edit keys* are operative in EM200 Modes and HP-PC Term Mode, but not in EM100 and EM52 Modes. When operative, the edit keys usually provide the functions indicated on their keycaps in most applications.

When the terminal is in an EM200 Mode, and the terminal is set to Multipage Mode, pressing **Page Up** while holding down the **Shift** key displays the previous page (24 or 25 lines) of display memory. **Page Down** + **Shift** displays the next page in display memory. These same functions are also available in HP-PC Term Mode using the **Alt** key instead of the **Shift** key.

Also, it is possible for applications to assign additional functions to the edit keys for use in HP-PC Term Mode. If an application has done this, you may be able to use the extra functions by pressing the specified edit keys individually or while holding down the **Shift** and/or **Ctrl** keys. The manuals for your applications should explain any additional functions that have been assigned to these keys.

Auxiliary Keypad

Use of the Auxiliary Keypad depends upon the terminal's current compatibility mode and the specific operating mode set for the Auxiliary Keypad.

The Auxiliary Keypad can be in either Numeric Mode or Application Mode. This can be specified in Setup (using the "Numeric Mode Keypad" field) or by application programs.

In HP-PC Term Mode

When in Numeric Mode, pressing the **Num Lock** key toggles Num Lock Mode on and off:

- When Num Lock Mode is on, "Num Lock" appears on the Status Line (if enabled), and the Auxiliary Keypad is set for numeric data entry. Num Lock Mode lets you use the Auxiliary Keypad for rapid entry of numeric data.
- When Num Lock is off, "Num Lock" is blanked from the Status Line (if enabled), and the keypad's number and **□** keys function like the Middle Keypad's editing and cursor movement keys.

In Numeric Mode, the **Enter** key functions the same as the Main Keypad's **Enter** key.

Also in Numeric Mode, the Auxiliary Keypad can be used with the **Alt** key to enter extended characters. See Appendix C.

In Application Mode, the Auxiliary Keypad sends predefined codes that can be used by applications for special purposes. Also, the top four keys (**Num Lock**, **↑**, **←** and **→**) act as program function keys, **PF1** through **PF4**, left to right. The functions of these keys depend on the application program. The manuals for your application should explain any functions that have been assigned to Auxiliary Keypad keys in Application Mode.

In EM200, EM100 and EM52 Modes

In Numeric Mode, the Auxiliary Keypad is set for numeric data entry. In Numeric Mode, the **+** key sends a comma (,), and pressing **+** while holding down **Shift** sends a minus sign (-). To enter + (plus sign), use the **+** key on the Main Keypad.

Also in Numeric Mode, the Auxiliary Keypad can be used with the **Shift** and **Ctrl** keys to generate additional characters. See the "Composing Characters" section of this chapter.

In Application Mode, the keypad functions the same as described above for HP-PC Term Mode.

Top Row Keys

The top row of keys on the HP 700/44's keyboard contains keys that have predefined functions as well as keys that are designed to be used by application software.

When the terminal is in either EM200 or HP-PC Term modes, application programs can assign special functions to keys **F1** through **F12**, and to the three blank keys above the Auxiliary Keypad (to the left of **Setup**). These keys can be assigned to perform special functions when they are pressed individually or while you hold down the **Alt**, **Ctrl** or **Shift** keys. Consult your application software manuals to see if special functions have been assigned to these keys.

Note that for some EM200 applications, the terminal's **F10** and **F11** keys refer to **Do** and **Help**, respectively.

Table 3-3 describes the top row keys that have predefined functions.

Table 3-3. Top Row Keys



Key	Description
Esc	Sends an escape character.
Print Screen	Sends either the entire screen or scrolling region (as specified in Setup) to the printer attached to the terminal's printer port. Pressing Print Screen while holding down the Ctrl key turns on and off Auto Print Mode.
SysRq	Has same functions as Print Screen .
Scroll Lock	Press once to tell the computer to stop sending data to the terminal (scrolling stops). Press again to tell the computer to resume sending data (scrolling resumes). When active, HOLD is displayed on the status line. This key has no effect if Xon/Xoff handshaking is disabled and DTR handshaking is disabled.
Pause	Pressing this key sends a break signal for 250 milliseconds, the effect of which depends upon your computer's programming. Pressing Pause while holding down the Shift key sends a longer break signal that in most cases discontinues an application program's control of the terminal (you exit the program). Pressing Pause while holding down the Ctrl key sends the answerback message (if one has been defined) to the computer.
Break	Has same functions as Pause .
Setup	Press this key to enter and exit Setup Mode.
F6 Esc	In EM100 and EM52 modes, this key sends an escape character. Application-dependent in the other compatibility modes.

Table 3-3. Top Row Keys (continued)

Key	Description
<code>F7 BS</code>	In EM100 and EM52 modes, this key sends the backspace (BS) character, which normally moves the cursor back one space. Application-dependent in the other compatibility modes.
<code>F8 LF</code>	In EM100 and EM52 modes, this key sends the line feed (LF) character, which normally moves the cursor down one line in the same column. Application-dependent in the other compatibility modes.

Printing

If you have a serial printer connected to your terminal, you can print data using the methods described here. Of course, the printer must be ready for operation and properly connected to the terminal. The terminal's setup must match the printer's requirements.

Printing the Screen Contents

Press the `Print Screen` key. This causes the display contents to be sent to the printer. The current value of the `Print Scroll Region` field in Setup Mode dictates whether the entire screen is printed or just the scrolling region. (The scrolling region is the area between the top and bottom margins set by an application program.)

Auto Print Mode

Auto Print Mode causes all data received from the computer to be both displayed on the screen and sent to the printer attached to the terminal.

There are two ways to turn on Auto Print Mode. One way is to press `Print Screen` while holding down the `Ctrl` key. The other way is select **Auto** in the `Print Mode` field in Setup.

There are two ways to turn off Auto Print Mode. One way is to press `Print Screen` again while holding down `Ctrl`. The other way is to select **Normal** in the `Print Mode` field in Setup.

Print Controller Mode

In Print Controller Mode, all data received from the computer is sent to the printer without being displayed on the screen.

You can turn on Print Controller Mode by selecting **Controller** in the `Print Mode` field in Setup. To turn off Print Controller Mode, select **Normal** in this same field.

3-10 Using the Terminal

Composing Characters

The HP 700/44 Display Terminal compose character feature lets you generate characters that aren't on the keyboard. The terminal also lets you generate additional characters by entering their decimal values. These methods greatly expand the variety of different characters that can be displayed.

EM200/100/52 Modes

In EM200, EM100 and EM52 modes, the basis of how you use the compose character feature depends on the current values of two Setup fields: `National Character Set` and `Keyboard Language`.

When the `National Character Set` field is set to **NO**, all the compose characters in Table 3-4 (Multinational Mode) are available to you. (When this field is set to **NO**, it means that your terminal is not set to any specific national character set, but instead is using a multinational character set.)

If the `National Character Set` field is set to **YES**, then the compose characters you can access are in Table 3-5 (National Mode). Within Table 3-5, you can access the characters in the section that matches the keyboard language you are using. For example, if the `Keyboard Language` field is set to **French**, then you can access the compose characters in the French section of Table 3-5.

There are two compose character sequences: the three-key sequence and the two-key sequence. The two-key sequence is the faster method, but more characters are available using the three-key sequence.

Three-Key Sequence

1. Locate the character you want to compose in the `Compose Character` column of Table 3-4.
2. Press the `Alt` key. `Compose` is displayed on the Status Line (if the Status Line is enabled).
3. Type the two corresponding characters from the `Three-Key Sequence` column.

For example, to generate the ¢ (cent sign), press `Alt`, then type `c` and `/` (lower case `c` and the slash character).

You can enter the two characters in Step 3 in any order unless the table states “*this order only*”.

Two-Key Sequence

1. Locate the character you want to compose.
2. Type the two corresponding characters from the Two-Key Sequence column.

In the two-key sequence, the first key typed is a mute diacritical character. These can be the grave accent (`), acute accent (´), circumflex (^), tilde (~), umlaut (¨) and ring mark (°). They are called “mute” because the characters are not displayed when the key is pressed alone. Instead, `Compose` is displayed on the Status Line (if the Status Line is enabled). Typing the second key completes the sequence. You must type the diacritical character first.

To display only the diacritical character itself, press the diacritical key and then the `Space Bar`.

Which, if any, diacritical character keys are on your keyboard depends on the language. For instance, the USASCII keyboard has no diacritical character keys. (Its tilde key is not used as an accent.)

Completing or Aborting a Compose Sequence

When you successfully complete a compose sequence, the composed character is displayed and `Compose` is blanked from the Status Line. If you enter an invalid sequence, the sequence is aborted.

If you accidentally begin a compose sequence, you can abort it by pressing the `Backspace` key. The warning bell is not invoked and a backspace is not performed.

Decimal Value Method

The sequences described above do not work if your keyboard does not have the required diacritical character key(s). However, you can generate any of the compose characters (and any characters in the set) by typing their decimal values. In EM200, EM100 or EM52 Mode, follow these steps:

1. Determine which table you will refer to:
 - Use Table 3-4 if `National Char Set` field is set to **NO**.
 - Use Table 3-5 if `National Char Set` field is set to **YES**. Refer to the section in Table 3-5 that matches your keyboard language (the setting of the `Keyboard Language` field in Setup).

2. Locate the compose character you want to generate in the left hand column of the table.
3. Hold down the **Shift** and **Ctrl** keys and type the decimal value of the character using the Auxiliary Keypad's number keys. Release **Shift** and **Ctrl**.

The character appears when **Shift** and **Ctrl** are released.

Table 3-4 Multinational Mode Compose Character Sequences

“Or” indicates two or more possible sequences for the same character.

