VXT 2000 Model VX225 Windowing Terminal

Service Information

Order Number: EK–VXT15–SV. A01

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This document describes how to install and service the VXT 2000 model VX225 windowing terminal, including how to start a session on a host computer system.

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About This Guide

This guide describes how to install and service the VXT 2000 model VX225 windowing terminal and start a session on a host computer system.

Audience

This guide is for Digital Services personnel and qualified self-maintenance customers.

Organization

The guide contains seven chapters and three appendices:

- Chapter 1, "A Look at the Terminal," describes the terminal's hardware and connectors, operating features, and site requirements.
- Chapter 2, "Installing the Terminal," describes how to unpack and install the terminal. The installation procedure describes how to connect the monitor, mouse, keyboard, network cable, and optional printer or tablet.
- Chapter 3, "Testing," describes how to run the terminal's built-in self-tests and diagnostic tests. The chapter also describes how to determine if there is a memory error.
- Chapter 4, "Troubleshooting," describes how to troubleshoot the VXT 2000 model VX225 windowing terminal, using displayed error codes, LED error codes, and a table of symptoms and solutions.
- Chapter 5, "Removing and Replacing FRUs," describes how to remove and replace the field replaceable units (FRUs) for the terminal. Some FRUs are customer-installable options.
- Chapter 6, "Aligning the Video Display," describes how to align the video display, using test patterns to make adjustments.

- Chapter 7, “Starting a Session,” provides step-by-step procedures on how to start using the terminal with a host computer.
- Appendix A, “Related Documents,” provides a list of related documents.
- Appendix B, “Recommended Spares List,” provides a list of the terminal’s recommended spare parts.
- Appendix C, “Self-Test Error Descriptions,” describes the terminal’s self-test error codes.

Tools and Equipment

You need the following tools to service the terminal:

Tools and Equipment	Part Number
Phillips screwdriver, number 2	29-11005-00
Wrist strap and antistatic mat (included in Digital Services antistatic kit)	29-26246-00
Two Ethernet terminators (H8225-00)*	12-26318-01
Mouse loopback connector	12-25628-01
Terminal technician tool kit	29-27340-01
Anode discharge tool	29-24717-00
Metric measuring tape	29-25342-00
Safety goggles	29-16141-00
Gloves	29-16146-00

*The thickwire and twisted-pair Ethernet connectors do not have a loopback connector.

Conventions

The following conventions are used in this guide:

Convention	Meaning
terminal	Refers to the VXT 2000 model VX225 terminal.
mouse	Refers to any pointing device, such as a mouse, a puck, or a stylus.
MB1, MB2, and MB3	MB1 indicates the left mouse button. MB2 indicates the middle mouse button. MB3 indicates the right mouse button. (The buttons can be redefined by the user.)
Keyboard key	Keys or switches that are labeled appear in a box.
	Example: Press the Return key.
Ctrl *key*	For Ctrl key sequences, hold down Ctrl and press the other key.
Warning	Provides information to prevent personal injury.
Caution	Provides information to prevent damage to equipment or software.
Note	Provides general information about the current topic.
Menu items . . .	Menu items followed by . . . will display a dialog box when selected.
PN	This is an abbreviation for part number.

Notes to the Reader

The screens and windows shown in this guide represent the latest information available at the time of publication. Some screens and windows may not exactly match those that appear on your terminal or reflect the system-default settings.

1

A Look at the Terminal

This chapter provides an overview of the terminal's hardware and connectors, operating features, and site requirements.

1.1 Product Description

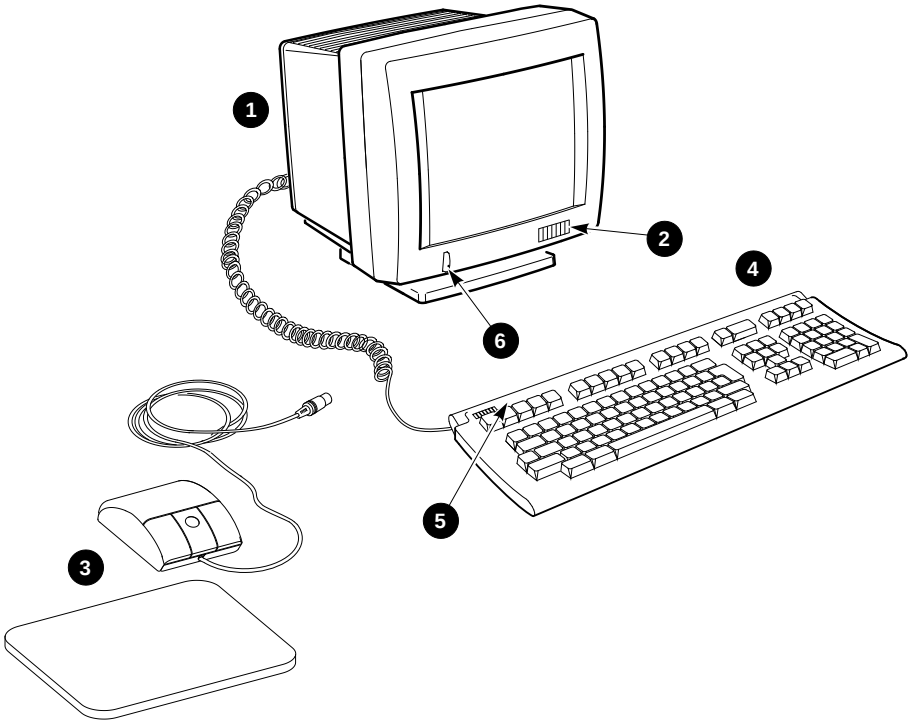
The VXT 2000 model VX225 is a monochrome terminal with a direct-viewed, antiglare screen. The terminal has an autoranging power supply for worldwide operation. A built-in tilt-swivel base lets you adjust the screen for viewing comfort. The terminal uses VXT software, which is downloaded from a host system or InfoServer.

The terminal can

- Connect to an Ethernet network through the terminal's thickwire or twisted-pair port
- Connect directly to a computer through the terminal's serial port
- Display multiple VXT DECterm windows and applications over both the Ethernet and serial line simultaneously
- Interact over an Ethernet network with multiple VXT DECterm windows and X window applications running under the UNIX, ULTRIX, or VMS operating system
- Communicate with the transmission control protocol/Internet protocol (TCP /IP) for UNIX and ULTRIX systems, the LAT protocol for VMS systems, and the local area system transport (LASTport) protocol for the InfoServer system

1.2 Terminal Components

The VXT 2000 model VX225 windowing terminal includes the following components:



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Item	Name	Description
❶	Terminal	Contains the system logic module, memory modules, network module, deflection module, video amp assembly, power supply, and connectors.
❷	Terminal logo	VXT 2000.
❸	Mouse	Three-button pointing device (VSXXX–GA)
❹	Keyboard	LK400 series.
❺	Keyboard LEDs	Hold and lock indicators (LK401/LK402 keyboards only).
❻	AC power switch with green LED	Press in to turn the terminal on.

1.2.1 Keyboard

The terminal uses an LK400 series keyboard—LK401, LK402, or LK421.

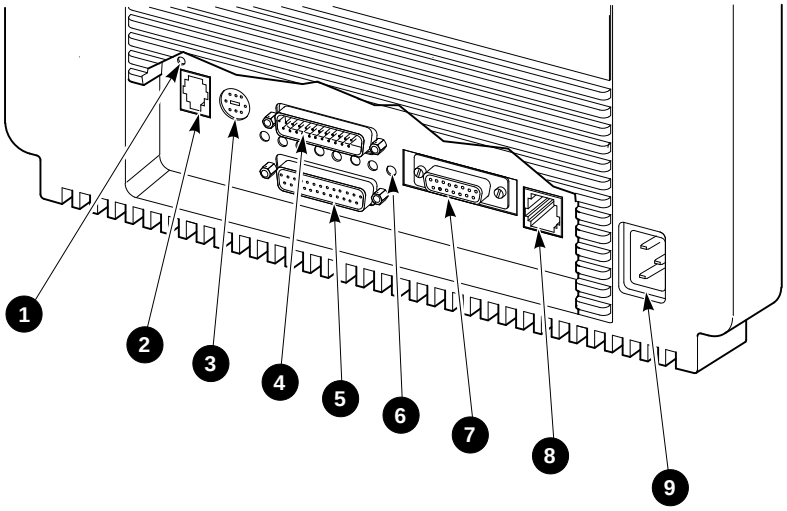
- The LK401–*xx* and LK402–*xx* keyboards have four groups of keys: the main keyboard, numeric and editing keypads, and top-row function keys. The keyboards also have two LED indicators (hold and lock) and two audible indicators (keyclick and bell). The LK401–*xx* is the standard version, and the LK402–*xx* is the word processing version.
- The LK421–*xx* keyboard is a short version of the LK401 keyboard, often used in UNIX environments. The LK421–*xx* does not have a numeric keypad or LED indicators. Users can still perform numeric keypad functions by using alternate key sequences.

1.2.2 Mouse

The mouse is a three-button pointing device. The mouse lets you move the screen cursor and perform many screen actions, such as choosing items from menus, changing button settings in dialog boxes, and moving windows.

1.2.3 Rear Panel Connectors and Switches

The terminal's rear panel provides the connectors for the keyboard, mouse, a serial or parallel printer, system communication, and power. The terminal is 391 mm (15.4 in.) deep × 400 mm (15.7 in.) wide × 400 mm (15.7 in.) high.



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❶ Halt switch
❷ Keyboard
❸ Mouse/pointer
❹ Serial printer/host port
❺ Parallel printer port
❻ Diagnostic LEDs
❼ thickwire Ethernet connector
❽ Twisted-pair Ethernet connector
❾ Terminal ac power

1.3 Operating Features

This section briefly describes terminal sessions, network protocols, and how to control feature settings on the terminal.

1.3.1 X Window Sessions and Terminal Window Sessions

The terminal allows you to open two types of sessions on host computers—X window sessions and terminal window sessions.

X Window Session
To run an X window session, you log in to a host that has X window applications.

You can have one X window session and several terminal window sessions open at the same time. Within the X window session, you can run multiple X window clients. Each X window session and terminal session appear in a separate window.

Terminal Window Session
The terminal has a VXT DECterm terminal emulator window that allows you to log in to a host as you would on a conventional video terminal. VXT DECterm windows are compatible with VT300 series text terminals and offer enhancements such as user-selectable fonts.

1.3.2 Network Communication Protocols

You can use the terminal with UNIX, ULTRIX, or VMS operating systems. You can run video terminal sessions and X window sessions on any of these operating systems.

For UNIX and ULTRIX systems:

The transmission control protocol/Internet protocol (TCP/IP) is the communication protocol. The terminal can use the TCP/IP Telnet or LAT communication protocols to make video terminal connections to UNIX and ULTRIX host systems in a wide-area network.

For VMS systems:

The LAT protocol is the communication protocol.

For InfoServer systems:

The terminal uses the LASTport protocol for InfoServer systems.

1.3.3 Terminal Software

The terminal software is downloaded from a host or an InfoServer. The InfoServer provides these added capabilities:

- Memory paging
- Configuration and font management for groups of terminals

1.3.4 Customizing the Terminal

There are several ways to check and control the terminal's operating features.

- **Terminal Manager Customize menu**
  When you click on Customize in the Terminal Manager window, the Customize menu appears. This menu lets you change many of the terminal's operating features, such as the keyboard setup, the display language, and the cursor style for the pointer (mouse).
- **VXT DECterm Options menu**
  When you create a Telnet, LAT, or serial port terminal window, the terminal displays a VXT DECterm window. The window includes an Options menu that lets you change certain terminal window features while an application is running. Many applications handle customization of the terminal window.
- **Window Manager Options menu**
  When you click on the window menu button in any window, the window manager displays a window menu. From the window menu, you can choose an Options submenu that lets you customize many window management features.
- **Configuration Manager window**
  Terminals that use VXT server-based software from an InfoServer have a configuration manager. When you click on Configuration... in the Terminal Manager window's Customize menu, the terminal displays a Configuration submenu. From the submenu, you can access the Resource Management and Font Management dialog boxes.

1.3.5 Checking the Terminal's System Configuration

From the Terminal Manager window, you can display a System Configuration dialog box to quickly verify many of the terminal's customizable configuration settings, such as the VXT system image, the work group, and the Ethernet address. To display this dialog box:

1. Click on the **Session** menu in the Terminal Manager window.
2. Click on the **Status** menu item to display a Status submenu.

3. Click on **System Configuration...** to display the System Configuration dialog box.

To learn how to use these windows and menus, see the *VXT 2000 Windowing Terminal User Information* guide.

1.4 Site Requirements

The terminal requires certain system software and network hardware to operate. The system manager or responsible site manager must ensure these requirements are met. The *VXT Software System Management Information* guide describes the required system management tasks for the terminal.

1.4.1 Network Hardware Support

The terminal requires one of the following physical connections to connect to a host computer system:

Ethernet connector (thickwire or twisted-pair)	Allows the terminal to operate with X window applications and multiple terminal sessions, using either the LAT or TCP/IP network protocol. An Ethernet connector is needed to operate with X window or DECwindows software.
Serial line	Allows the terminal to connect to a single host, as on traditional VT*xxx* video terminals.

1.4.2 Memory Requirements

When you turn on the terminal, it loads its VXT software from an InfoServer or from a host computer system. There are different memory requirements for using server-based or host-based software.

If You Use...	Your Terminal Needs...
Server-based VXT software	4 megabytes of memory
Host-based VXT software	10 megabytes

The standard terminal comes with 4 megabytes of memory. You can add memory by installing a memory controller board and memory modules in the terminal's system box. Some terminals have a memory controller board already installed.

Standard Terminal

- 4-megabyte system logic module

  or

- 2-megabyte system logic module and 2-megabyte memory controller module

Optional Memory

- 2-megabyte memory controller module

1.4.3 System Software Support

The following table summarizes the system resources needed to open X window sessions or terminal sessions:

Operation	Operating System	Communication Protocol
X window session	VMS Version 5.3-1 or higher	LAT
	UNIX (any version)	TCP/IP TFTP (UDP) for font service
	UWS Version 2.1 or higher (includes ULTRIX Version 3.1)	TCP/IP TFTP (UDP) for font service
Terminal session	VMS Version 4.0 or higher	LAT
	UNIX (any version)	Telnet (TCP/IP)
	ULTRIX (any version) UWS Version 2.2	Telnet (TCP/IP) LAT

2

Installing the Terminal

This chapter provides step-by-step instructions on how to

- Unpack, inspect, and check the terminal's components
- Connect the mouse, keyboard, and network cable to your terminal
- Connect an optional printer or tablet
- Verify the installation

Before You Start

Carefully read all installation instructions before you turn on the power.

2.1 Installation Steps

2.1.1 Unpack and check the contents of each carton.

WARNING

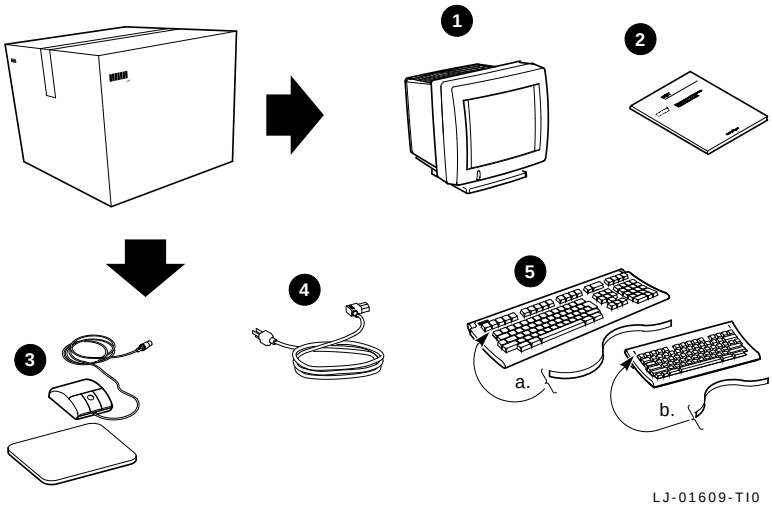
If necessary, use two people to lift or move the terminal.

- Make sure you have all the items shown in the following **Standard Parts Checklist**.
- If you ordered optional memory, cables, or adapters, also refer to the **Optional Parts Checklist**.
- Carefully inspect the components for shipping damage. If you have missing or damaged items, contact your sales representative and delivery agent.

Installing the Terminal
2.1 Installation Steps

- Save the empty shipping cartons and packing material for repacking, in case you move or relocate your terminal.

Standard Parts Checklist



❶ VXT 2000 Model VX225 terminal

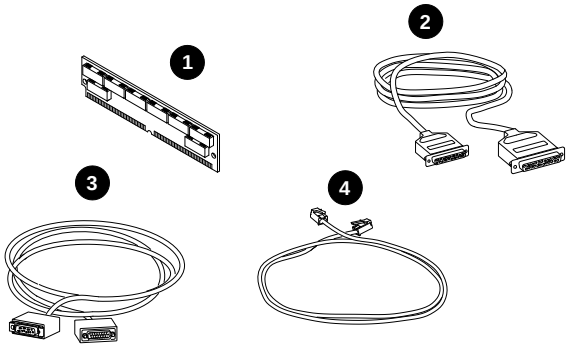
❷ User documentation kit

❸ Mouse and mouse pad

❹ Terminal power cord

❺ Keyboard and legend strip:
(a) LK401/LK402 ANSI or (b) LK421 short ANSI (UNIX style)

Optional Parts Checklist



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Caution

If you ordered memory modules, do not remove them from the antistatic bag at this time. Static electricity can damage these components.

❶ 2- or 4-megabyte memory module (up to three modules)

A 4-megabyte memory module has components mounted on both sides.

❷ Serial port and parallel port cables and adapters (not shown)

❸ Thickwire Ethernet network cable

❹ Twisted-pair Ethernet network cable

2.1.2 Install optional memory first.

Go to Chapter 5 to install any optional memory modules you ordered, then return here.

