

EK-VT330-PS-002

VT330

Pocket Service Guide

**Prepared by Educational Services
of
Digital Equipment Corporation**

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DECUS	RSTS	VT330, VT340
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CONTENTS

ABOUT THIS GUIDE

Warnings, Cautions, and Notes	vii
VT330 Video Terminal.	viii
Tools and Equipment	ix
Recommended Spares List	ix

1 TESTING AND TROUBLESHOOTING

1.1	General.	1
1.2	Using Self-Tests	1
1.3	Power-Up Self-Test.	1
1.4	Diagnostic Set-Up	3
1.5	Diagnostic Self-Tests.	5
1.5.1	Loopback Tests	5
1.5.2	Power-Up Test	8
1.5.3	Screen Tests	8
1.6	Printer Problems	8
1.7	Self-Test Error Codes	10
1.7.1	NVR Error — 1 Code.	11
1.8	Troubleshooting General Problems.	13

2 REMOVING AND REPLACING FRUs

2.1	General.	16
2.2	Rear Panel	16
2.3	ROM Cartridge.	17
2.4	Rear Enclosure/Base Assembly	18
2.5	CPU Module	20
2.6	Bitmap Module.	21
2.7	Discharging the CRT.	22
2.8	Video Amp Module.	24
2.9	Power Supply/Monitor Module.	26
2.10	AC Inlet/Switch Assembly	32
2.11	Control/Bracket Assembly (Brightness and Contrast)	34
2.12	LED Assembly (Power Indicator)	36
2.13	CRT/Bezel/Chassis Assembly	38
2.14	CRT Disposal (Digital Field Service Only)	39
2.15	Keyboard	43
2.16	Mouse or Tablet (Options)	46

iv CONTENTS

3 ALIGNING THE VIDEO MONITOR

3.1	General	48
3.2	Monitor Adjustments	49
3.2.1	Before You Start	51
3.2.2	Displaying Screen Tests	51
3.2.3	Sub-Brightness and Sub-Contrast	52
3.2.4	Display Size	55
3.2.4.1	Rotation	55
3.2.4.2	Horizontal Centering	57
3.2.4.3	Horizontal Width	58
3.2.4.4	Vertical Height	60
3.2.5	Character Quality	61
3.2.5.1	Linearity	61
3.2.5.2	Focus	63
3.2.6	Viewer Preference	65

4 USING SET-UP

4.1	General	67
4.2	What is Set-Up?	67
4.2.1	Dual Sessions	67
4.3	Entering and Leaving Set-Up	68
4.4	Selecting a Set-Up Screen	68
4.5	Selecting Set-Up Features	69
4.6	Saving Set-Up Values	69
4.7	Recalling Set-Up Values	70

A VT330/VT340 DOCUMENTATION

B TROUBLESHOOTING THE SESSION SUPPORT UTILITY

C FRU EXPLODED VIEW DRAWINGS

D CABLES

E PHYSICAL/FUNCTIONAL DIAGRAM

FIGURES

1-1	Successful Power-Up Self-Test Display	2
1-2	Diagnostic Set-Up	3
1-3	VT330 Ports and Loopback Connectors	6
3-1	Video Adjustments Controls.	49
4-1	Set-Up Directory	68
C-1	VT330 FRUs (External View)	78
C-2	VT330 FRUs (Internal View)	79
D-1	VT330 Cable Connections	80
E-1	Physical/Functional Diagram	83

TABLES

1-1	VT330 Display Error Codes	12
1-2	VT330 Troubleshooting Chart.	13
D-1	Interface Cables	81

ABOUT THIS GUIDE

This guide describes how to service the VT330 monochrome video terminal in the field. The guide covers the following topics.

Testing and troubleshooting
the field replaceable units (FRUs)
Removing and replacing FRUs
Aligning the video monitor
Using set-up

Appendices provide information on the following topics.

Related documentation
Troubleshooting the Session Support Utility
FRU exploded view diagrams
Cables
Physical/functional diagram

WARNINGS, CAUTIONS, AND NOTES

The warnings, cautions, and notes in this guide have specific purposes.

WARNING Contains information to prevent personal injury.

CAUTION Contains information to prevent damage to equipment.

NOTE Contains general information you should be aware of.

VT330 VIDEO TERMINAL

The VT330 is a monochrome text and graphics video terminal that is compatible with the VT220. The VT330 supports different versions of Digital's LK201 corporate keyboard, for different languages.

The VT330 uses a two-plane bitmap to display graphics in four shades of gray. The monitor has a 357.5 mm (14 inch) antiglare screen. The VT330 can display 24 rows of text in 80 or 132 columns. The twenty-fifth display line is a status line. The terminal's built-in tilt-swivel base lets the user adjust the screen for viewing comfort.

The VT330 has five interface connectors.

Connector	Connects the VT330 to...
Comm1 RS232 (25-pin)	A primary host computer, directly or indirectly (through a terminal server or modem).
Comm1 DEC-423 (6-pin)	A primary host computer, directly or indirectly (through a terminal server).
Comm2 DEC-423 (6-pin)	A secondary host computer, directly or indirectly (through a terminal server).
Printer DEC-423 (6-pin)	A printer.
Mouse/tablet (7-pin micro-DIN)	A mouse or graphics tablet.

The VT330 operates on full-duplex, asynchronous communication lines.

TOOLS AND EQUIPMENT

You need the following tools and equipment to service the VT330 video terminal.

Tools and Equipment	Part Number
Phillips screwdriver, number 2	29-13510-00
Anode discharge tool	29-24717-00
Video alignment tool	29-24746-00
Tuning wand	29-23190-00
Metric measuring tape	29-25342-00
Loopback connectors	
Host EIA (25-pin)	12-15336-00
Modular jack (6-pin)	12-25083-01
Micro-DIN (7-pin)	12-25628-01

RECOMMENDED SPARES LIST

The following is the recommended spares list for the VT330.

Spares	Part Number
CPU module	54-16909-01
Graphics bitmap module	54-16903-01
Power supply/monitor module	54-16905-01
Video amp module	54-16907-01
Control/bracket assembly	70-22618-01
CRT/bezel/chassis assembly	
white phosphor	70-22617-01
green phosphor	70-22617-02
amber phosphor)	70-22617-03
Inlet/switch assembly	70-22620-01
LED assembly	70-20773-01
Rear enclosure/base assembly	70-22622-01
ROM cartridge assembly	70-22623-04
Rear panel	74-32389-01

x ABOUT THIS GUIDE

Spares	Part Number
Keyboards	
North American/U.K.	LK201-NA
North American/U.K. (WPS)	LK201-PA
Belgian	LK201-LB
Danish	LK201-RD
Dutch	LK201-LH
Finnish	LK201-NF
French	LK201-LP
French Canadian	LK201-LC
German/Austrian	LK201-LG
Italian	LK201-LI
Norwegian	LK201-RN
Portuguese	LK201-LV
Spanish	LK201-LS
Swedish	LK201-LM
Swiss (French)	LK201-LK
Swiss (German)	LK201-LL
Options	
Mouse	VSXXX-AA
Graphics tablet	VSXXX-AB

1 TESTING AND TROUBLESHOOTING

1.1 GENERAL

This chapter describes how to run the self-tests built into the VT330 video terminal. The chapter also lists error codes for the tests and describes how to troubleshoot general problems.

1.2 USING SELF-TESTS

The VT330 has seven self-tests to help you isolate failures to the terminal's field replaceable units (FRUs). You run these tests from the terminal's Diagnostic Set-Up screen (Paragraph 1.4). The power-up self-test also runs each time you turn the terminal on.

If a test finds a faulty FRU, adjust or replace the faulty unit. Then repeat the tests in this chapter, to ensure the terminal operates correctly. Appendix C shows each FRU.

1.3 POWER-UP SELF-TEST

This test runs automatically each time you turn the terminal on. The test checks the terminal's internal memory, keyboard, and video circuitry. The test also makes sure the communication ports, printer port, and locator device port are operating correctly. The loopback self-tests on the Diagnostic Set-Up screen perform a more complete test of each port.

2 TESTING AND TROUBLESHOOTING

A successful power-up self-test ends as follows (Figure 1-1).

1. The keyboard's LED indicators are off.
2. The keyboard makes the bell tone sound.
3. A "VT330 OK" message appears in a rectangle on the screen, With the firmware revision level and a set-up screen copyright message. This message disappears when
 - the terminal receives any character except XON, XOFF, or NULL.
 - you press any key.
 - you leave the terminal on but inactive for 30 minutes.



MA-0482-06

Figure 1-1 Successful Power-Up Self-Test Display

If the Test Finds an Error

First look at the screen. The terminal will display one or more error messages. Each error message starts on a new line at the left margin of the display. Paragraph 1.7 describes the error messages.

If the screen display is faulty, check the keyboard LED indicators. They also display the error code.

If other problems occur, see Paragraph 1.8. It lists some common operating problems, their probable causes, and suggested solutions.

1.4 DIAGNOSTIC SET-UP

You use the Diagnostic Set-Up screen (Figure 1-2) to run one or more of the terminal's seven self-tests. Paragraph 1.5 describes each test.

You can run the five loopback tests and the power-up test in any combination. Each test runs until it is complete, or until the terminal detects an error. You must run the screen tests separately from the loopback tests and power-up test.

NOTE

If you are unfamiliar with the terminal's set-up screens, see Chapter 4.

DIAGNOSTIC SET-UP		VT330 Version V2.1
Feature	Current Setting	
Comm1 External Loopback (25)	disabled	
Comm1 External Loopback (6)	disabled	
Comm2 External Loopback (6)	disabled	
Printer External Loopback	disabled	
Locator External Loopback	disabled	
Power-Up Test	disabled	
Run Tests	Repeat Tests	
Run Screen Tests		
Use up/down arrow keys to select feature, right/left arrow keys to change current setting. To return to the Set-Up Directory, press SELECT key. Copyright © 1988, Digital Equipment Corporation - All Rights Reserved Terminal: (01, 01) Overstrike Mode Printer: None		

MA 0321-00

Figure 1-2 Diagnostic Set-Up Screen

The top half of the Diagnostic Set-Up screen has two columns.

Feature Current Setting

Feature Column

This column lists the individual loopback tests and the power-up test.

Current Setting Column

This column shows you if a test is enabled or disabled. You must enable a test before you can run it. Initially, all tests are disabled.

4 TESTING AND TROUBLESHOOTING

How to Change a Test's Current Setting

Use the **↑** and **↓** keys to move the cursor to the selected test in the feature column. Use the **←** and **→** keys or **Enter** key to change the test's current setting (enabled or disabled).

How to Run a Self-Test

You can run one or more self-tests as follows. You can run the tests one time or repeatedly. Before you run a loopback test, you must connect a loopback connector to the selected port (Paragraph 1.5.1). To run the screen tests, see Chapter 3.

1. Press **Set-Up**. The **Set-Up Directory** appears.
2. Use the arrow keys to move the cursor to **Diagnostic Set-Up**. Press **Enter** to display the **Diagnostic Set-Up** screen.
3. Use the arrow keys to enable each test you want to run.
4. Use the arrow keys to move the cursor to **Run Tests** or **Repeat Tests**.

Run Tests performs each enabled test one time.

Repeat Tests performs each enabled test continuously.

5. Press **Enter** to start the self-tests.

NOTE

The continuously running test ends when an error occurs or when you turn off the power. The keyboard does not make a bell tone sound during a continuously running test.

1.5 DIAGNOSTIC SELF-TESTS

You can select seven different self-tests from the Diagnostic Set-Up screen. The first five tests are loopback tests that check the terminal's three communication ports, the printer port, and the locator device port.

The sixth test is the power-up self-test. The last test is a set of screen patterns that field service personnel use to adjust the video display (Chapter 3).

1.5.1 Loopback Tests

All five loopback tests work the same way. You plug a loopback connector into the port you want to test. The loopback connector connects the port's transmit and receive data lines.

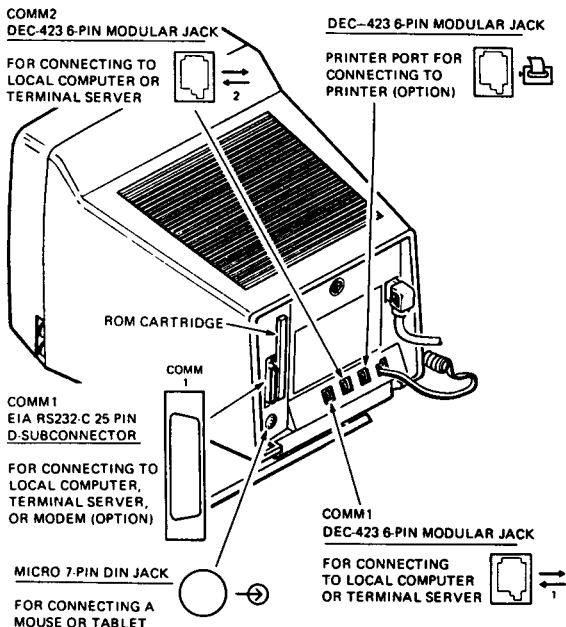
When you run the test, the terminal sends a predefined set of characters on its transmit line and receives them on its receive line. Then the terminal compares the output characters to the input characters. If the characters do not match, an error message appears on the screen.

You must use a loopback connector, or the test will fail. Use the following loopback connectors.

