VT100 Terminal Emulator Manual

for HP 9000 Series 200
Models 216/220/236

HP Part Number 98791-90002

Hewlett-Packard Company
3404 East Harmony Road, Fort Collins, Colorado 80525

HP Computer Museum
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Printing History

New editions of this manual will incorporate all material updated since the previous edition. Update packages may be issued between editions and contain replacement and additional pages to be merged into the manual by the user. Each updated page will be indicated by a revision date at the bottom of the page. A vertical bar in the margin indicates the changes on each page. Note that pages which are rearranged due to changes on a previous page are not considered revised.

The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

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Introduction

The HP 2392A and VT100[1] Terminal Emulator software allows an HP 9000 Series 200 computer to function as a VT100 terminal, while retaining the independent processing advantages of a workstation.

When operating as a VT100 terminal, an HP Model 216, 220, or 236 can communicate with the EDT editor on a VAX/VMS[1] system, or with most host computer application programs requiring a VT100 terminal.

Because the HP 2392A and VT100 Terminal Emulator software can operate as both the HP 2392A emulator and the VT100 emulator, these terminal emulators share many configuration menu items.

VT100 Emulator Features

The VT100 emulator has most of the features of the VT100 terminal, including:

- support of the EDT editor application program running on a VAX/VMS system;
- most ANSI and VT52 escape sequences and keyboard functions;
- a menu-driven emulator configuration feature for defining datacomm and operating characteristics;
- national language keyboards;
- scrolling-region, local mode, video enhancements, and support of a printer.

In addition, the VT100 emulator has:

- multiple-page display memory;
- the capability to switch between VT100 mode and HP 2392A mode through a menu selection;
- five configuration files, which allow you to store different configurations;
- file transfer capability in the HP 2392A mode.

[1] VT100, VAX and VMS are trademarks of Digital Equipment Corporation.

What You Need To Know

The HP 2392A and VT100 emulator software can operate as either the HP 2392A terminal emulator or the VT100 terminal emulator. For this reason, the emulators are similar in setup and operation.

The *HP 2392A Terminal Emulator Manual*, included in the HP 2392A and VT100 terminal emulator software package, documents in detail most of these similarities. The sections of the HP 2392A manual you should familiarize yourself with are:

- (Optional) Part I, "Learning About the Terminal Emulator";
- The "Preparing to Use the Terminal Emulator" chapter, particularly the "Data Communications Interface" section;
- The "Running the Emulator Software" chapter, with focus on the "Using Other Hardware Configurations" and "If Your System Contains Multiple Interfaces" sections;
- The "Mass Storage Operations" chapter, important for file transfers; and
- The "Supplemental Mass Storage Information" appendix.

How This Manual Is Set Up

The emulator menus shown on your HP Series 200 screen are either screen menus or softkey menus. Screen menus display menu information on the entire screen with softkey labels along the bottom of the screen. An example of a screen menu is the TERMINAL CONFIGURATION menu. Softkey menus display only the softkey labels along the bottom of the screen. An example of a softkey menu is the config menu. These menus are described in later chapters of this manual. Boxes or keycap symbols are used to distinguish keyboard keys, such as RUN or k1. Softkeys, such as `config` or `aids`, are printed as they appear on the screen.

To choose a softkey function, press the corresponding keyboard key labelled k0 through k9. If you choose a softkey with a lower-case name, the screen will show the menu named. If you choose a softkey with an upper-case name, the emulator will perform the specific action named.

To return to the aids softkey menu from any of the other menus, press RUN. The aids softkey menu is shown in the "Using the Terminal Emulator" section in the *HP 2392A Terminal Emulator Manual.*

Setting Up Your System 1

This chapter describes the hardware and software needed to set up the VT100 terminal emulator and connect it to a host computer. Prior to setting up the emulator, you should:

- Be familiar with the operation of your HP Series 200 computer;
- Know which flexible disc drive connected to or built in to your computer is used for booting. You can determine this by referring to the operating manual for your computer.
- Be familiar with any peripherals you intend to use with the terminal emulator. Turn all peripherals ON before loading the software.

If you have a:

- Model 217,
- Model 237,
- Model 220 with an HP 46020A-AZ HP-HIL keyboard,
- Model 310, or
- Model 320,

refer to the *VT100 Terminal Emulator Manual for the HP 9000 Series 200 Models 217/220/237/310/320.*

Required Hardware and Software

To use the HP 2392A and VT100 terminal emulator software, you need the following:

Item: **Description:**

Computer: HP Series 200 Models 216, 220, or 236 with **at least 512K bytes of RAM** and an ID PROM. The computer must be equipped with an ID PROM because the emulator's security system "locks" the software to a specific computer using an ID PROM. Refer to the following table to determine if your computer requires an ID PROM upgrade to run the emulator software.

Required Upgrades for Series 200 Computers without ID PROMS

Model Type:	Serial Number Prefix Lower Than:	Required Upgrade:
9816A	2346A, 2412G, 2346J	98143P
9816S	2346A, 2350G, 2346J	98143P
9836A or S	2314A	98143A

Monitor: If you have an HP Model 220, you must use the HP 35721A, HP 35721B, or HP 35721C monitors and the HP 98204B video output interface card. The CHAR SELECT switch on the HP 98204B video output interface card must be in position "0" to generate the line drawing character set. Refer to the "Keyboards and Character Sets" appendix of the *HP 2392A Terminal Emulator Manual* to determine how to change the CHAR SELECT switch.

You may also use the HP 82912A or HP 82913A monitor with an HP 98204A composite video interface card.

Keyboard: If you have an HP Model 220, you must use the HP 98203B keyboard.

Mass Storage: Any flexible or hard disc plus connecting cable supported by the Pascal 3.1 system. Refer to the *HP 2392A Terminal Emulator Manual* to determine which type of cable you need.

Printer (optional): Any printer plus connecting cable supported by the Pascal 3.1 system. Refer to the *HP 2392A Terminal Emulator Manual* to determine which type of cable you need.

RS-232 Interface Card: HP 98626A, HP 98628A, or HP 98644A (or the HP Model 216 built-in data communications interface).

Required Hardware and Software (cont'd)

Connection to Host:	A modem and/or cable(s) for connecting your Series 200 computer's RS-232 interface card to a remote host computer.
Software (Environment):	Pascal 3.1 Operating System or the limited Pascal environment from the "Series 200 Terminal Emulator Environment Disc", part number 98791-10325 (3 ½-inch disc) or 98791-10625 (5 ¼-inch disc).
Software (Program):	"9000 Models 216, 220, 236 HP 2392A and VT100 Terminal Emulator Program Disc", part number 98791-10334 (3 ½-inch disc) or 98791-10634 (5 ¼-inch disc).

VT100 Alpha Highlights

To emulate the VT100 Advanced Video Option, HP Series 200 computers must support inverse video, blinking, underlining, and half-bright capabilities. Refer to the following table to determine if your Series 200 computer can emulate the VT100 Advanced Video Option.

Advanced Video Option Table

Model	Video Capabilities Supported:	Video Option: Support Advanced
236	All	Yes
216	All, with a video enhancement board, part number09816-66582	Yes (with video enhancement board)
220 with HP 98204A composite video interface card	None	No
220 with HP 98204B composite video interface card	All	Yes

The HP 2392A and VT100 Emulator Package

The HP 2392A and VT100 emulator software for Models 216, 220 and 236 is stored on two flexible discs. One disc contains the emulator program, the configuration file and the codeword file. The other disc contains the "limited" Pascal environment. You can run the program disc using the "limited" Pascal environment disc or from a full Pascal workstation. However, you must use a full Pascal, BASIC or HPL language system to initialize the blank discs and create working copies of the software.

NOTE

It is recommended that you create copies of your discs for archival purposes. Although flexible discs are very reliable, extended use could cause wear and eventual failure of the media.

If your HP Series 200 workstation is connected to a hard disc or is on an SRM system, you may wish to create a copy of your emulator program, configuration file, and codeword file on the hard disc. Refer to the the *BASIC User's Guide*, the *HPL Operating Manual*, or the *Pascal Workstation System* manual for information on flexible disc initialization and copying. Refer to the "Supplemental Mass Storage Information" appendix in the *HP 2392A Terminal Emulator Manual* for information on volume and file specifications.

