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VT330+ Models G, H, and J Service Guide

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About This Guide

This guide describes how to service your VT33⁺ monochrome monitor models G, H, or J.

Organization

The guide has five chapters and five appendices. They cover the following topics:

- Troubleshooting the field replaceable units (FRUs)
- Removing and replacing FRUs
- Aligning the video monitor
- Using set-up features
- Related documentation
- Troubleshooting the Session Support Utility
- Exploded view and part listing of the unit
- Cables
- Physical/functional diagram

Intended Audience

This guide is for Digital Customer Services Engineers.

Conventions

This document uses the following conventions:

Convention	Meaning
Warning	Provides information to prevent personal injury.
Caution	Provides information to prevent damage to the equipment.
Note	Provides general information.
PN	Part number.

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CHAPTER 1

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Product Description

This chapter gives a general description of the VT330+ monitor, and also lists the tools and spare parts you may need when servicing the unit.

1.1 Video Monitor Variations

This guide describes VT330+ models G, H, and J which are modified versions of the VT330+ models A, B, and C.

The following table identifies the original and modified versions of the VT330+ monochrome monitor.

Original	Modified	Color	Voltage
VT330-A2	VT330-G2	White	100-240 V
VT330-B2	VT330-H2	Green	100-240 V
VT330-C2	VT330-J2	Amber	100-240 V

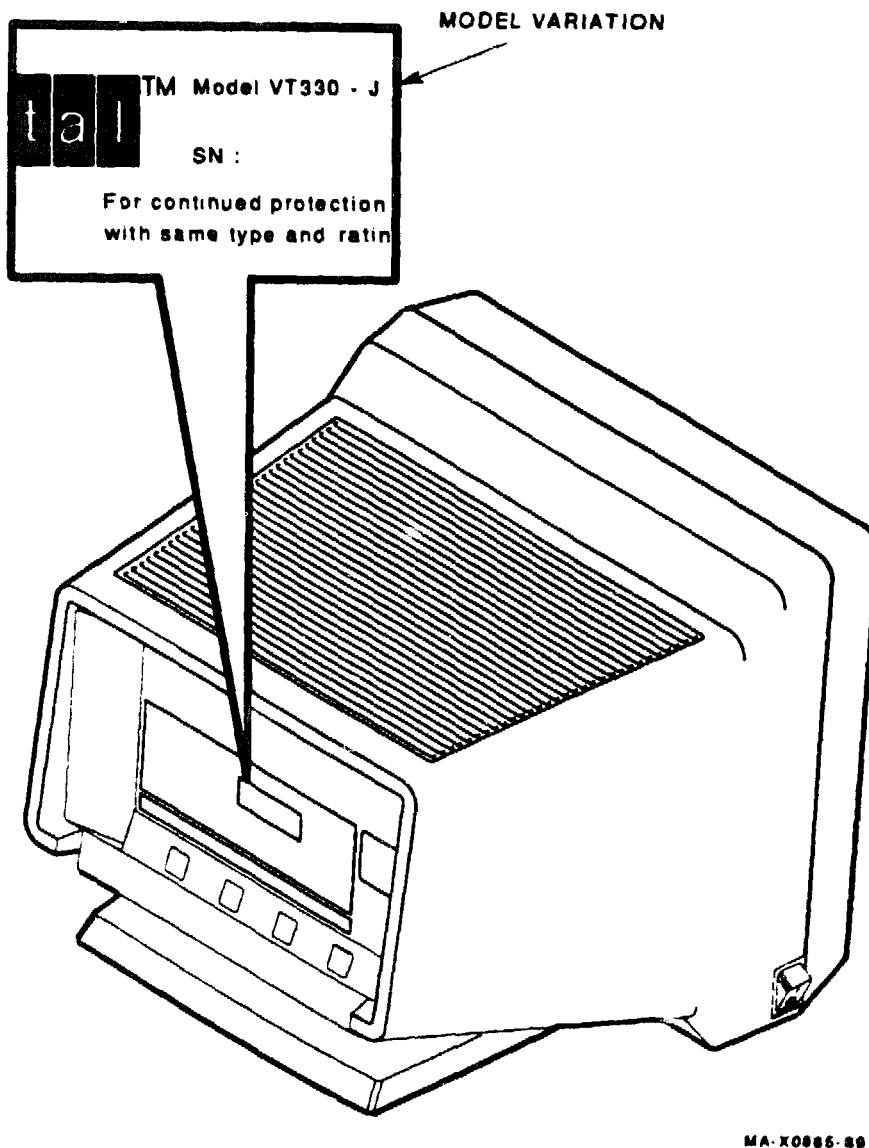
You can identify the model by looking at the label on the rear of the terminal as shown on Figure 1-1.

The new VT330+ models G, H, and J differ from the VT330+ models A, B, and C. The VT330+ models G, H, and J contains the following:

- Does not contain the plug-in ROM cartridge because the operating software is stored on ROM chips. The ROM chips are on the terminal control module.
- Contains a more simple logic design with all control and bitmap logic located on one terminal control module.
- Does not contain voltage select jumpers because the voltage selection is automatic in the 100 to 240 Vac range.

1-2 Product Description

For information on the VT330+ models A, B, and C, refer to the *VT330+ Pocket Service Guide* (EK-VT330-PS-002).



MA-X0886-89

Figure 1-1 VT330+ Rear Panel—Model Variations and Connectors

1.2 Terminal Description

The VT330+ models G, H, or J is a text and graphics monochrome video terminal that is compatible with the VT220 terminals. The VT330+ supports different versions of the Digital LK201 corporate keyboard for different languages.

NOTE

Throughout this manual, "VT330+" will be used to describe the VT330+ models G, H, or J.

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 flat screen that can display 24 rows of text in 80 or 132 columns. The 25th display line is a status line. The terminal supports multiple sessions. When connected to a host system, the terminal can display information you send to the host system and information the host system sends to you.

The power supply receives AC input and generates four regulated output DC voltages: +5V, +12V, +32V, and -12V. The AC voltage nominal range is from 100 Vac to 240 Vac (88 to 264 Vac), 50 to 60 Hz. Input voltage selection is done automatically without any mechanical voltage select jumpers. A 3 amp, 250V fast acting fuse (5 x 20mm) mounted on the power supply provides the overload protection.

The monitor built-in tilt-swivel assembly lets the user adjust the screen for viewing comfort.

Figure 1-2 is a simplified block diagram of a new VT330+. The major parts are the CRT/bezel/chassis assembly, the terminal control module, and the power supply/monitor (PS/M) module with the video amp module.

1-4 Product Description

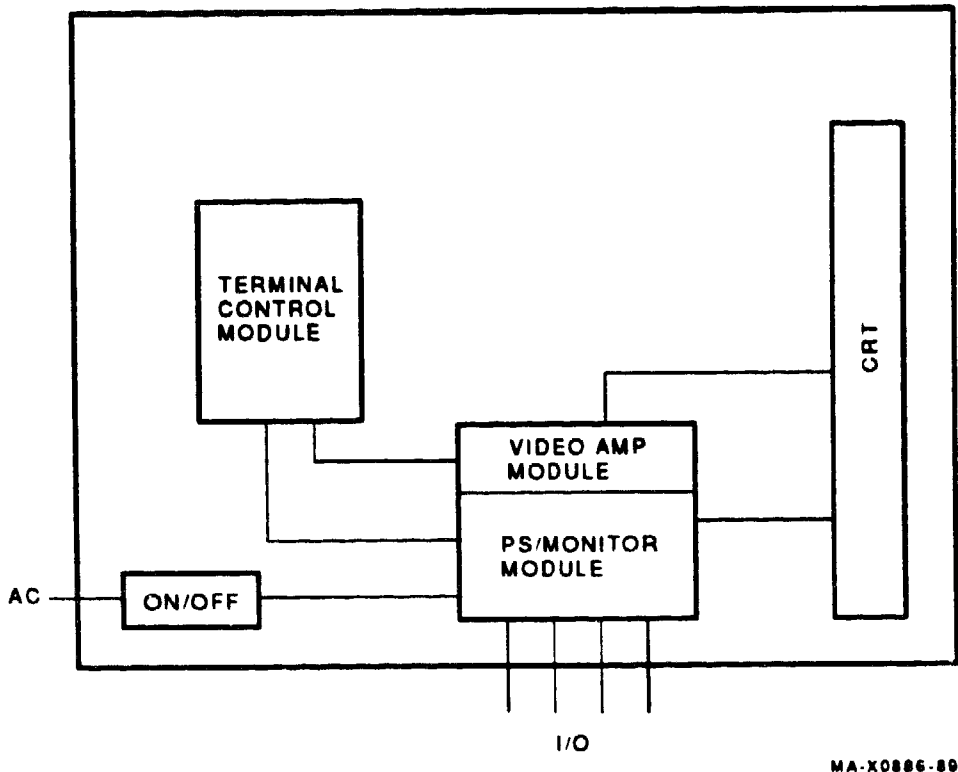


Figure 1-2 VT330+ Block Diagram

The following table describes the VT330+ interface connectors shown in Figure 1-1.

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 primary 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.

1.3 Tools and Equipment

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

Tools and Equipment	Part Number
Phillips screwdriver, No. 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

1.4 Recommended Spares List

The following list shows the part numbers for the recommended spares for the VT330+ models G, H, or J video terminal.

Spares	Part Number
Power supply/monitor module	54-20122-01
Terminal control module	54-20124-01
Bezel/CRT/chassis assembly, white	70-26556-01
Bezel/CRT/chassis assembly, green	70-26556-02
Bezel/CRT/chassis assembly, amber	70-26556-03
Control/bracket assembly	70-22618-01
Switch assembly	70-26550-01
Rear enclosure/base assembly	70-26560-01
Rear dress panel	70-32389-01

1.5 Data Input Devices

The following data entry devices can be used with a VT330+:

Device	Part Number
LK201 country keyboard	LK201-xx
Mouse	VSXXX-AA
Graphics tablet	VSXXX-AB

The symbol *xx* identifies the model. Figure C-1 lists the country models with their part numbers.

Testing and Troubleshooting

This chapter describes how to run a power-up self-test that is built into the VT330+ video terminal. The chapter also lists error codes and describes how to troubleshoot general problems that occur with the terminal.

2.1 Using Self-Tests

The VT330+ has seven self-tests to help you isolate failures to field replaceable units (FRUs) in the terminal. All these tests are run from the terminal Diagnostic Set-Up screen (Section 2.4). The power-up self-test runs each time you turn the terminal on.

If a test finds a faulty FRU, then adjust or replace that FRU. Then repeat the test to ensure the terminal operates correctly. Appendix C shows each FRU.

2.2 Power-Up Self-Test

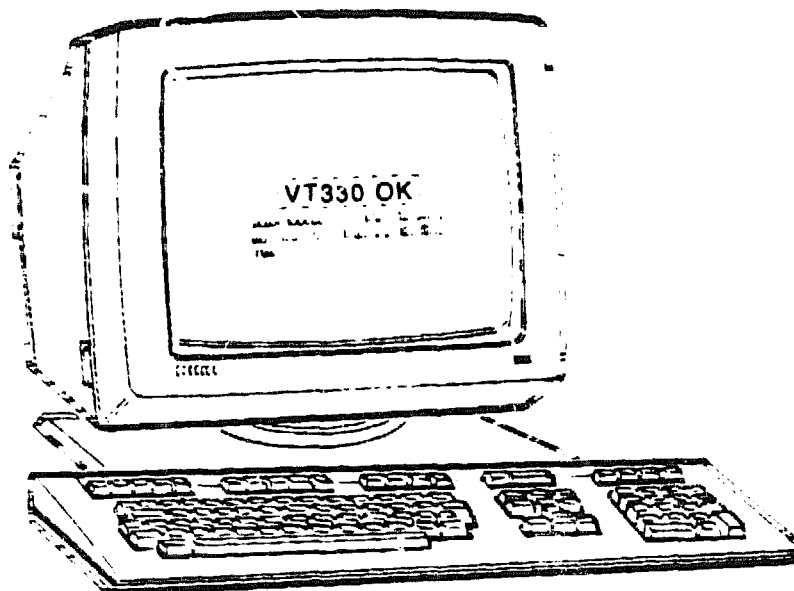
This test runs automatically each time you turn the terminal on. The test checks the terminal internal memory, keyboard, and video circuitry. The test also ensures that the communication ports, printer port, and locator device port are operating correctly.

A successful power-up self-test will result in the following (Figure 2-1):

- The keyboard LED indicators are off.
- The keyboard makes the bell tone sound.
- A "VT330+ OK" message appears on a screen together 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 from the host
 - you press any key on the keyboard

2-2 Testing and Troubleshooting

- you leave the terminal on but inactive for 30 minutes (screen saver feature)



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Figure 2-1 Successful Power-Up Self-Test Display

2.3 If the Test Finds an Error

If the test finds an error, do the following:

1. 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. Section 2.7 describes the error messages.
2. If the screen display is faulty, check the LED indicators on the keyboard. They also display the error code.
3. If other problems occur, see Section 2.8. It lists some common operating problems, their probable causes, and suggested solutions.

2.4 Diagnostic Set-Up Screen

Use the Diagnostic Set-Up screen (Figure 2-2) to run one or more of the terminal's seven self-tests. Section 2.5 describes each test.

You can run the five loopback tests and the power-up self-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 set-up screens, refer to Chapter 5.

DIAGNOSTIC SET-UP		VT330 Version V3.0
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 © 1989, Digital Equipment Corporation-All Rights Reserved.		
T 1 (01,01) Overstrike Mode Printer: None		

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Figure 2-2 Diagnostic Set-Up Screen

2.4.1 Diagnostic Set-Up Screen Format

The top half of the Diagnostic Set-Up screen has two columns; the Feature column, and Current Setting column. The following table describes both columns.

Feature	Current Setting
Feature	Lists the individual loopback tests and the power-up test.
Current Setting	Shows you if a test is enabled or disabled. You must enable a test before you can run it. Initially, all tests are disabled.

2.4.2 How to Change a Current Setting of a Test

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

2.4.3 How to Run a Self-Test

You can run one or more of the terminal's seven self-tests and as many times as you like. Before you run a loopback test, you must connect a loopback connector to the selected port (Section 2.5.1). To run the screen tests, see Chapter 4. To run a self-test, do the following:

1. Press the **[Set-Up]** key. The Set-Up Directory appears on the screen.
2. Use the arrow keys to move the cursor to **Diagnostic Set-Up**. Press the **[Enter]** key 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 Test** or **Repeat Tests**.

Run Test performs an enabled test one time.

Repeat Tests performs an enabled test continuously.

5. Press the **[Enter]** key to start the self-tests.

NOTE

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

2.5 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 three communication ports of the terminal, 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 are used to adjust the video display (Chapter 4).

2.5.1 Loopback Tests

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

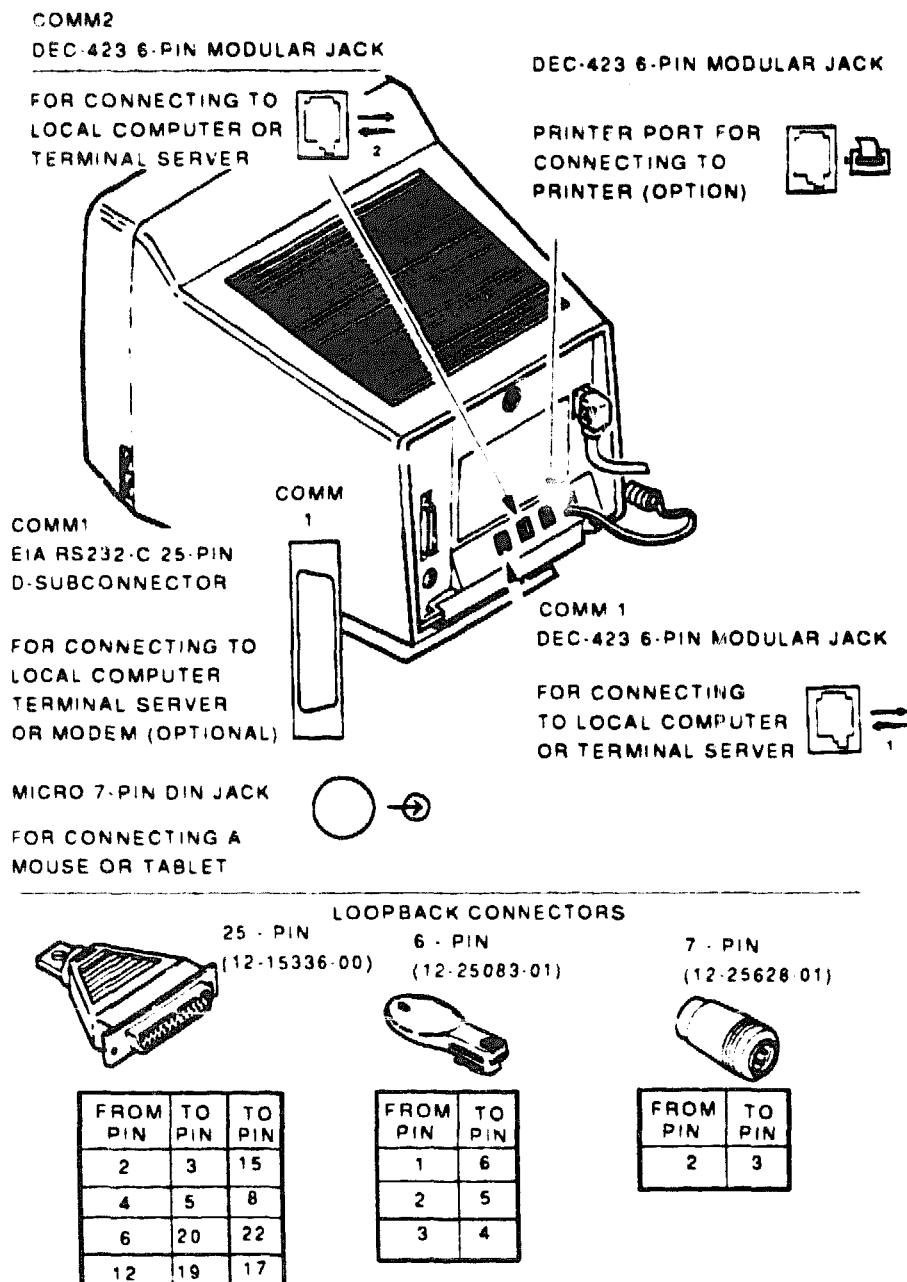
When you run the test, the terminal sends a predefined set of characters on its transmit line and receives them on its receive line. If the characters do not match when compared by the terminal, an error message appears on the screen.

You must use a loopback connector or the test will fail. The following table lists the loopback connectors and their part numbers.

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 2-3 shows the five VT330+ ports and the three loopback connectors. Note that the VT330+ has two *Comm1* connectors.

2-6 Testing and Troubleshooting



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Figure 2-3 VT330+ Ports and Loopback Connectors

How to Run a Loopback Test

To run a loopback test:

1. Turn the terminal off.
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.
5. Use the Diagnostic Set-Up screen to run the test.

A successful test will result in the following.

- The keyboard LED indicators are off.
- The keyboard makes a bell tone sound.
- A "VT330+ OK" message appears on the screen.

If the Test Finds an Error

If the test finds an error, your screen may display one of the following error messages. See Section 2.7 for more details.

For a Comm1 25-pin test, the following error message could appear:

```
VT330+ Comm1 Port Data Error - - 2
VT330+ Comm1 Port Control Error - - 3
```

There is no loopback test for the keyboard. However, if the keyboard is faulty, the following error message could appear:

```
Keyboard Error - - 4
```

For a Comm1 6-pin test, the following error message could appear:

```
VT330+ Comm1 DEC-423 Data Error - - 5
```


2-8 Testing and Troubleshooting

For a Comm2 6-pin test, the following error message could appear:

```
VT330+ Comm2 DEC-423 Data Error - - 6
```

For a Printer 6-pin test, the following error message could appear:

```
VT330+ Printer Port Error - - 7
```

For a Locator 7-pin test, the following error message could appear:

```
VT330+ Locator Port Error - - 8
```

2.5.2 Power-Up Test

This test is the same as the power-up self-test described in Section 2.3. If you use **Repeat Tests** to run this test, the test runs continuously until an error occurs or until you turn the power off.

2.5.3 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 4 for the procedures used for these tests.

2.6 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 (Section 2.3). If the terminal passes the test, go to step 2.
2. Run the printer external loopback test (Section 2.5.1). If the terminal passes this test, go step 3.

NOTE

If the terminal passes the above tests and it runs correctly, the problem is probably not in the VT330+ terminal.

3. Test the printer. Refer to its pocket service guide for correct procedures. If the printer operates correctly, go to step 4.

4. Check the following set-up features to ensure your terminal and printer are compatible. If you are unfamiliar with the terminal set-up screens, see Chapter 5.

- Check the **Printer Assignment** feature in the Global Set-Up screen. Make sure the printer is assigned to the session you are in, otherwise it will not print from your session.
- Check the printer status on the status line in set-up. The following table lists the printer status and their meaning.

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 a host computer end a data line with a carriage return, the terminal automatically sends the line to print.
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)
5. Make sure you are using the correct cable between the printer and terminal (Appendix D). Make sure the connections are secure at both ends of the cable.
 6. Put the terminal in the local state by using the **On Line/Local** feature in the Global Set-Up screen. Then exit the Set-Up screen and type some characters on the screen.