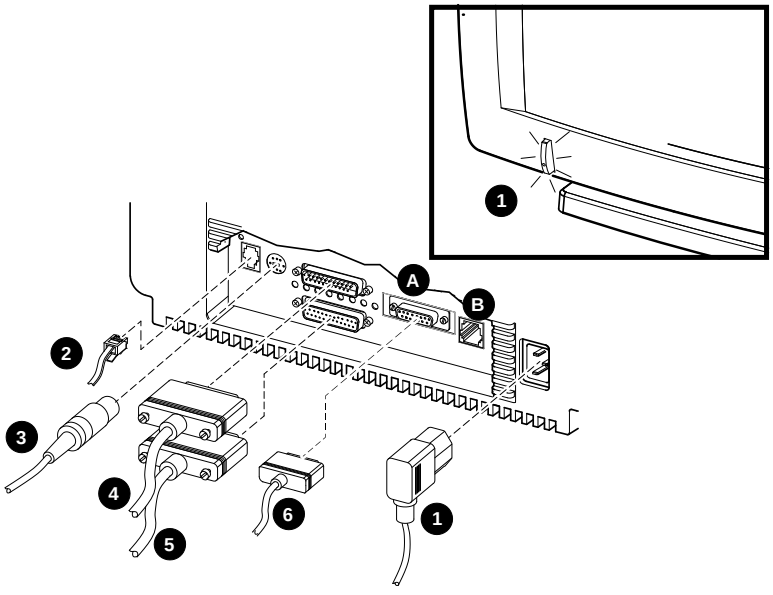
2.1.3 Place the terminal in position.

Place the terminal on a level surface. Leave room at the rear of the terminal for connecting cables.

2.1.4 Connect the cables to the rear of the terminal.

Refer to the following figure and connect cables in order.

1. Make sure the power switch at the front of the terminal is off. You press the switch in to turn the terminal on, and out to turn the terminal off. Connect the power cord to the terminal, then to a grounded electrical outlet.
2. Connect the keyboard to the terminal. Lower the keyboard's legs and install the legend strip for the top-row keys.
3. Connect the mouse or graphics tablet to the terminal. Set the mouse on the mouse pad.
4. If you have a serial printer or secondary host computer, connect the printer or host to the terminal.
5. If you have a parallel printer, connect the printer to the terminal.
6. Connect your network cable to the terminal. Connect the other end of the cable to your local area network. Your terminal has two network connectors—(a) a thickwire connector, and (b) a twisted-pair connector.



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2.1.5 Check the terminal's test display.

1. Turn the terminal on by pressing in the power switch at the front of the terminal. The light on the switch should turn on.
2. The terminal performs its self-tests. During the tests, you should see the following display on your terminal:

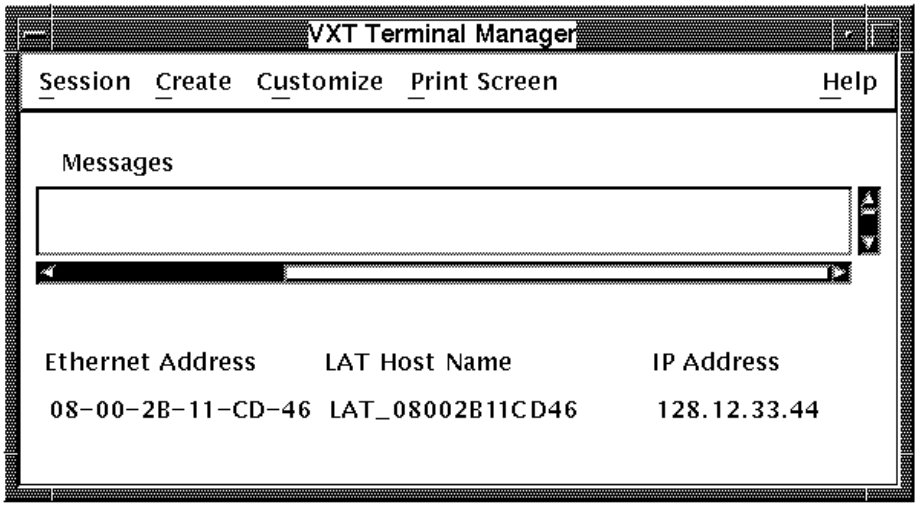
Display	Meaning
VXT V01.001	VXT boot ROM version number
08-00-2B-11-22-33	Terminal's Ethernet address
*nn*MB	Megabytes of memory installed (4 to 16)
■■■■■□□□□	Self-test progress indicator (Fills in as tests are completed.)

   If you installed additional memory: While the self-tests are running, make sure the amount of memory listed in the self-test display (*nn*MB) equals the total number of megabytes installed in your terminal.

   The standard terminal comes with 4 megabytes of installed memory. You can install up to three 2- or 4-megabyte optional memory modules.

3. When the self-tests are done, the terminal loads its software from a supporting host system or server (such as one of Digital's InfoServer models). Then the terminal displays the Terminal Manager window.

   Terminal Manager Window



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You may also see a log-in box from your host system, if your system manager has set up the terminal's AutoStart feature.

2.1.6 Final Steps...

- This is a good time to set the brightness, contrast, and viewing angle of your terminal. See Chapter 6.
- To start using your terminal, see Chapter 7.

2.2 Installation Problem?

If the Terminal Manager window does not appear or you have other problems, review the installation steps carefully. If the problem continues, refer to Chapter 4 in this manual. The Help menu at the upper right of the Terminal Manager window only appears on server-based terminals.

3 Testing

This chapter describes how to

- Run the terminal's built-in self-tests and diagnostic tests
- Determine if there is a memory error

To troubleshoot the terminal, see Chapter 4. To align the video display and use test patterns, see Chapter 6.

3.1 Self-Tests

The terminal has a series of self-tests to help you isolate failures to faulty device and field replaceable units (FRUs). You can run self-tests in two ways.

- Automatically during power-up
- Manually in console mode

The terminal automatically runs initialization self-tests during power-up. During the power-up process, the diagnostics test the basic functions of all FRUs. If the diagnostics detect an error, they continue testing (if possible) until finished, then report any errors.

You can configure the terminal to run a minimal or extended self-test at power-up by entering a command in console mode. You can also run self-tests manually in console mode.

3.1.1 Running Self-Tests in Console Mode

(Table 3–1) lists the power-up self-tests that run each time you turn on the terminal's power switch or press the halt switch on the rear panel twice. To run individual self-tests, you place the terminal in console mode.

To enter console mode:

Press the halt switch on the rear panel of the terminal. When you enter console mode, the terminal resets itself and quits all session activity. mode. The system displays the >>> console prompt.

Note

Before running tests in console mode, enter the UNJAM command at the console prompt to clear all pending interrupts.

To choose a minimal or extended power-up self-test:

To run a minimal self-test automatically at power-up, enter the following command:

```
>>> SET FBOOT 1
```

To run the extended self-test automatically at power-up, enter the following command:

```
>>> SET FBOOT 0
```

To run self-tests individually:

You may want to run self-tests at a time other than power-up. You can run individual tests or a range of test with TEST command. Use the test numbers listed in Table 3–1. For example, to run all the self-tests, enter the following command:

```
>>> TEST 1:10
```

Table 3–1 Power-Up Self-Tests

Device Number	Device	Test Number
1	NVR test	T 1
2	Video (monochrome)	T 2
3	QDZ (serial port, mouse, and keyboard)	T 3
4	Cache	T 4
5	Memory (MEM)	T 5
6	Floating point unit (FPU)	T 6
7	Interval timer (IT)	T 7
8	System logic	T 8
9	Network interface (NI)	T 9
10	Parallel port	T 10

If you set the diagnostic environment to manufacturing mode, you must install loopback connectors on the mouse and serial communication ports (Table B–2). To select the manufacturing diagnostic environment, enter the following command:

```
>>> SET DIAGENV 3
```

3.1.2 Checking the Self-Test Results

Power-up testing begins by displaying various patterns on the screen. The total test time depends on how much memory is installed and whether or not you are using fast boot (FBOOT) mode.

If a test finds an error:

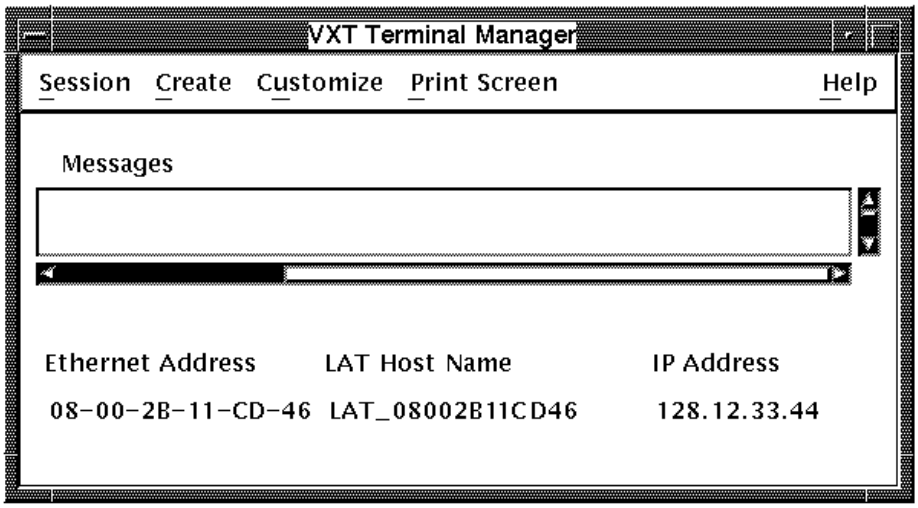
1. Record the error code.
2. Find the error code and suggested solution in Table 4–1.
3. Repeat the tests in this chapter to ensure the terminal operates correctly.

If the power-up self-tests finish successfully:

- The keyboard bell rings.
- On the LK401/LK402 keyboard, the keyboard LEDs turn off. (The LK421-AA does not have any LEDs.)
- The Terminal Manager window (Figure 3–1) replaces the power-up self-test patterns.

- The diagnostic summary box in the window indicates the font path status and system-related messages.

Figure 3–1 Terminal Manager Window



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3.1.3 Diagnostic LED Power-Up Sequence

At power-up, the terminal's self-tests check the system before the system tries to boot. The diagnostic LEDs on the rear of the system box indicate which test is in progress.

Table 3–2 lists the LED display for each device being tested. If diagnostic testing completes successfully, the LEDs turn off. If an error occurs, the LEDs display a flashing error code to indicate which test failed. See Section 4.6 to troubleshoot the LED error codes.

Table 3–2 Power-Up LED Codes

LED Display		LED Code	
Device	Subtest	(Hex.)	Description
●●●●	●●●●	FF	Power has been applied, but no instruction has been run.
●●●●	●●●o	FE	Power-up testing has started.
●●●●	●●o●	FD	Waiting for memory to initialize.
●●●●	●●oo	FC	Sizing memory in the terminal.
●●●●	●o●●	FB	Running a byte mask test on memory needed by the console.
●●●●	●o●o	FA	Performing a full memory data path test on memory needed by the console.
●●●●	●oo●	F9	Initializing the console data structures.
●●●●	●ooo	F8	Performing the auto configuration.
●●●●	o●●●	F7	Testing the NVR device.
●●●●	o●●o	F6	Testing the serial controller (QDZ) device.
●●●●	o●o●	F5	Testing the graphics output device.
●●●●	o●oo	F4	Initializing the console device.
●●●●	oo●●	F3	Starting the console program.
oo●o	oooo	20	Starting the monochrome/SPX self-test.
oo●●	oooo	40	Starting the cache test.
o●o●	oooo	50	Starting the full memory test.
o●●o	oooo	60	Starting the floating-point unit (FPU) test.
o●●●	oooo	70	Starting the interval timer (IT) test.
●ooo	oooo	80	Starting the ROM test.
●oo●	oooo	90	Starting the network interface (NI) self-test.
●o●●	oooo	D0	Starting the parallel port test.

Key to LED Codes

The left four LEDs = the device number.
The right four LEDs = the subtest number.

● = LED on; o = LED off.

(continued on next page)

Table 3–2 (Cont.) Power-Up LED Codes

LED Display Device	Subtest	LED Code (Hex.)	Description
•o••	ooo•	D1	Starting the parallel port interrupt test.
•o••	oo•o	D2	Starting the data path test.
•o••	oo••	D3	Starting the command signal test.

Key to LED Codes

The left four LEDs = the device number.
The right four LEDs = the subtest number.

• = LED on; o = LED off.

Note

LED codes 20, 50, and 60 may not be displayed when in FBOOT mode.

3.2 Displaying the Software Version Number

You can display the software version number by clicking on the Terminal Manager window's title bar (Figure 3–1). You can also check the software version by viewing the System Configuration dialog box (Section 1.3.5).

3.3 Network Service Failure Messages

The terminal may experience network problems even though the power-up self-tests finish successfully. Network problems may occur because vital network services failed.

If the network fails, the terminal may display one of the following network service failure messages at the top of the screen:

```
Cannot locate system image, retrying ...
Cannot connect with system image, retrying ...
Cannot locate free pagefile storage, retrying ...
Cannot locate pagefile, retrying ...
Cannot connect with pagefile, retrying ...
Cannot extend pagefile, more disk space is needed on server
```

If a network error occurs, contact the system manager or the Digital network service representative.

3.4 Checking for Memory Errors

The terminal displays memory status messages under certain conditions. You can also check for soft memory errors in console mode.

3.4.1 Memory Status Messages

The terminal reports memory status or potential memory problems in the Messages box of the Terminal Manager window when the terminal is using the host-based VXT system software. Table 3–3 describes possible memory status messages.

Table 3–3 Memory Status Messages

Status Message	Description
Memory Not Low	There is enough memory for the terminal to perform normal operations. The terminal displays a Memory Not Low message in the Terminal Manager window.
Memory Low	If the memory level continues to decrease, then the local VXT DECterm windows and remote client sessions may fail. The terminal continues to operate normally in this state.
Memory Very Low	If the memory level continues to decrease, then all terminal operations may fail. If the memory condition becomes Very Low when the terminal is servicing an X protocol request from a remote client, the request fails and the terminal disconnects the session to the remote client immediately. The terminal will not service any new X session requests, but all other operation continue normally.
No Memory Left	If there is no memory left, all terminal operations may fail until the user clears the No Memory Left condition. The terminal does not display any warning messages and operates as though it is in the Memory Very Low condition. If the terminal cannot recover enough memory to operate normally, the terminal restarts itself.

3.4.2 Soft Error Messages

If you suspect that the customer has a memory problem, such as not being able to run an application that ran previously, enter the following command:

```
>>> SHOW ERROR
```

The SHOW ERROR command displays any soft error message along with other errors. See Chapter 4 to troubleshoot either hard or soft errors.

4 Troubleshooting

This chapter describes how to troubleshoot hard and soft errors on the terminal by

- Using error codes displayed on the screen (Sections 4.4 and 4.5)
- Using error codes displayed by the LEDs (Sections 4.4.1 and 4.6)
- Checking a table of general problems (Section 4.7)

4.1 Troubleshooting Sequence

When troubleshooting the terminal, use the following sequence:

1. Check the console error codes.
2. Check the LED error codes.
3. Check the troubleshooting table in this chapter.

Example

Suppose the system logic module has failed.

1. There are *no console error codes*, because there is no video.
2. There is *no LED error code*, because the LEDs may be running through the test sequence.
3. Check the *Table 4–10* for a screen display problem that matches the symptoms of your terminal.

Symptom Screen Display Problems	Suggested Solution(s)
Monitor's power LED is on, but no video is displayed, and the system box LEDs are blinking.	Replace the system logic module. (Section 5.8). Also check the LED error code tables (Section 4.6).

4. Follow the suggested solutions in the order listed in the table.

4.2 Before You Start

The following information will help you troubleshoot the terminal easily and effectively:

WARNING

If you smell burning components, press the monitor power switch off and disconnect the power cord.

- If you are going to service a display problem, ask the customer to warm the monitor up for at least 20 minutes before you arrive, if possible.
- Magnetic fields affect monitor performance and can give a false indication of a monitor failure. Place the monitor away from any electromagnetic devices (such as printers and terminals) or large magnetized objects (such as filing cabinets and steel beams in walls).

Note

After you replace a video amp assembly, deflection module, or power supply module, always perform all required adjustments. Refer to Chapter 6.

4.3 Hard and Soft Errors

The terminal's power-up tests and self-tests can detect hard errors and soft errors.

- Hard errors are fatal errors that force the terminal to quit all session activity and enter console mode.
- Soft errors are nonfatal errors. Nonfatal errors do not interrupt session activity. Many memory errors may be soft errors, because the VXT 2000 model VX225 windowing terminal can operate as a server-based machine.

4.3.1 Entering Console Mode After a Hard Error

If a self-test detects a hard error on a newtworked terminal, the terminal automatically defaults to console mode and displays the >>> console mode prompt. In console mode, you can use the SHOW ERROR and SHOW MEM commands to display error information.

4.4 Troubleshooting Soft Memory Errors

The self-tests report many memory errors as soft errors. When a self-test finds a soft memory error, the terminal still indicates the self-test was successful. To troubleshoot soft memory errors, you need to display the memory positions and gaps so you can determine which FRU to replace. Therefore, you must correct any video problems before trying to correct any soft memory error.

You can use the SHOW ERROR console command to display error messages. Soft errors begin with one question mark (?). Hard errors begin with two question marks (??).

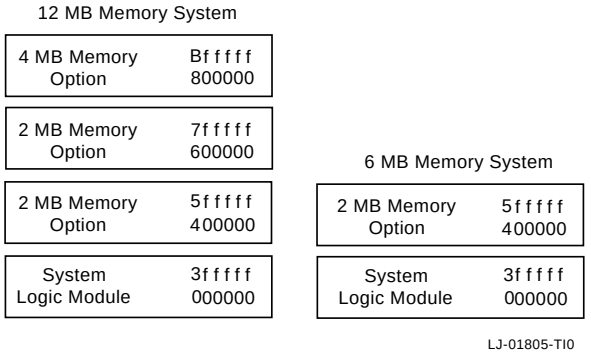
Some soft errors are due to fast boot mode. These errors have error numbers of 0fff. These errors indicate a device was not tested because of power-up time limitations. Generally, all soft errors can be ignored unless the terminal is malfunctioning.

Example—Troubleshooting Soft Memory Errors

To determine if the self-tests detected a memory error:

1. Enter console mode by pressing the halt switch on the rear of the terminal.
2. Enter the SHOW CONFIG command to determine the memory in the system. The display will show memory locations for components, such as those shown in Figure 4–1. The display will also show the total amount of physical memory in megabytes, and the usable memory (minus the console buffers) in kilobytes.

Figure 4–1 Sample Configurations—12 MB and 6 MB Systems



Each 2 MB MEM option occupies a 1ffff segment of memory.
Each 4 MB MEM option occupies a 3fffff segment of memory.

In SHOW CONFIG displays, the slot locations S[0], S[1], and S[2] correspond to locations J1, J2, and J3, respectively, on the memory controller module.

