

# **VR315 and VR325 Monochrome Monitors Service Guide**

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**Digital Equipment Corporation**

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# Contents

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<b>About This Manual</b>	vii
<b>1 Overview</b>	
1.1 Product Description . . . . .	1-1
1.1.1 Model Variations . . . . .	1-2
1.2 Tools and Equipment . . . . .	1-2
1.3 Recommended Spare Parts List . . . . .	1-3
<b>2 Troubleshooting</b>	
2.1 Before You Start . . . . .	2-1
2.2 Troubleshooting Procedures . . . . .	2-2
2.3 Troubleshooting Tables . . . . .	2-2
<b>3 Removing and Replacing FRUs</b>	
3.1 Introduction . . . . .	3-1
3.1.1 Removing the External Cables . . . . .	3-2
3.1.2 Removing the Rear Cover . . . . .	3-3
3.1.3 Removing the Top Cover . . . . .	3-4
3.2 Field Replaceable Units (FRUs) . . . . .	3-5
3.2.1 Interconnect Cable . . . . .	3-6
3.2.2 Power Supply Module . . . . .	3-8
3.2.3 Discharging the CRT and Removing the Anode Cap . . . . .	3-10
3.2.4 Deflection Module . . . . .	3-12
3.2.5 Video Casting Assembly . . . . .	3-16
3.2.6 CRT/Chassis Assembly . . . . .	3-20
3.3 CRT Disposal (Trained Service Personnel Only) . . . . .	3-21
3.4 Tilt-Swivel Base . . . . .	3-24

## 4 Aligning the Video Monitor

4.1	Introduction . . . . .	4-1
4.1.1	Before You Start . . . . .	4-1
4.1.2	Check LEDs and Heater Filament . . . . .	4-4
4.1.3	Displaying Screen Tests . . . . .	4-4
4.2	Monitor Adjustments . . . . .	4-5
4.3	Deflection Adjustments . . . . .	4-6
4.3.1	Raster Adjustment . . . . .	4-6
4.3.2	Anode Voltage Adjustment . . . . .	4-6
4.3.3	Height and Width Adjustments . . . . .	4-6
4.4	Using the Radiance Meter . . . . .	4-8
4.5	Cutoff Adjustment . . . . .	4-10
4.6	GAIN Adjustment . . . . .	4-11

## A VR315 and VR325 Documentation

### Figures

1-1	Monochrome Monitor . . . . .	1-1
3-1	Removing Cables from the Monitor . . . . .	3-2
3-2	Rear Cover Removal . . . . .	3-3
3-3	Top Cover Removal . . . . .	3-4
3-4	Field Replaceable Units . . . . .	3-5
3-5	Disconnecting the Interconnect Cable . . . . .	3-7
3-6	Removing the On/Off Switch Cable from the Power Supply . .	3-8
3-7	Removing the Power Supply . . . . .	3-9
3-8	Discharging the CRT and Removing the Anode Cap . . . . .	3-11
3-9	Loosening the Captive Screw . . . . .	3-13
3-10	Disconnecting Cables from the Deflection Module . . . . .	3-14
3-11	Removing the Deflection Module . . . . .	3-15
3-12	Removing Cables from the Video Casting . . . . .	3-17
3-13	Removing the CRT Socket Connector . . . . .	3-18
3-14	Removing the Video Casting . . . . .	3-19
3-15	Crushing the Evacuation Point . . . . .	3-23
3-16	Tilt-Swivel Base . . . . .	3-25
4-1	User Controls and Indicator . . . . .	4-3

4-2	Circle-Crosshatch Pattern . . . . .	4-4
4-3	Using the Metric Measuring Tape . . . . .	4-5
4-4	Internal Controls . . . . .	4-7
4-5	Radiance Meter . . . . .	4-9
4-6	Using the Radiance Meter . . . . .	4-10
4-7	GAIN, G2, and FOCUS (G4) Adjustments . . . . .	4-11

## Tables

1-1	Tools and Equipment . . . . .	1-2
1-2	Recommended Spare Parts . . . . .	1-3
2-1	Blank Screen, No Video or Raster . . . . .	2-3
2-2	Blank Screen, No Video, but Raster is Present . . . . .	2-5
2-3	Poor Display Quality . . . . .	2-6
4-1	Monitor Controls and Indicators . . . . .	4-2



# About This Manual

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## VR315 and VR325 Video Monitors

This guide describes how to service the VR315 and VR325 monochrome monitors in the field.

## Manual Organization

This manual is organized as follows:

- Chapter 1 provides a general overview of the product and includes a list of spare parts.
- Chapter 2 describes the troubleshooting procedures.
- Chapter 3 provides the removing and replacing procedures for the Field Replaceable Units (FRUs).
- Chapter 4 describes the alignment procedures.
- Appendix A describes related documentation.

## Conventions

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Convention	Meaning
Caution	Provides information to prevent damage to the equipment.
Warning	Provides information that relates to personal safety.
Note	Provides general information.
PN	Refers to a part number.
❶	This type of number in text refers to an item in an illustration.
monitor	Refers to the VR315 and VR325 monochrome monitors.

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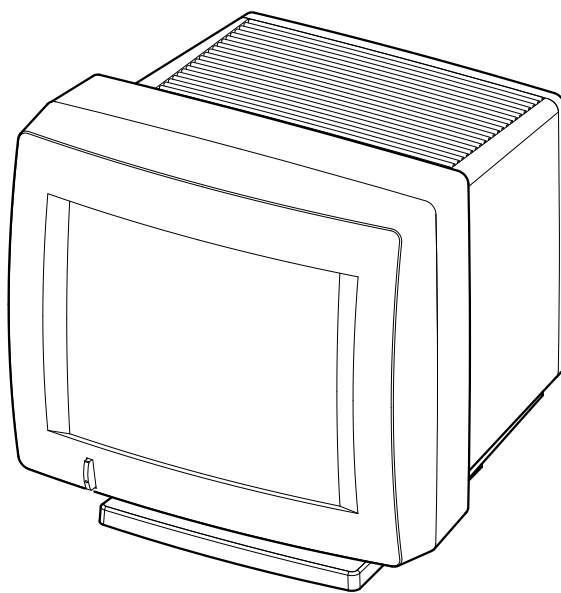
# 1

## Overview

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### 1.1 Product Description

The monochrome monitor (Figure 1–1) has a direct viewed antiglare screen with an auto-ranging power supply for worldwide operation. Its built-in tilt-swivel base lets the user adjust the screen for viewing comfort. When connected to a host system, the monitor displays information sent by the host.



MA-0299-90.DG

**Figure 1–1 Monochrome Monitor**

### 1.1.1 Model Variations

The monitor is available in the following models:

Model	Applicable Area
VR315-DA	Northern hemisphere
VR315-D4	Southern hemisphere
VR325-DA	Northern hemisphere
VR325-D4	Southern hemisphere

## 1.2 Tools and Equipment

Table 1-1 lists the tools and equipment you will need to service the monitor:

**Table 1-1 Tools and Equipment**

Tools and Equipment	Part Number
Terminal technician tool kit	29-27340-01
Static protection kit	29-26246-00
Anode discharge tool	29-24717-00
Metric measuring tape	29-25342-00
Safety goggles	29-16141-00
Gloves	29-16146-00

### 1.3 Recommended Spare Parts List

Table 1–2 lists the recommended spare parts for the monitor.

**Table 1–2 Recommended Spare Parts**

<b>Spare Part</b>	<b>VR315 Part Number</b>	<b>VR325 Part Number</b>
Power supply	54-19629-02	54-19629-03
Deflection module	54-19826-01	54-19826-02
Video casting assembly	70-27073-01	70-27073-01
Module interconnect cable	70-27000-02	70-27000-02
CRT/chassis assembly		
Northern Hemisphere	70-27477-01	70-27481-03
Southern Hemisphere	70-27477-02	70-27481-04



# 2

## Troubleshooting

---

This chapter describes how to troubleshoot a monitor problem through fault isolation.

### 2.1 Before You Start

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

#### **WARNING**

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

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

#### **NOTE**

**Any time you replace a video casting assembly, deflection module, or power supply module, perform all the necessary adjustments. Refer to Chapter 3.**

## 2.2 Troubleshooting Procedures

These procedures assume that only one assembly has failed or only one problem exists. Always troubleshoot the most obvious symptom first; however, one symptom may indicate multiple failures. Problems may come from either the host system or the monitor.

Troubleshoot the monitor as follows:

1. Ask the operator to describe the problem. The operator often is the most knowledgeable.
2. Identify the problem. The screen display often indicates which problem is occurring.
3. Isolate the problem. Refer to the troubleshooting tables (Section 2.3) to find the suggested solutions.
4. Display the host system alignment test patterns to make sure that no other problem exists. Refer to the host system service guide for displaying test patterns.

## 2.3 Troubleshooting Tables

The troubleshooting tables list the possible cause in order of probability. This troubleshooting information applies to three types of video problems that the monitor may exhibit:

- A blank screen, without video or raster (Table 2-1)
- A blank screen, without video, but raster present (Table 2-2)
- Poor display quality (Table 2-3)

Use the troubleshooting tables as follows:

1. Note the symptom of the problem.
2. Check the Symptom column for a match.
3. Check the conditions in the Possible Cause column in the order given.
4. Perform the action in the Suggested Solution column in the order given.