Compose Character	Decimal Value	Three-Key Sequence	Two-Key Sequence
"	34	" <space> or " <sp>	" <space>
#	35	++	
'	39	' <space>	' <space>
@	64	aa or AA	
[	91	((
\	92	/<	
]	93)>	
^	94	^ <space>	^ <space>
'	39	' <space>	' <space>
{	123	(-	
|	124	/^	
}	125)-	
~	126	~ <space>	~ <space>
!	161	!!	
¢	162	c/ or C/ or c| or C|	
£	163	l- or L- or l= or L=	
¥	165	y- or Y- or y= or Y=	
§	167	so or SO or S! or s! or s0 or S0	
¤	168	xo or XO or x0 or X0	
©	169	co or CO or c0 or C0	
♀	170	a_ or A_	
«	171	<<	
°	176	0^ or <space> *	
±	177	+ -	
¹	185	1^	
²	178	2^	
³	179	3^	
µ	181	/u or /U (this order only)	
¶	182	p! or P!	
•	183	.^	
◌	186	o_ or O_	
»	187	>>	

Table 3-4 Multinational Mode Compose Character Sequences (continued)

Compose Character	Decimal Value	Three-Key Sequence	Two-Key Sequence	
¼	fraction one-quarter	188	14 (this order only)	
½	fraction one-half	189	12 (this order only)	
¿	inverted ?	191	??	
À	A grave	192	A'	'A
Á	A acute	193	A'	'A
Â	A circumflex	194	A^	^A
Ã	A tilde	195	A~	~A
Ä	A umlaut	196	A''	''A
Å	A ring	197	A* or A°	°A
Æ	AE ligature	198	A E (this order only)	
Ç	C cedilla	199	C,	
È	E grave	200	E'	'E
É	E acute	201	E'	'E
Ê	E circumflex	202	E^	^E
Ë	E umlaut	203	E''	''E
Ì	I grave	204	I'	'I
Í	I acute	205	I'	'I
Î	I circumflex	206	I^	^I
Ï	I umlaut	207	I''	''I
Ñ	N tilde	209	N~	~N
Ò	O grave	210	O'	'O
Ó	O acute	211	O'	'O
Ô	O circumflex	212	O^	^O
Õ	O tilde	213	O~	~O
Ö	O umlaut	214	O''	''O
Œ	OE ligature	215	OE (this order only)	
Ø	O slash	216	O/	
Ù	U grave	217	U'	'U
Ú	U acute	218	U'	'U
Û	U circumflex	219	U^	^U
Ü	U umlaut	220	U''	''U
ÿ	Y umlaut	221	''Y or Y''	''Y
ß	German small sharp s	223	ss	

Table 3-4 Multinational Mode Compose Character Sequences (continued)

Compose Character	Decimal Value	Three-Key Sequence	Two-Key Sequence
à a grave	224	a'	'a
á a acute	225	a'	'a
â a circumflex	226	a^	^a
ã a tilde	227	a~	~a
ä a umlaut	228	a''	''a
å a ring	229	a* or a°	°a
æ ae ligature	230	ae (this order only)	
ç cedilla	231	c,	
è e grave	232	e'	'e
é e acute	233	e'	'e
ê e circumflex	234	e^	^e
ë e umlaut	235	e''	''e
ì i grave	236	i'	'i
í i acute	237	i'	'i
î i circumflex	238	i^	^i
ï i umlaut	239	i''	''i
ñ n tilde	241	n~	~n
ò o grave	242	o'	'o
ó o acute	243	o'	'o
ô o circumflex	244	o^	^o
õ o tilde	245	o~	~o
ö o umlaut	246	o''	''o
œ oe ligature	247	oe (this order only)	
ø o slash	248	o/	
ù u grave	249	u'	'u
ú u acute	250	u'	'u
û u circumflex	251	u^	^u
ü u umlaut	252	u''	''u
ÿ y umlaut	253	y''	''y

Table 3-5 National Set Mode Compose Character Sequences

“Or” indicates two or more possible sequences for the same character.

Compose Character	Decimal Value	Three-Key Sequence	Two-Key Sequence
BRITISH KEYBOARD			
£ pound sign	35	L- or L- or l= or L=	
\ backslash	92	/<	
GERMAN KEYBOARD			
Ä A umlaut	91	A''	
Ü U umlaut	93	U''	
ä a umlaut	123	a''	
ü u umlaut	125	u''	
§ section sign	64	so or Os or !s or !S or Os or OS	
ö O umlaut	92	O''	
ö o umlaut	124	o''	
^ circumflex accent	94	^ <space>	
` grave accent	96	' <space>	
# number sign	35	++	
ß German small sharp s	126	ss	
ITALIAN KEYBOARD			
£ pound sign	35	L- or l- or L= or l=	
§ section sign	64	s! or S! or so or So or sO or SO or s0 or S0	
ç c cedilla	92	c,	
é e acute	93	e'	
^ circumflex accent	94	^ <space>	
FRENCH and BELGIAN KEYBOARDS			
£ pound sign	35	L- or l- or L= or l=	
§ section sign	64	s! or S! or so or So or Os or OS or Os or OS	
è e grave	125	e'	
ù u grave	124	u'	
` grave accent	96	' <space>	
à a grave	64	a'	
ç c cedilla	92	c,	
é e acute	123	e'	
SPANISH KEYBOARD			
£ pound sign	35	L- or l- or L= or l=	
§ section sign	64	s! or S! or so or So or Os or OS or Os or OS	
¡ inverted !	91	!!	
¿ inverted ?	93	??	
° degree sign	123	0^	
^ circumflex accent	94	^ <space>	
` grave accent	96	' <space>	
ç c cedilla	125	c,	

Table 3-5 National Set Mode Compose Character Sequences (continued)

Compose Character	Decimal Value	Three-Key Sequence	Two-Key Sequence
DANISH and NORWEGIAN KEYBOARDS			
æ AE ligature	91	AE (this order only)	
æ ae ligature	123	ae (this order only)	
# number sign	35	+ +	
Å A ring	93	A*	
Ø O slash	92	O/	
å a ring	125	a*	
ø o slash	124	o/	
" quotation mark	34	" <space>	
' apostrophe	39	' <space>	
@ commercial at	64	AA <i>or</i> Aa <i>or</i> aa	
ˆ circumflex	94	^	
˘ grave accent	96	˘ <space>	
~ tilde	126	~ <space>	
SWISS KEYBOARD			
à a grave	64	a˘	˘a
ç c cedilla	92	c,	
ê e circumflex	93	e^	^e
é e acute	91	e'	
è e grave	95	e˘	˘e
î i circumflex	94	i^	^i
ô o circumflex	96	o^	^o
û u circumflex	126	u^	^u
ù u grave	35	u˘	˘u
ä a umlaut	123	ä"	
ö o umlaut	124	ö"	
ü u umlaut	125	ü"	
SWEDISH KEYBOARD			
# number sign	35	+ +	
Å A ring	93	A*	
É E acute	64	E'	
Û U umlaut	94	U"	
å a ring	125	a*	
é e acute	96	e'	
ü u umlaut	126	ü"	
ö O umlaut	92	O"	
Ä A umlaut	91	A"	
ö o umlaut	124	o"	
ä a umlaut	123	a"	



Table 3-6 Compose Characters Available in HP-PC Term Mode (continued)

Keyboard Language	Character Set	Available Characters
<i>French</i>	PC U.S.	äëïöÿÄÖÜ âêîôù
	Multinational or PC Multilingual	äëïöÿÄËÏÖÜ âêîôùÂÊËÏÔÙ
<i>Spanish</i>	PC U.S.	äëïöÿÄÖÜ âêîôù áéíóúÉ àèìòù
	Multinational or PC Multilingual	äëïöÿÄËÏÖÜ âêîôùÂÊËÏÔÙ áéíóúÁÉÍÓÚ àèìòùÀÈÌÒÙ
<i>Swiss</i>	PC U.S.	äëïöÿÄÖÜ âêîôù áéíóúÉ àèìòù ñÑ
	Multinational or PC Multilingual	äëïöÿÄËÏÖÜ âêîôùÂÊËÏÔÙ áéíóúÁÉÍÓÚÝ àèìòùÀÈÌÒÙ ãõñÃÕÑ

Decimal Value Method

Another way to generate additional characters in HP-PC Term mode is the decimal value method. This method lets you generate any character in the terminal's repertoire.

- 1.** Locate the table you will use. If PC Character Set mode is **OFF**, then you will use Table 3-4 (for the Multinational Character Set) or Table 3-5 (for National Character Sets). If PC Character Set is **ON**, however, refer to the table in Appendix C that matches the active PC Character Set. For instance, if U.S. is the active PC Character Set, use Table C-1.
- 2.** Locate the character you want in the table.
- 3.** Hold down the **[Alt]** key and type the decimal value of the character using the Auxiliary Keypad's numeric keys. Release **[Alt]**.

The character appears when the **[Alt]** key is released. To display the characters for decimal values 1 through 33, refer to the Monitor Mode command in Appendix B.

4

Troubleshooting and Maintenance

Problems and Solutions

If you encounter a problem in using the HP 700/44 Display Terminal, it may be something that you can easily fix yourself. Read this chapter before calling for repair service.

Symptoms of problems are in bold type followed by possible solutions.

CAUTION

Under no circumstances should you open your terminal to expose its internal circuitry. Only a qualified service engineer should perform maintenance procedures that require opening the terminal case.

WARNING

Do not disconnect the keyboard cable while the terminal is powered on as doing so could damage the terminal.

The power button is pushed in, but the display is blank.

- Press the **Shift** key. If the screen saver feature has blanked the screen, this will restore the display.
- Brightness may be turned down. Slide the brightness control to the right.
- Turn the power off and on again. If you didn't hear the beep, make sure the power cord is plugged securely into the terminal and power outlet. Make sure the power outlet is on.

