



HP700/22

USER'S MANUAL



HEWLETT
PACKARD



HP700/22

USER'S MANUAL

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Warranty Information (U.S.A. and Canada)

In the U.S. and Canada, this terminal is warranted by Hewlett-Packard against defects in materials and workmanship for one year from date of original purchase. If you transfer ownership, this warranty is automatically transferred to the new owner and remains in effect for the original one year period.

During the warranty period we will repair or, at our option, replace at no charge any unit that proves to be defective, provided it is returned, shipping prepaid, to an identified Hewlett-Packard repair facility. You are responsible for all customs duties in connection with the return of the unit.

This warranty does not apply if the product has been damaged by accident or misuse, or as a result of service or modification by other than an authorized HP repair facility, or by hardware, software interfacing, or peripherals not provided by Hewlett-Packard. Hewlett-Packard shall have no obligation to modify or update products once manufactured.

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If your hardware should fail during the warranty period, return the failed piece of equipment to an HP Field Repair Center in your area. When sending equipment to a Field Repair Center, use the original shipping container if possible. Insure the equipment.

Call Hewlett-Packard Sales and Services Offices to learn more about the support services available to you.

Warranty Information (Except U.S.A. and Canada)

In other countries, contact your local Hewlett-Packard Sales and Service facility to determine warranty terms.

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This equipment generates, uses and can radiate radio frequency energy and if not installed and used in strict accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protections against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever steps may be required to correct the interference.

For Germany

This equipment has been certified to comply with the German PTT regulations FTZ 1046/84.

This product may allow control settings that do not comply with the German ergonomic standard ZH 1/618.

United Kingdom Telecom Statement

Interconnection directly, or by way of other apparatus of ports marked “WARNING. CONNECT ONLY APPARATUS COMPLYING WITH RS6301 TO THIS (THESE) PORT(S)” with ports not so marked, may produce hazardous conditions on the network, and advice should be obtained from a competent engineer before such a connection is made. Connection to the network must be disconnected before the equipment power plug is removed. Connection to the network must not be hardwired. This apparatus complies with RS6301. Connect only apparatus complying with RS6301 to the ports of this apparatus.

For Japan

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しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Display Screen

- 14 inch; choice of flicker free soft white, green or amber phosphor
- 24 lines for data, 25th line for status messages
- 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

- VT220-compatible, 105 key keyboard with tactile feedback
- 21 unshifted function keys for application use
- 30 programmable keys
- Keyboard available in 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, 9-pin bi-directional serial printer port with baud rates from 75 to 38400

Additional Features

- Four pages of display memory
- 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
- One or four pages of display memory, user selectable

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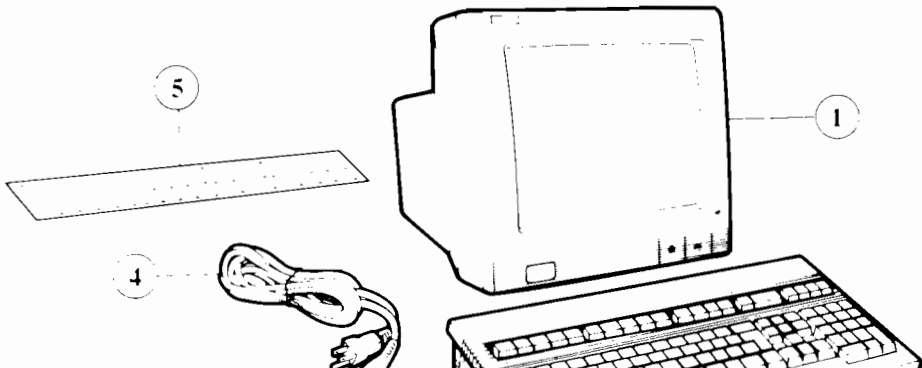
Appendix C. International Keyboards

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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

Figure 1-1. Terminal Components



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.

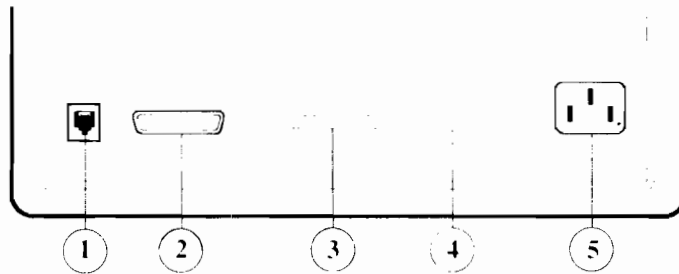
In addition, if you are going to connect the terminal to a printer, you will need a 9-pin female cable for that purpose, as well.

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 or a 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 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 labeled RS-232 on the terminal's rear panel. The other end of the cable must be connected to a 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.

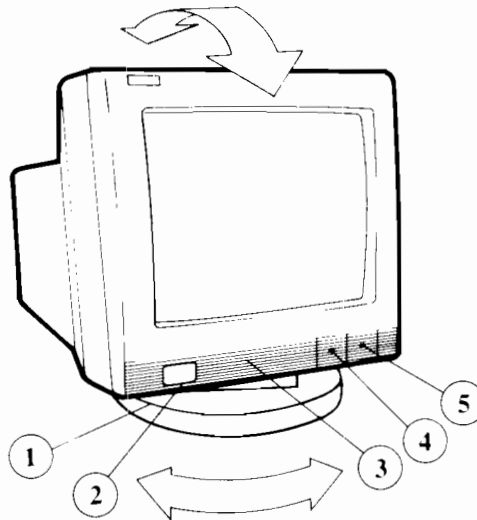
You'll hear two beeps when you turn on the terminal. The terminal performs a quick self-test every time it's powered on. If there are any problems, refer to Chapter 4, "Troubleshooting".