**Table 2-1 Blank Screen, No Video or Raster**

Symptom	Possible Cause	Suggested Solution
Blank screen, no video or raster. Power to the monitor is on (the power switch is in) but the power indicator light is off.	The power cord is not connected to the power source or monitor.	Connect the power cord to the power source or monitor.
	Low or no power at wall outlet.	Use another wall outlet. If the problem continues, call the facilities person.
	Power supply module is faulty.	Replace the power supply module (Section 3.2.2).
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
No video or raster, but the power indicator is on.	Video module is faulty.	Replace the video casting assembly (Section 3.2.5).
	Brightness or contrast is set incorrectly.	Adjust the brightness and contrast controls.
	Power to the host system is not on.	Turn power to the host system on.
	Host signal cable is disconnected.	Connect the signal cable to the monitor and host.

**Table 2-1 (Cont.) Blank Screen, No Video or Raster**

<b>Symptom</b>	<b>Possible Cause</b>	<b>Suggested Solution</b>
No video or raster, but the power indicator and LED on the deflection module are on.	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
	Video casting assembly is faulty.	Replace the video casting assembly (Section 3.2.5).
	CRT/chassis assembly is faulty.	Replace the CRT/chassis assembly (Section 3.2.6) only after trying the previous solutions.
	Internal cabling is loose or faulty.	Check all cabling going to the deflection module and the video casting assembly, including the CRT socket connector. If necessary, secure the cables.
	G2 Bias is set incorrectly.	Correct the G2 adjustment. (Section 4.5).
No video or raster, but the power indicator LED is on; the deflection module LED is off.	Signal cable is faulty.	Replace the signal cable. Refer to the host system documentation.
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).



**Table 2-2 Blank Screen, No Video, but Raster is Present**

Symptom	Possible Cause	Suggested Solution
Raster can be displayed by adjusting the brightness control, but no video or cursor can be seen even when the contrast control is at maximum.	The Host system CRT screen saver feature is activated.	Press any key to reactivate the display.
	Internal cabling is loose or faulty.	Check all the cables to the deflection module and the video casting assembly.
	The host system is not supplying video signals to the monitor.	Connect the monitor to a known working host system (if available) to verify the problem before replacing any monitor modules.
	Host system is faulty.	Repair the host system.
	Video casting assembly is faulty.	Replace the video casting assembly (Section 3.2.5).
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
	Faulty CRT/chassis assembly	Replace the CRT/chassis assembly (Section 3.2.6) only after trying the previous solutions.

**NOTE**

**Make sure the monitor has warmed up for at least 20 minutes before you use Table 2-3.**

**Table 2-3 Poor Display Quality**

<b>Symptom</b>	<b>Possible Cause</b>	<b>Suggested Solution</b>
Poor geometry, centering, height, width, and/or linearity.	Controls on top of the monitor are out of adjustment.	See section 4.1.
	Local magnetic fields.	Remove any electro-mechanical devices from the vicinity of the monitor, or move the monitor to another location.
	Monitor is out of adjustment.	Perform the alignment procedure. Refer to Chapter 4.
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
	CRT/chassis assembly is faulty.	Replace the CRT/chassis assembly (Section 3.2.6) only after trying the previous solutions.
Poor light output (using the all-white diagnostic pattern). The Display is not bright enough.	The brightness or contrast control is set incorrectly.	Adjust the brightness and contrast controls.
	Host system is not supplying correct signal levels.	Repair the host system.
	GAIN and Cutoff adjustments may be incorrect.	Perform the GAIN adjustment (Section 4.6) and the Cutoff adjustment (Section 4.5).
	Video casting assembly is faulty.	Replace the video casting assembly (Section 3.2.5).
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).

**Table 2-3 (Cont.) Poor Display Quality**

<b>Symptom</b>	<b>Possible Cause</b>	<b>Suggested Solution</b>
Display is too bright.	CRT is worn out.	Replace the CRT/chassis assembly (Section 3.2.6) only after trying the previous solutions.
	Brightness control is set incorrectly.	Set the brightness control to the optimum range.
	Video casting assembly is faulty.	Replace the video casting assembly (Section 3.2.5).
Vertical lines are not straight.	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
	Local magnetic fields are present.	Remove any electro-mechanical devices from the vicinity of the monitor, or move the monitor.
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
Video noise (Display has intermittent flashing or changes in brightness.)	Faulty CRT/chassis assembly	Replace the CRT/chassis assembly (Section 3.2.6) only after trying the previous solutions.
	The signal cable is loose or faulty.	Reseat the connectors or replace the signal cable.
	Video casting assembly is faulty.	Replace the video casting assembly (Section 3.2.5).
Focus is not sharp.	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).
	Power supply module is faulty.	Replace the power supply module (Section 3.2.2).
	Host system is faulty.	Repair the host system.
	Adjustment is incorrect.	Perform the FOCUS adjustment (Section 4.5).
	Deflection module is faulty.	Replace the deflection module (Section 3.2.4).

**Table 2-3 (Cont.) Poor Display Quality**

Symptom	Possible Cause	Suggested Solution
	Video casting assembly is faulty.	Replace the video casting assembly (Section 3.2.5).
	CRT/chassis assembly is faulty.	Replace the CRT/chassis assembly (Section 3.2.6) only after trying the previous solutions.

# 3

## Removing and Replacing FRUs

---

### 3.1 Introduction

This chapter describes how to remove and replace the monitor field replaceable units (FRUs).

The monitor consists of a small number of removable FRUs that are easily accessed and removed from the rear of the monitor. No special tools are needed, and self-retaining hardware is used.

The procedures describe how to remove the FRUs. To install each FRU, do the reverse of the removal procedure.

#### **WARNING**

**Turn power to the monitor off before performing any of these procedures.**

#### **NOTE**

**Before removing any FRUs, you must remove the rear cover and the top cover.**

## 3-2 Removing and Replacing FRUs

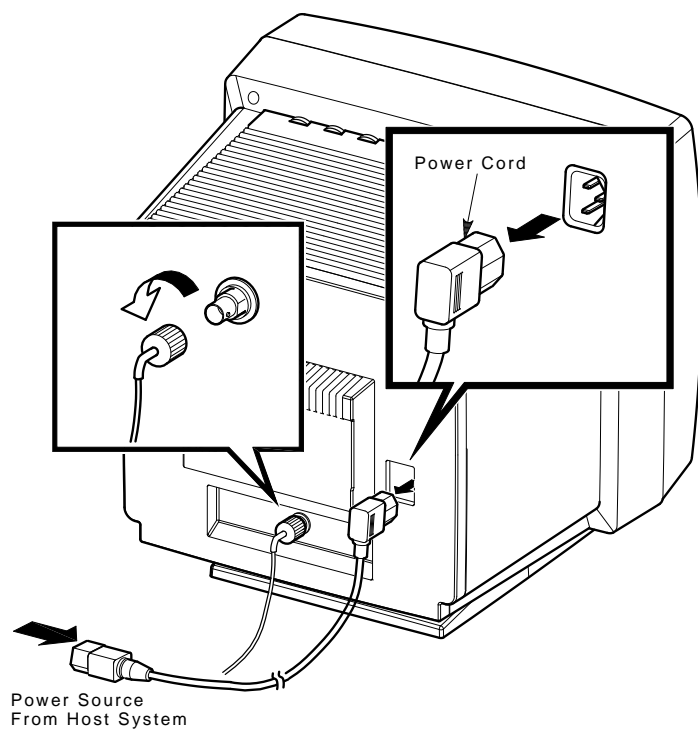
### 3.1.1 Removing the External Cables

Remove the external cables (Figure 3-1) as follows:

1. Make sure the power switch is off (out).
2. Unplug the power cord from the power source (wall outlet or host system) first, then from the monitor.
3. Remove the signal cable from the rear of the monitor.

#### NOTE

**Push the connector in and rotate it to the left until the signal cable is released from the connector.**



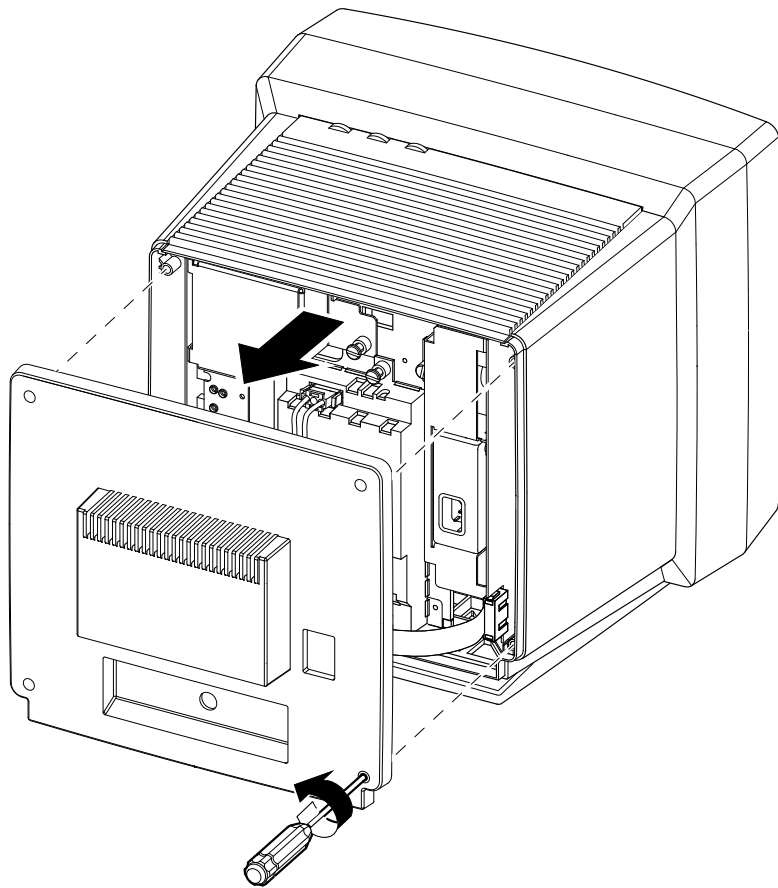
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**Figure 3-1 Removing Cables from the Monitor**

### 3.1.2 Removing the Rear Cover

Remove the rear cover as follows:

1. Remove the external cables (Section 3.1.1).
2. Use a Phillips screwdriver to remove the four screws that hold the rear cover to the enclosure (Figure 3-2).
3. Remove the rear cover by pulling the cover towards you.