Security

The HP 2392A and VT100 emulator software is secured and requires a unique codeword to be declared for each HP workstation. For more information on security procedures, refer to the "Running the Emulator Software" chapter of the "Getting Started" section in the *HP 2392A Terminal Emulator Manual.*

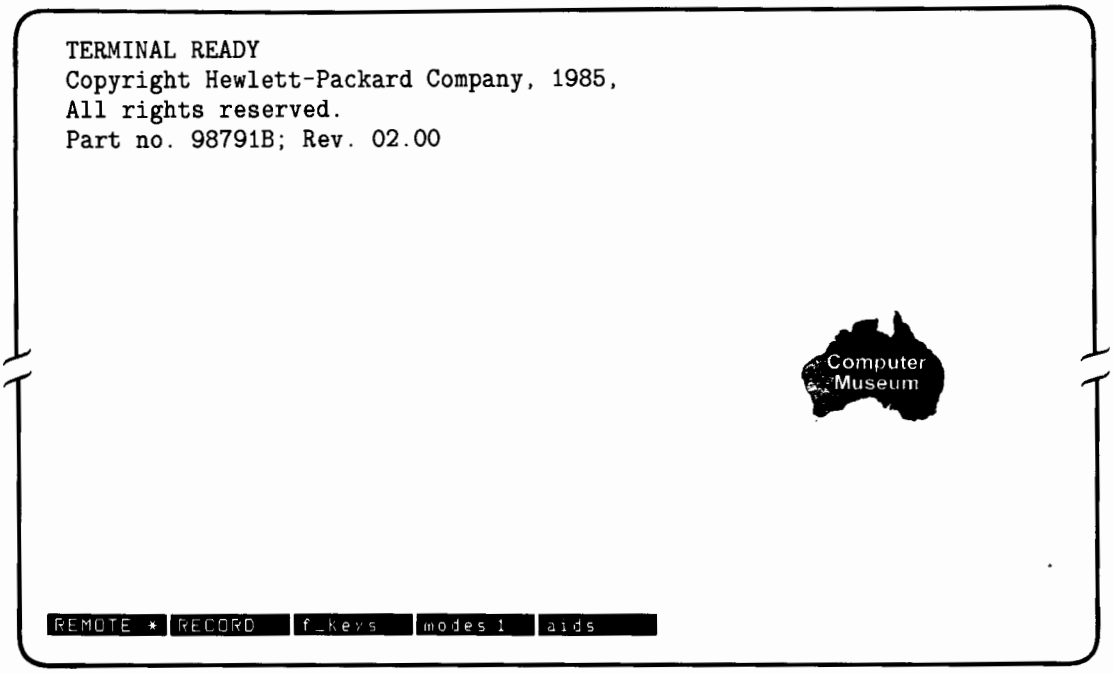
Loading the Software

For instructions on loading your software, refer to the "Running the Emulator Software" chapter of the "Getting Started" section in the *HP 2392A Terminal Emulator Manual.*

NOTE

To properly load the software, be sure that the disc drive containing the disc with TERM.CODE (the emulator program), TRM_CNF (the configuration file), and TRM_CODW (the codeword file) is designated as the Pascal workstation's system volume. The system volume is indicated by an asterisk (*) when you execute the "Volumes" command while in the Pascal Filer.

When you load the emulator program, it will be in the HP 2392A emulator mode. This is how the screen will appear:



HP 2392A Emulator Mode Screen Display

To change the emulator from HP 2392A mode to VT100 mode, follow these steps:

1. Press RUN. (See "Terminal Configuration" of the "Configuration" chapter.)
2. Press k9 (**aids**).
3. Press k9 (**config**).
4. Press k5 (**term_cnf**).
5. Press TAB until the cursor is positioned at the **TermType** field. Press SHIFT-TAB to move the cursor back to the previous item. (See "Changing Terminal Emulator Modes" of the "Configuration" chapter.)
6. Press k5 (**NEXT**) or k6 (**PREVIOUS**) to change **HP** to **VT100**.

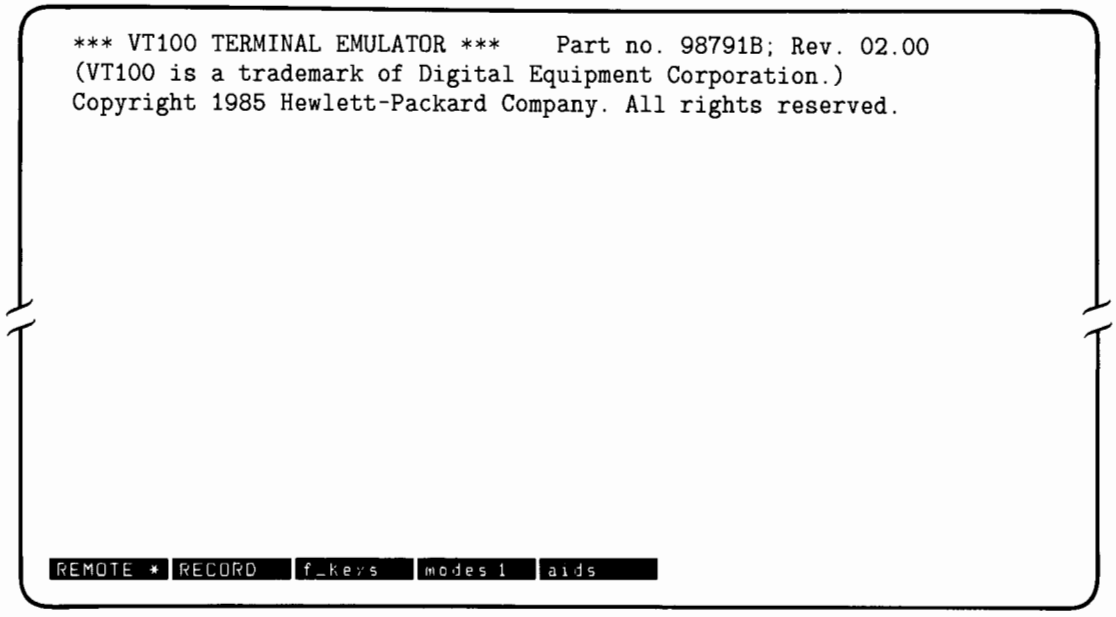
Now that you are in VT100 mode you must further confiqure the emulator so that you can actually communicate with another machine and have the display appear to be a VT100 display.

7. Set tabs in every column or every eighth column. (Follow the steps in the section "Tab Settings" of the "Configuration" chapter.)
8. Turn on **InhEolWrp(C)**. (See "Accessing the TERMINAL CONFIGURATION Screen Menu" first and then "InhEolWrp(C) Menu Item" of the "Configuration" chapter.)
9. Press RUN and k7 (**f_keys**) to return to the Function Keys Menu.

10. Press [k7] to turn on the block style cursor, **CURSOR**. (See "VT100 Function Keys Setup" of the "Configuration" chapter.)
11. Press [k8] to turn on autorepeat, **AR**. (See "VT100 Function Keys Setup" of the "Configuration" chapter.)
12. Press [k6] to turn on VT100 remote mode, **VT RMT**. (See "VT100 Function Keys Setup" of the "Configuration" chapter.)

The VT100 Emulator is Loaded

The emulator software is now loaded and in the VT100 emulator mode. The screen display should consist of the three-line VT100 legend shown below:



VT100 Emulator Mode Screen Display with Legend

After you change the emulator from HP 2392A mode to VT100 mode, the emulator will operate in VT100 mode during your work session, but will continue to power up in the default HP 2392A mode. If you plan to work predominantly in VT100 mode, you may want to save the VT100 configuration as the new default configuration. For more information, refer to the "Configuration" chapter of this manual. The "Configuration" chapter also explains other emulator parameters you may wish to set if you plan to operate in VT100 emulator mode.

Configuration 2

The HP 2392A and VT100 emulator configuration menus are identical, except for the VT100 function keys menu, accessed by the `f_keys` softkey. The function keys are predefined in VT100 mode, but are user-definable in HP 2392A mode.

Refer to the "Configuration Files and Defaults" chapter of the *HP 2392A Terminal Emulator Manual* for detailed information on the configuration menus. The best way to become familiar with the configuration menus is to explore them while referring to the chapter mentioned above.

VT100 Emulator Configuration Files

The HP 2392A and VT100 Terminal Emulator can emulate either the HP 2392A terminal or the VT100 terminal, but not both at the same time. The items shown in the table below are implemented when the emulator is operating as the VT100 terminal instead of the HP 2392A terminal. The first column of the table lists the VT100 feature that is desired, the second column gives the emulator name for that feature, the third column lists the name of the menu in which the configuration item is located, and the last column lists the specific softkey you must press to enter the menu. DATACOMM CONFIGURATION and TERMINAL CONFIGURATION are screen menus with softkey labels along the bottom of the screen. The remaining menus are softkey menus.

VT100 Emulator Mode Items

VT100 Terminal Feature:	VT100 Emulator Feature:	Menu Location:	Softkey Pressed:
AUTO XON/XOFF	`Protocol Handshake`	DATACOMM CONFIGURATION	`datacomm`
PARITY SENSE	`Parity`	DATACOMM CONFIGURATION	`datacomm`
PARITY	`Chk Parity`	DATACOMM CONFIGURATION	`datacomm`
BITS PER CHAR	`Bits/Char`	DATACOMM CONFIGURATION	`datacomm`
TRANSMIT/RECEIVE SPEED	`BaudRate`	DATACOMM CONFIGURATION	`datacomm`
WRAP AROUND	`InhEolWrp`	TERMINAL CONFIGURATION	`term_cnf`
AUTOREPEAT	`AR *`	function keys	`f_keys`
CURSOR	`CURSOR`	function keys	`f_keys`
ANSI/VT52	`ANSI/VT52`	function keys	`f_keys`
NEW LINE	`AUTOLF`	modes 2	`modes`
TAB SETTINGS	Tab Settings	tabs	`tabs`