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 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

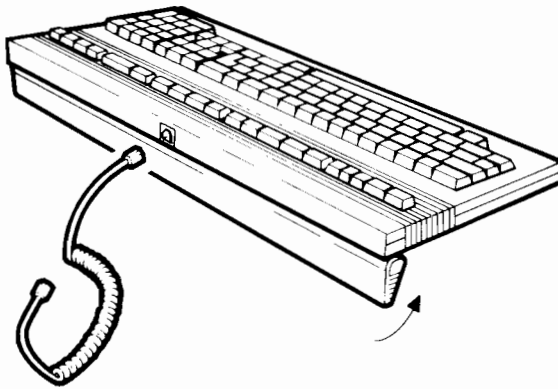
The brightness and contrast controls are slide switches under the front right corner of the terminal. You can slide these switches to the left and right to adjust screen brightness and contrast.

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



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 occasionally you may want to use Setup Mode to make minor adjustments to specific features of the terminal or to program the terminal's function keys.

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 four 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
	Recv Baud Rate
	DataBits/Parity
	Check Parity
	Port Selection
	XON/XOFF
	Disconnect Delay
	Stop Bits
	Local Echo
	Unlimited Xmit
	Printer:
	Baud Rate
	DataBits/Parity
	Stop Bits
	Character Set
	Print Mode
	Print Scroll Region
	Terminator
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
Programmable Function Key Setup Menu	
Qualifier Key	Clear Key
Function Key	Key Definition

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

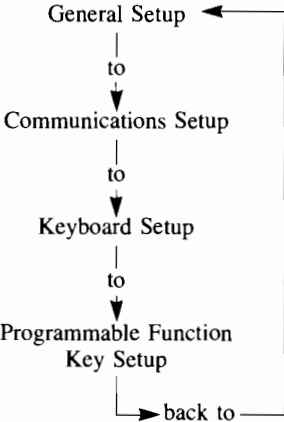
The terminal is shipped from the factory with default values ready for power-on use. The labels displayed at the bottom of each Setup menu indicate the keys that you will use to change your terminal's setup.

[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 four 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 Answerback, Use Communications, Beep Volume, Beep, Port, Port 2, Serial Setup, Terminal Log, Port Mode, Port Type, Answerback Mode, Low Latency, Serial Queue Size, and Reverse Key. Pressing the [Enter] key when one of these fields is highlighted causes the indicated function to be performed. For instance, when Beep 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 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 DisplayClear CommunicationsReset Terminal

RecallSaveDefaultSetup = English

Terminal Mode	EM200, 7 Bit Ctrls	EM100 ID	FM220
On Line	YES	Interpret Control Codes	YES
Columns	80	User Features Locked	NO
Smooth Scroll	YES	User Defined Keys Locked	NO
Block Cursor	YES	Numeric Mode Keypad	YES
Cursor OFF	NO	Normal Mode Cursor Keys	YES
Light Background	NO	National Character Set	NO
Inhibit Auto Wrap	YES	Frame Rate (Hz)	72
New Line	NO	Display OFF After (min)	15
MultiPage	NO		
Status Line	None		

Terminal TestPort 1 TestPort 2 Test

1818-xxxx xxxx

[Next Screen]=Next Setup <arrows> [Enter]=Select [Setup]=Exit

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 Français 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 Ctrl's** if your application programs expect the terminal to send 7-bit control characters. Select **EM200, 8 Bit Ctrl's** if the applications expect the terminal to send 8 bit control characters. Note also that **EM200, 7 Bit Ctrl's** 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	— VT220 Mode, 7 bit controls — VT220 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.
Status Line	None Indicator Host Writable	NONE blanks the Status Line. INDICATOR displays the terminal's Status Line. HOST WRITABLE reserves the line for messages from the application program.
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 sends 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 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 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	EIA, 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
Character Set	National Only		

[Next Screen]=Next Setup <arrows> [Enter]=Select [Setup]=Exit

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

Field	Choices	Description
NOTE		
The HP 700/22 Display Terminal's printer port supports Xon/Xoff and DTR handshaking.		
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
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.		
Character Set	National Only National & Line Drwg Multinational	— Uses the ASCII or specified national character set. — Can use both the ASCII and line drawing character sets. — 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 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 [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.

Keyboard Setup

Keyboard Language	North American	Data Processing Keys	NO
Keyclick	YES	Shift Lock	NO
Margin Bell	YES	Break	YES
Warning Bell	YES	Auto Repeat	YES

Answerback =

Auto Answerback

NO

Conceal Answerback

Clear All Tabs

Set 8 Column Tabs

T

T

T

T

T

T

T

T

T

T

1234567890

1234567890

1234567890

1234567890

1234567890

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[Next Screen]=Next Setup

<arrows>

[Enter]=Select

[Setup]=Exit

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)

Field	Choices	Description
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.		
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.

Programmable Function Key Setup Menu

This menu lets you program (that is, define special functions for) the terminal's function keys (fkeys).

There are 15 fkeys: `F6` through `F20`, including `Help` and `Do`, all located on the top row of the keyboard.