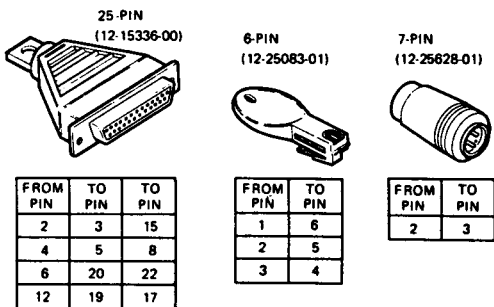
Loopback Connector	Part Number
Host EIA port (25-pin)	12-15336-00
Modular jack (6-pin)	12-25083-01
Micro-DIN (7-pin)	12-25628-01

Figure 1-3 shows the five VT330 ports and the three loopback connectors. Note that the VT330 has two Comm1 connectors.

6 TESTING AND TROUBLESHOOTING



LOOPBACK CONNECTORS



MA 0622 06

Figure 1-3 VT330 Ports and Loopback Connectors

How to Run a Loopback Test

1. Turn the terminal off (0).
2. Disconnect the cable from the port you are testing.
3. Connect the appropriate loopback connector to the port.

Test	Loopback Connector
Comm1 (25-pin)	12-15336-00
Comm1 (6-pin)	12-25083-01
Comm2 (6-pin)	12-25083-01
Printer (6-pin)	12-25083-01
Locator (7-pin)	12-25628-01

4. Turn the terminal on (1).
5. Use the Diagnostic Set-Up screen to run the test.

A successful test ends as follows.

1. The keyboard's LED indicators are off.
2. The keyboard makes a bell tone sound.
3. A "VT330 OK" message appears on the screen.

If the Test Finds an Error

Your screen may display one of the following messages. See Paragraph 1.7 for details.

Comm1 25-pin test

VT330 Comm1 Port Data Error -- 2

VT330 Comm1 Port Control Error -- 3

Comm1 6-pin test

VT330 Comm1 DEC-423 Data Error -- 5

Comm2 6-pin test

VT330 Comm2 DEC-423 Data Error -- 6

Printer 6-pin test

VT330 Printer Port Error -- 7

Locator 7-pin test

VT330 Locator Port Error -- 8

8 TESTING AND TROUBLESHOOTING

1.5.2 Power-Up Test

This test is the same as the power-up self-test described in Paragraph 1.3. If you use Repeat Tests to run this test, the test runs continuously until an error occurs or until you turn off the power.

1.5.3 Screen Tests

These tests are a series of calibration and alignment displays. You use these patterns to adjust the display height, width, and linearity. You do not need a loopback connector for these tests.

See Chapter 3 for the procedures used with these tests.

1.6 PRINTER PROBLEMS

If a printer connected to a VT330 does not print, use the following steps to isolate the problem to the printer or terminal.

1. Run the power-up self-test (Paragraph 1.3). If the terminal passes the test, go to step 2.
2. Run the printer external loopback self-test (Paragraph 1.5.1). If the terminal passes this test, go to step 3.

NOTE

If your terminal passes the above tests, it is running correctly. The problem is probably not in the terminal.

3. Test the printer. See your printer's pocket service guide for the correct procedures. If your printer is operating correctly, go to step 4.
4. Check the following set-up features to make sure your terminal and your printer are compatible. If you are unfamiliar with the terminal's set-up screens, see Chapter 4.

- Check the **Printer Assignment** feature in the **Global Set-Up** screen. Make sure the printer is assigned to the session you are in. If the printer is assigned to the other session, the printer will not print from your session.
- Check the printer's status on the status line in set-up.

Printer Status	Meaning
Ready	The printer is available to print.
Not Ready	The printer port is not available to print.
None	The printer is turned off or not connected to the printer port.
Auto Print	When you or the host end a line with a carriage return, the terminal sends the line to the printer.
Controller	Information from the host goes directly to the printer.
Busy	The printer port is performing another operation (such as Local Print).
Not Assigned	The printer port is not assigned to the active session.

- Check the following features in the **Printer Set-Up** screen. The settings for the printer and terminal must match.

Print speed (75 to 19.2K baud)

Character format (8- or 7-bit; even, odd, or no parity)

Stop bits (1 or 2)

Flow control (XON/XOFF, DSR/DTR)

10 TESTING AND TROUBLESHOOTING

5. Make sure you are using the correct cable between your terminal and printer (Appendix D). Make sure the connections are secure at both ends of the cable.
6. Put your terminal in the local state by using the On Line/Local feature in the Global Set-Up screen. Then leave set-up and type some characters on the screen.
7. Press the Local Print key. The data on your screen should print out if the printer is operating correctly. If the data does not print out, go back to step 3.

1.7 SELF-TEST ERROR CODES

If your screen displays an error message, see Table 1-1. It lists the field replaceable unit (FRU) you must replace to correct the problem.

If your VT330 fails the power-up self-test, see the troubleshooting chart, Table 1-2.

If there is a problem with the screen display, check the keyboard's LED indicators. The LED indicators always display the error code for the test currently running. This test must run successfully before your terminal clears the LED error code.

If the LEDs flash the same pattern repeatedly, or do not turn on at all, replace the CPU module (Paragraph 2.5). If the LEDs flash an alternating pattern, replace the bitmap module (Paragraph 2.6).

See Table 1-2 for other troubleshooting procedures.

1.7.1 NVR Error — 1 Code

If a "VT330 NVR Error — 1" message appears when you turn on VT330, there is a problem with the terminal's nonvolatile memory (NVR) that stores the factory-default set-up settings. You can save the factory-default settings in NVR as follows. This procedure applies to single or dual sessions.

1. Press **Set-Up**. The **Set-Up Directory** appears.
2. Move the cursor to **Recall Factory Default Settings** and press **Enter**.
3. Move the cursor to **Save Current Settings** and press **Enter**.
4. Move the cursor to **User-Defined Key Set-Up** and press **Enter**. The **User-Defined Key Set-Up** screen appears.
5. Move the cursor to **Save User-Defined Keys** and press **Enter**.
6. Press **Select** to return to the **Set-Up Directory**.
7. Press **Next Screen** to display the **Global Set-Up** screen.
8. Move the cursor to **Dual Terminal** and press **Enter** to enable the dual sessions feature.
9. Press **Set-Up** to leave set-up.
10. Press **Switch Session (F4)** to move to the second session.
11. Press **Set-Up** to display the **Set-Up Directory** again.
12. Move the cursor to **Recall Factory Default Settings** and press **Enter**.
13. Move the cursor to **Save Current Settings** and press **Enter**.
14. Press **Set-Up** to leave set-up.
15. Turn the terminal off, then on. If the "VT330 NVR Error — 1" message still appears on the screen, the terminal has a hardware failure. See Table 1-1.

12 TESTING AND TROUBLESHOOTING

Table 1-1 VT330 Display Error Codes

Error Message*	Solution†
NVR Error — 1	<ol style="list-style-type: none">1. Recover from the NVR (1.7.1).2. Replace the CPU module (2.5).
Comm1 Port Data Error — 2	Replace the CPU module (2.5).
Comm1 Port Control Error — 3	Replace the CPU module (2.5).
Keyboard Error — 4	<ol style="list-style-type: none">1. See if the keyboard is plugged in.2. Turn the VT330 off, then on.3. If the error continues, replace the keyboard (2.15).4. If the error still continues, replace the power supply/monitor module (2.9).5. If the error still continues, replace the CPU module (2.5).
Comm1 DEC-423 Data Error — 5	<ol style="list-style-type: none">1. Replace the power supply/monitor module (2.9).2. If the error continues, replace the CPU module (2.5).
Comm2 DEC-423 Data Error — 6	<ol style="list-style-type: none">1. Replace the power supply/monitor module (2.9).2. If the error continues, replace the CPU module (2.5).
Printer Port Error — 7	<ol style="list-style-type: none">1. Replace the power supply/monitor module (2.9).2. If the error continues, replace the CPU module (2.5).
Locator Port Error — 8	<ol style="list-style-type: none">1. See if the mouse/tablet is plugged in.2. Turn the VT330 off, then on.3. If the error continues, replace the mouse/tablet.4. If the error still continues, replace the CPU module (2.5).

* All error messages start with "VT330".

† Paragraph numbers are in bold type.

1.8 TROUBLESHOOTING GENERAL PROBLEMS

Table 1-2 lists some common operating problems, their probable causes, and suggested solutions.

Table 1-2 VT330 Troubleshooting Chart

Symptom	Probable Cause	Suggested Solution*
No VT330 OK display, power indicator off, no bell tone.	VT330 not plugged in, or no power at wall outlet.	Plug in the VT330, or try another wall outlet.
	AC power cord	Check for an open line or shorts.
	Voltage select jumper on wrong pin.	Check that the voltage select jumper is configured correctly on the power supply/monitor module.
	Inlet/switch assembly	Check the connections on the power supply/monitor module.
Power indicator flashes.	Power supply/monitor module	Replace the power supply/monitor module (2.9).
	ROM cartridge	Check that the ROM cartridge is installed.
Keyboard LEDs flash the same pattern repeatedly.	CPU module	Replace the CPU module (2.5).
	CPU module	Replace the CPU module (2.5).
Keyboard LEDs flash in an alternating pattern.	Bitmap module	Replace the bitmap module (2.6).
Keyboard LEDs stay on.	CPU module	Replace the CPU module (2.5).
Compressed raster, no video.	Video cable connections	Check the connections from the power supply/monitor module to the CRT yoke.

* Paragraph numbers are in bold type.

14 TESTING AND TROUBLESHOOTING

Table 1-2 VT330 Troubleshooting Chart (Cont)

Symptom	Probable Cause	Suggested Solution*
Raster, no video.	Video amp module	Check connectors and reconnect.
		Check the CRT socket connection.
		Replace the video amp module (2.8)
CRT filaments not lit.	CRT/bezel/chassis assembly	Check the CRT socket connection.
		Replace the CRT/bezel/chassis assembly (2.13).
VT330 OK display present, power indicator off.	LED assembly	Check the connection to the power supply/monitor module.
		Replace the LED assembly (2.12).
Screen display distorted.	Monitor is out of alignment.	Perform the alignment procedures (Chapter 3).
	Monitor circuit	Replace the power supply/monitor module (2.9).
	CPU module	Replace the CPU module (2.5).
Screen display distorted.	CRT/bezel/chassis	Replace the CRT/bezel/chassis (2.13)
No bell tone.	Warning bell is disabled.	Set Warning Bell to "high" or "low" in Keyboard Set-Up .
	Keyboard speaker faulty.	Replace the keyboard (2.15).
Different characters appear on screen than were typed in local.	Alternate character set selected.	Use Recall Saved Settings in the Set-Up Directory .
	Keyboard	Replace the keyboard (2.15).
	CPU module	Replace the CPU module (2.5).

* Paragraph numbers are in bold type.

Table 1-2 VT330 Troubleshooting Chart (Cont)

Symptom	Probable Cause	Suggested Solution*
Different characters appear on screen than were typed while on-line with host. (Terminal works in local).	Transmit and receive speeds are set wrong.	Set speeds to match host (Communications Set-Up).
	Bits per character or parity setting is wrong.	Set Character Format to match host (Communications Set-Up).
	Stop Bits setting is wrong.	Set Stop Bits to match host (Communications Set-Up).
Screen display does not scroll. Hold Session indicator is on.	Screen display is locked.	Press the Hold Session key to release.
Terminal appears locked, does not respond to data from host.	—	Clear the terminal with the Clear Communications field in the Set-Up Directory.
Screen goes blank after successful power-up, then is inactive for one-half hour. Power indicator is on.	CRT Saver feature in Global Set-Up is enabled.	Press any key to reactivate screen.
Messages are incomplete.	XON/XOFF not selected.	Set Transmit Flow Control to "XON/XOFF" (Communications Set-Up).
	Comm port connections	Check cables at comm ports.
	CPU module	Replace the CPU module (2.5).
Terminal does not respond to an escape sequence.	Incorrect Terminal Mode selected.	Check the setting of the Terminal Mode feature in General Set-Up.

* Paragraph numbers are in bold type.

2 REMOVING AND REPLACING FRUs

2.1 GENERAL

This chapter shows you how to remove and replace VT330 field replaceable units (FRUs). Appendix C contains exploded view drawings that provide the location, part name, and part number of each FRU.

CAUTION

Use a static protection kit (PN 29-11762-00) when handling any internal components.

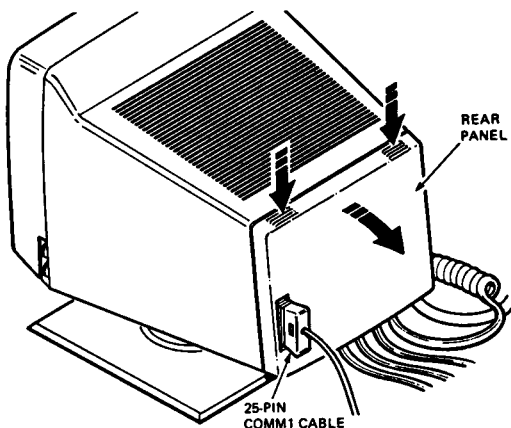
2.2 REAR PANEL

Remove the rear panel as follows.

1. Grasp the top of the rear panel and pull toward you.
2. If there is a cable connected to the 25-pin Comm1 port, slide the panel down the cable and away from the terminal.

Otherwise, lower the panel and remove from the terminal. Set the panel aside.

To install the rear panel, reverse steps 1 and 2.