The screen goes blank while the terminal is on.

- The screen saver feature is probably on. This feature blanks the screen after a specified period of inactivity. Press any key to cause the display screen to come back on without any loss of data.

There is no response on the display when you press keys.

- If HOLD is displayed on the status line, then the `Scroll Lock` key probably has been pressed. Press `Scroll Lock` so that HOLD is not displayed on the status line.
- If the message KB Locked is displayed on the status line, then the keyboard is locked. Go into Setup Mode and select the `Case Communications` field.
- If there is no response when you press the `Setup` key, make sure that the keyboard cable is securely connected to the keyboard and display unit.
- In Setup Mode, select the `Reset Terminal` field.
- In Setup Mode, select the `Beep` field.
- Press `Pause` while holding down `Shift`. If the condition persists, it could be due to the next problem.

The computer is not responding to your terminal.

- Make sure the cable to the communications port you are using, either the RS-232 port or the 20mA port, is connected securely.
- Go into Setup Mode and make sure the `Online` field is set to **YES**.
- In Setup Mode, make sure that all the fields involving communications with the computer are set properly. Use the worksheet at the end of this manual as a guide for which fields to check.
- If you are using a modem, make sure it is working properly.
- The computer system may be down.

Characters you type are displayed twice.

- Go into Setup Mode and set the `Local Echo` field to **No**.

4-2 Troubleshooting and Maintenance

The screen displays nonsense characters (garbage).

- Make sure that all the fields in the Data Communications Menu in Setup are set correctly for communicating with your computer.
- Ask a technician to make sure that the pin assignments of the data communications cable for your terminal are correct for your computer.

The printer attached to your terminal is not printing correctly.

- See that the printer is plugged in and its power switch is set to on. If the printer doesn't power on, make sure the power outlet you're using has power.
- Make sure the printer cable is connected securely to the terminal and the printer.
- Go into Setup Mode and make sure all the fields for communication with the printer match the printer's requirements. Use the worksheet at the end of this manual as a guide for which fields to check.
- Ask a technician to see if the pin assignments for the printer cable are correct.

<Defaults configs used. Press <---' ENTER to continue.> is displayed at the bottom of the screen when the terminal is powered on.

- Non-volatile memory could not be accessed, so the terminal's default Setup values were invoked. Try powering on the terminal again. If the condition persists, the terminal requires service by a qualified technician.

You select the Terminal Test field, but no test pattern is displayed.

- Try selecting the field again. If the condition persists, the terminal requires service by a qualified technician.

Preventive Maintenance

Regularly clean the display unit and keyboard to remove dust and grease. Dust lightly using a damp, lint-free cloth. (Paper towels are fine.) The cloth should be just damp enough to pick up dust. Avoid wiping dust or lint into the keyboard.

If smudges or fingerprints persist, use a mild solution of soap and water. Remember to wring the cloth thoroughly; otherwise, rubbing the dirty areas will drip water over the terminal. Avoid getting any liquid between the keys.

CAUTION

Never use petroleum-based cleaners such as lighter fluid, or cleaners containing benzene, trichloroethylene, dilute ammonia, ammonia or acetone. These cleaners may harm the terminal's plastic surface.



A

Pin Assignment Connections

Table A-1. RS-232 Port Pin Assignments

Pin	Mnemonic	EIA Circuit	Description	Direction
1	PGND	AA	Frame Ground	
2	TXD	BA	Transmit Data	Output
3	RXD	BB	Received Data	Input
4	RTS	CA	Request to Send	Output
5	CTS	CB	Clear to Send	Input
6	DSR	CC	Data Set Ready	Input
7	SGND	AB	Signal Ground (Common Return)	
8	RLSD	CF	Received Line Signal Detector (Carrier Detect)	Input
12	SPDI	CI	Secondary Received Line Signal Detector (Speed Indicator)	Input
20	DTR	CD	Data Terminal Ready	Output
23	SPDS	CH	Data Signal Rate Selector (Speed Select)	Output

Figure A-1. 25-Pin RS-232 Port and Pin Numbers

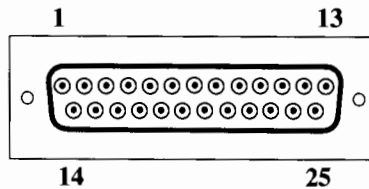


Table A-2. 20mA Port Pin Assignments

Pin	Signal
1	-12 Volt
2	Transmit Data (negative)
3	Receive Data (negative)
5	Transmit Data (positive)
7	Receive Data (positive)
8	Ground

Figure A-2. 20mA Port

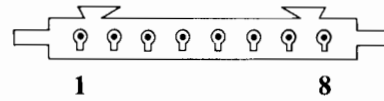


Table A-3. Printer Port Connector Pin Assignments

Pin	Signal	Mnemonic	EIA Circuit	Direction
1	Frame Ground	PGND	AA	
2	Transmit Data	TXD	BA	Output
3	Receive Data	RXD	BB	Input
4	Request to Send	RTS	CA	Output
5	Data Terminal Ready	DTR	CD	Output
6	Data Set Ready	DSR	CC	Input
7	Signal Ground	SGND	AB	

Figure A-3. Printer Port and Pin Numbers

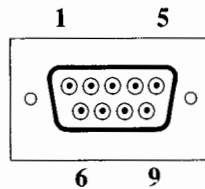


Table A-4. HP Printer Cable Connection

9-Pin Female	Signal	Mnemonic	EIA Circuit	25-Pin Male
1	Frame Ground	PGND	AA	1
2	Transmit Data	TXD	BA	3
3	Receive Data	RXD	BB	2
4	Request to Send	RTS	CA	8
5	Data Terminal Ready	DTR	CD	5,6
6	Data Set Ready	DSR	CC	20
7	Signal Ground	SGND	AB	7

A-2 Pin Assignment Connections

B

Terminal Commands Summary

NOTE

Spaces are used between command elements in this appendix for readability. Do not use spaces, though, when you enter the commands. For instance, ESC H is printed here with a space between the elements for readability, however, do not include a space between ESC and H when you enter the command.

C0 Codes and C1 Codes

Supported ASCII C0 Control Codes

Mnemonic	Hex	Description
NUL	00	Null. Ignored.
ENQ	05	Enquiry. The answerback message is sent.
BEL	07	Bell. Sounds the bell if enabled.
BS	08	Backspace. Moves the cursor one position to the left; no action if cursor is at the left margin.
HT	09	Horizontal Tab. Moves cursor to the next tab stop or to the right margin if no further tab stops are in the line. No auto wrap.
LF	0A	Line Feed. Executes a line feed or a new line operation (see New Line Mode).
VT	0A	Vertical Tab. Interpreted as LF.
FF	0C	Form Feed. Interpreted as LF.
CR	0D	Carriage Return. Moves cursor to column 1 of the current line.
SO	0E	Shift Out. The character set currently designated as G0 is invoked into GL.
SI	0F	Shift In. The character set currently designated as G1 is invoked into GL.
DC1	11	Device Control 1 (Xon). Causes the terminal to resume transmission if Xon/Xoff handshaking is enabled.
DC3	13	Device Control 3 (Xoff). If Xon/Xoff is enabled, causes the terminal to stop transmission of all codes except Xon and Xoff.
CAN	18	Cancel. Aborts current escape sequence or device control string; the Cancel character is not displayed.
SUB	1A	Substitute. Aborts current escape sequence or device control string; displays reverse question mark.
ESC	1B	Escape. Escape sequence introducer.
DEL	7F	Delete. Ignored.

Supported C1 Control Codes

Mnemonic	Hex	7-Bit Code Extension Equivalent	Description
IND	84	ESC D	Index. Moves cursor down a line in the same column; scroll up if cursor is at bottom margin.
NEL	85	ESC E	Next Line. Moves cursor to beginning of next line; scroll up if cursor is at bottom margin.
HTS	88	ESC H	Horizontal Tab Set. Sets a tab stop in the column currently occupied by the cursor.
R1	8D	ESC M	Reverse Index. Moves cursor up a line in the same column; scrolls down if cursor is at top margin.
SS2	8E	ESC N	Single Shift G2. The character set designated as G2 is temporarily invoked into GL for the next graphic character received.
SS3	8F	ESC O	Single Shift G3. The character set designated as G3 is temporarily invoked into GL for the next graphic character received.
DCS	90	ESC P	Device Control String. Introducer of a device control string.
CSI	9B	ESC [	Control Sequence Introducer. Introduces a control sequence.
ST	9C	ESC \	String Terminator. Close of a string opened by DCS.

Key Codes

Default Codes Sent by the Edit Keys

These keys are active in EM200 and HP-PC modes only.

Key	HP-PC Term & EM200 Modes		HP-PC Term Mode Only*	
	No Qualifier	Shift	Ctrl	Ctrl/Shift
HOME	CSI 1 ~	CSI 201 ~	CSI 301 ~	CSI 401 ~
INSERT	CSI 2 ~	CSI 202 ~	CSI 302 ~	CSI 402 ~
DELETE	CSI 3 ~	CSI 203 ~	CSI 303 ~	CSI 403 ~
END	CSI 4 ~	CSI 204 ~	CSI 304 ~	CSI 404 ~
PAGE UP	CSI 5 ~	CSI 205 ~	CSI 305 ~	CSI 405 ~
PAGE DOWN	CSI 6 ~	CSI 206 ~	CSI 306 ~	CSI 406 ~

* Press the edit key while holding down SHIFT and/or CTRL.

Codes Sent by the Main Keypad's Special Keys

BACKSPACE	DEL or BS
TAB	HT
ENTER	CR or CR/LF
SPACE BAR	SP

Except in Key Code Mode, CTRL, LOCK, SHIFT and ALT act locally without sending characters to the host.