7. Press the **Local Print** (F2) key. The data on your screen should print out if the printer is operating correctly. If the data does not print, go back to step 3.

2.7 Self-Test Error Messages and Codes

If the screen displays an error message, see Table 2-1. It lists the FRU you must replace to correct the problem.

If the VT330+ fails the power-up self-test, see Table 2-2.

If there is a problem with the screen display, check the keyboard 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 flash an alternating pattern, or do not turn on at all, replace the terminal control module (Section 3.3). Refer to (Table 2-2) for troubleshooting procedures.

Table 2-1 VT330+ Display Error Messages

Error Message	Solution
VT330+ NVR Error—1	Recover from Nonvolatile memory (NVR) (Section 2.7.1). Replace the terminal control module (Section 3.3).
VT330+ Comm1 Port Data Error—2	Replace the terminal control module (Section 3.3).
VT330+ Comm1 Port Control Error—3	Replace the terminal control module (Section 3.3).
VT330+ Keyboard Error—4	See if the keyboard is plugged in. Turn the VT330+ power off, then turn the power on again. If the error continues, replace the keyboard (Section 3.11). If the error still continues, replace the PS/M module (Section 3.5). If the error still continues, replace the terminal control module (Section 3.3).
VT330+ Comm1 DEC-423 Data Error—5	Replace the PS/M module (Section 3.5). If the error continues, replace the terminal control module (Section 3.3).

Table 2-1 (Cont.) VT330+ Display Error Messages

Error Message	Solution
VT330+ Comm2 DEC-423 Data Error—6	Replace the PS/M module (Section 3.5). If the error message appears again, then replace the terminal control module (Section 3.3).
VT330+ Printer Port Error—7	Replace PS/M module (Section 3.5). If the error message appears again, then replace the terminal control module (Section 3.3).
VT330+ Locator Port Error—8	See if the mouse/tablet is plugged in. Turn the VT330+ power off, then turn the power on. If the error message appears again then, replace the mouse/tablet (Section 3.12). If the error message appears again, then replace the terminal control module (Section 3.3).

2.7.1 NVR Error—1 Code

If a "VT330+ NVR Error—1" message appears when you turn the terminal on, there is a problem with the terminal 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 double sessions.

1. Press the **Set-Up** key. The Set-Up Directory appears.
2. Move the cursor to **Recall Factory Default Settings** and press the **Enter** key.
3. Move the cursor to **Global Set-Up** and press the **Enter** key. The Global Set-Up screen appears.
4. Check if the **Terminal Comm Ports** setting is **S1=Comm1, S2=Comm2**. If it is correct, then press the **Select** key to return to the Set-Up Directory. If the setting is not correct, then change it to **S1=Comm1, S2=Comm2**. Finally, press the **Select** key to return to the Set-Up Directory screen.
5. Move the cursor to **Save Current Settings** and press the **Enter** key. A Done message appears at the bottom of the screen.
6. Move the cursor to **User-Defined Key Set-Up** and press the **Enter** key. The User-Defined Key Set-Up screen appears.

7. Move the cursor to **Save User-Defined Keys** and press the **Enter** key. A **Done** message appears at the bottom of the screen.
8. Press the **Set-Up** key to exit the set-up.
9. Press the **Switch Session** key to enter the other session.
10. Press the **Set-Up** key to display the Set-Up directory again.
11. Move the cursor key to **Recall Factory Default Settings** and press the **Enter** key. A **Done** message appears at the bottom of the screen. The User-Defined Key Set-Up screen appears.
12. Move the cursor key to **Save User-Defined Keys** and press the **Enter** key. A **Done** message appears at the bottom of the screen.
13. Press the **Set-Up** key to exit Set-Up.
14. Turn the terminal power off, then turn the power on again. If the "VT330+ NVR Error—1" message still appears on the screen, the terminal has a hardware failure. Refer to Table 2-1 to determine the corrective action.

2.8 Troubleshooting General Problems

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

Table 2-2 VT330+ Troubleshooting Chart

Symptom	Probable Cause	Solution
There is no "VT330+ OK" message, power indicator off, no bell tone.	VT330+ is not plugged in, or no power at power outlet	Plug in VT330+, or try another wall power outlet.
	AC power cord	Check for an open line or shorts.
	Power switch assembly	Check the connections on the PS/M module (Section 3.5).
	PS/M module	Replace the PS/M module (Section 3.5).
Keyboard LEDs are blinking.	Terminal control module	Replace the terminal control module (Section 3.3).

Table 2-2 (Cont.) VT330+ Troubleshooting Chart

Symptom	Probable Cause	Solution
Keyboard LEDs stay on.	Terminal control module	Replace the terminal control module (Section 3.3).
Compressed raster, there is no video.	Video cable connections	Check the connections from the PS/M module to the CRT yoke.
Raster, no video	Video amp module	Check module connectors and reconnect if necessary. Check the CRT socket connection. Replace the PS/M module (Section 3.5).
CRT filaments are not lit.	CRT/bezel/chassis assembly	Check the CRT socket connection. Replace the CRT/bezel/chassis assembly (Section 3.9).
The "VT330+ OK" display is present, power indicator off.	LED assembly	Check the connection to the power supply/monitor module. Replace the CRT/bezel/chassis assembly (Section 3.9). Replace the PS/M module (Section 3.5).
Screen display is distorted.	Monitor is out of alignment	Perform the alignment procedure (Chapter 4).
	Monitor circuit	Replace the PS/M module (Section 3.5).
	Terminal control module	Replace the terminal control module (Section 3.3).
	CRT/bezel assembly	Replace the CRT/bezel assembly (Section 3.9).
There is no bell tone.	Bell is disabled	Set Warning Bell to "high" or "low" in the Keyboard Set-Up.
	Keyboard speaker is faulty	Replace the keyboard (Section 3.11).

Table 2-2 (Cont.) VT330+ Troubleshooting Chart

Symptom	Probable Cause	Solution
Different characters appear on the screen than were typed in the local mode.	Alternate character set selected	Use the Recall Saved Settings in the Set-Up directory.
	Keyboard	Replace the keyboard (Section 3.11).
	Terminal control module	Replace the terminal control module (Section 3.3).
Different characters appear on screen than were typed while on-line with the host (terminal works in local).	Transmit and receive speeds are set wrong	Set speeds to match the host (Communications Set-Up).
	Bits per character or parity setting is wrong	Set Character Format to match the host (Communications Set-Up).
	Stop Bits setting is wrong	Set Stop Bits to match the host (Communications Set-Up).
Screen display does not scroll. Hold Session indicator is on.	Screen display is locked	Press the Hold Session (F1) key to release.
Terminal appears to be locked, does not respond to the data from the host.	Wrong session selected	Press the Switch Session key.
	LAT is disconnected	Press the Set-Up key. Move the cursor to Enable Sessions and press the Enter key. Press the Set-Up key to exit Set-Up. Turn the power off (0), then on (1). Log in to the terminal and establish dual sessions.
	Incorrect communications setting	Clear the settings by using the Clear Communications field in the Set-Up directory.

Table 2-2 (Cont.) VT330+ Troubleshooting Chart

Symptom	Probable Cause	Solution
Screen goes blank after a successful power-up, then is inactive for one-half hour. Power indicator is on.	CRT Saver feature in the Global Set-up is enabled	Press any key to reactivate the screen.
Messages are incomplete.	XON/XOFF is not selected	Set Transmit Flow Control to XON/XOFF (Communications Set-Up).
	Comm port connections	Check cables at the comm ports.
	Terminal control module	Replace the terminal control module (Section 3.3).
Terminal does not respond to an escape sequence.	Incorrect Terminal Mode selected	Check the setting of the Terminal Mode feature in the General Set-Up.

3

Removing and Replacing FRUs

This chapter shows you how to remove and replace VT330+-G, H, and J 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.

WARNING

Refer to Section 3.10 when you need to remove and dispose of a defective CRT.

3.1 Rear Panel

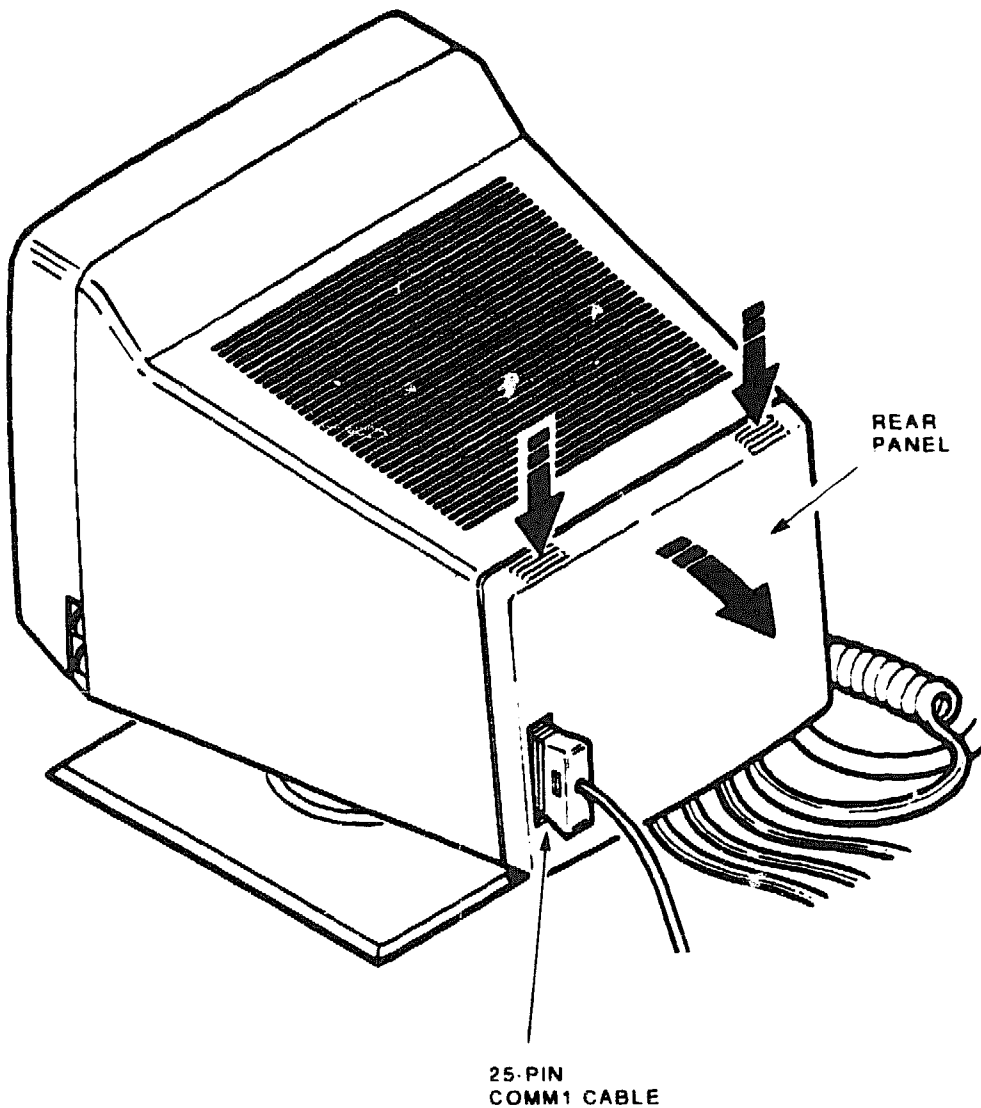
To remove the rear panel:

1. Turn the terminal power switch off (0).
2. Grasp the top of the rear panel and pull it towards you.
3. 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 it. Set the panel aside.

To install the panel, reverse steps 1 through 3.

3-2 Removing and Replacing FRUs



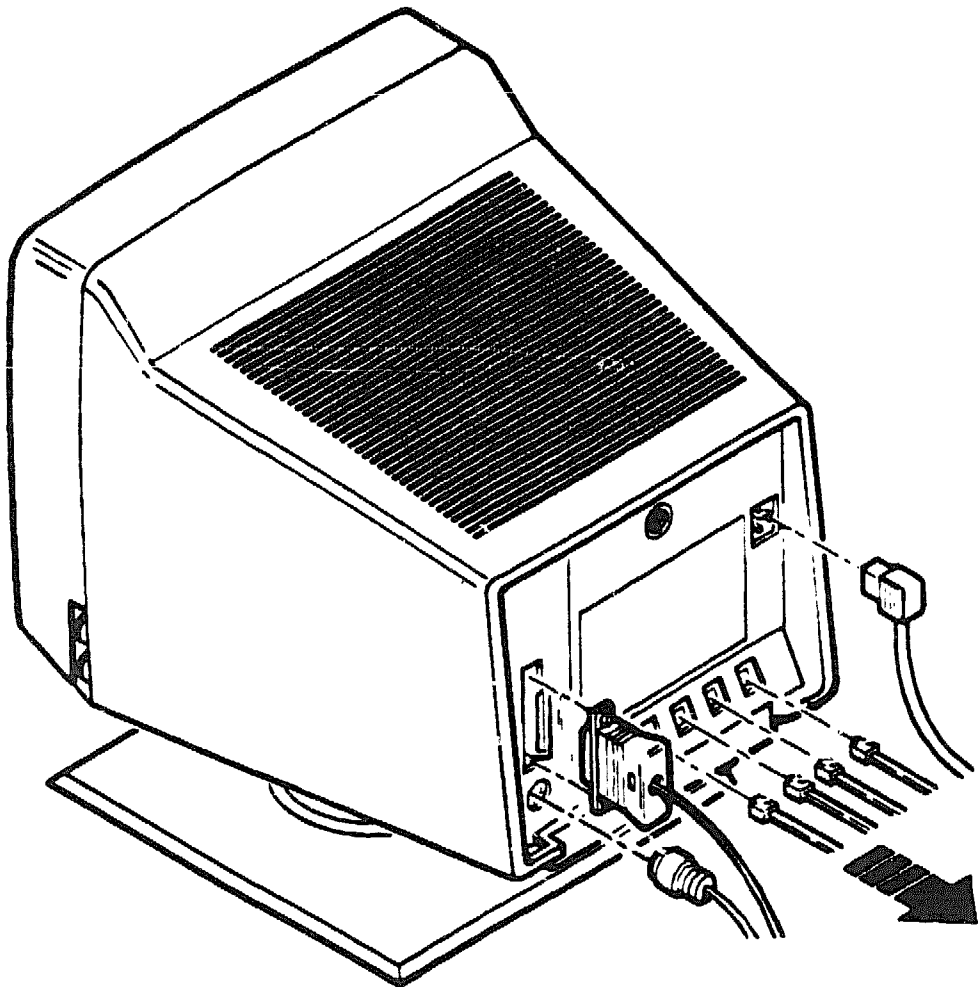
MA-X0887-89

3.2 Rear Enclosure/Base Assembly

To remove the rear cover/base assembly:

1. Remove the rear panel (Section 3.1).
2. Turn the terminal power switch off (0).
3. Unplug the power cord from the wall outlet, then from the terminal.

4. Disconnect the keyboard cable from the terminal.
5. Disconnect all other cables from the rear of the terminal including the:
 - host port cable(s)
 - printer cable
 - locator device cable



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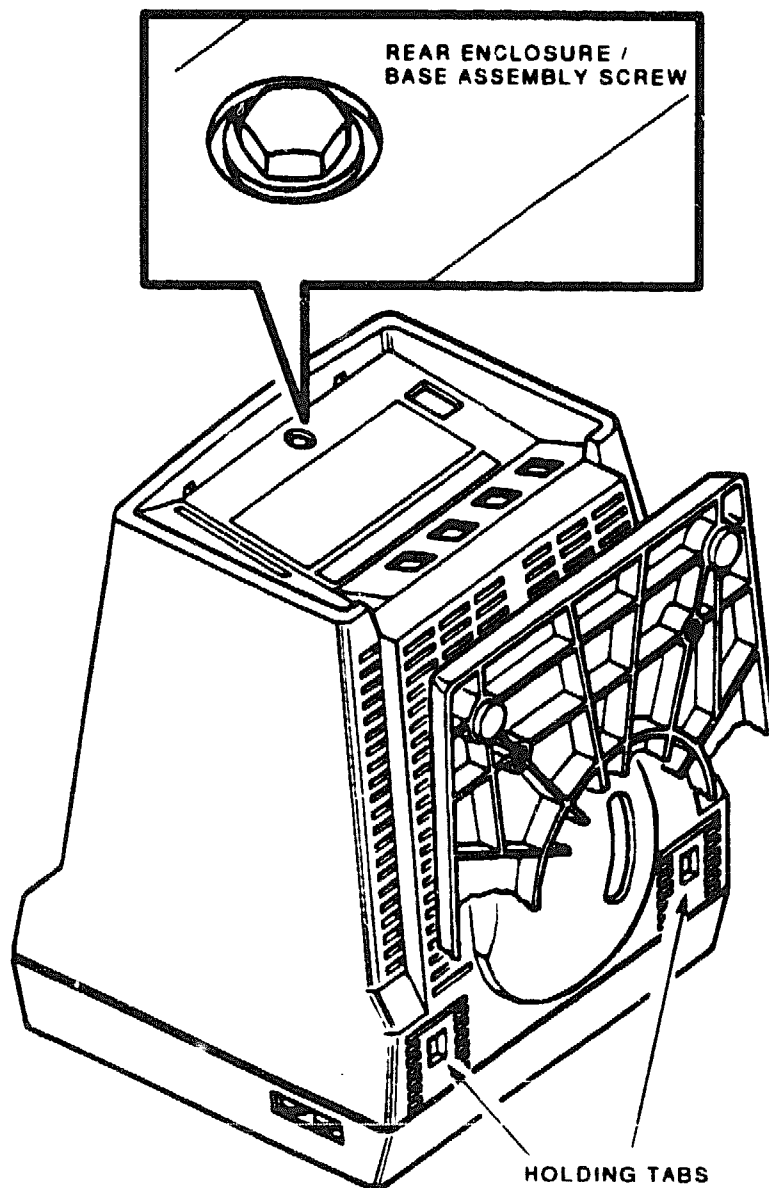
6. Place a piece of paper on a flat working surface. Carefully place the terminal facedown on the paper. The paper prevents scratches on the monitor bezel.

3-4 Removing and Replacing FRUs

NOTE

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

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



MA-X0889-89

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.

8. 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 8.

CAUTION

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

3.3 Terminal Control Module

To remove the terminal control module:

NOTE

If you have to discharge the CRT before removing the terminal control module, refer to Section 3.4.

1. Remove the rear panel (Section 3.1).
2. Remove the rear enclosure/base assembly (Section 3.2).

CAUTION

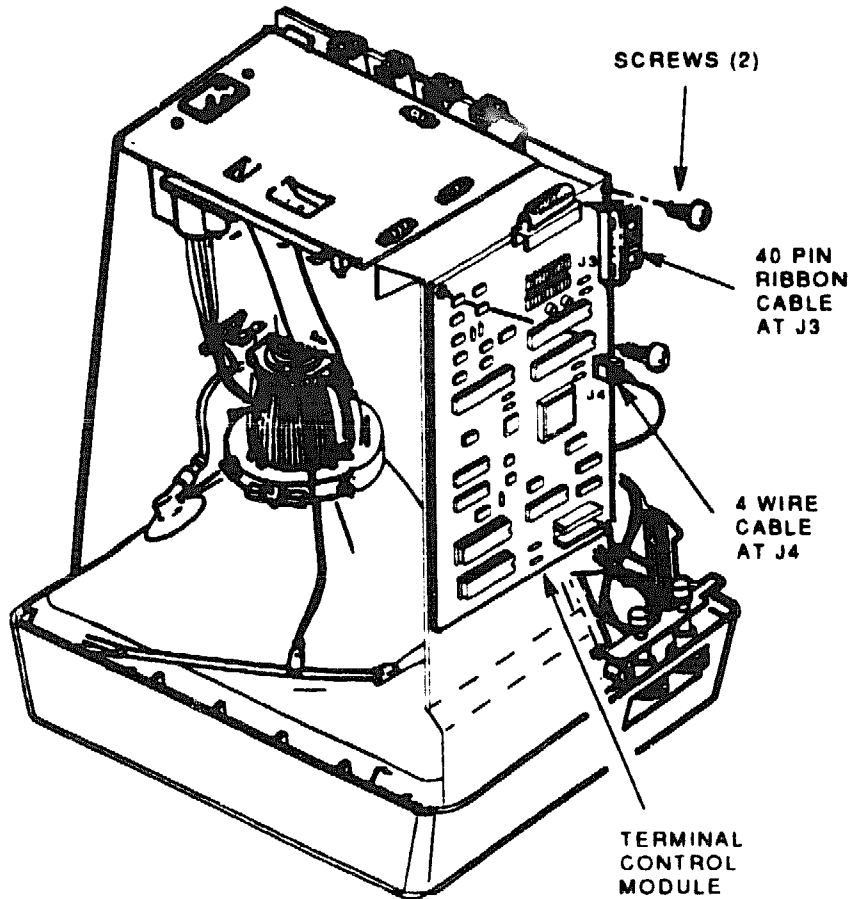
Use a static protection kit (PN 29-11762-00) when handling any internal components.