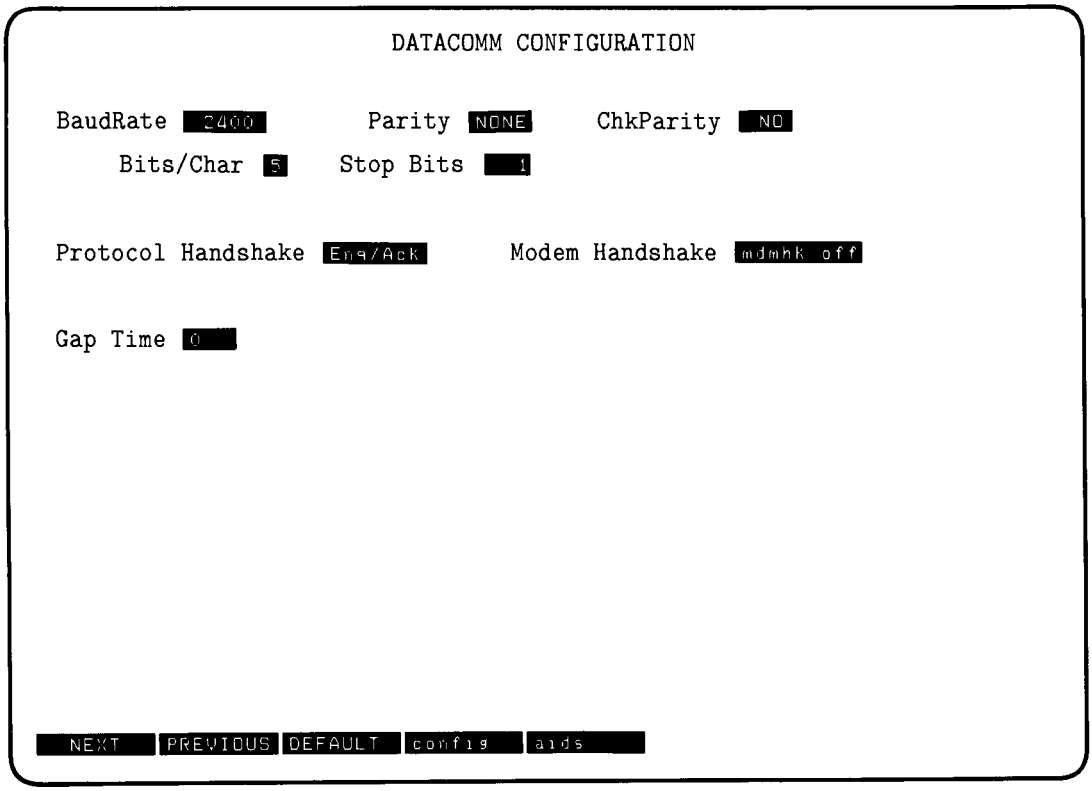
The modes 2 softkey menu, accessed by the `modes 2` softkey, is described in detail in the *HP 2392A Terminal Emulator Manual.* The remaining menus are described later in this chapter.

Datacomm Configuration

To examine the menu containing the datacomm values, perform the following steps:

1. Press RUN.
2. Press k9 (aids).
3. Press k9 (config).
4. Press k6 (datacomm).

The softkey menus accessed by the aids softkey and the config softkey are described in detail in the *HP 2392A Terminal Emulator Manual.* The emulator now displays the DATACOMM CONFIGURATION screen menu.



DATACOMM CONFIGURATION Screen Menu Display

The configuration values shown on your screen may differ from those shown in the illustration. The Gap Time item appears only if your computer uses the HP 98628A data communications interface.

Modifying Your Datacomm Values

Your host computer and datacomm link may require different configuration values from those supplied with the software. In the VT100 emulator mode, it is usually best to change the `Protocol Handshake` item from `Enq/Ack` to `XonXoff`. You will probably also need to change the `BaudRate` and `Parity` datacomm items to what is required by your host computer or modem.

To modify an item value, press [TAB] to move the cursor forward until it is positioned at the item to be changed. To move the cursor back to a previous item, press [SHIFT]-[TAB]. When the cursor is at an item you wish to change, press [k5] (`NEXT`) or [k6] (`PREVIOUS`) to scan through the available values until you arrive at the desired setting. Once the setting is changed, press [TAB] to continue to the next item you wish to change. When you complete all desired changes, press [k9] to exit the DATACOMM CONFIGURATION screen menu.

If you wish to retain the new datacomm values for future emulator use, follow the steps given in the "The Default Configuration File" section at the end of this chapter.

Terminal Configuration

The screen menu and softkeys controlling most of the terminal emulator's operating characteristics are in the TERMINAL CONFIGURATION screen menu.

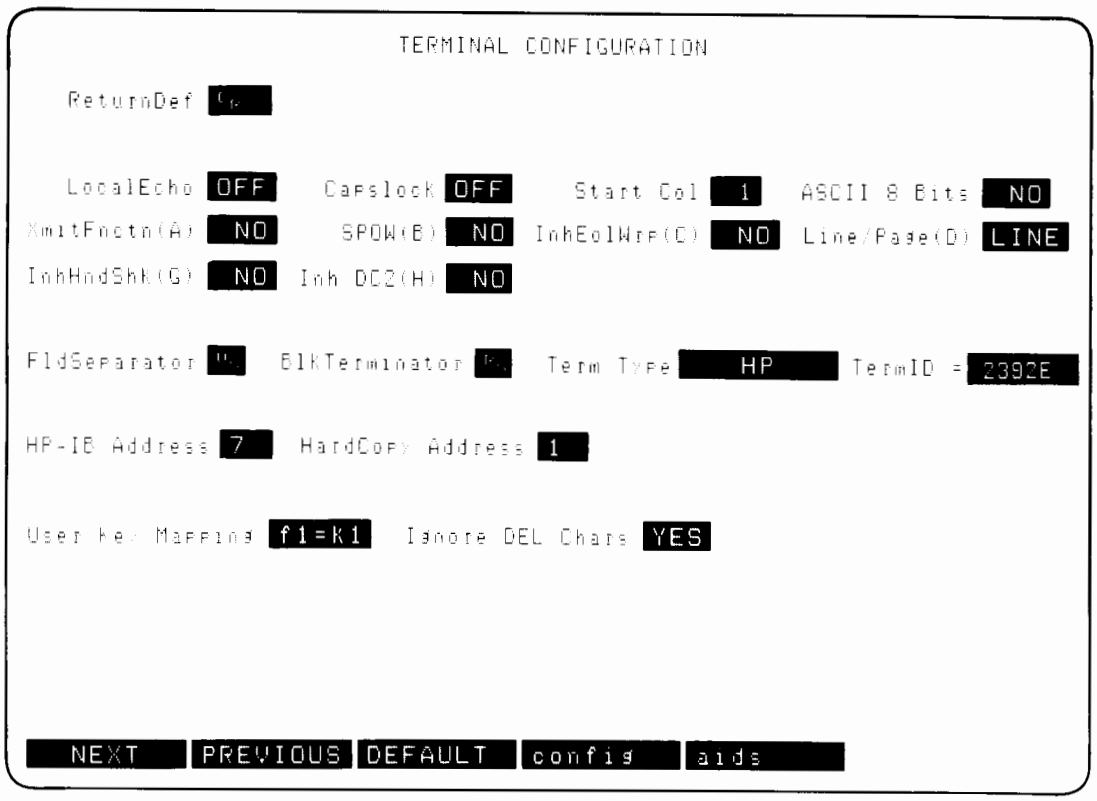
Accessing the TERMINAL CONFIGURATION Screen Menu

To access the TERMINAL CONFIGURATION screen menu and softkeys:

1. Press [RUN].
2. Press [k9] (`aids`).
3. Press [k9] (`config`).
4. Press [k5] (`term_cnf`).

The softkey menus accessed by the `aids` softkey and the `config` softkey are described in detail in the *HP 2392A Terminal Emulator Manual.*

The TERMINAL CONFIGURATION screen menu and softkeys should appear as below. The terminal configuration item values shown are VT100 default values.



TERMINAL CONFIGURATION Screen Menu Display

Changing Terminal Emulator Modes

The `TermType` menu item allows you to switch between the VT100 emulator mode and the HP 2392A emulator mode. To change the emulator mode:

1. Press TAB until the cursor is positioned at the `TermType` item (press SHIFT-TAB to move the cursor back to a previous item).
2. Press k5 (`NEXT`) or k6 (`PREVIOUS`) to change the type of terminal from `VT100` to `HP` or back.

InhEolWrp(C) Menu Item

`InhEolWrp(C)` is the only item in the terminal configuration menu that emulates a VT100 terminal function (WRAP AROUND). Position the cursor at this item and press k5 (`NEXT`) or k6 (`PREVIOUS`) to change the value between `YES` and `NO`.

If the value of `InhEolWrp(C)` is `NO` (default) and the rightmost screen column contains a character, an attempt to enter a character into the rightmost column causes the new character to be placed in the first column of the next line.

If the value of `InhEolWrp(C)` is `YES` and the rightmost screen column contains a character, an attempt to enter a character in the rightmost column causes the additional character entered to overwrite the existing character.

Non-VT100 Terminal Configuration Items

The items listed in the following table are described in detail in the "Terminal Configuration" chapter in the *HP 2392A Terminal Emulator Manual.* While they are not present on the VT100 terminal, their values do affect VT100 emulator operation.