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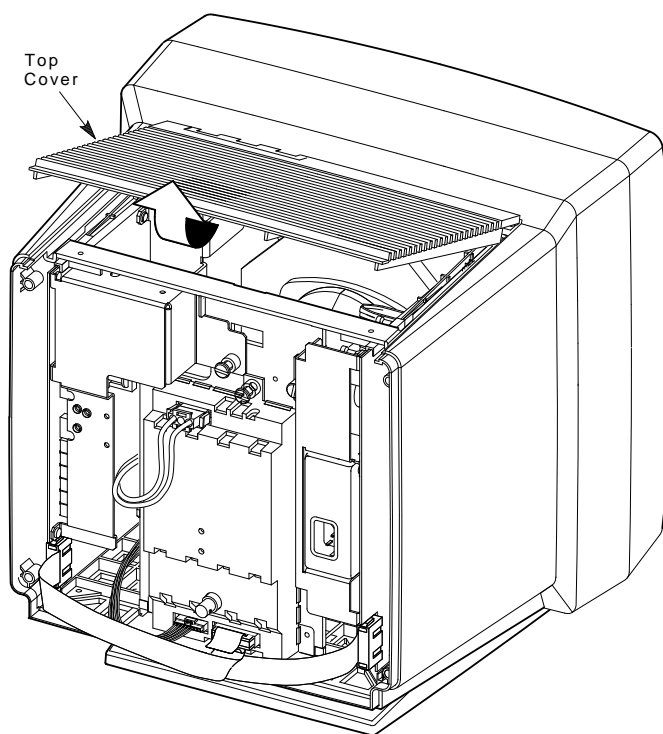
Figure 3-2 Rear Cover Removal

## 3-4 Removing and Replacing FRUs

### 3.1.3 Removing the Top Cover

Remove the top cover as follows:

1. Remove the rear cover (Section 3.1.2).
2. Tilt the top cover up and slide it toward the rear of the monitor. (Figure 3-3).



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**Figure 3-3 Top Cover Removal**



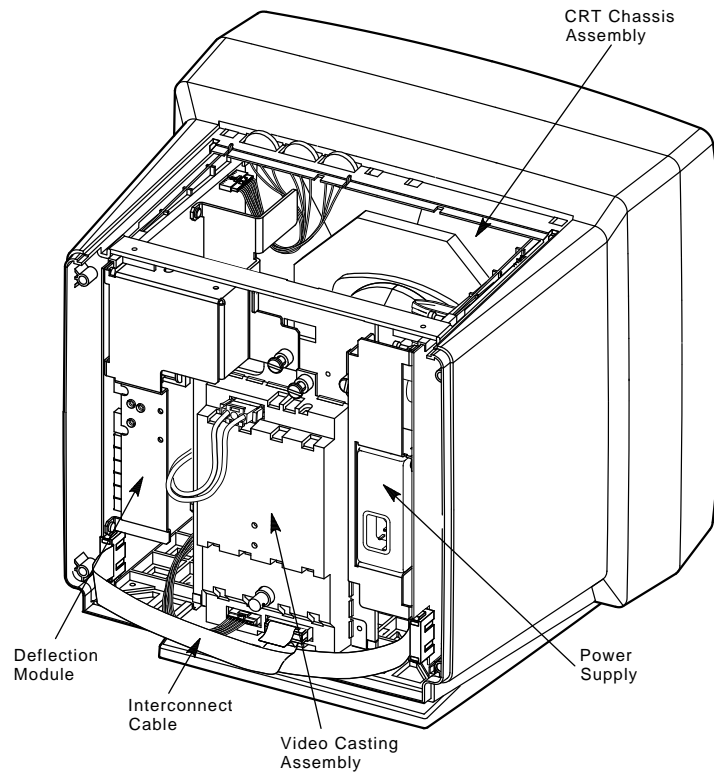
## 3.2 Field Replaceable Units (FRUs)

The monitor FRUs are shown in Figure 3-4.

When replacing any FRU, tilt the monitor from the back to the front to allow easier access to the modules.

### **WARNING**

**Turn the power off before disconnecting or replacing any FRU.**



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**Figure 3-4 Field Replaceable Units**

**3.2.1 Interconnect Cable**

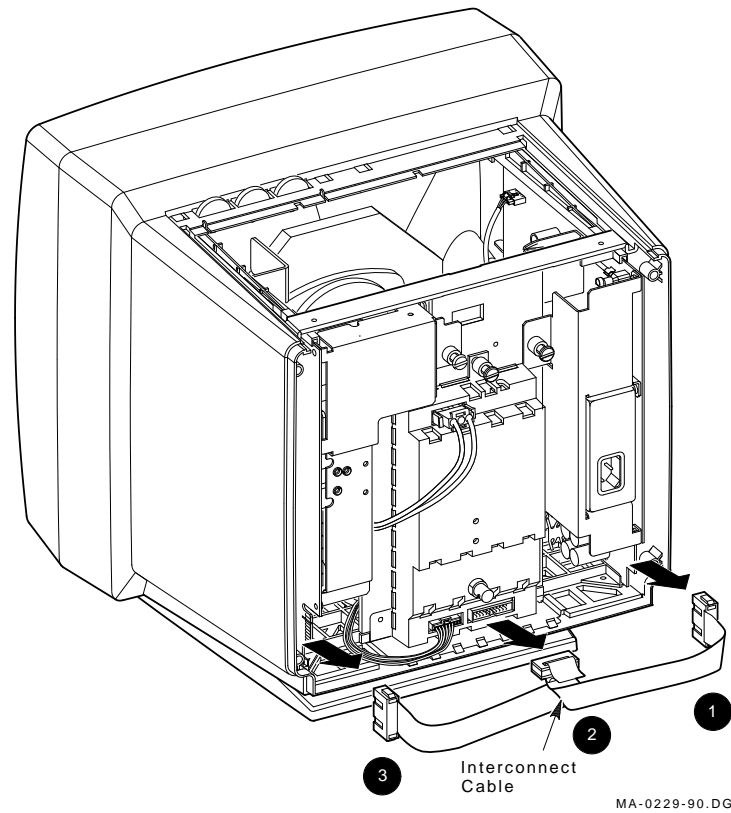
Remove the interconnect cable as follows:

- 1. Remove the rear cover (Section 3.1.2).
- 2. Remove the top cover (Section 3.1.3).
- 3. Disconnect the interconnect cable in the following order (Figure 3-5).

FRU	Connector	Interconnect Cable Plug
Power supply (right)	J1	P1 ❶
Video casting (center)	J2	P2 ❷
Deflection module (left)	J3	P3 ❸

**CAUTION**

**When replacing the interconnect cable, verify that the pull tab (labeled P2) is above the cable connector on the deflection module. You can damage the monitor if this cable is replaced incorrectly.**

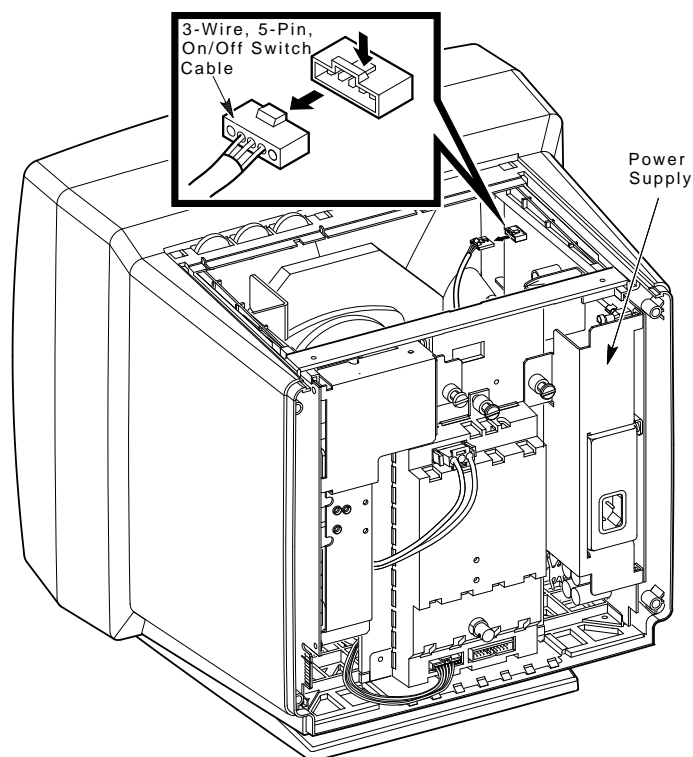


**Figure 3-5 Disconnecting the Interconnect Cable**

### 3.2.2 Power Supply Module

Remove the power supply module as follows:

