HP700/22

USER'S MANUAL

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The VT220, VT100 and VT52 terminals are products of Digital Equipment Corporation.

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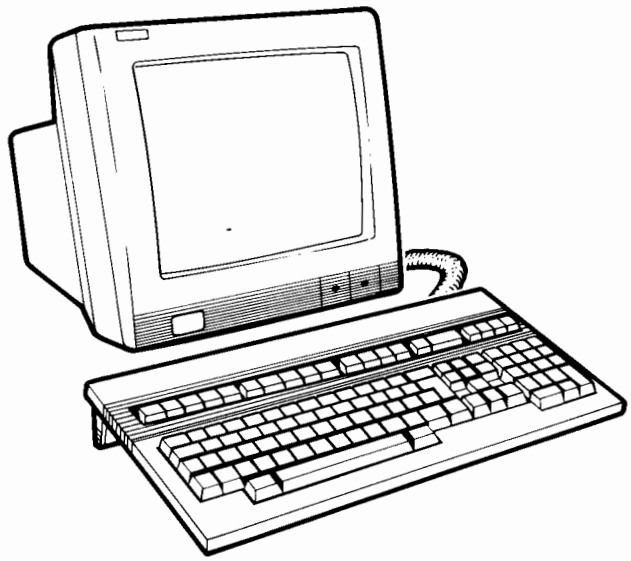
Preface

The HP 700/22 Display Terminal is a versatile, high-performance, low-cost, ANSI-compatible terminal. Designed and built in the Hewlett-Packard tradition of quality, the HP 700/22 offers ergonomic features, powerful functionality and exceptional display quality.

The HP 700/22 is 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

Display Screen

- 14 inch; choice of flicker free soft white, green or amber phosphor
- 24 lines for data, plus one line for status messages
- 13 x 11 dot matrix in a 18 x 14 character cell (80 columns)
- 9 x 11 dot matrix in a 12 x 14 character cell (132 columns)
- Superior character formation with true descenders
- CRT screen saver
- Single and double height/width characters

Keyboard

- VT220-compatible, 106 key keyboard with tactile feedback
- 21 unshifted function keys for application use
- 30 programmable keys
- Keyboard available in 15 national layouts
- User definable character set

Communications

- EIA Standard RS-232C or 20mA current loop standard
- Data communication baud rates up to 38400
- DEC-compatible 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
- Erasable characters attribute
- Block/underline cursor
- Keyclick enable/disable
- Selectable refresh rates of 50, 60 or 72Hz
- Compose character capability

Where to Find More Information

If you need more detailed information about the terminal, or intend to write programs for the terminal, refer to the "HP 700/22 Reference Manual". You can obtain the "HP 700/22 Reference Manual" (part number C1004-90001) by contacting your local HP Sales Office. Or, in the U.S.A., call HP's Direct Marketing Division at (800) 538-8787.

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1

Installation

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

Getting Ready

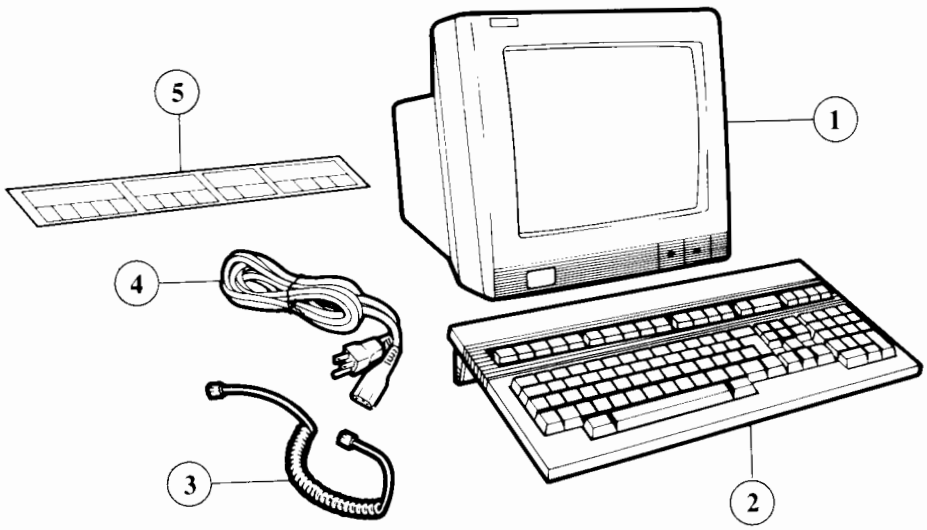
If the terminal is still in its shipping container, unpack the terminal. You should have the display unit, keyboard, keyboard cable, power cord, and a keyboard overlay template. Keep the container and other packing material in case the terminal has to be repacked at a later date.

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 5) Keyboard Overlay Template

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. Modem connection is only via EIA interface.

- If you are going to connect the terminal to a computer or modem via EIA 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.

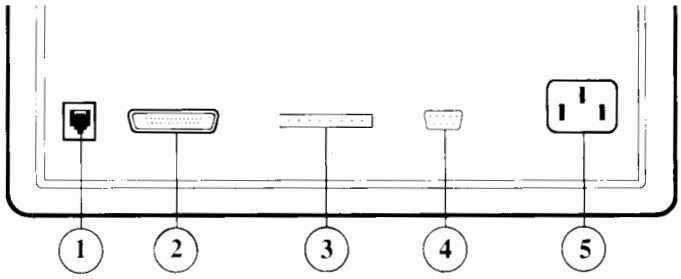
In addition, if you are going to connect the terminal to a printer, you will need a 9-pin female cable for that purpose, as well.

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 700/22 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 700/22 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 700/22 Display Terminal to your computer or modem, and if applicable, to a printer.

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 EIA 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 labelled 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, connect the printer's 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 screw driver 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.

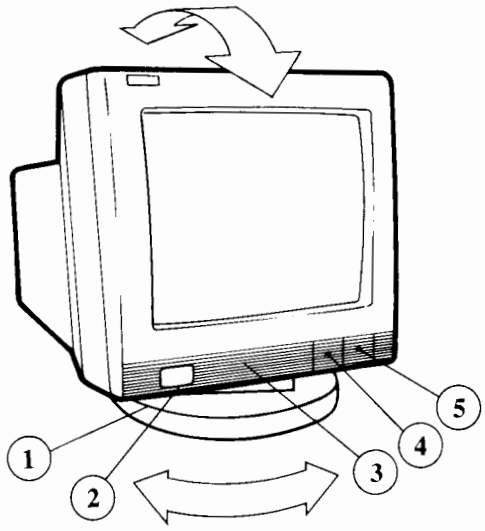
You'll hear two beeps when you turn on the terminal. The terminal performs a quick self-test every time it's powered on. If there are any problems, refer to Chapter 4, "Troubleshooting".