Codes Sent by the Cursor Keys

Key	HP-PC Term Mode		EM200, EM100 Modes		EM52 Mode	
	Normal	Application	Normal	Application	Normal	Application
CURSOR UP	CSI A	SS3 A	CSI A	SS3 A	ESC A	ESC A
CURSOR DOWN	CSI B	SS3 B	CSI B	SS3 B	ESC B	ESC B
CURSOR RIGHT	CSI C	SS3 C	CSI C	SS3 C	ESC C	ESC C
CURSOR LEFT	CSI D	SS3 D	CSI D	SS3 D	ESC D	ESC D
Same in Normal and Application Modes						
SHIFT + CURSOR UP	CSI 207~		CSI S		ESC [S	
SHIFT + CURSOR DOWN	CSI 208~		CSI T		ESC [T	
SHIFT + CURSOR RIGHT	CSI 209~		CSI >1s		ESC [>1s	
SHIFT + CURSOR LEFT	CSI 210~		CSI >0s		ESC [>0s	
CTRL + CURSOR UP	CSI 307~		CSI A		ESC A	
CTRL + CURSOR DOWN	CSI 308~		CSI B		ESC B	
CTRL + CURSOR RIGHT	CSI 309~		CSI C		ESC C	
CTRL + CURSOR LEFT	CSI 310~		CSI D		ESC D	
SHIFT + CTRL + CURSOR UP	CSI 407~		CSI S		ESC [S	
SHIFT + CTRL + CURSOR DOWN	CSI 408~		CSI T		ESC [T	
SHIFT + CTRL + CURSOR RIGHT	CSI 409~		CSI >1s		ESC [>1s	
SHIFT + CTRL + CURSOR LEFT	CSI 410~		CSI >0s		ESC [>0s	

* The EM52 cursor keys send the same codes for normal and application use.

Default Codes Sent by the Top Row Keys

+ @ Key	HP-PC Term & EM200 Modes	EM100 & EM52 Modes	HP-PC Term Mode Only	
	Code	Code	Key Strokes	Code
F1	CSI 17 ~		F1+SHIFT	CSI 37~
F2	CSI 18 ~		F2+SHIFT	CSI 38~
F3	CSI 19 ~		F3+SHIFT	CSI 39~
F4	CSI 20 ~		F4+SHIFT	CSI 40~
F5	CSI 21 ~		F5+SHIFT	CSI 41~
F6	CSI 23 ~	ESC	F6+SHIFT	CSI 43~
F7	CSI 24 ~	BS	F7+SHIFT	CSI 44~
F8	CSI 25 ~	LF	F8+SHIFT	CSI 45~
F9	CSI 26 ~		F9+SHIFT	CSI 46~
F10	CSI 28 ~		F10+SHIFT	CSI 48~
F11 (HELP)	CSI 29 ~		F11+SHIFT	CSI 49~
F12 (DO)	CSI 31 ~		F12+SHIFT	CSI 51~
* F13	CSI 32 ~		F13+SHIFT	CSI 52~
* F14	CSI 33 ~		F14+SHIFT	CSI 53~
* F15	CSI 34 ~		F15+SHIFT	CSI 54~

B-4 Terminal Commands Summary

HP-PC Term Mode Only

Key Strokes	Code	Key Strokes	Code	Key Strokes	Code
F1+CTRL	CSI 57 ~	F1+CTRL+SHIFT	CSI 77~	F1+ALT	CSI 97~
F2+CTRL	CSI 58 ~	F2+CTRL+SHIFT	CSI 78~	F2+ALT	CSI 98~
F3+CTRL	CSI 59 ~	F3+CTRL+SHIFT	CSI 79~	F3+ALT	CSI 99~
F4+CTRL	CSI 60 ~	F4+CTRL+SHIFT	CSI 80~	F4+ALT	CSI 100~
F5+CTRL	CSI 61 ~	F5+CTRL+SHIFT	CSI 81~	F5+ALT	CSI 101~
F6+CTRL	CSI 63 ~	F6+CTRL+SHIFT	CSI 83~	F6+ALT	CSI 103~
F7+CTRL	CSI 64 ~	F7+CTRL+SHIFT	CSI 84~	F7+ALT	CSI 104~
F8+CTRL	CSI 65 ~	F8+CTRL+SHIFT	CSI 85~	F8+ALT	CSI 105~
F9+CTRL	CSI 66 ~	F9+CTRL+SHIFT	CSI 86~	F9+ALT	CSI 106~
F10+CTRL	CSI 68 ~	F10+CTRL+SHIFT	CSI 88~	F10+ALT	CSI 108~
F11+CTRL	CSI 69 ~	F11+CTRL+SHIFT	CSI 89~	F11+ALT	CSI 109~
F12+CTRL	CSI 71 ~	F12+CTRL+SHIFT	CSI 91~	F12+ALT	CSI 111~
F13+CTRL	CSI 72 ~	F13+CTRL+SHIFT	CSI 92~	F13+ALT	CSI 112~
F14+CTRL	CSI 73 ~	F14+CTRL+SHIFT	CSI 93~	F14+ALT	CSI 113~
F15+CTRL	CSI 74 ~	F15+CTRL+SHIFT	CSI 94~	F15+ALT	CSI 114~

+ Except in Key Code Mode, PRINT SCREEN, SCROLL LOCK and PAUSE act locally without sending codes to the host, and SYS RQ and BREAK have no functions.

* F13, F14 and F15 are the three blank keys on the top row, adjacent to SETUP. Of these F13 is the leftmost, F15 is rightmost.

@ In HP-PC Term Mode, the terminal sends 7-bit controls only.

Codes Sent by the Auxiliary Keypad Keys

Key	EM200 & EM100 Modes		EM52 Mode		HP-PC Term Mode		Application Mode
	Numeric Mode	Application Mode	Numeric Mode	Application Mode	Numeric Mode On Mode	Numeric Mode Off Mode	
0	0	SS3 p	0	ESC ? p	0	CSI 2 ~	SS3 p
1	1	SS3 q	1	ESC ? q	1	CSI 4 ~	SS3 q
2	2	SS3 r	2	ESC ? r	2	CSI B	SS3 r
3	3	SS3 s	3	ESC ? s	3	CSI 6 ~	SS3 s
4	4	SS3 t	4	ESC ? t	4	CSI D	SS3 t
5	5	SS3 u	5	ESC ? u	5		SS3 u
6	6	SS3 v	6	ESC ? v	6	CSI C	SS3 v
7	7	SS3 w	7	ESC ? w	7	CSI 1 ~	SS3 w
8	8	SS3 x	8	ESC ? x	8	CSI A	SS3 x
9	9	SS3 y	9	ESC ? y	9	CSI 5 ~	SS3 y
+	°	SS3 l*	°	ESC ? l	+	+	SS3 l*
.	.	SS3 n	.	ESC ? n	.	CSI 3 ~	SS3 n
ENTER	CR or CR LF	SS3 M	CR or CR LF	ESC ? M	CR or CR LF	CR or CR LF	SS3 M
NUMLOCK	SS3 P	SS3 P	ESC P	ESC P	(local)	(local)	SS3 P
/	SS3 Q	SS3 Q	ESC Q	ESC Q	/	/	SS3 Q
*	SS3 R	SS3 R	ESC R	ESC R	*	*	SS3 R
-	SS3 S	SS3 S	ESC S	ESC S	-	-	SS3 S

*—SS3 m shifted

°—shifted

Keyboard Generated Control Characters

Press with the CTRL key	Control Code	Press with the CTRL key	Control Code
2 or Spacebar	NUL	Q	DC1
A	SOH	R	DC2
B	STX	S	DC3
C	ETX	T	DC4
D	EOT	U	NAK
E	ENQ	V	SYN
F	ACK	W	ETB
G	BEL	X	CAN
H (and F7)*	BS	Y	EM
I	HT	Z	SUB
J (and F8)*	LF	3 or [(and F6)*	ESC
K	VT	4 or \	FS
L	FF	5 or]	GS
M	CR	6 or ~	RS
N	SO	7 or /	US
O	SI	8	DEL
P	DLE		

*Dedicated fkeys in EM100 and EM52 modes only.

Terminal Configuration

Set Compatibility Mode

```

Set for EM100 mode          CSI 61 "" p
Set for EM200 mode, 8-bit controls  CSI 62 "" p
                               or  CSI 62 ; 0 "" p
                               or  CSI 62 ; 2 "" p
Set for EM200 mode, 7-bit controls  CSI 62 ; 1 "" p
Set for HP-PC Term Mode      CSI 44 "" p
  
```

Set C1 Control Transmission (EM200 Mode Only)

These commands determine whether or not C1 codes will be translated by the terminal into their 7-bit extension equivalents for transmission to the host.

```

Select 7-bit control transmission (C1 codes translated into their 7-bit extensions)  ESC <space> F
  
```

```

Select 8-bit control transmission (No translation)  ESC <space> G
  
```

The above commands are unavailable in HP-PC Term Mode. In HP-PC Term Mode the terminal always sends 7-bit controls.