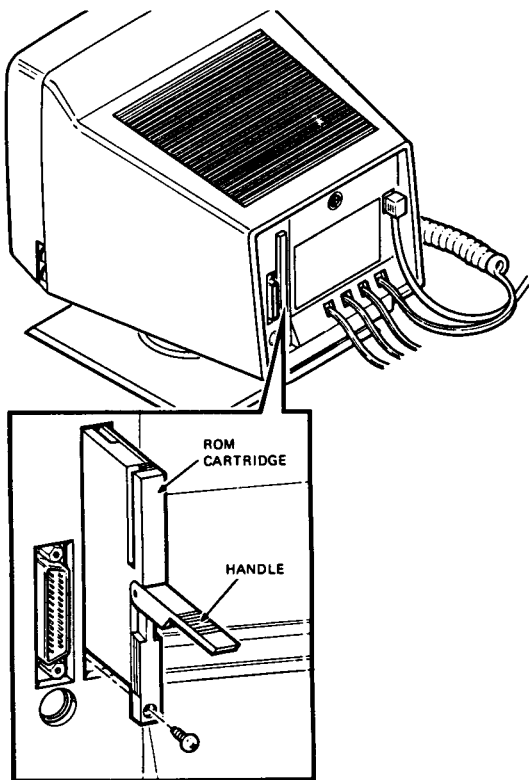


2.3 ROM CARTRIDGE

Remove the ROM cartridge as follows. First remove the following FRU.

Rear panel (Paragraph 2.2)

1. Turn the terminal's power switch off (0).
2. Lift the handle on the ROM cartridge.
3. Remove the phillips screw on the bottom of the ROM cartridge. This screw holds the ROM cartridge to the CPU module.
4. To remove the ROM cartridge, grasp the handle and pull firmly.



MA. 0494-06

To install the ROM cartridge, reverse steps 1 through 4.

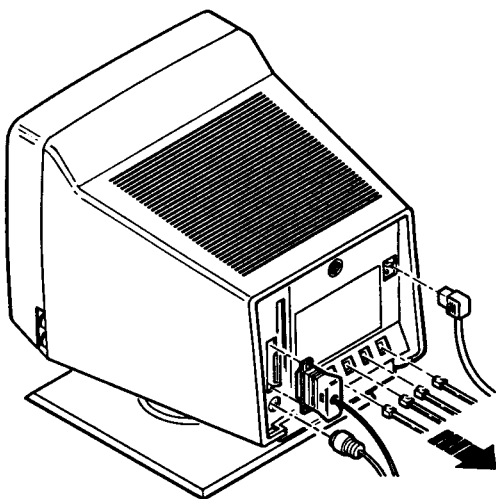
18 REMOVING AND REPLACING FRUs

2.4 REAR ENCLOSURE/BASE ASSEMBLY

Remove the rear enclosure/base assembly as follows. First remove the following FRU.

Rear panel (Paragraph 2.2)

1. Unplug the power cord from the wall outlet first, then from the terminal.
2. Disconnect the keyboard cable from the terminal.
3. Disconnect all other cables from the rear of the terminal, including the following.
 - host port cable(s)
 - printer cable
 - locator device cable



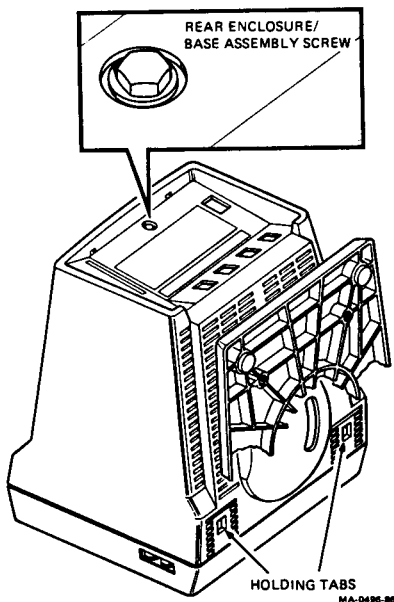
MA-0495-05

4. Place a piece of paper on a flat working surface. Carefully place the monitor facedown on the paper. The paper prevents scratches on the monitor bezel.

NOTE

You must clean the face of the CRT after you service the terminal.

5. Use a 5/16 inch nutdriver to loosen the captive screw on the rear panel. This screw holds the rear enclosure/base assembly to the chassis.



WARNING

The next step exposes you to the CRT anode, which stores a high voltage. Use caution while the rear enclosure is off the terminal.

6. Remove the rear enclosure/base assembly by pressing the two holding tabs in and sliding the cover straight up.

To install the rear enclosure/base assembly, reverse steps 1 through 6.

CAUTION

When you install the rear enclosure/base assembly, carefully align the screw hole and holding tabs.

20 REMOVING AND REPLACING FRUs

2.5 CPU MODULE

The CPU module is connected to the bitmap module. Remove the CPU module as follows. First remove the following FRUs.

Rear panel (Paragraph 2.2).

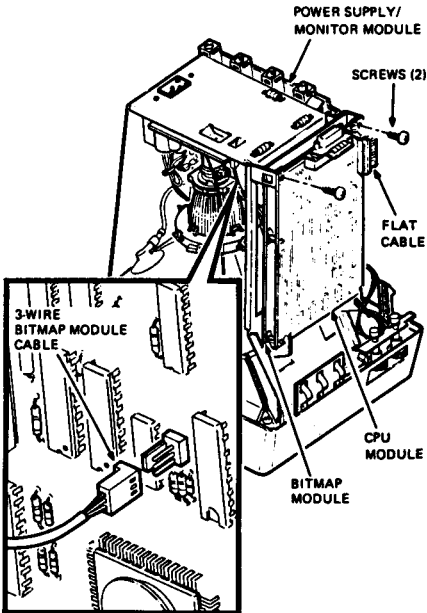
ROM cartridge (Paragraph 2.3).

Rear enclosure/base assembly (Paragraph 2.4).

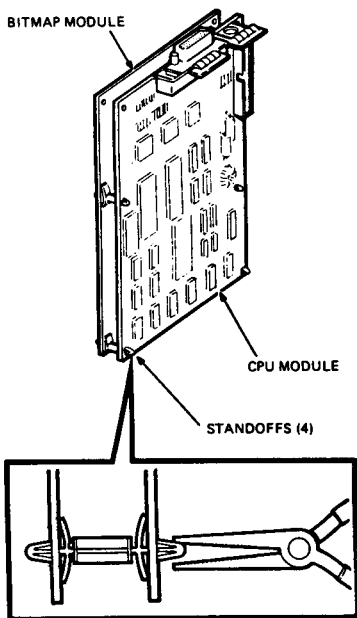
CAUTION

Use a static protection kit (PN 29-11762-00) when handling any internal components.

1. Disconnect the flat cable on the CPU module. This cable goes to the power supply/monitor module.
2. Disconnect the 3-wire cable on the bitmap module by pressing the tab under the connector. This cable goes to the video amp module.



3. Remove the two screws that hold the CPU module and bitmap module to the chassis.
4. Slide the two modules to the right and gently pull them toward you.
5. Release the CPU module from the four standoffs by lifting the module and squeezing the standoffs with needlenose pliers.



MA-0498-02

6. Separate the CPU module from the bitmap module by pulling the modules apart. Save the bitmap module and standoffs.

To install the CPU module, reverse steps 1 through 6.

2.6 BITMAP MODULE

To remove the bitmap module, use the same procedure as the CPU module (Paragraph 2.5). Save the CPU module and standoffs.

22 REMOVING AND REPLACING FRUs

2.7 DISCHARGING THE CRT

Discharge the CRT as follows. First remove the following FRUs.

WARNING

The following steps expose you to the CRT anode, which may store a high voltage.

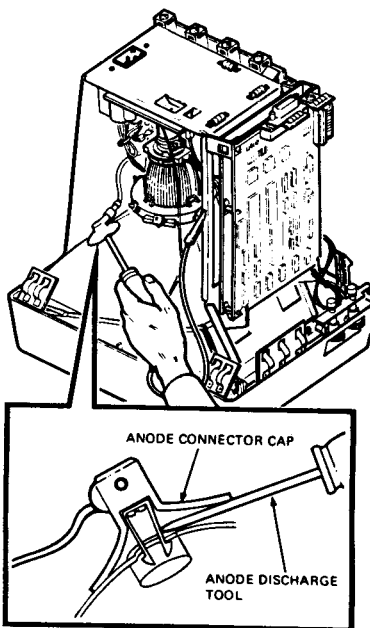
Rear panel (Paragraph 2.2).

Rear enclosure/base assembly (Paragraph 2.4).

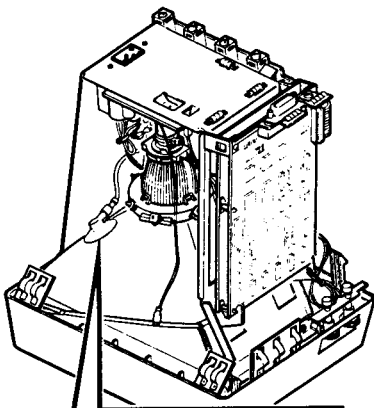
1. Attach the clip end of the anode discharge tool (PN 29-24717-00) to the metal chassis.
2. Push the probe end under the soft plastic anode connector cap, until you feel the probe touching the anode connector.

CAUTION

Do not scratch the glass of the CRT when discharging the anode.



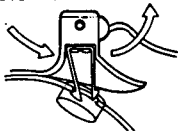
3. Hold the probe against the anode connector for at least 3 seconds, then remove the probe.
4. Remove the CRT anode connector from the CRT, as shown.



A. PUSH IN THE DIRECTION OF THE ARROW



B. WHEN ONE BARB IS FREE PUSH IN THE OPPOSITE DIRECTION (SEE ARROWS) TO REMOVE ANODE CAP



24 REMOVING AND REPLACING FRUs

2.8 VIDEO AMP MODULE

Remove the video amp module as follows. First remove the following FRUs.

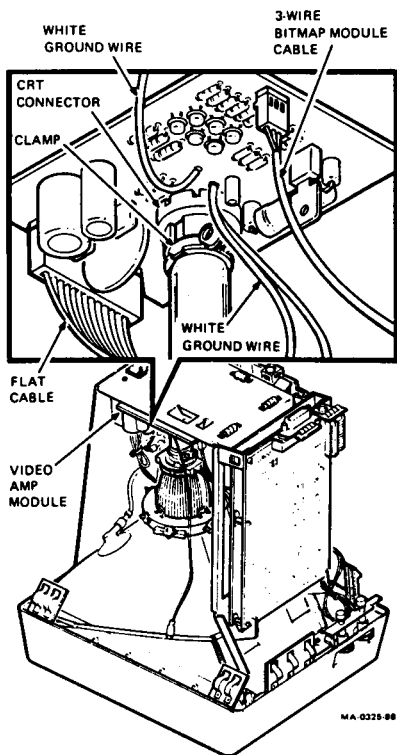
Rear panel (Paragraph 2.2).

Rear enclosure/base assembly (Paragraph 2.4).

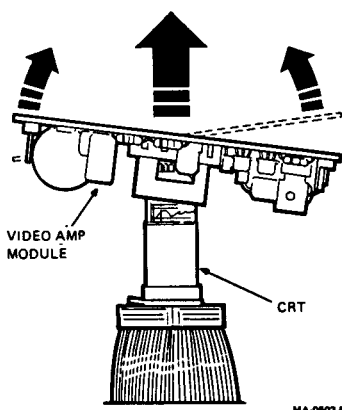
WARNING

You must discharge the CRT (Paragraph 2.7) before removing the video amp module.

1. Disconnect the following cables on the video amp module.
 - 3-wire cable to the bitmap module (To remove, press the tab under the connector.)
 - white ground wires to the chassis



2. Loosen the phillips screw on the clamp that holds the CRT connector. The connector sits on the neck of the CRT.
3. Disconnect the flat cable on the video amp module. This cable goes to the power supply/monitor module.
4. Carefully lift the module off the CRT by using a gentle side-to-side rocking motion.



MA-0502-86

To install the video amp module, reverse steps 1 through 4.

NOTE

When you install the video amp module on the CRT, make sure the socket aligns with the CRT pins. Press the socket firmly on the CRT, but take care not to bend the CRT pins.

CAUTION

When you tighten the clamp on the CRT connector, first take up the slack on the clamp. Then tighten $3/4$ of a turn. Do not overtighten, or you may crack the neck of the CRT.

26 REMOVING AND REPLACING FRUs

2.9 POWER SUPPLY/MONITOR MODULE

Remove the power supply/monitor module as follows. First remove the following FRUs.

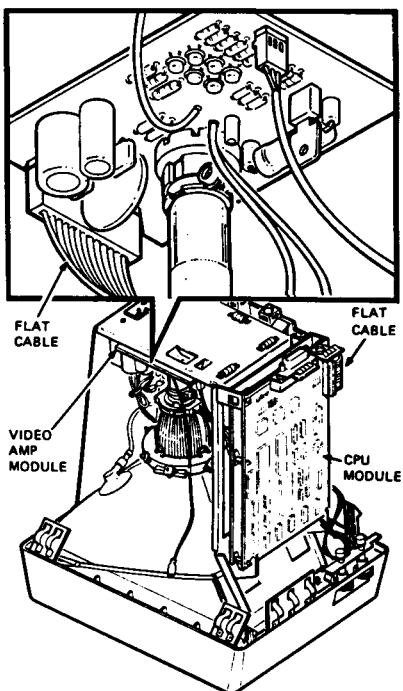
Rear panel (Paragraph 2.2).

Rear enclosure/base assembly (Paragraph 2.4).

WARNING

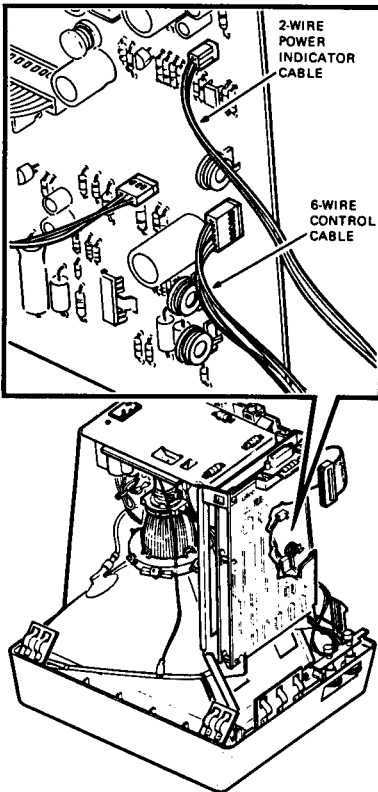
You must discharge the CRT (Paragraph 2.7) before removing the power supply/monitor module.