3. Disconnect the following cables on the terminal control module:
 - 40-pin ribbon cable from connector J3
 - 4-wire cable from connector J4 (locked)

3-6 Removing and Replacing FRUs

4. Loosen the two phillips screws that hold the terminal control module to the chassis.
5. Press the bottom of the module to loosen it, and slide the module up, then carefully pull it toward you.

To install the terminal control module, reverse steps 3 through 5.



MA-X0890-89

3.4 Discharging the CRT

To discharge the CRT:

WARNING

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

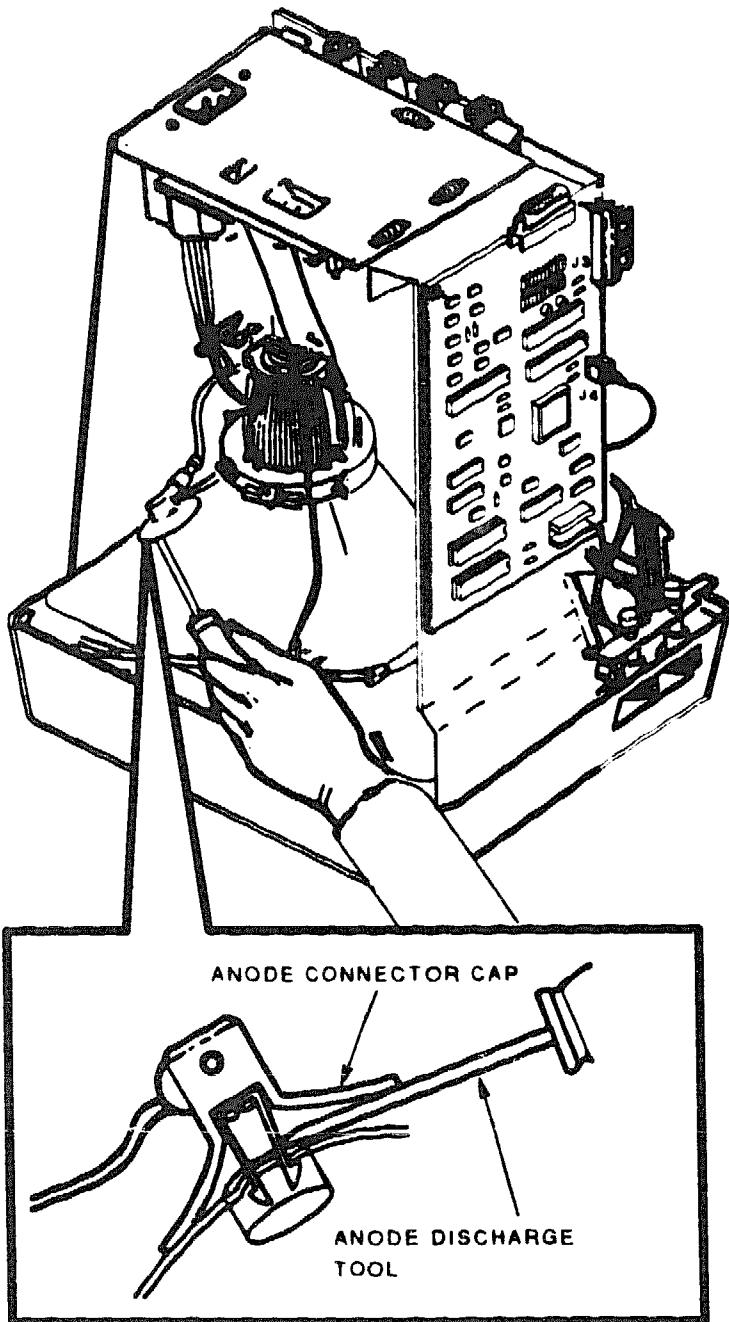
1. Remove the rear panel (Section 3.1).
2. Remove the rear enclosure/base assembly (Section 3.2).
3. Attach the clip end of the anode discharge tool (PN 29-24717-00) to the metal chassis.
4. Push the probe end under the soft plastic anode connector cap, until you feel the probe touching the anode connector.

CAUTION

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

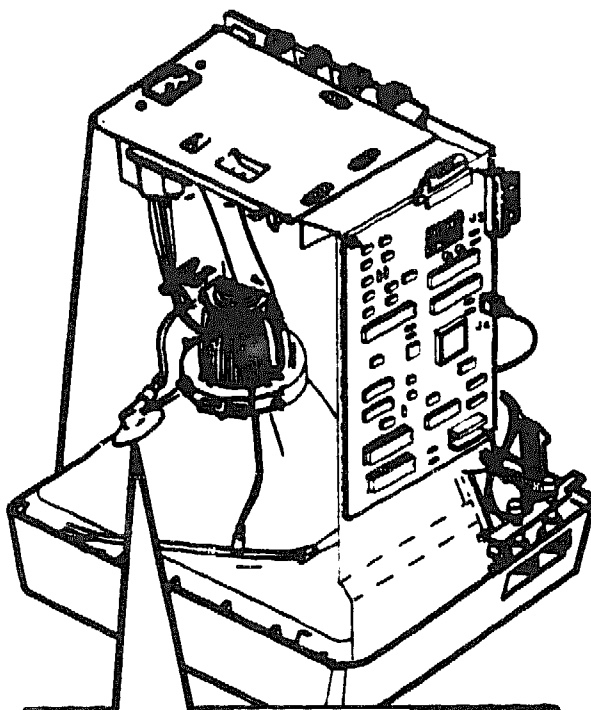
5. Hold the probe against the anode connector for at least 3 seconds, then remove the probe.

3-8 Removing and Replacing FRUs



MA X0891 89

6. Remove the CRT anode connector from the CRT, as shown.



A PUSH THE DIRECTION
OF THE ARROW



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



3.5 Power Supply/Monitor Module and Video Amp Module

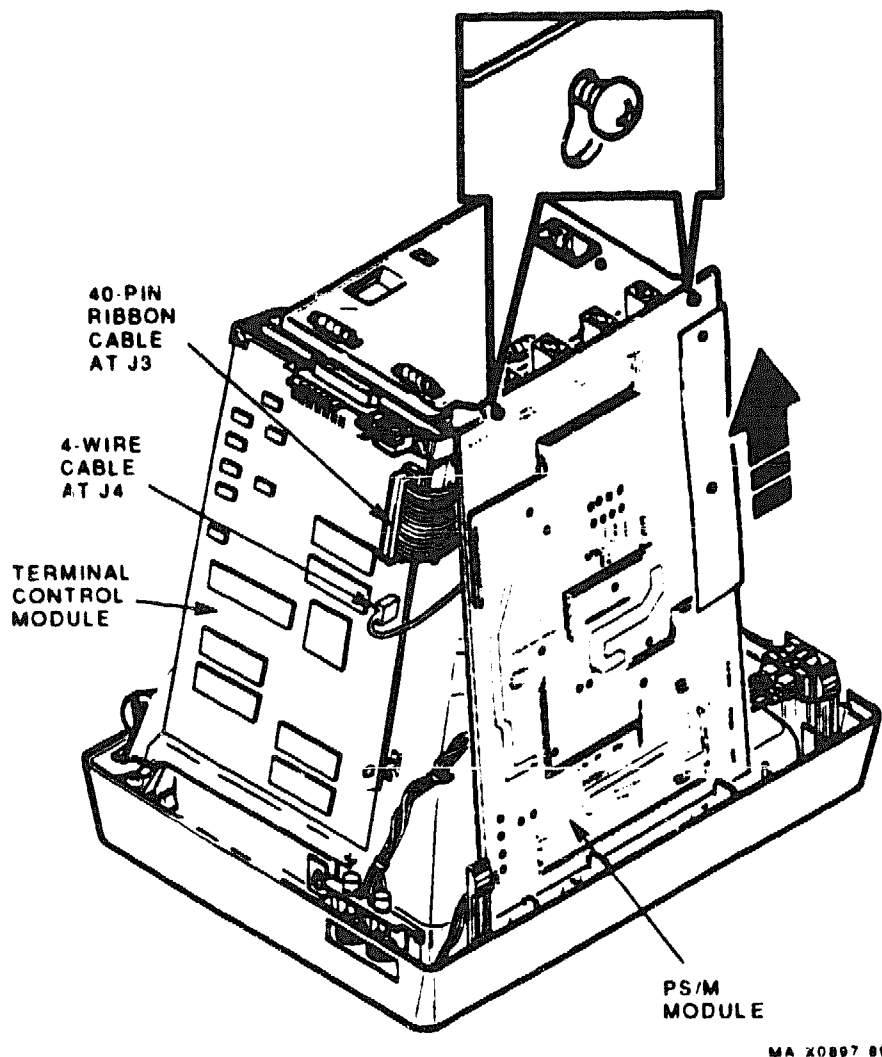
To remove the power supply/monitor (PS/M) module and video amp module:

1. Remove the rear panel (Section 3.1).
2. Remove the rear enclosure/base assembly (Section 3.2).

WARNING

You must discharge the CRT (Section 3.4) before removing the PS/M module and video amp module. Keep the CkT anode connector detached from the CRT.

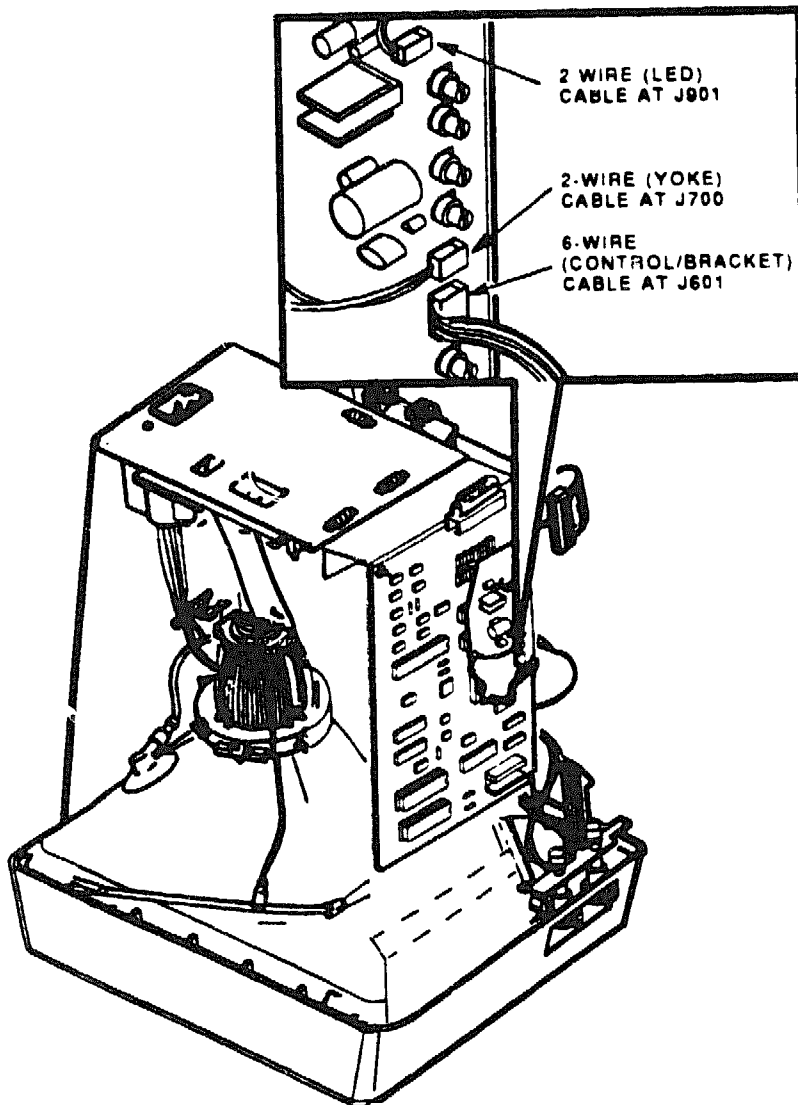
3. Disconnect the 40-pin ribbon cable from the terminal control module connector J3.
4. Disconnect the 4-wire cable from the terminal control module connector J4.
5. Remove the wires from the two cable tie wraps on the chassis.
6. Loosen the two phillips screws that hold the PS/M module to the chassis.
7. Gently slide the PS/M module up and off the screws to expose the cables.



8. Disconnect the following cables on the PS/M module:

- 2-wire (LED) cable to connector J901 (locked)
- 6-wire (control/bracket) cable to connector J601 (locked)
- 2-wire (yoke) cable to connector J700 (locked) (above 6-wire cable)

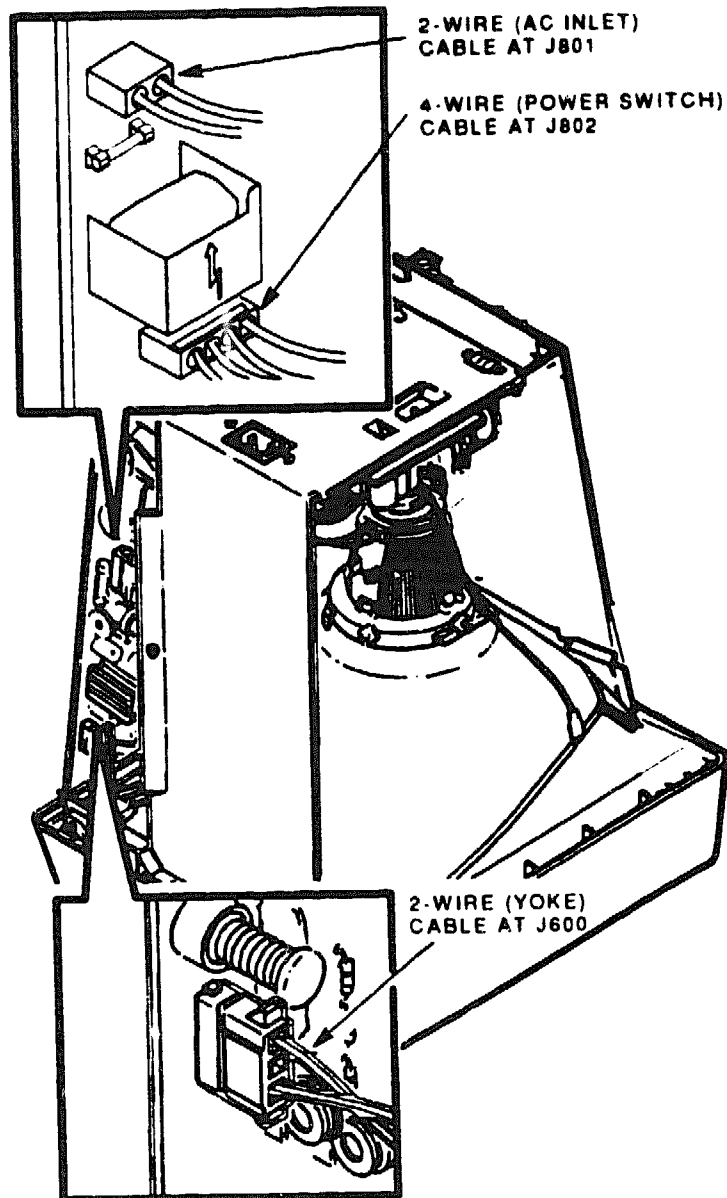
3-12 Removing and Replacing FRUs



MA X0896-89

- 2-wire (AC inlet) to connector J801 (locked)
- 4-wire (power switch) cable to connector J802 (locked)

- 2-wire (yoke) cable to connector J600



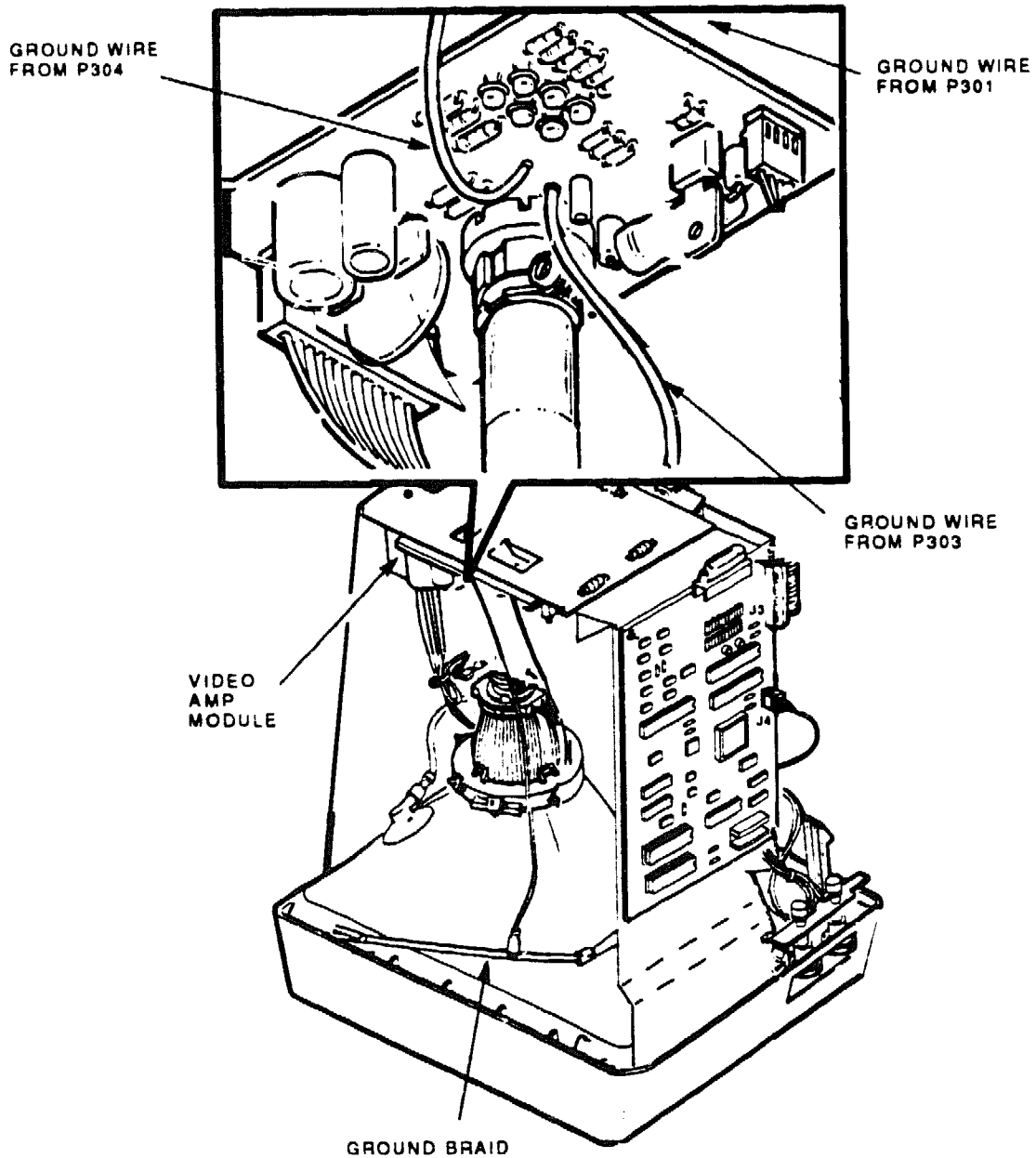
MA X0898-89

9. Disconnect the following ground wires:

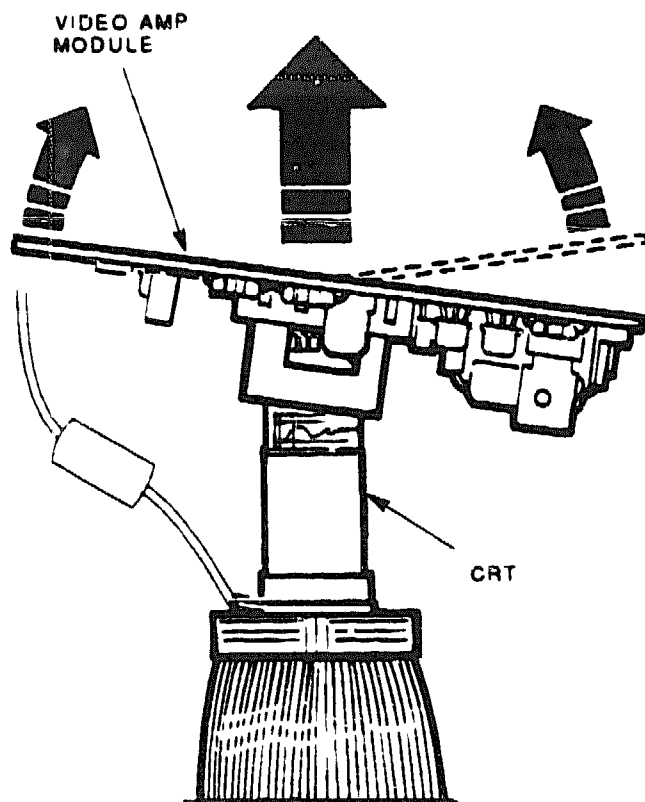
- From the video amp module (P302) to the grounding braid (one wire)
- From the video amp module (P304) to the back of the chassis (one wire)

3-14 Removing and Replacing FRUs

- From the video amp module (P301) to the side of the chassis (one wire)



10. Carefully lift the video amp module off the neck of the CRT by using a gentle side-to-side motion. The video amp module is still connected to the PS/M module by a 9-wire cable.



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11. Remove the PS/M module and video amp module from the chassis.

To install the PS/M module and video amp module, reverse steps 1 through 11 and refer to the following list.