Non-VT100 Configuration Items

Configuration Item:	Default Value:	Description:
`Keyboard`	`USASCII`(or the physical keyboard attached)	Specifies which characters your keyboard will generate. The keys on your keyboard will correspond to the keys on the national language keyboard you select and will produce the same characters as the national language keyboard itself. The default is the physical keyboard attached. Refer to the "Keyboards and Character Sets" appendix of the *HP 2392A Terminal Emulator Manual* for the national language keyboard maps.
`LocalEcho`	`OFF`	If set to OFF, characters entered on the keyboard are not echoed locally to the screen. If set to ON, characters entered on the keyboard are echoed locally to the screen.
`Capslock`	`OFF`	If set to OFF, the keyboard generates both upper-case and lower-case ASCII characters. If set to ON, the keyboard generates only upper-case ASCII characters.
`ASCII 8 Bits`	`NO`	If set to NO, the emulator transmits seven-bit ASCII codes. If set to YES, the emulator transmits eight-bit ASCII codes, used for alternate language character sets.
`Hardcopy Address`	`7`	Identifies the select code for the interface card that runs the hardcopy printer for your HP Series 200 computer. If your printer is connected to an HP 98626A interface card (RS-232) in your computer, the select code of this card is used instead of the default 7.
`HP-IB Address`	`1`	Because several devices can be connected to an HP-IB interface, you must specify a interface card address for the emulator to access the hardcopy printer. If your printer is connected to an HP 98626A interface card in your computer, the HP-IB address value should be "blank".
`User Key Mapping`	`f1=k1`	Allows you to select between two schemes for the eight VT100 function keys. When f1 = k0, softkeys k0 through k3 are used in the menus. When f1 = k1, softkeys k1 through k4 are used. Softkeys k5 through K9 are unchanged by the `User Key Mapping` setting.

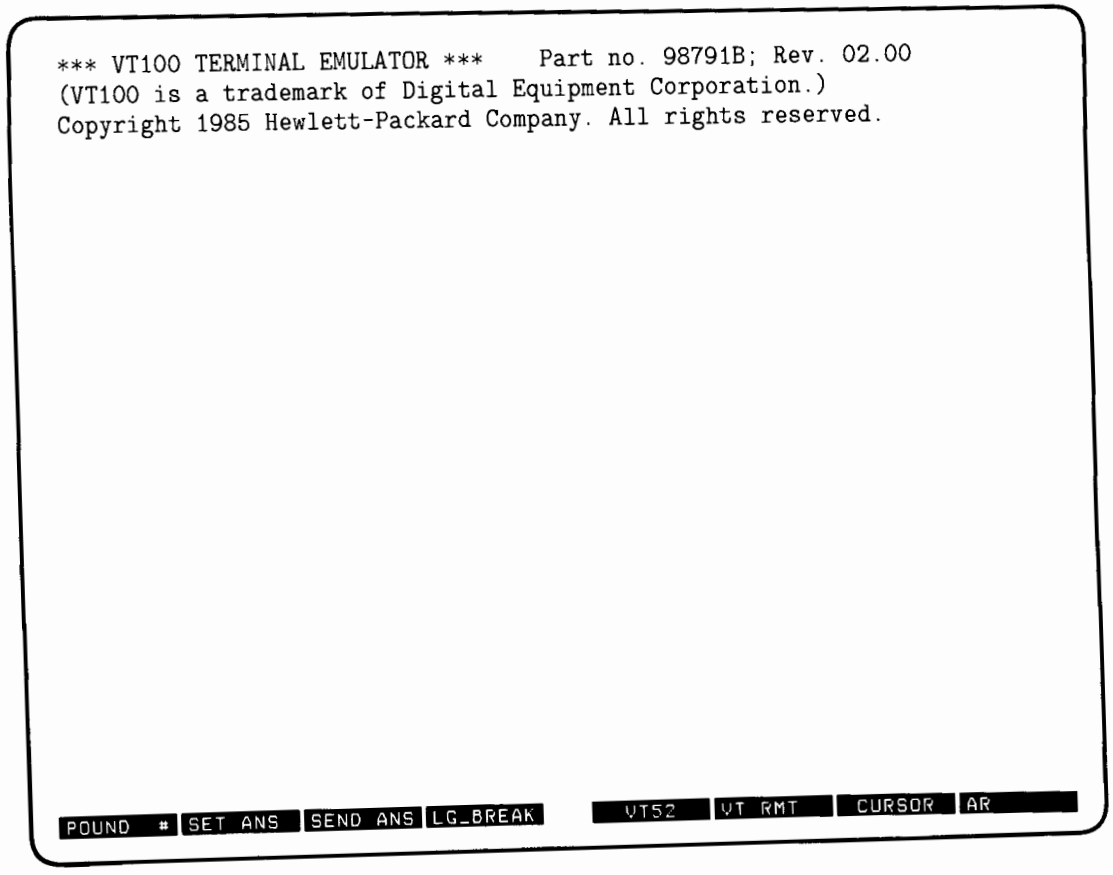
NOTE

National language keyboard characters are represented by ASCII character codes. The VT100 emulator has different codes from the VT100 terminal itself, although both sets of codes define the same characters. Take care not to access or work with a file on the VT100 emulator containing codes generated by the VT100 terminal itself, or vice versa. The codes will not translate correctly between the two different terminals. For additional information on national keyboards, see the "Keyboards and Character Sets" appendix in the *HP 2392A Terminal Emulator Manual.*

The remaining terminal configuration items have no bearing on VT100 operation but are important for correct emulator operation. They are included in the "Menu Items You Should Not Change" section, later in this chapter.

VT100 Function Keys Setup

The VT100 function keys are accessed through the function keys menu and can remain on the screen during VT100 operation. The function keys menu, a softkey menu, can be reached from any other menu by pressing RUN and then k7 (f_keys). This is how the function keys menu appears on the screen when the emulator is in VT100 mode:



Function Keys Menu Display

SEND ANS (k3) and LG_BREAK (k4) are not setup configuration items but are included in the following table to complete the function keys description.

NOTE

The following table, which gives a description of the function keys, assumes that the Terminal Configuration item User Key Mapping has default value f1=k1. If you change this item to f1=k0, then substitute k0 through k3 for k1 through k4 to access the first four function keys.

Function Keys

Function Key:	Softkey:	Description:
POUND	k1	Press this softkey to switch between the USASCII pound symbol # and the English pound symbol £.
SET ANS	k2	This softkey allows you to set up the answerback message. An answerback message is sent to the host computer when you receive an "Enq" character only if the emulator's handshake is set to NONE or XonXoff. When you set the handshake to Enq/Ack, you should disable the answerback message by emptying it. Refer to the "Entering the Answerback Message" section following this table to determine how to enter the answerback message.
SEND ANS	k3	Press this softkey to send the answerback message to the host computer if the VT100 remote mode (VT RMT) is ON (the asterisk is present in the softkey screen display).
LG_BREAK	k4	Press this softkey to generate the VT100 long break (3.5 seconds).
ANSI/VT52	k5	Press this softkey to select either ANSI or VT52 operation. ANSI and VT52 are VT100 submodes. Your choice will depend on the requirements of the VT100 software you use.
VT RMT	k6	Press this softkey to select either remote or local VT100 operation. If an asterisk is present in the softkey display (VT RMT*), the emulator is in remote mode. **DO NOT** confuse this with the HP REMOTE mode, accessed by a softkey in the modes menu, **which must always be on**. In VT100 remote mode, all keystrokes except the local function keys are sent to the host computer and the return transmission from the host computer determines the screen display. In local mode, keystrokes are interpreted locally, directly controlling the display without host computer intervention.
CURSOR	k7	Press this softkey to choose between the underline or block style cursor.
AR	k8	Press this softkey to turn autorepeat ON and OFF. If an asterisk is present in the softkey screen display (AR*), autorepeat is ON (active) and multiple keystrokes are generated when you hold a key down. **Note:** The four rightmost character positions of the autorepeat item window are used to represent the state of the four VT100 LEDs by displaying the numbers of those LEDs that are on. These numbers are sometimes manipulated by host computer programs. Except for sharing the same item window, the autorepeat state and the simulated LED display are unrelated.

Entering The Answerback Message

To enter an Answerback Message for the SET ANS function key:

1. Press k2 (SET ANS). This displays the current answerback message. All control characters in the message are represented as triangles on the screen. If the message is satisfactory, press the space bar to exit.
2. To change the message, press k2 (SET ANS) again. You may now type in a message containing up to 40 characters. If you wish to include a control character in your message, refer to the "USASCII Control Characters" section of the "Keyboards and Character Sets" appendix in the *HP 2392A Terminal Emulator Manual* for more information on how to enter a control character. (If you make a mistake while entering an answerback message, exit and re-enter this menu by pressing k2 (SET ANS) three times and then retype your message.)
3. Once the correct answerback message is entered into the field, press k2 (SET ANS) to exit the mode and store your message in your HP Series 200's memory. To save this message in the default configuration file, follow the procedure outlined in "The Default Configuration File" section at the end of this chapter.

Auto-Linefeed

AUTOLF (Auto-Linefeed) on the emulator serves as the VT100 terminal NEW LINE function. AUTOLF can be set or reset either by the softkey k7 (AUTOLF) in the modes 2 menu, or the ANSI NEW LINE MODE escape sequence. This section details the use of the softkey. Refer to the "ANSI Escape Sequences" appendix of this manual for information on the ANSI NEW LINE MODE escape sequence.

When AUTOLF is ON, an asterisk (*) is shown in the AUTOLF display. A carriage return and linefeed are transmitted when you press ENTER. If a linefeed is received from the host computer, the display reacts as though both a carriage return and a linefeed were received. If the cursor is at the bottom of the scrolling region, the scrolling region scrolls up.