Programming an fkey means defining what will be sent when the fkey is pressed while holding down either the `Ctrl` or `Shift` key. In this menu, `Ctrl` and `Shift` are specified in the Qualifier field. Thus, there is a total of 30 separate programmable key combinations possible.

Programmable Function Key Setup

Qualifier Key

Function Key

Shift

F6

Clear Key

Key Definition

In Remote Mode (`Online` field in Setup = **YES**), pressing an fkey while holding down `Ctrl` or `Shift` sends the fkey definition string to the computer. In Local Mode (`Online` field in Setup = **NO**), the string is sent to the display screen.

To program fkeys:

1. Enter Setup Mode, if not already in Setup Mode.
2. Press **Next Screen** until the Programmable Function Key Setup menu is displayed.
3. Specify the fkey combination you want to program:
 - a. Highlight the Qualifier field and select either **Ctrl** or **Shift** as the qualifier.
 - b. Highlight the Function Key field and select the fkey to be programmed.
4. Highlight the Key Definition field and type in the program that will be sent.
5. Repeat steps three and four until you are finished programming the fkeys.

For example, to program **F10** so that it will send the message `Run Program` when it is pressed while the **Shift** key is being held down:

- Set the Qualifier field to Shift,
- set the Function Key field to F10, and
- type “Run Program” into the Key Definition field.

To save the definitions in nonvolatile RAM (for ongoing use), use the Save field in the General Setup Menu. To save them only temporarily, exit Setup without using the Save field. (See “Saving Changes for Power-On Use” in Chapter 2.)

Notes:

- A maximum of 512 bytes can be stored, total, for all the programmed fkeys. If you reach the 512 byte limit, the terminal will not let you enter any more characters.
- Up to 80 characters can be entered for each key combination in the Key Definition field.
- Control characters and escape sequences can be included in the definitions. They are displayed in the field and interpreted when sent.
- Each control character counts as one character. Each space character counts as one character.
- *The escape sequence for programming function keys (summarized in Appendix B) does not limit each string to 80 bytes.*
- You can use the **Backspace** key to go back over and remove characters in a definition.
- Selecting the Clear Key field removes the entire key definition.

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

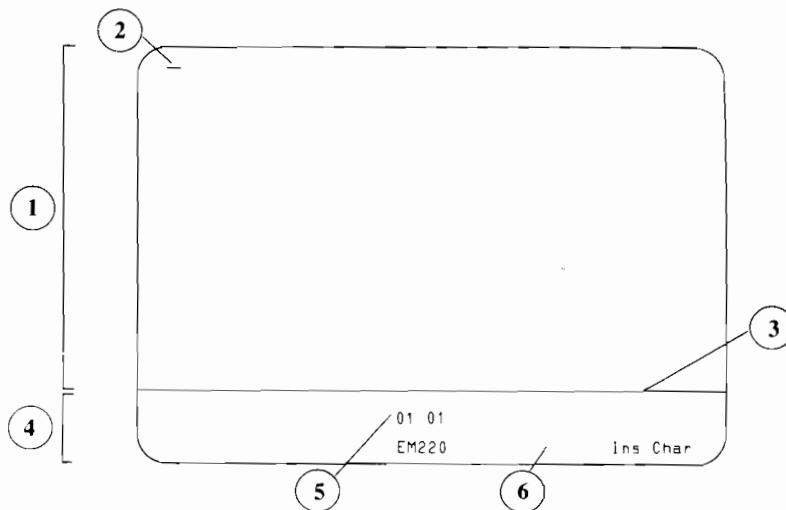
If you don't know how to turn the terminal on and off or adjust its controls, refer to the last two pages of Chapter 1.

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) 24 Lines of User Area (80 or 132 columns) 2) Cursor 3) Separator Line
4) Message Area 5) Cursor Position 6) Status Line

The Screen Areas and Cursor

The top 24 lines of the screen are the **user area (1)**. It displays a single page of display memory. The display can consist of 80 or 132 columns. This feature is selectable in Setup.

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

The **Separator Line (3)** separates the user area from the message area. The **message area (4)** consists of the cursor position numbers and the Status Line. The cursor cannot move below the Separator Line.

The **cursor's position (5)** is stated 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 **Status Line (6)**. What is displayed on this line depends upon the current setting of the Status Line field in Setup Mode. If that field is set to None, this line will be blank. If that field is set to Indicator, this line will display the terminal's own status messages. If that field is set to Host Writable, this field will be reserved for user messages from the application program.

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 Locked Compose EM200 Lock Ins Char HOLD L1L2L3L4