3-16 Removing and Replacing FRUs

The following is a list of modules, cables, and tie wraps that must be connected to properly install the PS/M module and arc protection module.

- ☐ PS/M module to the chassis.
- ☐ Video amp module to the CRT neck.
- ☐ Ground wire from P301 on the video amp module to the rear of the chassis.
- ☐ Ground wire from P304 on the video amp module to the side of the chassis.
- ☐ Ground wire from P302 on the video amp module to the grounding braid.
- ☐ 2-wire (yoke) cable to connector J600 on the PS/M module.
- ☐ 2-wire (power switch) cable to connector J802 on the PS/M module.
- ☐ 2-wire (AC inlet) cable to connector J801 on the PS/M module.
- ☐ 2-wire (yoke) cable to connector J700 (above the 6-wire cable) on the PS/M module.
- ☐ 6-wire (control/bracket) cable to connector J601 on the PS/M module.
- ☐ 2-wire (LED) cable to connector J901 on the PS/M module.
- ☐ Two tie wraps holding wires on the chassis.
- ☐ 40-wire cable from the terminal control module connector J4.
- ☐ 40-pin ribbon cable from the terminal control module connector J3.
- ☐ Anode connector to the CRT.

CAUTION

When you install the video amp board 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.

3.6 Power Switch Assembly

First remove the following FRUs:

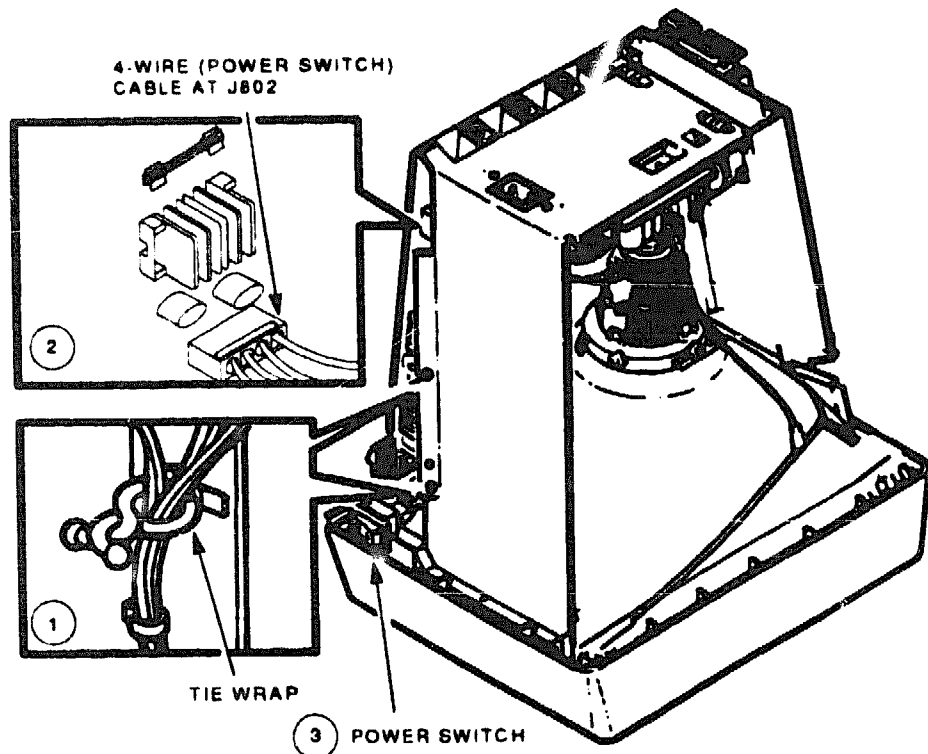
Rear panel (Section 3.1).

Rear enclosure/base assembly (Section 3.2).

To remove the power switch assembly:

1. Remove the power switch wires from the two tie wraps on the chassis.
2. Disconnect the 4-wire (power switch) cable (locked) from the PS/M module connector J802.
3. Pull the switch up and out of the holder and remove the assembly.

To install the power switch assembly, reverse steps 1 through 3.



3.7 AC Inlet Assembly

First remove the following FRUs:

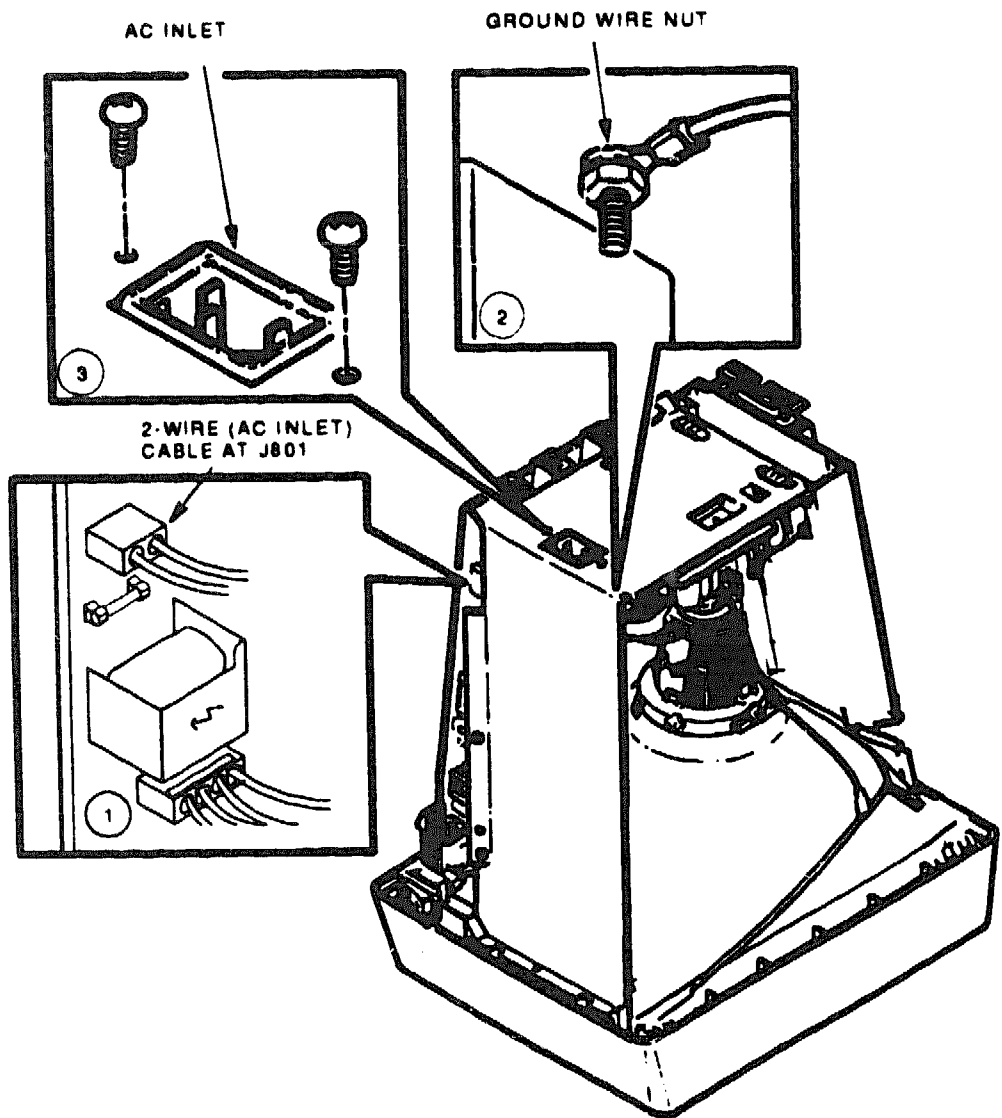
Rear panel (Section 3.1).

Rear enclosure/base assembly (Section 3.2).

To remove the AC inlet assembly:

- 1. Disconnect the 2-wire (AC inlet) cable from the PS/M module connector J801.**
- 2. Use a 3/8 inch nutdriver to remove the nut that holds the ground wire (green) from the AC inlet to the chassis.**
- 3. Remove the two phillips screws and nuts holding the AC inlet, then remove the AC inlet.**

To install the AC inlet assembly, reverse steps 1 through 3.



3.8 Control/Bracket Assembly (Brightness and Contrast)

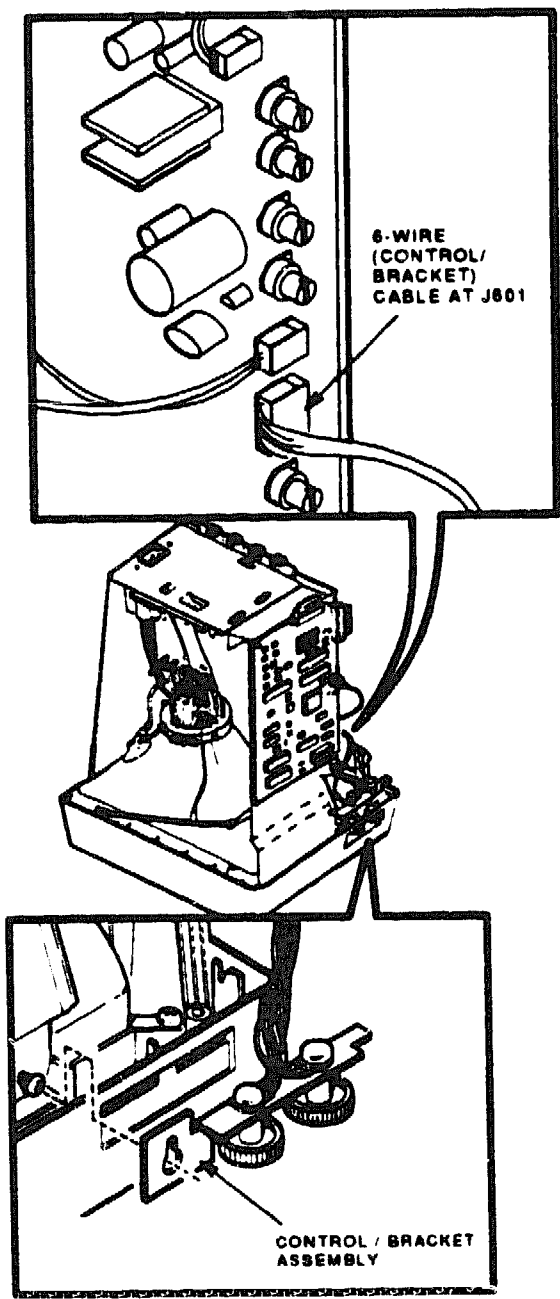
To remove the control/bracket assembly:

1. Remove the rear panel (Section 3.1).
2. Remove the rear enclosure/base assembly (Section 3.2).
3. Disconnect the 6-wire (control/bracket) cable from the PS/M module connector J601.
4. Loosen the phillips screw that holds the brightness and contrast controls to the chassis.
5. Lift the control/bracket assembly off the chassis.

To install this assembly, reverse steps 1 through 5.

NOTE

When installing the control/bracket assembly, make sure the controls do not bind against the bezel.



3.9 CRT/Bezel/Chassis Assembly

The CRT/bezel/chassis assembly is one FRU. The LED is part of this assembly. Do not try to remove or repair any part of this assembly in the field.

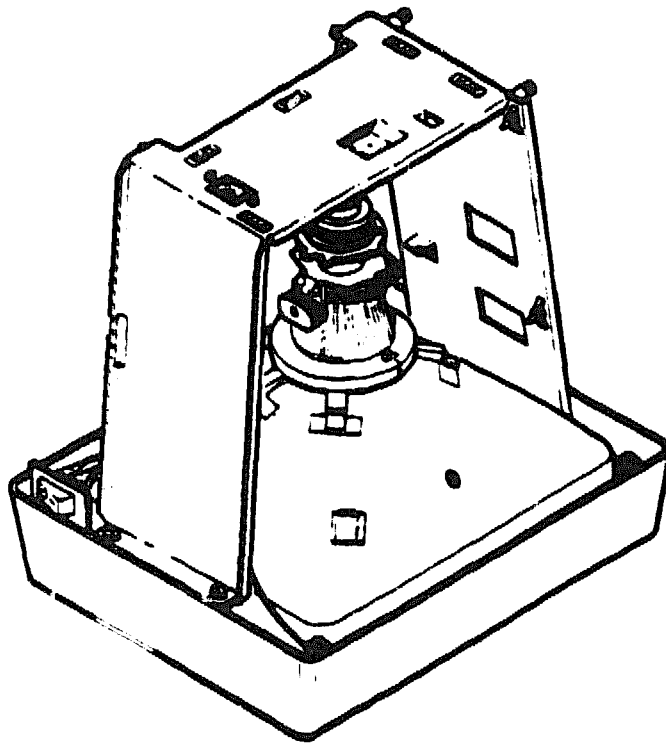
To replace the assembly:

WARNING

You must discharge the CRT (Section 3.4) before removing any of the following FRUs.

1. Remove and save the rear panel (Section 3.1).
2. Remove and save the rear enclosure/base assembly (Section 3.2).
3. Remove and save the terminal control module (Section 3.3).
4. Remove and save the PS/M module and video amp module (Section 3.5).
5. Remove and save the power switch assembly (Section 3.6).
6. Remove and save the AC inlet (Section 3.7).
7. Remove and save the control/bracket assembly (Section 3.8).
8. Now you can remove the CRT/bezel/chassis assembly.

To install the CRT/bezel/chassis assembly, perform steps 1 through 8 in the reverse order. To prepare the assembly for installation, 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.



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3.10 CRT Disposal

WARNING

These steps should only be performed by trained Digital Customer Services Engineers only. This procedure is not intended for use by OEM and self-maintenance customers.

This section describes how to safely dispose of the terminal cathode ray tube (CRT).

NOTE

This procedure supersedes all other tech tips about replacing and disposing of CRTs.

3-24 Removing and Replacing FRUs

CRTs are glass vacuum tubes. Because air pressure outside the tube is greater than air pressure inside the tube, 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 personnel. Only Digital personnel should be in the area during CRT removal and replacement.

Protective Gear

Any person replacing a CRT must wear at least safety goggles (PN 29-16141-00) and the approved gloves (PN 29-16146-00).

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 an emergency**
- **Safety goggles (PN 29-16141-00)**
- **Gloves (PN 29-14146-00)**
- **Pliers (PN 29-10311-00)**

WARNING

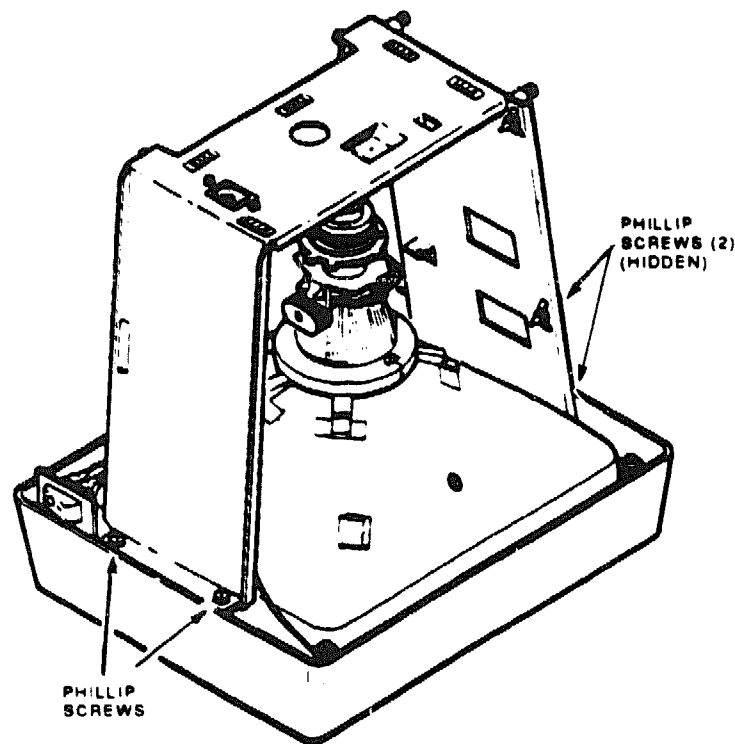
Be careful when performing this procedure. For your safety, you must use the specified gloves and goggles.

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

Remove the following:

1. **Remove and save the rear panel (Section 3.1).**
2. **Remove and save the rear enclosure/base assembly (Section 3.2).**
3. **Remove and save the terminal control module (Section 3.3).**
4. **Remove and save the PS/M module and video amp module (Section 3.5).**
5. **Remove and save the power switch assembly (Section 3.6).**
6. **Remove and save the AC inlet (Section 3.7).**
7. **Remove and save the control/bracket assembly (Section 3.8).**
8. **Remove the four phillips screws that secure the chassis to the CRT/bezel.**

3-26 Removing and Replacing FRUs



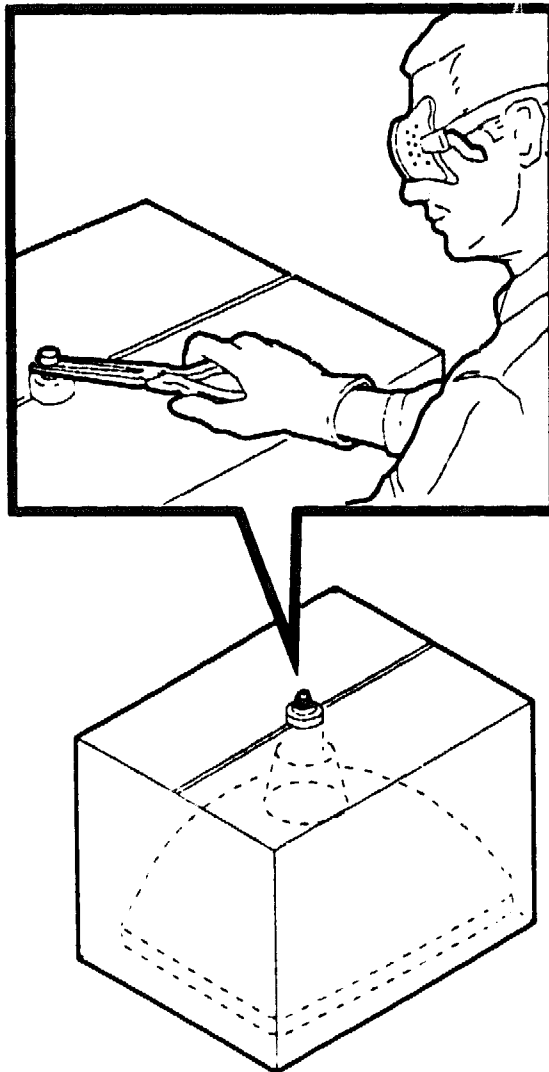
MA 81336 00

9. Remove the chassis.
10. Discard the chassis.
11. Place the old CRT and the original packing material in the container from which you removed the new CRT.
12. Seal up the container so that only the very tip of the CRT neck is exposed.
13. 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 intrushing air has stopped.

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.