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 it 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

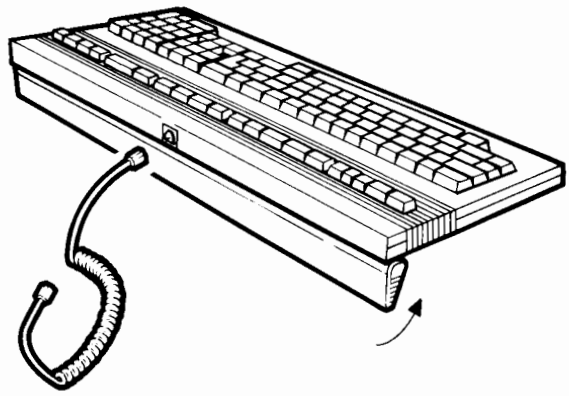
The brightness and contrast controls are slide switches under the front right corner of the terminal. You can slide these switches to the left and right to adjust screen brightness and contrast.

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 Adjustments



2

Terminal Setup

Introduction

This chapter tells you how to use the HP 700/22'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 occassionally 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. Use the worksheet at the end of this manual to write down the Setup information you need.

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	Inhibit Auto Wrap
Clear Communications	New Line
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	Terminal Test
Cursor Off	Port 1 Test
Light Background	Port 2 Test

Communications Setup Menu

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

Keyboard Setup Menu

Keyboard Language	Auto Repeat
Keyclick	Answerback =
Margin Bell	Auto Answerback
Warning Bell	Conceal Answerback
Data Processing Keys	Clear All Tabs
Shift Lock	Set 8 Column Tabs
Break	Tabs Ruler