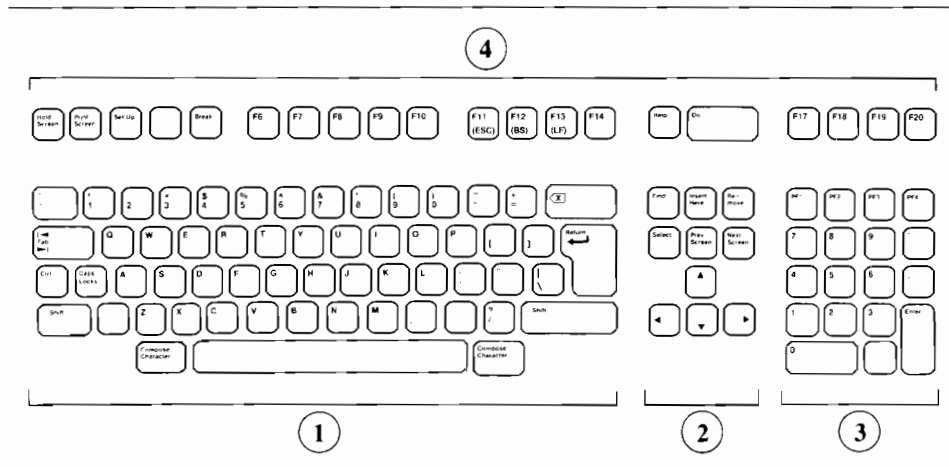
Table 3-1. Status Line Messages

Message	Description
KB Locked	The keyboard is in a locked state. Refer to Chapter 4 Troubleshooting if the condition persists.
Compose	Indicates you have started a compose character sequence. See the "Compose Character" section of this chapter.
EM200 EM100 EM52	This area of the Status Line states the terminal's current 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 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. These correspond to the four indicator lights on the VT100 keyboard.

The Keyboard

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

Key	Description
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.
XXX	(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 EM200 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 EM200 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 EM100 and EM52 modes this key sends an escape character.
F12 BS	In EM100 and EM52 modes this key sends the backspace (BS) character, which normally moves the cursor back one space.
F13 LF	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.

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  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> or " <sp>	" <space>
# number sign	++	
' apostrophe	' <space>	' <space>
@ commercial at sign	aa or AA or aA	
[opening bracket	((	
\ backslash	/) or /<	
] closing bracket	))	
^ circumflex	^ <space>	^ <space>
` grave accent	` <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	
♀ female ordinal indicator	a_ or A_	
« angle quotation mark left	<<	
° degree sign	0^ or <space> * or <space> °	
± plus/minus sign	+_	

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

Compose Character	Three-Key Sequence	Two-Key Sequence
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'
Á	A acute	'A
Â	A circumflex	^A
Ã	A tilde	A~
Ä	A umlaut	¨A
Å	A ring	A* or A°
Æ	AE ligature	A E (this order only)
Ç	C cedilla	C,
È	E grave	E'
É	E acute	'E
Ê	E circumflex	^E
Ë	E umlaut	¨E
Ì	I grave	I'
Í	I acute	'I
Î	I circumflex	^I
Ï	I umlaut	¨I
Ñ	N tilde	N~
Ò	O grave	O'
Ó	O acute	'O
Ô	O circumflex	^O
Õ	O tilde	O~
Ö	O umlaut	¨O
Œ	OE ligature	OE (this order only)
Ø	O slash	O/
Ù	U grave	U'
Ú	U acute	'U
Û	U circumflex	^U
Ü	U umlaut	¨U
Ý	Y umlaut	¨Y

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

Compose Character		Three-Key Sequence	Two-Key Sequence
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* <i>or</i> a [°]	
æ	æ ligature	ae (this order only)	
ç	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
ÿ	y umlaut	y [¨]	¨y
ß	German small sharp s	ss	

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
ù 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’	
ù 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		
Æ AE ligature	A E (this order only)	
æ ae ligature	ae (this order only)	
# 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''	
ü 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=	
ÿ y umlaut	ij (this order only)	
½ one half	12 (this order only)	
f 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 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''	
ä a ring	a*	
é e acute	e'	
ü u umlaut	u''	
ö O umlaut	O''	
Å A umlaut	A''	
o 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,	



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.

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

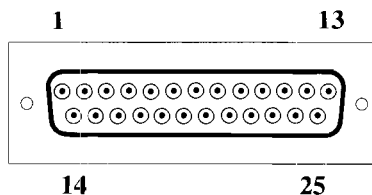


Table A-2. 20mA Port Pin Assignments

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

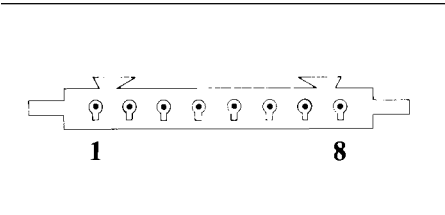
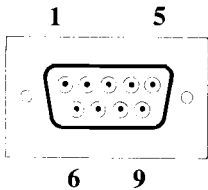


Table A-3. Printer Port Connector Pin Assignments

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



Terminal Commands Summary

This appendix lists the HP 700/22 Display Terminal's commands. If you want more detailed information on the terminal's commands, 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, call HP's Direct Marketing Division at (800) 538-8787.

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

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.
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.
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

Codes Sent by the Edit Keys

These keys are active in EM200 modes 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 EM52 cursor keys send the same codes for normal or application use.

	EM200 Normal	and EM100 Applic	EM52
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 <i>or</i> CR/LF
SPACE BAR	SP

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

Keyboard Indicators

All off	CSI q
L1 on	CSI 1q
L2 on	CSI 2q
L3 on	CSI 3q
L4 on	CSI 4q

The Status Line messages L1, L2, L3 and L4 correspond to the four indicator lights on the VT100 keyboard.

Codes Sent by the Unshifted Top Row Keys

EM200 Modes		EM100/EM52 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

Key	Numeric Mode	Application EM200 EM100	Mode EM52
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
PF1	SS3 P	SS3 P	ESC P
PF2	SS3 Q	SS3 Q	ESC Q
PF3	SS3 R	SS3 R	ESC R
PF4	SS3 S	SS3 S	ESC S

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 EM100 and EM52 modes only.