Resetting the Terminal

```

Soft reset          CSI ! p
Hard reset         ESC c
  
```

B-6 Terminal Commands Summary

Terminal Operating Modes

Cursor Movement Keys: Set to application	CSI ? 1 h
Set to cursor	CSI ? 1 l
Columns: Set columns to 132	CSI ? 3 h
Set columns to 80	CSI ? 3 l
* Scrolling: Set to smooth scrolling	CSI ? 4 h
Set to jump scrolling	CSI ? 4 l
* Screen Display: Set to reverse video	CSI ? 5 h
Set to normal video	CSI ? 5 l
Cursor Origin Mode: Set to origin	CSI ? 6 h
Set to absolute	CSI ? 6 l
Auto Wrap: Set Auto Wrap Mode on	CSI ? 7 h
Set Auto Wrap Mode off	CSI ? 7 l
* Auto Repeat: Set Auto Repeat Mode on	CSI ? 8 h
Set Auto Repeat Mode off	CSI ? 8 l
Print Form Feed: Set to on	CSI ? 18 h
Set to off	CSI ? 18 l
Print Extent: Set to full screen	CSI ? 19 h
Set to scrolling region	CSI ? 19 l
Cursor Visibility: Set to on (enable)	CSI ? 25 h
Set to off (disable)	CSI ? 25 l
Character Set: Set to Multinational	CSI ? 42 h
Set to National	CSI ? 42 l
Auxiliary Keypad: Set to application	ESC =
Set to numeric	ESC >
* Keyboard: Lock	CSI 2 h
Unlock	CSI 2 l
Insert/Replace: Set to Insert Mode	CSI 4 h
Set to Replace Mode	CSI 4 l
Send/Receive: Set to local echo off	CSI 12 h
Set to local echo on	CSI 12 l
Line Feed/New Line:	
Set to New Line Mode	CSI ? 20 h
Set to Line Feed Mode	CSI ? 20 l
Set the terminal to EM52 mode:	CSI ? 21
The display screen's 25th line:	
Set as part of user workspace	CSI > 10 h
Set as part of the message area	CSI > 10 l

* Can be locked in Setup.

Controlling the Screen Cursor Control

n = number; l = line number; c = column number

Move cursor up <i>n</i> line(s); no scroll up	CSI <i>n</i> A
Move cursor down <i>n</i> line(s); no scroll down	CSI <i>n</i> B
Move cursor right <i>n</i> column(s); no auto wrap	CSI <i>n</i> C
Move cursor left <i>n</i> column(s); no auto wrap	CSI <i>n</i> D
Position cursor at <i>l</i> , <i>c</i> (depends on setting of Origin Mode)	CSI <i>l</i> ; <i>c</i> H or CSI <i>l</i> ; <i>c</i> F
Move cursor down a line in same column; scroll up if at bottom margin	ESC D (IND)
Move cursor up a line in same column; scroll down if at top margin	ESC M (RI)
Move cursor to to beginning of next line; scroll up if at bottom margin	ESC E (NEL)
Save cursor-related attributes	ESC 7
Restore cursor-related attributes	ESC 8
Cursor displayed	CSI ? 25 h
Cursor not displayed	CSI ? 25 l
Block-style cursor	CSI 22 ; 0 * x
Underline-style cursor	CSI 22 ; 1 * x

Setting Margins

t = line number of top margin;

b = line number of bottom margin

t and *b* are included in the scrolling region.

Set top and bottom margins CSI *t* ; *b* r

Using Tabs

Set tab stop at cursor column	ESC H
Clear tab stop at cursor column	CSI g
	or CSI 0 g
Clear all tab stops	CSI 3 g

Editing

These actions begin at the cursor's current position:

Insert <i>n</i> blank line(s)	CSI <i>n</i> L
Delete <i>n</i> blank line(s)	CSI <i>n</i> M
Insert <i>n</i> blank characters (EM220 only)	CSI <i>n</i> @
Delete <i>n</i> characters	CSI <i>n</i> P

Line Attributes

Cursor line becomes:

top half of a double-width/double-height line	ESC # 3
bottom half of a double-width/double-height line	ESC # 4
single-width/single-height (normal)	ESC # 5
single-width/double-height	ESC # 6

Separator Line

CSI > 13 l Enable separator line.

CSI > 13 h Disable separator line.

When in 25 Line Mode and separator mode is disabled, that line is available for user messages.

Erasing Characters

Erasing includes beginning and ending positions.

* Erase <i>n</i> character(s) starting at cursor	CSI <i>n</i> X
Erase from cursor position to end of line	CSI 0 K or CSI K
Erase from start of line to cursor position	CSI 1 K
Erase the whole line	CSI 2 K
Erase from cursor position to end of screen	CSI 0 J or CSI J
Erase from start of screen to cursor position	CSI 1 J
Erase the whole screen	CSI 2 J
* Erase all erasable characters from cursor to end of line (attributes unaffected)	CSI ? 0 K or CSI ? K
* Erase all erasable characters from start of line to the cursor position	CSI ? 1 K
* Erase all the line's erasable characters	CSI ? 2 K
* Erase all erasable characters from cursor to end of screen (attributes unaffected)	CSI ? 0 J or CSI ? J
* Erase all erasable characters from start of the screen to the cursor	CSI ? 1 J
* Erase all the screen's erasable characters	CSI ? 2 J
* Set subsequent characters to be erasable	CSI 0 " q
	or
* Set subsequent characters to be nonerasable	CSI 2 " q
	CSI 1 " q
* Applies to EM220 Mode only.	

User Message Line

CSI 0 \$ } Select main display (send subsequent data to the display's user workspace).

CSI 1 \$ } Select the user message line (send subsequent data to the user message line).

If the above command is omitted, data sent to the display goes to the display's main area by default.

CSI *s* \$ ~ Use this string to specify the active message line.

s = 0 (default) In 24-line mode, no user message line. In 25-line mode, no status or user message lines.

1 In 24-line mode, no user message line. In 25-line mode, only the status line is active.

2 User message line is active.

The status line is always active in 24-line mode and in 25 Line Mode when the separator line is disabled.

B-8 Terminal Commands Summary

Graphic Renditions

Set graphic rendition(s) CSI *s* {*s*} m

<i>s</i>	<i>parameter selection</i>
0	turn off all attributes
1	bold
4	underscored
5	blinking
7	inverse (reverse) video
22	normal intensity
24	no underline
25	no blinking
27	normal video (reverse off)



Character Sets

Designating Character Sets

Designate a character set as either G0, G1, G2, G3:

ESC (*s* designates as G0
ESC) *s* designates as G1
ESC * *s* designates as G2
ESC + *s* designates as G3

s = parameter selection character set

B ASCII
< Supplemental (EM220 Mode only)
0 Special Graphics
* Name Name of a soft character set

Available in National Mode only:

A United Kingdom
R French
K German
Y Italian
Z Spanish
R Belgian
E or 6 Danish/Norwegian
H or 7 Swedish
= Swiss

*EM220 Mode only. The name of a soft character set can consist of 0, 1 or 2 intermediate characters in hex range of 20 through 2F and a final character in hex range 30 through 7E.

Invoking Character Sets

Mnemonic	Hex	Sequence	Description
LS0	0E	SO	Lock Shift G0, Left: invoke G0 into GL.
LS1	0F	SI	Lock Shift G1, Left: invoke G1 into GL.
LS1R*		ESC ~	Lock Shift G1, Right: invoke G1 into GR.
LS2*		ESC n	Lock Shift G2, Left: invoke G2 into GL.
LS2R*		ESC }	Lock Shift G2, Right: invoke G2 into GR.
LS3*		ESC o	Lock Shift G3, Left: invoke G3 into GL.
LS3R*		ESC |	Lock Shift G3, Right: invoke G3 into GR.
SS2	8E	ESC N	Single Shift G2, Left: invoke G2 into GL for only the next received graphic character
SS3	8F	ESC O	Single Shift G3, Left: invoke G3 into GL for only the next received graphic character

* EM200 Mode only.

Downloading a Soft Character Set

Use this string to download a soft character set. Up to 94 characters can be defined in the string. Applicable only for EM200 modes.

DCS *f;sc;ec;cm;wa;tf;{name bpi;bp2;...;bpn* ST

Parameter	Description
DCS	device control string introducer
<i>f</i>	font number 0 or 1
<i>cn</i>	initial character number. ASCII code of character.
<i>ec</i>	erase control: 0 or 2 = erase all characters in set 1 = erase only characters being loaded
<i>cm</i>	character matrix: 0 = 7 x 10 (default) 1 = not used 2 = 5 x 10 3 = 6 x 10 4 = 7 x 10
<i>wa</i>	width specification 0 or 1 = 80 columns 2 = 132 columns
<i>t</i>	text/full-cell 0 or 1 = text 2 = full-cell
;	separates parameters
{	denotes this as a soft font download command
<i>name</i>	name of the soft character set (see "Designating Character Sets")
<i>bp</i>	bit pattern representations for downloaded characters ASCII characters for upper columns / is required separator ASCII characters for lower columns
ST	string terminator

B-10 Terminal Commands Summary

Clearing a Soft Character Set

Clear a downloaded soft character set:

```
DCS 1; 1; 2 { sp @ ST
```

“sp” is the space character (20H). Include it in the command.

Using PC Character Sets

These commands are valid only in HP-PC Term Mode.

Turn PC Character Set Mode on: CSI > 12 h (default)

Turn PC Character Set Mode off: CSI > 12 l

When PC Character Set Mode is on, only the PC characters are available. All character set designation and invoking sequences are disabled. When PC Character Set Mode is reset (turned off), the default designations are restored.

Select a PC Character Set CSI 21 ; s * x

<i>s</i>	<i>parameter selection</i>
0 or 437	U.S. PC Character Set (default)
850	Multilingual PC Character Set
865	Danish/Norwegian PC Character Set

For the selected PC Character Set to be active, PC Character Set Mode must be **ON**.

In PC Character Set mode, received C1 control codes are displayed, not acted upon. To display a single C0 control code character symbol, precede the C0 control code with an ESC. To display a block of C0 control code character symbols, enter monitor mode.

Turn Monitor Mode on: ESC U

Turn Monitor Mode off: ESC u or ESC X

These Monitor Mode sequences are only available when PC Character Set Mode is on.

Note: When an ESC character is received in Monitor Mode, it is not displayed until the next character is received. If the next character is another ESC character, two ESC character symbols are displayed.

Other Terminal Command Functions

Programmable Keys

To program keys for functions when pressed with either ALT, SHIFT and/or CTRL or alone:

DCS *c* ; *l* | *kyn/stn* {;*kyn/stn*} ST

Available for the Fkeys in EM200 mode and for the Fkeys and middle keypad keys in HP-PC Term mode.