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.

```
[Next Screen]=Next Setup    <arrows>    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 [Next Screen] key.

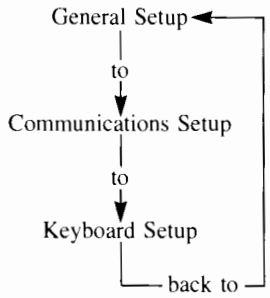
2. Select the field you want to change by pressing the arrow (cursor movement) keys. A field is highlighted when it is selected.

3. Press the [Enter] key to change a highlighted value or to perform a Setup action.

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

[Next Screen]= Next Setup	Press the [Next Screen] key when you want to display the next Setup menu. [Next Screen] 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.
[Enter]=Select	Press the [Enter] key 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 Communications, Reset Terminal, Recall, Save, Default, Setup English, Terminal Test, Port 1 Test, Port 2 Test, Conceal Answerback, Clear All Tabs and Set 8 Column Tabs. Pressing the [Enter] key when one of these fields is highlighted causes the indicated function to be performed. For instance, when Recall 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.

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. 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 decribes 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.

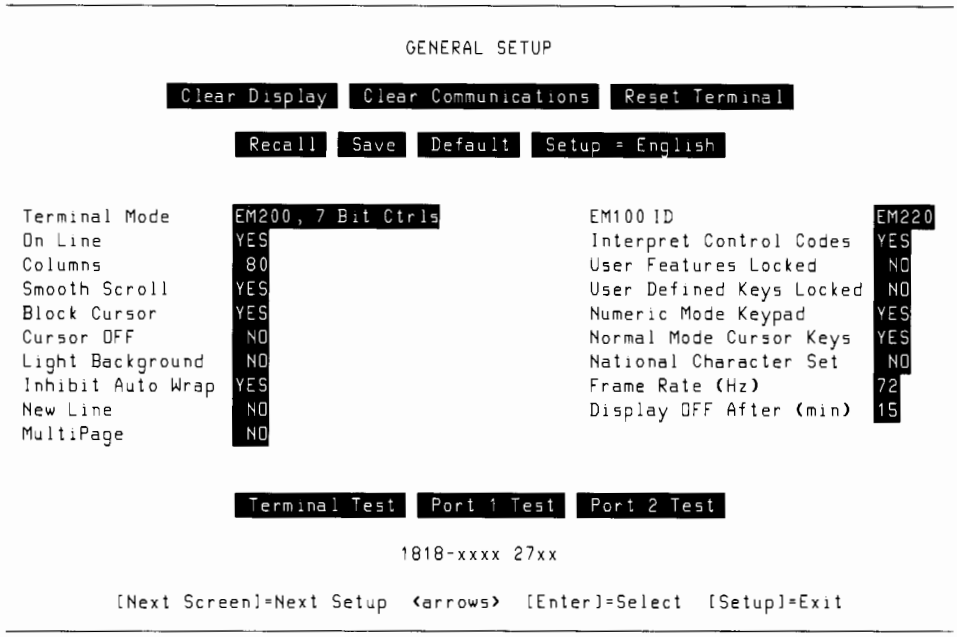


Table 2-3. Fields of the General Setup Menu

Field	Choices	Description
Clear Display	-	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.
Clear Communications	-	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.
Reset Terminal	-	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.)
Recall	-	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.)
Save	-	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.
Default	-	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.
Setup	English Francais Deutsch	Selects the language used in the Setup menus.

NOTE

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.

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

Field	Choices	Description
Terminal Mode	**EM200, 7 Bit Ctrls** **EM200, 8 Bit Ctrls** **EM52** **EM100**	- VT200 Mode, 7 bit controls - VT200 Mode, 8 bit controls - VT52 Mode - VT100 Mode
On line	**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.
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 Return key is pressed.
MultiPage	**NO** **YES**	**NO** sets terminal to single page (24 lines). **YES** sets terminal to 4 pages of memory.
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**.

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

Field	Choices	Description
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.
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 Multinational 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 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.
Terminal Test	-	Exits Setup Mode and starts the terminal test. When the test is completed, the terminal's test pattern is displayed.
Port 1 Test	-	Requires additional equipment to be run. Do not select this field.
Port 2 Test	-	Requires additional equipment to be run. Do not seleet 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.

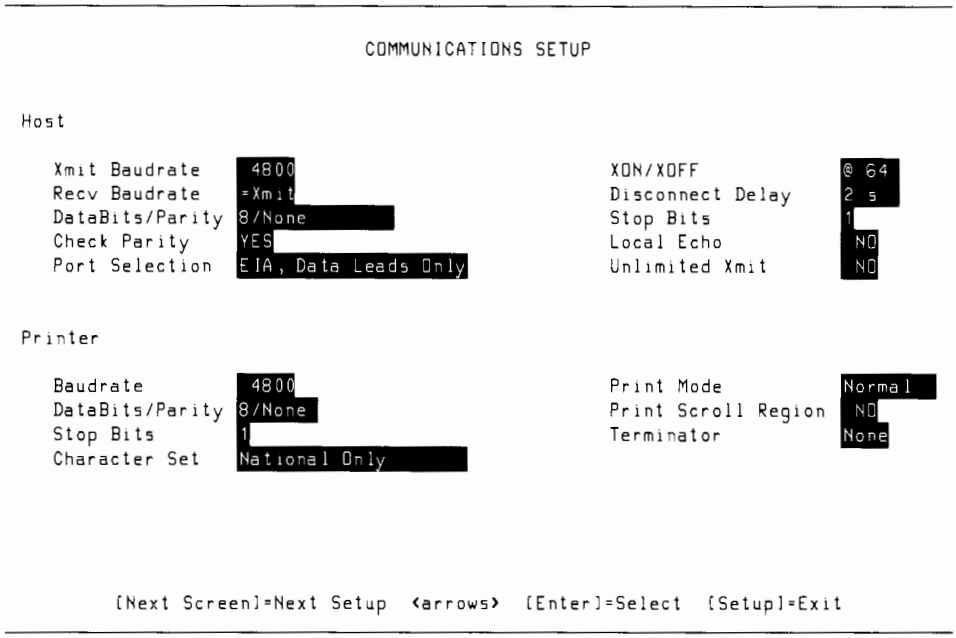


Table 2-4. Communications Setup Menu: Host Fields

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

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	**YES** **NO**	Selects checking or ignoring parity for each received data byte.
Port Selection	**EIA Port, Data Leads Only** **EIA Port, Modem Control** **20mA Port**	Sets the terminal for: - 3-wire EIA interface - Modem using the EIA Port - Current loop interface
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. **2 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.

Table 2-5. Communications Setup Menu: Printer Fields

NOTE

The HP 700/22 Display Terminal's printer port supports Xon/Xoff and DTR handshaking.

Field	Choices	Description