Terminal Configuration

Set Compatibility Mode

Set for EM52 mode	CSI ? 2 1
Set for EM100 mode	CSI 61 " p
Set for EM200 mode, 8-bit controls	CSI 62 " p
<i>or</i>	CSI 62 ; 0 " p
<i>or</i>	CSI 62 ; 2 " p
Set for EM200 mode, 7-bit controls	CSI 62 ; 1 " 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

Resetting the Terminal

Soft reset	CSI ! p
Hard reset	ESC c

Terminal Operating Modes

Cursor Movement Keys: Set to application	CSI ? 1 h	Auxiliary Keypad: Set to application	ESC =
Set to cursor	CSI ? 1 l	Set to numeric	ESC >
Columns: Set columns to 132	CSI ? 3 h	* Keyboard: Lock	CSI 2 h
Set columns to 80	CSI ? 3 l	Unlock	CSI 2 l
* Scrolling: Set to smooth scrolling	CSI ? 4 h	Insert/Replace: Set to insert mode	CSI 4 h
Set to jump scrolling	CSI ? 4 l	Set to replace mode	CSI 4 l
* Screen Display: Set to reverse video	CSI ? 5 h	Send/Receive: Set to local echo off	CSI 12 h
Set to normal video	CSI ? 5 l	Set to local echo on	CSI 12 l
Cursor Origin Mode: Set to origin	CSI ? 6 h	Line Feed/New Line:	
Set to absolute	CSI ? 6 l	Set to New Line mode	CSI 20 h
Auto Wrap: Set auto wrap mode on	CSI ? 7 h	Set to Line Feed mode	CSI 20 l
Set auto wrap mode off	CSI ? 7 l	Set terminal to EM52 mode:	CSI ? 2 1
* Auto Repeat: Set auto repeat mode on	CSI ? 8 h	* Can be locked in Setup.	
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		

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
Home up cursor	CSI H or CSI 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

Defaults in Single Page Mode:

1 (top) and 24 (bottom).

Defaults in Multipage Mode:

1 top and bottom of display memory.

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 <i>n</i> tab stop(s)	CSI <i>n</i> I
Move cursor back <i>n</i> tab stop(s)	CSI <i>n</i> Z
Move cursor to next tab stop	CTRL I

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 (EM200 only)	CSI <i>n</i> @
Delete <i>n</i> characters	CSI <i>n</i> P

Multipage Mode

Turn Multipage Mode on	CSI > 1 h
Turn Multipage Mode*off	CSI > 1 l

When Multipage Mode is on:

Previous page	CSI V
Next page	CSI *U
Scroll up <i>n</i> lines	CSI <i>n</i> S
Scroll down <i>n</i> lines	CSI <i>n</i> T
*Home cursor to the top of the scrolling region	CSI > 0 s
*Home cursor to the bottom of the scrolling region	CSI > 1 s

*The default scrolling region is four pages (96 lines).

Host Writable Status Line

CSI <i>s</i> \$ ~	Use this string to activate/deactivate the Status Line as a host writable line.
<i>s</i> = 0	No display on Status Line (default).
1	Indicator (normal Status Line).
2	Status Line is host writable.
CSI <i>s</i> \$ }	Use this string to select either the main display or the Status Line.
<i>s</i> = 0	Send subsequent data to the main display's user workspace.
1	Send subsequent data to the Status Line.

To send data to the Status Line, the program must first specify the Status Line as host writable.

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 J
* Erase all the screen's erasable characters	CSI ? 2 J
* Set subsequent characters to be erasable	CSI 0 " q
	or CSI 2 " q
* Set subsequent characters to be nonerasable	CSI 1 " q
* Applies to EM200 Mode only.	

Graphic Renditions

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

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

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 (EM200 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

*EM200 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*	1B 7E	ESC ~	Lock Shift G1, Right: invoke G1 into GR.
LS2*	1B 4F	ESC n	Lock Shift G2, Left: invoke G2 into GL.
LS2R*	1B 7D	ESC }	Lock Shift G2, Right: invoke G2 into GR.
LS3*	1B 6F	ESC o	Lock Shift G3, Left: invoke G3 into GL.
LS3R*	1B 7C	ESC	Lock Shift G3, Right: invoke G3 into GR.
SS2	8E or 1B 4E	SS2 or ESC N	Single Shift G2, Left: invoke G2 into GL for only the next received graphic character
SS3	8F or 1B 4F	SS3 or 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 for EM200 Mode only.

DCS *fn;cn;e;cms;w;t{name :sxbp1;sxbp2;...;sxbpn}* ST

parameter	description
DCS	device control string introducer
<i>fn</i>	font number 0 or 1
<i>cn</i>	initial character number: ASCII code of character
<i>e</i>	erase control: 0 or 2 = erase all characters in set 1 = erase only characters being loaded
<i>cms</i>	character matrix size 0 = 7 x 10 (default) 1 = not used 2 = 5 x 10 3 = 6 x 10 4 = 7 x 10
<i>w</i>	width specification 0 or 1 = 80 columns 2 = 132 columns
<i>t</i>	text/full-cell 0 or 1 = text 2 = full-cell
<i>:</i>	end of one and beginning of another DCS parameter
<i>name</i>	name of the soft character set (see "Invoking Character Sets")
<i>sxbpn</i>	sixel bit patterns 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 EM200 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		key	
	number	combination	number	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 + DO
	29	SHIFT + DO	49	CTRL + HELP
	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 ? 1 i

Bi-Directional Printer Port

CSI ? 9 i	Turn on Bi-Directional Mode. Data may be sent and received via the printer port.
CSI ? 8 i	Turn off Bi-Directional Mode. Data cannot be received by the printer port.