When AUTOLF is OFF, an asterisk (*) is not shown in the AUTOLF display. A carriage return is transmitted when you press ENTER. If a linefeed is received from the host computer, the display reacts by moving the cursor down one line with no carriage return.

Tab Settings

When the HP 2392A/VT100 emulator powers up, it reads the default configuration file, including any tab stop settings you have saved. If you have not saved any tab stop settings, the emulator starts the session with no tab stops. If you plan on using the EDT editor on a VAX running VMS, you should set a tab in every column. To change the tab settings:

1. Press RUN.
2. Press k7 (f_keys)
3. Switch to VT100 local mode using the VT RMT (k6) function key.
4. Press RUN.
5. Press k9 (aids).
6. Press k7 (tabs).

Press the arrow keys to move the cursor to the proper location. Press k5 (SET_TAB) to set a tab, k6 (CLR_TAB) to clear a tab, or k7 (CLR_TABS) to clear all tab settings. The VT100 screen ruler tab is not provided with the emulator.

When you finish altering your tab settings, return to the function keys menu, accessed by the f_keys softkey. Then return to VT100 remote mode using the VT RMT (k6) function key.

Menu Items You Should Not Change

Proper VT100 emulation depends on the state of several HP 2392A emulator menu items. When you switch the emulator from HP 2392A emulator mode to VT100 emulator mode, using the `TermType` item in the TERMINAL CONFIGURATION screen menu, these items are automatically set.

You should not change these items. If you accidentally change any of these items, and are unsure of the correct settings, exit and re-enter the VT100 mode. This re-establishes all VT100 settings, but **you will lose your screen data**.

The following table lists the menu items that should not be altered, their required settings, the name of the menu where the items are located, and the softkey you must press to get the menu on the emulator screen.

Menu Items Not To Change

Item:	Required Setting:	Menu:	Softkey Pressed:
ReturnDef	$^{C}_{R}$	TERMINAL CONFIGURATION	term_cnf
XmitFnctn(A)	YES	TERMINAL CONFIGURATION	term_cnf
SPOW(B)	NO	TERMINAL CONFIGURATION	term_cnf
Line/Page(D)	LINE	TERMINAL CONFIGURATION	term_cnf
InhHndShk(G)	YES	TERMINAL CONFIGURATION	term_cnf
Inh DC2(H)	YES	TERMINAL CONFIGURATION	term_cnf
FldSeparator	$^{U}_{S}$	TERMINAL CONFIGURATION	term_cnf
BlkTerminator	$^{R}_{S}$	TERMINAL CONFIGURATION	term_cnf
Ignore DEL Chars	NO	TERMINAL CONFIGURATION	term_cnf
REMOTE	ON	modes	modes
BLKMODE	OFF	modes 1	modes 1
MOD_ALL	OFF	modes 1	modes 1
LN_MDFY	OFF	modes 1	modes 1
DSP_FNS	OFF	modes 2	modes 2
MEMLOCK	OFF	modes 2	modes 2

The Default Configuration File

If you changed any of the default configuration settings and anticipate you will use the new settings most of the time, you may wish to create a new default configuration file for powerup.

Follow these steps to store a new default configuration file:

1. Press [RUN].
2. Press [k9] (aids).
3. Press [k9] (config).
4. Press [k0] (save_cnf).
5. Press [k0] (SAVE_DEF).

Follow these steps to access the default configuration file:

1. Press [RUN].
2. Press [k9] (aids).
3. Press [k9] (config).
4. Press [k4] (get_cnf).
5. Press [k0] (GET_DEF).

The softkey menus accessed by the aids softkey, the config softkey, the get_cnf softkey, and the save_cnf softkey are described in detail in the *HP 2392A Terminal Emulator Manual.*

Refer to the "Configuration Files and Defaults" chapter in the *HP 2392A Terminal Emulator Manual* for information on the specific values stored in the default configuration file.

The Alternate Configuration Files

The HP 2392A and VT100 Terminal Emulator has the capability to store four different configurations in addition to the default configuration. You may use this feature for storing configurations you will use occasionally, but not as frequently as the default configuration.

Follow these steps to store a configuration in one of the alternate configuration files:

1. Press RUN.
2. Press k9 (aids).
3. Press k9 (config).
4. Press k0 (save_cnf).
5. Press k1, k2, k3, or k4 to store alternate configuration files 1, 2, 3 or 4, respectively.

Follow these steps to access one of the alternate configuration files:

1. Press RUN.
2. Press k9 (aids).
3. Press k9 (config).
4. Press k4 (get_cnf).
5. Press k1, k2, k3, or k4 to access alternate configuration files 1, 2, 3 or 4, respectively.

The softkey menus accessed by the aids softkey, the config softkey, the get_cnf softkey, and the save_cnf softkey are described in detail in the *HP 2392A Terminal Emulator Manual.*

Refer to the "Configuration Files and Defaults" chapter in the *HP 2392A Terminal Emulator Manual* for information on the specific values stored in the alternate configuration files.

Using the VT100 Terminal Emulator 3

This chapter contains information on using the HP 2392A and VT100 terminal emulator in VT100 mode. The areas discussed are:

- Connecting to the Host Computer
- The EDT Editor
- The VT100 Emulator Keyboard
- Multi-Page Mode
- File Transfer Capability
- Line-Drawing Character Set

If an error occurs while you are using the VT100 emulator, refer to the "Handling Errors" appendix of the *HP 2392A Terminal Emulator Manual* for the proper course of action.

Connecting to the Host Computer

After you have loaded the emulator software, you are ready to log on to the host computer. If you are using a modem to talk to the host computer, you should set up the datacomm configuration of the emulator so that it is compatible with your modem and the host computer. Refer to the "Configuration" chapter of this manual for more information on the emulator datacomm configuration.

Example: Logging On To The VAX Running VMS

This section explains the procedure to log on to a VAX host computer running VMS. Your host computer need not be a VAX/VMS. The VAX/VMS is only an example host computer used to explain how to log on. The emulator must be in ANSI submode for this procedure.

1. Log on by pressing ENTER. Your first host computer message will be:

   `Username:`

2. Type in your assigned Username, followed by ENTER. Wait for the prompt:

   `Password:`

3. Type in your password followed by ENTER. You should get the messsage:

   `WELCOME TO VAX/VMS`

   or a similar host computer message. You should also get the VMS prompt `$`.

4. With a VAX/VMS host computer, you should now type in:

   `set terminal/vt100/notab` ENTER

   This step tells the VAX that you are on a VT100 terminal and sets the host computer handshake to `XonXoff`.

You are now ready to use the VT100 emulator connection to the VAX.

NOTE

If the `BaudRate` item in the emulator DATACOMM CONFIGURATION screen menu is set higher than `2400`, the emulator AND the host computer should use the `XonXoff` handshake. Otherwise, you may get the error message:

`Receive buffer overflow; Press any key to continue.`

Helpful Hints For Logging On To Non-VMS Host Computers

If your host computer is a VAX/UNIX[1] system, instead of the "set terminal" key sequence shown in the previous example, you should type the last step of the log on process as:

```
stty -ixany ixon ixoff ENTER
```

If your host computer is a VAX running the Berkeley version of the UNIX system, you should type in:

```
stty tandem
```

If either case, you will need to set up your termcap by typing either:

```
TERM=vt100 export TERM
```

for a bourne shell; or


```
setenv TERM vt100
```

for a C shell.

NOTE

The termcap tells the host computer that you are on a VT100 terminal. If you are unsure how to set up your termcap, ask the host computer system administrator or refer to the host computer user's manual.

---

[1] UNIX is a trademark of Bell Laboratories.

The EDT Editor

The EDT editor is a common application program that can be used with the VT100 emulator. The following sections discuss the steps to enter and exit the EDT editor.

Entering the EDT Editor

To run the EDT editor, perform the following steps:

1. Type:

   `ed` ENTER

   The VAX response is:

   `$_File:`

2. Enter the name of the file you wish to edit or a new file name (to create a new file) by typing:

   <file name> ENTER

   The EDT editor writes the first line of an existing file to the screen and prompts with

   *

   if you are creating a new file, the first line is blank.

3. To get into the screen-oriented EDT editor, type:

   `c` ENTER

   This step places the first page of your file on the screen.

The EDT rubber keypad overlay included with your software fits on the HP Series 200 keypad and is helpful when using the EDT editor.

NOTE

If you are using the keypad overlay for the EDT editor application, take care not to press both keys under the double-key overlay simultaneously. Doing so may cause the function to occur twice.

Keypad HELP Mode

To acquire additional information on each of the EDT keypad functions, press the HELP keypad overlay key while in the EDT editor. This causes the overlay descriptions to be shown on your display. Press the designated key to receive detailed information on its function or press the space bar to exit the HELP mode.

Exiting the EDT Editor

To exit the EDT editor, perform the following steps:

1. Press CTRL-Z.
2. Type:

   `exit` ENTER

   This step updates your file, returns the emulator to the VAX/VMS command level, and shows the `$` prompt.

Log-out of the VAX/VMS Host Computer

To break the remote connection to your host computer, type:

`logout` ENTER

This terminates the session between your VT100 terminal emulator and the host computer.