If the command shows a 2 MB MEM at S[0] and a 4 MB MEM at S[1], the memory map is as follows:

`000000 3fffff`	4K bytes for the system logic module
`400000 5fffff`	S[0] (2MB MEM)
`600000 Afffff`	S[1] (4MB MEM)

The MEM cards can be any combination of 4 and 2 MB MEM cards. The only restriction is that you must load the MEM slots starting with S[0] and progressing to S[2]. If there is an empty slot between MEMs, the self-tests report a hard memory error (??). Hard memory errors prevent the system from autobooting.

3. Enter the SHOW ERROR command at the console prompt.

   If the self-tests detect a memory error, the console displays a memory error code beginning with a question mark. For example:

   `?001 005 MEM` *nnn*

   `?` indicates a soft error.

   `001` indicates a field replaceable unit—the system logic module.

   `005` indicates the device that failed—memory.

   `MEM` indicates a memory error.

   `nnn` indicates where the memory error occurred.

4. Enter the SHOW MEM command to determine the areas of memory. This command displays any valid gap in the memory areas, as well as any bad memory area. A **valid gap** in memory is space reserved for future memory expansion.

   Examples

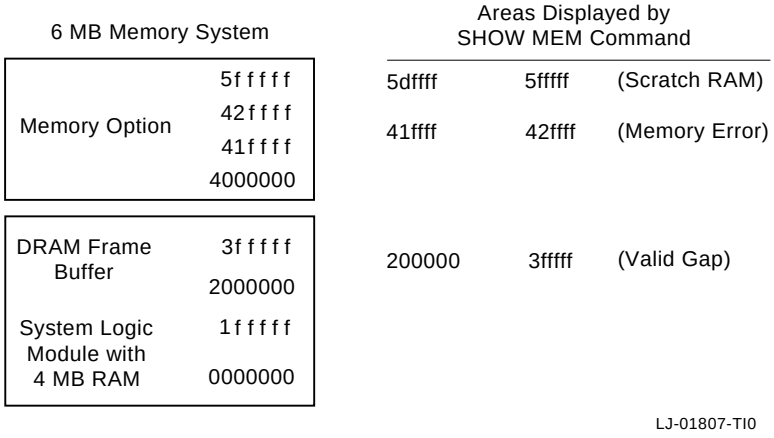
   - If the terminal has a valid gap in memory and the maximum memory is 6 megabytes (MB), then the SHOW MEM command may display the following information:

     ```
     3C0000   3fffff
     5dffff   5fffff
     ```

     – `3C0000 - 3fffff` is a sample valid gap for a system logic module that has a video frame buffer in resident memory (Figure 4–2).

     – `5dffff - 5fffff` is the **scratch RAM** area. Scratch RAM is 128K bytes of memory reserved for booting, always positioned at the top of memory. As more memory modules are installed, these numbers increase to occupy the last 128K bytes in memory. The last entry of the list is always the memory reserved for scratch RAM. If there is any bad memory that is contiguous with scratch RAM, then this area may look considerably larger.

Figure 4–2 Example of 6 MB System with Soft Memory Error



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- If the terminal has bad memory and the top of memory is 8 MB, then the SHOW MEM command may display the following information:

```
3C0000 3fffff
41ffff 42ffff
5dffff 5fffff
```

  – `3C0000 - 3fffff` may be the valid gap on the system logic module.

  – `41ffff - 42ffff` is not normal for a 6 MB system. These numbers represent the bottom and top, respectively, of the bad memory area.

  – `5dffff - 5fffff` is the scratch RAM area at the top of memory.

5. By analyzing the memory data, you can determine the valid gaps, the scratch RAM area, and any bad memory data. By comparing the memory data with the configuration, you can determine which FRU is showing the bad soft memory error.

   - In the example (Figure 4–2), the bad memory area (`41ffff - 42ffff`) is within the memory configuration area of `400000 - 5fffff`. This is the resident 4 MB RAM on the system logic module, so the system logic module has a soft memory error and should be replaced.

4.4.1 Troubleshooting Soft Memory Errors by LEDs

When self-tests find the first soft error, the memory test displays the soft errors on the screen (Table 4–1). The diagnostic LEDs on the system box momentarily display the memory test error code (Section 4.6).

4.5 Troubleshooting Hard Errors

If the terminal's self-tests find an error, the terminal attempts to display an error code on the screen and a device code on the diagnostic LEDs. Table 4–1 lists the error codes reported on the screen. If the video fails, refer to Section 4.6 to read the error code from the LEDs.

To troubleshoot hard errors:

1. At the >>> console prompt, enter the SET FBOOT 0 command. This command sets the self-test mode to non-fastboot, so the terminal tests all resident memory.
2. Record any screen error code. If the video failed, record any LED device code.

   Normally, the terminal does not display a code for soft memory errors. If you suspect a soft memory error, see Section 4.4.
3. Check Table 4–1 for screen error code you recorded, to determine if the error is a device error. If the video failed, check the tables in Section 4.6 for your LED device code.

   For a detailed description of the error codes, see Appendix C.

Example—Troubleshooting Hard Errors

For hard errors, the power-up self-tests may report the following information:

VXT V01.*nnn*	ROM version
nn-nn-nn-nn-nn-nn	The terminal's Ethernet address
2MB	Megabytes of memory installed
?? 001 9 VNI 0168	Error for disconnected network cable.
?? 003 3 QDZ 0096	Other error messages (See Figure 4–3 and Table 4–1.)
	Self-test progress indicator (Fills in as tests are completed.)

Figure 4–3 shows the format of an error message.

Figure 4–3 Error Message Format

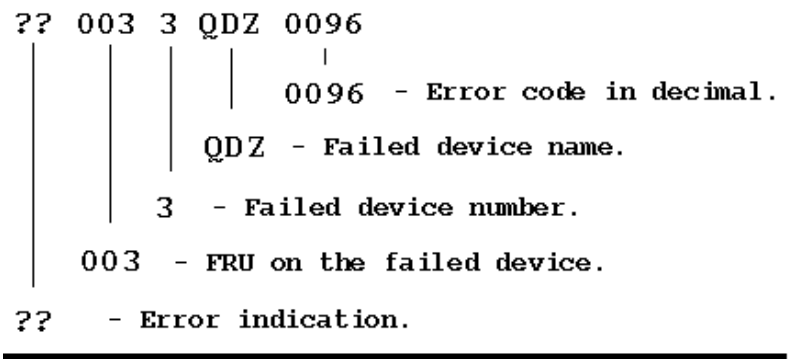

Table 4–1 lists possible error codes. The probable solution for any error code not listed in the table is to replace the system logic module. To display a complete list of all the devices in the terminal's configuration, enter the SHOW CONFIG console command.

Network Interface (NI) Errors

If a network interface (NI) error occurs, check the rear of the system box to verify that a loopback connector is installed on the selected network port and that the network cable is firmly connected.

If needed, enter the TEST 9 console command to run the NI self-test again.

Table 4–1 Self-Test Error Codes

Error Code (Decimal)	Replace	Error Code (Decimal)	Replace
0066	System logic module	0170	NI module
0068	System logic module	0172	NI module
0071	NI module	0256	System logic module
0080	Keyboard	0512	System logic module
0096	Mouse	0514	System logic module
0128	System logic module	0770	System logic module
0130	NI module	1024	System logic module

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Table 4–1 (Cont.) Self-Test Error Codes

Error Code (Decimal)	Replace	Error Code (Decimal)	Replace
0132	NI module	1280	System logic module
0160	NI module	1536	System logic module
0162	NI module	1794	System logic module
0164	NI module	2050	System logic module
0166	NI module	2304	System logic module
0168	NI module	2305	System logic module

4.6 LED Error Codes

If the screen cannot display an error message, you can check the LED error code displayed by the diagnostic LEDs on the rear of the system box. Use the following tables to troubleshoot LED error codes. The tables describe the LED error codes and list the suggested action to take.

Table 4–2 NVR LED Error Codes
Table 4–3 Monochrome LED Error Codes
Table 4–4 QDZ LED Error Codes
Table 4–5 Cache LED Error Codes
Table 4–6 MEM LED Error Codes
Table 4–7 SYS Device LED Error Codes
Table 4–8 NI Device LED Error Codes
Table 4–9 Printer Port Device LED Error Codes

Key to Tables

In the **LED Display** column:

The left four LEDs = the device number.
The right four LEDs = the subtest number.

• = LED on. o = LED off.

The **Replace** or **Action** column provides a section reference.

Table 4–2 NVR LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Replace
ooo● | ooo●	11	NVR test failed.	System logic module (5.8).

Table 4–3 Monochrome LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Action
oo●o | oooo	20	Monochrome/SPX self-test has been entered. LEDs sequence without returning an error.	Check for loose connectors.
oo●o | ooo●	21	Monochrome configure test failed.	Replace the system logic module (5.8).
oo●o | oo●o	22	Monochrome reset test failed.	Replace the system logic module (5.8).
oo●o | oo●●	23	Monochrome memory test failed.	Replace the system logic module (5.8).
oo●o | o●oo	24	Monochrome RAMdac test failed.	Replace the system logic module (5.8).
oo●o | o●o●	25	Monochrome cursor test failed.	Replace the system logic module (5.8).
oo●o | o●●o	26	Monochrome drawing test failed.	Replace the system logic module (5.8).

Table 4–4 QDZ LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Action
oo●● | oooo	30	QDZ test has been entered. LEDs sequence without returning an error.	Check for loose connectors.
oo●● | ooo●	31	QDZ reset test failed.	Replace the system logic module (5.8).

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Table 4–4 (Cont.) QDZ LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Action
oo●● | oo●o	32	QDZ modem test failed.	Replace the system logic module (5.8).
oo●● | oo●●	33	QDZ polled test failed.	Replace the system logic module (5.8).
oo●● | o●oo	34	QDZ interrupt test failed.	Replace the system logic module (5.8).
oo●● | o●o●	35	LK401 test failed.	Replace the keyboard (5.18).
oo●● | o●●o	36	Mouse test failed.	Replace the mouse (5.18).

Table 4–5 Cache LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Replace
o●oo | ooo●	41	Data store read write error.	System logic module (5.8)
o●oo | oo●o	42	Read/write error to the tag area.	System logic module (5.8)
o●oo | oo●●	43	The cache did not contain the proper state of the valid bit. This is part 1 where valid should be set.	System logic module (5.8)
o●oo | o●oo	44	Error during the cache tag validation. The tag diagnostic space is missing.	System logic module (5.8)
o●oo | o●o●	45	Unexpected tag parity error.	System logic module (5.8)
o●oo | o●●o	46	Cache did not provide the expected data during cache hit testing.	System logic module (5.8)
o●oo | o●●●	47	Parity was not expected.	System logic module (5.8)
o●oo | ●ooo	48	Tag not valid during cache hit test.	System logic module (5.8)

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Table 4–5 (Cont.) Cache LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Replace
o●oo | ●oo●	49	Data not expected during cache hit test.	System logic module (5.8)
o●oo | ●o●o	4A	Cache write through test failed. The information in the data store did not agree with expected data.	System logic module (5.8)
o●oo | ●o●●	4B	Cache write through test failed. The information in the memory did not agree with expected data.	System logic module (5.8)
o●oo | ●●oo	4C	Error occurred during a write miss.	System logic module (5.8)

Table 4–6 MEM LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Replace
o●o● | oooo	50	Memory byte mask test failed.	System logic module (5.8)
o●o● | ooo●	51	Byte mask test fails.	System logic module (5.8)
o●o● | oo●o	52	Memory error occurred in the forward pass.	System logic module (5.8)
o●o● | oo●●	53	Memory error occurred in the reverse pass.	System logic module (5.8)
o●o● | o●oo	54	Memory error in parity test 1.	System logic module (5.8)
o●o● | o●o●	55	Memory error in parity test 2.	System logic module (5.8)
o●o● | o●●o	56	Top of menu conflicts with configuration.	System logic module (5.8)
o●●o | oooo	60	Floating point test.	System logic module (5.8)
o●●● | oooo	70	Interval timer test.	System logic module (5.8)

Table 4–7 SYS Device LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Replace
•ooo | oooo	80	ROM verify test failed.	System logic module (5.8)
•ooo | ooo•	81	Interrupt controller test failed.	System logic module (5.8)

Table 4–8 NI Device LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Action
•oo• | oooo	90	NI self-test has been entered. LEDs sequence without returning an error.	Check for loose connectors.
•oo• | ooo•	91	Network address test failed.	Replace the system logic module (5.8).
•oo• | oo•o	92	NI register test failed.	Replace the system logic module (5.8).
•oo• | oo••	93	NI initialization test failed.	Replace the system logic module (5.8).
•oo• | o•oo	94	NI internal loopback/DMA test failed.	Replace the system logic module (5.8).
•oo• | o•o•	95	NI interrupt test failed.	Replace the system logic module (5.8).
•oo• | o••o	96	NI CRC test failed.	Replace the system logic module (5.8).
•oo• | o•••	97	NI receive miss/buffer test failed.	Replace the system logic module (5.8).
•oo• | •ooo	98	NI collision test failed.	Replace the system logic module (5.8).
•oo• | •oo•	99	NI address filtering test failed.	Replace the system logic module (5.8).
•oo• | •o•o	9A	NI external loopback test failed.	Replace the system logic module (5.8).

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Table 4–8 (Cont.) NI Device LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Action
•oo• | •o••	9B	NI transmit buffer test failed.	Replace the system logic module (5.8).

Table 4–9 Printer Port Device LED Error Codes

LED Display Dev. | Test	LED Code (Hex)	Description	Action
•o•• | oooo	D0	Entered printer port test. LEDs sequence without returning an error.	Check for loose connectors.
•o•• | ooo•	D1	Started printer port interrupt test.	
•o•• | oo•o	D2	Started data path test.	
•o•• | oo••	D3	Started command signal test.	

4.7 Troubleshooting General Problems

Table 4–10 describes some general operating problems with suggested solutions. For each symptom described, the table assumes that only one assembly has failed or only one problem exists. However, one symptom may indicate multiple failures. Always troubleshoot the most obvious symptom first. Problems may come from the terminal or from a host system.

Troubleshoot the terminal as follows:

1. Ask the operator to describe the problem. The operator often has the most information about how the problem occurred.
2. Identify the problem. The screen display often helps identify the problem.
3. Isolate the problem. Check column 1 in Table 4–10 for a symptom that matches your problem. Then try the suggested solutions.
4. After you correct a problem, display the host system alignment test patterns to make sure that no other problem exists. See Section 6.2 for displaying test patterns.

4.7 Troubleshooting General Problems

Table 4–10 Troubleshooting the Terminal

Symptom	Suggested Solution
Monitor Problems—Blank Screen (No Video or Raster)	
The terminal's power switch is on, but the LED on the power switch is off.	Check the terminal's power cord connection at the rear of the monitor and at the power outlet. Use another power outlet. If the problem continues, call the facilities person. Replace the power supply module (Section 5.12). Replace the deflection module (Section 5.14). Replace the video amp assembly (Section 5.11).
The terminal's power switch and LED are on.	Check the brightness and contrast controls (Section 6.1). Replace the system logic module (Section 5.8). Replace the deflection module (Section 5.14). Replace the video amp assembly assembly (Section 5.11). Replace the system logic module (Section 5.8). Replace the CRT/chassis assembly (Section 5.15) only after trying the previous solutions.
The terminal's power switch and LED are on, and the LED on the deflection module is on.	Check all cabling going to the deflection module and the video amp assembly, including the CRT socket connector. If necessary, secure the cables. Check the brightness and contrast controls (Section 6.1). Correct the G2 adjustment. (Section 6.6). Replace the deflection module (Section 5.14).
Other Monitor Problems	
The terminal loses power for no apparent reason, or the Terminal Manager window appears after the monitor loses power for no apparent reason.	Replace the power supply (Section 5.12).
The Terminal Manager window is not displayed.	Replace the network module (Section 5.6). Replace the video amp assembly (Section 5.11). Replace the deflection module (Section 5.14).

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Table 4–10 (Cont.) Troubleshooting the Terminal

Symptom	Suggested Solution
Blank Screen (No Video, But Raster Is Present)	
You can display raster by adjusting the brightness control, but there is no video or cursor displayed even when the contrast control is at maximum.	The host system's CRT screen saver feature is activated. Press any key to reactivate the display. Check all the cables to the deflection module and the video amp assembly. Replace the video amp assembly (Section 5.11). Replace the deflection module (Section 5.14). Replace the CRT/chassis assembly (Section 5.15) only after trying the previous solutions.
Poor Display Quality	
Make sure the monitor has warmed up for at least 20 minutes before you troubleshoot display quality problems.	
Geometry, centering, height, width, or linearity are out of adjustment.	Use the alignment controls to adjust the settings (Section 6.1). Remove any electromechanical devices that are near the terminal or move the terminal to another location. Perform the alignment procedure (Section 6.1). Replace the deflection module (Section 5.14). Replace the CRT/chassis assembly (Section 5.15) only after trying the previous solutions.
The display is not bright enough (using the all-white diagnostic pattern).	Adjust the brightness and contrast controls (Section 6.1). Perform the gain adjustment (Section 6.7) and the cutoff adjustment (Section 6.6). Replace the video amp assembly (Section 5.11). Replace the deflection module (Section 5.14). Replace the CRT/chassis assembly (Section 5.15) only after trying the previous solutions.
The display is too bright.	Set the brightness control to the optimum range. Replace the video amp assembly (Section 5.11). Replace the deflection module (Section 5.14).

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Table 4–10 (Cont.) Troubleshooting the Terminal

Symptom	Suggested Solution
Poor Display Quality	
Vertical lines are not straight.	Remove any electromechanical devices that are near the terminal or move the terminal.
	Replace the deflection module (Section 5.14).
	Replace the CRT/chassis assembly (Section 5.15) only after trying the previous solutions.
There is video noise in the display (intermittent flashing or changes in brightness.)	Reseat the connectors.
	Replace the video amp assembly (Section 5.11).
	Replace the deflection module (Section 5.14).
	Replace the power supply module (Section 5.12).
	Replace the system logic module (Section 5.8).
The screen focus is not sharp.	Perform the focus adjustment (Section 6.6).
	Replace the deflection module (Section 5.14).
	Replace the video amp assembly (Section 5.11).
	Replace the CRT/chassis assembly (Section 5.15) only after trying the previous solutions.
Screen Display Problems	
Curved lines appear on screen during power-up.	Curved lines are part of the normal power-up display. The terminal is operating correctly.
The screen is off-center or rotated.	Move the terminal to another location.
	Check the terminal's rotation adjustment (Section 6.1).
Horizontal or vertical line appears on screen.	Check the terminal's horizontal and vertical adjustments (Section 6.1).
The screen display is distorted or jittery.	Nearby devices are creating electrical interference. Move the terminal away from the electrical devices.
	The monitor is out of alignment. Align the terminal (Section 6.1).
The screen image seems to wobble at the end of a successful power-up sequence.	This action is normal. The terminal is operating correctly.