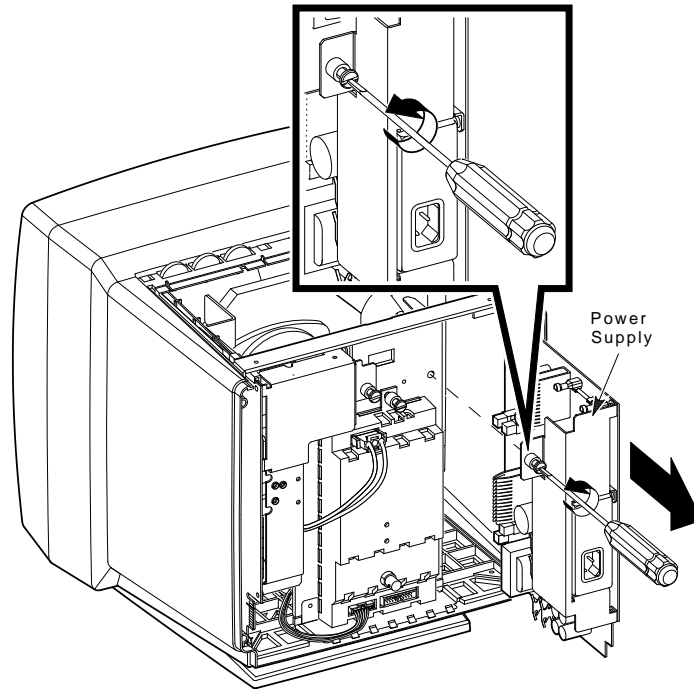
1. Remove the rear cover (Section 3.1.2).
2. Remove the top cover (Section 3.1.3).
3. Remove the interconnect cable (Section 3.2.1).
4. Disconnect the 3-wire, 5-pin On/Off switch cable (P4) from the connector (J4) at the top of the power supply by pressing the tab on top of the connector (Figure 3-6).



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**Figure 3-6** Removing the On/Off Switch Cable from the Power Supply

5. Loosen the captive screw that holds the power supply to the chassis (Figure 3-7).
6. Slide the power supply module out of the card guides.



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**Figure 3-7 Removing the Power Supply**

### 3.2.3 Discharging the CRT and Removing the Anode Cap

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

1. Remove the rear cover (Section 3.1.2).
2. Remove the top cover (Section 3.1.3).
3. Remove the interconnect cable (Section 3.2.1).
4. Remove the power supply module (Section 3.2.2).

**WARNING**

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

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

**WARNING**

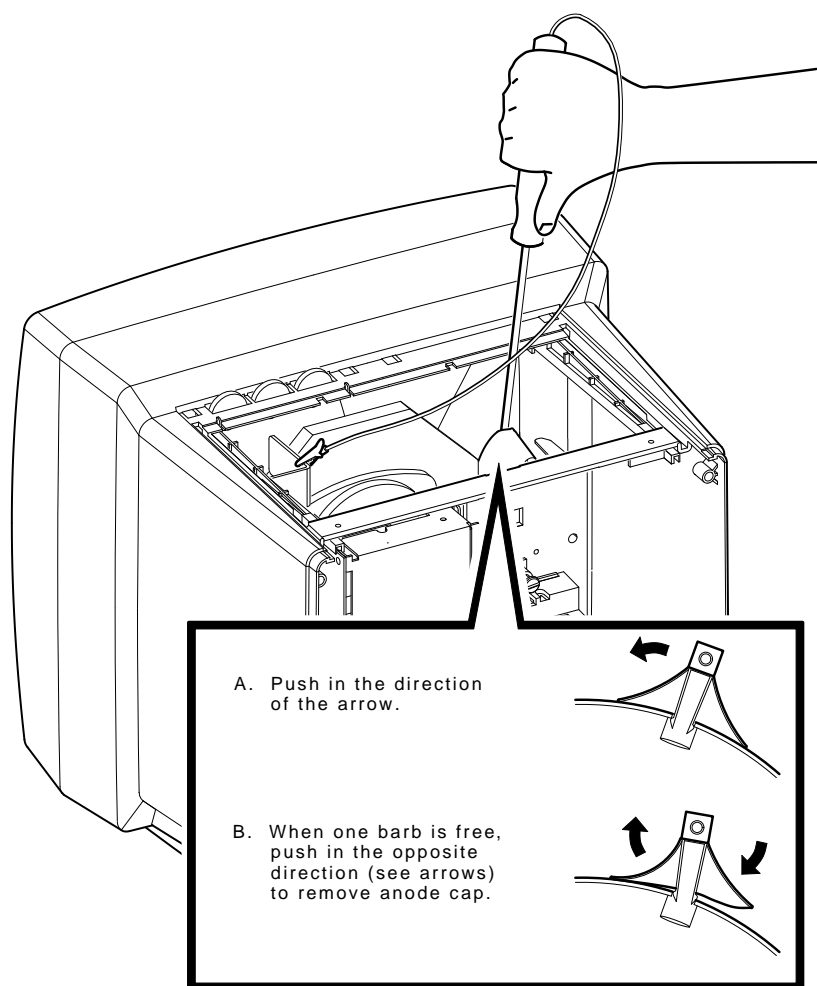
**Keep your free hand away from any part of the monitor during the anode discharge process.**

6. Using one hand, carefully slip the anode discharge tool under the CRT anode connector cup until it touches the connector prongs. Maintain contact for at least 10 seconds.

**NOTE**

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

7. Remove the CRT anode cap from the CRT, as shown in Figure 3-8.



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Figure 3-8 Discharging the CRT and Removing the Anode Cap

### 3.2.4 Deflection Module

Remove the deflection module as follows:

**CAUTION**

**Use a static protection kit (PN 29-26246-00) when handling the deflection module.**

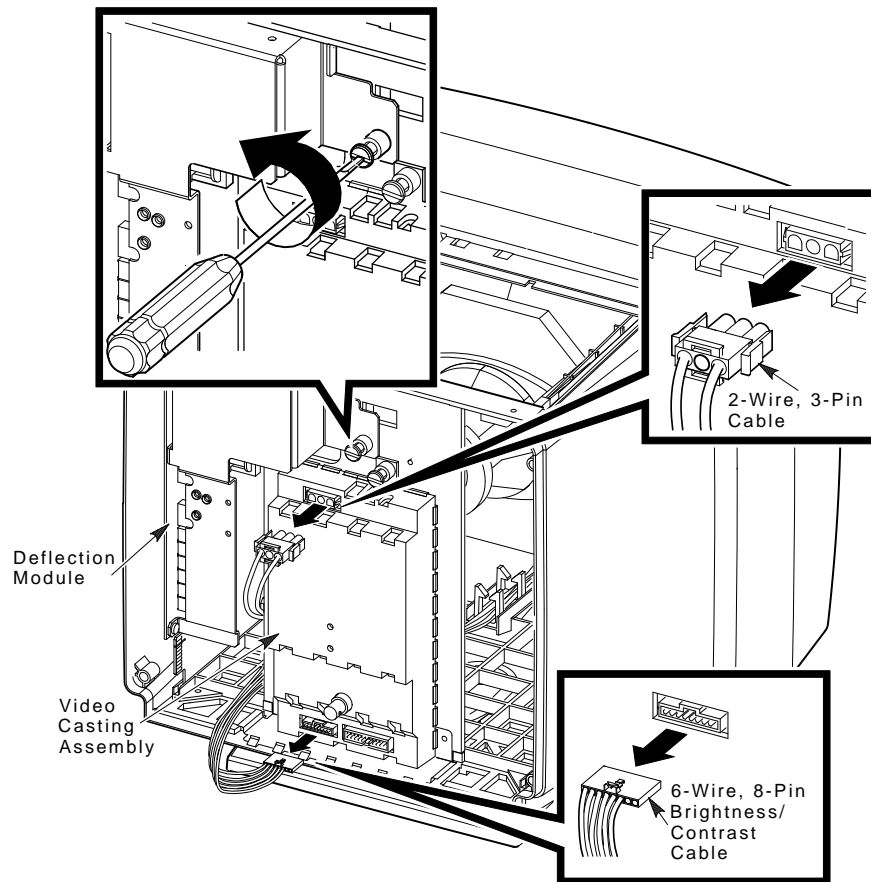
1. Remove the rear cover (Section 3.1.2).
2. Remove the top cover (Section 3.1.3).
3. Remove the power supply module (Section 3.2.2).
4. Discharge the CRT and remove the anode cap (Section 3.2.3).

**WARNING**

**You must complete the discharge procedure for the CRT (Section 3.2.3) before removing the deflection module.**

5. Remove the interconnect cable (Section 3.2.1).
6. Loosen the captive screw that holds the deflection module to the chassis (Figure 3-9).
7. Remove the 2-wire, 3-pin G2 and Focus cable (P7) from the connector (J7) at the top of the video casting assembly by pressing on the sides of the connector and pulling. You may need a small screwdriver to assist in releasing the tabs.



