AppleColor High-Res RGB Monitor

Specifications

AppleColor High-Resolution RGB Monitor

Characteristics

Picture Tube

13-in. viewable diagonal screen
0.26 mm aperture grille pitch
Trinitron CRT

Screen Resolution

640x480; 69 dpi
Displays up to 16.7 million colors with Macintosh Display Card 4•8, 8•24, or 8•24GC

Scan Rates

Vertical refresh rate: 66.7 Hz
Horizontal scan rate: 35.0 kHz
Dot clock: 30.24 MHz

Active Video Display Area	9.3 in. by 6.9 in. (235 mm by 176 mm)
Input Signals	Video: red, green, and blue analog signals; RS-343 standard

Controls

User Controls

Rear panel: power switch and degauss switch
Right side: brightness and contrast controls

Adjustment Controls

Vertical misconvergence adjustment
Horizontal misconvergence adjustment

Physical and Electrical

Power Supply

Universal power supply
Voltage: 85–270 VAC
Frequency: 47–63 Hz
Power: 90 W

Size and Weight

Height: 11 in. (281 mm)
Width: 13.5 in. (344 mm)
Depth: 15.2 in. (385 mm)
Weight: 34 lb. (15.5 kg)

Operating Environment

Temperature	50°F–104°F (10°C–40°C)
Humidity	90% maximum, noncondensing
Altitude	10,000 feet (3,048 m) maximum

Troubleshooting

AppleColor High-Resolution RGB Monitor

General

The Symptom Charts included in this chapter will help you diagnose specific symptoms related to your product. Because cures are listed on the charts in the order of most likely solution, try the first cure first. Verify whether or not the product continues to exhibit the symptom. If the symptom persists, try the next cure. (Note: If you have replaced a module, reinstall the original module before you proceed to the next cure.)

If you are not sure what the problem is, or if the Symptom Charts do not resolve the problem, refer to the Flowchart for the product family.

For additional assistance, contact Apple Technical Support.

Symptom Charts

No Raster

No raster, LED off (condition may occur after monitor has been on for a few minutes)	1 Ensure monitor's video cable is connected to the computer or the video card in the computer. 2 Check power cord. 3 Check internal power connectors. 4 Replace blown fuse. 5 If deflection board is Rev. A board, replace high-voltage capacitor. 6 Replace deflection board D. 7 Replace power supply.

No Raster (Continued)

No raster, LED on	1 Ensure monitor's video cable is connected to the computer or the video card in the computer. 2 Adjust contrast and brightness knobs. 3 Check power supply and deflection board D connections. 4 Verify that video card in computer is working properly. 5 Replace video board C. 6 Replace video color board assembly. 7 Replace CRT.

Geometry

Raster size small/large, short/tall, narrow/wide

Note: When using the Rev. A version of the High-Resolution RGB Monitor with a Macintosh LC, the width of the raster/image area is reduced 3/16 inch from both sides of the screen. Adjust the horizontal size.

1 Adjust horizontal or vertical size.
2 Replace deflection board D.
3 Replace CRT.

Raster not centered

1 Verify that distortion is not due to environmental conditions. Move monitor to another location.
2 Adjust horizontal shift or vertical shift control (as appropriate) on video board H.
3 Replace deflection board D.

Geometry (Continued)

Vertical linearity bad (screen top and bottom differ)	1 Adjust V.LIN control. 2 Replace deflection board D.
Raster fades in and out	Replace video board C.
Abnormal/distorted raster (other than above)	1 Verify that distortion is not due to environmental conditions. Move monitor to another location. 2 Verify that all connectors are correctly placed and secure. 3 Perform appropriate geometry adjustments. 4 Replace deflection board D.

Synchronization

Picture breaks into diagonal lines	1	Connect another monitor to computer and verify video signal.
	2	Replace deflection board D.
Picture rolls vertically	1	Connect another monitor to computer and verify video signal.
	2	Verify that video card in computer is working properly.
	3	Replace deflection board D.
Single vertical line on screen	1	Check yoke connectors.
	2	Replace deflection board D.
	3	Replace CRT.

Synchronization (Continued)

Single horizontal line on screen

Note: A thin, gray, horizontal line may be visible across the bottom third of a lit screen. This line is inherent in the design of Trinitron monitors. Do not replace modules.