1. Disconnect the flat cable on the CPU module. This cable goes to the power/supply monitor module.
2. Disconnect the flat cable on the video amp module. This cable goes to the power/supply monitor module.



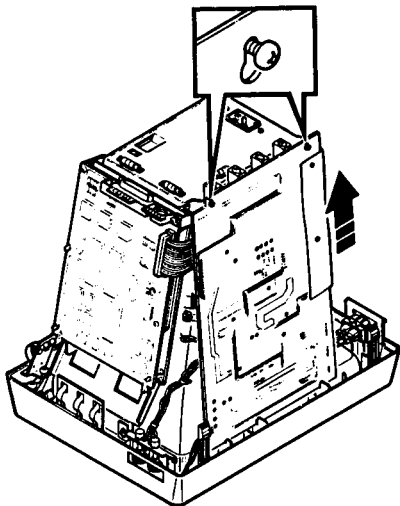
3. Disconnect the following cables on the power supply/monitor module. To disconnect a cable, press the tab under the cable connector.

- 2-wire cable to the power indicator
- 6-wire cable to the control/bracket assembly



28 · REMOVING AND REPLACING FRUs

4. Loosen the two phillips screws that hold the power supply/monitor module to the chassis.
5. Gently slide the module up and off the screws.

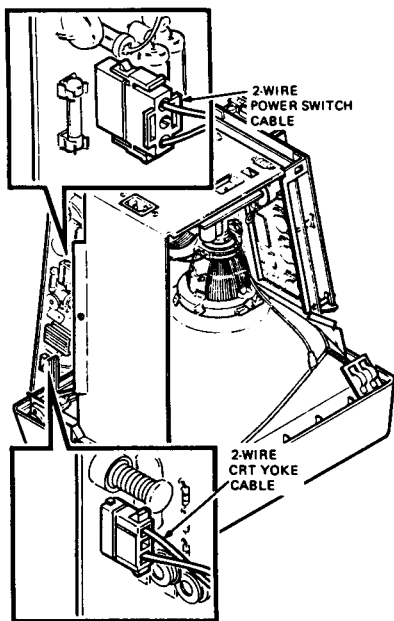


MA 0320-00

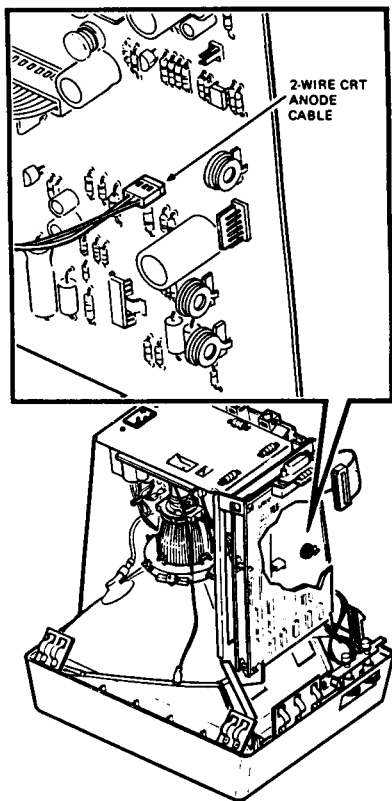
6. Carefully move the power supply/monitor module away from the chassis, so you can see the remaining connectors.

7. Disconnect the following cables on the power supply/monitor module.

- 2-wire cable to the power switch
- 2-wire cable to the CRT anode
- 2-wire cable to the CRT yoke



30 REMOVING AND REPLACING FRUs

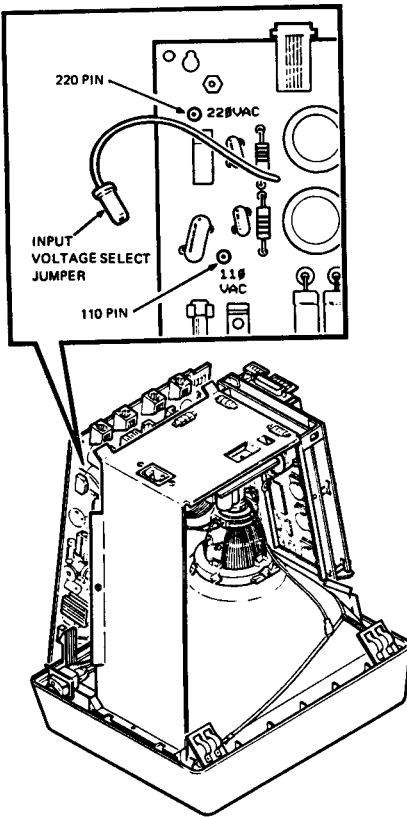


8. Remove the power supply/monitor module.

To install the power supply/monitor module, reverse steps 1 through 8.

CAUTION

Make sure you set the input voltage select jumper on the power supply/monitor module to match the input voltage used. For 110 V, place the jumper on the 110 pin. For 220 V, place the jumper on the 220 pin.



32 REMOVING AND REPLACING FRUs

2.10 AC INLET/SWITCH ASSEMBLY

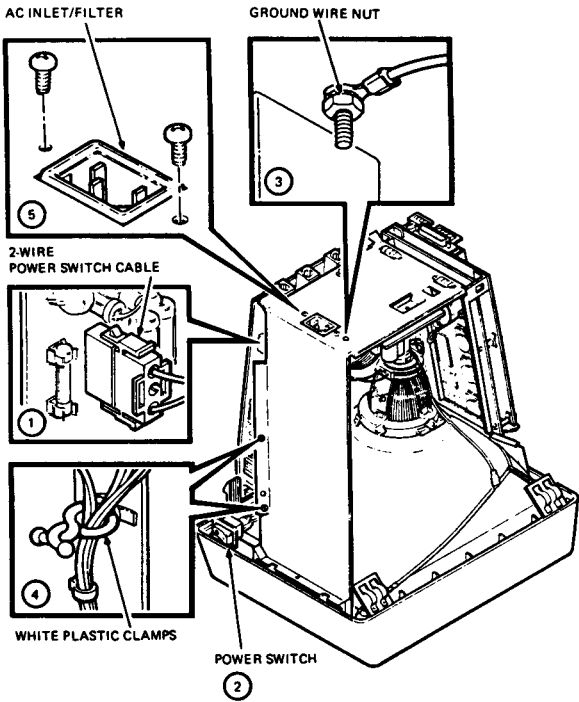
Remove the ac inlet/switch assembly as follows. First remove the following FRUs.

Rear panel (Paragraph 2.2).

Rear enclosure/base assembly (Paragraph 2.4).

- 1. Find the 2-wire cable from the power switch to the power supply/monitor module. Disconnect the cable at the module.**
- 2. Pull the switch up and out of the holder. Bring the switch to the front of the unit.**
- 3. Use a 3/8 inch nutdriver to remove the nut that holds the ground wires from the ac inlet filter to the chassis.**
- 4. Untwist the white plastic clamp that holds the inlet/switch assembly wires to the chassis.**
- 5. Hold the ac inlet filter while removing the two phillips screws on the rear chassis. Remove the filter.**

To install the ac inlet/switch assembly, reverse steps 1 through 5.



34 REMOVING AND REPLACING FRUs

2.11 CONTROL/BRACKET ASSEMBLY (BRIGHTNESS AND CONTRAST)

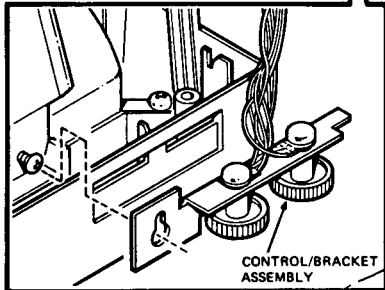
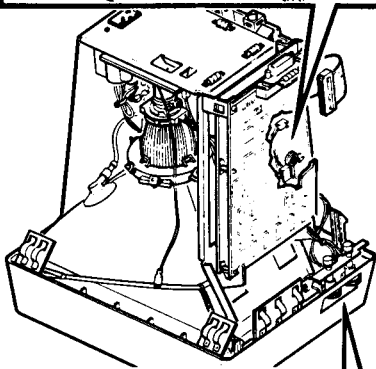
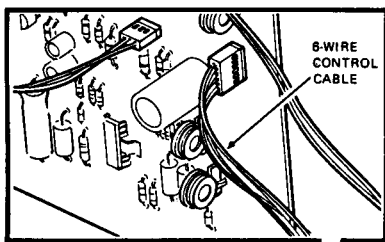
Remove the control/bracket assembly as follows.
First remove the following FRUs.

Rear panel (Paragraph 2.2).

Rear enclosure/base assembly (Paragraph 2.4).

1. Disconnect the 6-wire control cable on the power supply/monitor module by pressing the tab under the connector.
2. Loosen the phillips screw that holds the brightness and contrast controls to the chassis.
3. Lift the control/bracket assembly off the chassis.

To install the control/bracket assembly, reverse steps 1 through 3.



36 REMOVING AND REPLACING FRUs

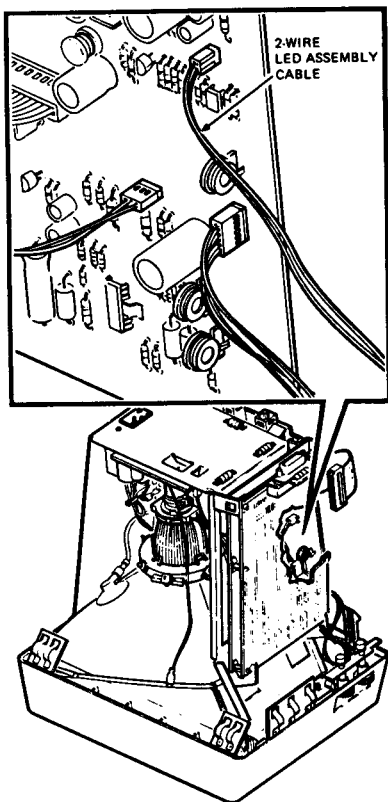
2.12 LED ASSEMBLY (POWER INDICATOR)

Remove the LED assembly as follows. First remove the following FRUs.

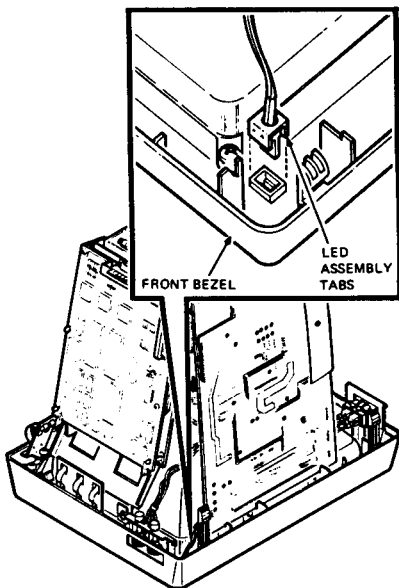
Rear panel (Paragraph 2.2).

Rear enclosure/base assembly (Paragraph 2.4).

1. Find the 2-wire cable from the front bezel to the power supply/monitor module. Disconnect the cable at the module by pressing the tab under the connector.



2. Lift the LED assembly from the front bezel by spreading the tabs on the LED with a small-bladed screwdriver.



MA-0376-06

To install the LED assembly, reverse steps 1 and 2.

38 REMOVING AND REPLACING FRUs

2.13 CRT/BEZEL/CHASSIS ASSEMBLY

The CRT/bezel/chassis is one FRU. Do not try to remove or repair any part of this assembly in the field. To replace the assembly, remove and save the following FRUs.

WARNING

You must discharge the CRT (Paragraph 2.7) before removing the bitmap module, video amp module, and power supply/monitor module.

Rear panel (Paragraph 2.2)

ROM cartridge (Paragraph 2.3).

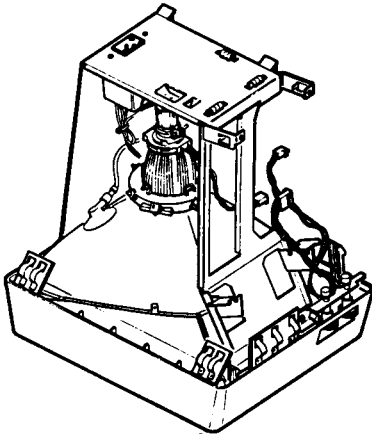
Rear enclosure/base assembly (Paragraph 2.4)

CPU module (Paragraph 2.5)

Bitmap module (Paragraph 2.6)

Video amp module (Paragraph 2.8)

Power supply/monitor module (Paragraph 2.9)



MA-0236-88

To install the CRT/bezel/chassis assembly, reverse the above procedures. Place a piece of paper on a flat working surface. Carefully place the new monitor facedown on the paper. The paper prevents scratches to the monitor bezel.

2.14 CRT DISPOSAL (DIGITAL FIELD SERVICE ONLY)

This section describes how to safely dispose of the monitor's cathode-ray tube (CRT).

NOTE

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

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.

To prevent personal injury from CRT implosion, use the following guidelines and disposal procedure to remove and dispose of a CRT. These guidelines and procedure are Digital field policy for all CRTs more than 3 inches in diameter.

Location

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

Protective Gear

Any service person replacing a CRT must wear at least safety goggles and the approved gloves.