(continued on next page)

Table 4–10 (Cont.) Troubleshooting the Terminal

Symptom	Suggested Solution
Screen Display Problems	
In local mode, the terminal displays different characters than those typed.	Choose the correct character set from the General Options dialog box in the Options menu of a VXT DECterm window.
	Choose the correct keyboard type by using the Customize Keyboard dialog box, accessed from the Terminal Manager window's Customize menu.
While on-line with the host, the terminal displays different characters than those typed. (The terminal works in local mode.)	The transmit and receive speeds are incorrect. Set the speeds to match the host by using the Serial and Parallel Ports dialog box. To access the dialog box, click on the Terminal Manager window's Customize menu and choose the Customize Communications submenu.
	Bits/character or parity setting is wrong. Set the Word Size or Parity setting to match the host by using the Serial and Parallel Ports dialog box.
	The stop bits setting is incorrect. Set the Stop Bits number to match the host by using the Serial and Parallel Ports dialog box.
Messages are garbled, and reverse question marks appear on the screen.	XON/XOFF flow control is not enabled. Click on the XOFF at 64 or 128 button in the Serial and Parallel Ports dialog box. To access the dialog box, click on the Terminal Manager window's Customize menu and choose the Customize Communications submenu.
The screen display does not scroll.	Press F1 to resume scrolling.
The screen is blank.	Press any key to restore the screen display.
	Check the Screen Saver setting in the Customize Screen Background dialog box, accessed from the Terminal Manager window's Customize menu.
The terminal fails after warming up. The screen goes blank, and the LED on the power switch turns off.	Thermal shutdown occurred.
	Replace the power supply (Section 5.12).

(continued on next page)

Table 4–10 (Cont.) Troubleshooting the Terminal

Symptom	Suggested Solution
Memory Problems	
Memory quota seems low.	Check the messages in the Terminal Manager window's Messages box (Section 3.4.1). There is not enough memory installed in the terminal. Memory modules are installed in the wrong slot. Install the memory modules in the correct slot (Section 5.4).
Problems at Power-Up	
The Terminal Manager window appears, but the keyboard bell does not ring.	The power-up self-tests detected a soft or hard error. See Section 4.4 to troubleshoot soft memory errors. See Section 4.5 to troubleshoot hard errors. Replace the keyboard (Section 5.18).
The Terminal Manager window appears, and the bell tone sounds, but the terminal cannot communicate with host.	Check the Ethernet cable connection on the rear of the terminal. Enter the terminal's correct IP address. For information on entering the IP address, see the system manager or refer to Section 7.4.1. Check the terminal's serial port and parallel port cable connections on the rear of the terminal. The serial communication port circuits are faulty. Run the serial port loopback tests. See test 9 (NI test) in Section 3.1.1. The baud rate is incorrect. Check the Transmit and Receive speeds in the Customize Communications, Serial and Parallel Ports dialog box (Customize menu in the Terminal Manager window).
A keyclick sound stays on continuously at power-up.	Check for a stuck keyboard key. Replace the keyboard (Section 5.18).
The terminal cannot save customized settings.	The system logic module was replaced, but the Ethernet chip from the old module was not installed on the new module (Section 5.8).

(continued on next page)

Table 4–10 (Cont.) Troubleshooting the Terminal

Symptom	Suggested Solution
Problems at Power-Up	
Customized settings are lost without any apparent reason.	Ask the system manager or site manager to check if the terminal is set to read-only mode. Refer to the configuration management chapter in the *VXT 2000 Windowing Terminal User Information* guide.
The system does not respond, even though the mouse pointer moves on the screen.	Check if there are network messages (Section 3.3) at the top of the screen. If network messages appear, then the InfoServer is having problems. The terminal is operating correctly.

5

Removing and Replacing FRUs

This chapter describes how to remove and replace the field replaceable units (FRUs) for the terminal. See Appendix B for the recommended spares lists.

- External Cables (Section 5.1)
- Rear Cover (Section 5.2)
- System FRUs (Section 5.3)
  - Memory Modules (Section 5.4)
  - Bulkhead Panel (Section 5.5)
  - Network Module (Section 5.6)
  - Top Cover (Section 5.7)
  - System Logic Module (Section 5.8)
  - Safety Wall (Section 5.9)
- Monitor FRUs (Section 5.10)
  - Video Amp Assembly (Section 5.11)
  - Power Supply Module (Section 5.12)
  - Discharging the CRT and Removing the Anode Cap (Section 5.13)
  - Deflection Module (Section 5.14)
  - CRT/Chassis Assembly (Section 5.15)
  - CRT Disposal (Trained Service Personnel Only) (Section 5.16)
- Tilt-Swivel Base (Section 5.17)
- Keyboard, Mouse, and Printer (Section 5.18)

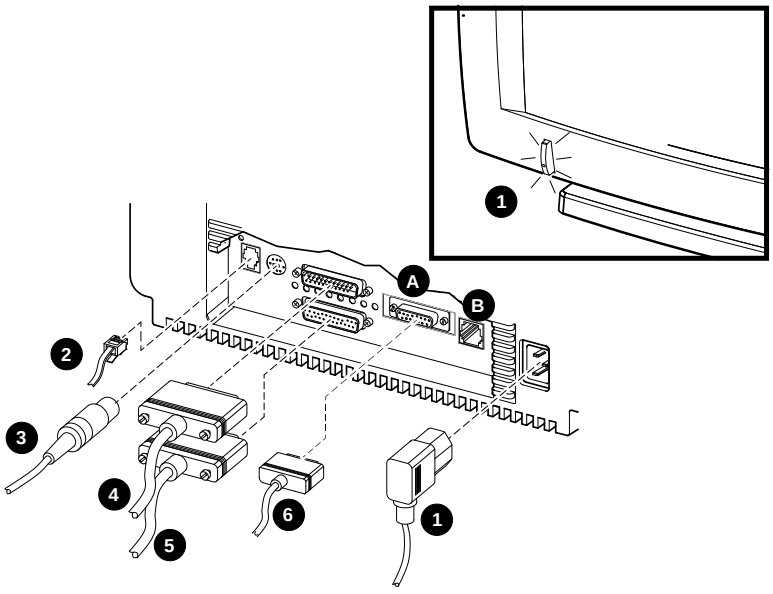
Caution

Always use a static protection kit (PN 29–26246–00) when handling any internal components.

5.1 External Cables

To remove the external cables:

1. Make sure the power switch at the front of the terminal is off (pressed out). Unplug the power cord from the power outlet first, then from the terminal.
2. Disconnect the keyboard cable from the terminal.
3. Disconnect the mouse cable from the terminal.
4. If you have a serial printer or secondary host computer, disconnect the printer or host cable from the terminal.
5. If you have a parallel printer, disconnect the printer cable from the terminal.
6. Your terminal has two network connectors–(a) a thickwire connector, and (b) a twisted-pair connector. Disconnect the network cable from the terminal.



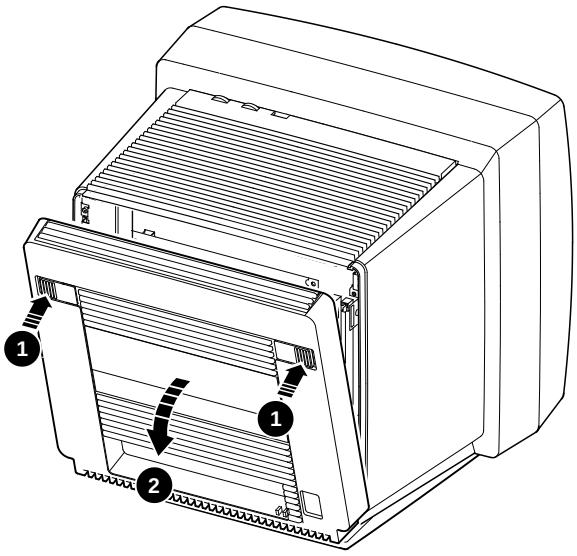
LJ-01624-TI0A

5.2 Rear Cover

To open the rear cover:

1. Disconnect the external cables from the rear of the terminal (Section 5.1).
2. Release the rear cover by pressing in the two tabs ❶ with your thumbs, as shown.
3. Slowly lower the top of the cover ❷ toward you.

To close the rear cover: Raise the cover and push firmly until it snaps in place.



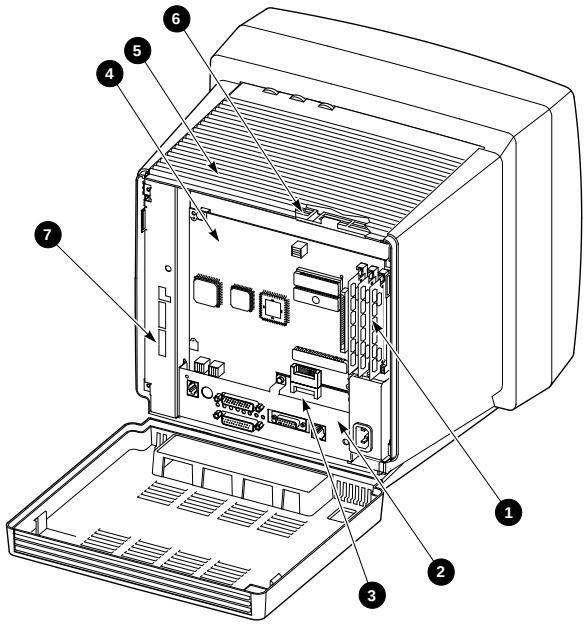
LJ-01623-TI0

5.3 System FRUs

When you open the rear cover, you can see the FRUs in the system section of the terminal. Appendix B lists all FRU part numbers. When replacing any FRU, tilt the terminal from the back to the front to allow easier access to the modules.

WARNING

Turn the power off and remove the power cord before disconnecting or replacing any FRU.



LJ-01699-TI0

1. Memory modules
2. Bulkhead panel
3. Network module
4. System logic module
5. Top cover
6. Safety wall
7. Video alignment controls

5.4 Memory Modules

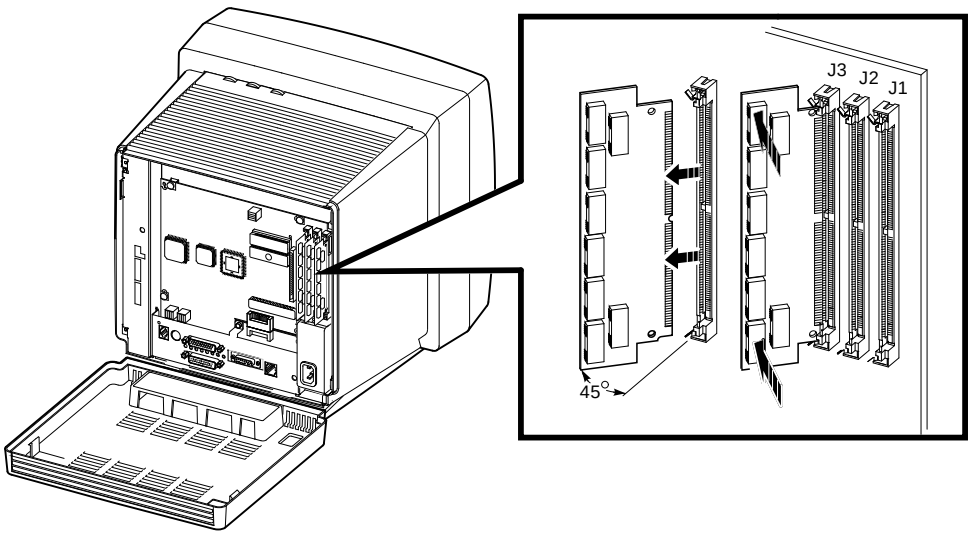
Caution

Memory modules can be damaged by electrostatic discharge. Handle the memory module by the side edges of the module. Avoid contact with the gold contact fingers on the module.

5.4.1 Removing Memory Modules

To remove memory modules from the system logic module:

1. Open the rear cover (Section 5.2).
2. Remove the memory modules in order, starting with the module in slot J3.
   a. Release both sides of the memory module from the connector by gently pushing each clip away from the sides of the module.
   b. Grasp the edges of the memory module firmly and lift up to remove the module from the connector.

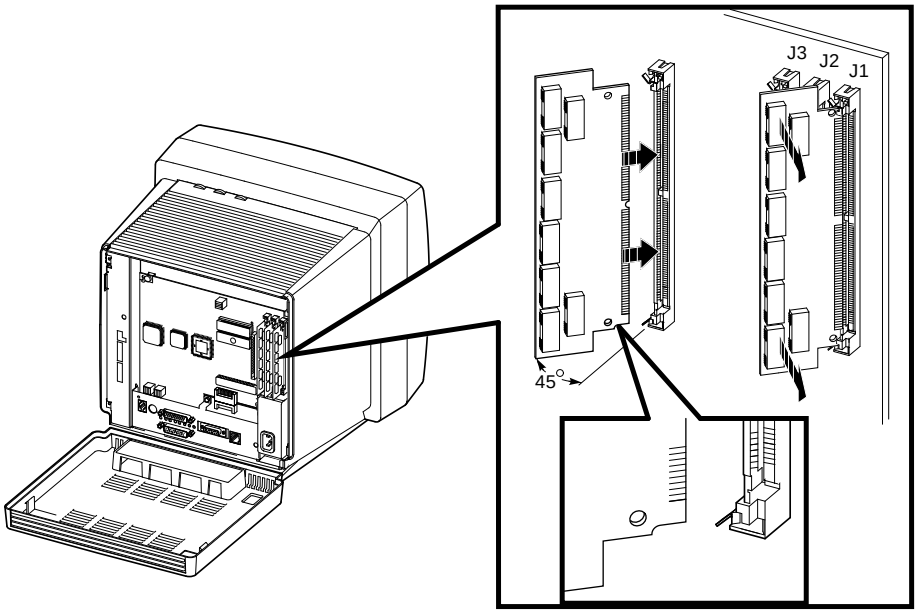


LJ-01710-TI0A

5.4.2 Installing Memory Modules

To install memory modules on the system logic module:

1. Remove the memory modules from the shipping bag.
2. Find the slot labeled J1 on the memory controller board. J1 is the slot closest to the edge of the system logic module.
3. Place the first memory module into the J1 slot at a 45-degree angle. Face the memory module so that the notch on the bottom corner is at the bottom of the connector.



LJ-01710-TI0

4. While pushing in on the memory module, move the memory module into a standup position. Both sides of the module lock into the metal connector clips. Make sure the plastic tabs go into the holes on the memory module. Also make sure the metal connector clips return to their original position, locked in place

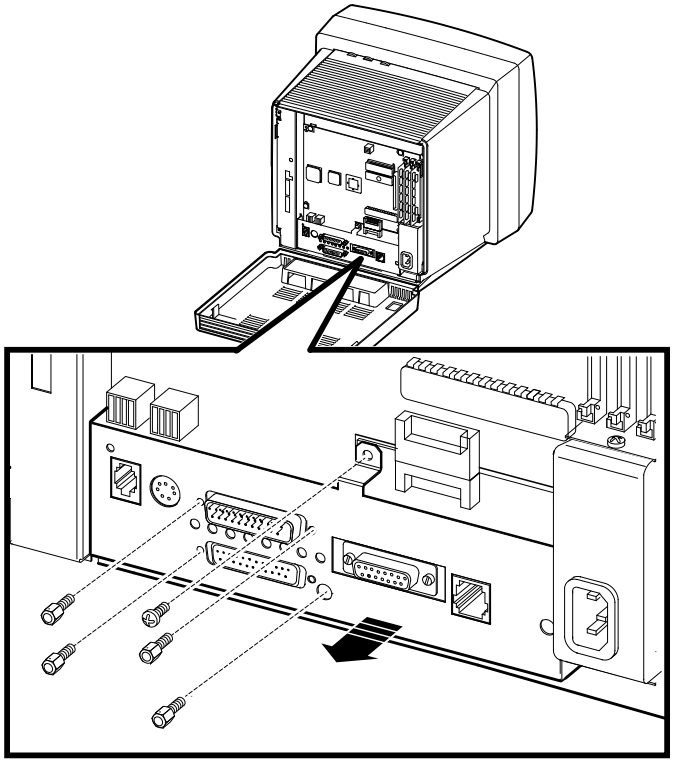
Repeat these steps for a second and third memory module, if you have them. Insert the second module into slot J2 and the third module into slot J3.

5.5 Bulkhead Panel

To remove the bulkhead panel:

1. Open the rear cover (Section 5.2).
2. Remove the single Phillips screw, as shown.
3. Remove the four hex screws on the serial and parallel port connectors.
4. Remove the bulkhead panel.

To install the bulkhead panel: Reverse steps 1 through 4.



LJ-01700-TI0

5.6 Network Module

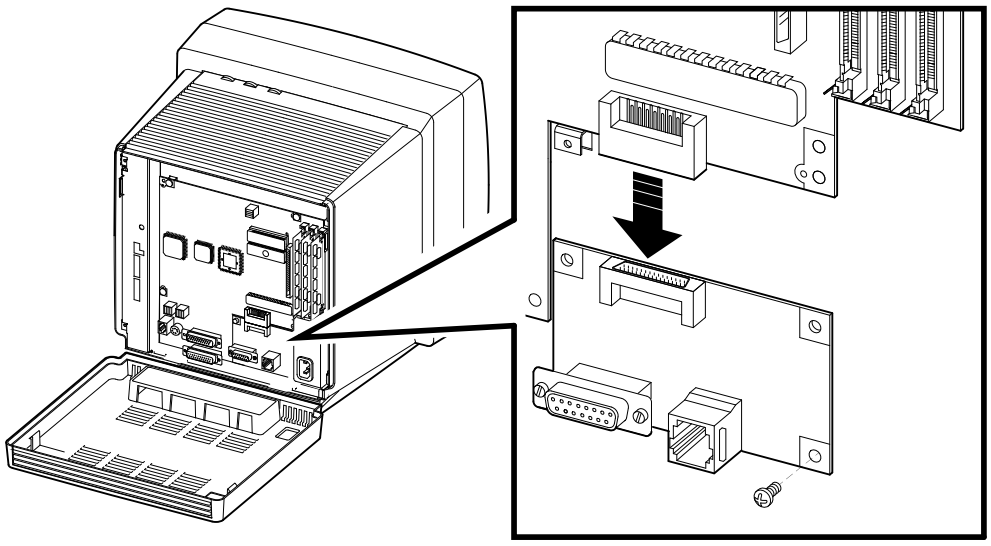
Caution

The network module can be damaged by electrostatic discharge. Handle the network module by its edges.