Otherwise,

1 Check yoke connectors.
2 Replace deflection board D.
3 Replace CRT.

Video

Predominant red, blue, or green tint	1 Verify that video card in computer is working properly. 2 Check monitor-to-computer connections. 3 Perform white balance adjustments. 4 Replace video color board assembly. 5 Replace CRT.
Picture too dark or too bright	1 Adjust brightness and contrast knobs. 2 Verify that video card in computer is working properly. 3 Set cutoff control on video board H. 4 Adjust white balance. 5 Replace video color board assembly. 6 Replace deflection board D.

Video (Continued)

Cannot adjust brightness or contrast	1 Replace video color board assembly. 2 Replace contrast control board J.
Picture out of focus	1 Adjust focus control on video board H. 2 Replace deflection board D. 3 Replace video board C. 4 Replace video color board assembly. 5 Replace CRT.

Video (Continued)

Picture out of focus with color-shadowed characters

Note: Colors in the crosshatch pattern indicate a convergence problem. (If you see no color and the display is fuzzy or the characters on the focus pattern are unclear, the problem is focus rather than convergence.)

1 Perform convergence adjustment; then adjust focus control on video board H if necessary.
2 Replace deflection board D.
3 Replace CRT.

Miscellaneous

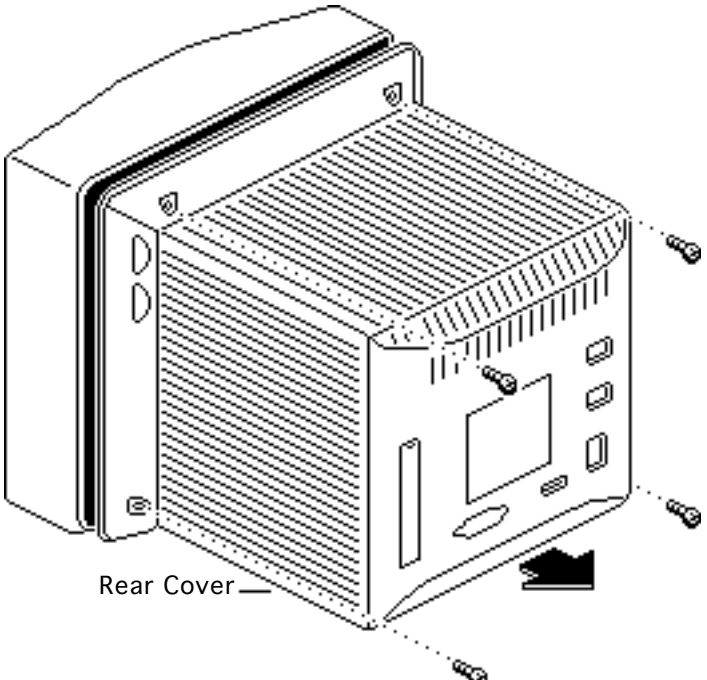
Intermittently shuts down (LED does not light)	1 Ensure monitor's video cable is connected to the computer or the video card in the computer. 2 Perform cutoff adjustment. 3 Replace high-voltage capacitor. 4 Replace deflection board D.
Picture jitters or flashes	1 Check that all ground cables are secure. 2 Verify that adjacent computer equipment is properly grounded. Move electrical devices away from monitor. Temporarily shut off fluorescent lights. 3 Replace deflection board D.
Black screen spots (burnt phosphors)	Replace CRT.

Miscellaneous (Continued)

Monitor emits high-pitched noise	Replace deflection board D.
Degauss button does not correct uneven patches of color	Replace power supply.