Reports

Primary device attributes request: (product type)	CSI c or CSI 0 or ESC Z
Responses:	
EM100 Mode, EM100 ID	ESC [? 1;2 c
EM100 Mode, EM101 ID	ESC [? 1;0 c
EM100 Mode, EM102 ID	ESC [? 6 c
EM200 Mode	CSI ? 62;1;2; 6;7;8;9 c
Secondary device attributes request: (firmware and options)	CSI > 0 c
Response:	
EM200 Mode only (<i>v</i> = <i>version</i> , <i>o</i> = <i>options</i>)	CSI > 1; <i>v</i> ; <i>o</i> c
Terminal status request:	CSI 5 n
Responses:	
working properly	CSI 0 n
malfunctioning	CSI 3 n
Cursor position request:	CSI 6 n
Response: (<i>r</i> = <i>row</i> , <i>c</i> = <i>column</i>)	CSI <i>r</i> ; <i>c</i> R
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

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

International Keyboards

Figure C-1. United Kingdom

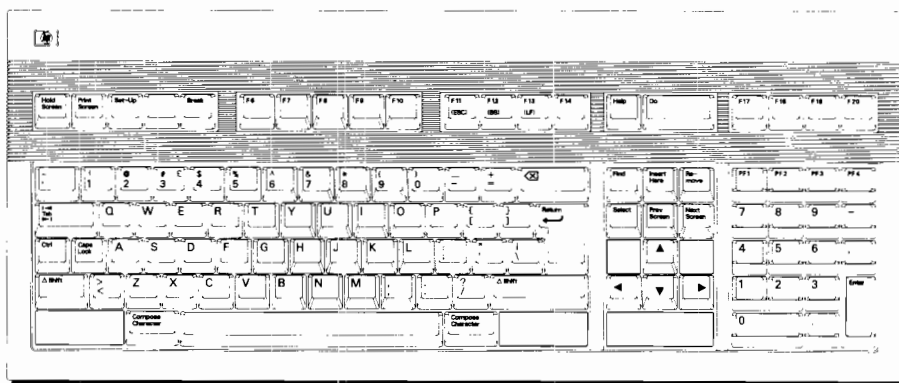


Figure C-2. German

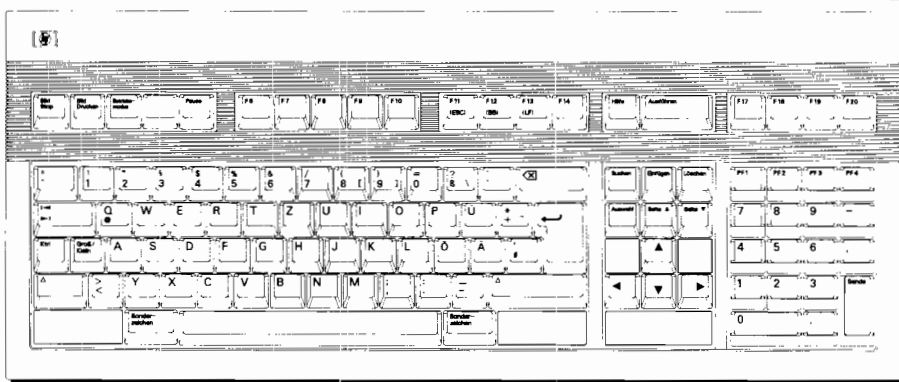


Figure C-3. French

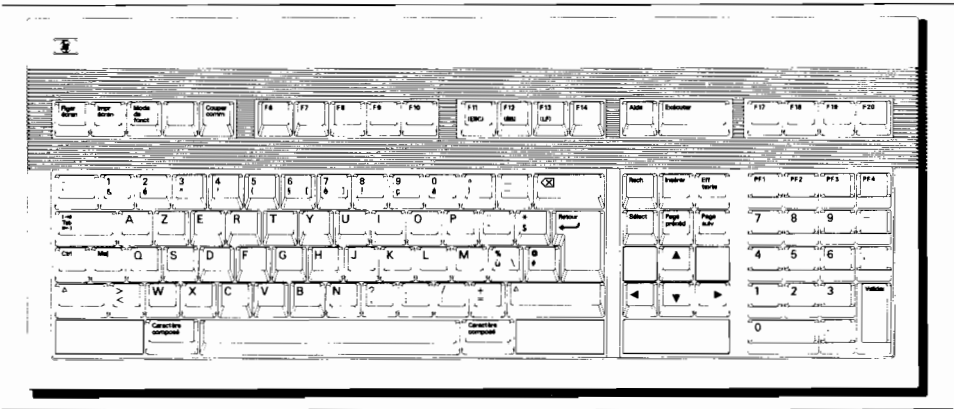


Figure C-4. Italian

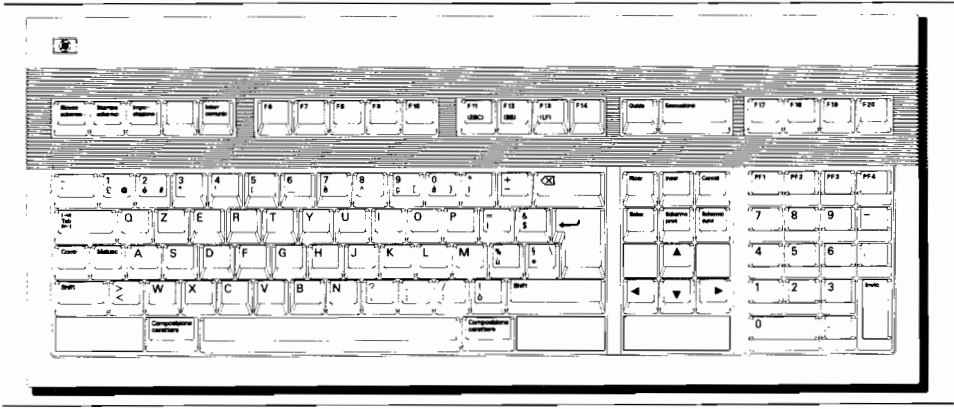


Figure C-5. Swedish

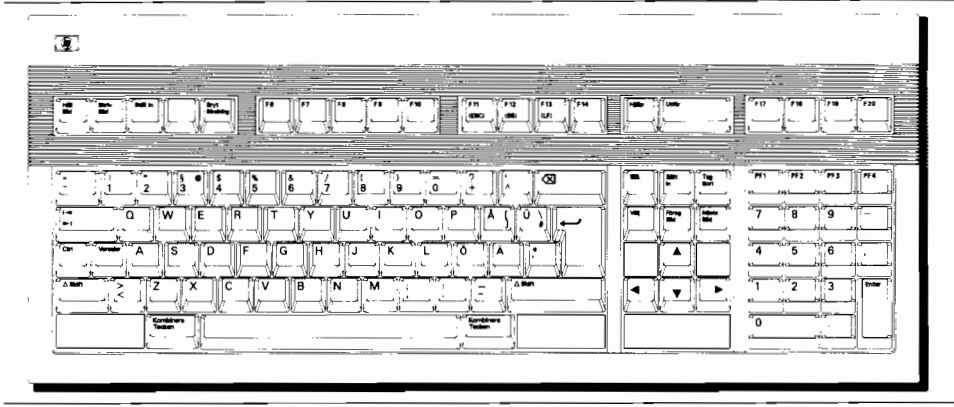