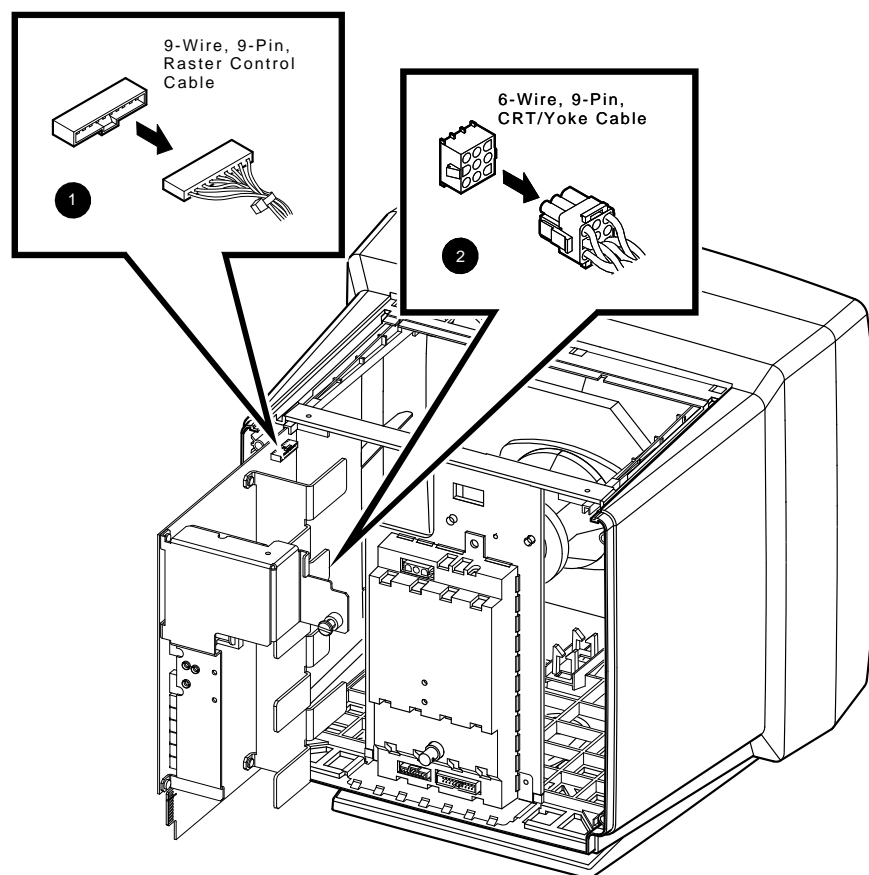


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Figure 3-9 Loosening the Captive Screw

### 3-14 Removing and Replacing FRUs

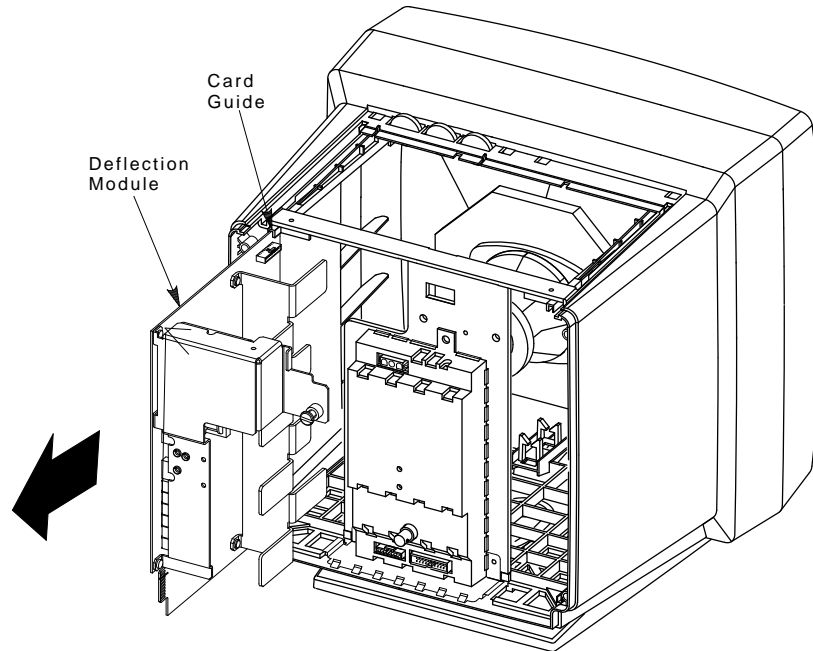
9. Disconnect the 9-wire, 9-pin raster control cable (P6) from the connector (J6) ❶ at the top of the deflection module by pressing the tab on top of the connector.
10. Disconnect the multicolored, 6-wire, 9-pin CRT/yoke cable (P11) from the connector (J11) ❷ on the deflection module by pressing the tabs on the connector (Figure 3-10).



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**Figure 3-10 Disconnecting Cables from the Deflection Module**

11. Slide the deflection module out of the card guides (Figure 3-11).



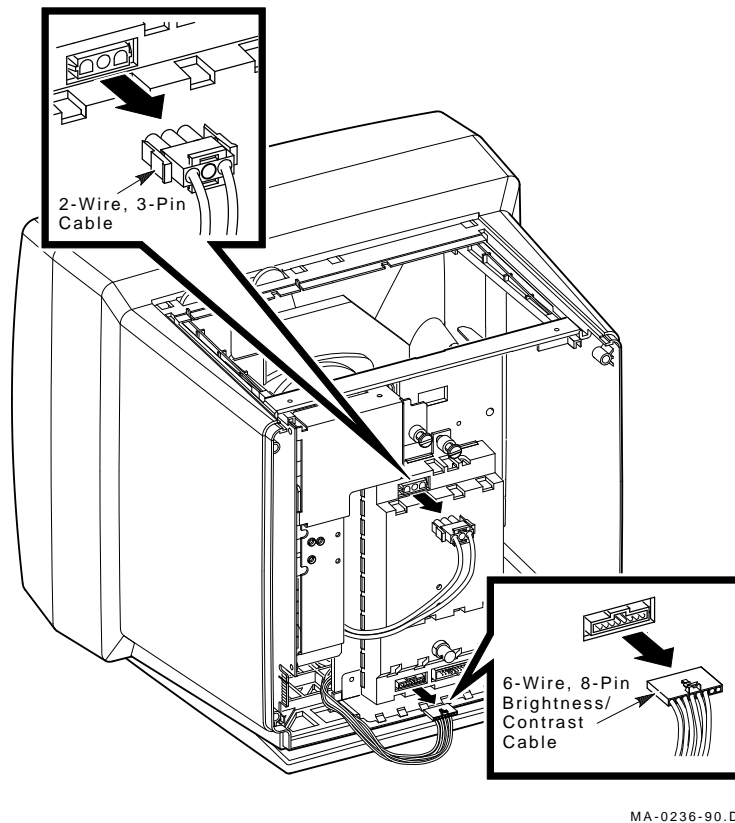
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**Figure 3-11 Removing the Deflection Module**

### **3.2.5 Video Casting Assembly**

Remove the video casting assembly as follows:

1. Remove the rear cover (Section 3.1.2).
2. Remove the top cover (Section 3.1.3).
3. Remove the interconnect cable (Section 3.2.1).
4. Remove the 2-wire, 3-pin cable (P4) from the connector (J4) at the top of the video casting assembly (Figure 3-12) by pressing on the sides of the connector and pulling. You may need a small screwdriver to assist in releasing the tabs.
5. Disconnect the 6-wire, 8-pin brightness/contrast cable (P5) from the connector (J5) at the bottom of the video casting assembly by pressing the top center tab on the connector. Place the cable out of the way behind the video casting.



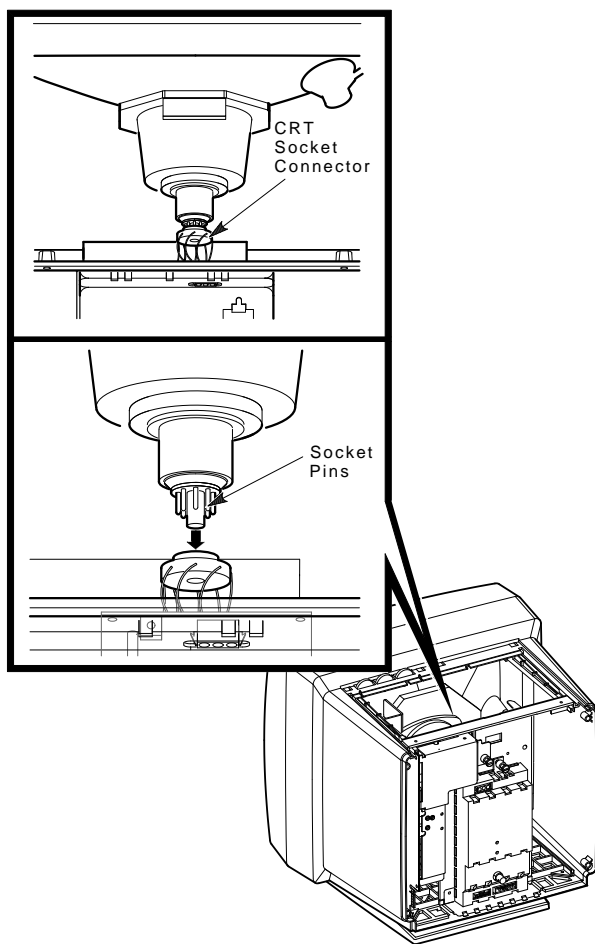
**Figure 3-12 Removing Cables from the Video Casting**

6. Gently push the CRT socket connector off the socket pins (Figure 3-13).

**CAUTION**

**When you install the video casting assembly, carefully push the CRT socket connector onto the CRT neck. Use care not to bend the pins during this procedure.**