Take Apart

AppleColor High-Resolution RGB Monitor



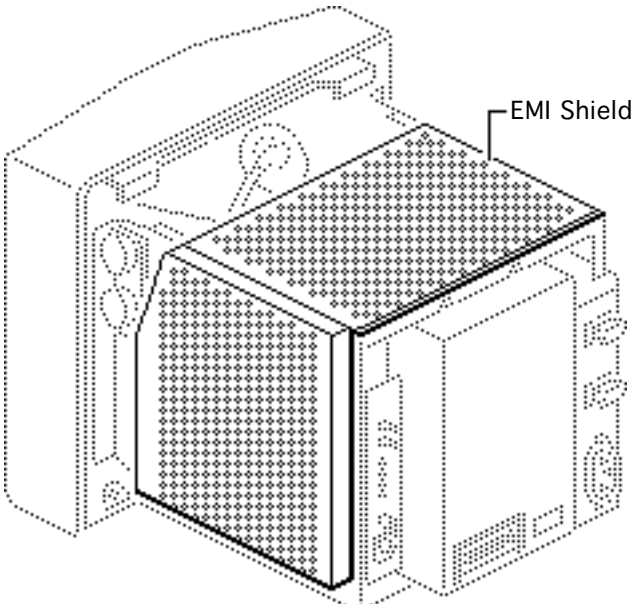
Rear Cover

No preliminary steps are required before you begin this procedure.

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

Warning: Never use a grounding wriststrap until after discharging the CRT.

Remove the four case screws and lift off the rear cover.



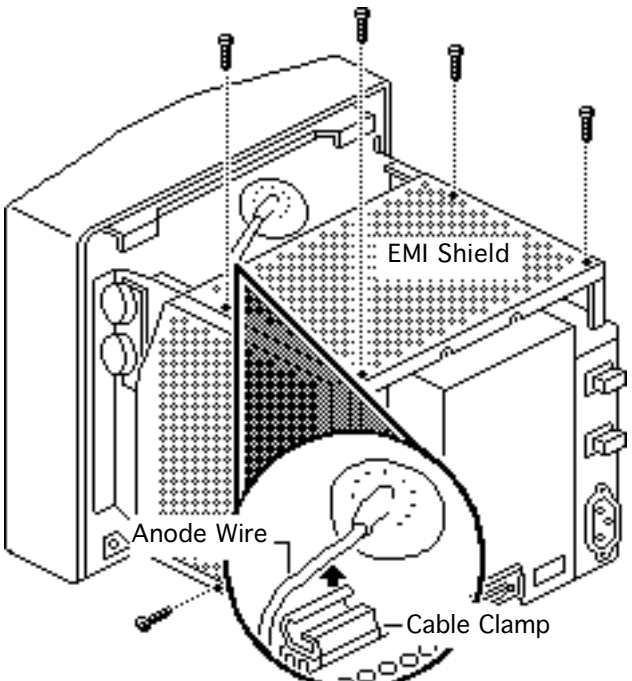
EMI Shield

Before you begin,

- Remove the rear cover
- Discharge the CRT

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

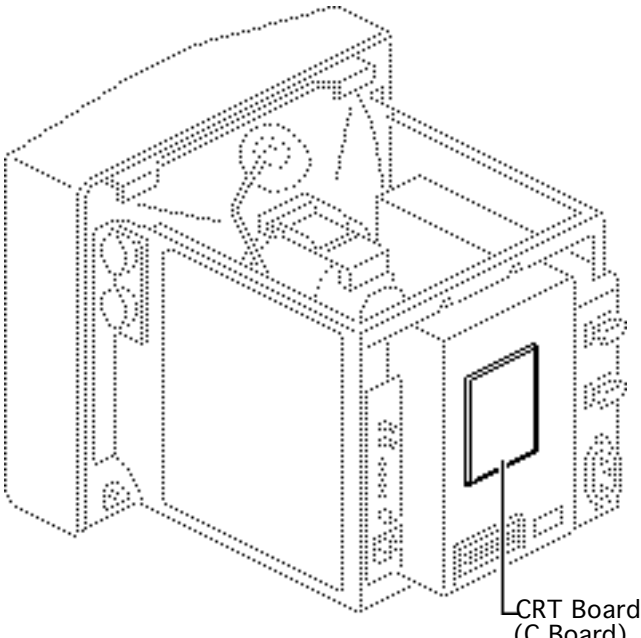
Warning: Never use a grounding wriststrap until after discharging the CRT.



1 Remove the five screws that secure the EMI shield to the chassis.

2 ⚠**Warning:** Do not touch the anode wire to remove it from the shield.

Gently pull and twist the shield to release the anode wire from the cable clamp.