To remove the network module:

1. Open the rear cover (Section 5.2).
2. Remove the bulkhead panel (Section 5.5).
3. Remove the Phillips screw connecting the network module to the safety wall.
4. Grasp the connectors on the bottom of the network module and pull down gently to release the network module connector from the system logic module. Pull the module out of the terminal.

To install the network module: Reverse steps 1 through 4.



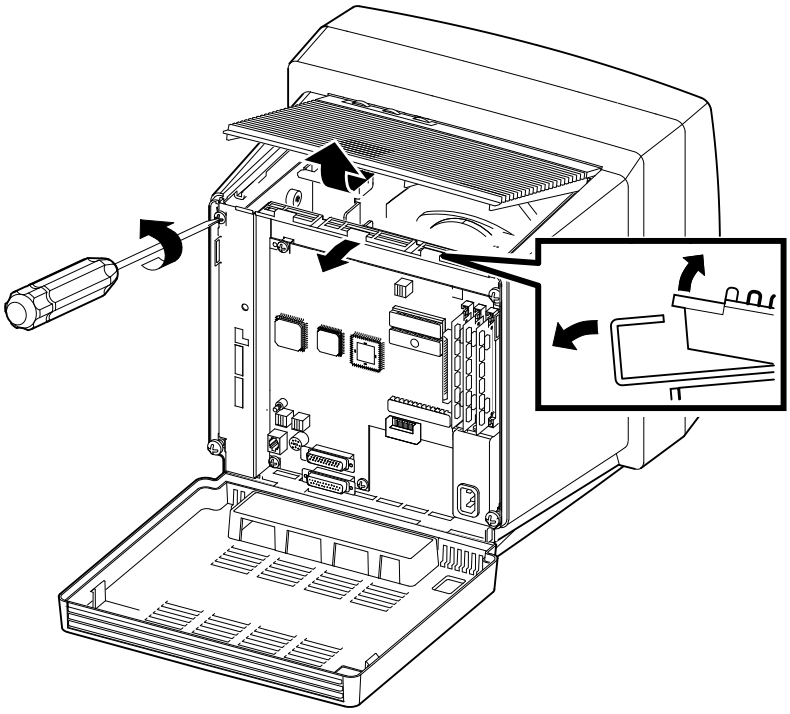
LJ-01701-TI0

5.7 Top Cover

To remove the top cover:

1. Open the rear cover (Section 5.2).
2. Loosen the two Phillips screws at the top of the safety wall until you release the clamps securing the top cover, as shown.
3. Slowly lift the top cover until you release its tabbed hinges from the front of the chassis. Lift the top cover completely off the terminal.

To install the top cover: Reverse steps 1 through 3.

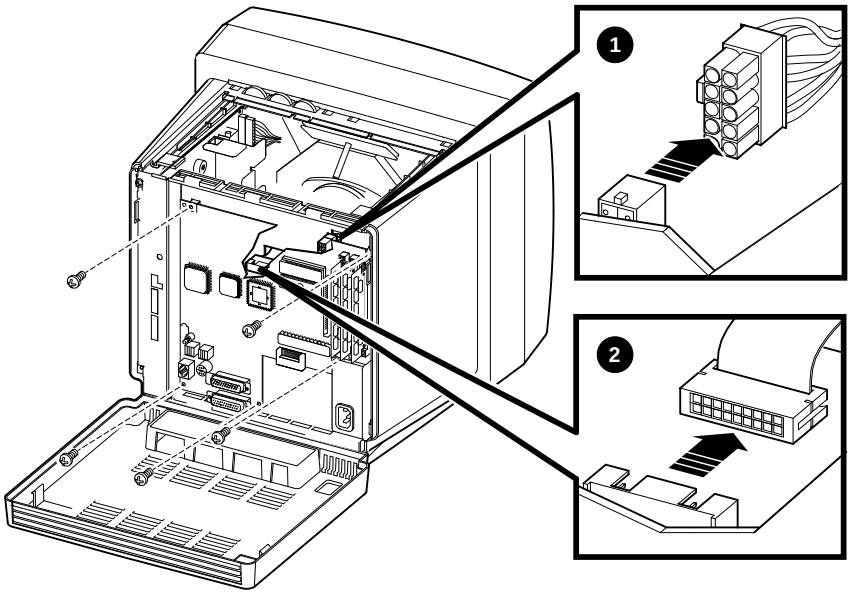


LJ-01702-TI0

5.8 System Logic Module

To remove the system logic module:

1. Open the rear cover Section 5.2.
2. Remove the bulkhead panel (Section 5.5).
3. Remove memory modules (if installed) (Section 5.4.1).
4. Remove the network module (Section 5.6).
5. Remove the top cover (Section 5.7).
6. From the top of the terminal, reach behind the safety wall and disconnect the 8-wire, 10-pin power cable ❶ from its connector at the top of the safety wall.



LJ-01703-TI0

7. Remove the five Phillips screws securing the module to the safety wall, as shown.
8. Slowly pull the top of the system logic module toward you, until you have enough clearance to reach behind the module and disconnect the video ribbon cable ❷ from the lower part of the module.
9. Pull the system logic module out of the terminal.

Removing and Replacing FRUs
5.8 System Logic Module

To install the system logic module: Reverse steps 1 through 9.

Note

You must remove the Ethernet address chip from the system logic module and reinstall it onto the replacement module. Make sure the chip aligns with the notches when you seat it.

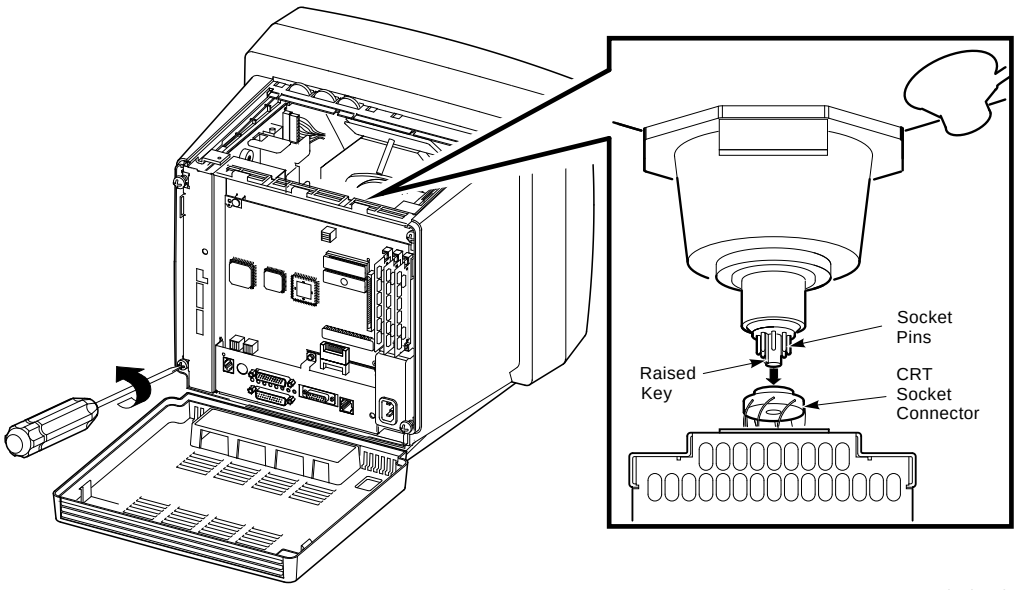
Entering the User's Customized Settings

After you replace the system logic module, refer to (Chapter 7) to enter and save the user's required settings. These include host name or IP address, font paths, and the terminal IP address.

5.9 Safety Wall

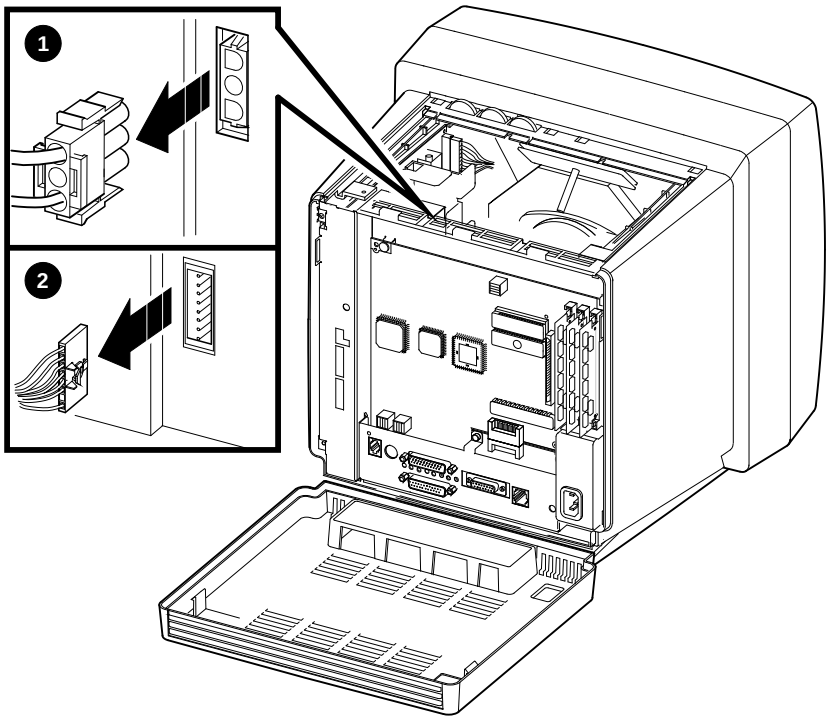
To remove the safety wall:

1. Open the rear cover (Section 5.2).
2. Remove the top cover (Section 5.7).
3. Loosen the two bottom captive screws still holding the safety wall in place, as shown.
4. Remove the CRT socket connector by gently pulling the connector away from the socket.



LJ-01704-TI0

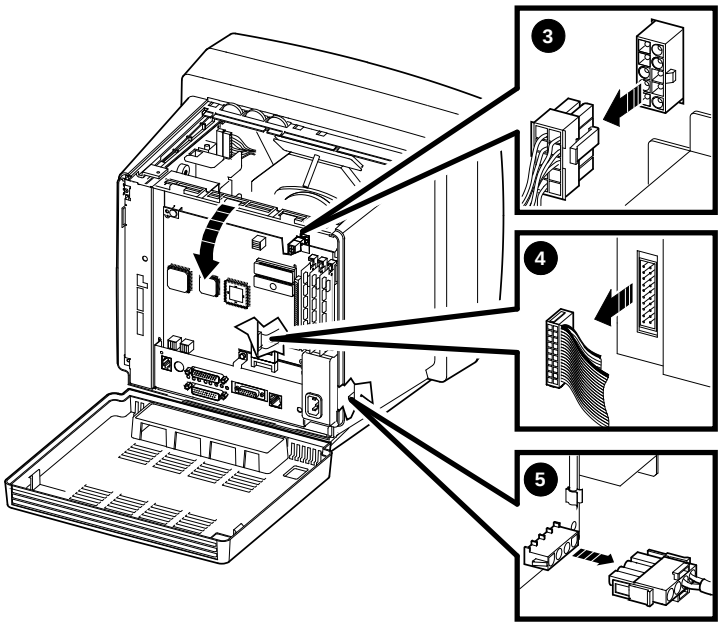
5. Disconnect the 2-wire, 3-pin deflection cable (P7) from connector J7 ❶ at the top of the video amp assembly, by pressing on the sides of the connector and pulling it out.
6. Disconnect the 6-wire, 8-pin brightness/contrast cable (P5) from connector J5 ❷ at the bottom of the video amp assembly, by pressing the tab on the connector and pulling out. You may need a small screwdriver to release the tab.



LJ-01706-TI0A

7. Tilt the safety wall away from the CRT and disconnect the 8-wire, 10-pin power supply cable from the connector ❸ at the top of the safety wall.
8. Disconnect the interconnect ribbon cable ❹ from the bottom of the video amp assembly.
9. Disconnect the 3-wire, 4-pin line filter cable from the connector ❺ at the bottom of the power supply module, by pressing on the sides of the connector and pulling out.
10. Remove the safety wall.

To install the safety wall: Reverse steps 1 through 9.



LJ-01707-TI0A

Caution

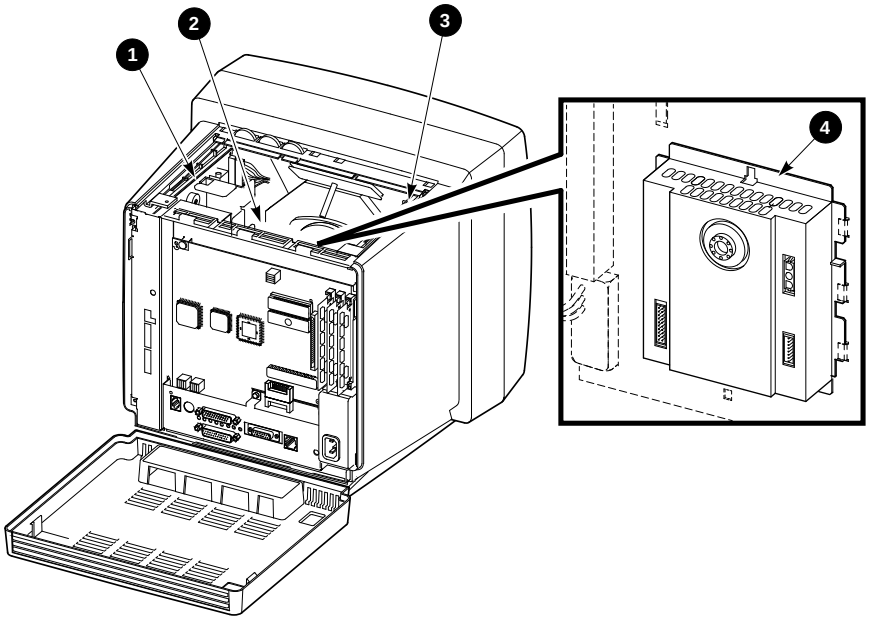
When you install the safety wall, carefully push the CRT socket connector onto the CRT neck. Be careful not to bend the pins during this procedure.

5.10 Monitor FRUs

The following figure shows the FRUs in the monitor section of the terminal, behind the safety wall. Appendix B lists all FRU part numbers. When replacing any FRU, tilt the monitor from the back to the front to allow easier access to the modules.

WARNING

Turn the power off and remove the power cord before disconnecting or replacing any FRU.



LJ-01712-TI0

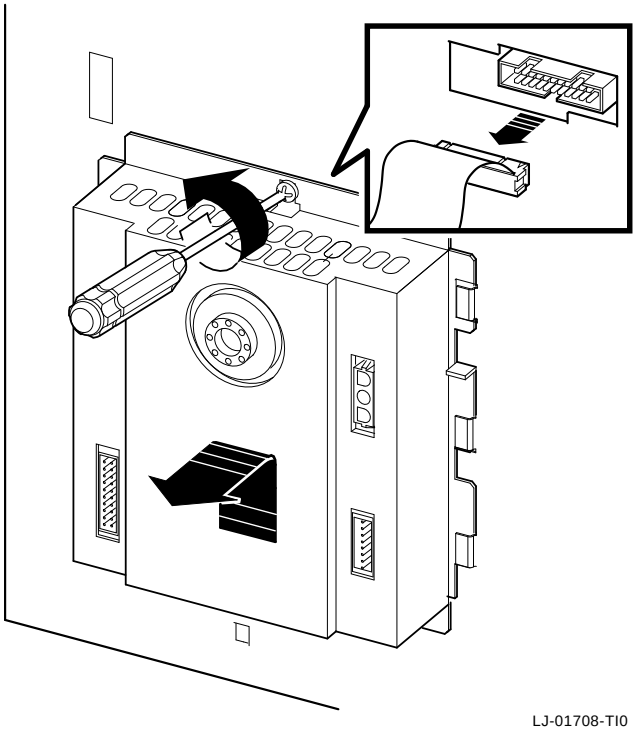
❶ Deflection module
❷ Cathode ray tube
❸ Power supply module
❹ Video amp assembly

5.11 Video Amp Assembly

To remove the video amp assembly:

1. Open the rear cover (Section 5.2).
2. Remove the top cover (Section 5.7).
3. Remove the safety wall (Section 5.9).
4. Loosen the single captive screw securing the video amp assembly to the rear of the safety wall.
5. Slide the assembly up and out of the slots holding it in place.
6. Slowly pull the assembly away from the safety wall, then disconnect the video cable that connects the assembly to the system logic module.

To install the video amp assembly: Reverse steps 1 through 6.



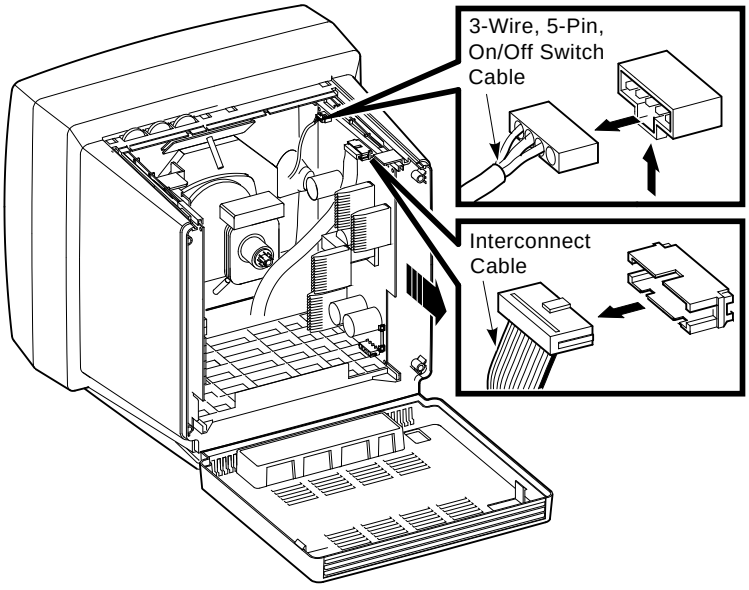
LJ-01708-TI0

5.12 Power Supply Module

To remove the power supply module:

1. Open the rear cover (Section 5.2).
2. Remove the top cover (Section 5.7).
3. Remove the safety wall (Section 5.9).
4. Disconnect the interconnect cable at the top of the power supply.
5. Disconnect the 3-wire, 5-pin LED cable (P4) from connector J4 at the top of the power supply, by pressing the tab on the bottom of the connector.
6. Slide the power supply module out of the card guides.