Baud Rate	**75** **110** **1345** **150** **300** **600** **1200** **1800** **2400** **4800** **9600** **19200** **38400**	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)

NOTE

The Character Set field specifies the character set(s) the terminal uses to send data to a printer attached the terminal. Choose the character set selection supported by the printer.

Field	Choices	Description
Character Set	**National Only**	- Uses the ASCII or specified national character set.
	National & Line Drwg	- Can use both the ASCII and line drawing character sets.
	Multinational	- Uses a multinational character set.

NOTE

The Print Mode field specifies the print modes that will be used with a printer that is attached to the terminal.

Print Mode	**Normal**	- Print functions can be invoked from the keyboard or via escape sequences.
	Auto	- The cursor line is printed whenever a linefeed, vertical tab or form feed character is received by the terminal.
	Controller	- Data is passed on to the printer without being displayed on the screen.
Print Scroll Region	**NO** **YES**	If **NO**, the Print Screen 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**).

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.

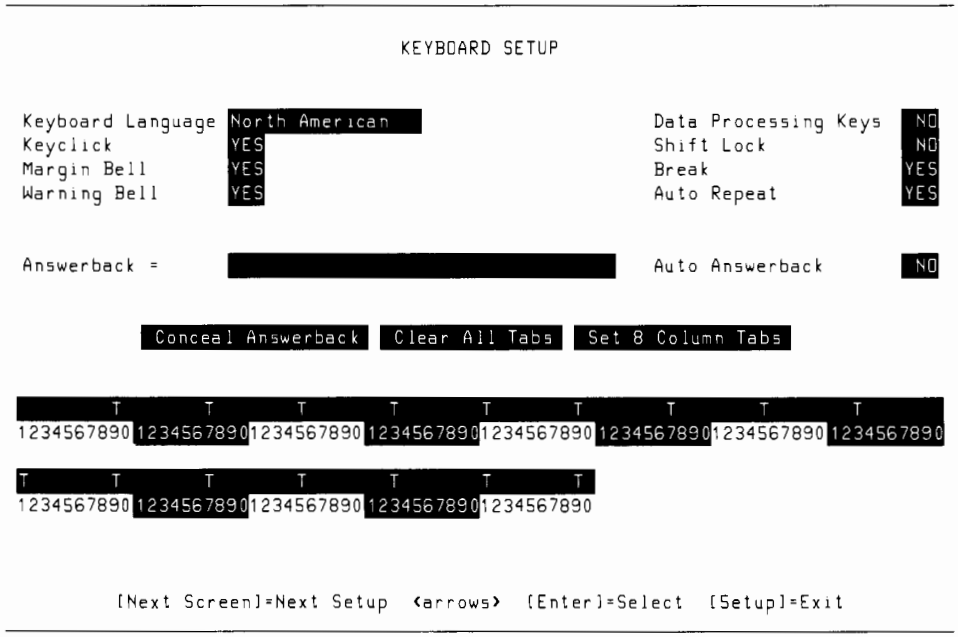


Table 2-6. Fields in the Keyboard Setup Menu

Field	Choices	Description
Keyboard Language	**North American** **British** **Flemish** **Canadian (French)** **Danish** **Finnish** **German** **Dutch** **Italian** **Swiss (French)** **Swiss (German)** **Swedish** **Norwegian** **French/Belgian** **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.

NOTE

If you are using the North American keyboard, select **NO** for the Data Processing Keys field. For any other keyboard, choose the values that fit your application requirements.

Data Processing Keys	**NO** **YES**	**NO**: Specifies that characters on the left side of the keycaps will be used. **YES**: Specifies that characters of the right side of the keycaps will be used.

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

NOTE

The Shift Lock field specifies the function of the [Lock] key. When [Lock] is pressed, Lock is displayed on the Status Line, and either Caps Lock Mode or Shift Lock mode is enabled. Pressing [Lock] again turns off the Lock mode.

Field	Choices	Description
Shift Lock	**NO**	- Caps Lock Mode is active. All alphabetic keys send uppercase characters.
	YES	- Shift Lock Mode is active. All alphabetic keys send uppercase characters, and the numeric/symbol keys send the characters at top of their keycaps. Pressing [Shift] also turns off this Lock mode.
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.

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	**YES** **NO**	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.
Tabs 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

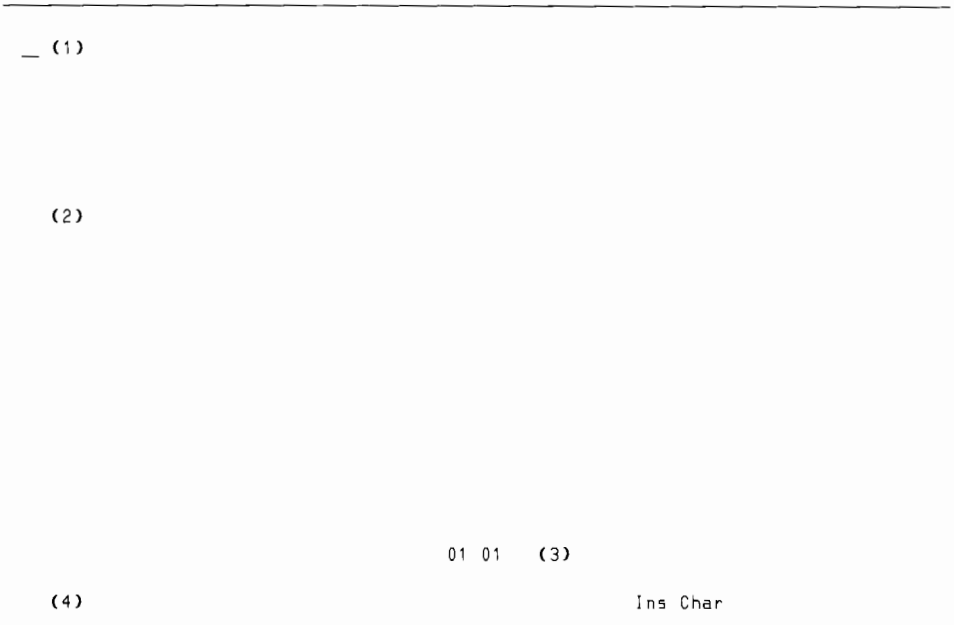
If you don't know how to turn the terminal on and off or adjust its controls, refer to the last two pages of Chapter 1.

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 700/22 Display Screen



1) The Cursor 2) 24 Lines of User Area (80 or 132 columns)
3) Cursor Position 4) Status Line

The Screen Areas

The top 24 lines of the screen are the user workspace. It displays a single page of display memory.

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

Line 25 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 the first line and first column.

The bottom line of the screen is the terminal's Status Line. It displays brief messages indicating the terminal's status.

The Cursor

The cursor indicates where the next character you type will appear on the screen. The cursor style is block or an underline, selectable in Setup Mode.

Status Line Messages

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

Specific areas of the status line are reserved for the messages. The figure below illustrates all the possible status messages and the positions where they will appear.