CRT Board (C Board)

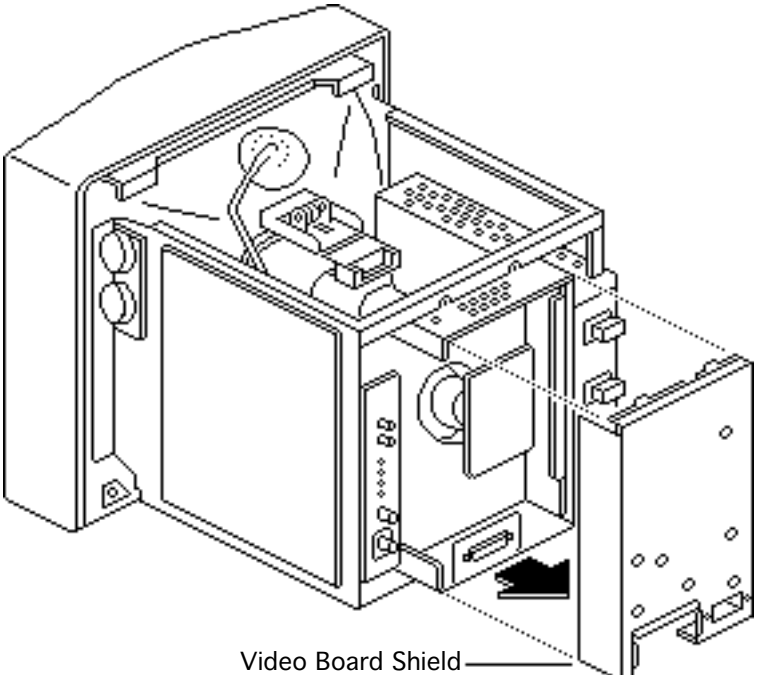
Before you begin,

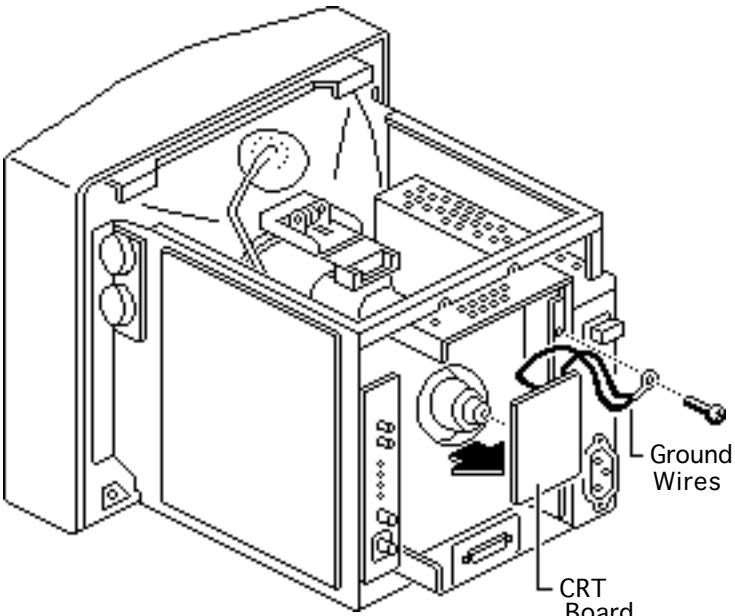
- Remove the rear cover
- Remove the EMI shield
- Discharge the CRT

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

Warning: Never use a grounding wriststrap until after discharging the CRT.