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

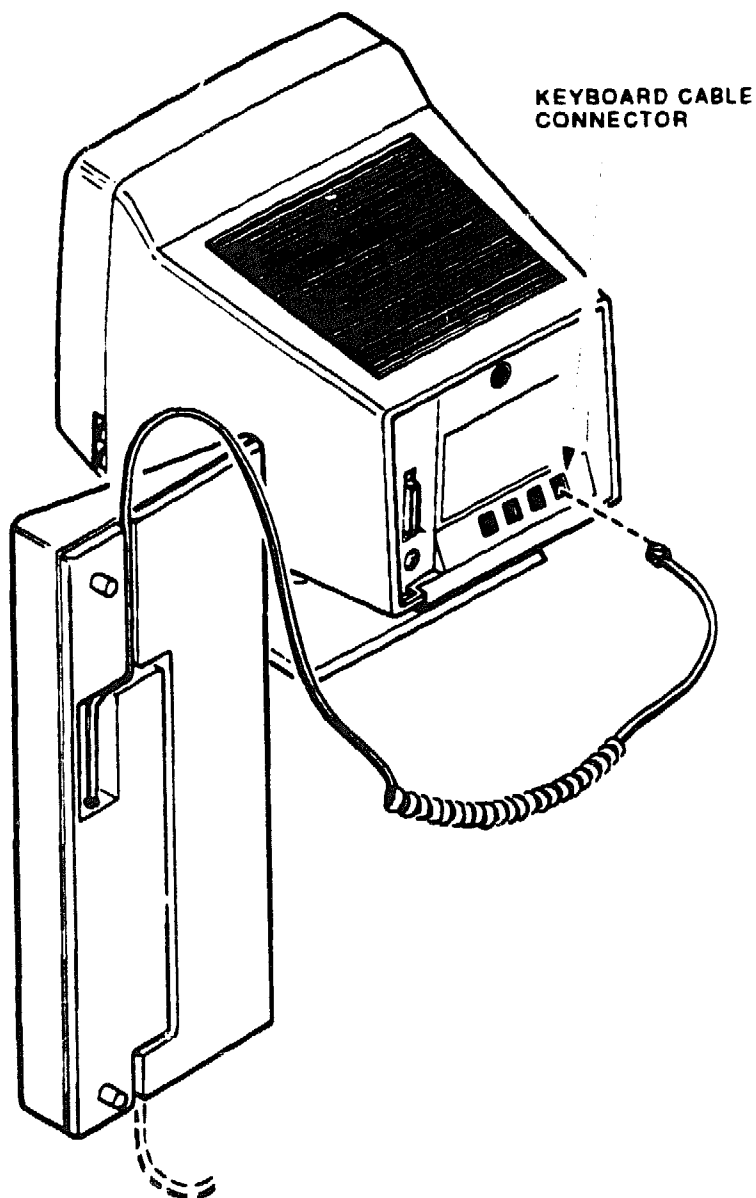
NOTE

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

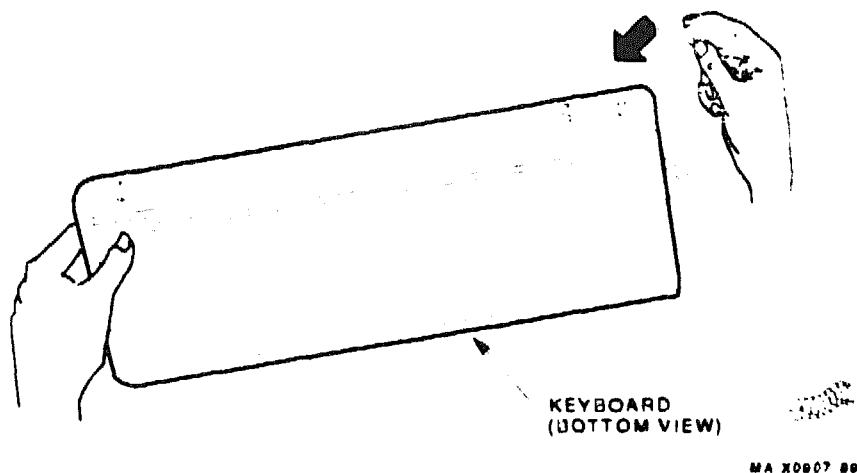
3.11 Keyboard

If the keyboard is faulty, replace the complete keyboard. To replace the keyboard:

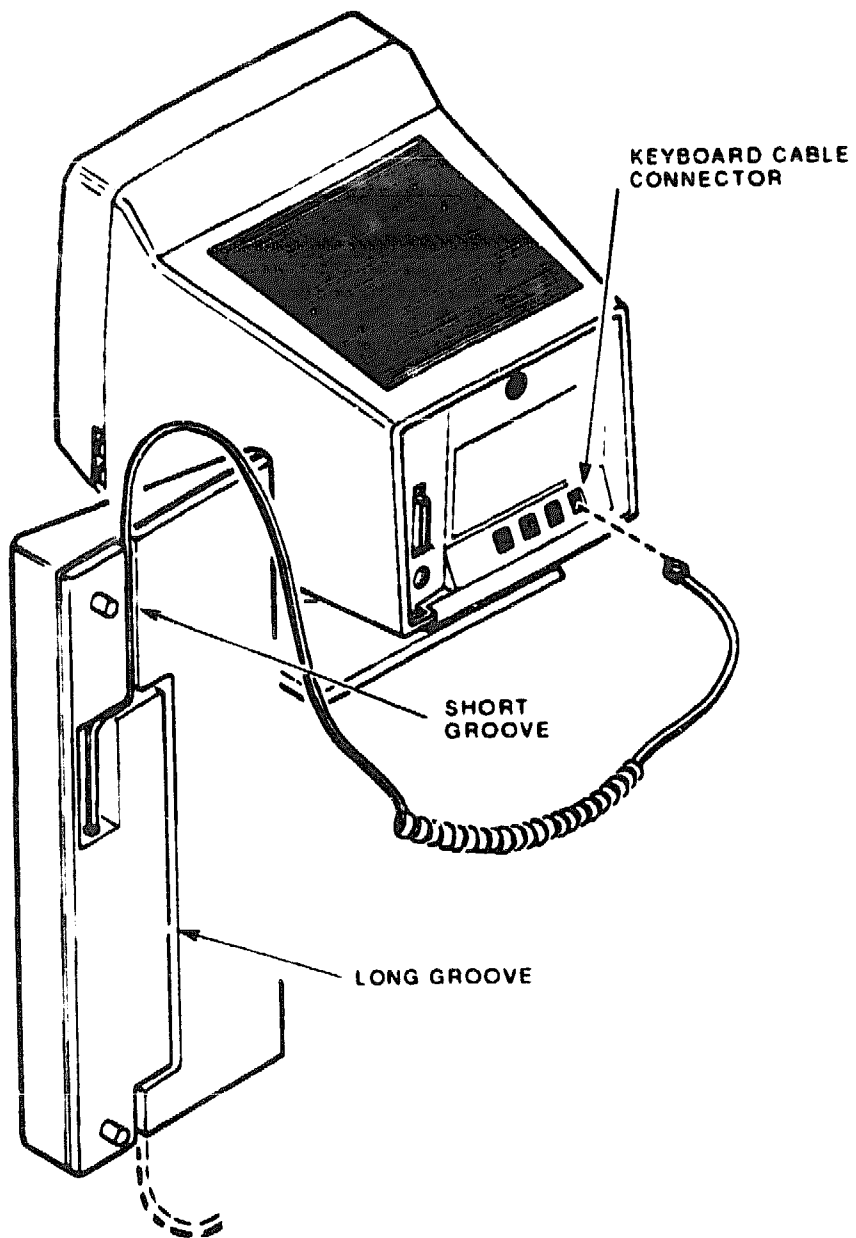
1. Turn the terminal power switch off (0).
2. Disconnect the keyboard cable from the rear of the terminal.
3. Remove the old keyboard. If you have a US keyboard, go to step 5.



5. Install the keyboard standoffs on the new keyboard.



6. Connect the new keyboard to the terminal as follows:
 - a. Insert the long straight end of the keyboard cable into the connector on the bottom of the keyboard.
 - b. 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.
 - c. Insert the other end of the cable into the keyboard connector on the rear of the terminal.



3.12 Mouse or Tablet (Options)

The VSXXX-AA mouse and 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:

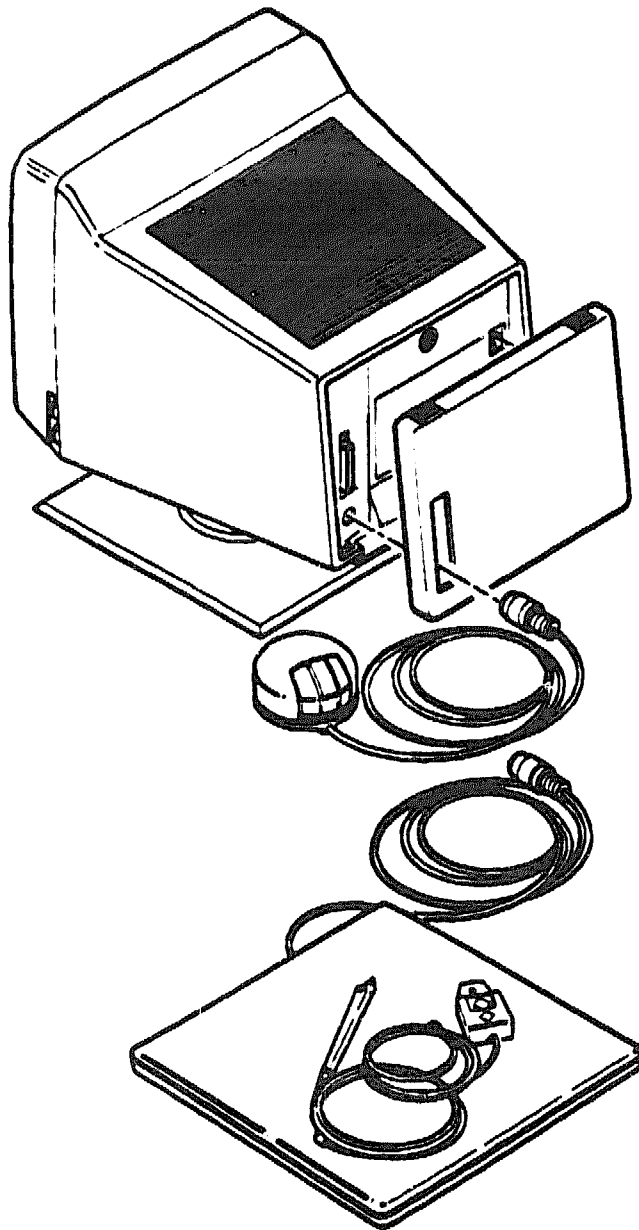
1. Remove the terminal rear panel (Section 3.1).
2. Disconnect the mouse or tablet cable from the terminal.

To install a new mouse or tablet:

1. Feed the cable through the opening in the rear panel.
2. Connect the cable to the 7-pin connector and 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.



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4

Aligning the Video Terminal

This chapter explains how to align the VT330+ Models G, H, and J terminals.

4.1 General

When you need to do an adjustment, check all adjustments in the order shown, because many adjustments affect each other. You do not have to perform every adjustment each time you align the terminal. If a setting is already correct, you can skip that adjustment and go to the next one.

You must use the screen adjustment test patterns to make all adjustments. Use Section 4.2.1 to setup 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 metal clip on the tape, start the measurement at 10 cm (100 mm). Make sure all adjustments are made under these conditions.

4.2 Video Terminal Adjustments

Figures 4-1 and 4-2 show the location of the controls used to make most adjustments. Table 4-1 lists the controls and their locations. The individual procedures describe the function of each control.

NOTE

Let the terminal warm up for at least 5 minutes before performing any adjustments on the power supply/monitor (PS/M) module.

4-2 Aligning the Video Terminal

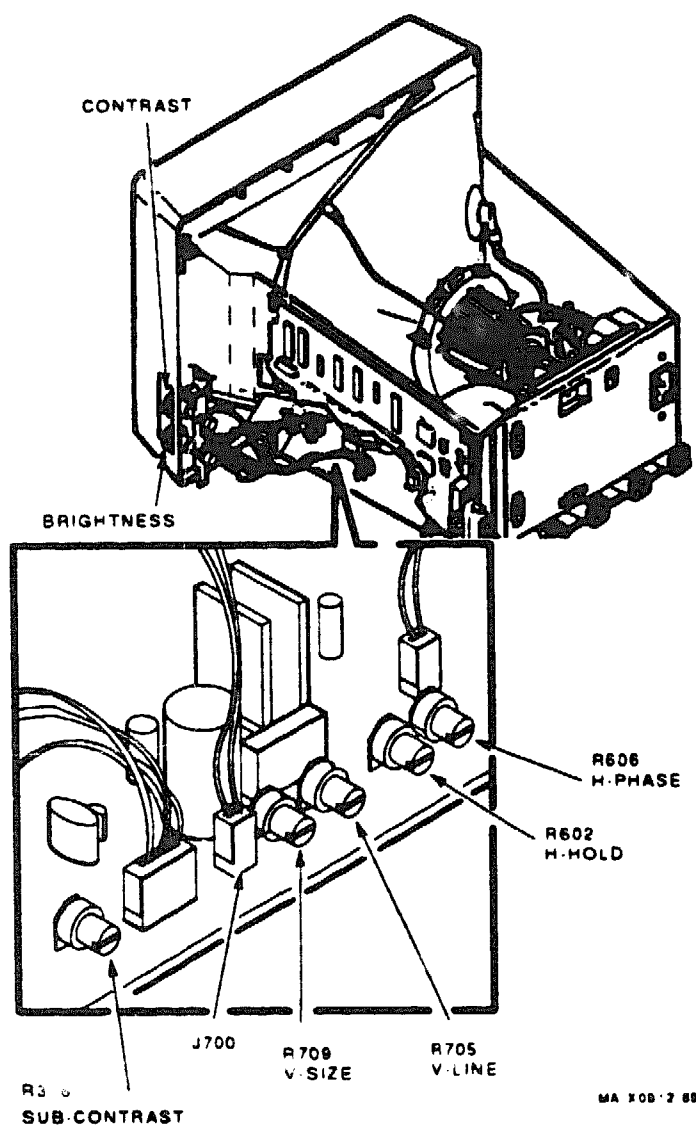
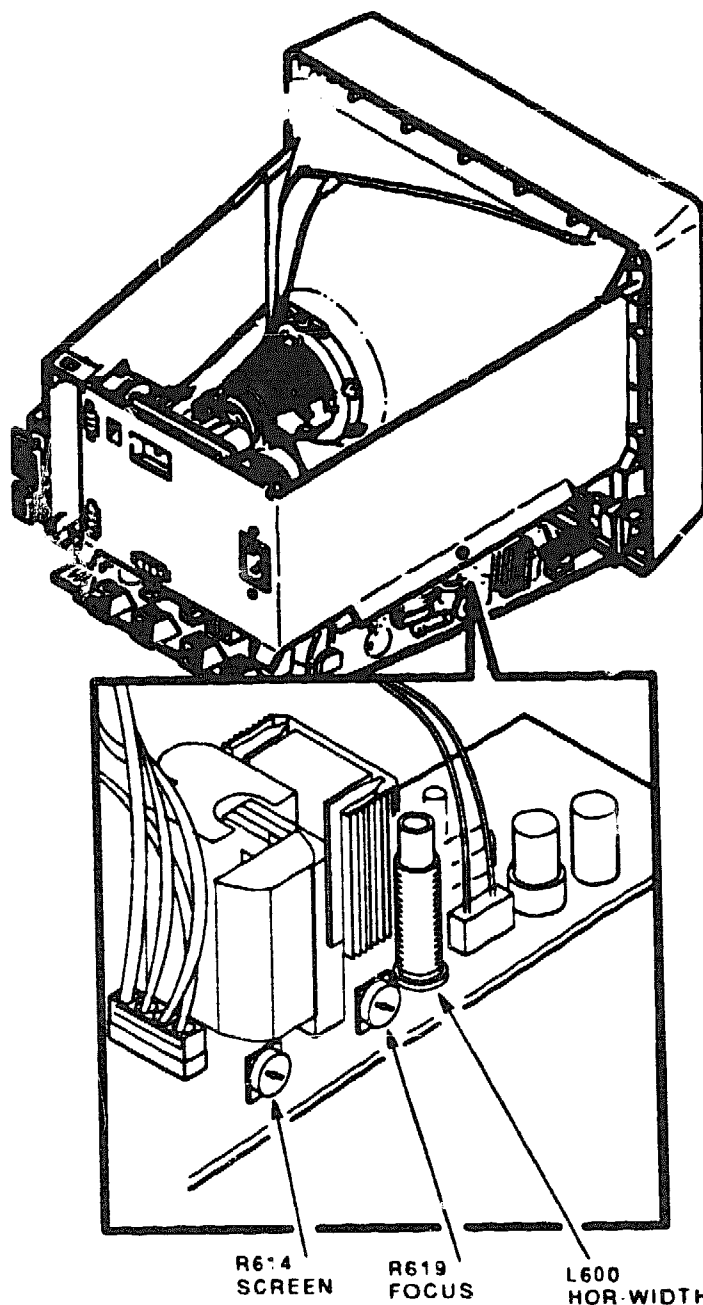


Figure 4-1 Video Adjustment Controls - 1

Figure 4-2 also shows the location of the controls used to make adjustments.



MA X0913 88

Figure 4-2 Video Adjustment Controls - 2

4-4 Aligning the Video Terminal

Table 4-1 lists the adjustment controls and their locations.

Table 4-1 Adjustment Controls

PS/M Module (From Bezel to Rear of Chassis)			
Left Side		Right Side	
L600	HOR-WIDTH (Horizontal width)	R316	SUB-CONTRAST
R619	Focus	R709	V-SIZE (Vertical height)
R614	Screen	R765	V-LINE (Vertical linearity)
		R602	H-HOLD (Horizontal hold)
		R606	H-PHASE (Horizontal phase)

4.2.1 Before You Start

Before you perform the adjustment:

1. Remove the rear panel (Section 3.1).
2. Remove the rear enclosure/base assembly (Section 3.2).
3. Place the terminal on a nonconductive surface.
4. Reconnect the keyboard cable and power cord.
5. Turn the power switch on (1). Wait for the "VT330+ OK" message to appear on the screen.

4.2.2 Displaying Screen Tests

To display the test patterns, use the Diagnostic Set-Up screen (Section 2.4).

1. Let the terminal warm up for at least 5 minutes.
2. Press the **Set-Up** key. The Set-Up Directory appears on the screen.
3. Use the arrow keys to select the **Diagnostics Set-Up** field. Press the **Enter** key to display the Diagnostic Set-Up screen.
4. Use the arrow keys to select **Run Screen Tests**.

5. Press the **Enter** key to run the screen tests. The terminal displays a series of test patterns repeatedly.

- To keep a test pattern on the screen, press the **Hold Session** key when the pattern appears.
- To select a pattern at random, press one of the following keys on the numeric keypad and the **Hold Screen** key. If you want to use this method to display screen test patterns, do not press the **Hold Screen** key until you want to display the series of test patterns repeatedly.

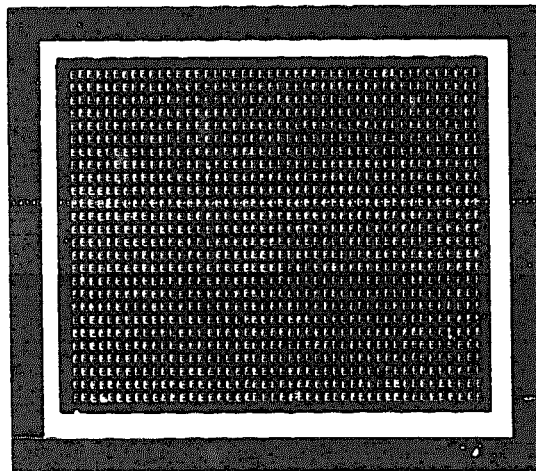
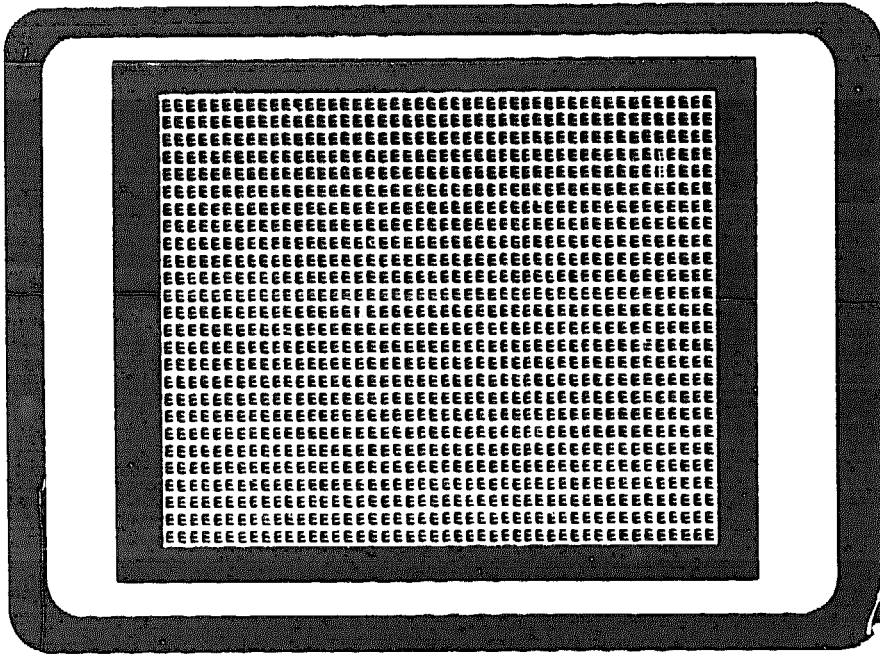
0	= light gray screen
1	= screen of Es
2	= crosshatch
3	= alternating rows of %s and a blank line
4	= gray scale
5	= dark gray screen
6	= white screen
Enter	= Diagnostic Set-Up screen

4.2.3 Sub-Brightness and Sub-Contrast

To adjust the settings:

1. Run the screen test (Section 4.2.2).
2. Select the screen of Es by pressing the **1** key or stop the screen test with the **Hold Session** key when the screen of Es appears.

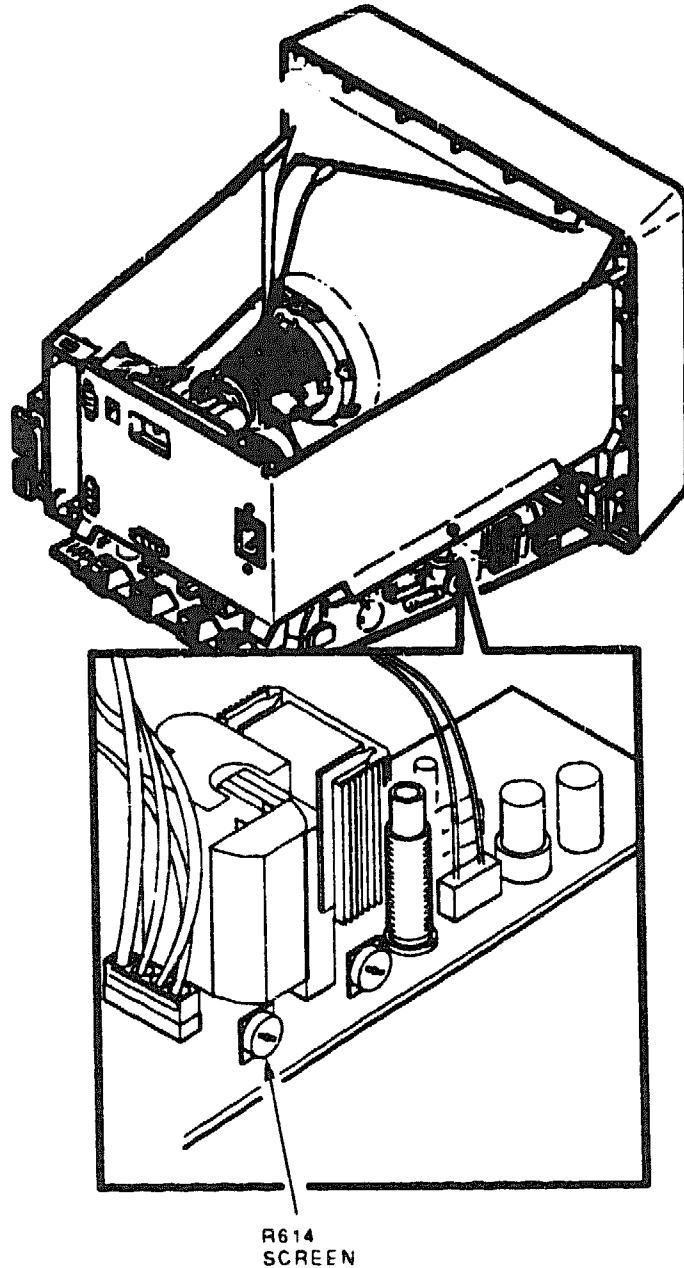
4-6 Aligning the Video Terminal



MA X0938 88

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

4. Adjust the R614 (Screen) control until the raster (white diagonal lines) almost disappears but is still distinctly visible.