The VT100 Emulator Keyboard

This section describes how to perform certain transmitted and local keyboard functions on the VT100 emulator.

SHIFT and CTRL do nothing unless pressed simultaneously with other keys. Their functions are identical on the VT100 terminal keyboard and HP Series 200 keyboard.

You can change the national language of the emulator keyboard by changing the `Keyboard` item in the TERMINAL CONFIGURATION screen menu, which is described in the "Configuration" chapter of this manual.

NOTE

National language keyboard characters are represented by ASCII character codes. The VT100 emulator has different codes from the VT100 terminal itself, although both sets of codes define the same characters. Take care not to access or work with a file on the VT100 emulator containing codes generated by the VT100 terminal itself, or vice versa. The codes will not translate correctly between the two different terminals. For additional information on national keyboards, see the "Keyboards and Character Sets" appendix in the *HP 2392A Terminal Emulator Manual.*

Control Characters and Transmitted Sequences

The table below lists the VT100 terminal keys in the left column, and the corresponding emulator keystrokes in the right column.

Desired VT100 Action:	You Should Type on the Series 200:
Tab	TAB
Back Space	BACK SPACE
Del	SHIFT - BACK SPACE
Return	ENTER
Escape	CONTINUE
Break	CLR I/O
Linefeed	CTRL-J
Bell G	CTRL-G
PF1	E {on numeric keypad only}
PF2	({on numeric keypad only}
PF3	) {on numeric keypad only}
PF4	^ {on numeric keypad only}
No Scroll	CTRL-S{to pause host transmission}
	CTRL-Q{to resume host transmission}

NOTE

When using the No Scroll control character, press CTRL-S UNTIL the screen stops scrolling.

Local Keyboard Functions

The following table shows the local VT100 terminal functions that can be performed by the emulator:

Desired VT100 Action:	You Should Type on the Series 200:
Caps Lock	CAPS LOCK
Unlock Keyboard	SHIFT-CLR I/O This is a "soft" reset, typically used to "unlock" a "locked" keyboard. The soft reset: 1. Clears a keyboard lock caused by an "Xoff". 2. Clears the datacomm buffers. 3. Disables PRT ALL. Refer to the "Using the Terminal Emulator" section in the *HP 2392A Terminal Emulator Manual* for information on PRT ALL.
Reset	To simulate a "hard" reset, retrieve an emulator configuration that is set in VT100 mode.

Additional emulator features not available on the VT100 terminal are:

Desired Action:	You Should Type on the Series 200:
Clear Line	CLR LN
Clear Screen	CLR SCR

Multi-Page Mode Local Keyboard Functions

Multi-page mode is discussed in detail later in this chapter. The following keyboard functions are enabled only in multi-page mode:

Desired VT100 Action:	You Should Type On The Series 200:
Home Up	SHIFT-←
Home Down	SHIFT-→
Roll Up	SHIFT-↑ or turn Knob counterclockwise
Roll Down	SHIFT-↓ or turn Knob clockwise
Previous Page	PRV_PAGE (k5) of screen_k softkey menu
Next Page	NXT_PAGE (k6) of screen_k softkey menu

Unimplemented Terminal Functions

The VT100 terminal emulator software does not implement the following VT100 terminal functions:

- 132-column Mode
- Double-height, Double-width Line
- No Scroll Key
- Dark Characters on Light Screen
- Keyclick
- Margin Bell (always activated)
- Screen Alignment Display (used only for DEC screen alignment)
- Interlace (appropriate only to DEC VT100 hardware)
- Power (50/60 Hz.)
- Invoke Confidence Test

Instead of the VT100 terminal's bold enhancement feature, the emulator provides a half-bright enhancement feature.

NOTE

The **No Scroll** key can be implemented only by pressing CTRL-S to pause scrolling and CTRL-Q to resume scrolling.

Multi-Page Mode

The VT100 emulator provides multi-page capability, which the VT100 terminal does not. The multi-page capability allows the emulator to remember lines of text that have been scrolled off the screen. Depending upon the density of the text, the emulator retains about five pages of scrolled material. The multi-page keyboard functions described in the "Multi-Page Mode Local Keyboard Functions" section in this chapter can be used to view this text.

The multi-page capability is enabled only if the top and bottom rows of the scrolling region are defined as 1 and 24, respectively. In single-page mode, the emulator performs as a VT100 terminal, remembering only what is visible on the screen.

Re-enable the Multi-page Mode

If a host computer program has left the emulator in single-page mode, you may enable the multi-page capability by performing the following steps:

1. Press RUN.
2. Press k7 (`f_keys`).
3. Switch the emulator to local mode using the k6 function key.
4. Press CONTINUE immediately followed by [and then r.
5. Switch the emulator back to VT100 remote mode using the k6 function key.

These steps re-establish the multi-page function by resetting the margins of the scrolling region to the default values of 1 and 24. The information on your screen remains unaffected.

File Transfer Capability

Although the HP 2392A and VT100 Terminal Emulator provides file transfer capability, which the VT100 does not provide, the emulator supports file transfer only in HP 2392A mode. To transfer files, you must switch the emulator from VT100 mode to HP 2392A mode.

NOTE

Attempting to transfer files while in the VT100 mode may cause corruption of the file's contents.

To switch the emulator from VT100 to HP 2392A mode:

1. In the TERMINAL CONFIGURATION screen menu, position the the cursor at the `TermType` item.
2. Press k5 (`NEXT`) or k6 (`PREVIOUS`) to switch to HP 2392A emulator mode.
3. Refer to the "Mass Storage Operations" chapter of the *HP 2392A Terminal Emulator Manual* for details on file transfer.

Line Drawing Character Set

Because the HP Series 200 does not have a line drawing character set, the VT100 line drawing character set is simulated with characters that exist on the HP Series 200 computer. Refer to the "Line Drawing Character Set" appendix of this manual for a complete list of these characters.

Vertical lines, horizontal lines, crossing points and corners are important line drawing characters used for chart construction. They are simulated with the characters |, -, and +. An example of a diagram that uses these characters for chart construction is the numeric keypad diagram, shown when you press **HELP** while in the EDT editor.

Suitable representations also exist for the diamond, rubout, degree symbol, pi and English pound sign. Some line drawing characters are represented with "national language" characters. For example, the carriage return symbol, ⁋, in a single character, is represented by the French cedille "ç".

NOTE

If you have a Model 220 equipped with an HP 98204B composite video interface card, the CHAR SELECT switch on the interface card must be set to position "0" for the emulator to generate the line drawing character set. Refer to the "Keyboards and Character Sets" appendix in the *HP 2392A Terminal Emulator Manual* for information on how to change the CHAR SELECT switch.

Control Characters

A

The VT100 emulator generates a certain response to control characters sent by the host computer. Control characters are executed immediately even if embedded in escape sequences. The following actions are valid in both the ANSI and the VT52 submode.

Control Character:	ASCII Decimal Value:	Action:
ENQ	5	Send the ANSWERBACK message to the host computer if the handshake is set to `XonXoff` or `none`. If the handshake is set to `Enq/Ack`, the emulator response to the host computer's "ENQ" is "ACK" if the emulator can accept 80 characters.
BEL	7	Beep
BS	8	Move the cursor one space to the left. Do not move the cursor if the cursor is at the leftmost screen position.
HT	9	Move the cursor to the next tab stop or to the rightmost screen position if there are no tab stops on the line.
LF	10	See the "New Line Mode" ANSI escape sequence in the "ANSI Escape Sequence" appendix.
VT	11	Same as "LF."
FF	12	Same as "LF."
CR	13	Move the cursor to the leftmost position on the line.
SO	14	Select the "G1" character set.
SI	15	Select the "G0" character set.
XON	17	Resume terminal transmission if `XonXoff` handshake is invoked.
XOFF	19	Stop terminal transmission of all codes except "XON" and "XOFF" if `XonXoff` handshake is invoked.
CAN	24	Abort the current escape sequence and place the rubout character at the cursor position.
SUB	26	Same as "CAN."
ESC	27	Introduce an escape sequence.

ANSI Escape Sequences B

This appendix lists the specific VT100 emulator responses to the ANSI escape sequence commands. Refer to Appendix C for the VT52 escape sequences.

Escape Sequence Overview

Unless otherwise specified, the escape sequences listed on the following pages are sent to the emulator by the host computer. The cursor position is unchanged by an escape sequence except where mentioned.

Escape sequences can be parameterized or non-parameterized. An escape sequence is parameterized if $^{E}_{C}$ is immediately followed by "[". Otherwise, the escape sequence is non-parameterized. ANSI escape sequences can be parameterized or non-parameterized, but all VT52 escape sequences are non-parameterized.

Parameterized sequences are terminated by the ASCII codes for decimal 32 through 47 and 64 through 127. Non-parameterized sequences are terminated by the ASCII codes for decimal 48 through 127.

When the terminator code arrives from the host computer, the emulator examines the character sequence to see if it is a legal expression. If the escape sequence is found to be a legal expression, the emulator performs the corresponding action. Otherwise, the emulator takes no action.

Some of the parameterized ANSI sequences listed in the following tables contain the notations <P1> or <P2>. <P1> and <P2> indicate the first and second parameter needed to implement a single escape sequence. Leading zeros in a parameter are permitted but ignored. The absence of a parameter in a parameterized ANSI sequence is interpreted as a single parameter of zero (i.e., P1 = 0).