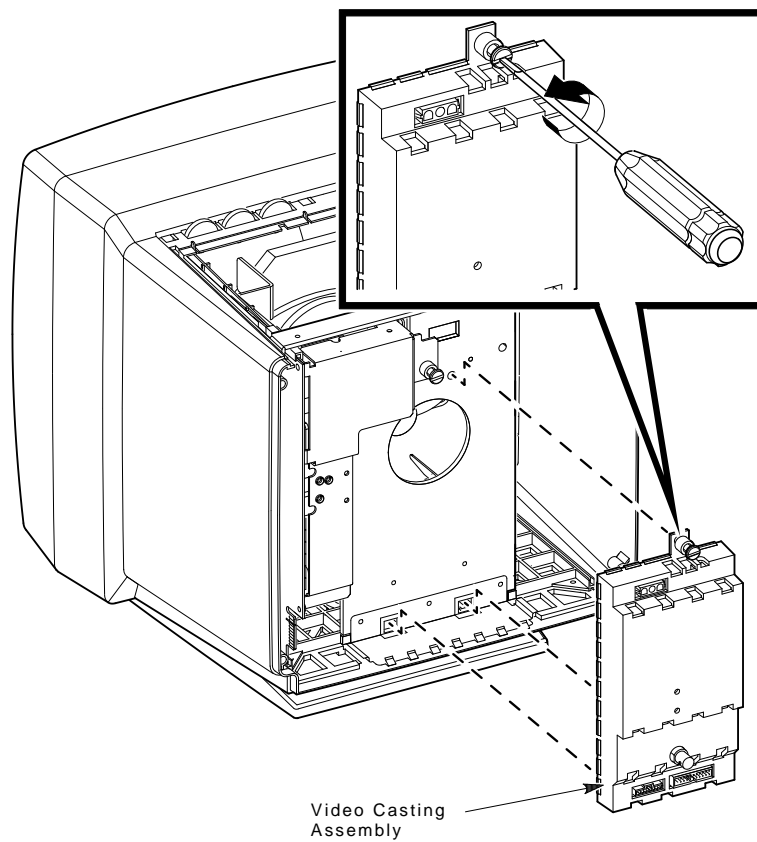
### 3-18 Removing and Replacing FRUs



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**Figure 3-13 Removing the CRT Socket Connector**

7. Loosen the captive screw at the top of the video casting (Figure 3-14).
8. Gently pull the top of the video casting assembly towards you and lift it out of the chassis.



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**Figure 3-14 Removing the Video Casting**

### 3.2.6 CRT/Chassis Assembly

To disassemble the CRT/chassis assembly:

1. Remove the rear cover (Section 3.1.2).
2. Remove the top cover (Section 3.1.3).
3. Remove the interconnect cable (Section 3.2.1)
4. Remove the power supply module (Section 3.2.2)
5. Discharge the CRT and remove the anode cap (Section 3.2.3).

**WARNING**

**You must discharge the CRT and remove the anode cap (Section 3.2.3) before removing the deflection module.**

6. Remove the deflection module (Section 3.2.4)
7. Remove the video casting assembly (Section 3.2.5)

**NOTE**

**After removing the above FRUs, the remaining part is the CRT/chassis assembly.**



### 3.3 CRT Disposal (Trained Service Personnel Only)

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

#### **WARNING**

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

#### **NOTE**

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

#### **Location**

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

#### **Handling a CRT**

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

#### **Stocking and Storage**

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

#### **CRT Disposal**

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

**WARNING**

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

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

At the Digital facility you must:

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

**WARNING**

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

Before you perform the following procedure, remove the FRUs listed in Section 3.2.6.

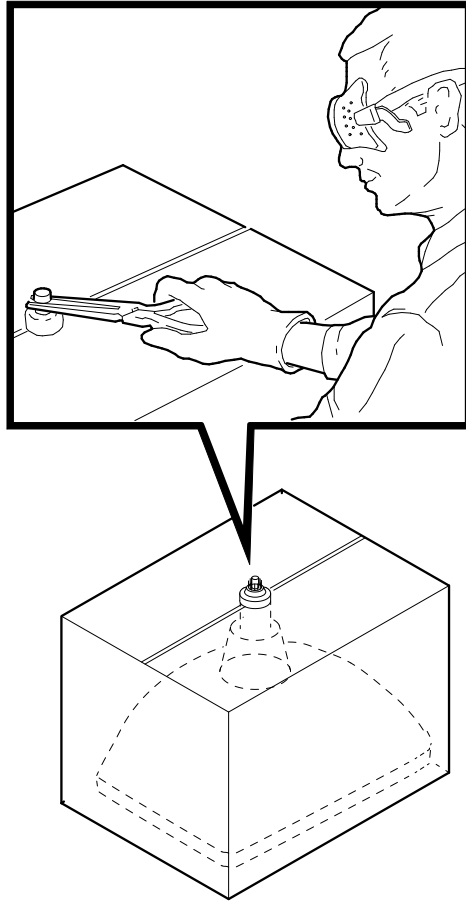
1. Place the old CRT/chassis assembly and the original packing material in the container from which you removed the new CRT/chassis assembly.
2. Using pliers, slowly crush, **but do not snap**, the evacuation point (Figure 3-15). Do not move or disturb the CRT until the hissing sound of in-rushing air stops.

**CAUTION**

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

**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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**Figure 3-15 Crushing the Evacuation Point**

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

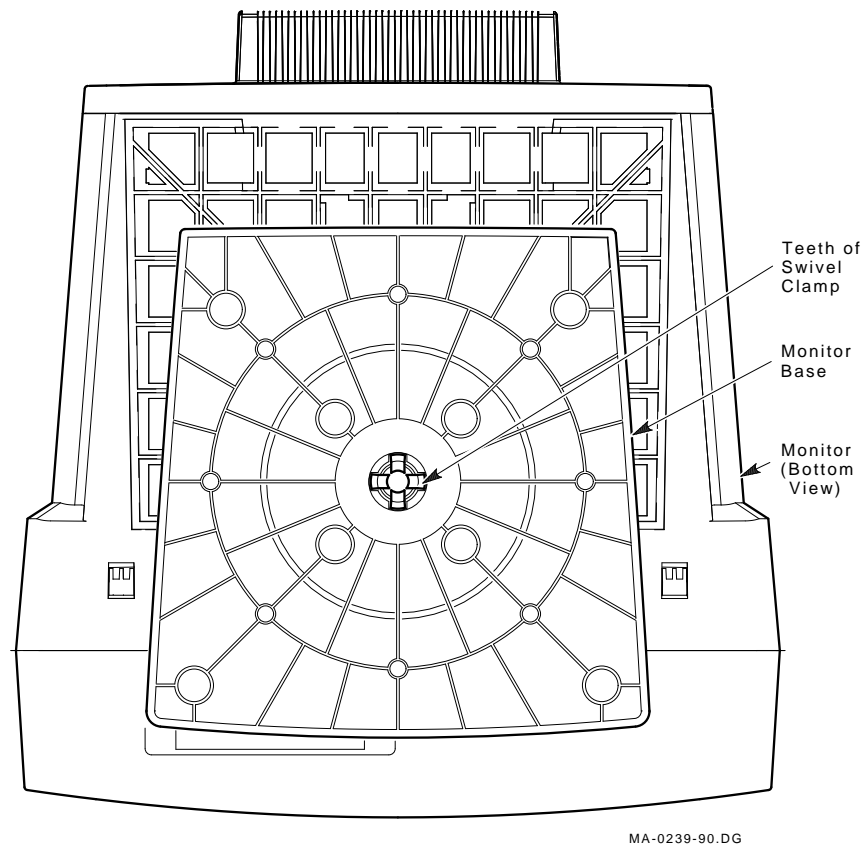
**NOTE**

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

### 3.4 Tilt-Swivel Base

**Helpful Hint:** During normal use, the tilt-swivel base should not come off the unit. There is a retainer plug in the center of the swivel retainer (74-39791-01) to hold the base on. If the tilt-swivel base should come off and the retainer teeth are not broken, you do not have to take the monitor apart. Use the following procedure to put the tilt-swivel base back on the monitor.

1. Place the monitor screen-side down on a soft pad.
2. Align the tilt-swivel base with the wider part downward toward the screen (Figure 3-16).
3. Place a curved tool, like a long Allen wrench, through the center of the swivel retainer inside the base.
4. While pressing on the base with one hand, pull the swivel retainer toward the base until the retainer teeth click into position.
5. Install a retainer plug (74-41176-01) in the retainer to keep the teeth apart.



**Figure 3-16 Tilt-Swivel Base**



# 4

## Aligning the Video Monitor

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### 4.1 Introduction

This chapter describes how to align the monitor display. You do not have to perform every adjustment procedure each time you align the monitor; however, you should check all adjustments in the order shown.

The success of one adjustment may depend on the accuracy of the preceding adjustments with the exception of the FOCUS and G2 adjustments. If a setting is already correct, you can skip that adjustment and go on to the next one.

Use Section 4.1.1 to set up the monitor for adjustments. You must use the screen alignment test patterns to make all adjustments. Refer to your host system documentation to set up test patterns.

#### 4.1.1 Before You Start

##### NOTE

**If a customer calls with a display quality type of problem, ask the customer to leave the monitor on until you arrive. Then, after removing the rear cover, only a 5 minute warm-up is needed.**

##### Clean the Monitor

Use a soft tissue or cloth and a non-abrasive, nonflammable glass cleaner, or use Digital's video screen cleaner (PN VT3XX-SC).

##### Set up the Monitor

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

1. Place the monitor on a nonconductive surface.
2. Remove the rear cover (Section 3.1.2).
3. Remove the top cover (Section 3.1.3).
4. Reconnect the video cable.