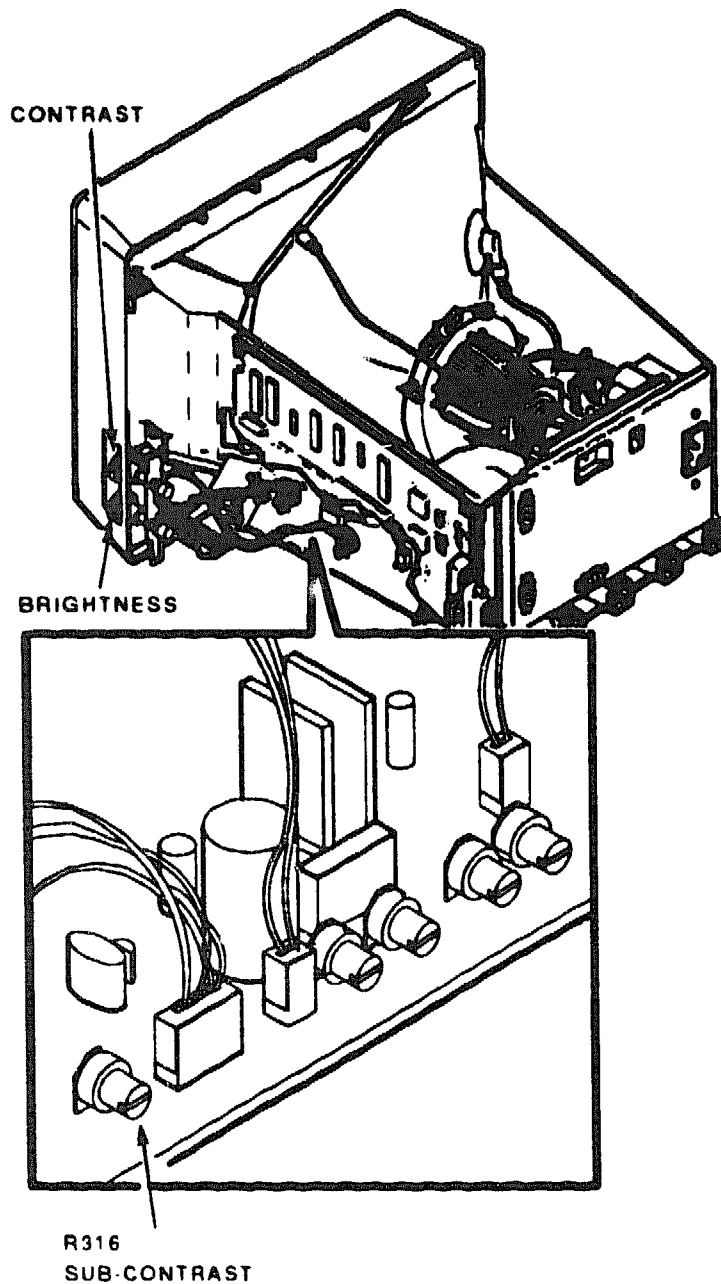


MA X0102 90

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

4-8 Aligning the Video Terminal

6. Adjust the R316 (SUB-CONTRAST) control until the characters are almost blurred but still in focus.



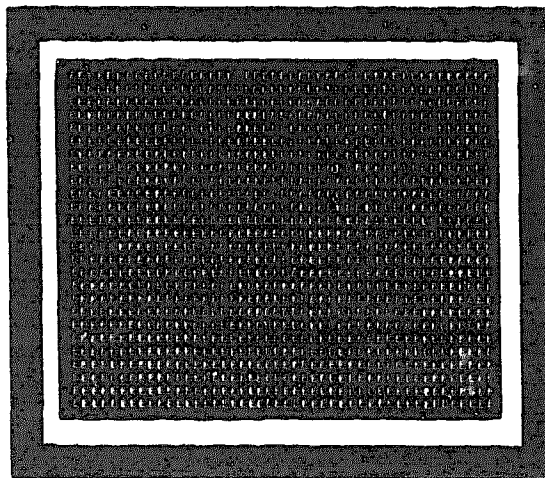
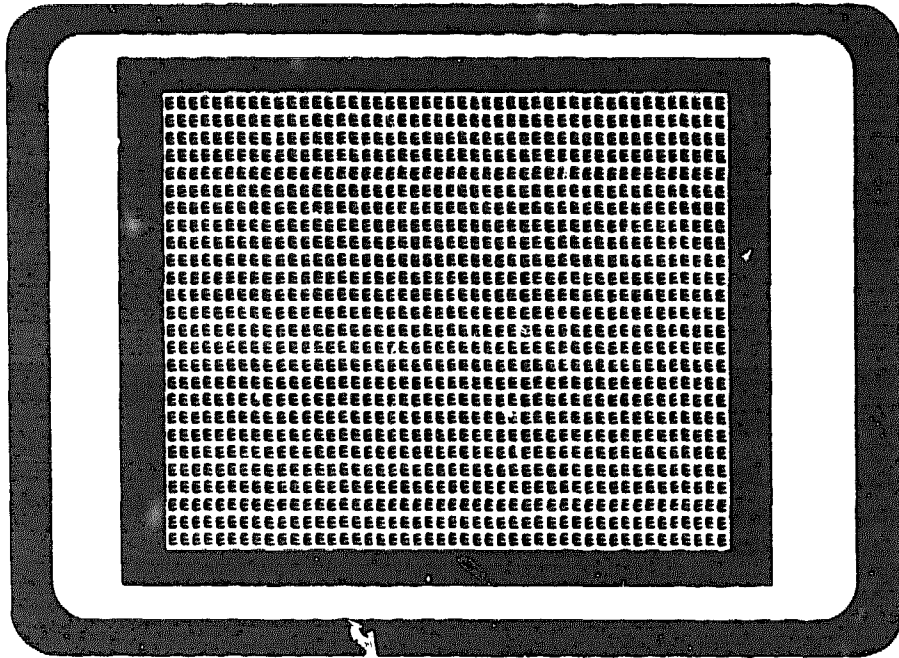
MA X0105 90

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

4.2.4 Display Size

This section describes how to check and adjust rotation, horizontal width, horizontal centering and vertical height. To perform these adjustments:

1. Run the screen test (Section 4.2.2).



4-10 Aligning the Video Terminal

2. Select the screen of Es by pressing the **1** key or stop the screen test with the **Hold Session** key when the screen of Es appears.

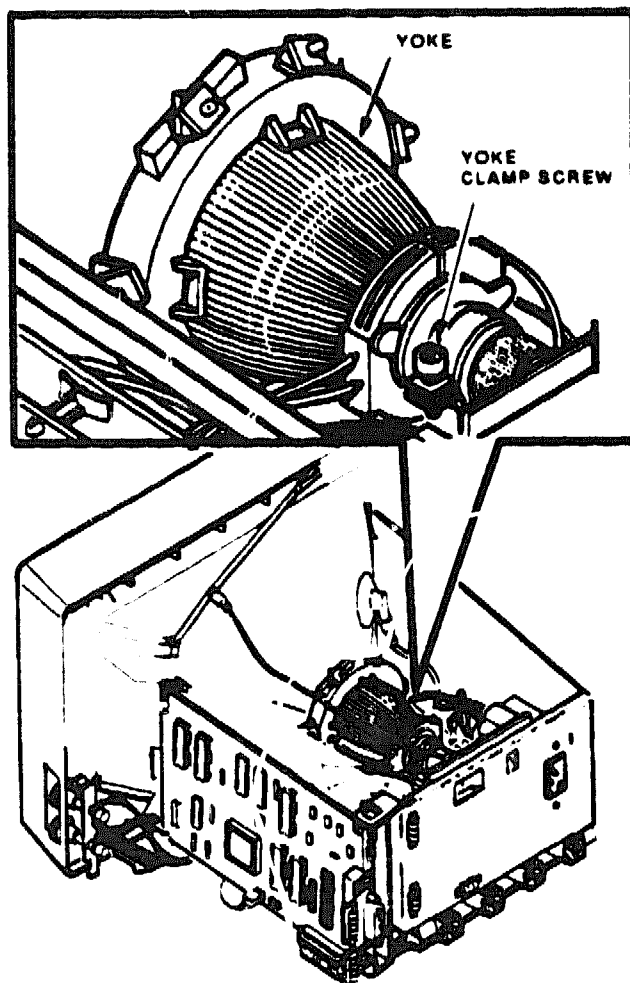
4.2.4.1 Rotation

If the display is rotated or slanted, to adjust the display:

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



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CAUTION

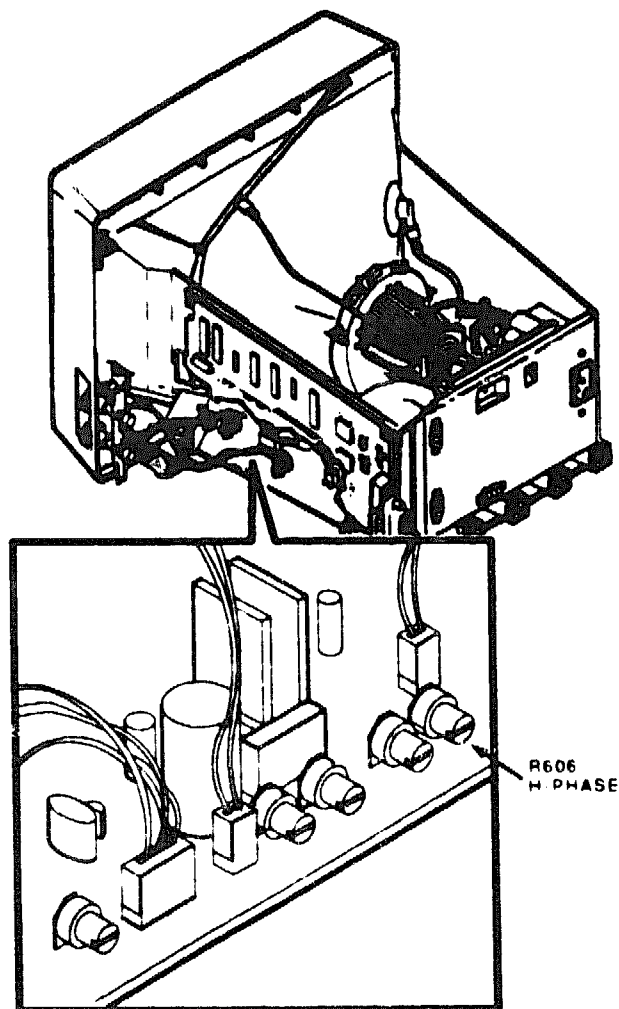
Before you perform step 3, to tighten the screw, make sure you take up the slack on the clamp. Do not overtighten, or you may crack the neck of the CRT.

3. Tighten the screw on the CRT connector clamp $\frac{3}{4}$ of a turn.

4.2.4.2 Horizontal Centering

To check and adjust the horizontal centering:

1. Check the screen of Es to see if the display appears to be centered.
2. If necessary, adjust the R606 (H-PHASE) control to center the display.

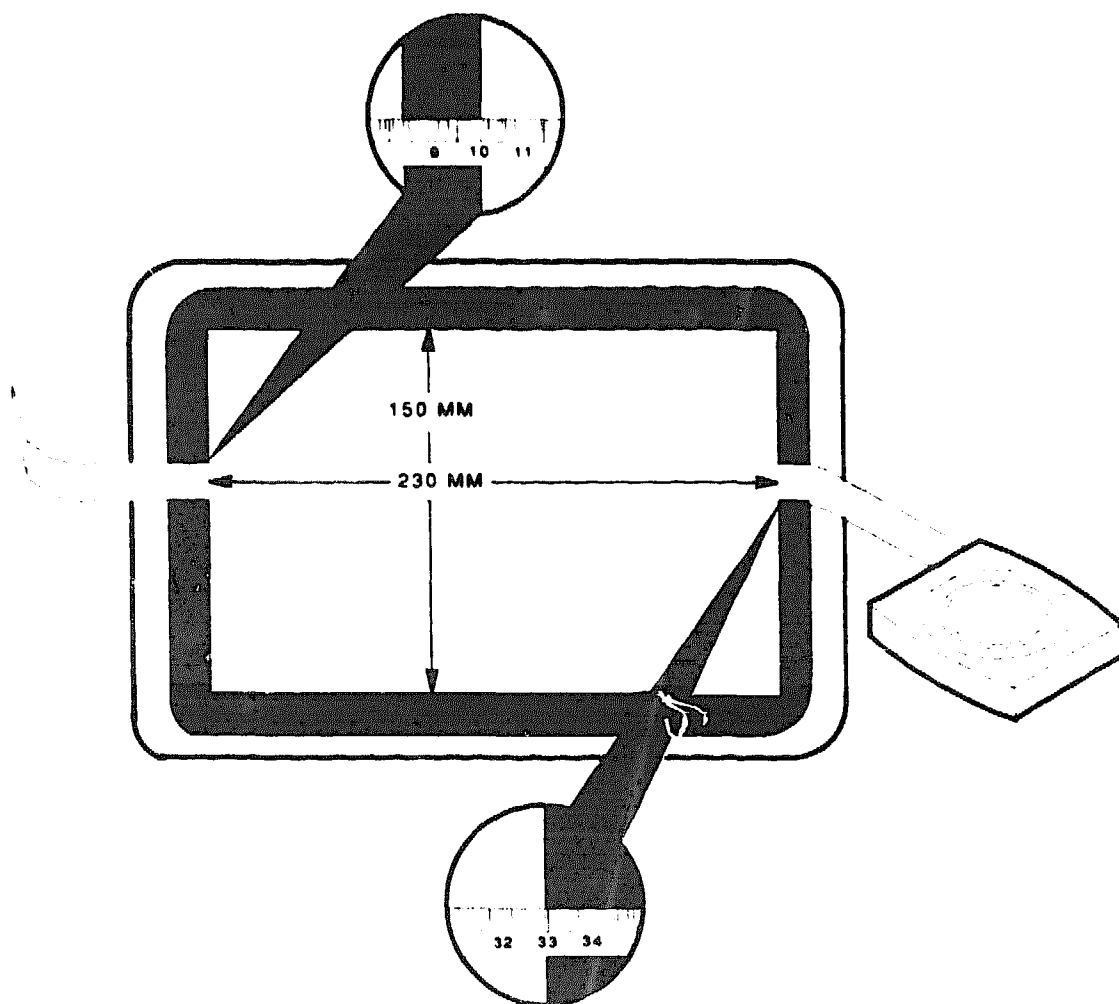


4.2.4.3 Horizontal Width

To check and adjust the horizontal width:

NOTE

In the following steps, use a metric measuring tape (PN 29-25342-00) to measure the dimensions of the screen display. To avoid scratching the screen with the metal clip on the tape, start the measurements at 10 cm (100 mm).

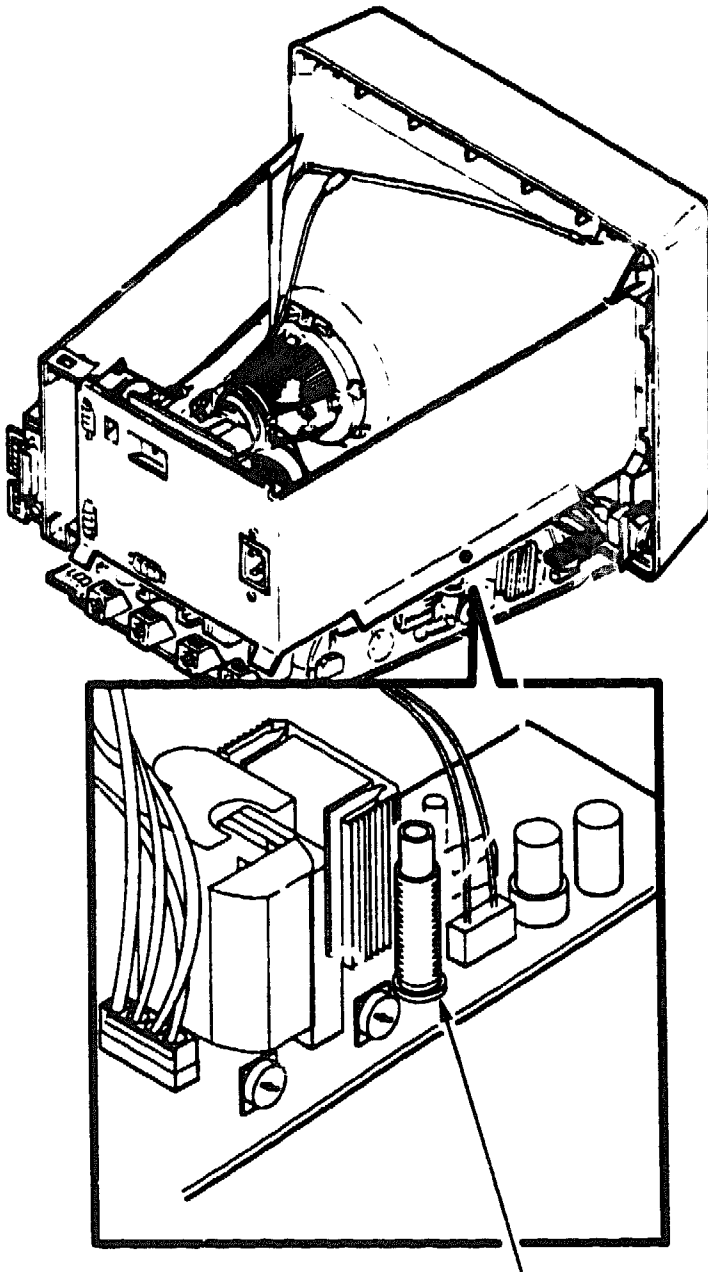


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1. Measure and check the screen of Es for a width of about 230 mm (\pm 2.0 mm).

4-14 Aligning the Video Terminal

2. If necessary, adjust the display width to 230 mm by turning the horizontal width coil, L600 (HOR-WIDTH), with a tuning wand (PN 29-23190-00).