Parameters	Description
DCS	device control string introducer
<i>c</i>	clear parameter 0 = clear all keys (default) 1 = clear only redefined keys
<i>l</i>	lock parameter 0 = lock keys to prevent redefinition (default) 1 = don't lock keys
|	denotes this as a programmable keys sequence
<i>kyn</i>	key number
;	separates <i>c</i> and <i>l</i>
<i>stn</i>	definition string: hex pairs for each character in the string
ST	string terminator

Function Key Numbers in EM200 and HP-PC Term Modes

Key Number	Key Strokes	Key Number	Key Strokes
17	SHIFT + F1	37	CTRL + F1
18	SHIFT + F2	38	CTRL + F2
19	SHIFT + F3	39	CTRL + F3
20	SHIFT + F4	40	CTRL + F4
21	SHIFT + F5	41	CTRL + F5
23	SHIFT + F6	43	CTRL + F6
24	SHIFT + F7	44	CTRL + F7
25	SHIFT + F8	45	CTRL + F8
26	SHIFT + F9	46	CTRL + F9
28	SHIFT + F10	48	CTRL + F10
29	SHIFT + F11	49	CTRL + F11
31	SHIFT + F12	51	CTRL + F12
32	SHIFT + F13 *	52	CTRL + F13 *
33	SHIFT + F14 *	53	CTRL + F14 *
34	SHIFT + F15 *	54	CTRL + F15 *

Function Key Numbers in HP-PC Term Mode Only

Key Number	Key Strokes	Key Number	Key Strokes	Key Number	Key Stroke
57	CTRL + SHIFT + F1	77	ALT + F1	97	F1
58	CTRL + SHIFT + F2	78	ALT + F2	98	F2
59	CTRL + SHIFT + F3	79	ALT + F3	99	F3
60	CTRL + SHIFT + F4	80	ALT + F4	100	F4
61	CTRL + SHIFT + F5	81	ALT + F5	101	F5
63	CTRL + SHIFT + F6	83	ALT + F6	103	F6
64	CTRL + SHIFT + F7	84	ALT + F7	104	F7
65	CTRL + SHIFT + F8	85	ALT + F8	105	F8
66	CTRL + SHIFT + F9	86	ALT + F9	106	F9
68	CTRL + SHIFT + F10	88	ALT + F10	108	F10
69	CTRL + SHIFT + F11	89	ALT + F11	109	F11
71	CTRL + SHIFT + F12	91	ALT + F12	111	F12
72	CTRL + SHIFT + F13 *	92	ALT + F13 *	112	F13 *
73	CTRL + SHIFT + F14 *	93	ALT + F14 *	113	F14 *
74	CTRL + SHIFT + F15 *	94	ALT + F15 *	114	F15 *

B-12 Terminal Commands Summary

Parameters	Description		
Middle Keypad Key Numbers in HP-PC Term Mode Only			
Key Number	Key Strokes	Key Number	Key Strokes
1	HOME	301	CTRL + HOME
2	INSERT	302	CTRL + INSERT
3	DELETE	303	CTRL + DELETE
4	END	304	CTRL + END
5	PAGE UP	305	CTRL + PAGE UP
6	PAGE DOWN	306	CTRL + PAGE DOWN
201	SHIFT + HOME	401	CTRL + SHIFT + HOME
202	SHIFT + INSERT	402	CTRL + SHIFT + INSERT
203	SHIFT + DELETE	403	CTRL + SHIFT + DELETE
204	SHIFT + END	404	CTRL + SHIFT + END
205	SHIFT + PAGE UP	405	CTRL + SHIFT + PAGE UP
206	SHIFT + PAGE DOWN	406	CTRL + SHIFT + PAGE DOWN

Notes: A total of 512 bytes are available for the user key strings.

* F13, F14 and F15 are the three blank keys on the top row of keyboard to the left of SETUP. Of these F13 is leftmost, F15 is rightmost.

[F1] through [F15] on the HP 700/44 keyboard correspond to [F6] through [F20] on the DEC VT220 keyboard.

Printing

Auto Print Mode on	CSI ? 5 i
Auto Print Mode off	CSI ? 4 i
Print Controller Mode on	CSI 5 i
Print Controller Mode off	CSI 4 i
Print display screen	CSI i
	or CSI 0 i
Print the cursor line	CSI ? 1 i

PC Key Code Mode

Turn on PC Key Code Mode:	CSI > 11 h
Turn off PC Key Code Mode:	CSI > 11 l

PC Key Code Mode is available only in HP-PC Term Mode.

Reports

Primary device attributes request:	CSI c
(product type)	or CSI 0
Responses:	
EM100 Mode, EM100 ID	ESC [? 1;2 c
EM100 Mode, EM101 ID	ESC [? 1;0 c
EM100 Mode, EM102 ID	ESC [? 6 c
EM220 Mode	CSI ? 62;1;2; 6;7;8;9;11c
HP-PC Term Mode	CSI ? 44;1;2; 6;7;8;9;11c

Secondary device attributes request:	CSI > 0 c
(firmware and options)	
Response:	
EM220 Mode only	CSI > 1; v ; o c
(v = version, o = options)	

Terminal status request:	CSI 5 n
Responses:	
working properly	CSI 0 n
malfunctioning	CSI 3 n

Cursor position request:	CSI 6 n
Response:	CSI r ; c R
(r = row, c = column)	

Printer status request:	CSI ? 15 n
Responses:	
Printer is ready	CSI ? 10 n
Printer is not ready	CSI ? 11 n
Printer is not connected	CSI ? 13 n

Function key status request:	CSI ? 25 n
Responses:	
Function keys are unlocked	CSI ? 20 n
Function keys are locked	CSI ? 21 n

Keyboard Key Codes

This table lists hex values. AP = Auxiliary Keypad.

Key	Down	Up	Key	Down	Up
A	1E	9E	CTRL (rt)	E0 1D	E0 9D
B	30	B0	CTRL (lft)	1D	9D
C	2E	AE	ALT (rt)	E0 38	E0 B8
D	20	A0	ALT (lft)	38	B8
E	12	92	!	02	82
F	21	A1	2@	03	83
G	22	A2	3#	04	84
H	23	A3	4\$	05	85
I	17	97	5%	06	86
J	24	A4	6^	07	87
K	25	A5	7&	08	88
L	26	A6	8*	09	89
M	32	B2	9(	0A	8A
N	31	B1	0)	0B	8B
O	18	98	- _	0C	8C
P	19	99	+ =	0D	8D
Q	10	90	[{	1A	9A
R	13	93	]}	1B	9B
S	1F	9F	' ~	29	A9
T	14	94	::	27	A7
U	16	96	"	28	A8
V	2F	AF	, <	33	B3
W	11	91	. >	34	B4
X	2D	AD	/?	35	B5
Y	15	95	\ |	2B	AB
Z	2C	AC	NUM LCK	45	C5
RETURN	1C	9C	SCRL LCK	46	C6
SPACE	39	B9	1 (AP)*	4F	CF
SHIFT (rt)	36	B6	2 (AP)	50	D0
SHIFT (lft)	2A	AA	3 (AP)	51	D1
CAP LOCK	3A	BA	4 (AP)	4B	CB
BCK SPC	0E	8E	5 (AP)	4C	CC
TAB	0F	8F	6 (AP)	4D	CD
ESC	01	81	7 (AP)	47	C7
F1	3B	BB	8 (AP)	48	C8
F2	3C	BC	9 (AP)	49	C9
F3	3D	BD	0 (AP)	52	D2
F4	3E	BE	. (AP)	53	D3
F5	3F	BF	/ (AP)	E0 35	E0 B5
F6	40	C0	shifted / (AP)	E0 AA E0 35	E0 B5 E0 2A
F7	41	C1	* (AP)	37	B7
F8	42	C2	- (AP)	4A	CA
F9	43	C3	+ (AP)	4E	CE
F10	44	C4	ENTER (AP)	E0 1C	E0 9C
F11	57	D7	* PAUSE/	E1 1D 45	E1 9D C5
F12	58	D8	* (shifted) BRK	E0 46	E0 C6

* Codes are sent on the down stroke of the key ONLY.

	Down/Up	Down/Up	Down/Up
	Normal or SHIFT + NUM LCK	Shifted	NUM LOCK
INSERT	E0 52/E0 D2	E0 AA E0 52/E0 D2 E0 2A	E0 2A E0 52/E0 D2 E0 AA
HOME	E0 47/E0 C7	E0 AA E0 47/E0 C7 E0 2A	E0 2A E0 47/E0 C7 E0 AA
PG UP	E0 49/E0 C9	E0 AA E0 49/E0 C9 E0 2A	E0 2A E0 49/E0 C9 E0 AA
DELETE	E0 53/E0 D3	E0 AA E0 53/E0 D3 E0 2A	E0 2A E0 53/E0 D3 E0 AA
END	E0 4F/E0 CF	E0 AA E0 4F/E0 CF E0 2A	E0 2A E0 4F/E0 CF E0 AA
PG DN	E0 51/E0 D1	E0 AA E0 51/E0 D1 E0 2A	E0 2A E0 51/E0 D1 E0 AA
UP ARROW	E0 48/E0 C8	E0 AA E0 48/E0 C8 E0 2A	E0 2A E0 48/E0 C8 E0 AA
DN ARROW	E0 50/E0 D0	E0 AA E0 50/E0 D0 E0 2A	E0 2A E0 50/E0 D0 E0 AA
LFT ARROW	E0 4B/E0 CB	E0 AA E0 4B/E0 CB E0 2A	E0 2A E0 4B/E0 CB E0 AA
RT ARROW	E0 4D/E0 CD	E0 AA E0 4D/E0 CD E0 2A	E0 2A E0 4D/E0 CD E0 AA
PRT SCRN	E0 2A E0 37 / E0 B7 E0 AA E0 37 / E0 B7 54 / D4	(normal) (shift or control) (ALT + PRT SCRN)	

Setting Start and Stop Characters

DCS *Pd* * * * *x* *start or stop / hex pair* { ; *start or stop / hex pair* } ST

Pd 0 = Redefine start and stop characters referenced later in command.
1 = Set start and stop characters to default values.