Safety goggles	PN 29-16141-00
Gloves	PN 29-16146-00

40 REMOVING AND REPLACING FRUs

WARNING

To avoid injury to the eyes or hands, always wear goggles and gloves when you work with a CRT.

Handling a CRT

- **Never handle the CRT by the neck. Always use two hands and hold the CRT by the sides near its face.**
- **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 will need

- **An area clear of nonessential personnel**
- **A second person in the area in case of emergency**
- **Safety goggles (PN 29-16141-00)**
- **Gloves (PN 29-16146-00)**
- **Pliers (PN 29-10236-00)**

WARNING

Be careful when performing this procedure. For your safety, you must use the specified gloves and goggles.

Never handle pieces of phosphor-coated glass without wearing protective gloves.

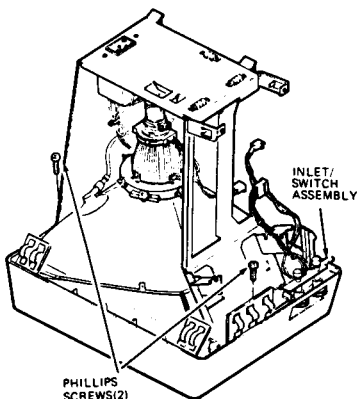
Before you perform the following procedure, remove the FRUs listed in Paragraph 2.13.

Then, remove the following FRUs.

Inlet/switch assembly (Paragraph 2.10)

Control/bracket assembly (Paragraph 2.11)

1. Remove the two phillips screws that secure the chassis to the CRT/bezel.



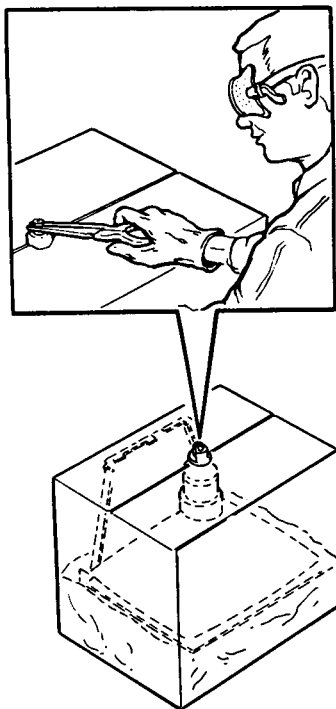
MA 0647-06

2. Remove the chassis.
3. Discard the chassis.
4. Place the old CRT and the original packing material in the container from which you removed the new CRT.
5. Seal up the container so that only the very tip of the CRT neck is exposed.
6. Using the specified pliers, slowly crush, but do not snap, the evacuation point. Do not move or disturb the CRT until the hissing sound of inrushing air has stopped.

42 REMOVING AND REPLACING FRUs

NOTE

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-1500-87

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

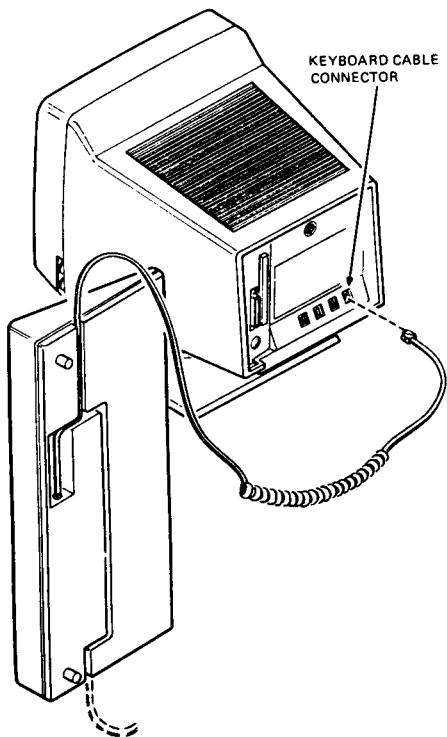
NOTE

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

2.15 KEYBOARD

If the keyboard is faulty, replace the complete keyboard (whole option swap). Remove the keyboard as follows.

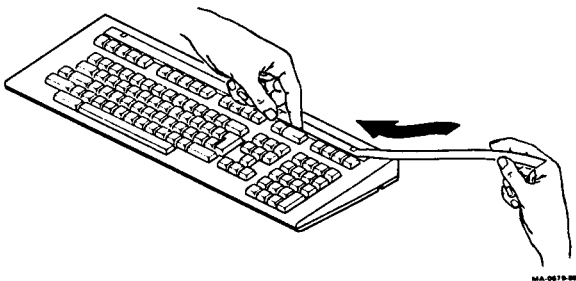
1. Disconnect the keyboard cable from the rear of the terminal.



44 REMOVING AND REPLACING FRUs

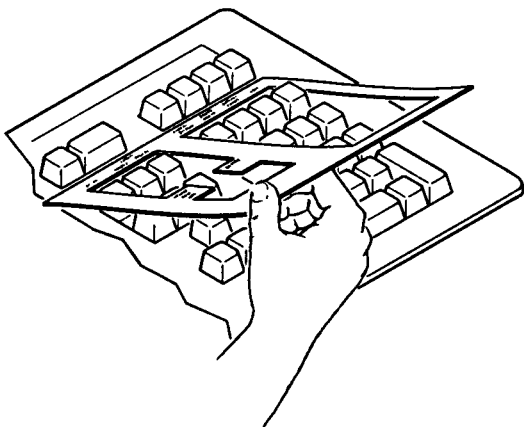
**Install the legend strip
(non-U.S./U.K. keyboards only).**

1. Remove the legend strip from the old keyboard.
2. Slide the legend strip under the tabs, so it fits over the legend strip already on the new keyboard.

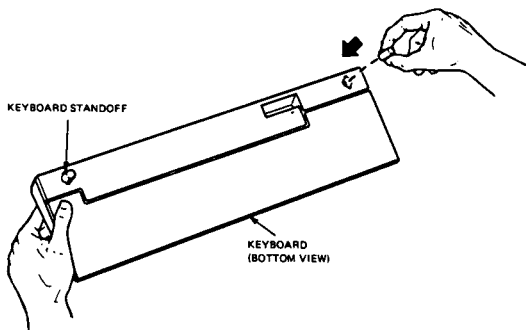


**Install the template for the local editing keys
(non-U.S./U.K. keyboards only).**

1. Place the template so that it fits around the editing and numeric keypads.



Install the keyboard standoffs.



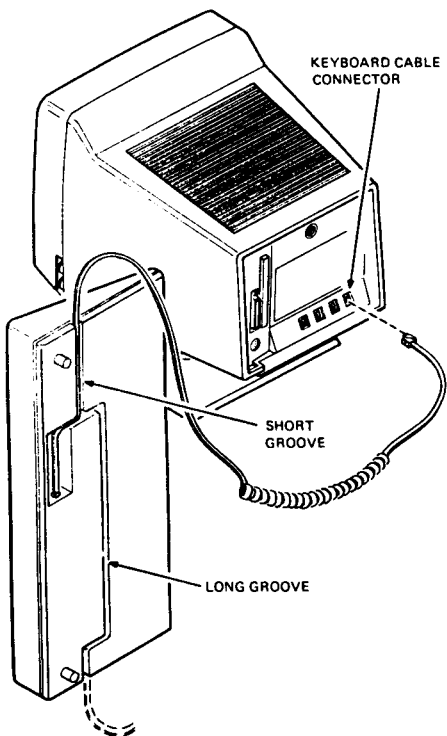
MA-0776-B3

Connect the keyboard to the terminal.

1. Turn the terminal's power switch off (0).
2. Insert the long straight end of the keyboard cable into the connector on the bottom of the keyboard.
3. Press the cable into the long or short groove. Use the long groove if routing to the left. Use the short groove if routing to the right.

46 REMOVING AND REPLACING FRUs

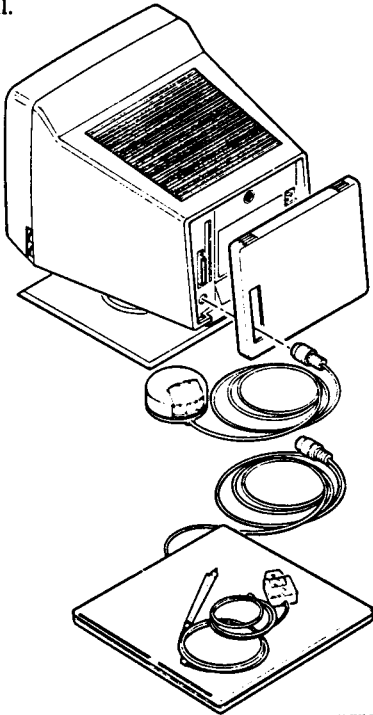
4. Insert the other end of the cable into the keyboard connector on the rear of the terminal.



MA-0824-B6

2.16 MOUSE or TABLET (OPTIONS)

The VSXXX-AA mouse and the VSXXX-AB graphics tablet are single FRUs (whole option swap). The cable for the mouse or tablet connects to the 7-pin locator device connector on the rear of the terminal. To disconnect a mouse or tablet, first remove the terminal's rear panel (Paragraph 2.2). Then disconnect the mouse or tablet cable from the terminal.



To install a new mouse or tablet, first feed its cable through the opening in the rear panel. Connect the cable to the 7-pin connector, then install the rear panel.

NOTE

The cable for the mouse or tablet has a keying plug. Make sure you align the keying plug to the slot on the 7-pin connector.

3 ALIGNING THE VIDEO MONITOR

3.1 GENERAL

This chapter shows you how to align the VT330 monitor. You do not have to perform every adjustment procedure each time you align a monitor. However, you should check all adjustments in the order shown, because many adjustments affect each other. If a setting is already correct, you can skip that adjustment and go on to the next one.

You must use the screen alignment test patterns to make all adjustments. Use Paragraph 3.2.1 to set up the terminal for adjustments.

Use a metric measuring tape (PN 29-25342-00) 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 (100 mm). Make sure all adjustments are made under these conditions.

3.2 MONITOR ADJUSTMENTS

Figure 3-1 shows the location of the controls used to make most adjustments. The individual procedures describe the purpose of each control.

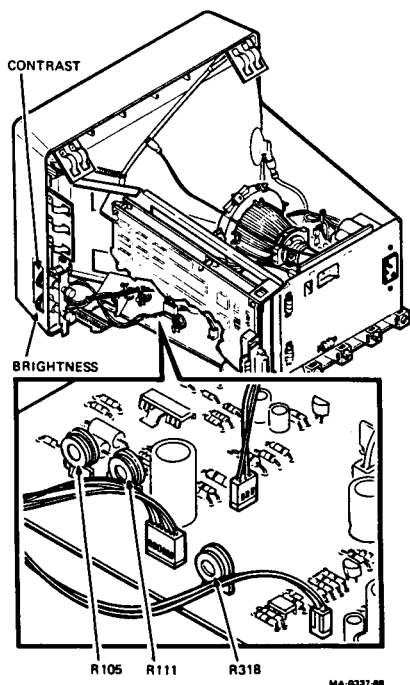


Figure 3-1 Video Adjustment Controls (1 of 2)

R105	Vertical height
R111	Vertical linearity
R318	Sub-contrast

50 ALIGNING THE VIDEO MONITOR

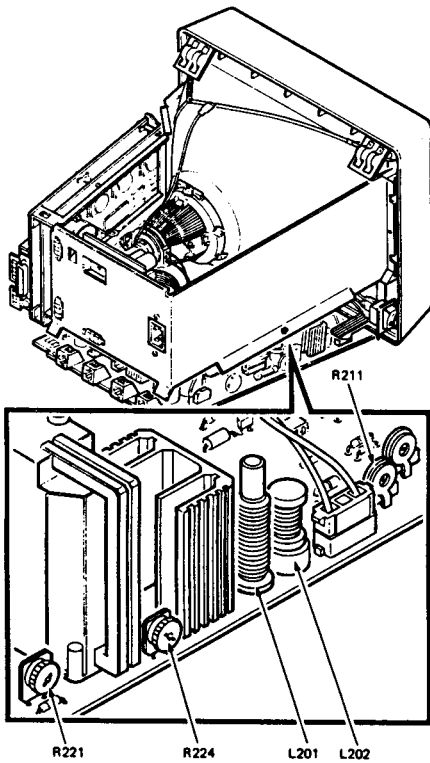


Figure 3-1 Video Adjustment Controls (2 of 2)

L201	Horizontal width
R211	Horizontal centering
R221	Cutoff
R224	Focus

3.2.1 Before You Start

Before you perform adjustments, set up the terminal as follows. First remove the following FRUs.

Remove the rear panel (Paragraph 2.2).

Remove the rear enclosure/base assembly (Paragraph 2.3).

1. Place the terminal on a nonconductive surface.
2. Reconnect the keyboard cable and power cord.
3. Turn the power switch on (1). Wait for "VT330 OK" to appear on the screen.

3.2.2 Displaying Screen Tests

To display the test patterns, you use the Diagnostic Set-Up screen (Paragraph 1.4).

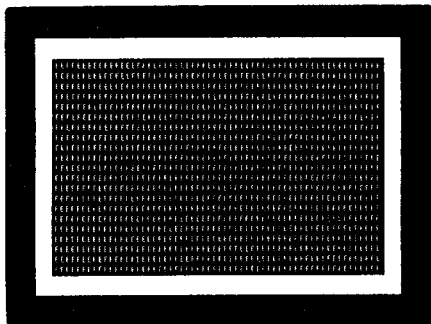
1. Let the terminal warm up for at least 5 minutes.
2. Press Set-Up to enter set-up. The Set-Up Directory screen appears.
3. Use the arrow keys to select the Diagnostics Set-Up field. Press Enter to display the Diagnostics Set-Up screen.
4. Use the arrow keys to select Run Screen Tests.
5. Press Enter to run the screen tests. The monitor displays seven test patterns repeatedly. To keep a test pattern on the screen, press the Hold Session key.