1 Pull off the metal video board shield.

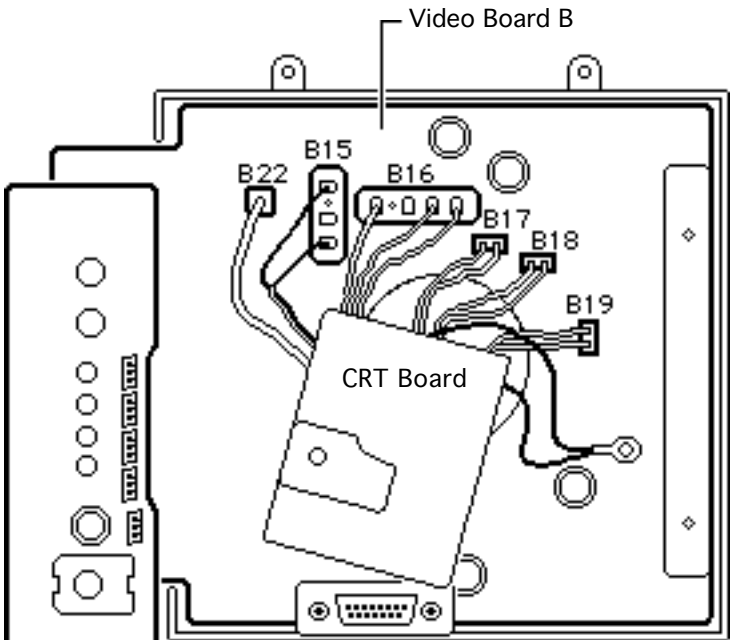




2 Remove the screw that secures the black ground wires to the video color board frame.

3 Pull the CRT board straight off the neck of the CRT.

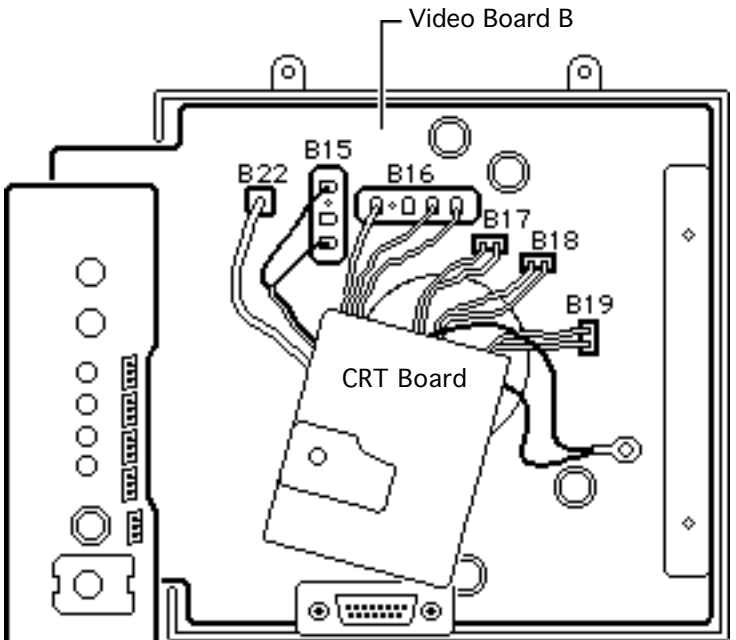
4 **Caution:** Excessive force might damage the video board B connectors. If the connectors are difficult to remove, slip a jeweler's screwdriver between the two halves of the connector and carefully pry them apart.



Note: Some connector locations are different on the Rev. A and Rev. B versions of the CRT board.

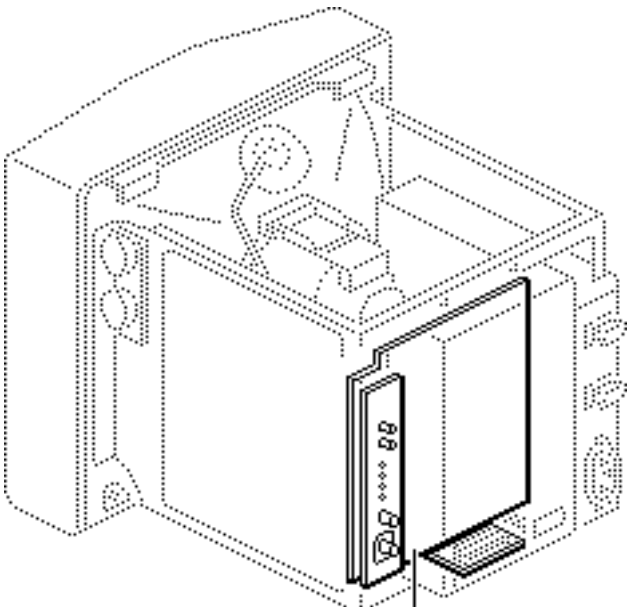
Disconnect the following CRT board cable connectors from video board B:

- Gray, 1-wire cable from B22
- White, 2-wire cable from B15
- White, 4-wire cable from B16
- Black, 2-wire cable from B17