#### 4-2 Aligning the Video Monitor

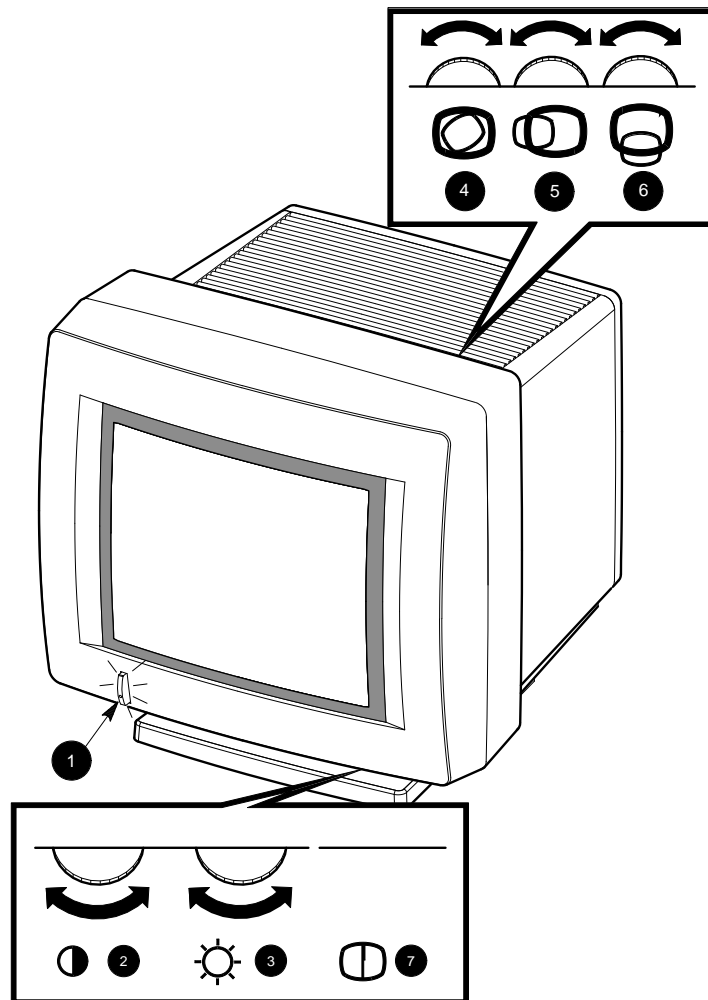
5. Reconnect the power cord.
6. Press the power switch to on. Wait for a video display to appear on the screen.
7. Verify that the user controls on the top of the monitor are in the center position of the thumbwheels. The user adjustments are listed in Table 4-1 and shown in Figure 4-1.
8. Rotate the monitor so the adjustments on the deflection board are on the right and the screen to view the test pattern is on the left. When performing the geometry adjustments, the monitor should be facing east, if possible.

**Table 4-1 Monitor Controls and Indicators**

Item	Control/Indicator	Function
❶	Power switch/ indicator	Turns the power on and off. When the power is on, the switch is lit up. For extended monitor life, switch the power off when not in use.
❷	Contrast	Adjusts the video display intensity.
❸	Brightness	Adjusts the video background intensity.
❹	Rotation	Rotates the video display area.
❺	Horizontal centering	Adjusts the horizontal position of the active area with respect to the bezel.
❻	Vertical centering	Adjusts the vertical position of the active area with respect to the bezel.
❼	Degauss switch	Not installed <sup>1</sup> .

<sup>1</sup>The VR315 has a degauss icon on the bezel because this bezel was planned for use with a companion color product. The VR315 and VR325 monochrome monitors do not have or need a degauss switch.





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Figure 4-1 User Controls and Indicator

### 4.1.2 Check LEDs and Heater Filament

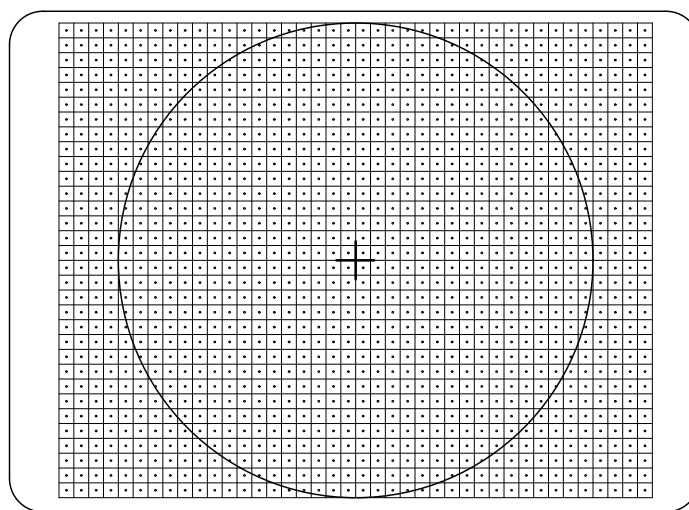
Visually check the monitor to ensure that the following components are ON:

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

### 4.1.3 Displaying Screen Tests

The procedures in this chapter refer to a circle-crosshatch alignment test pattern (Figure 4-2) and an all-white test pattern. Display them on the screen as needed by using procedures for your host system.

Refer to the host system service guide for accessing these diagnostic screen patterns.



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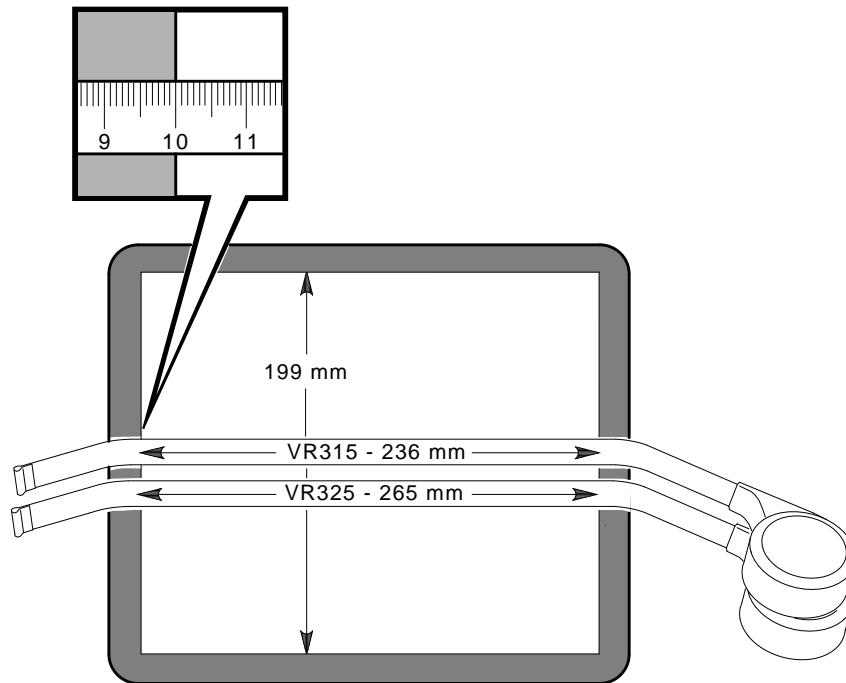
**Figure 4-2 Circle-Crosshatch Pattern**

## 4.2 Monitor Adjustments

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

### NOTE

**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. See Figure 4-3.**



LJ-00545-T10

**Figure 4-3 Using the Metric Measuring Tape**

## 4.3 Deflection Adjustments

### 4.3.1 Raster Adjustment

1. Set the user controls (Figure 4-1) on the top and the bottom of the monitor in the center position of the thumbwheels.
2. Adjust the Contrast control just until the raster displays.
3. Adjust the G2 potentiometer to its centered position (Figure 4-4).
4. Adjust VLIN potentiometer to its centered position.
5. Using a hex-head driver, set HLIN for the maximum width of the raster, then reduce the raster size by about 5 mm.

### 4.3.2 Anode Voltage Adjustment

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

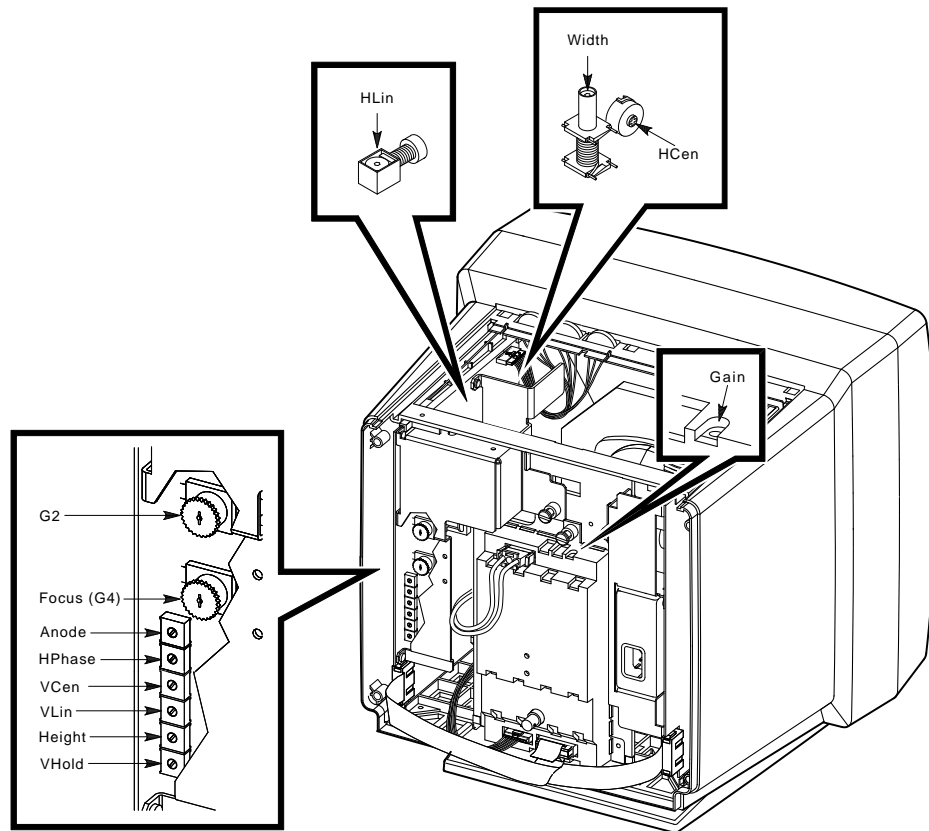
1. Mark the position on the ANODE potentiometer where the display size is maximized and minimized, by turning it in one direction and then the other.
2. Set the ANODE potentiometer to the half-way point between where the display size was at a maximum and at a minimum.