* * * Required as part of command.

start or stop 0 = define the start character
1 = define the stop character

/ Required as part of command.

hex pair ASCII representation of the new start or stop character.
Example: For start character "A" = 41H use two ASCII characters, a "4" and "1".

; *start or stop / hex pair* Repetition of this part of the command allows setting of both start and stop characters in one sequence. Note that the semicolon is used as a delimiter between the start and stop command sequences.

This command, while available in all compatibility modes, generally is used only in conjunction with PC scan codes.

EM52 Mode Escape Sequences

Sequence	Description
ESC A	Cursor up
ESC B	Cursor down
ESC C	Cursor right
ESC D	Cursor left
ESC F	Select and enable alternate character set
ESC G	Select and enable base character set
ESC H	Home cursor
ESC I	Reverse linefeed
ESC J	Erase to end of screen
ESC K	Erase to end of line
ESC Y Ln Cn	Direct cursor address
ESC Z	Identify
ESC =	Enter alternate keypad mode
ESC >	Exit alternate keypad mode
ESC <	Go to ANSI mode

C

PC Character Sets

The tables in this appendix contain the terminal's three PC character sets and their decimal values, 000 through 255.

The terminal's three PC character sets are U.S. (Code Page 437), Multilingual (Code Page 850), and Danish/Norwegian (Code Page 865).

The PC character sets can be used only when the terminal is in HP-PC Term Mode and in PC Character Set Mode. These modes can be set programmatically or in Setup.

The PC character sets are part of the terminal's repertoire of character sets. (The terminal's other character sets are DEC-compatible.) Only one PC character set can be active at a time.

NOTE

Some keyboards have a § (section sign) keycap. However, when the active PC character set is U.S. or Danish/Norwegian, the § can be displayed only when Monitor Mode is on or by using the Display Single Control command.

Table C-1. U.S. PC Character Set

Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic
0		32		64	@	96	`	128	Ç	160	á	192	ı	224	α
1	☺	33	!	65	A	97	a	129	ü	161	í	193	⊥	225	β
2	☉	34	"	66	B	98	b	130	é	162	ó	194	τ	226	Γ
3	♥	35	#	67	C	99	c	131	â	163	ú	195	†	227	π
4	♦	36	\$	68	D	100	d	132	ä	164	ñ	196	—	228	Σ
5	♣	37	%	69	E	101	e	133	à	165	Ñ	197	‡	229	σ
6	♠	38	&	70	F	102	f	134	å	166	ä	198	‡	230	μ
7	•	39	´	71	G	103	g	135	ç	167	ø	199	‡	231	τ
8	■	40	(	72	H	104	h	136	ê	168	ı	200	⊥	232	Φ
9	○	41	)	73	I	105	i	137	ë	169	Γ	201	⊥	233	Θ
10	■	42	*	74	J	106	j	138	è	170	⌋	202	⊥	234	Ω
11	♂	43	+	75	K	107	k	139	ï	171	½	203	⊥	235	δ
12	♀	44	,	76	L	108	l	140	î	172	¼	204	‡	236	∞
13	🎵	45	-	77	M	109	m	141	ı	173	ı	205	=	237	φ
14	🎵	46	.	78	N	110	n	142	Ä	174	«	206	‡	238	ε
15	✳	47	/	79	O	111	o	143	Å	175	»	207	⊥	239	∩
16	▶	48	0	80	P	112	p	144	É	176	⋮	208	⊥	240	≡
17	◀	49	1	81	Q	113	q	145	æ	177	⋮	209	‡	241	±
18	↕	50	2	82	R	114	r	146	Æ	178	⋮	210	π	242	≧
19	!!	51	3	83	S	115	s	147	ô	179	|	211	⊥	243	≦
20	¶	52	4	84	T	116	t	148	ö	180	†	212	⊥	244	∩
21	§	53	5	85	U	117	u	149	ò	181	‡	213	F	245	∩
22	▪	54	6	86	V	118	v	150	û	182	‡	214	π	246	±
23	↕	55	7	87	W	119	w	151	ù	183	π	215	‡	247	≈
24	↑	56	8	88	X	120	x	152	ÿ	184	‡	216	‡	248	°
25	↓	57	9	89	Y	121	y	153	Ö	185	‡	217	∩	249	●
26	→	58	:	90	Z	122	z	154	Ü	186	||	218	∩	250	•
27	←	59	;	91	[	123	{	155	ç	187	π	219	■	251	√
28	↳	60	<	92	\	124	|	156	£	188	⋮	220	■	252	"
29	↔	61	=	93	]	125	}	157	¥	189	⋮	221	■	253	²
30	▲	62	>	94	^	126	~	158	Ps	190	‡	222	■	254	■
31	▼	63	?	95	_	127	□	159	f	191	∩	223	■	255	■

C-2 PC Character Sets

Table C-2. Multilingual PC Character Set

Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic
0		32		64	@	96	`	128	Ç	160	á	192	˘	224	Ó
1	☺	33	!	65	A	97	a	129	ü	161	í	193	˙	225	ß
2	☹	34	"	66	B	98	b	130	é	162	ó	194	˚	226	Ô
3	♥	35	#	67	C	99	c	131	â	163	ú	195	˛	227	Ò
4	♦	36	\$	68	D	100	d	132	ä	164	ñ	196	˜	228	õ
5	♣	37	%	69	E	101	e	133	à	165	Ñ	197	†	229	Õ
6	♠	38	&	70	F	102	f	134	å	166	ä	198	ã	230	μ
7	•	39	^	71	G	103	g	135	ç	167	ç	199	Ã	231	ρ
8	■	40	(	72	H	104	h	136	ê	168	ˆ	200	℄	232	ρ
9	○	41	)	73	I	105	i	137	ë	169	®	201	ℓ	233	Ú
10	◼	42	*	74	J	106	j	138	è	170	⌈	202	≡	234	Û
11	♂	43	+	75	K	107	k	139	ï	171	½	203	ℓ	235	Û
12	♀	44	,	76	L	108	l	140	î	172	¼	204	ℓ	236	ý
13	♪	45	-	77	M	109	m	141	ì	173	ı	205	=	237	Ý
14	♫	46	.	78	N	110	n	142	Ä	174	«	206	≠	238	˘
15	✳	47	/	79	O	111	o	143	Å	175	»	207	℄	239	˘
16	▶	48	0	80	P	112	p	144	É	176	⋯	208	ö	240	˘
17	◀	49	1	81	Q	113	q	145	æ	177	⋯	209	D	241	±
18	↕	50	2	82	R	114	r	146	Æ	178	⋯	210	Ê	242	=
19	!!!	51	3	83	S	115	s	147	ô	179	|	211	Ë	243	¼
20	¶	52	4	84	T	116	t	148	ö	180	†	212	È	244	¶
21	§	53	5	85	U	117	u	149	ò	181	Á	213	ı	245	§
22	▪	54	6	86	V	118	v	150	û	182	Â	214	Í	246	÷
23	↕	55	7	87	W	119	w	151	ù	183	À	215	Î	247	˘
24	↑	56	8	88	X	120	x	152	ÿ	184	©	216	Ï	248	°
25	↓	57	9	89	Y	121	y	153	Ö	185	¶	217	ı	249	˘
26	→	58	:	90	Z	122	z	154	Ü	186	||	218	ı	250	•
27	←	59	;	91	[	123	{	155	ø	187	¶	219	■	251	ı
28	˘	60	<	92	\	124	|	156	£	188	¶	220	■	252	3
29	↔	61	=	93	]	125	}	157	Ø	189	¶	221	ı	253	2
30	▲	62	>	94	^	126	˘	158	×	190	¥	222	ı	254	■
31	▼	63	?	95	—	127	□	159	f	191	ı	223	■	255	

Table C-3. Danish/Norwegian PC Character Set

Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic	Decimal	Graphic
0		32		64	@	96	`	128	Ç	160	á	192	ˆ	224	α
1	☺	33	!	65	A	97	a	129	ü	161	í	193	˜	225	β
2	●	34	"	66	B	98	b	130	é	162	ó	194	τ	226	Γ
3	♥	35	#	67	C	99	c	131	â	163	ú	195	†	227	π
4	♦	36	\$	68	D	100	d	132	ä	164	ñ	196	—	228	Σ
5	♣	37	%	69	E	101	e	133	à	165	Ñ	197	+	229	σ
6	♠	38	&	70	F	102	f	134	å	166	ä	198	†	230	μ
7	•	39	'	71	G	103	g	135	ç	167	ø	199	†	231	τ
8	■	40	(	72	H	104	h	136	ê	168	ı	200	⊥	232	Φ
9	○	41	)	73	I	105	i	137	ë	169	⌈	201	⌈	233	Θ
10	◐	42	*	74	J	106	j	138	è	170	⌋	202	⊥	234	Ω
11	♂	43	+	75	K	107	k	139	ï	171	½	203	⌈	235	δ
12	♀	44	,	76	L	108	l	140	î	172	¼	204	⌈	236	∞
13	♪	45	-	77	M	109	m	141	ï	173	ı	205	=	237	φ
14	♫	46	.	78	N	110	n	142	Ä	174	«	206	⌈	238	ε
15	✳	47	/	79	O	111	o	143	Å	175	⌘	207	⊥	239	∩
16	▶	48	0	80	P	112	p	144	É	176	⌘	208	⊥	240	≡
17	◀	49	1	81	Q	113	q	145	æ	177	⌘	209	⌈	241	±
18	↕	50	2	82	R	114	r	146	Æ	178	⌘	210	⌈	242	≥
19	!!	51	3	83	S	115	s	147	ô	179	|	211	⊥	243	≤
20	¶	52	4	84	T	116	t	148	ö	180	†	212	⊥	244	∩
21	§	53	5	85	U	117	u	149	ò	181	†	213	⌈	245	∪
22	▪	54	6	86	V	118	v	150	û	182	⌈	214	⌈	246	÷
23	↕	55	7	87	W	119	w	151	ù	183	⌈	215	⌈	247	≈
24	↑	56	8	88	X	120	x	152	ÿ	184	†	216	⌈	248	°
25	↓	57	9	89	Y	121	y	153	Ö	185	⌈	217	⌈	249	●
26	→	58	:	90	Z	122	z	154	Û	186	⌈	218	⌈	250	•
27	←	59	;	91	[	123	{	155	ø	187	⌈	219	■	251	√
28	˘	60	<	92	\	124	|	156	£	188	⌈	220	■	252	"
29	↔	61	=	93	]	125	}	157	Ø	189	⌈	221	■	253	²
30	▲	62	>	94	^	126	-	158	Þ	190	†	222	■	254	■
31	▼	63	?	95	_	127	□	159	f	191	†	223	■	255	■