- Yellow, 2-wire cable from B18
- Red, 2-wire cable from B19

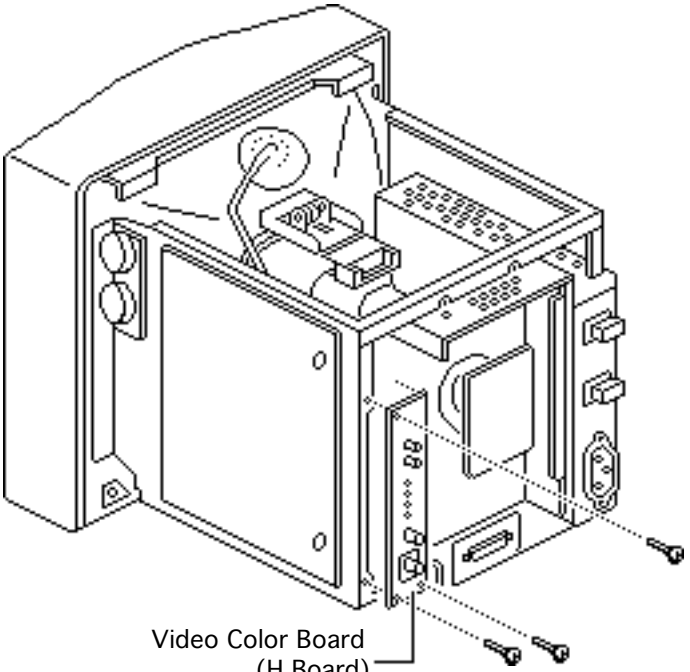
Video Color Board



Before you begin,

- Remove the rear cover
- Remove the EMI shield
- Discharge the CRT
- Remove the CRT board

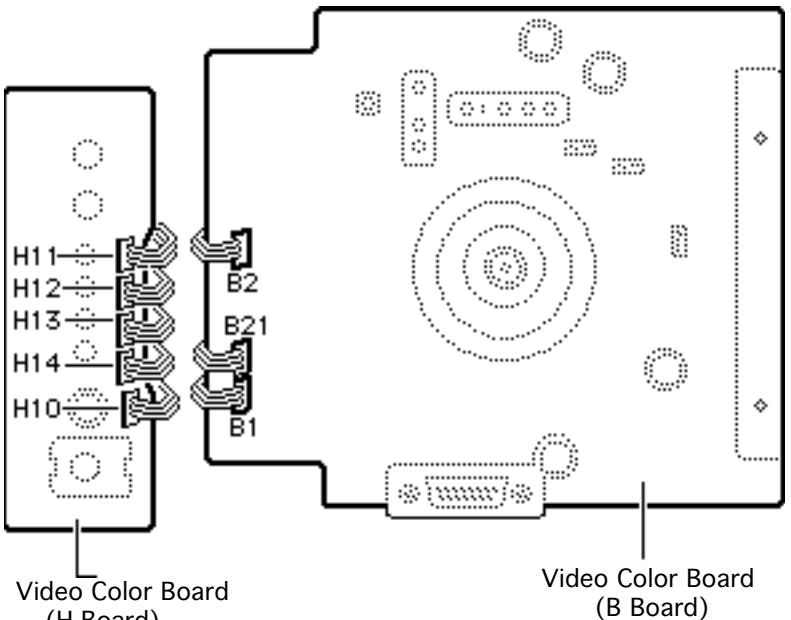
Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.



Warning: Never use a grounding wriststrap until after discharging the CRT

Note: The video color board is an assembly composed of three boards (H, B, and Q), the metal frame that supports the boards, and the exterior I/O connector.