52 ALIGNING THE VIDEO MONITOR

3.2.3 Sub-Brightness and Sub-Contrast

Check the sub-brightness and sub-contrast settings as follows.

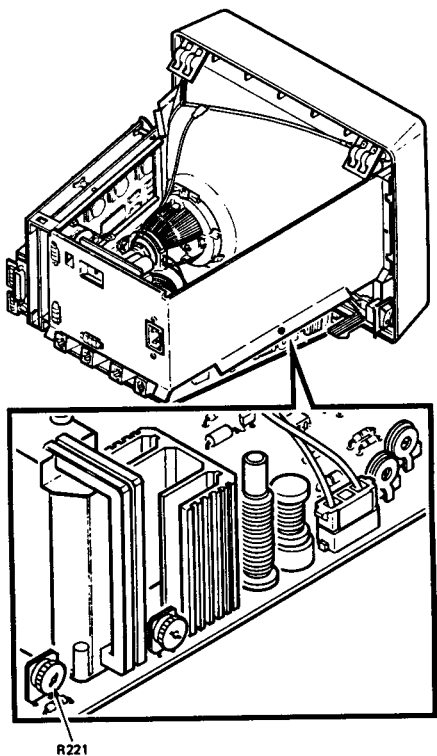
1. Run the screen test (Paragraph 3.2.2).
2. Stop the screen test at the screen of E's by pressing the Hold Session key.



MA-0029-06

3. Set the brightness control to maximum. Then set the contrast control to minimum.

4. Adjust the R221 control until the raster (white diagonal lines) almost disappears, but is still distinctly visible.

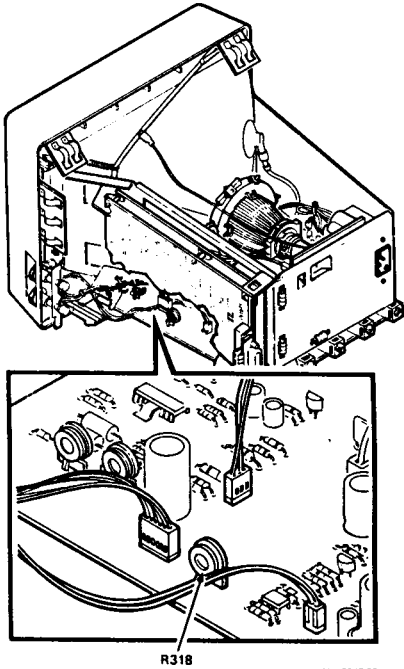


MA-0379-00

5. Set the contrast control to maximum. Then adjust the brightness control until the raster just disappears.

54 ALIGNING THE VIDEO MONITOR

6. Adjust the R318 (Sub-Con) control until the characters are almost blurred, but still in focus.

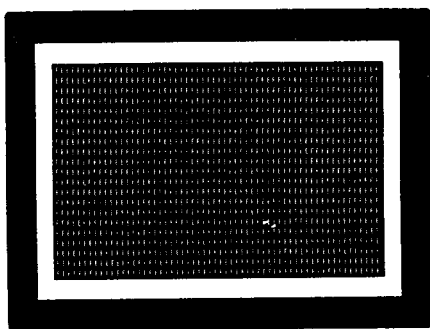


7. Adjust the contrast control to the best viewing level.

3.2.4 Display Size

This section covers rotation, horizontal width, horizontal centering and vertical height adjustments. For these adjustments, first do the following.

1. Run the screen test (Paragraph 3.2.2)
2. Stop the test at the screen of E's by pressing the Hold Session key.



MA-0629-86

3.2.4.1 Rotation - If the display is rotated or slanted, adjust as follows.

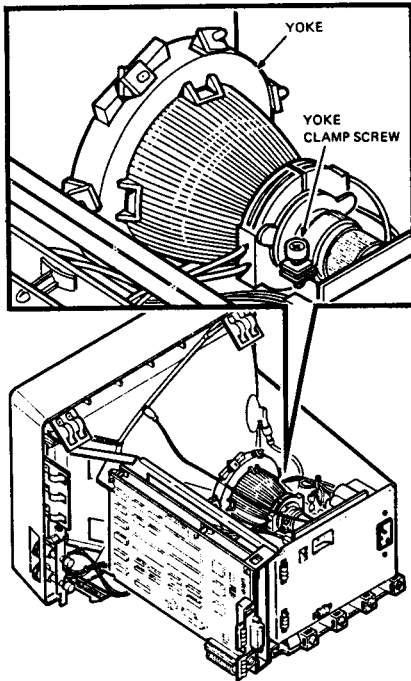
WARNING

The next step exposes you to the CRT anode, which stores a high voltage. Use caution when working in this area.

1. Loosen the phillips screw that holds the CRT connector clamp on the neck of the CRT.

56 ALIGNING THE VIDEO MONITOR

2. Rotate the yoke so the display is square and level on the screen.



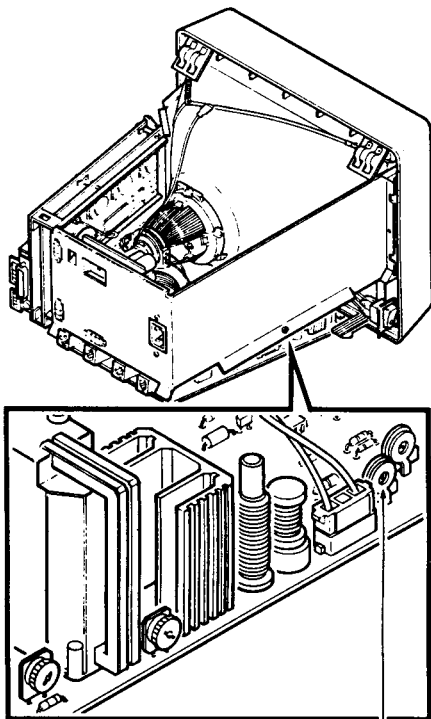
3. Tighten the screw on the CRT connector clamp $3/4$ of a turn.

CAUTION

Before you tighten the screw, make sure you take up the slack on the clamp. Do not overtighten, or you may crack the neck of the CRT.

3.2.4.2 Horizontal Centering - Check and adjust horizontal centering as follows.

1. Check the screen of E's to see if it appears centered on the screen.
2. If necessary, adjust the R211 (H-Center) control to center the display.



R211

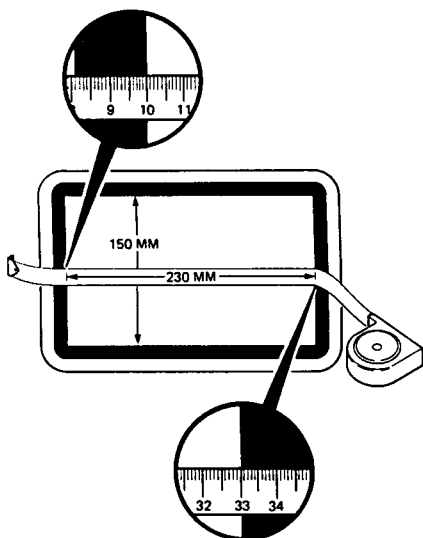
MA 0042-88

58 ALIGNING THE VIDEO MONITOR

3.2.4.3 Horizontal Width - Check and adjust the horizontal width as follows.

NOTE

In the following steps, 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 (100 mm).

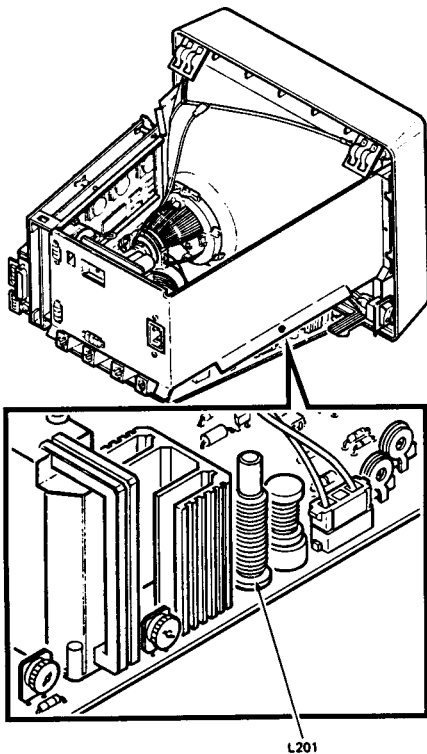


MA-0633-06

1. Check the screen of E's for a width of about 230 mm (± 2.0 mm).

ALIGNING THE VIDEO MONITOR 59

2. If necessary, adjust the display width to 230 mm by turning L201 (the horizontal width coil) with a tuning wand (PN 29-23190-00).



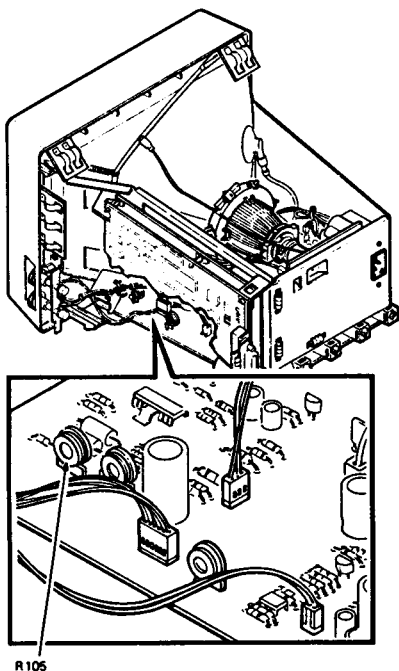
L201

MA-0343-88

60 ALIGNING THE VIDEO MONITOR

3.2.4.4 Vertical Height - Check and adjust the vertical height as follows.

1. Check the screen of E's for a vertical height of 150 mm (\pm 2.0 mm).
2. If necessary, adjust the R105 (V-Height) control until the display height is 150 mm.



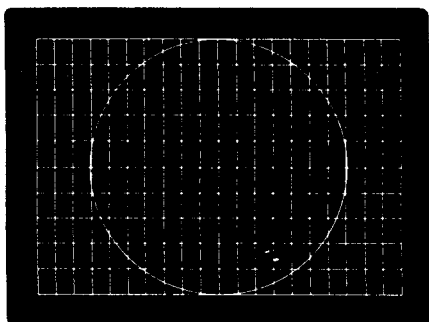
R105

MA-0344-00

3.2.5 Character Quality

This section covers linearity and focus adjustments. For these adjustments, first do the following.

1. Run the screen test (Paragraph 3.2.2)
2. Stop the test at the following screen by pressing the Hold Session key.



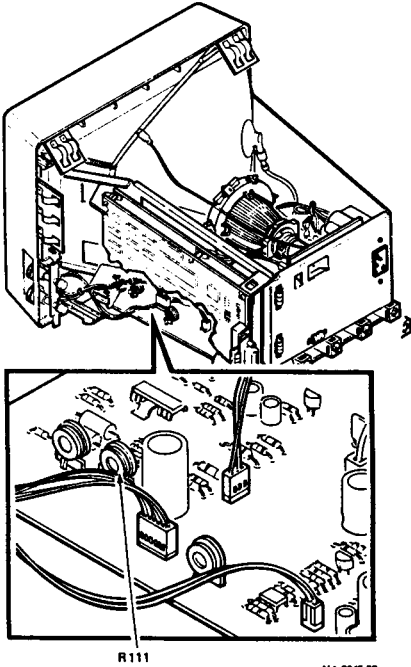
MA 0636-86

3.2.5.1 Linearity - Check and adjust the linearity as follows.

1. Check the height of each block near the four corners of the display. Each block must appear to be the same size.

62 ALIGNING THE VIDEO MONITOR

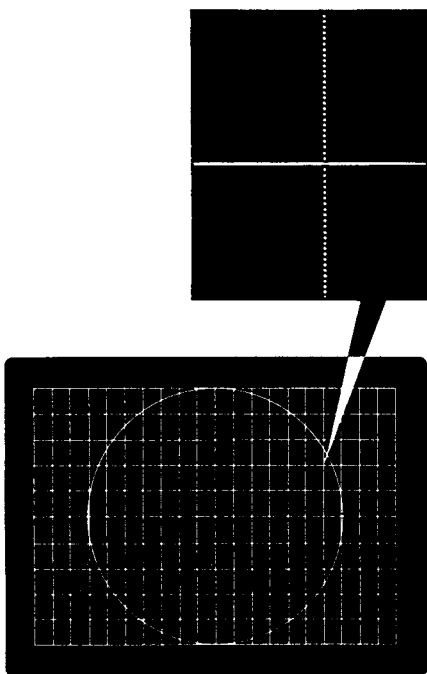
2. If necessary, adjust the R111 (V-Lin) control until the block is the same height in all four corners.



3. If you adjust the linearity, you must adjust the vertical height (Paragraph 3.2.4.4).

3.2.5.2 Focus - Check and adjust the focus as follows.

1. Select a point on the grid pattern four blocks from the right and three blocks down from the top.



MA-0636-86A

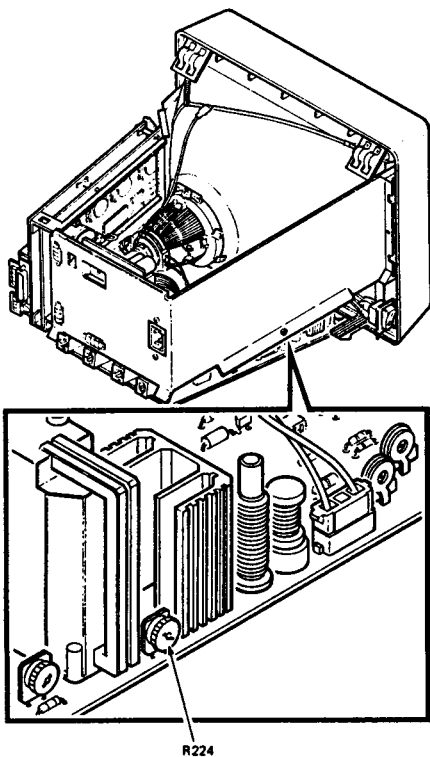
2. Examine the intersecting lines for sharpness.