C-4 PC Character Sets

D

International Keyboards

Figure D-1. Belgian

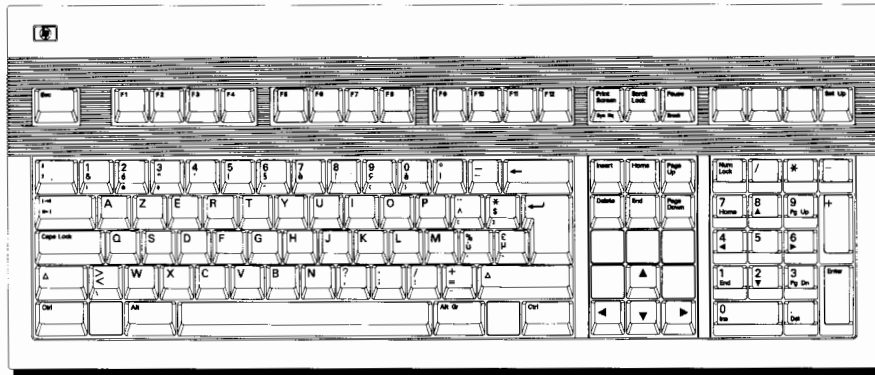


Figure D-2. French

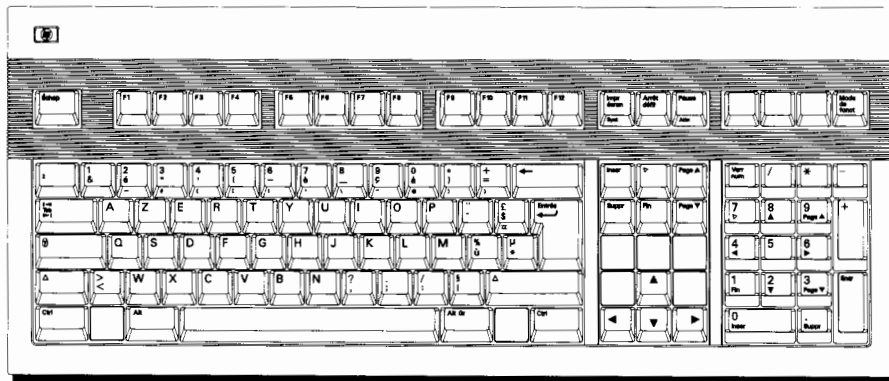


Figure D-3. German

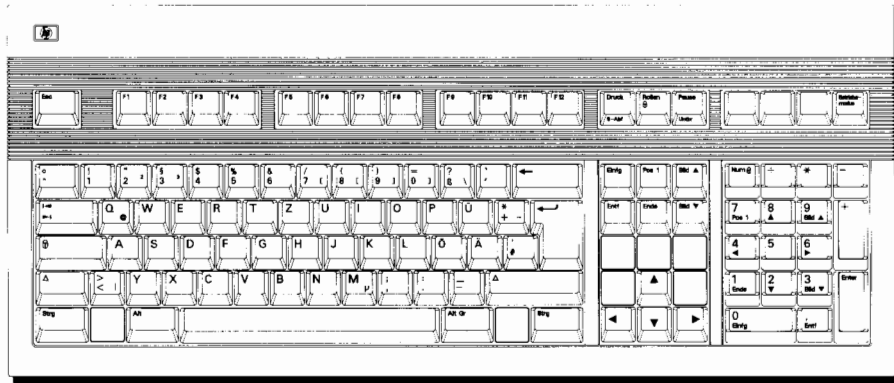


Figure D-4. Italian

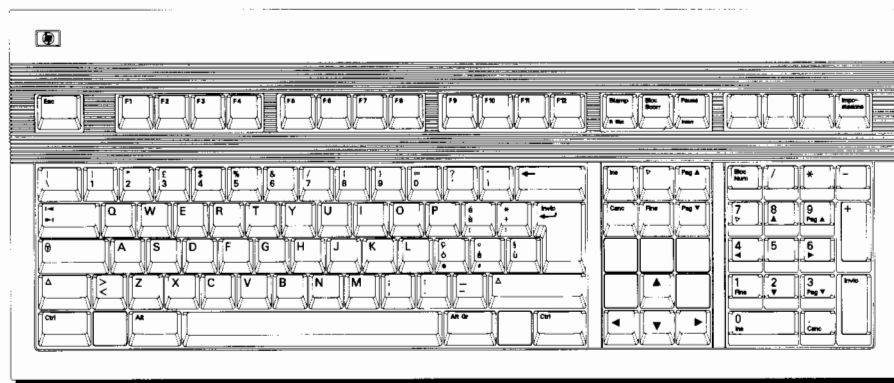
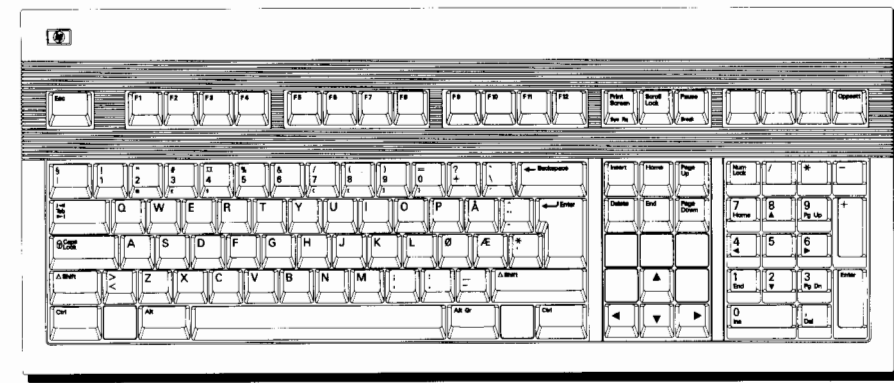


Figure D-5. Norwegian



D-2 International Keyboards

Figure D-9. British

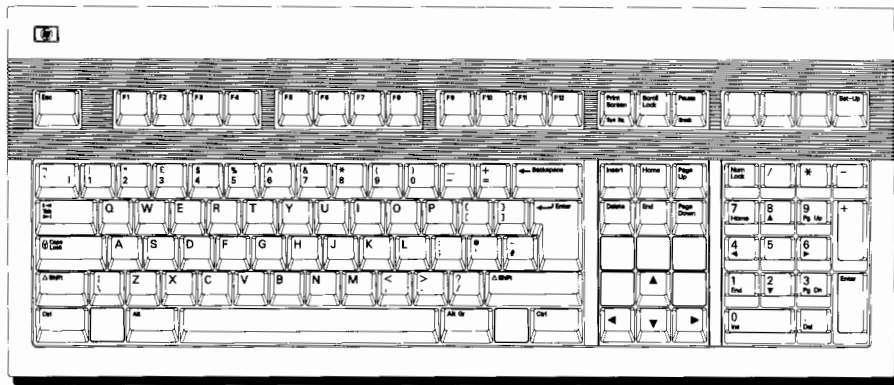
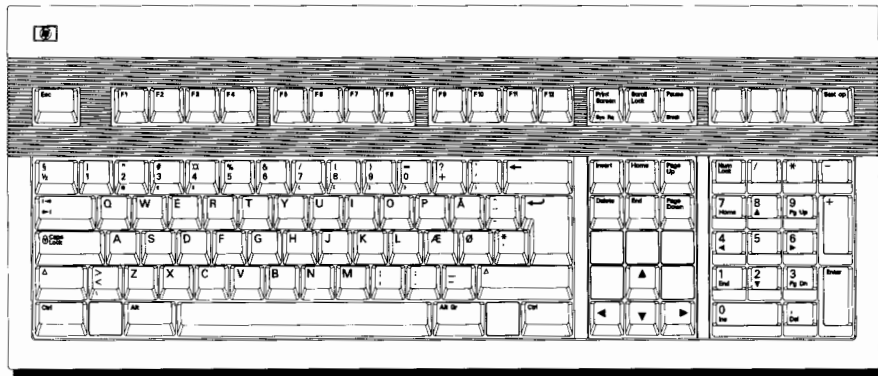


Figure D-10. Danish



D-4 International Keyboards



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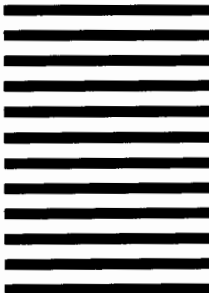
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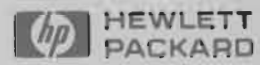


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