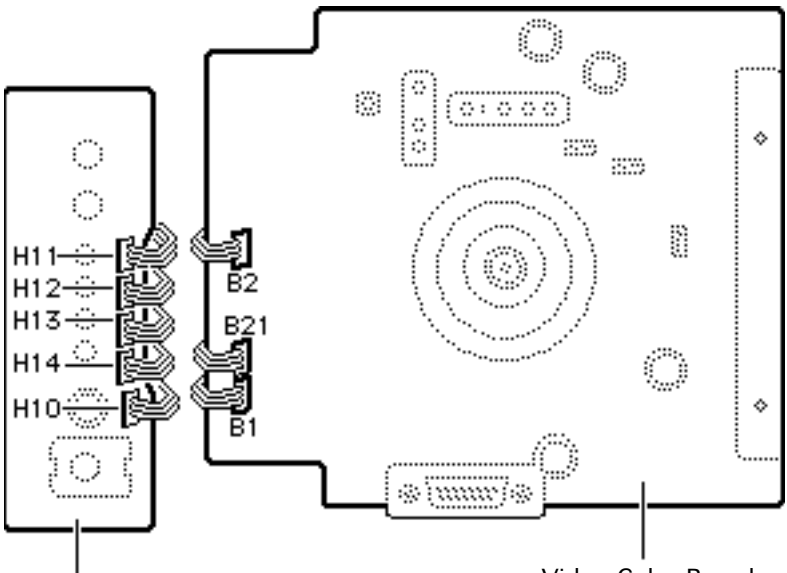
1 Remove the three screws that secure the video color board (H board) to the metal chassis and pull the board out slightly.



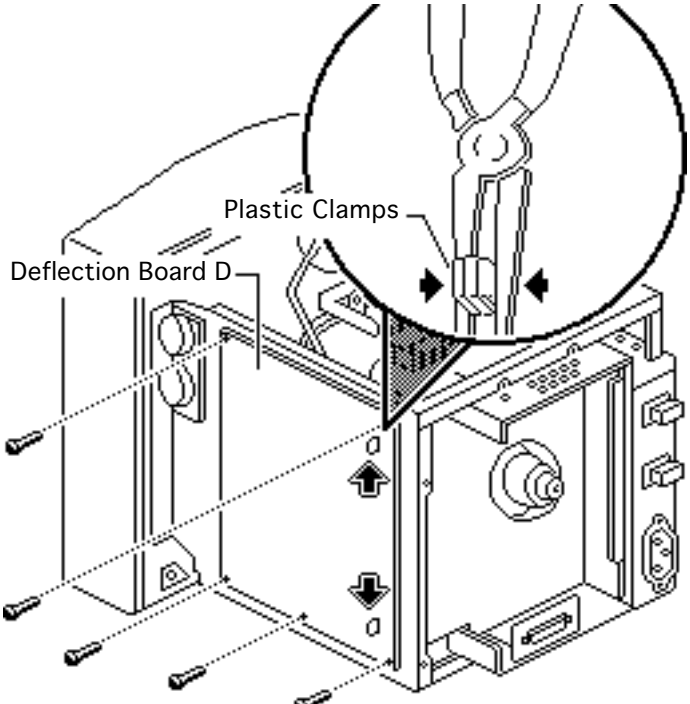
2 **Caution:** Excessive force may pull the connector off the board. If the connector is difficult to disconnect, slip a jeweler's screwdriver between the two halves of the connector and carefully pry them apart.

Disconnect the following connectors from video color boards B and H.

- Yellow, 3-wire cable from H10
- White, 3-wire cable from H14

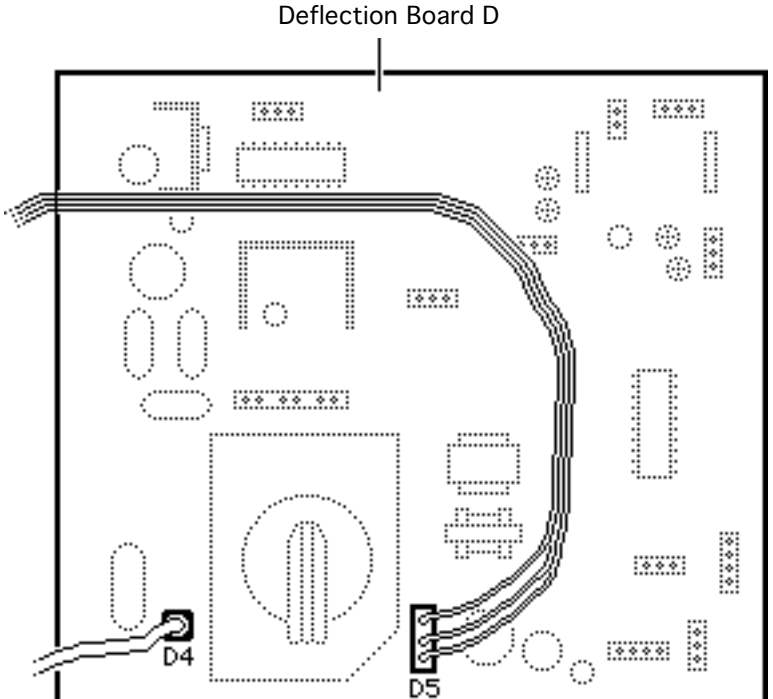


- Black, 3-wire cable from H13
- Red, 3-wire cable from H12
- White, 3-wire cable from H11
- White, 3-wire cable from B2
- Yellow, 4-wire cable from B21
- Black, 4-wire cable from B1