NOTE

Make sure the screen is clean. A dirty screen can appear to affect the focus. In some cases, the operator may want the focus set to suit personal preference.

64 ALIGNING THE VIDEO MONITOR

3. Adjust the R224 (Focus) control until you can see the individual pixels on the vertical line and the horizontal line is sharp.

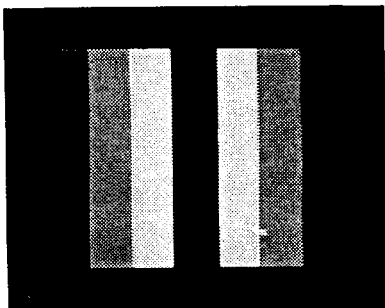


MA-0346-00

3.2.6 Viewer Preference

This procedure lets you to set the monitor for viewing preference. For these adjustments, first do the following.

1. Run the screen test (Paragraph 3.2.2).
2. Stop the screen at the screen with the gray scale by pressing the Hold Session key.

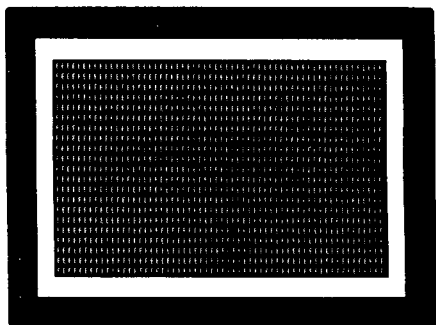


MA-0432-88

3. Adjust the brightness control until the raster (white diagonal lines) disappears.
4. Adjust the contrast control to the preferred viewing level.

66 ALIGNING THE VIDEO MONITOR

5. Press the **Hold Session** key to continue the screen test.
6. Stop the screen test at the screen of E's by pressing the **Hold Session** key.



MA-0629-86

7. Check the horizontal width (Paragraph 3.2.4.3) and vertical height (Paragraph 3.2.4.4). Adjust if necessary.

USING SET-UP 4

4.1 GENERAL

The VT330 terminal has a set-up utility that lets you change the settings of operating features from the keyboard. This chapter provides a brief summary of how to use set-up. Chapter 5 of the *Installing and Using the VT330/VT340 Video Terminal* describes the set-up utility in detail.

4.2 WHAT IS SET-UP?

The set-up utility is a series of display screens. Each screen lists a group of related features, such as communications or diagnostics. Each set-up screen has basic directions at the bottom for selecting and changing feature settings. You can move from screen to screen in set-up.

4.2.1 Dual Sessions

The VT330 can run two sessions with the host system at the same time. Each session has its own set-up settings. If the terminal is set for dual sessions, the set-up screens display the settings for the active session. Chapters 3 and 8 of *Installing and Using the VT330/VT340 Video Terminal* describe how to set up and use dual sessions.

4.3 ENTERING AND LEAVING SET-UP

You enter set-up by pressing the Set-Up key on the top row of the keyboard. When you press Set-Up, the Set-Up Directory screen appears (Figure 4-1). The top half of the Set-Up Directory lists all the VT330 set-up screens. The bottom half lists some action you can perform directly from the Set-Up Directory.

You can leave set-up from any set-up screen, by pressing Set-Up again.

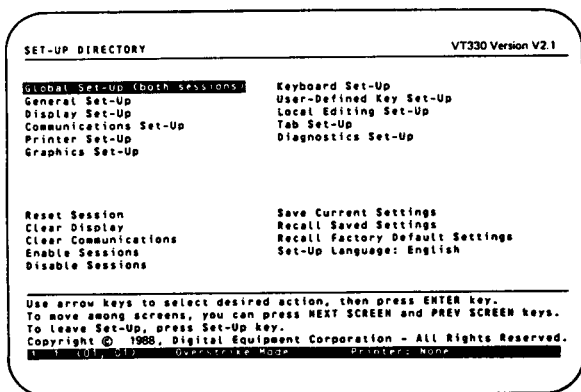


Figure 4-1 Set-Up Directory

4.4 SELECTING A SET-UP SCREEN

You can select any set-up screen from the Set-Up Directory screen.

1. Press Set-Up to enter set-up. The Set-Up Directory appears.
2. Use the arrow keys to move the highlighting cursor to the name of the screen you want to display.
3. Press Enter. The selected screen appears.

You can also use the Next Screen key to move from one set-up screen to the next. You can use the Prev Screen key to back up to a screen you have already seen. The screens appear in the order listed in the Set-Up Directory. You can press Next Screen and Prev Screen when viewing any set-up screen.

To return to the Set-Up Directory, press the Select key.

4.5 SELECTING SET-UP FEATURES

You use the arrow keys to move the cursor to any field on a set-up screen. There are two basic types of fields.

Action fields When you move to an action field and press Enter, the terminal performs that action. The Set-Up Directory, User-Defined Key, and Tab screens have action fields.

Features Features have more than one setting. You use the , , or Enter key to change the current setting of a feature. When you leave set-up, the terminal uses the new setting you selected.

Do not change any settings unless necessary.

4.6 SAVING SET-UP VALUES

You may want to save the current settings in set-up before you run tests. Check with the user. When you save settings, you can recall them later. You can save all set-up settings as follows. If the terminal is set for dual sessions, this procedure only applies to the active session.

1. Press Set-Up to enter set-up. The Set-Up Directory screen appears.
2. Use the arrow keys to move to the Save Current Settings field in the Set-Up Directory screen.
3. Press Enter to save the current settings.

4.7 RECALLING SET-UP VALUES

You can reset the terminal to a previous set of set-up values. There are two types of set-up values you can recall. Check with the user to see which settings were in use.

- **Factory-default settings**
- **Saved settings (previously selected by the user)**

You can recall set-up values as follows. If the terminal is set for dual sessions, this procedure applies only to the active session.

1. Press **Set-Up** to enter set-up. The **Set-Up Directory** screen appears.
2. Use the arrow keys to select the **Recall Factory Default Settings** or **Recall Saved Settings** field.
3. Press **Enter** to recall the selected set-up values.

A VT330/VT340 DOCUMENTATION

In addition to this guide, you can order the following VT330/VT340 documents from Digital.

Installing and Using

The VT330/VT340 Video Terminal EK-VT3XX-UG

This manual provides users with the information needed to install, operate, and maintain the VT330/VT340 terminals. The manual describes all controls, indicators, and keys. The manual also describes set-up and special features such as dual sessions and local editing.

VT330/VT340

Programmer Reference Manual (two volumes)

Vol. 1: Text Programming EK-VT3XX-TP

This manual provides programmers with information on character processing, character codes, and control functions available for general text applications.

Vol. 2: Graphics Programming EK-VT3XX-GP

This manual provides programmers with information on graphics features of the VT330 and VT340 terminals. The manual describes three types of graphics programming: ReGIS, Tektronix 4010/4014, and sixels. The manual also describes how to program a locator device (mouse or graphics tablet) and how to print graphics.

VT330/VT340

Programmer Pocket Guide EK-VT3XX-HR

This guide is a summary of the text and graphics control functions described in the two-volume programmer reference manual.

VT340 Pocket Service Guide EK-VT340-PS

This guide provides service personnel with the information needed to test, troubleshoot, and repair the VT340 color video terminal.

VT330 Video Terminal IPB EK-VT330-IP

VT340 Video Terminal IPB EK-VT340-IP

These documents provide a detailed parts breakdown of the VT330 and VT340 field replaceable parts. The documents do not contain part numbers for components on the printed circuit boards. However, these components are listed in the *Field Maintenance Print Set*, ordered separately.

VT330 Field Maintenance Print Set MP-02411-01

VT340 Field Maintenance Print Set MP-02412-01

These documents provide a complete set of electrical and mechanical schematic diagrams for the VT330 and VT340 terminals.

Installing and Using

The Session Support Utility AA-JB84A-TE

This guide provides system managers with instructions for installing SSU software to support dual sessions over a single communication line. The guide is part of an SSU software kit. The kit is available on different media.

Magtape	00-Q*ZAV-HM
RX50	00-Q*ZAV-H3
TK50	00-Q*ZAV-H5

* = processor number.

B TROUBLESHOOTING THE SESSION SUPPORT UTILITY

The VT330 can run dual sessions over a single communication line if Digital's SSU software is installed on the host system. If you have problems running dual sessions with SSU software, first check the software versions running on the system and the terminal.

- The host system must have VMS V4.4 or later, and SSU V1.0 or later. See "Restrictions" at the end of the appendix.
- The VT330 must have firmware version V1.1 or later. You can check the firmware version listed on the top of any set-up screen.

Next, make sure the following set-up features are set correctly.

In Global Set-Up

- **Dual Terminal** should be "enabled".
- **Terminal Comm Ports** should be set to "Sessions Comm1" or "Sessions Comm2", depending on the comm port you are using.

In Display Set-Up

- **Vertical Coupling** should be "enabled".

The rest of this appendix lists symptoms and solutions for SSU problems. Many of the symptoms shown are DCL error messages. In order to make your error messages appear in the same format as those shown here, type the following command at the DCL \$ prompt.

```
$ set message/nofacility/severity/noid/text
```

PROBLEMS WITH ENABLING SSU SOFTWARE

When SSU software is installed correctly, you can enable it by typing "ssu enable" after the \$ prompt. This section lists some error messages that may appear on the terminal when you try to enable SSU software.

Message

```
$ ssu enable
%E, failure to enable multiple sessions on <dev:>
%E, specified device is not associated with a
    virtual terminal.
```

Solution

- This error is often caused by using the DCL command SET HOST to log into the host system. When you use SET HOST, the system identifies the terminal as an RTxx: device. SSU does not work on RTxx: devices. You must log directly onto the system.
- Use the DCL command SHOW TERMINAL to see if your system has virtual terminals enabled. The first line of the response should show "Terminal: VTAnnn". If not, this is an SSU problem that needs to be resolved on the host system. Have the system manager do an SSU INSERT on the physical line. See *Installing and Using the Session Support Utility*.

Message

```
$ ssu enable
%E, error opening device TDA:
%W, no such device available
```

Solution

- Make sure (1) SSU was installed without any errors, and (2) the system startup procedure executes the file called SSU STARTUP.COM. See *Installing and Using the Session Support Utility*.

- Make sure TDDRIVER is loaded on your VMS system, by typing the DCL command:

```
$ SHOW DEVICE _TDA
```

You should get a list of terminal devices in the left column, including at least TDA0: . If the message "No such device available" appears, TDDRIVER is not loaded correctly. This is an SSU problem that needs to be resolved on the host system. See *Installing and Using the Session Support Utility*.

- Make sure the system's TDDRIVER and SSU software have the same version number, and that the version is V1.0 or later. You can check the version numbers with the DCL commands ANALYZE/IMAGE SYS\$SYSTEM:TDDRIVER.EXE and ANALYZE/IMAGE SYS\$SYSTEM:SSU.EXE. Look for the line saying "Image file identification: SSU V1.0".

Message

```
$ ssu enable
%W, unrecognized command verb - check
    validity and spelling
```

Solution

- Make sure all SSU installation instructions were performed correctly, in particular the ones that include the definition of the SSU command in the common user start-up file. See *Installing and Using the Session Support Utility*.

Message

```
$ ssu enable
!@AJI!@AJI!@AJI!@AJI!@AJI!@AJ
```

Solution

Make sure the set-up features listed at the beginning of this appendix are set correctly.

76 B: THE SESSION SUPPORT UTILITY

In Global Set-Up

- Dual Terminal should be "enabled".
- Terminal Comm Ports should be set to "Sessions Comm1" or "Sessions Comm2", depending on the comm port you are using.

In Display Set-Up

- Vertical Coupling should be "enabled".

DECserver LAT PROBLEMS

Symptom

Your session(s) were running fine, but now the terminal is not responding. You think that you are still logged into the system.

Solution

- Select Disable Sessions in the Set-Up Directory.
- At the Local> prompt, reconnect to your VMS system and log in. If system parameters allow disconnected jobs, you may now be able to reconnect to your old job.

Symptom

When you try to enable sessions or open a session, the terminal's warning bell sounds or you get thrown back to the Local> prompt.

Solution

Make sure you do not set your terminal server "forward" or "local" characters to Ctrl-\ or Ctrl-T. To be safe, enter the following commands for your terminal server before logging into VMS.

```
Local> set local none  
Local> set forward none
```

Restrictions

- DECserver 200 lines
- For systems running VAX/VMS V4.4 or V4.5: If the LAT+ driver shipped with the DECserver 200 lines is installed, you cannot use SSU on the DECserver 200 lines.

The normal LAT driver shipped with VAX/VMS V4.4 or V4.5 will work with SSU.

- For systems running VAX/VMS V4.6 or later and its associated LAT driver shipped with the DECserver 200: You can use SSU on the DECserver 200 lines.
- SSU is not supported on the OPA0: device, due to internal differences between this device and all other terminal devices on VAX/VMS.

C FRU EXPLODED VIEW DRAWINGS

Figures C-1 and C-2 show the VT330 FRUs and their part numbers.