Each ANSI escape sequence listed in the following table implements a single command on the emulator. The host computer may combine the parameters of up to fifteen single commands into one escape sequence. For example, the host computer may wish to send the SELECT GRAPHIC RENDITION escape sequence, which is listed in the following table as:

$^{E}_{C}$[<P1>m

where <P1> can be:

0 (attributes off)
1 (half bright)
4 (underscore)
5 (blink)
7 (inverse video)

The host computer would send the following escape sequence to turn off all attributes, then turn on underscore, turn on blink, and turn on inverse video:

E[0;4;5;7m

ANSI Command Escape Sequence Table

Function Desired:	Escape Sequence:	Description:
CURSOR UP	E[<P1>A	Moves the cursor up P1 lines. The cursor does not move beyond the top of the scrolling region unless it is already outside the scrolling region. In this case, it does not move beyond the top of the screen. A "0" is read as a "1".
CURSOR DOWN	E[<P1>B	Moves the cursor down P1 lines. The cursor does not move beyond the bottom of the scrolling region unless it is already outside the scrolling region. In this case, it does not move beyond the bottom of the screen. A "0" is read as a "1".
CURSOR FORWARD	E[<P1>C	Moves the cursor right P1 characters. The cursor does not move beyond the right side of the screen. A "0" is read as a "1".
CURSOR BACKWARD	E[<P1>D	Moves the cursor left P1 characters. The cursor does not move beyond the left side of the screen. A "0" is read as a "1".
CURSOR POSITION	E[<P1;P2>H or E[,<P1;P2>f	Places the cursor at row P1 and column P2. If the emulator receives only P1, the row is designated and the column set to "1" (HOME). A "0" is read as a "1". The position on the screen where the cursor is placed depends on the state of the ORIGIN MODE. If ORIGIN MODE is reset, the origin becomes the upper left position on the screen. Row numbers of the screen display are 1 through 24 and column numbers are 1 through 80. The cursor is placed in the position indicated by row P1 and column P2 of the screen display.

ANSI Command Escape Sequence Table (cont'd)

Function Desired:	Escape Sequence:	Description:
CURSOR POSITION (cont'd)		If ORIGIN MODE is set, the origin is redefined as the upper left position of the scrolling region. Rows and columns of the file are numbered starting at the origin. The cursor is placed at the position indicated by row P1 and column P2 of the scrolling region.
INDEX	^[D	Moves the cursor down one line. If the cursor is at the bottom of the scrolling region, the region is scrolled up. If the cursor is at the bottom of the screen below the scrolling region, the cursor stops at the bottom of the screen and no scrolling occurs. If the NEW LINE mode is set, INDEX also causes a carriage return. This function is identical to a linefeed.
NEXT LINE	^[E	Equal to INDEX (described above) plus a carriage return.
REVERSE INDEX	^[M	Moves the cursor up one line. If the cursor is at the top of the scrolling region, the region scrolls down. If the cursor is at the top of the screen above the region, no cursor movement or scrolling occurs.
SAVE CURSOR	^[7	Saves the current cursor position, attributes, and character set.
RESTORE CURSOR	^[8	Restores the cursor position, attributes and character set saved by the last SAVE CURSOR command.
CURSOR POSITION REPORT	^[[<P1;P2>R	The emulator reports the current cursor position as row P1 and column P2 in response to a DEVICE STATUS REPORT from the host computer. The cursor position reference is the upper left screen position if the ORIGIN MODE is reset or the upper left scrolling region if the ORIGIN MODE is set.
DEVICE STATUS REPORT	^[[<P1>n	If P1 equals 5, the host computer commands the emulator to report a 'noerror' status by sending ^[[0n. If P1 equals 6, the host computer commands the emulator to report the cursor position using CURSOR POSITION REPORT. If both 5 and 6 are present as parameters, the cursor report is sent before the error status.
REQUEST TERMINAL PARAMETERS	^[[<P1>x	The host computer requests the VT100 emulator to report its parameters using the REPORT TERMINAL PARAMETERS escape sequence. P1 can equal 1 or 0.

ANSI Command Escape Sequence Table (cont'd)

Function Desired:	Escape Sequence:	Description:
REPORT TERMINAL PARAMETERS	Ec[3;	3 - not sending unsolicited reports
	<par>;	<par> can be: 1 - other than odd or even parity 4 - odd parity 5 - even parity
	<nbits>;	<nbits> can be: 1 - 8 bits/character 2 - 7 bits/character
	<xspeed>;	<xspeed> can be: 0 - 50 bps 8 - 75 bps 16 - 110 bps 24 - 134.5 bps 32 - 150 bps 40 - 200 bps 48 - 300 bps 56 - 600 bps 64 - 1200 bps 72 - 1800 bps 88 - 2400 bps 96 - 3600 bps 104 - 4800 bps 108 - 7200 bps (HP 98626A card) 112 - 9600 bps 120 - 19200 bps
	<rspeed>;	(same as <xspeed>)
	1; 0x	The emulator sends the entire sequence listed in the center column to report its parameters in response to a REQUEST TERMINAL PARAMETERS. **For example**, to report the terminal parameters with odd parity, 1-8 bits/character, xspeed of 150 bps and rspeed of 300 bps, the host computer would send this sequence: Ec[3;4;1;32;48;1;0x
DEVICE ATTRIBUTES	Ec[0c or EcZ	The host computer requests the VT100 emulator to report its installed options. The emulator always reports the ADVANCED VIDEO OPTION by sending the sequence: Ec[?1;2c.

ANSI Command Escape Sequence Table (cont'd)

Function Desired:	Escape Sequence:	Description:
LOAD LEDS	Esc[<P1>q	Manipulates the emulator's LEDs. If P1 equals 1, 2, 3, or 4, the corresponding LED is lit. Multiple LEDs may be lit if multiple parameters are sent in the escape sequence. If P1 equals 0, all activated LEDs are turned off, including those up to that point in the parameter stream.
SELECT GRAPHIC RENDITION	Esc[<P1>m	Turns the emulator's video enhancements on and off. If P1 equals one of the following values, the corresponding actions occur: 0 - attributes off 1 - half bright[1] 4 - underscore 5 - blink 7 - inverse video Multiple enhancements are activated if multiple parameters are sent in the escape sequence. If P1 equals 0, all activated enhancements are turned off, including those up to that point in the parameter stream.
ERASE IN DISPLAY	Esc[<P1>J	If P1 equals one of the following values, the corresponding action occurs on the emulator: 0 - Erase from cursor to end of screen (default) 1 - Erase from start of screen to cursor 2 - Erase entire screen Multiple actions are performed if multiple parameters are sent in the escape sequence.
ERASE IN LINE	Esc[<P1>K	If P1 equals one of the following values, the corresponding action occur on the emulator: 0 - Erase from cursor to end of line (default) 1 - Erase from start of line to cursor 2 - Erase entire line Multiple actions are performed if multiple parameters are sent in the escape sequence.
SELECT CHARACTER SET	Esc(B	Sets G0 to USASCII character set
	Esc)B	Sets G1 to USASCII character set
	Esc(A	Sets G0 to UK character set
	Esc)A	Sets G1 to UK character set
	Esc(0	Sets G0 to LINE DRAWING SET
	Esc)0	Sets G1 to LINE DRAWING SET

[1] VT100 terminal uses full bright.

ANSI Command Escape Sequence Table (cont'd)

Function Desired:	Escape Sequence:	Description:
SELECT CHARACTER SET (cont'd)		G0 and G1 are host computer names for two available character sets. The UK and USASCII sets differ only in pound sign representation for character code decimal value 35. For the detailed list of graphics characters, see the "Line Drawing Set" appendix.
SET HORIZONTAL TAB	E_CH	Sets a horizontal tab at the current cursor position.
CLEAR TAB	E_C[<P1>g	If P1 equals one of the following values, the corresponding action occur on the emulator: 0 - Clear tab at cursor position 3 - Clear all tabs
SET TOP AND BOTTOM MARGINS	E_C[<P1 ; P2>r	Sets the scrolling region margins at P1 (top row), and P2 (bottom row). The command is valid only if P1 is less than 24 and P2 is greater than P1 and less than 25. If P1 equals 0, the parameter is read as 1. If P2 equals 0 or not present, the parameter is read as 24. The cursor is placed at HOME. HOME is the upper left position of the scrolling region if the ORIGIN MODE is set or the upper left position of the screen if the ORIGIN MODE is reset. Refer to the "Configuration" chapter of this manual for information on the effect of Wraparound (`InhEolWrp(C)`) on the scrolling region.
RESET TO INITIAL STATE	E_Cc	Performs a soft reset on the VT100 emulator, but performs a hard reset on the VT100 terminal. The datacomm card is reset and any error condition is cleared. The VT100 emulator is initialized as in power up, but the configuration file isn't read (values remain unchanged). If `XonXoff` handshake is on, DC1 is then sent to the host computer.
INVOKE CONFIDENCE TEST	E_C[2;1y	INVOKE CONFIDENCE TEST is not performed, but a reset is performed exactly as the RESET TO INITIAL STATE above.

ANSI Modes Escape Sequences Table

The following mode sequences are set or reset with the escape sequences:

Set : Ec[?<parameters>h
Reset : Ec[?<parameters>l

The following escape sequences contain a single parameter which performs a certain action. The host computer may actually send up to fifteen parameters in a single escape sequence, thereby performing multiple actions.