```
KB Lockd   Compose                          Lock   Ins Char   HOLD   L1L2L3L4
```

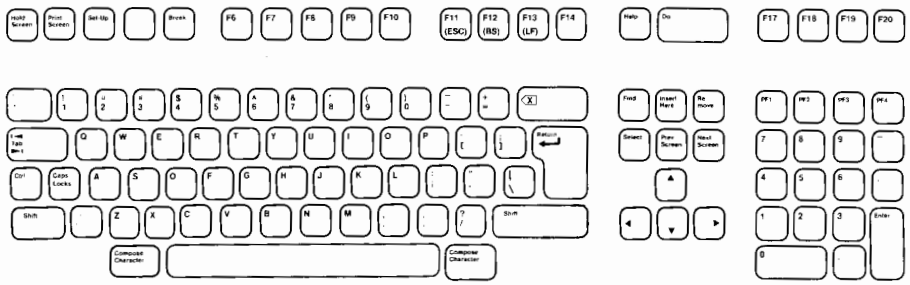
Table 3-1. Status Line Messages

Message	Description
KB Locked	The keyboard is in a locked state. Refer to Chapter 4 **Troubleshooting** if the condition persists.
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.
Compose	Indicates you have started a compose character sequence. See the "Compose Character" section of this chapter.
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.
HOLD	The [Hold Screen] key has been pressed preventing data from reaching the screen. Press [Hold Screen] to clear.
L1 L2 L3 L4	The meanings of these symbols depend on the application program.

The Keyboard

There are 105 keys on the HP 700/22's keyboard.

Figure 3-2. The HP 700/22 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

Ctrl	This key is used with certain keys to provide predefined functions. Press the indicated key while holding down Ctrl.
Compose character	This key lets you display characters that are not on the keyboard's keycaps. Refer to the "Composing Characters" section later in this chapter.
⌫	(Delete key) In most applications, pressing this key moves the cursor left one space, erasing the character at that space. The effect of this key always depends upon the application program.
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.
Return	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 Return indicates that you have completed an operation.
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.

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. The cursor keys also have the following functions when they are pressed while holding down the shift key:

- ▲ + 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 edit keys perform the functions indicated by their keycaps (in most applications). Except as described below, these keys are operative only in VT220 modes.

When the terminal is in Multipage Mode, pressing Prev Screen while holding down Shift displays the previous page (24 lines) in display memory. Next Screen + Shift displays the next page in display memory.

Auxiliary Keypad

The Auxiliary Keypad can operate in either of two modes: Numeric Mode or Application Mode. The mode of operation can be specified in Setup (using the `Numeric Mode Keypad` field) or by application programs.

In Numeric Mode, this keypad sends the characters on its keycaps. To facilitate rapid entry of numeric data, the keypad is arranged like a calculator.

In Application Mode, the Auxiliary Keypad sends predefined codes that can be used by applications for special purposes. The manuals for your applications should explain any special functions that have been assigned to these keys.

The PF1, PF2, PF3 and PF4 keys on the top row of the Auxiliary Keypad are "program function" keys that also can be used by application programs for specialized functions.

The Enter key has the same effect as the Return key in most applications. Also, Enter is used to select values in Setup Mode.

The Auxiliary Keypad always reverts to Numeric Mode when the terminal is powered on or reset.

Top Row Keys

The top row of keys on the keyboard contains keys that have predefined functions and keys that are designed to be used by application software.

When your terminal is in VT220 Mode, application programs can assign special functions to keys [F6] through [F20] including the [Help] and [Do] keys. These keys can be designated to perform special functions when they are pressed while holding down either the [Shift] or [Ctrl] keys. Consult your application software manuals to see if special functions have been assigned to these keys.

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

Table 3-3. Top Row Keys

Key	Description
[Hold Screen]	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 has been disabled.)
[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.
[Setup]	Press this key to enter and exit Setup Mode.
[Break]	Pressing this key sends a break signal for 250 milliseconds, the effect of which depends upon your computer's programming. Pressing [Break] 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 [Break] while holding down the [Ctrl] key sends the answerback message (if one has been defined) to the computer.
[F11 Esc]	In VT100 and VT52 modes this key sends an escape character.
[F12 BS]	In VT100 and VT52 modes this key sends the backspace (BS) character, which normally moves the cursor back one space.
[F13 LF]	In VT100 and VT52 modes this key sends the line feed (LF) character, which normally moves the cursor down one line in the same column.

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.

Composing Characters

The HP 700/22 Display Terminal's compose character feature lets you generate characters that aren't listed on the keyboard. Tables 3-4 and 3-5 list the more than 90 extra characters available through this feature.

The basis of how you can use this 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 **Danish**, then you can access the compose characters in the Danish section of Table 3-5.

There are two ways to compose characters: the three-key sequence and the two-key sequence. The two-key sequence is the faster method of the two, but more characters are available to you via the three-key sequence.

NOTE

If your keyboard language is set to North American, then the only compose character method you can use is the three-key sequence method. All other keyboard languages allow you to use either the three-key sequence or two-key sequence method.

Three-Key Sequence

1. Locate the character you want to compose in the left hand column of Table 3-4 or 3-5.
2. Press the [Compose Character] key. `Compose` is displayed in the Status Line.
3. Type the two corresponding characters from the middle ("Three-Key Sequence") column.