### 4.3.3 Height and Width Adjustments

Check and adjust linearity as follows:

1. Display the circle-crosshatch pattern (Figure 4-2).
2. Set the Brightness control on the bottom of the monitor to display the raster.
3. Set the HPHASE potentiometer so that video display is centered in the raster.
4. Using a Phillips screwdriver, adjust HCEN to center the display in the bezel.
5. Using a hex-head driver, set WIDTH so that the right half of the display is the correct width.
6. Using a hex-head driver, set HLIN so that the left half of the display is correct.

7. Repeat step 4 until the correct size, centering, and linearity is obtained. Then continue with step 8.



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**Figure 4-4 Internal Controls**

8. Adjust VCEN (Figure 4-4) so that the display is centered in the bezel.
9. Set HEIGHT so that the center to the bottom half of the dimension is correct.
10. Adjust VLIN so that the center rectangles are the same size as the bottom and top rectangles.

## 4.4 Using the Radiance Meter

Use the radiance meter as follows:

1. Remove the cap from the radiance meter sensor head and connect the occluder to the radiance meter (Figure 4-5).

### **CAUTION**

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

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

### **NOTE**

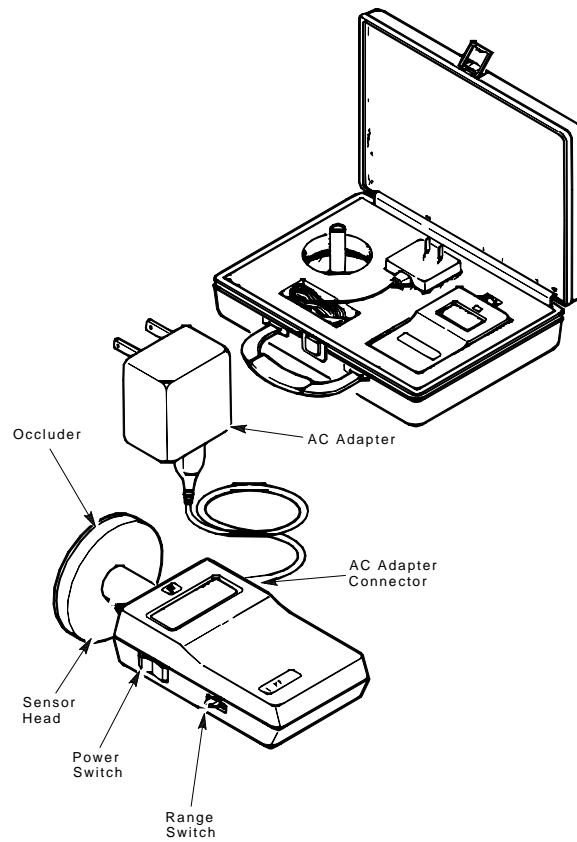
**Ensure that your radiance meter is in calibration.**

3. Turn the power switch to on.

### **NOTE**

**Do not use the POWER ON W/BACKLIGHT position when you are using the radiance meter with batteries.**

4. Set the range switch to the second position from the top (1.999).



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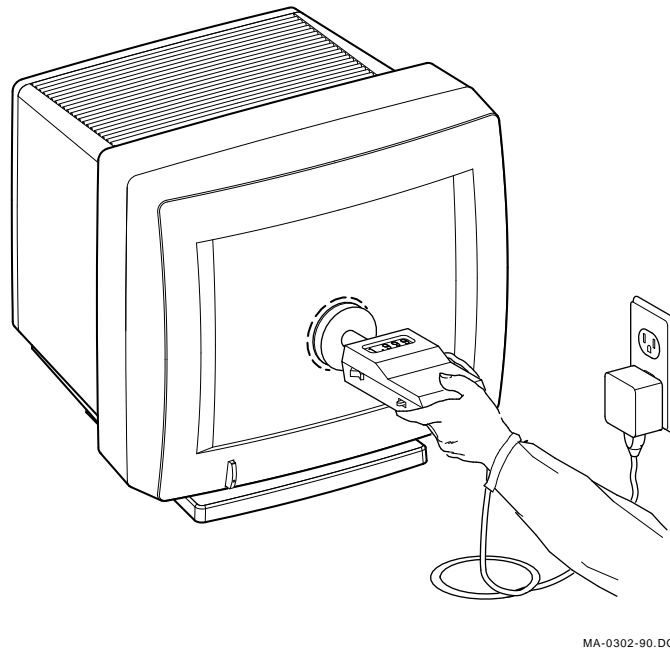
**Figure 4-5 Radiance Meter**

5. Place the occluder firmly against the center of the screen (Figure 4-6). Take a red china pencil to draw an arc or circle around the occluder.

**NOTE**

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

#### 4-10 Aligning the Video Monitor



**Figure 4-6 Using the Radiance Meter**

### 4.5 Cutoff Adjustment

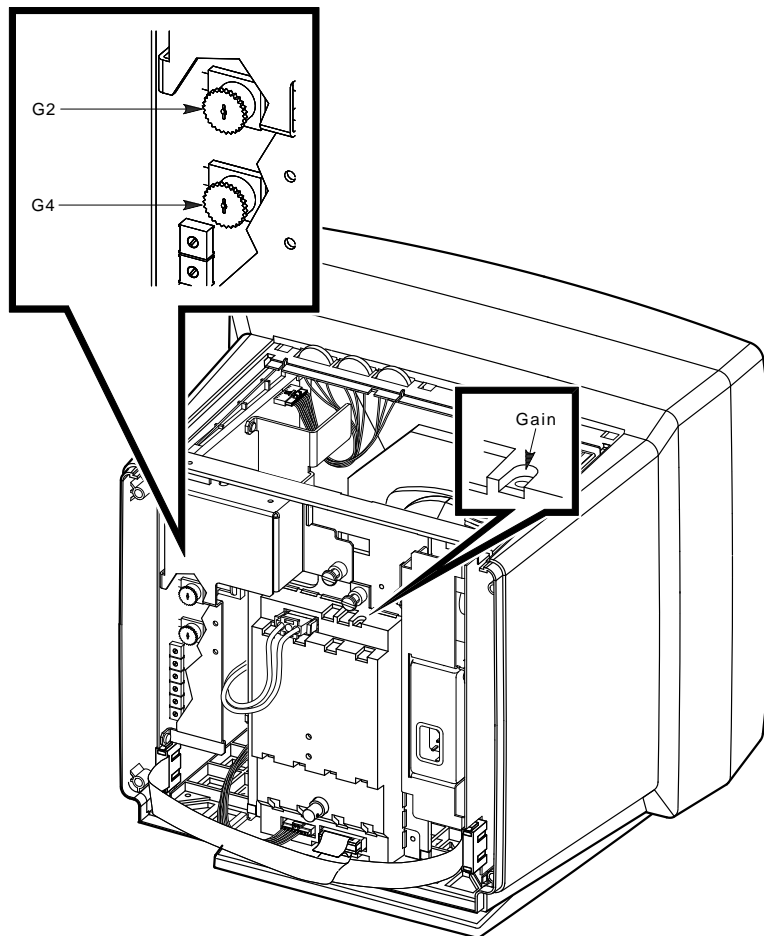
To adjust G2 control, use the radiance meter on the screen (Figure 4-6). Check and adjust G2 (Figure 4-7) as follows:

1. Set the Brightness to minimum and Contrast controls to maximum.
2. Set G2 using the raster pattern so that the maximum background luminance is 0.010.
3. Display the Circle/Crosshatch pattern and set FOCUS (G4) for best overall sharpness.



## 4.6 GAIN Adjustment

1. Set the Contrast control to maximum and Brightness control for background extinction.
2. Set GAIN using the All-White pattern to obtain 0.283 luminance at the screen center.



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Figure 4-7 GAIN, G2, and FOCUS (G4) Adjustments



# A

## VR315 and VR325 Documentation

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You can order the following VR315 and VR325 documents, some of which are available in several languages, from Digital. Contact your sales representative for availability and more information.

***Installing and Using the VR315 and VR325 Monochrome Monitors***  
**EK-VR315-IN-002**

This guide provides users with the information needed to install, operate, and maintain the VR315 and VR325 monitors. The manual also describes all controls and indicators.

***VR315/VR325 Monochrome Monitor IPB***  
**EK-VR315-IP-002**

This document provides a detailed parts breakdown of the VR315 and VR325 field replaceable parts. The documents do not contain part numbers for components on the printed circuit modules. However, these components are listed in the *Field Maintenance Print Set*, ordered separately.

***VR315 Field Maintenance Print Set***  
**MP-03013-01**

This document provides a complete set of electrical and mechanical schematic diagrams for the VR315 monitor.

***VR325 Field Maintenance Print Set***  
**MP-03013-02**

This document provides a complete set of electrical and mechanical schematic diagrams for the VR325 monitor.