Figure C-6. Spanish

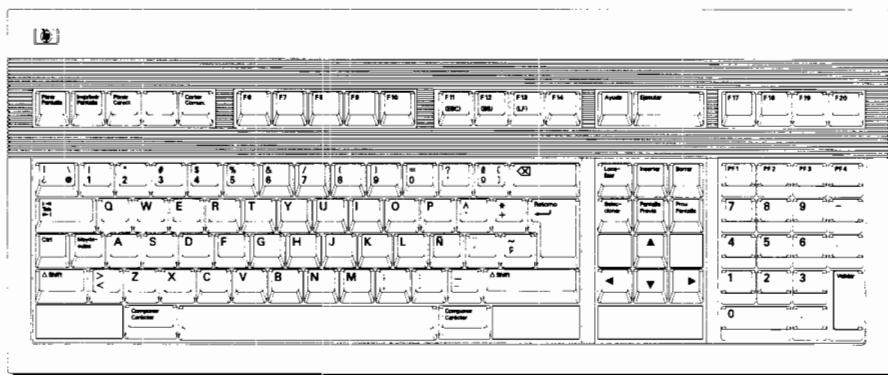


Figure C-7. Dutch

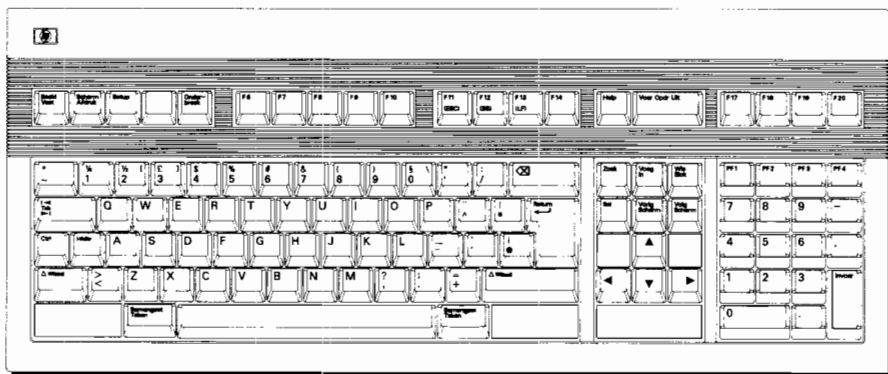


Figure C-8. Norwegian

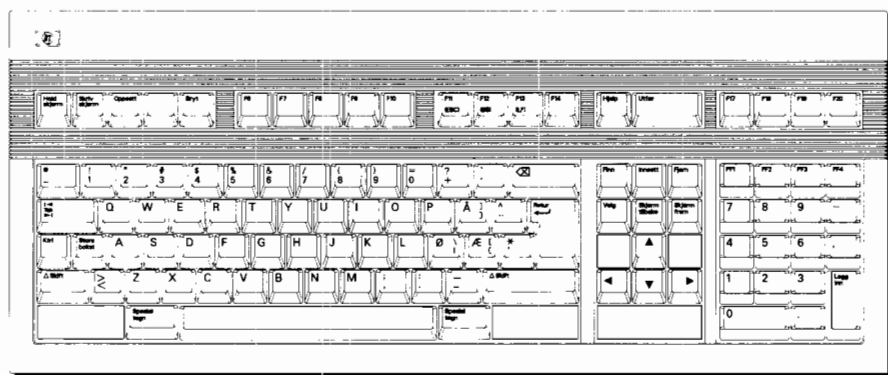


Figure C-9. Swiss — German

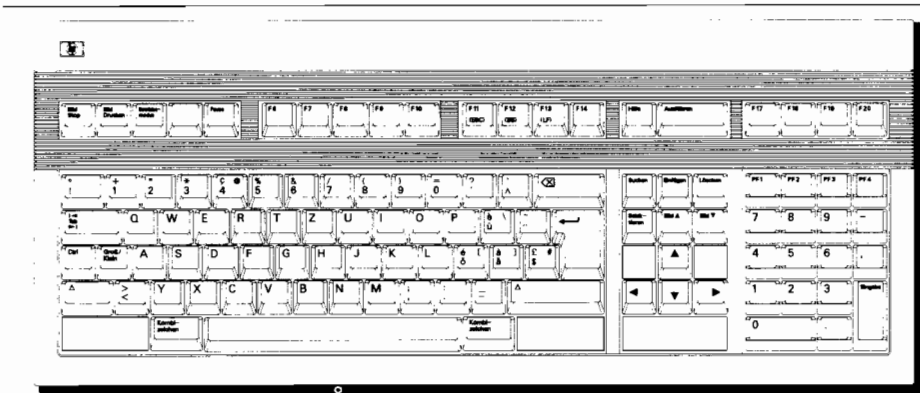


Figure C-10. Swiss — French

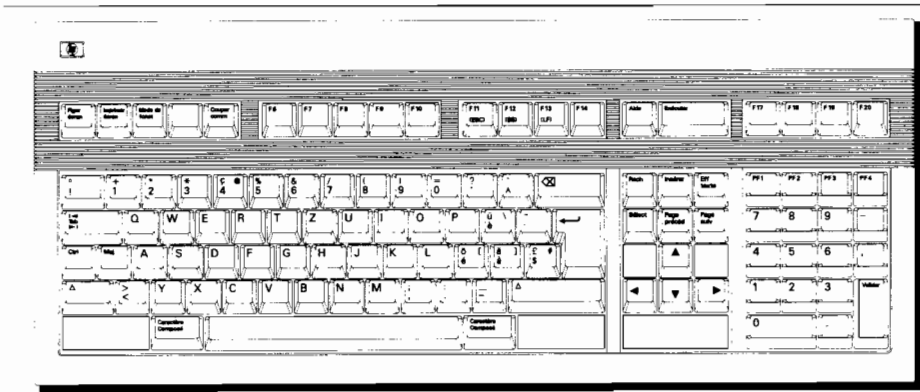


Figure C-11. Finnish

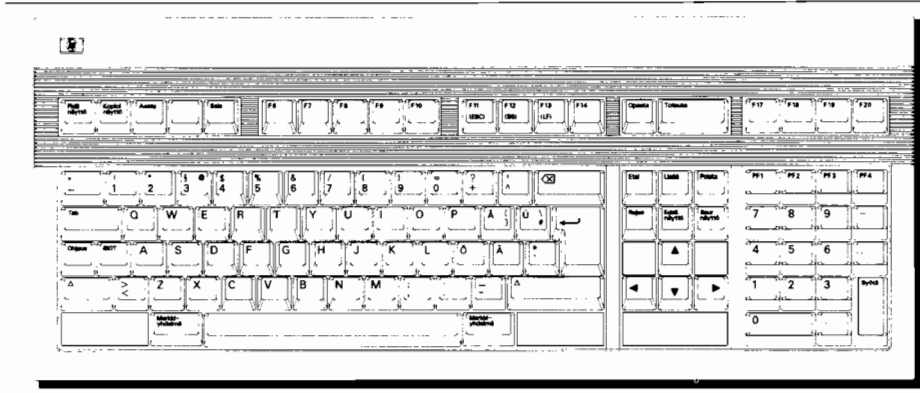
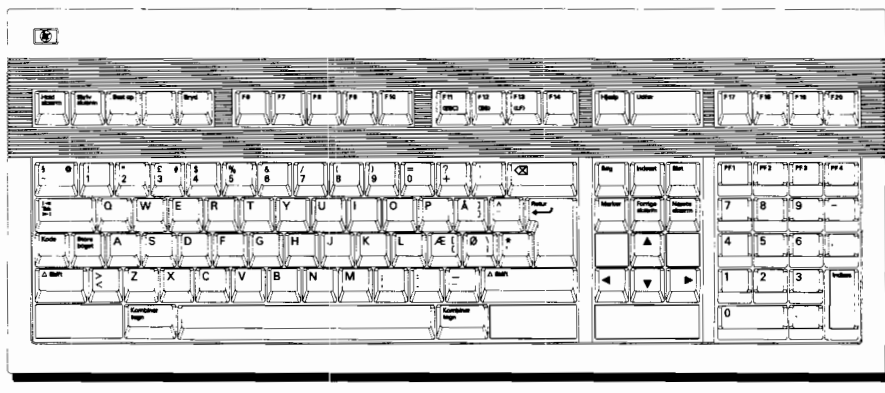


Figure C-12. Danish



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