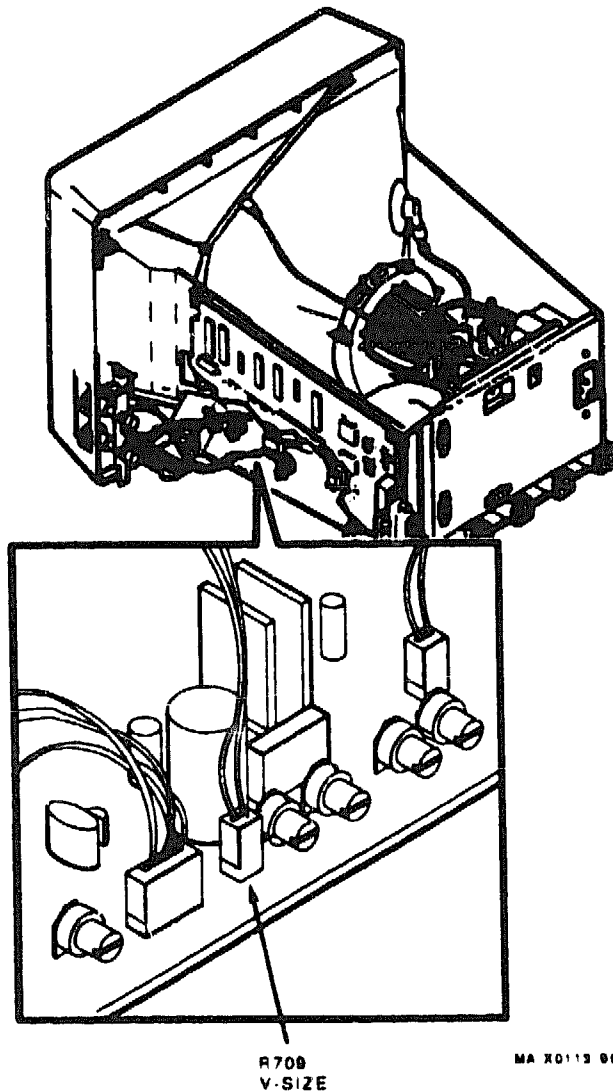
L600
HOR-WIDTH

MA-X0104-90

4.2.4.4 Vertical Height

To check and adjust the vertical height:

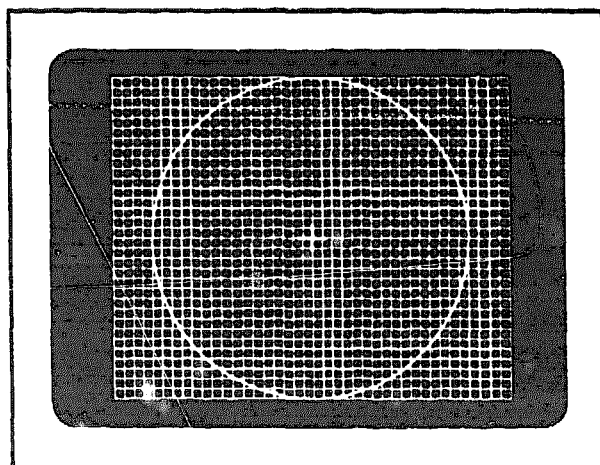
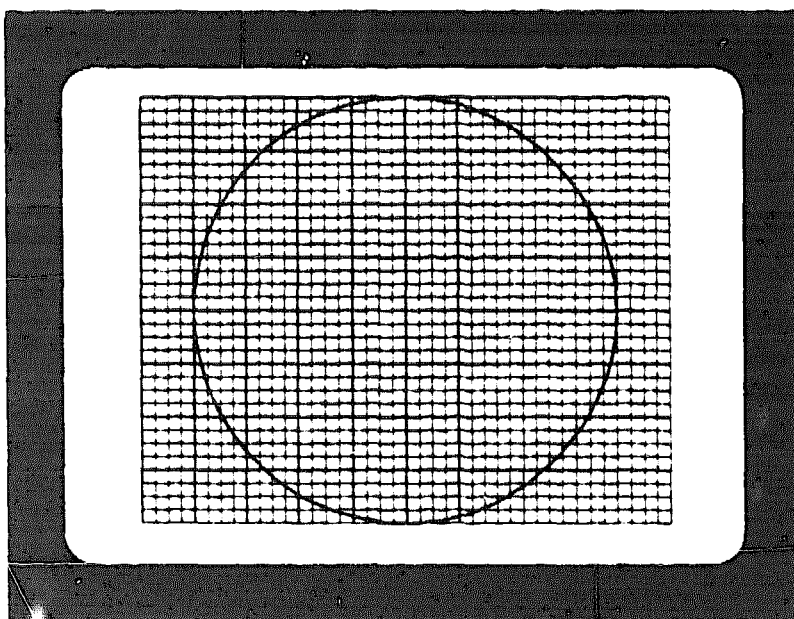
1. Measure and check the screen of Es for a vertical height of about 150 mm (± 2.0 mm).
2. If necessary, adjust the R709 (V-SIZE) control until the display height is 150 mm.



4.2.5 Character Quality

This section covers linearity and focus adjustments. To make these adjustments:

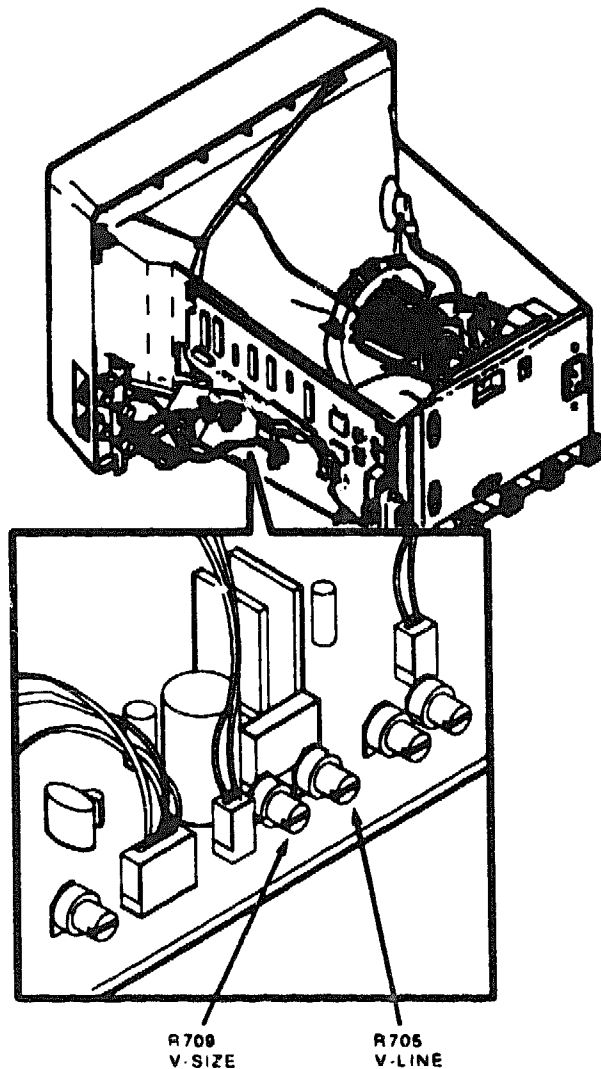
1. Run the screen test (Section 4.2.2).
2. Select the crosshatch screen by pressing the **2** key or stop the screen test with the **Hold Session** key when the crosshatch screen appears.



4.2.5.1 Linearity

To check and adjust the linearity:

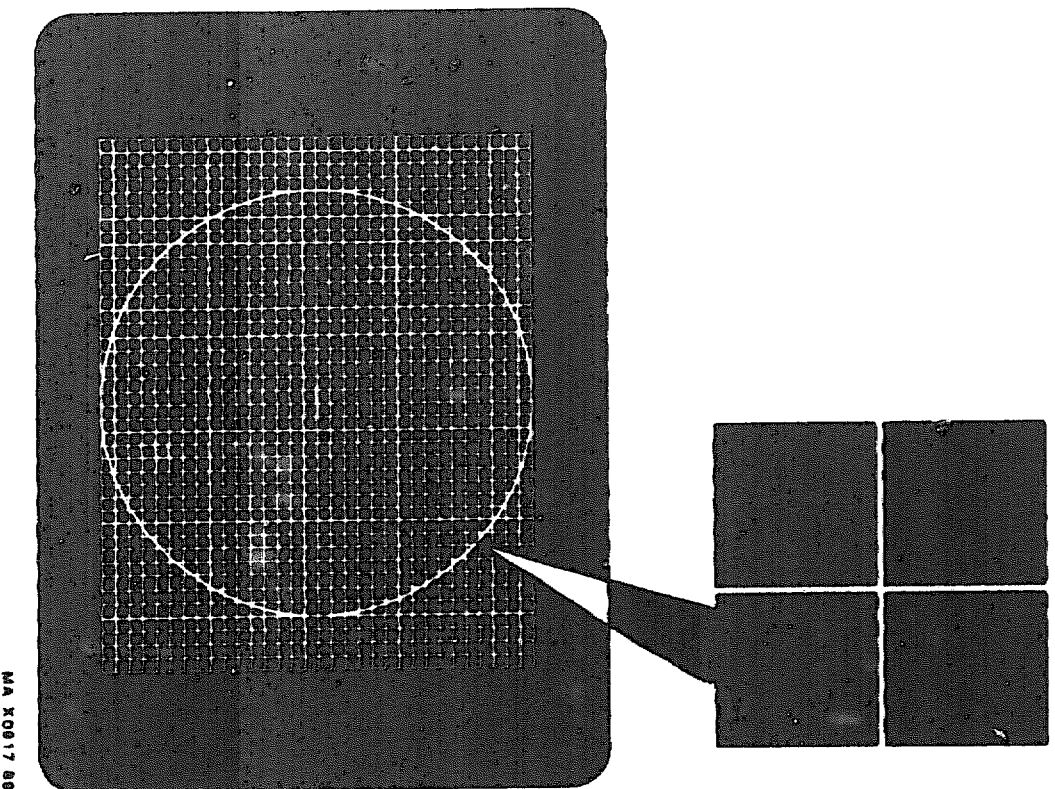
1. Measure and check the height of each block near the four corners of the crosshatch display. Each block must be the same size.
2. If necessary, adjust the R705 (V-LINE) control until the block is the same height in all four corners.
3. If you adjust the linearity, you *must* adjust the vertical height (Section 4.2.4.4).



4.2.5.2 Focus

To check and adjust the focus:

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

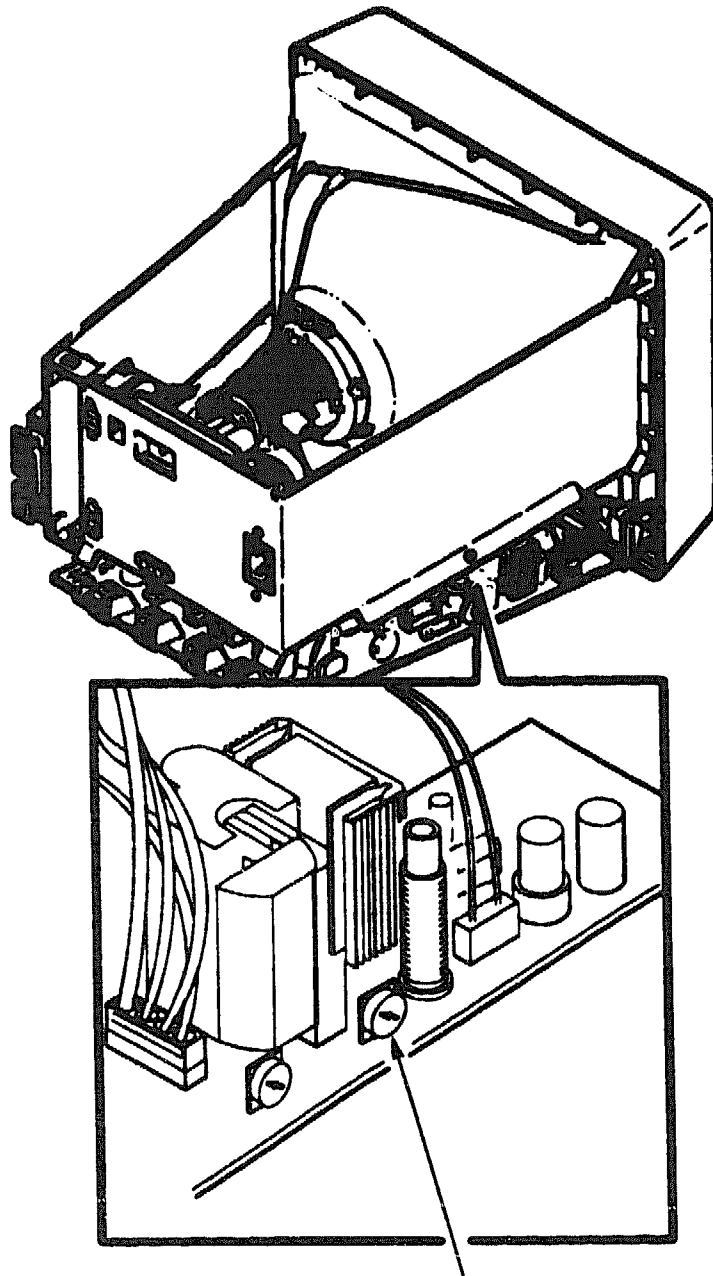


2. Examine the intersecting lines for sharpness.

NOTE

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

3. Adjust the R619 (Focus) control until you can see the individual pixels on the vertical line and the horizontal line are sharp.

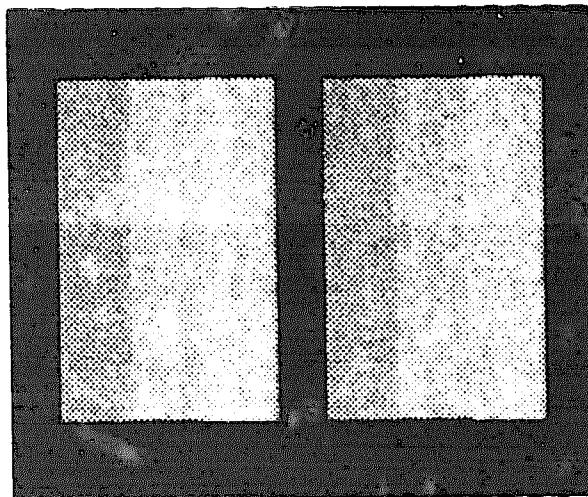


R619
FOCUS

4.2.6 Viewer Preference

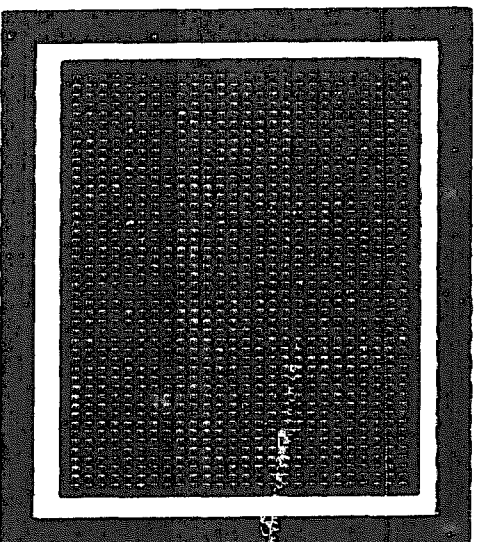
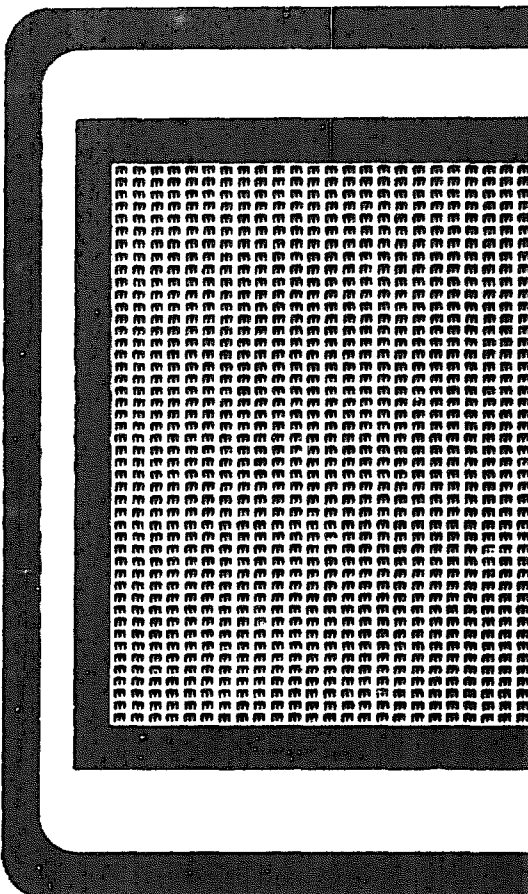
This procedure lets you set the terminal for viewing preference. To make these adjustments:

1. Run the screen test (Section 4.2.2).
2. Select the gray scale by pressing the **4** key or stop the screen test with the **Hold Session** key when the gray scale appears.



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3. Adjust the brightness control until the raster (white diagonal lines) disappears.
4. Adjust the contrast control to the preferred viewing level.
5. Select the screen of Es by pressing the **1** key or restart the screen test by pressing the **Hold Session** key and stop the screen test with the **Hold Session** key when the screen of Es appears.



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6. Check the horizontal width (Section 4.2.4.3) and vertical height (Section 4.2.4.4) of the display. Adjust if necessary.

CHAPTER 5

5

Using Set-Up

This chapter gives a brief summary on how to use a Set-Up utility to change the settings of operating features from the keyboard. Chapter 5 of *Installing and Using the VT330/VT340+ Terminal*, EK-VT3XX-UG describes the Set-Up utility in detail.

5.1 What is Set-Up

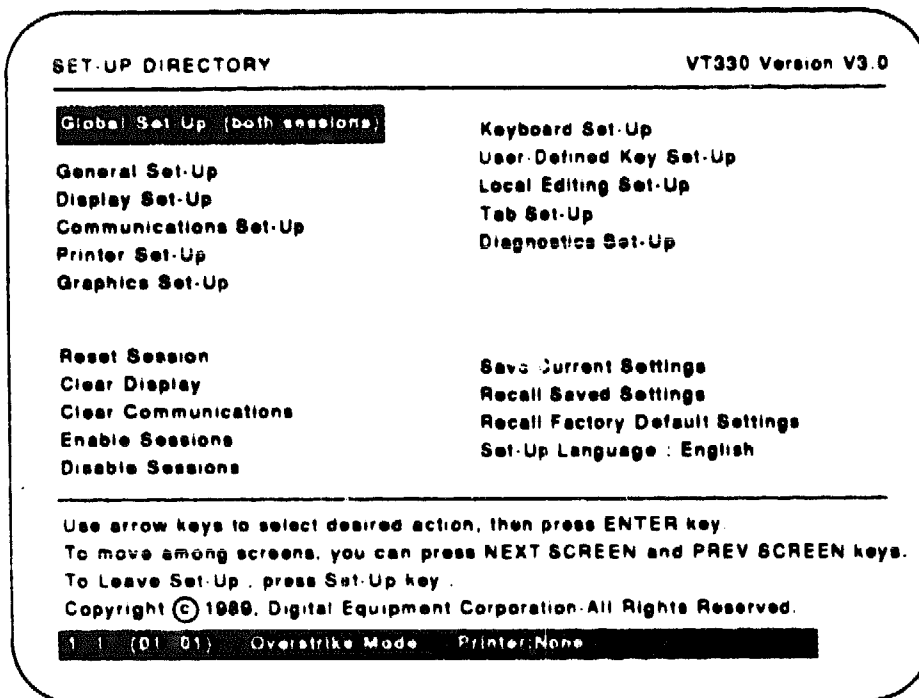
The Set-Up utility is a series of display screens. Each screen lists a group of related features, such as communications or diagnostics. Each Set-Up screen has basic directions at the bottom for selecting and changing feature settings. You can move from screen to screen in the Set-Up utility.

5.1.1 Dual Sessions

The VT330+ can run two sessions simultaneously with the host system. Each session has its own 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 Terminals*, EK-VT3XX-UG describe how to set up and use dual sessions.

5.2 Entering and Leaving Set-Up

You enter set-up by pressing the **Set-Up** key on the top row of the keyboard. The Set-Up directory screen appears (Figure 5-1). The top half of the directory screen lists all the VT330+ Set-Up screens. The bottom half of the directory screen lists some functions you can perform directly from the Set-Up directory.



MA 20878-00

Figure 5-1 Set-Up Directory

5.3 Selecting A Set-Up Screen

To select any Set-Up screen from the Set-Up Directory screen:

1. Press the **Set-Up** key. The Set-Up Directory appears.
2. Use the arrow keys to move the cursor to the name of the screen you want to display.

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 previous screen. The screens appear in the order listed in the Set-Up directory. You can press the **Next Screen** key and the **Prev Screen** key when viewing any Set-Up screen.

3. Press the **Enter** key.

4. To return to the Set-Up directory, press the **Select** key.

5.4 Selecting Set-Up Features

You can 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 the Enter key, 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 arrow keys or the Enter key to change the current setting of a feature. When you exit Set-Up, the terminal uses the new setting you selected. |

Do not change any settings unless necessary.

5.5 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. To save set-up values:

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

5.6 Recalling Set-Up Values

You can reset the terminal to recall the previous 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. To recall set-up values:

1. Press the **Set-Up** key. 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 the **Enter** key to recall the selected set-up values.

A

Related Documentation

In addition to this guide, you can order other VT330/VT340+ documents, as follows:

Documentation	Part Number
Installing and Using The VT330/VT340+ Video Terminals*	EK-VT3XX-UG
VT330/VT340+ Programmer Reference Manual (Two volumes)	
Vol. 1: Text Programming	EK-VT3XX-TP
Vol. 2: Graphics Programming	EK-VT3XX-GP
VT330/VT340+ Programmer Pocket Guide	EK-VT3XX-HR
VT340+ Pocket Service Guide	EK-VT340-PS
VT330+ Video Terminal IPB	EK-VT330-IP
VT340+ Video Terminal IPB	EK-VT340-IP
VT330+ Field Maintenance Print Set	MP-02411-01
VT340+ Field Maintenance Print Set	MP-02412-01
Installing and Using The Session Support Utility	AA-JB84B-TE
*Includes Technical Change Notices (EK-VT3XX-CN)	

B

Troubleshooting The Session Support Utility

The VT330+ can run the dual sessions over a single communication line if Digital SSU software is installed on the host system. If you have problems running dual sessions with SSU software, check the software versions and the Set-Up features, as follows:

B.1 Checking Software and Set-Up

To check the software and Set-Up features:

1. Check the software versions running on the system and the terminal as follows:
 - The host system must have VMS Version 4.4 or later, and SSU Version 1.0 or later. See "Restrictions" in Section B.3.
 - The VT330+ must have the firmware Version 1.1 or later. You can check the firmware version listed on the top of any Set-Up screen.
2. 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".