For example, to generate ¢ (the cent sign), press [Compose Character], 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 corresponding two characters in the right hand column.

In the two-key sequence, the first character typed is a diacritical character. These are the grave accent (`), acute accent (´), circumflex (^), tilde (~), umlaut (¨) and ring mark (°). When you type one of these diacritical characters, `Compose` is displayed on the Status Line. The second character completes the sequence. You must type the diacritical character first.

Completing or Aborting a 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 terminal's bell sounds (if the warning bell has been enabled in Setup) and the sequence is aborted.

If you accidentally begin a compose sequence, you can abort it by pressing the (X) key or a function key. The warning bell is not invoked.

Table 3-4 Multinational Mode Compose Character Sequences

"*Or*" indicates two or more possible sequences for the same character.

Compose Character	Three-Key Sequence	Two-Key Sequence
" quotation mark	" (space)	¨ (space)
# number sign	++	
' apostrophe	' (space)	` (space)
@ commercial at sign	aa *or* AA	
[opening bracket	((	
\ backslash	/) *or* /<	
] closing bracket	))	
^ circumflex	^ (space)	^ (space)
` single quote mark	' (space)	' (space)
{ opening brace	(-	
| vertical line	/^	
} closing brace	)-	
~ tilde	~ (space)	~ (space)
¡ inverted !	!!	
¢ cent sign	c/ *or* C/ *or* c| *or* C|	
£ pound sign	l- *or* L- *or* l= *or* L=	
¥ yen sign	y- *or* Y- *or* y= *or* Y=	
§ section sign	so *or* SO *or* S! *or* s! *or* s0 *or* S0	
¤ currency sign	xo *or* XO *or* x0 *or* X0	
© copyright sign	co *or* CO *or* c0 *or* C0	
ª female ordinal indicator	a_ *or* A_	
« angle quotation mark left	<<	

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

Compose Character		Three-Key Sequence	Two-Key Sequence
°	degree sign	0^ *or* (space) *	
±	plus/minus sign	+_	
¹	superscript 1	1^	
²	superscript 2	2^	
³	superscript 3	3^	
µ	micro sign	/u *or* /U (this order only)	
¶	paragraph sign	p! *or* P!	
·	middle dot	.^	
º	masculine ordinal indicator	o_ *or* O_	
»	angle quotation mark right	>>	
¼	fraction one-quarter	14 (this order only)	
½	fraction one-half	12 (this order only)	
¿	inverted ?	??	
À	A grave	A`	`A
Á	A acute	A'	'A
Â	A circumflex	A^	^A
Ã	A tilde	A~	~A
Ä	A umlaut	A"	"A
Å	A ring	A* *or* A°	°A
Æ	AE ligature	A E (this order only)	
Ç	C cedilla	C,	
È	E grave	E`	`E
É	E acute	E'	'E
Ê	E circumflex	E^	^E
Ë	E umlaut	E"	"E
Ì	I grave	I`	`I
Í	I acute	I'	'I
Î	I circumflex	I^	^I
Ï	I umlaut	I"	"I
Ñ	N tilde	N~	~N
Ò	O grave	O`	`O
Ó	O acute	O'	'O
Ô	O circumflex	O^	^O
Õ	O tilde	O~	~O
Ö	O umlaut	O"	"O
Œ	OE ligature	OE (this order only)	
Ø	O slash	O/	
Ù	U grave	U`	`U
Ú	U acute	U'	'U
Û	U circumflex	U^	^U
Ü	U umlaut	U"	"U

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

Compose Character		Three-Key Sequence	Two-Key Sequence
P	a grave	a‘	’a
O	a acute	a’	’a
R	a circumflex	a^	^a
a	a tilde	a~	~a
Q	a umlaut	a”	¨a
N	a ring	a* *or* a°	°a
e	ae ligature	ae (this order only)	
:	cedilla	c,	
U	e grave	e‘	’e
T	e acute	e’	’e
W	e circumflex	e^	^e
V	e umlaut	e”	¨e
Z	i grave	i‘	’i
X	i acute	i’	’i
I	i circumflex	i^	^i
&	i umlaut	i”	¨i
?	n tilde	n~	~n
4	o grave	o‘	’o
3	o acute	o’	’o
6	o circumflex	o^	^o
f	o tilde	o~	~o
5	o umlaut	o”	¨o
œ	oe ligature	oe (this order only)	
9	u grave	u‘	’u
8	u acute	u’	’u
.	u circumflex	u^	^u
0	u umlaut	u”	¨u

Table 3-5 National Set Mode Compose Character Sequences

"*Or*" indicates two or more possible sequences for the same character.

Compose Character		Three-Key Sequence	Two-Key Sequence
BRITISH KEYBOARD			
£	pound sign	l- *or* L- *or* l= *or* L=	
/	backslash	/<	
FRENCH CANADIAN KEYBOARD			
à	a grave	`a	`a
â	a circumflex	^a	^a
ç	c cedilla	,c	
ê	e circumflex	^e	^e
è	e grave	`e	`e
î	i circumflex	^i	^i
ô	o circumflex	^o	^o
ú	u grave	`u	`u
û	u circumflex	^u	^u
^	circumflex accent	^ <space>	
`	grave accent	` <space>	
"	quotation mark	" <space>	
#	number sign	++	
ê	e circumflex	e^	^e
é	e acute	e'	'e
FLEMISH KEYBOARD			
à	a grave	a`	
ç	c cedilla	c,	
è	e grave	e`	
ú	u grave	u`	
"	quotation mark	" <space>	
`	grave accent	` <space>	
£	pound sign	-L *or* -l *or* =L *or* =l	
§	section sign	!s *or* !S *or* so *or* So *or* sO *or* SO *or* s0 *or* S0	
é	e acute	e'	
°	degree sign	* <space> or 0^	
FINNISH KEYBOARD			
#	number sign	++	
@	commercial at	aa *or* AA *or* aA	
Å	A ring	A*	
ü	U umlaut	U"	
é	e acute	e'	
å	a ring	a*	
ü	u umlaut	u"	
"	quotation mark	" <space>	
Ä	A umlaut	A"	
ö	O umlaut	O"	
ä	a umlaut	a"	
ö	o umlaut	o"	

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

Compose Character		Three-Key Sequence	Two-Key Sequence
DANISH KEYBOARD			
#	number sign	++	
Ä	A umlaut	A"	¨A
Å	A ring	A*	°A
Ø	O slash	O/	
ü	U umlaut	U"	¨U
ä	a umlaut	a"	¨a
å	a ring	a*	°a
ø	o slash	o/	
ü	u umlaut	u"	¨u
"	quotation mark	" <space>	
#	number sign	++	
GERMAN KEYBOARD			
Ä	A umlaut	A"	
Ü	U umlaut	U"	
ä	a umlaut	a"	
u	u umlaut	u"	
§	section sign	so *or* Os *or* !s *or* !S *or* 0s *or* 0S	
Ö	O umlaut	O"	
ö	o umlaut	o"	
^	circumflex accent	^ <space>	
`	grave accent	` <space>	
#	number sign	++	
ß	German small sharp s	ss	
DUTCH KEYBOARD			
£	pound sign	L- *or* l- *or* L= *or* l=	
i j	i j sign	ij (this order only)	
½	one half	12 (this order only)	
	florin	f- (this order only)	
"	quotation mark	" <space>	
^	circumflex accent	^ <space>	
`	grave accent	` <space>	
¼	one-quarter	14 (this order only)	
ITALIAN KEYBOARD			
£	pound sign	L- *or* l- *or* L= *or* l=	
§	section	s! *or* S! *or* so *or* So *or* sO *or* SO *or* s0 *or* S0	
à	a grave	a`	'a
ç	c cedilla	c,	
é	e acute	e'	
ù	u grave	u`	'u
è	e grave	e`	
ì	i grave	i`	
ò	o grave	o`	
^	circumflex accent	^	

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

Compose Character		Three-Key Sequence	Two-Key Sequence
SWISS (FRENCH) KEYBOARD			
ä	a umlaut	a"	
ç	c cedilla	c,	
ê	e circumflex	e^	^e
î	i circumflex	i^	^i
ô	o circumflex	o^	^o
ö	o umlaut	o"	
û	u circumflex	u^	^u
ü	u umlaut	u"	
ù	u grave	u‘	‘u
é	e acute	e’	
è	e grave	e‘	