LK201-NA US/UK
 LK201-LC FRENCH/CANADIAN
 LK201-LB BELGIUM
 LK201-RD DANISH
 LK201-NF FINNISH
 LK201-LG AUSTRIAN
 LK201-LH HOLLAND
 LK201-LI ITALIAN
 LK201-LK SWISS/FRENCH
 LK201-LL SWISS/GERMAN
 LK201-LM SWEDEN
 LK201-RN NORWAY
 LK201-LP FRANCE
 LK201-LS SPANISH
 LK201-LV PORTUGAL
 LK201-PA US/UK WPS (GOLD)

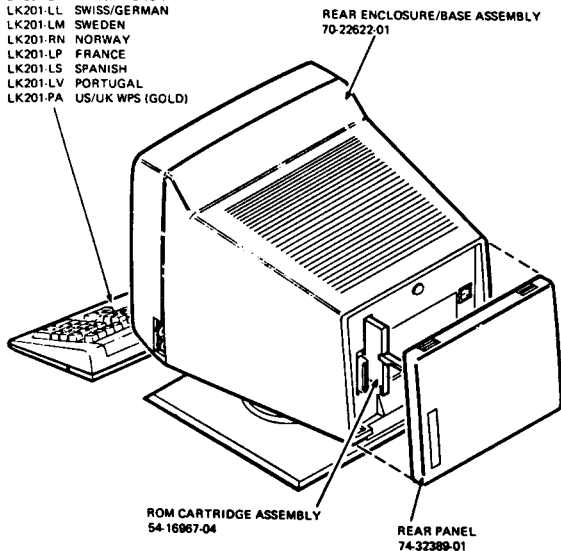


Figure C-1 VT330 FRUs (External View)

C: FRU EXPLODED VIEW DRAWINGS 79

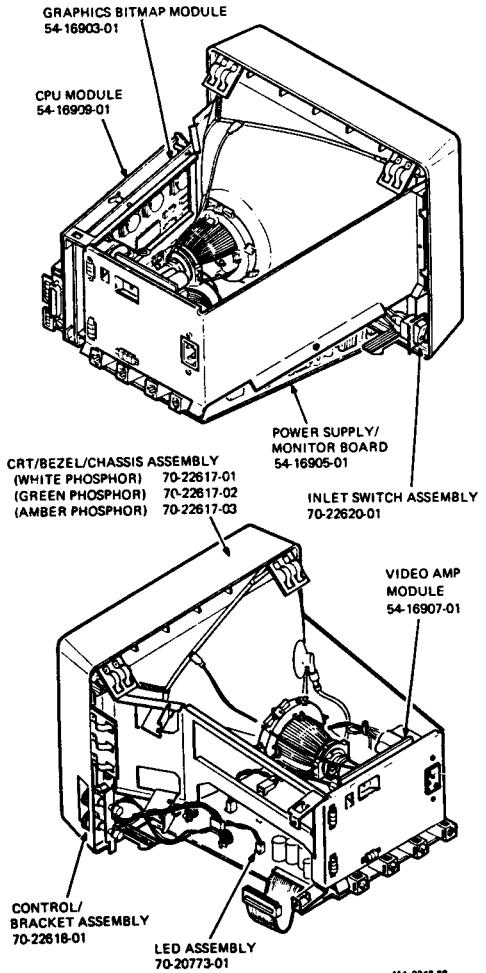
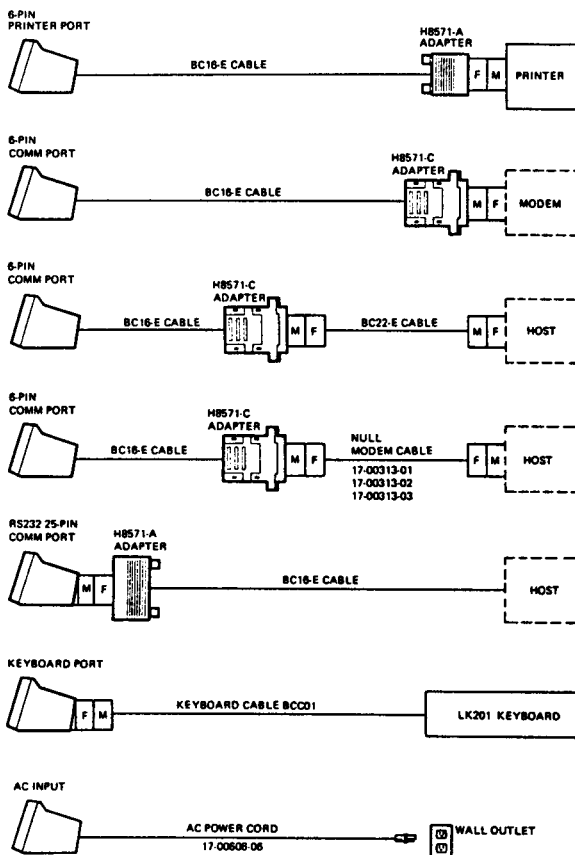


Figure C-2 VT330 FRUs (Internal View)

D CABLES

Figure D-1 shows the possible cable connections for the VT330 terminal. Table D-1 lists the interface cables and their part numbers.



MA-1256-080

Figure D-1 VT330 Cable Connections

Table D-1 Interface Cables

Part Number	Length	Connector
Adapters		
H8571-A		25-pin F
H8571-C		25-pin M
Extension Cables		
BC22E-10	10 ft (3 m)	25-pin F RS232 to
BC22E-25	25 ft (7.6 m)	25-pin M RS232
Null Modem Cables		
17-00313-01	10 ft (3 m)	25-pin F RS232 to
17-00313-02	25 ft (7.6 m)	25-pin F RS232
17-00313-03	50 ft (15.2 m)	
Communication Cables		
BC16E-10	10 ft (3 m)	6-pin M DEC-423 to
BC16E-25	25 ft (7.6 m)	6-pin M DEC-423
Keyboard Cable		
17-00294-00	6 ft (1.8 m)	Telephone jack
AC Power Cables		
	Country	
17-00198-08	Australia, New Zealand	
17-00199-13	Austria, Belgium, Finland, France, Germany, Netherlands, Norway, Sweden	
17-00606-06	Canada, Japan, Mexico, United States	
17-00310-06	Denmark	
17-00456-09	India, South Africa	
17-00209-09	Ireland, United Kingdom	
17-00457-09	Israel	
17-00364-09	Italy	
17-00210-06	Switzerland	

M = male, F = female.

E PHYSICAL/FUNCTIONAL DIAGRAM

Figure E-1 is a physical/functional diagram showing how the VT330 components work together.

NOTE

All voltage readings are based on a line voltage of 115 Vac. Your readings may differ, depending on your line voltage.

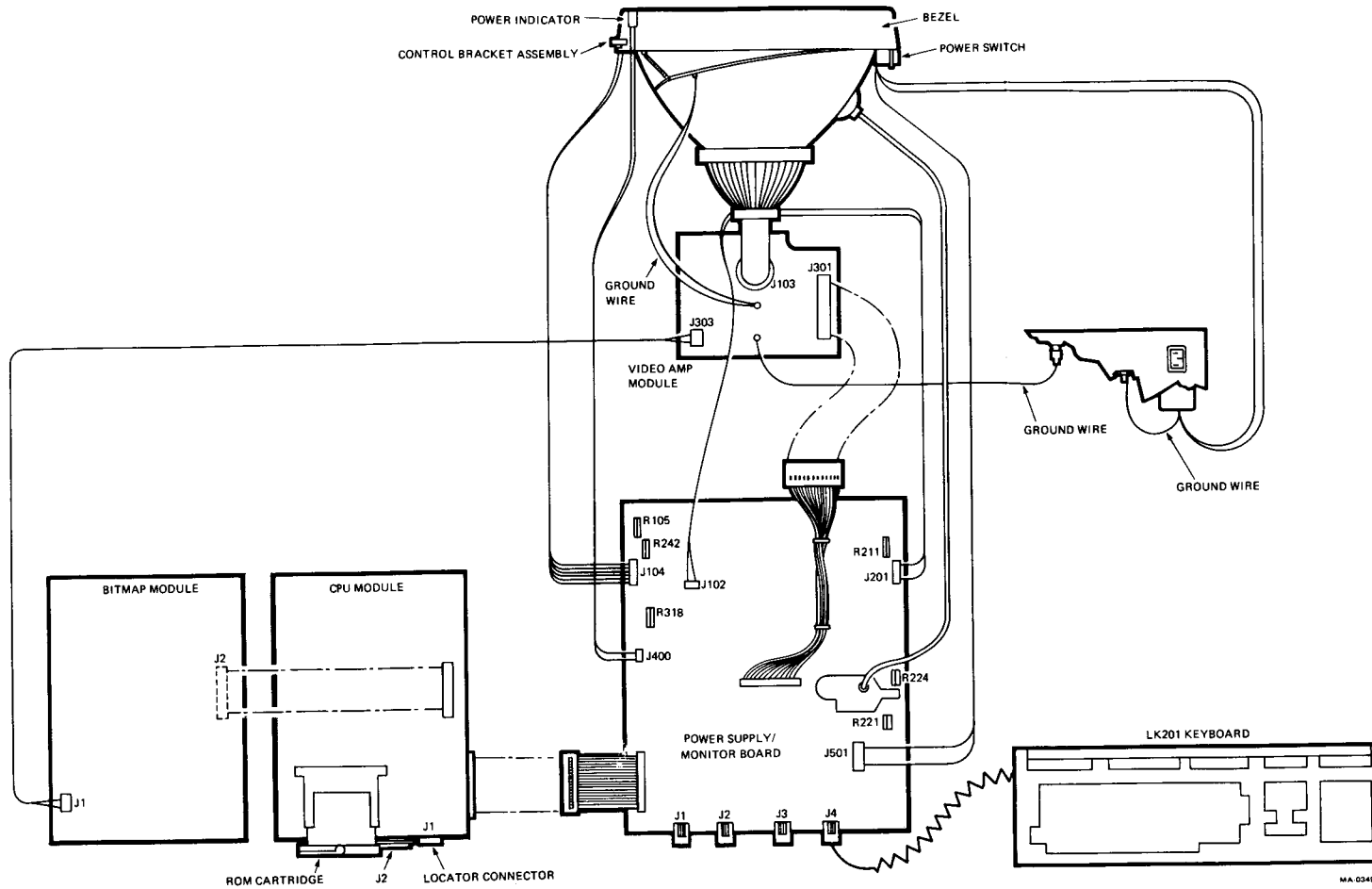


Figure E-1 VT330 Physical/Functional Diagram

84 E: PHYSICAL/FUNCTIONAL DIAGRAM

Power Supply/Monitor Module

J1 Comm1 Port Connector

Pin	1	E423DTR	Data terminal ready
	2	E423TXD	Transmitted data
	3	GND	Transmit ground
	4	E423CMM	Receive ground
	5	E423RXD	Received data
	6	E423DSR	Data set ready

J2 Comm2 Port Connector

Pin	1	EH2DTR	Data terminal ready
	2	EH2TXD	Transmitted data
	3	GND	Transmit ground
	4	EH2CMM	Receive ground
	5	EH2RXD	Received data
	6	EH2DSR	Data set ready

J3 Printer Port Connector

Pin	1	PTRDTR	Data terminal read
	2	PTRTXD	Transmitted data
	3	GND	Transmit ground
	4	PTRCMM	Receive ground
	5	PRTRXD	Received data
	6	PTRDSR	Data set ready

J4 Keyboard Port Connector

Pin	1	K/BTXD	Transmitted data
	2	GND	Ground
	3	+12 V	
	4	K/BRXD	Received data

J102 CRT Vertical Yoke

Pin	1	Vert yoke
	2	Not used
	3	Vert yoke

J104 Control/Bracket

Pin	1	Contrast
	2	Contrast
	3	Brightness
	4	Brightness

J201 CRT Horizontal Yoke

Pin	1	Hor yoke
	2	Not used
	3	Hor yoke

J400 LED

Pin	1	Sig	Signal
	2	-12 V	

J501 AC Input

Pin	1	Phase	
	2	GND	Ground
	3	Neutral	

Video Amp Module

J103 CRT Socket Connector

Pin	1	G1	Grid 1
	2	Cathode	
	3	Heater -12 V	
	4	Heater GND	Ground
	5	Not used	
	6	G2	Grid 2
	7	G4	Grid 4

J301 Power Supply/Monitor Connector

Pin	1	+5 V	
	2	+12 V	
	3	-12 V	
	4	Contrast	
	5	Contrast	
	6	GND	Ground
	7	GND	Ground
	8	+48 V	
	9	G1	Grid 1
	10	G4	Grid 4
	11	G2	Grid 2

J303 Bitmap Connector

Pin	1	VID0	Video 0
	2	GND	Ground
	3	VID1	Video 1

Bitmap Module

J1 Video Amp Connector

Pin	1	VIDOUT0	Video out 0
	2	GND	Ground
	3	VIDOUT1	Video out 1

CPU Module

J1 Locator Connector

Pin	1	GND	Ground
	2	MOUSERXD	Received data
	3	MOUSETXD	Transmitted data
	4	-12 V	
	5	+5 V	
	6	+12 V	
	7	Not used	

J2 EIA 25-Pin Comm1 Connector

Pin	1	GND	Ground
	2	TXD	Transmitted data
	3	RXD	Received data
	4	RTS	Request to send
	5	CTS	Clear to send
	6	DSR	Data set ready
	7	SIG GND	Signal ground
	8	CDL	Carrier detect
	9	Not used	
	10	Not used	
	11	Not used	
	12	SPDI	Speed indicator
	13	Not used	
	14	Not used	
	15	Not used	
	16	Not used	
	17	Not used	
	18	Not used	
	19	Not used	
	20	DTR	Data terminal ready
	21	Not used	
	22	Not used	
	23	SPDS	Speed select
	24	Not used	
	25	Not used	