To install the power supply module: Reverse steps 1 through 6.



LJ-01709-TI0

5.13 Discharging the CRT and Removing the Anode Cap

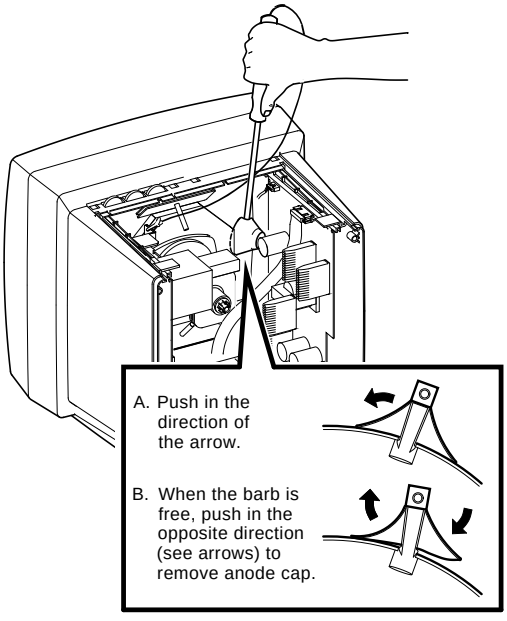
Discharging the CRT is a process that drains to ground any voltages remaining on the extra-high tension (EHT) cable after power is removed. Discharge the CRT as follows:

1. Open the rear cover (Section 5.2).
2. Remove the top cover (Section 5.7).
3. Remove the safety wall (Section 5.9).
4. Remove the power supply module (Section 5.12).

WARNING

The following steps expose you to the CRT anode, which may store a high voltage. Keep your free hand away from any part of the monitor during the anode discharge process.

5. Attach the clip end of the anode discharge tool (PN 29–24717–00) to a chassis ground point near the CRT anode.



LJ-01732-TI0

Note

Be careful when you use the anode discharge tool. Do not tap the CRT. Avoid scratching or marring the CRT glass when you insert or remove the tool.

6. Use one hand to carefully slip the anode discharge tool under the CRT anode connector cup until it touches the connector prongs. Maintain contact for at least 10 seconds.
7. Remove the CRT anode cap from the CRT, as shown.

To install the anode cap: Reverse steps 1 through 7.

5.14 Deflection Module

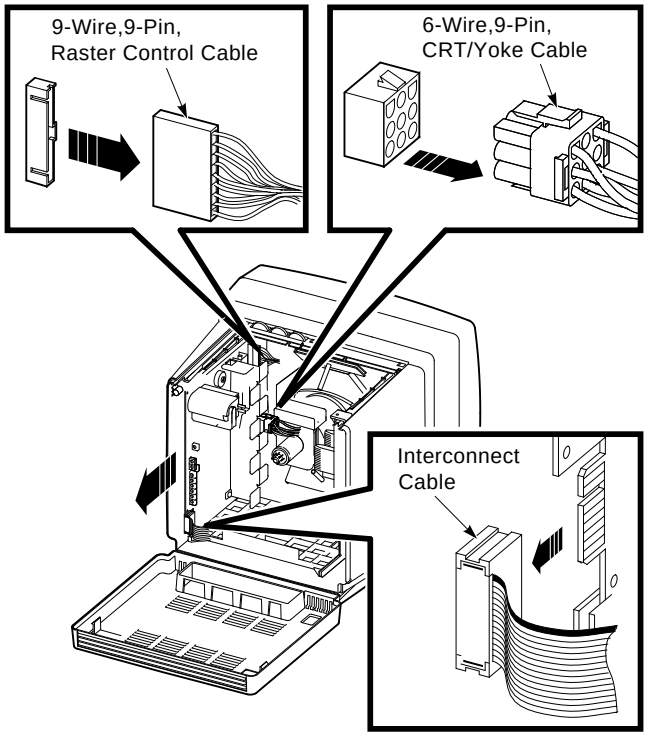
To remove the deflection module:

1. Open the rear cover (Section 5.2).
2. Remove the top cover (Section 5.7).
3. Remove the safety wall (Section 5.9).
4. Remove the power supply module (Section 5.12).
5. Discharge the CRT and remove the anode cap (Section 5.13).

WARNING

You must complete the discharge procedure for the CRT (Section 5.13) before removing the deflection module.

6. Disconnect the interconnect cable, as shown.



LJ-01711-TI0

7. Disconnect the 9-wire, 9-pin raster control cable (P6) from connector J6 at the top of the deflection module, by pressing the tab on the connector.
8. Disconnect the 6-wire, 9-pin CRT/yoke cable (P11) from connector J11 on the deflection module, by pressing the tabs on the connector.
9. Slide the deflection module out of the card guides.

To install the deflection module: Reverse steps 1 through 9.

5.15 CRT/Chassis Assembly

To disassemble the CRT/chassis assembly:

1. Remove the rear cover (Section 5.2).
2. Remove the top cover (Section 5.7).
3. Remove the safety wall (Section 5.9)
4. Remove the power supply module (Section 5.12)
5. Discharge the CRT and remove the anode cap (Section 5.13).

WARNING

You must discharge the CRT and remove the anode cap (Section 5.13) before removing the deflection module.

6. Remove the deflection module (Section 5.14)

5.16 CRT Disposal (Trained Service Personnel Only)

Note

This procedure supersedes all other tech tips about replacing and disposing of CRTs. This procedure is for Digital personnel only, and is not intended for use by OEM and self-maintenance customers.

This section describes how to safely dispose of the monitor's cathode-ray tube (CRT). CRTs are glass vacuum tubes. Because air pressure outside the tube is greater than air pressure inside, there is always the possibility of accidental implosion.

WARNING

You must handle CRTs very carefully to avoid accidental implosion and shattering glass. Use the following guidelines and disposal procedure to remove and dispose of a CRT. These guidelines and procedure are Digital policy for all CRTs with a diameter or more than three inches.

5.16 CRT Disposal (Trained Service Personnel Only)

Location
Work in areas where risks and exposure are limited to trained Digital personnel. Only Digital personnel should be in the area during CRT removal and replacement.

Handling a CRT

- Never handle the CRT by the neck. Always use two hands and hold the CRT by the sides near the face of the tube.
- Keep the CRT away from your body during handling.
- Do not let the neck strike anything.
- Do not rest the CRT on its neck.
- Do not let the CRT touch any tools, such as screwdrivers and soldering irons.

Stocking and Storage
All CRTs must be kept in a closed container or mounted in the device cabinetry.

CRT Disposal
Use the following procedure to safely dispose of CRTs. Always perform this procedure at a Digital facility.

WARNING

Do not dispose of any CRT until it is rendered inoperative and safe to dispose.

Never perform the following disposal procedure at the customer site. Return the defective CRT to the local Digital facility for disposal.

At the Digital facility you must

- Clear the area of nonessential personnel
- Have a second person in the area in case of an emergency
- Wear safety goggles (PN 29–16141–00)
- Wear gloves (PN 29–16146–00)
- Use pliers

Removing and Replacing FRUs
5.16 CRT Disposal (Trained Service Personnel Only)

WARNING

To avoid injury to your eyes or hands, always wear goggles and gloves when you work with a CRT. Never handle pieces of phosphor-coated glass without wearing protective gloves.

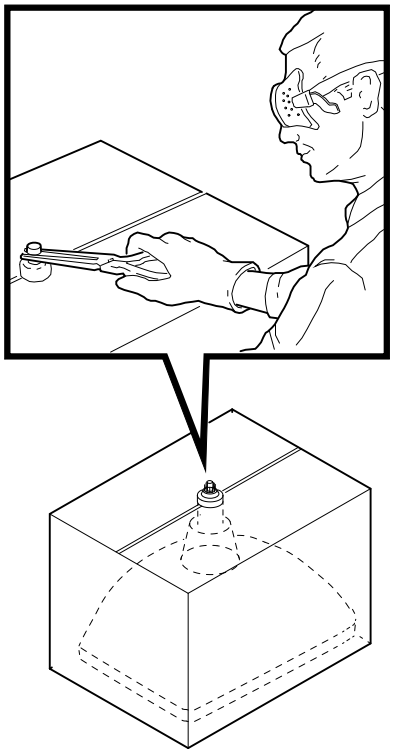
Before you perform the following procedure, remove the FRUs listed in Section 5.15.

1. Place the old CRT/chassis assembly and the original packing material in the container from which you removed the new CRT/chassis assembly.
2. Using pliers, slowly crush, **but do not snap,** the evacuation point. Do not move or disturb the CRT until the hissing sound of inrushing air stops.

Caution

Use care not to break the unprotected glass area of the CRT neck that surrounds the evacuation point.

The evacuation point is a protrusion that extends from the circular area defined by the CRT neck pins. The glass protrusion is sometimes encased in a protective plastic cap, and more force is required to crush it.



MA-X0667-88

3. Seal the carton with packing tape and dispose of it in the Digital site's trash receptacle.

Note

The safe gassing of the CRT is necessary to prevent liability and safety problems that may arise from accidental CRT implosion.

5.17 Tilt-Swivel Base

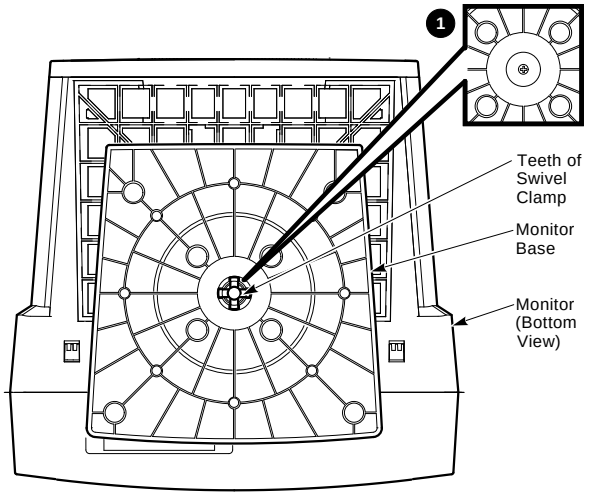
There are two versions of the tilt-swivel base. One version comes with a retainer plug, and the other comes with a set screw in the base. During normal use, the tilt-swivel base should not come off the unit.

The retainer plug version has a retainer plug (PN 74–39791–01) in the center of the swivel retainer to hold the base on. If the tilt-swivel base comes off but the retainer teeth are not broken, you do not have to take the monitor apart.

To reattach the tilt-swivel base to the monitor:

1. Place the terminal screen facedown on a soft pad.
2. Turn the tilt-swivel base so the wider part is tilted downward toward the screen.
3. Place a curved tool, such as a long Allen wrench, through the center of the swivel retainer inside the base.
4. While pressing on the base with one hand, pull the swivel retainer toward the base until the retainer teeth click into position.
5. Install a retainer plug (PN 74-41176-01) in the retainer to keep the teeth apart.

   If you have the set screw version, adjust the set screw ❶ in the base to the proper tension for the best tilt-swivel action.



LJ-01806-TI0

5.18 Keyboard, Mouse, and Printer

Disconnect the keyboard, mouse, and printer cables from the rear of the terminal. You do not have to turn off the power.

To install a keyboard, mouse, and printer, connect its cable to the appropriate connector on the rear of the terminal.

6

Aligning the Video Display

This chapter describes how to align the monitor display. The chapter covers the following major topics:

- Before You Start (Section 6.1)
- Deflection and Video Amp Adjustments (Section 6.3)
- Using the Radiance Meter (Section 6.4)
- Cutoff and Gain Adjustments (Section 6.5)

You do not have to perform every adjustment procedure each time you align the monitor. However, you should check all adjustments in the order shown, because many adjustments affect each other. Exceptions are the FOCUS (G4), VPARAB, and G2 adjustments. If a setting is already correct, you can skip that adjustment and go on to the next one.

6.1 Before You Start

Before you make adjustments, set up the monitor as described in this section. Use the screen alignment test patterns to make all adjustments.

Let the monitor warm up for at least 20 minutes before performing any adjustments. The warm-up time ensures that the circuitry is at a stable temperature before you do any adjustments.

Note

If a customer calls with a display problem, ask the customer to leave the monitor on until you arrive. If the monitor is left on, you only need to warm up the monitor for 5 minutes after you remove the rear cover.

Clean the Monitor

Use a soft tissue or cloth with a nonabrasive, nonflammable glass cleaner, or use Digital's video screen cleaner (PN VT3XX–SC).

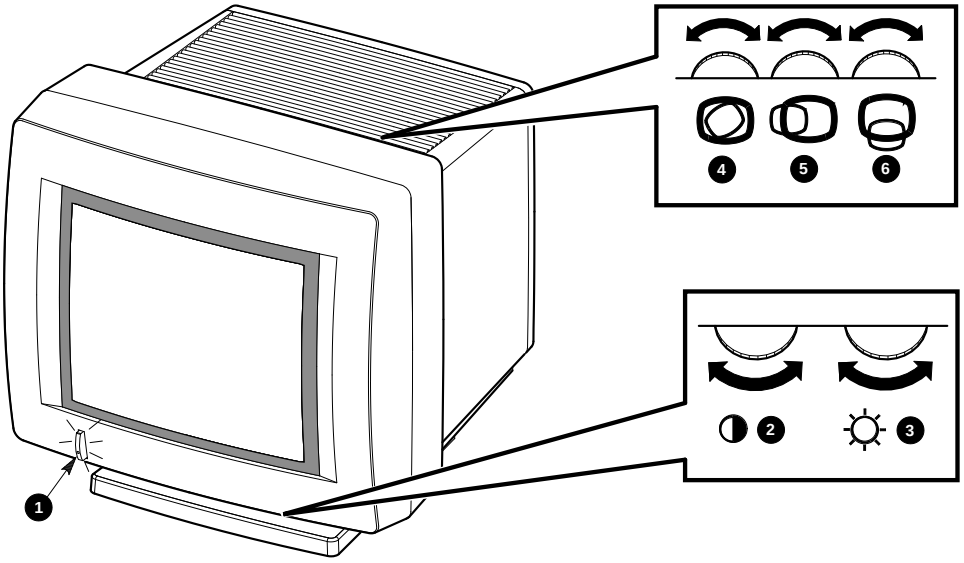
Set Up the Monitor

Before you perform adjustments, set up the monitor as follows:

1. Place the monitor on a nonconductive surface.
2. Remove the rear cover (Section 5.2).
3. Remove the top cover (Section 5.7).
4. Reconnect the power cord.
5. Turn on power by pressing in the power switch. Wait for a video display to appear on the screen.
6. Set the user controls on the top of the monitor to their center position (Figure 6–1).
7. Turn the monitor so the adjustment controls on the deflection module are on the right and the screen is on the left. When performing the geometry adjustments (linearity and centering), the monitor should be facing east, if possible.

Aligning the Video Display
6.1 Before You Start

Figure 6–1 User Controls



Item	Control/Indicator	Function
❶	Power switch and indicator light	Turns the power on and off. When the power is on, the indicator light is on. For extended monitor life, switch the power off when not in use.
❷	Contrast	Adjusts the video display intensity.
❸	Brightness	Adjusts the video background intensity.
❹	Rotation	Rotates the video display area.
❺	Horizontal centering	Adjusts the screen display to the left or right.
❻	Vertical centering	Adjusts the screen display up or down.

Check the LEDs and Heater Filament

Visually check the monitor to ensure that the following components are on:

- LED on the power switch
- LED on the deflection module
- CRT heater filament

6.2 Screen Alignment Patterns

You must use screen alignment test patterns to make all video adjustments. To display a test pattern, you use screen alignment test patterns menu in console mode.

To enter console mode, you press the halt switch on the rear panel of the terminal (Section 1.2.3). When you enter console mode, the terminal quits all session activity and performs a software reset.

To view the screen alignment test patterns menu, enter the following command at the >>> console prompt:

```
>>> T/UTIL 2
```

From the menu, choose the alignment pattern that you will be using for video alignment.

To return from a display pattern to the menu, press the space bar. To return to the console prompt, press Ctrl C.

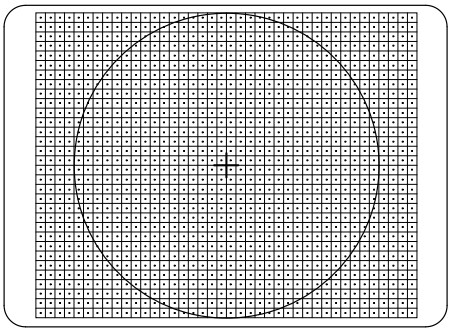
6.2.1 Displaying Alignment Patterns

You use the following test patterns to perform the adjustment procedures:

- Circle-crosshatch alignment test pattern (test pattern 6) (Figure 6–2)
- Raster pattern (test pattern 4)
- All-white test pattern (test pattern 0)

To display test patterns, use the procedures in Chapter 3.

Figure 6–2 Circle-Crosshatch Pattern

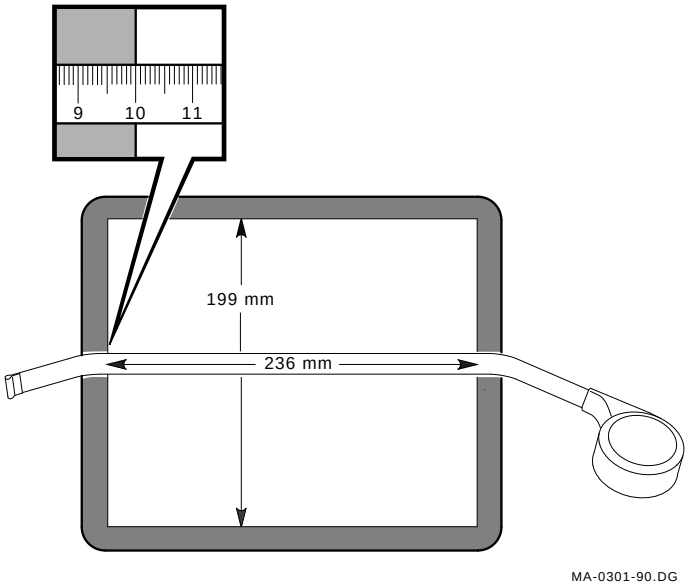


MA-X0889-88

Aligning the Video Display
6.2 Screen Alignment Patterns

Use a metric measuring tape (PN 29–25342) to measure the dimensions of the screen display. To avoid scratching the screen with the tape's metal clip, start the measurement at 10 cm (Figure 6–3).