à	a grave	a‘	’a
"	quotation mark	" <space>	
SWISS (GERMAN) KEYBOARD			
à	a grave	a‘	‘a
ç	c cedilla	c,	
ê	e circumflex	e^	^e
é	e acute	e’	’e
è	e grave	e‘	‘e
î	i circumflex	i^	^i
ô	o circumflex	o^	^o
û	u circumflex	u^	^u
ù	u grave	u‘	‘u
ä	a umlaut	a"	
ö	o umlaut	o"	
ü	u umlaut	u"	
SWEDISH KEYBOARD			
#	number sign	++	
Å	A ring	A*	
É	E acute	E’	
Ü	U umlaut	U"	
å	a ring	a*	
é	e acute	e’	
ü	u umlaut	u"	
ö	O umlaut	O"	
Ä	A umlaut	A"	
ö	o umlaut	o"	
ä	a umlaut	a"	

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

Compose Character		Three-Key Sequence	Two-Key Sequence
NORWEGIAN KEYBOARD			
#	number sign	++	
Å	A ring	A*	
Ä	A umlaut	A"	¨A
Æ	AE ligature	AE (this order only)	
Ü	U umlaut	U"	
ä	a umlaut	a"	¨a
æ	ae ligature	ae (this order only)	
å	a ring	a*	
é	e acute	e'	
ü	u umlaut	u"	¨u
ø	O slash	/O	
ø	o slash	/o	
æ	ae ligature	ae (this order only)	
å	a ring	a*	
FRENCH/BELGIAN KEYBOARD			
£	pound sign	L- *or* l- *or* L= *or* l=	
§	section	s! *or* S! *or* so *or* So *or* Os *or* OS *or* 0s *or* 0S	
è	e grave	e`	
ù	u grave	u`	
`	grave accent	` <space>	
à	a grave	a`	
ç	c cedilla	c,	
é	e acute	e'	
SPANISH KEYBOARD			
£	pound sign	L- *or* l- *or* L= *or* l=	
§	section	s! *or* S! *or* so *or* So *or* Os *or* OS *or* 0s *or* 0S	
¡	inverted !	!!	
¿	inverted ?	??	
°	degree sign	O^	
~	tilde mark	~ <space>	
Ñ	N tilde	N~	
ñ	n tilde	n~	
^	circumflex accent	^ <space>	
`	grave accent	` <space>	
ç	c cedilla	c,	

4

Troubleshooting and Maintenance

Problems and Solutions

If you encounter a problem in using the HP 700/22 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 [Hold Screen] key probably has been pressed. Press [Hold Screen] 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 **Clear 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 **Recall** field.
- Press [Break] 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-232/423 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**.

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 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 RETURN 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
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 Deteetor (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

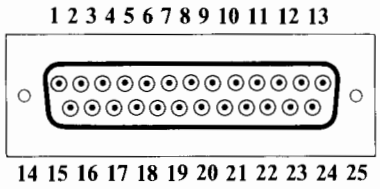


Table A-2. 20mA Port Pin Assignments

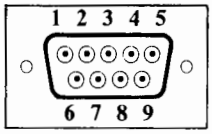
Pin	Signal
1	−12 Volt
2	Transmit Data (negative)
3	Receive Data (negative)
5	Transmit Data (positive)
7	Receive Data (positive)
8	Ground

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



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 G1 is invoked into GL.
SI	0F	Shift In. The character set currently designated as G0 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

Mnemomic	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.
RI	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.
DSC	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

Codes Sent by the Edit Keys

These keys are active in VT220 mode only.

FIND	CSI 1 ~
INSERT HERE	CSI 2 ~
REMOVE	CSI 3 ~
SELECT	CSI 4 ~
PREV SCREEN	CSI 5 ~
NEXT SCREEN	CSI 6 ~

Codes Sent by the Cursor Keys

These VT52 cursor keys send the same codes for normal or application use.

	VT220 and Normal	VT100 Applic	VT52
CURSOR UP	CSI A	SS3 A	ESC A
CURSOR DOWN	CSI B	SS3 B	ESC B
CURSOR RIGHT	CSI C	SS3 C	ESC C
CURSOR LEFT	CSI D	SS3 D	ESC D

Codes Sent by the Main Keypad's Special Keys

DELETE	DEL
TAB	HT
RETURN	CR *or* CR/LF
SPACE BAR	SP

CTRL, LOCK, SHIFT and COMPOSE CHARACTER act locally without sending characters to the host.

Codes Sent by the Unshifted Top Row Keys

VT220 Mode		VT100/VT52 Modes	
f6	CSI 17 ~		
f7	CSI 18 ~		
f8	CSI 19 ~		
f9	CSI 20 ~		
f10	CSI 21 ~		
f11	CSI 23 ~	f11	ESC
f12	CSI 24 ~	f12	BS
f13	CSI 25 ~	f13	LF
f14	CSI 26 ~		
HELP	CSI 28 ~		
DO	CSI 29 ~		
f17	CSI 31 ~		
f18	CSI 32 ~		
f19	CSI 33 ~		
f20	CSI 34 ~		

HOLD SCREEN, PRINT SCREEN, SETUP, and BREAK (f1 through f5) act locally without sending codes to the host.

Codes Sent by the Auxiliary Keypad Keys

	Numeric Mode	Application Mode VT220 VT100	Application Mode VT52
0	0	SS3 p	ESC ? p
1	1	SS3 q	ESC ? q
2	2	SS3 r	ESC ? r
3	3	SS3 s	ESC ? s
4	4	SS3 t	ESC ? t
5	5	SS3 u	ESC ? u
6	6	SS3 v	ESC ? v
7	7	SS3 w	ESC ? w
8	8	SS3 x	ESC ? x
9	9	SS3 y	ESC ? y
-	- (minus)	SS3 m	ESC ? m
,	, (comma)	SS3 l	ESC ? l
.	. (period)	SS3 n	ESC ? n
ENTER	CR *or* CR LF	SS3 M	ESC ? M

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 f12)*	BS	Y	EM
I	HT	Z	SUB
J (and f13)*	LF	3 *or* { (and f11)*	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 VT100 and VT52 modes only.
#When Xon/Xoff is enabled, Ctrl-Q sends Xon and Ctrl-S sends Xoff. If Xon/Xoff is disabled, the codes listed are sent.

Terminal Configuration

Set Compatibility Mode

Set for VT100 mode	CSI 61 " p
Set for VT220 mode, 8-bit controls	CSI 62 " p
or	CSI 62 ; 0 " p
or	CSI 62 ; 2 " p
Set for VT220 mode, 7-bit controls	CSI 62 ; 1 " p

Set C1 Control Transmission (VT 220 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

Resetting the Terminal

Soft reset	CSI ! p
Hard reset	ESC c

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 / Unlock	CSI 2 h / CSI 2 l
Insert/Replace: Set to insert mode / Set to replace mode	CSI 4 h / CSI 4 l
Send/Receive: Set to local echo off / Set to local echo on	CSI 12 h / CSI 12 l
Line Feed/New Line:	
Set to New Line mode	CSI ? 20 h
Set to Line Feed mode	CSI ? 20 l
Set terminal to VT52 mode:	CSI ? 2 l

* Can be locked in Setup.

Controlling the Screen

Cursor Control

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

Move cursor up *n* line(s); no scroll up	CSI *n* A
Move cursor down *n* line(s); no scroll down	CSI *n* B
Move cursor right *n* column(s); no auto wrap	CSI *n* C
Move cursor left *n* column(s); no auto wrap	CSI *n* D
Position cursor at *l*, *c* (depends on setting of Origin Mode)	CSI *l* ; *c* H or CSI *l* ; *c* 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

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