Function Desired:	Escape Sequence:	Description:
SET NEW LINE	Ec[20h	AUTOLF on the emulator serves as the VT100 terminal NEW LINE function. A set of the NEW LINE mode performs the same action on the emulator as when AUTOLF is ON (set). See the "Configuration" chapter of this manual for details on the effect on the emulator when AUTOLF is ON (set).
RESET NEW LINE	Ec[20l	AUTOLF on the emulator serves as the VT100 terminal NEW LINE function. A reset of the NEW LINE mode performs the same action on the emulator as when AUTOLF is OFF (reset). See the "Configuration" chapter of this manual for details on the effect on the emulator when AUTOLF is reset.
SET CURSOR KEY	Ec[?1h	If CURSOR KEY is set, the emulator sends the following escape sequences to the host computer when you press the corresponding arrow key. ↑ EcOA ↓ EcOB → EcOC ← EcOD
RESET CURSOR KEY	Ec[?1l	If CURSOR KEY is reset, the emulator sends the following escape sequences to the host computer when you press the corresponding arrow key. ↑ Ec[A ↓ Ec[B → Ec[C ← Ec[D
RESET ANSI/VT52 SUBMODE	Ec[?2l	Changes the emulator submode to VT52. See the VT52 Escape Sequences appendix in this manual for the command which returns the emulator submode to ANSI. This function can only be reset in the ANSI submode.

ANSI Modes Escape Sequences Table (cont'd)

Function Desired:	Escape Sequence:	Description:
SET COLUMN MODE	Ec[?3h	Homes the cursor and clears the screen. This mode sequence has no effect on the VT100 emulator because 132-column mode, available on the VT100 terminal, is not supported on the emulator, and therefore cannot be manipulated.
RESET COLUMN MODE	Ec[?3l	Homes the cursor and clears the screen. This mode sequence has no effect on the VT100 emulator because 132-column mode, available on the VT100 terminal, is not supported on the emulator, and therefore cannot be manipulated.
SET ORIGIN MODE	Ec[?6h	Positions the origin at the upper left corner of the scrolling region (HOME). The line and column numbers are relative to HOME. The cursor cannot be positioned outside of the margins.
RESET ORIGIN MODE	Ec[?6l	Positions the origin (HOME) at the upper left corner of the screen. The cursor is placed at the new HOME position. The line and column numbers are relative to HOME. The cursor may be placed anywhere on the screen with the CURSOR POSITION REPORT escape sequence, but the scrolling region is still defined by the top and bottom margins.
SET WRAPAROUND MODE	Ec[?7h	Sets emulator configuration item `InhEolWrp(C)` to `NO`. `InhEolWrp(C)` is described in the "Configuration" chapter of this manual.
RESET WRAPAROUND MODE	Ec[?7l	Sets emulator configuration item `InhEolWrp(C)` to `YES`. `InhEolWrp(C)` is described in the "Configuration" chapter of this manual.
SET AUTOREPEAT MODE	Ec[?8h	Activates the keyboard autorepeat.
RESET AUTOREPEAT MODE	Ec[?8l	Deactivates the keyboard autorepeat.

KEYPAD APPLICATION AND NUMERIC MODE

The keypad operates in two modes: application and numeric. These modes determine the sequences sent by the keypad keys. The escape sequences are:

Set Keypad Application Mode : Esc=
Reset Keypad Numeric Mode : Esc>

KEYPAD KEY	ANSI or VT52 NUMERIC MODE	ANSI APPL MODE	VT52 APPL MODE
0	0	Esc O p	Esc ? p
1	1	Esc O q	Esc ? q
2	2	Esc O r	Esc ? r
3	3	Esc O s	Esc ? s
4	4	Esc O t	Esc ? t
5	5	Esc O u	Esc ? u
6	6	Esc O v	Esc ? v
7	7	Esc O w	Esc ? w
8	8	Esc O x	Esc ? x
9	9	Esc O y	Esc ? y
/	/	Esc O m	Esc ? m
*	*	Esc O l	Esc ? l
,	,	Esc O n	Esc ? n
-	-	Esc O M	Esc ? M
+	+	Esc O M	Esc ? M
.	.	Esc O p	Esc ? p
E	Same as APPL MODE	Esc O P	Esc P
(	Same as APPL MODE	Esc O Q	Esc Q
)	Same as APPL MODE	Esc O R	Esc R
^	Same as APPL MODE	Esc O S	Esc S

VT52 Escape Sequences

C

This appendix lists the specific VT100 emulator responses to the VT52 escape sequence commands below. Refer to Appendix B for a description of the ANSI escape sequences.

VT52 Escape Sequence Table

Function Desired:	Escape Sequence:	Description:
CURSOR UP	^[A	Move the cursor up one line. The cursor stops at the top of the screen.
CURSOR DOWN	^[B	Move the cursor down one line. The cursor stops at the bottom of the screen.
CURSOR RIGHT	^[C	Move the cursor right one character. The cursor stops at the right side of the page.
CURSOR LEFT	^[D	Move the cursor left one character. The cursor stops at the left side of the page.
CURSOR TO HOME	^[H	Put the cursor in the upper left position of the scrolling region if ORIGIN MODE is set. If ORIGIN MODE is reset, put the cursor in the upper left position of the screen. (**Note:** Setting and resetting the ORIGIN MODE and establishing the top and bottom scrolling region limits can only be done in the ANSI SUBMODE.)
ENTER GRAPHICS MODE	^[F	Set the character set to the line drawing set. See SELECT CHARACTER SET command in the ANSI Command Escape Sequence table.
EXIT GRAPHICS	^[G	Set the character set to ASCII.
REVERSE LINE FEED	^[I	Move the cursor up one line. If the cursor is at the top of the scrolling region, the region scrolls down. If it is at the top of the screen above the region, no cursor movement or scrolling occurs.
ERASE TO END OF SCREEN	^[J	Erase all characters from the cursor position to the end of the screen, inclusive.
ERASE TO END OF LINE	^[K	Erase all characters from the cursor position to the end of the line, inclusive.
IDENTIFY	^[Z	Send the identify sequence (^[Z)to the host computer.

VT52 Escape Sequence Table

Function Desired:	Escape Sequence:	Description:
ENTER ALTERNATE KEYPAD MODE	ESC=	See the ANSI KEYPAD MODE for the APPLICATION KEYPAD sequence sent in VT52 SUBMODE.
EXIT ALTERNATE KEYPAD MODE	ESC>	See the ANSI KEYPAD MODE for the NUMERIC KEYPAD sequences sent in VT52 SUBMODE.
ENTER ANSI MODE	ESC<	Set the emulation submode to ANSI.
DIRECT CURSOR ADDRESS	ESCY<line><col>	Place the cursor at line number <line> and column number <col>. <line> and <col> are defined as: LINE #(1 through 24) + 31 = a decimal number. The ASCII character represented by the decimal number = <line> COLUMN #(1 through 80) + 31 = a decimal number. The ASCII character represented by the decimal number = <col> For example, to place the cursor at line position 5 and column position 12, you would use the escape sequence: ESCY$+ The cursor position is always relative to the upper left position of the screen, whether or not the ORIGIN MODE is set or reset. If one of the parameter values is beyond the edge of the screen, no cursor movement takes place in that axis.

Line Drawing Character Set D

The LINE set selection is performed by the ANSI SELECT CHARACTER SET escape sequence. This set is identical to the ASCII set for characters with ASCII values 0 through 94. Characters with values 95 through 126 have been replaced by the following characters, which simulate the VT100 line drawing set.

VT100 Line Drawing Character Set

Key Pressed:	ASCII Value:	Character Displayed On VT100:	Character Displayed On HP Series 200:
_	95	Blank	
`	96	♦ Diamond	◀
a	97	▒ Rubout	▒
b	98	HT Horiz. Tab	␉
c	99	FF Form Feed	␌
d	100	CR Carriage Return	␍
e	101	LF Line Feed	␊
f	102	° Degree	°
g	103	± Plus/minus	±
h	104	NL New Line	␤
i	105	VT Vertical Tab	␋
j	106	+ Lower R. Corner	+
k	107	+ Upper R. Corner	+
l	108	+ Upper L. Corner	+
m	109	+ Lower L. Corner	+
n	110	+ Crossing Lines	+
o	111	– Horiz. Line - Scan 1	‾
p	112	– Horiz. Line - Scan 3	‾
q	113	– Horiz. Line - Scan 5	–
r	114	– Horiz. Line - Scan 7	_
s	115	– Horiz. Line - Scan 9	_
t	116	+ Left T	+
u	117	+ Right T	+
v	118	+ Bottom T	+
w	119	+ Top T	+
x	120	| Vertical Bar	|
y	121	≤ Less than or equal to	≤
z	122	≥ Greater than or equal to	≥
{	123	π Pi	π
|	124	# Not Equal to	#
}	125	£ English Pound	£
~	126	• Centered Dot	·

NOTE

If you have an HP Model 220 equipped with an HP 98204B composite video interface card, the CHAR SELECT switch on the interface card must be set in the "O" position for the emulator to generate the line drawing set. Refer to the "Keyboards and Character Sets" appendix in the *HP 2392A Terminal Emulator Manual* for information on how to change the CHAR SELECT switch.

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