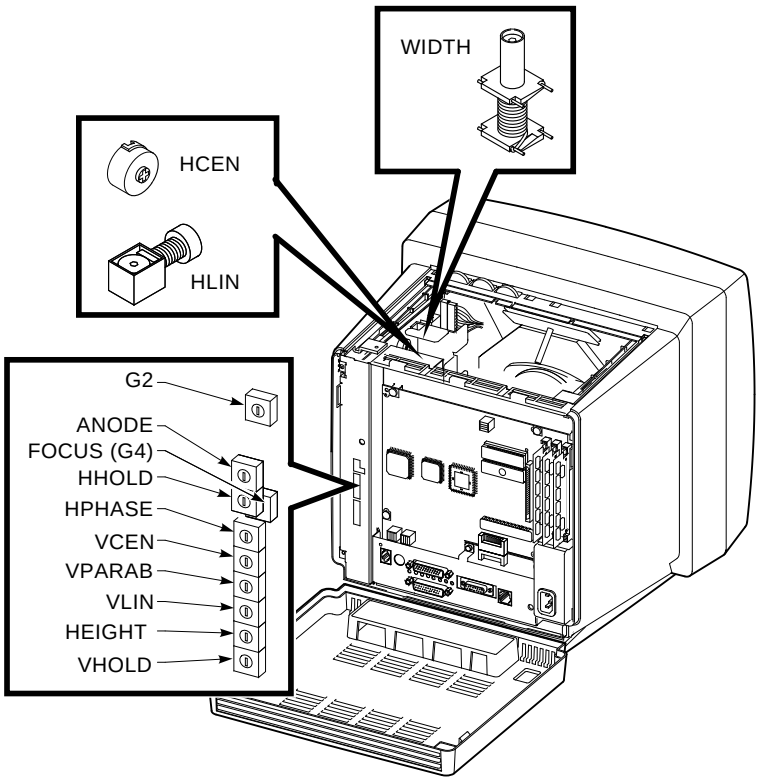
Figure 6–3 Using the Metric Measuring Tape



6.3 Deflection and Video Amp Adjustments

Perform the following adjustments in order. Figure 6–4 shows the location of adjustment controls.

Figure 6–4 Adjustment Controls



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6.3.1 Raster Adjustment

1. Set the user controls (Figure 6–1) on the top and the bottom of the monitor to their center position.
2. Display the circle-crosshatch pattern (test pattern number 6) (Figure 6–2).
3. Adjust the brightness control until the monitor just starts to display the raster.

4. Adjust the contrast control until the test pattern appears.
5. Adjust the G2 control to its centered position (Figure 6–4).
6. Adjust VLIN control to its centered position.
7. Use a hex-head driver to set HLIN for the maximum width of the raster, then reduce the raster size by about 5 mm.

6.3.2 Anode Voltage Adjustment

The anode voltage affects both the height and the width of the display. Only the center region of the control affects the display size. Adjust the anode voltage as follows:

1. Mark the positions on the ANODE control where the display is at its minimum and maximum size, by turning the control in one direction and then the other.
2. Adjust the ANODE control so the setting is **exactly** halfway between the minimum and maximum points.

6.3.3 Height and Width Adjustments

Check and adjust linearity as follows:

1. Set the brightness control on the bottom of the monitor to display the raster.
2. Set the HPHASE control so the video display is centered in the raster.
3. Use a Phillips screwdriver to adjust the HCEN control so the display is centered in the bezel.
4. Use a hex-head driver to set the WIDTH control so that the right half of the display is the correct width.
5. Use a hex-head driver to set the HLIN control so that the left half of the display is correct.
6. Repeat steps 3, 4, and 5 until the correct size, centering, and linearity is obtained. Then continue with step 7.
7. Adjust the VCEN control so that the display is centered in the bezel.
8. Set the HEIGHT control so that the center to the bottom half of the dimension is correct.
9. Adjust the VLIN control so that the center rectangles are the same size as the bottom and top rectangles.

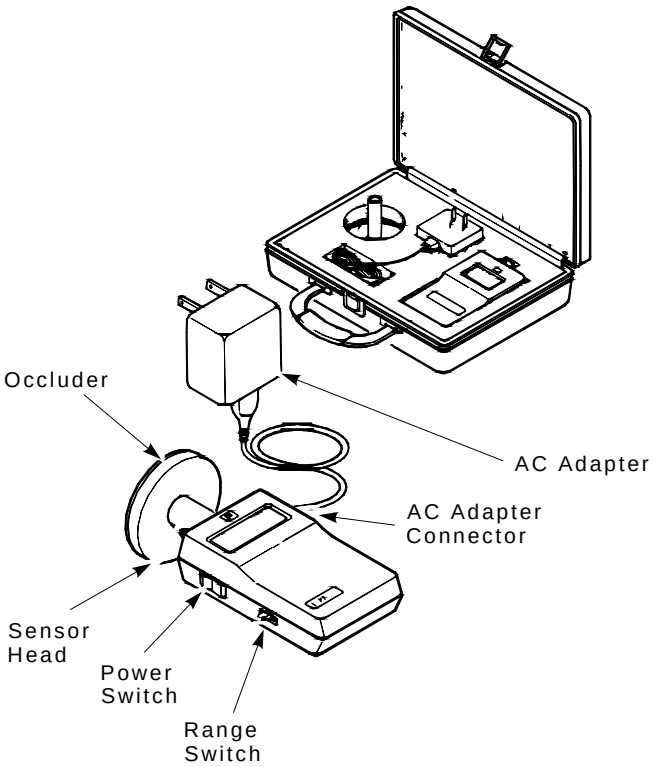
6.4 Using the Radiance Meter

You use a radiance meter to perform the cutoff adjustment. To use the radiance meter:

1. Remove the cap from the radiance meter sensor head and connect the occluder to the radiance meter.

Caution

Avoid excessive force when tightening the occluder or you may damage the radiance meter. Do not touch the exposed filter after the protective cap is removed.



MA-X0665-88

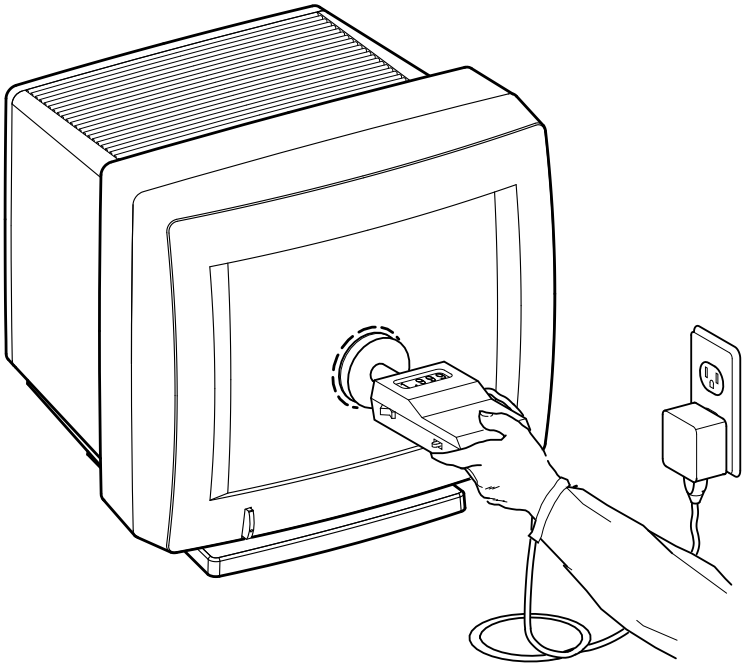
2. Connect the ac line adapter to the radiance meter and plug the adapter into a wall outlet.

Aligning the Video Display
6.4 Using the Radiance Meter

Ensure that your radiance meter is calibrated correctly. Do not use the POWER ON W/BACKLIGHT position when you are using the radiance meter with batteries.

3. Turn on the power switch.
4. Set the range switch to the second position from the top (1.999).
5. Place the occluder firmly against the center of the screen, as shown. Take a red china pencil to draw an arc or circle around the occluder.

   You must take all meter readings with the meter centered in this arc or circle.

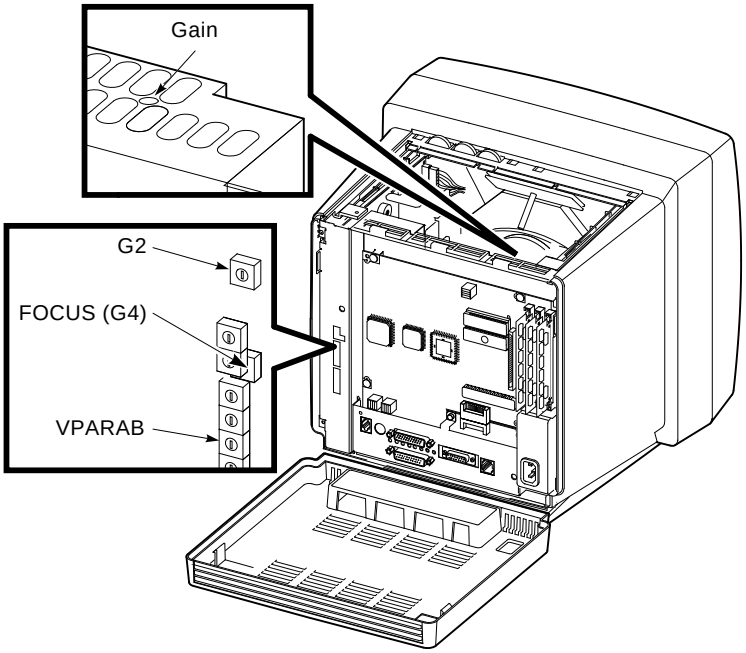


MA-0302-90.DG

6.5 Cutoff and Gain Adjustments

This section describes how to make the cutoff and gain adjustments. Figure 6–5 shows the location of the cutoff (G2) and gain controls.

Figure 6–5 GAIN, G2, FOCUS (G4), and VPARAB Adjustments



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6.6 Cutoff Adjustment

When you adjust the G2 control, use the radiance meter on the screen (Section 6.4). Check and adjust G2 (Figure 6–5) as follows:

1. Set the brightness control to maximum and the contrast control to minimum.
2. Display the raster pattern (test pattern 4) and set the G2 control so that the maximum background luminance is 0.010.
3. Display the circle-crosshatch pattern (test pattern 6).
4. Set the brightness control to minimum and the contrast control to maximum.

5. Set the FOCUS (G4) control for best overall sharpness. Set the VPARAB control for the best corner focus.

6.7 GAIN Adjustment

1. Set the contrast control to maximum. Set the brightness control until the raster just disappears.
2. Display the all-white pattern (test pattern 0) and set the GAIN control to obtain a 0.283 luminance at the center of the screen.
3. Repeat the anode voltage (Section 6.3.2) and the height and width adjustments (Section 6.3.3) until correct size is obtained.

7

Starting a Session

This chapter provides step-by-step procedures on how to start using your terminal with a host computer. If you are unfamiliar with using a mouse or windows, see *VXT 2000 Windowing Terminal User Information* for more detailed procedures with supporting screens.

Before you start, you should set the terminal to use the desired display language and keyboard type. By default, the terminal uses the English language and the North American keyboard type.

You can use your terminal with a wide range of operating systems, including the UNIX, ULTRIX, or VMS operating systems. You can open two types of sessions on these systems—an X window session or a terminal window session.

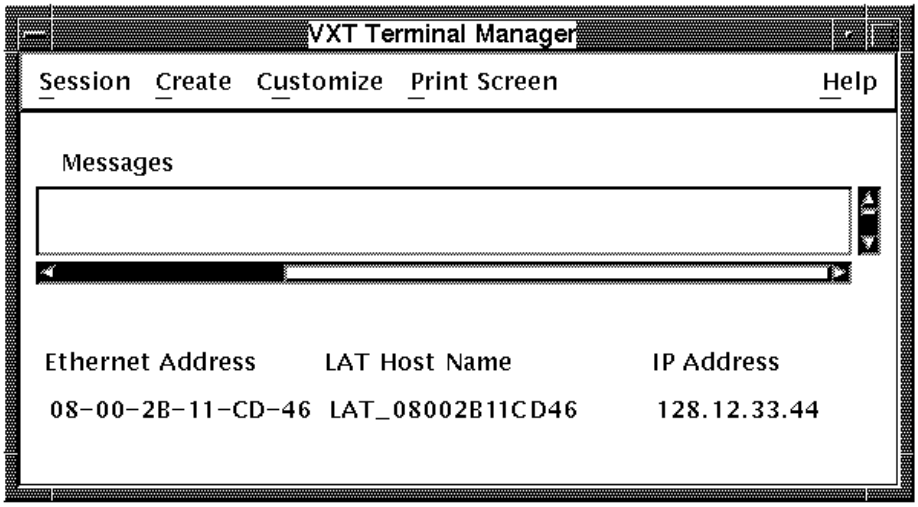
The chapter covers the following topics:

- Terminal Manager Window (Section 7.1)
- Choosing the Display Language (Section 7.2)
- Choosing the Correct Keyboard Type (Section 7.3)
- Starting a Session on Your Host System (Section 7.4)
- Using the Keyboard Instead of the Mouse (Section 7.5)
- Ending a Session (Section 7.6)

7.1 Terminal Manager Window

When you turn on the terminal, it performs its self-tests, then normally displays the Terminal Manager window. You use the Terminal Manager window to create sessions on your host system.

The menu bar of the Terminal Manager window contains four menu names: Session, Create, Customize, and Print Screen. Server-based systems also have a Help menu.



LJ−01140−RAGS

AutoStart

The Session menu has a customizable AutoStart feature that lets you automatically connect to a chosen host or service when you turn the terminal on. In this case, the terminal displays a log-in box and you can start a session immediately by logging in. For information on entering a host service for the AutoStart feature, see *VXT 2000 Windowing Terminal User Information*.

This chapter describes how to start a session on a terminal that has not been customized to use the AutoStart feature.

Help Menu for Creating Sessions

The Help menu in the Terminal Manager window also provides access to step-by-step instructions on creating sessions.

7.2 Choosing the Display Language

Before you start, you should set the terminal to use the desired display language. The display language is initially set to English.

To change the display language:

1. Turn on the terminal. After the terminal completes its self-tests, the Terminal Manager window is displayed.
2. Point to the **Customize** menu name in the Terminal Manager window's menu bar. Click mouse button 1 to display the Customize menu.
3. Point to the **Language . . .** menu item. Click mouse button 1 (MB1) to display the Customize Language dialog box.
4. In the dialog box, click on your language choice. Your choice is highlighted.
5. Click on the **OK** button to save your choice and dismiss the Customize Language dialog box.
6. To apply your choice, you must quit the terminal session:
   a. Point to the **Session** menu name in the Terminal Manager window's menu bar. Click MB1 to display the Session menu.
   b. Point to the **Quit** menu item and click MB1 to quit the terminal session and restart the terminal.
   c. The terminal displays a confirmation box, asking if you really want to quit the session. Click on **Yes**.

      The Terminal Manager window is displayed in your chosen language.

7.3 Choosing the Correct Keyboard Type

Digital's standard ANSI keyboard comes in many models, for use with different languages. By default, the terminal is set to work with the North American keyboard type. If you have another keyboard, you must change the setting.

To change the keyboard type:

1. Turn on the terminal. After the terminal completes its self-tests, the Terminal Manager window is displayed.
2. Point to the **Customize** menu in the Terminal Manager's menu bar. Click mouse button 1 (MB1) to display the Customize menu.
3. Point to the **Keyboard . . .** menu item and click MB1 to display the Customize Keyboard dialog box.

4. Turn the keyboard upside down and look for a label that specifies the model number. The model number should be in a format similar to LK401-*xx*. Use the *xx* value to choose your keyboard type from the Keyboard Type scroll box.

   For example, if you have a Belgian French keyboard and the model number is LK401-AP, you can choose either the Belgian_French_LK401_AP_DP or Belgian_French_LK401_AP_TW setting. The choice of a *TW* (typewriter) version or *DP* (data processing) version affects keys with more than three characters on their keycaps. Data processing characters are on the right half of keycaps.

5. Click on the your keyboard choice in the Keyboard Type scroll box. If needed, click on the arrows to scroll through the selections until you see your keyboard model.

6. Click on the **OK** button to save your choice and dismiss the Customize Keyboard dialog box.

7.4 Starting a Session on Your Host System

The following sections show you how to use the Terminal Manager window to

- Create an IP X window or TELNET terminal window session on a UNIX or ULTRIX system
- Create a LAT X window or LAT terminal window session on a VMS system
- Create a terminal window session on a system using the serial port

7.4.1 Creating an IP X Window or TELNET Terminal Window Session

This section describes how to create an IP X window session or a TELNET terminal window session, on a UNIX or ULTRIX host system.

Enter and save the terminal's IP address.

Before you start your first session, you must enter and save the terminal's IP address. You only need to perform this procedure one time.

1. Turn on the terminal. The Terminal Manager window is displayed.
2. Display the Customize TCP/IP dialog box.
   a. Point to the **Customize** menu name in the Terminal Manager window's menu bar. Click mouse button 1 (MB1) to display the Customize menu.
   b. Point to the **Communications** menu item. Click MB1 to display the Communications submenu.

c. Point to the **TCP/IP . . .** menu item. Click MB1 to display the Customize TCP/IP dialog box.

3. Enter your terminal's IP address in the **IP Address** box. For example: **`12.123.123.12`**
4. Optional: Click on the **IP Subnet Mask** box and enter your terminal's IP subnet mask. For example: **`255.255.0.0`**
5. Click on the **OK** button to save the settings and dismiss the dialog box. The IP address you entered is displayed at the lower right of the Terminal Manager window.

Create the Session

After you save the terminal's IP address, you can start an IP X or TELNET terminal window session as follows:

1. Point to the **Create** menu name in the Terminal Manager window's menu bar. Click MB1 to display the Create menu.
2. **For an IP X session:** Click on the **IP X Session . . .** menu item to display the Create an IP X Session dialog box.

   For a TELNET terminal window session: Click on the **TELNET Terminal Window . . .** menu item to display the Create a TELNET Terminal Window dialog box.
3. Enter a host name or IP address, then connect to the host:

   a. In the **Host Name or IP Address** box, enter the name or IP address of the host you want to connect to.

      For example: **`12.123.123.12`**

   b. Click on the **Add** button to add your host to the Preferred Services scroll box.

   c. Click on the **Save** button to save your host name or host IP address, so you do not have to enter it each time you turn on the terminal.

   d. Click on the **Connect** button to connect to the host. The terminal displays a log-in prompt.
4. Log in to the session.