B-2 Troubleshooting The Session Support Utility

The rest of this appendix lists symptoms and solutions for SSU problems. Many of the symptoms shown are DCL error messages. 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
```

B.2 Problems with Enabling SSU Software

When SSU software is installed correctly, you can enable it by typing the following at the \$ prompt:

```
$ ssu enable
```

This section lists some error messages that may appear on the terminal when you try to enable SSU software and their solutions.

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 AA-JB84B-TE*.

Message

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

Solution

- Make sure (1) SSU was installed without any errors, and (2) the system start-up procedure executes the file called SSU_STARTUP.COM. See *Installing and Using the Session Support Utility AA-JB84B-TE*.
- Make sure TDDRIVER is loaded on your VMS system, by typing the following 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 AA-JB84B-TE*.

- Make sure the system TDDRIVER and SSU software have the same version number and that the version is Version 1.0 or later. You can check the version numbers with the following DCL commands:

```
ANALYZE/IMAGE
SYS$SYSTEM:TDDRIVER.EXE

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 AA-JB84B-TE*.

Message

```
$ ssu enable
|@AJ|@AJ|@AJ|@AJ|@AJ|@AJ
```

Solution

- Make sure the set-up features at the beginning of this appendix are set correctly as follows:

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".

B.3 DECserver LAT Problems

This section lists DECserver LAT problems and their suggested solutions.

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 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-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 Version 4.4 or 4.5: If the LAT+ driver shipped with the DECserver 200 lines is installed, you cannot use SSU on the DECserver 200 lines.

NOTE

The normal LAT driver shipped with VAX/VMS Version 4.4 or 4.5 will work with SSU.

You can use SSU on DECserver 200 lines for systems running VAX/VMS Version 4.6 or later and its associated LAT driver with DECserver 200 lines.

- SSU is not supported on the OPA0: device because of internal differences between this device and all terminal devices on VAX/VMS.

APPENDIX C

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C

FRU Exploded View Diagrams

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

C-2 FRU Exploded View Diagrams

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-LB	SPANISH
LK201-LV	PORTUGAL
LK201-PA	US/UK WPS (GOLD)

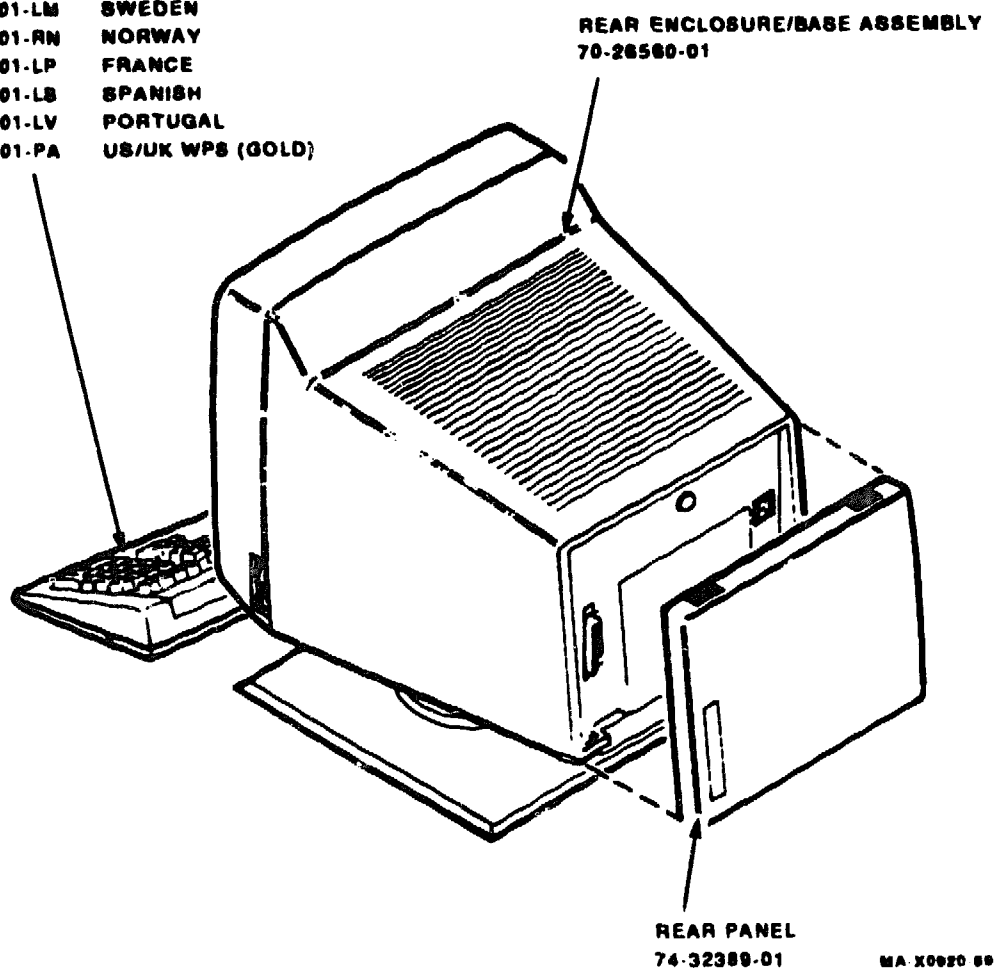
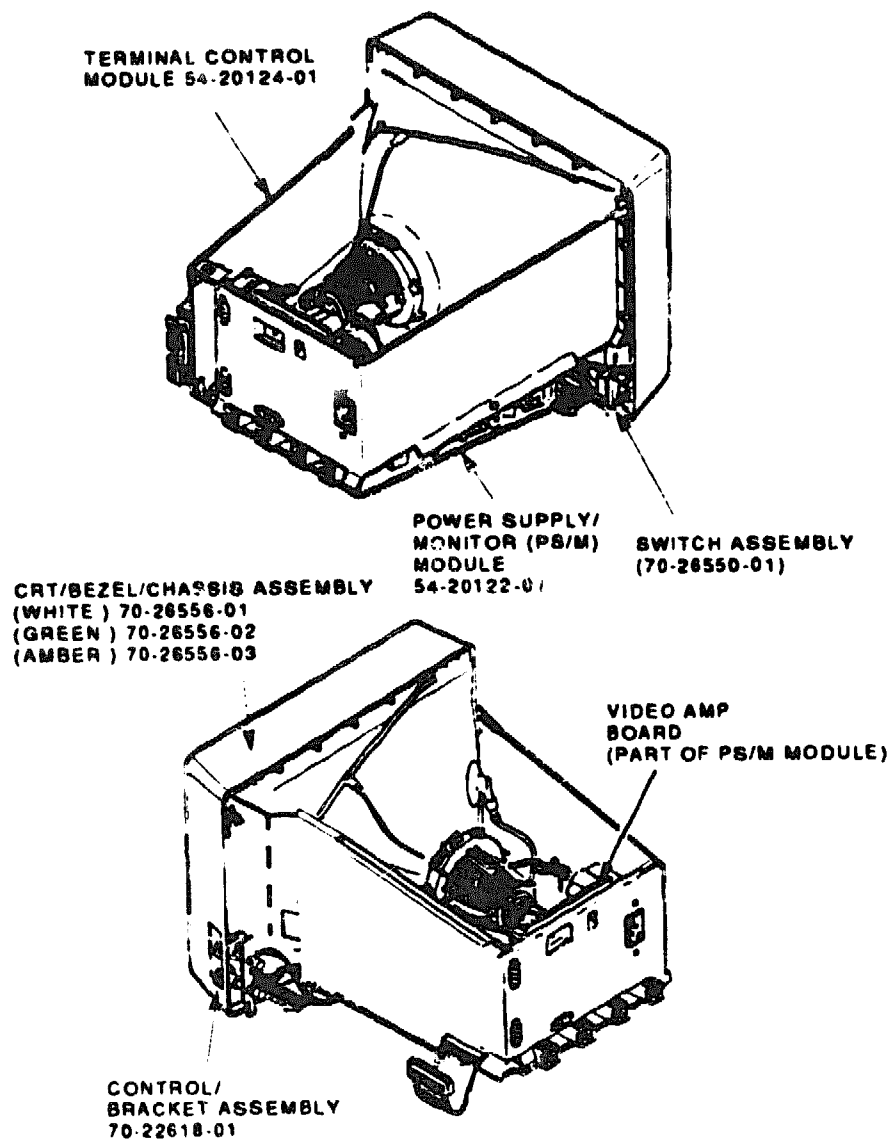


Figure C-1 VT330+ FRUs (External View)



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Figure C-2 VT330+ FRUs (Internal View)

APPENDIX D

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D

Cables

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

Table D-1 Interface Cables and Adapters

Part Number	Length	Connector
Printer Cables and Adapter (VT420 to printer)		
BC16E-10	10 ft (3 m)	6-pin M*DEC-423 to
BC16E-25	25 ft (7.6 m)	6-pin M*DEC-423
H8751-A adapter	-	6-pin F*DEC-423 to 25-pin F*RS-232
H8751-C or -F adapter	-	25-pin F*RS-232 to 6-pin M*DEC-423
Extension Cables		
BC22E-10	10 ft (3 m)	25-pin F*RS-232 to
BC22E-25	25 ft (7.6 m)	25-pin M*RS-232
Null Modem Cables		
BC22D-xx	-	25-pin F*RS-232 to 25-pin F*RS-232
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

*M=male. F=female.

Table D-1 (Cont.) Interface Cables and Adapters

Part Number	Length	Connector
AC Power Cables	Country	
BN20V-2E	Australia, New Zealand	
BN20S-2E	Austria, Belgium, Finland, France, Germany, Netherlands, Norway, Portugal, Spain, Sweden	
BN20P-2E	Canada	
BN20U-2E	Denmark	
BN20R-2E	Ireland, United Kingdom	
BN19U-2E	Israel	
BN20W-2E	Italy	
BN20T-2E	Switzerland	

xx = length in feet (10, 25, 50, 100, 200, 250)

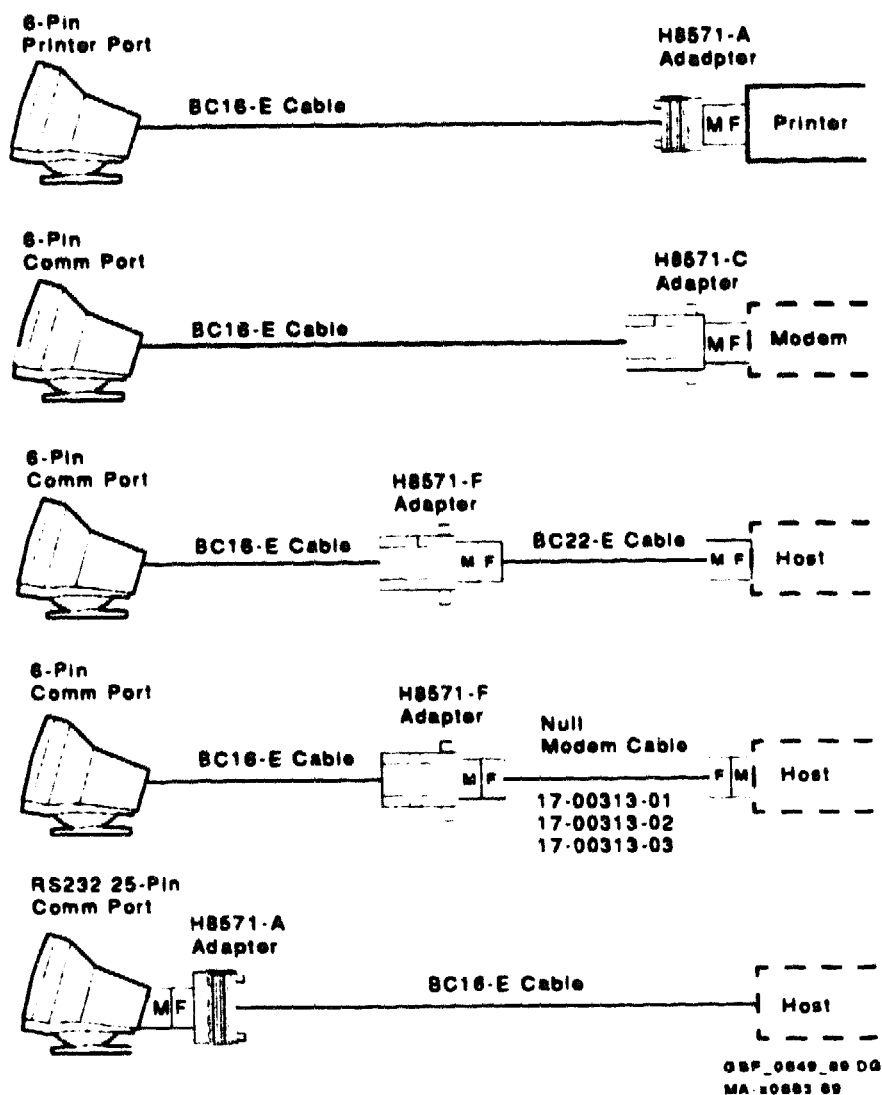


Figure D-1 VT330+ Cable Connections

APPENDIX E

[illegible]

E

Physical/Functional Diagram

Figure E-1 is a physical/functional diagram showing how the VT330+ components work together. Table E-1 lists the pin assignments for connectors on the PS/monitor and arc protection assembly, the video amp module, and the terminal control module.

NOTE

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

E-2 Physical/Functional Diagram

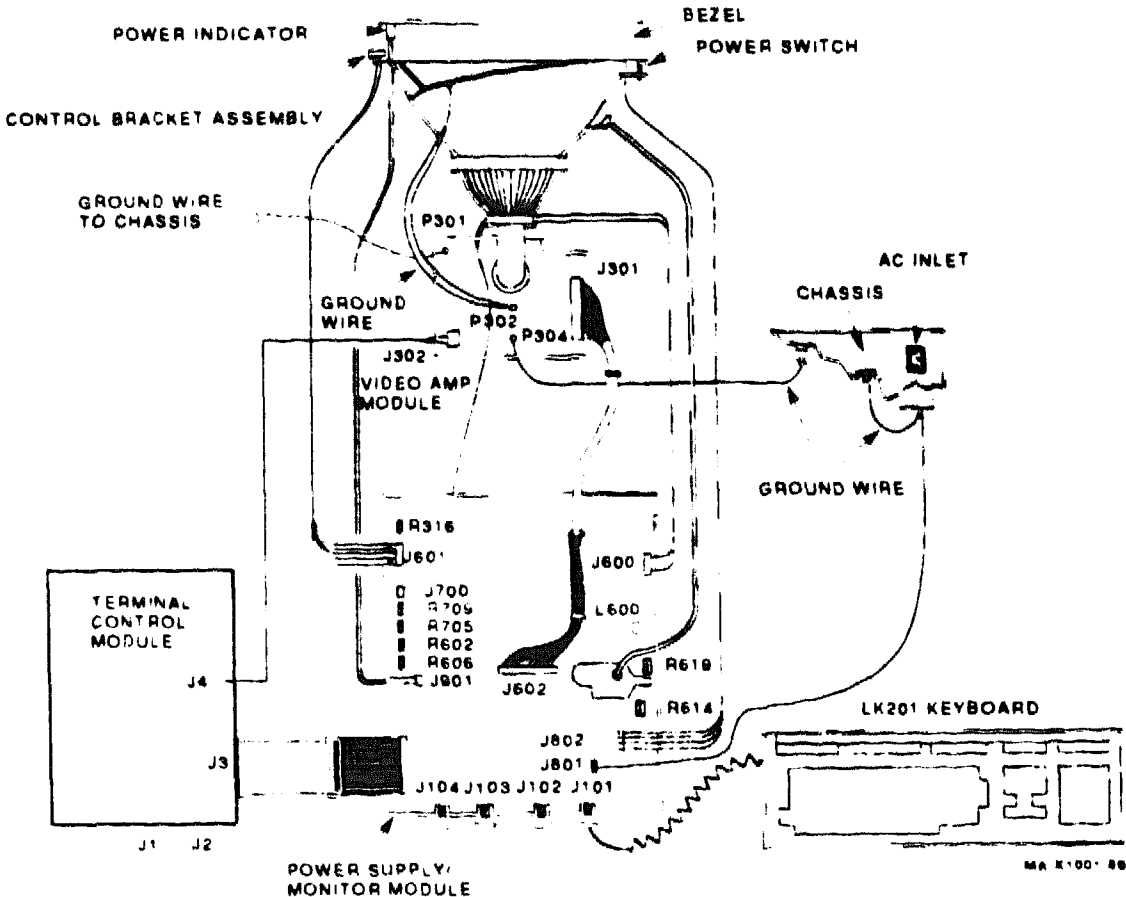


Figure E-1 Connection Diagram

Table E-1 VT330 + Signals and Pin Assignments

Power Supply/Monitor Module

Pin	Function	Description
J104 Comm1 Port Connector		
1	DTR	Data terminal ready
2	TXD	Transmitted data
3	GND	Transmit ground
4	CMM	Receive ground

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
J104 Comm1 Port Connector		
5	RXD	Received data
6	DSR	Data set ready
J103 Comm2 Port Connector		
1	DTR	Data terminal ready
2	TXD	Transmitted data
3	GND	Transmit ground
4	CMM	Receive ground
5	RXD	Received data
6	DSR	Data set ready
J102 Printer Port Connector		
1	DTR	Data terminal ready
2	TXD	Transmitted data
3	GND	Transmit ground
4	CMM	Receive ground
5	RXD	Received data
6	DSR	Data set ready
J101 Keyboard Port Connector		
1	TXD	Transmitted data
2	GND	Ground
3	+12 VF	Voltage fused
4	RXD	Received data

E-4 Physical/Functional Diagram

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
J700 Yoke Connector		
1	V-DY	Vertical deflection yoke
2	Not used	
3	V-DY	Vertical deflection yoke
J600 Yoke Connector		
1	H-DY	Horizontal deflection yoke
2	Not used	
3	H-DY	Horizontal deflection yoke
J601 Control Bracket		
1	Contrast	
2	Contrast	
3	Contrast	Armature
4	Brightness	
5	Brightness	
6	Brightness	Armature
J901 Power OK Connector		
1	-12 V	
2	PWR OK	Power OK Circuit
P802 Power Switch		
1	Line	Line-side switch
2	Line	Line-side switch
3	Line	Neutral-side switch
4	Line	Neutral-side switch

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
P801 AC Input		
1	Neutral	
2	Line	
Video Amp Module		
P801 Arc Protection		
1	+12 V	
2	C-ADJ	Contrast adjust
3	GND	
4	GND	
5	+48 V	
6	GND	
7	Not used	
8	Not used	
9	G2	Grid 2
10	Not used	
11	G4	Grid 4
12	Not used	
13	G1	Grid 1
J302 Video Input Connector (To Arc Protection Board)		
1	VIDEO I	Intensity
2	VIDEO 2	
3	GND	
4	VIDEO 1	
Terminal Control Module		

E-6 Physical/Functional Diagram

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
J4 Video Output Connector		
1	VID 2	Video 2
2	VID 0	Video 0
3	GND	
4	VID 1	Video 1
J2 Mouse Connector		
1	GND	Ground
2	RXD	Received data
3	TXD	Transmitted data
4	-12 V	
5	+5 V	
6	+12 VF	Voltage fused
7	Not used	
8	SHIELD	Ground

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
J3 Interface Connector		
1	BVSYNC	Vertical sync
2	-12 V	
3	BHSYNC	Horizontal sync
4	+12 VF	Voltage fused
5	60/50 HZ	
6	+5 V	
7	KBRXD	Keyboard received data
8	+5 V	
9	KBTXD	Keyboard transmitted data
10	+5 V	

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
J3 Interface Connector		
11	PTRDSR	Printer port, data set ready
12	+5 V	
13	PTRRXD	Printer port, received data
14	+5 V	
15	PTRCOM	Printer port, receive ground
16	+5 V	
17	PTRTXD	Printer port, transmitted data
18	+5 V	
19	PTRDTR	Printer port, data terminal ready
20	GND	
21	H2DSR	Host port 2, data set ready
22	GND	
23	H2RXD	Host port 2, received data
24	GND	
25	H2COM	Host port 2, receive ground
26	GND	

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
J3 Interface Connector		
27	H2TXD	Host port 2, transmitted data
28	GND	
29	H2DTR	Host port 2, data terminal ready
30	GND	
31	H1423DSR	Host port 1, DEC-423, data set ready
32	GND	
33	H1423RXD	Host port 1, DEC-423, received data
34	CPU-R	
35	H1423COM	Host port 1, DEC-423, receive ground
36	NC	Not connected
37	H1423TXD	Host port 1, DEC-423, transmitted data
38	GND	
39	H1423DTR	Host port 1, DEC-423, data terminal ready
40	GND	

Table E-1 (Cont.) VT330 + Signals and Pin Assignments

Pin	Function	Description
J1 EIA 25-Pin Comm1 Connector		
1	GND	Protective ground (open)
2	H1232TXD	Host port 1, RS-232, transmitted data
3	H1232RXD	Host port 1, RS-232, received data
4	H1RTS	Host port 1, ready to send
5	H1CTS	Host port 1, clear to send
6	H1232DSR	Host port 1, RS-232, data set ready
7	SIGNAL GND	
8	H1CD	Host port 1, carrier detect
9	Not used	
10	Not used	
11	Not used	
12	SPDIND	Speed indicator
13	Not used	
14	Not used	
15	Not used	
16	Not used	
17	Not used	
18	Not used	
19	Not used	
20	H1232DTR	Host port 1, RS-232, data terminal ready
21	Not used	
22	Not used	
23	SPDSEL	Speed select
24	Not used	
25	Not used	