Move cursor right *n* tab stop(s)	CSI *n* I
Move cursor back *n* tab stop(s)	CSI *n* Z
Move cursor to next tab stop	CTRL I

Editing

These actions begin at the cursor's current position:

Insert *n* blank line(s)	CSI *n* L
Delete *n* blank line(s)	CSI *n* M
Insert *n* blank characters (VT220 only)	CSI *n* @
Delete *n* characters	CSI *n* P

Erasing Characters

Erasing includes beginning and ending positions.

*	Erase *n* character(s) starting at cursor	CSI *n* 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 not affected)	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 K
*	Erase all the screen's erasable characters	CSI ? 2 K
*	Set subsequent characters to be erasable	CSI 0 " q
		or CSI 2 " q
*	Set subsequent characters to be nonerasable	CSI 1 " q

* Applies to VT220 Mode only.

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

Graphic Renditions

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

s	*parameter selection*
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 (VT220 Mode only)
0	Special Graphics
* Name	Name of a soft character set

Available in national mode only:

A	United Kingdom
4	Dutch
C *or* 5	Finnish
R	French
Q	French Canadian
K	German
Y	Italian
E *or* 6	Danish/Norwegian
Z	Spanish
H *or* 7	Swedish
=	Swiss

*VT220 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

Invoke G0 into Control

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

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 for VT220 Mode only.

DCS *f*;*SC*;*ec*;*cm*;*wa*;*tf*;{*name bp*1; ...;*bpn*ST

parameter	description
DCS	device control string introducer
f	font number 0 or 1
sc	initial character number: ASCII code of character
ec	erase control: 0 or 2 = erase all characters in set 1 = erase only characters being loaded
cm	character matrix size 0 = 7 x 10 (default) 1 = not used 2 = 5 x 10 3 = 6 x 10 4 = 7 x 10
wa	width specification 0 or 1 = 80 columns 2 = 132 columns
tf	text/full-cell 0 or 1 = text 2 = full-cell
;	end of one and beginning of another DCS parameter
{	denotes this as soft font download command
name	name of the soft character set (see "Invoking Character Sets")
bp	bit pattern representation for first download character: ASCII characters for upper columns / is required separator ASCII characters for lower columns
ST	string terminator (ST)

Clearing a Soft Character Set

Clear a downloaded soft character set DCS 1;1;2 { *sp* @ ST
(sp = a space character)

Include the space character in the above command.

Other Terminal Command Functions

Function Keys

To assign programs to function keys to be enacted when they are pressed with either the SHIFT or CTRL keys:

DCS *pc* ; *pl* | *kyn*/*stn* {;*kyn*/*stn*} ST

This function is available in VT220 mode only.

parameters	description
DCS	device control string introducer
pc	clear parameter 0 = clear all keys (default) 1 = clear only redefined keys
pl	lock parameter 0 = lock keys to prevent redefinition (default) 1 = don't lock keys
kyn	key number

key number	key combination	key number	key combination
17	SHIFT + F6	37	CTRL + F6
18	SHIFT + F7	38	CTRL + F7
19	SHIFT + F8	39	CTRL + F8
20	SHIFT + F9	40	CTRL + F9
21	SHIFT + F10	41	CTRL + F10
23	SHIFT + F11	43	CTRL + F11
24	SHIFT + F12	44	CTRL + F12
25	SHIFT + F13	45	CTRL + F13
26	SHIFT + F14	46	CTRL + F14
28	SHIFT + HELP	48	CTRL + HELP
29	SHIFT + DO	49	CTRL + DO
31	SHIFT + F17	51	CTRL + F17
32	SHIFT + F18	52	CTRL + F18
33	SHIFT + F19	53	CTRL + F19
34	SHIFT + F20	54	CTRL + F20

stn	definition string: hex pairs for each character in the string
ST	string terminator

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

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?1i

Reports

Primary device attributes request:		CSI c
(product type)	*or*	CSI 0
	or	ESC Z
Responses:		
VT100 Mode, VT100 ID		ESC [? 1;2 c
VT100 Mode, VT101 ID		ESC [? 1;0 c
VT100 Mode, VT102 ID		ESC [? 6 c
VT220 Mode		CSI ? 62;1;2; 6;7;8;9 c
Secondary device attributes request:		
(firmware and options)		CSI > 0 c
Response:		
VT220 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

VT52 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

International Keyboards

Below are the layouts for the United Kingdom, German, French, Italian and Swedish keyboards.

Additional keyboards or localization kits are available.

Figure C-1. United Kingdom

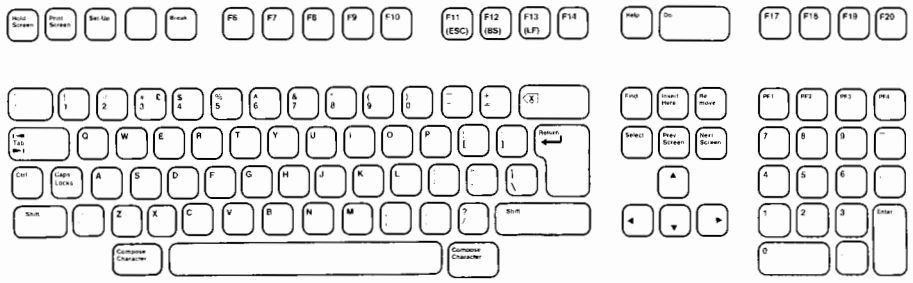


Figure C-2. German

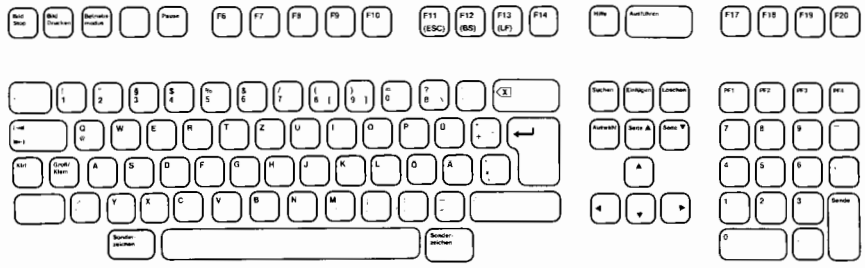


Figure C-3. French

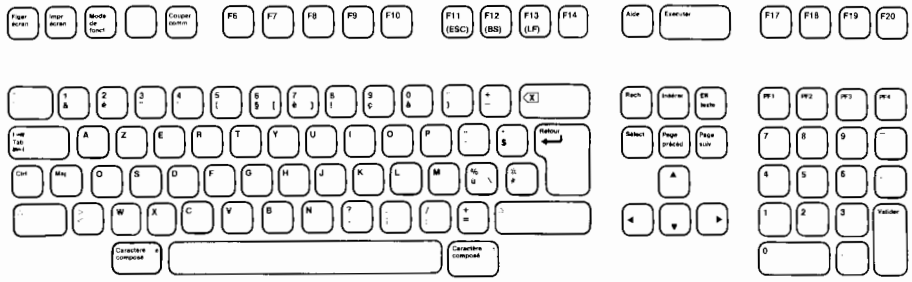


Figure C-4. Italian

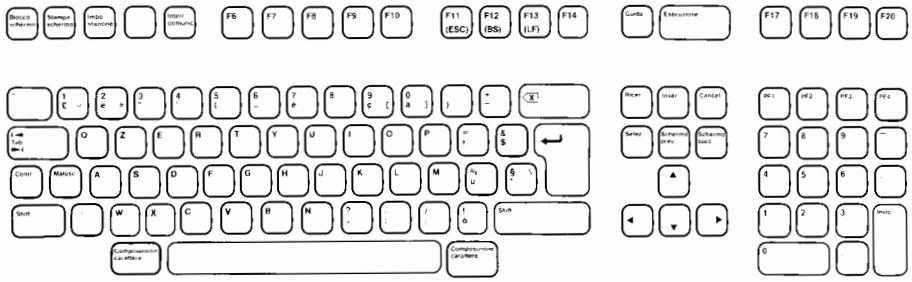


Figure C-5. Swedish

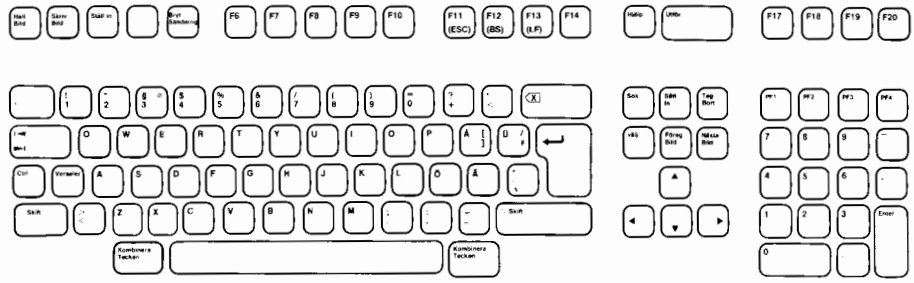
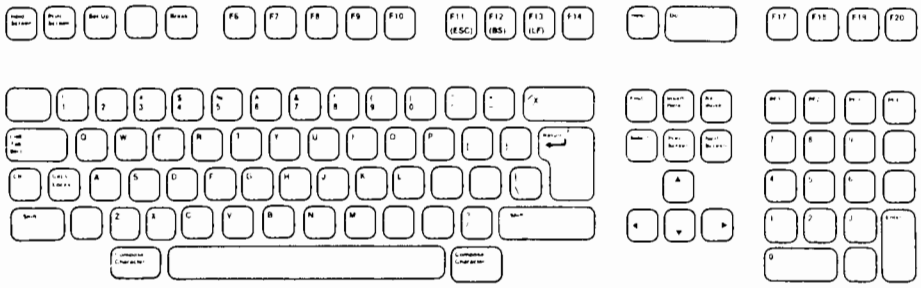


Figure C-6. U.S. ASCII



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TERAOKA TAPE ANCHOR BRAND

Reader Comment Card

We at Hewlett-Packard value your comments and suggestions about our product manuals. By listening to you we can improve our publications, tailoring them to your needs.

Name: **Company:**

Address: **City/State/Zip:**

Product Model Number: **Manual Title (User's or Reference):**

1. What is your occupation, and what applications are you running on your terminal?

2. Did you buy or influence the purchase of your terminal?

3. What computer systems are you using? Would you classify yourself as a beginning, intermediate or advanced user of your computer system(s)?

4. Are you able to understand and apply the material in this manual? If no, please explain:

5. Were there particular sections, pages, illustrations that you found particularly helpful (or particularly confusing)? Please comment:

6. How do you rate the following:

	Excellent	**Good**	**Fair**	**Poor**
Depth of Coverage	4	3	2	1
Illustrations	4	3	2	1
Organization	4	3	2	1
Overall Content	4	3	2	1
Overall Appearance	4	3	2	1

7. What is your experience with terminals?

☐ None ☐ Beginner ☐ Intermediate ☐ Advanced

8. Please provide any additional comments you have about the manual.