7.4.2 Creating a LAT X Window or Terminal Window Session

This section describes how to create a LAT X window session or LAT terminal window session on a VMS host system.

1. Turn on the terminal. The Terminal Manager window is displayed.

   Point to the **Create** menu name in the Terminal Manager window's menu bar. Click mouse button 1 (MB1) to display the Create menu.

2. **For a LAT X session:** Click on the **LAT X Session . . .** menu item to display the Create a LAT X Session dialog box.

   For a LAT terminal window session: Click on the **LAT Terminal Window . . .** menu item to display the Create a LAT Terminal Window dialog box.

3. Enter a service or host name, then connect to the host.

   a. In the **Service or Host Name** box, enter the name of the service or host you want to connect to.

      For example: **VMSNODE**

   b. Click on the **Add** button to add your host to the Services scroll box.

   c. Click on the **Save** button to save your host name so you do not have to enter it each time you turn on the terminal.

   d. Click on the **Connect** button to connect to the service in the box. The terminal displays a log-in prompt.

4. Log in to the session.

7.4.3 Starting a Terminal Window Session on the Serial Port

This section describes how to start a terminal window session on a UNIX, ULTRIX, or VMS system that is connected to the terminal's serial port.

1. Turn on the terminal. The Terminal Manager window is displayed.
2. Point to the **Create** menu name in the Terminal Manager window's menu bar. Click mouse button 1 (MB1) to display the Create menu.
3. Click on the **Terminal Window on Serial Port . . .** menu item to display a serial terminal window.
4. Press the Return key until the log-in prompt is displayed.
5. Log in to the host as you would on a conventional video terminal.

7.5 Using the Keyboard Instead of the Mouse

The terminal uses a Motif window manager that lets you use the mouse or keyboard to navigate through windows and make menu selections. For example, you can use the following key functions to choose menu items:

To ...	Press...
Activate keyboard navigation and move to the first menu in a menu bar	F10
Move to different menus in the menu bar	→ and ←
Pull down a menu	Alt Function + the underlined letter in the menu's name
Move to a menu item	↓ and ↑ keys
Choose a menu item	Return
Dismiss the menu and deactivate keyboard navigation	F10

For more information on using the keyboard instead of the mouse, see *VXT 2000 Windowing Terminal User Information*.

7.6 Ending a Session

You can end a session at any point, by choosing the Quit menu item from the Session menu. Choosing Quit returns the terminal to its initial start-up state. End a session only after completing your work. When you end a session, the terminal

- Terminates all host connections
- Deletes all windows on the screen
- Performs a complete software reset
- Displays the Terminal Manager window

To end your session:

1. Point to the **Session** menu name in the Terminal Manager's menu bar. Click MB1 to display the Session menu.
2. Click on the **Quit** menu item. The terminal displays a dialog box to confirm that you want to end the session.
   - To end the session, click on the **Yes** button.
   - To remain in the session, click on the **No** button.

A

Related Documents

Table A–1 list some related documents on the VXT 2000 model VX225 windowing terminal that you can order from Digital. This guide refers to these documents.

Table A–1 Related Documents

Documents	Order Number
VXT 2000 Windowing Terminal User Information	EK–VXT20–UG
VXT 2000 Model VX225 Windowing Terminal Installing and Getting Started	EK–VXT15–IN
VXT 2000 Model VX225 Illustrated Parts Breakdown	EK–VXT15–IP

A.1 Ordering Information

You can order options and documentation by mail, phone, or electronically.

Need Help?

If you need help deciding which documentation best meets your needs, please call 800–343–4040 before placing your order.

Electronic Orders

To place an order at the Electronic Store, dial 800–234–1998 using a 1200- or 2400-baud modem. If you need help, call 800–DIGITAL (800–344–4825).

Telephone or Direct Mail Orders

If You Are From . . .	Call . . .	Or Write . . .
Continental USA, Alaska, or Hawaii	800–DIGITAL	Digital Equipment Corporation P.O. Box CS2008 Nashua, New Hampshire 03061
Puerto Rico	809–754–7575	Local Digital subsidiary
Canada From outside Canada	800–267–6215 613–591–6000	Digital Equipment of Canada Attn: DECdirect Operations KAO2/2 P.O. Box 13000 100 Herzberg Road Kanata, Ontario, Canada K2K 2A6
International	–	Local Digital subsidiary or approved distributor

Digital Personnel

You can order documentation by electronic mail. Contact the following organizations for instructions:

If You Need . . .	Contact . . .
Software documentation[1]	USASSB Order Processing WMO/E15 *or* U.S. Area Software Supply Business Digital Equipment Corporation Westminster, MA 01473
Hardware documentation	Publishing & Circulation Services (P&CS) NRO2-2/I5 Digital Equipment Corporation Northboro, MA 01532

[1]You must request an electronic Internal Software Order Form.

B

Recommended Spares List

This appendix lists the recommended spares for the terminal.

Table B–1 VX225–AA Field Replaceable Units

Description	Part Number
CRT/chassis assembly(NH)	70–27477–04
CRT/chassis assembly(SH)	70–27477–05
Rear cover assembly	70–29098–01
Screw for system logic module and network module	90–09984–07
Hex-head screw for serial and parallel port connector	90–08451–12
Power supply assembly	54–21169–01
Interconnect cable	70–27000–03
System logic module (4 MB)	70–29102–01
Thickwire/twisted-pair Ethernet module	54–20482–02
Memory module (2 MB)	MS200–AA
Memory module (4 MB)	MS200–BA
Deflection module	54–21660–01
Video amp assembly	70–29100–01

Table B–2 General Recommended Spares

Power Cables	
Australia, New Zealand	BN20V–2E
Austria, Belgium, Finland, France, Germany, Netherlands, Norway, Portugal, Spain, Sweden	BN20S–2E
Canada	BN20P–2E
Denmark, Israel	BN20U–2E
Ireland, United Kingdom	BN20R–2E
Italy	BN20W–2E
Switzerland	BN20T–2E
USA	17–00606–02
Network Cables	
Thickwire Ethernet cable	17–01321–01
Twisted-pair Ethernet cable (uncrossed)	BN24G–03
Twisted-pair Ethernet cable (crossed)	BN24F–03
Loopback Connectors	
Loopback connector, MMJ (H3103–00)	12–25083–01
Mouse loopback connector	12–25628–01
VSXXX–GA Mouse	
Mouse pad	12–34174–01,–02
VSXXX–AB Tablet	
Stylus	29–25995–00
Tablet puck	29–25996–00
Tablet assembly	29–25997–00
Tablet printed circuit board and cable	29–25998–00
Tablet top enclosure	29–25999–00
Tablet bottom enclosure	29–26000–00

Recommended Spares List

Table B–3 Keyboards

Keyboard	Standard	Word Processing (WPS)	Short UNIX
North American/ United Kingdom	LK401–AA	LK402–AA	LK421–AA
Belgium/Flemish	LK401–AB	LK402–AB	None
Canada (English)	LK401–AQ	LK402–AQ	None
Canada (French)	LK401–AC	LK402–AC	None
Denmark	LK401–AD	LK402–AD	None
Finland	LK401–AF	LK402–AF	None
France	LK401–AP	LK402–AP	None
Germany/Austria	LK401–AG	LK402–AG	None
Hebrew	LK401–AT	None	None
Italy	LK401–AI	LK402–AI	None
Netherlands	LK401–AH	LK402–AH	None
Norway	LK401–AN	LK402–AN	None
Portugal	LK401–AV	LK402–AV	None
Spain	LK401–AS	LK402–AS	None
Sweden	LK401–AM	LK402–AM	None
Switzerland (French)	LK401–AK	LK402–AK	None
Switzerland (German)	LK401–AL	LK402–AL	None

C

Self–Test Error Descriptions

Table C–1 lists the device numbers for all possible devices in the terminal's configuration. Table C–2 through Table C–11 describe the meaning for all terminal errors.

Table C–1 Configuration Devices

Device Number	Device	Refer to ...
1	Nonvolatile RAM (NVR)	Table C–2
2	Monochrome (MONO)	Table C–3
3	Serial line controller (QDZ)	Table C–4
4	Cache self-test	Table C–5
5	Memory module (MEM)	Table C–6
6	Floating point unit (FPU)	Table C–7
7	Interval timer (IT)	Table C–8
8	System logic module (SYS)	Table C–9
9	Network interface (NI)	Table C–10
10	Parallel interface	Table C–11
13 to 99	Reserved for future use	–

Self-Test Error Descriptions

Table C–2 NVR Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
4	4	Bad battery.	System logic module
8	8	NVR register test failed.	System logic module
12	C	Battery down and NVR register test failed.	System logic module
64	40	Battery check test failed (hard error).	System logic module
65	41	Battery check test failed (soft error).	System logic module
72	48	Battery check test failed and NVR register test failed.	System logic module

Table C–3 Monochrome Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
128	080	No memory to use for data area.	System logic module
256	100	Monochrome configuration failed.	System logic module
512	200	Monochrome reset failed.	System logic module
1024	300	Monochrome RAMDAC failed.	System logic module
1280	400	Monochrome cursor failed.	System logic module
1536	600	Byte mask test of VMEM failed.	System logic module
1794	702	Data compare error occurred during the forward pass of VMEM.	System logic module
2050	802	Data compare error occurred during the reverse pass of VMEM.	System logic module
4095	0FFF	Monochrome test run in FBOOT mode.	Not necessarily an error.

Table C–4 QDZ Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
16	10	QDZ reset test failed.	System logic module
32	20	QDZ modem test failed.	System logic module
48	30	QDZ polled test failed.	System logic module
64	40	QDZ interrupt driver transfer test failed.	System logic module
80	50	QDZ LK401 test failed.	Keyboard
96	60	QDZ mouse test failed.	Mouse
112	70	QDZ INIT driver failed.	System logic module
128	80	No memory to use for data area.	System logic module
144	90	QDZ AB timer failed.	System logic module
160	A0	QDZ CD timer failed.	System logic module
224	E0	QDZ modem signal interrupt failed.	System logic module

Table C–5 Cache Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
512	200	Read/write error to the data store.	System logic module
768	300	Read/write to the tag store.	System logic module
1024	400	Valid bit failed to set as designed.	System logic module
1280	500	Tag does not contain tag for diagnostic space.	System logic module
1536	600	Unexpected tag parity error.	System logic module
1792	700	Cache failed to provide expected data during a cache hit.	System logic module
2048	800	Cache data parity error.	System logic module
2304	900	Tag not valid during cache hit testing.	System logic module

(continued on next page)

Self-Test Error Descriptions

Table C–5 (Cont.) Cache Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
2560	A00	Data not valid during cache hit testing.	System logic module
2816	B00	Cache data write-through test failed, because of invalid data in the cache data store.	System logic module
3072	C00	Cache data write-through test failed, because of invalid data in memory.	System logic module

Table C–6 MEM Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
66	042	A gap was found between MEM pairs.	System logic module
68	044	Illegal MEM configuration register.	System logic module
256	100	Byte mask test failure.	System logic module
514	202	Data compare error occurred during the forward pass.	System logic module
770	302	Data compare error occurred during the reverse pass.	System logic module
1280	500	Default memory pattern (01010101) deposit failure.	System logic module
1536	600	No contiguous 512K bank in option memory.	System logic module
2304	900	Main memory configuration does not match the top of memory (hard error) in keyboard loopback mode.	System logic module
2305	901	Main memory configuration does not match the top of memory (soft errors) except in manufacturing mode.	System logic module

(continued on next page)

Table C–6 (Cont.) MEM Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
2560	A00	Bottom 256K of memory has bad pages	System logic module

Table C–7 FPU Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
258	102	MOVE instruction test failed.	System logic module
260	104	Unexpected exception occurred during MOVE test.	System logic module
514	202	MNEGF instruction test failed.	System logic module
516	204	Unexpected exception occurred during MNEGF test.	System logic module
770	302	ACBF instruction test failed.	System logic module
772	304	Unexpected exception occurred during ACBF test.	System logic module
1026	402	ADDF2/ADDF3 instruction test failed.	System logic module
1028	404	Unexpected exception occurred during ADDF*x* test.	System logic module
1282	502	CMPF instruction test failed.	System logic module
1284	504	Unexpected exception occurred during CMPF test.	System logic module
1538	602	CVTFD/CVTFG instruction test failed.	System logic module
1540	604	Unexpected exception occurred during CVTFD/CVTFG test.	System logic module
1794	702	CVTF*x* instruction test failed.	System logic module
1796	704	Unexpected exception occurred during CVTF*x* test.	System logic module
2050	802	CVT*x*F instruction test failed.	System logic module

(continued on next page)

Self-Test Error Descriptions

Table C–7 (Cont.) FPU Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
2052	804	Unexpected exception occurred during CVT*x*F test.	System logic module
2306	902	DIVF2/DIVF3 instruction test failed.	System logic module
2308	904	Unexpected exception occurred during DIVF*x* test.	System logic module
2562	A02	EMODF instruction test failed.	System logic module
2564	A04	Unexpected exception occurred during EMODF test.	System logic module
2818	B02	MULF2/MULF3 instruction test failed.	System logic module
2820	B04	Unexpected exception occurred during MULF*x* test.	System logic module
3074	C02	POLYF instruction test failed.	System logic module
3076	C04	Unexpected exception occurred during POLYF test.	System logic module
3330	D02	SUBF2/SUBF3 instruction test failed.	System logic module
3332	D04	Unexpected exception occurred during SUBF*x* test.	System logic module
3586	E02	TSTF instruction test failed.	System logic module
3588	E04	Unexpected exception occurred during TSTF test.	System logic module
4095	0FFF	FPU not tested in FBOOT mode.	Not necessarily an error.

Table C–8 IT Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
x	*xx*02	Interval timer failed to interrupt at the correct rate.	System logic module Neglect the *xx* output; however, this will be calculated in the decimal error results.

Table C–9 SYS Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
*xx*2	*xx*02	System ROM test failed.	System logic module Neglect the *xx* output; however, this will be calculated in the decimal error results.
4095	0FFF	System not tested in FBOOT mode.	Not necessarily an error.

Table C–10 NI Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
If an NI error occurs, verify that a loopback connector is installed on the selected network port on the rear of the terminal or that the network cable is firmly connected. Rerun the NI self-test, if necessary.			
16	10	Network address ROM error: read access failed.	System logic module
18	12	Network address ROM error: null address.	System logic module
20	14	Network address ROM error: bad group address.	System logic module
22	16	Network address ROM error: bad checksum.	System logic module
24	18	Network address ROM error: bad group 2.	System logic module

(continued on next page)

Self-Test Error Descriptions

Table C–10 (Cont.) NI Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
26	1A	Network address ROM error: bad group 3.	System logic module
28	1C	Network address ROM error: bad test patterns.	System logic module
30	1E	SGEC CSR0 read/write error.	System logic module
32	20	SGEC CSR0 read/write error.	System logic module
34	22	SGEC CSR0 read/write error.	System logic module
36	24	SGEC CSR0 read/write error.	System logic module
38	26	SGEC CSR0 read/write error.	System logic module
40	28	SGEC CSR0 read/write error.	System logic module
42	2A	SGEC CSR0 read/write error.	System logic module
44	2C	SGEC CSR0 read/write error.	System logic module
46	2E	SGEC CSR0 read/write error.	System logic module
48	30	SGEC CSR0 read/write error.	System logic module
50	32	SGEC CSR0 read/write error.	System logic module
52	34	SGEC CSR0 read/write error.	System logic module
54	36	SGEC CSR0 read/write error.	System logic module
56	38	SGEC CSR0 read/write error.	System logic module
58	3A	SGEC CSR0 read/write error.	System logic module
60	3C	SGEC CSR0 read/write error.	System logic module
62	3E	SGEC chip self-test: ROM error.	System logic module
64	40	SGEC chip self-test: RAM error.	System logic module
66	42	SGEC chip self-test: address filter RAM error.	System logic module
68	44	SGEC chip self-test: transmit FIFO error.	System logic module
70	46	SGEC chip self-test: receive FIFO error.	System logic module
72	48	SGEC chip self-test: self-test loopback error.	NI module

(continued on next page)

Table C–10 (Cont.) NI Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
74	4A	SGEC initialization: setup frame send failure.	System logic module
76	4C	SGEC interrupts: initialization failed.	System logic module
78	4E	SGEC interrupts: transmit failed.	System logic module
80	50	SGEC interrupts: receive failed.	System logic module
82	52	SGEC interrupts: packet comparison failed.	System logic module
84	54	SGEC interrupts: NI ISR not entered.	System logic module
86	56	SGEC interrupts: NI ISR entered multiple times.	System logic module
88	58	SGEC CRC: initialization failed.	System logic module
90	5A	SGEC CRC: transmit failed.	System logic module
92	5C	SGEC CRC: receive failed.	System logic module
94	5E	SGEC CRC: packet comparison failed.	System logic module
96	60	SGEC CRC: SGEC generated bad CRC.	System logic module
98	62	SGEC CRC: SGEC rejected good CRC.	System logic module
100	64	SGEC CRC: SGEC accepted bad CRC.	System logic module
102	66	SGEC CRC: other error.	System logic module
104	68	SGEC collision: initialization failed.	System logic module
106	6A	SGEC collision: unknown transmit error.	System logic module
108	6C	SGEC collision: RETRY not flagged.	System logic module
110	6E	SGEC collision: transmitter disabled.	System logic module

(continued on next page)

Table C–10 (Cont.) NI Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
112	70	SGEC address filtering: initialization failed.	System logic module
114	72	SGEC address filtering: transmit failed.	System logic module
116	74	SGEC address filtering: receive failed.	System logic module
118	76	SGEC address filtering: packet comparison failed.	System logic module
120	78	SGEC address filtering: broadcast filtering failed.	System logic module
122	7A	SGEC address filtering: promiscuous mode failed.	System logic module
124	7C	SGEC address filtering: null destination accepted.	System logic module
126	7E	SGEC address filtering: good logical address rejected.	System logic module
128	80	SGEC external loopback: initialization failed.	NI module
130	82	SGEC external loopback: packet comparison failed.	NI module
132	84	SGEC external loopback: check NI port connector.	NI module

Table C–11 Printer Port Self-Test Error Codes

Error (Decimal)	Error (Hex.)	Meaning	Replace
32	20	Data path error.	System logic module
48	30	Control signal path error.	System logic module
64	40	Interrupt signal path error.	System logic module
128	80	No memory available for data area.	System logic module

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