3 Remove the five screws that secure deflection board D to the chassis.

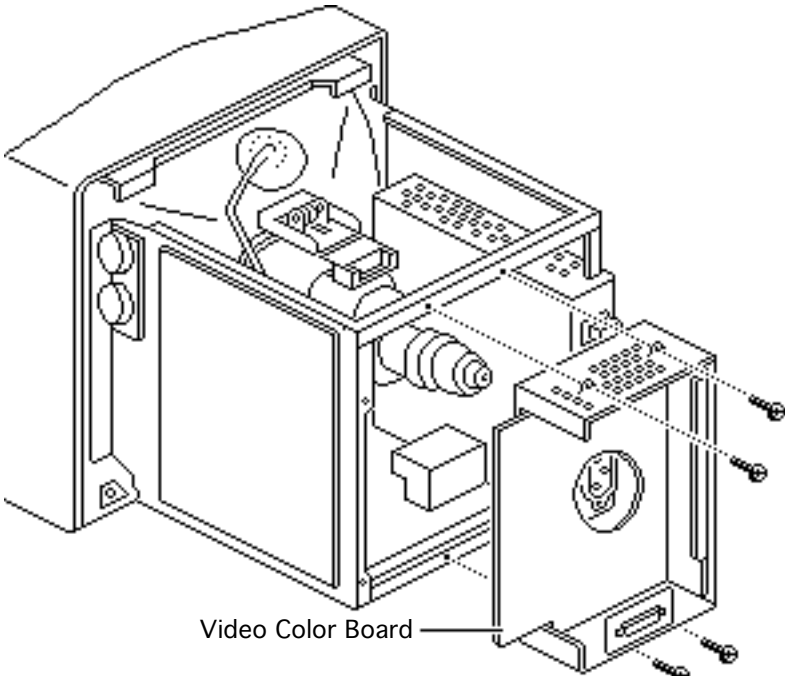
4 Squeeze together the plastic clamps and release the deflection board. Squeeze the clamps one at a time; if necessary, use needlenose pliers.



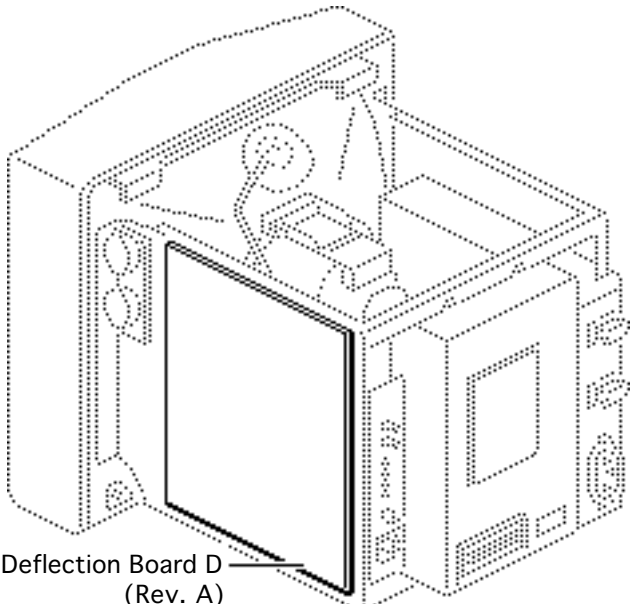
5 Disconnect connectors D-4 and D-5 from deflection board D.

Note: On the Rev. B version of the deflection board, the connectors may begin with the letter “B.”

Note: Some connector locations are different on the Rev. A and Rev. B versions of the video color board.



6 Remove the four screws that secure the metal frame of the video color board to the chassis, and remove the video color board.



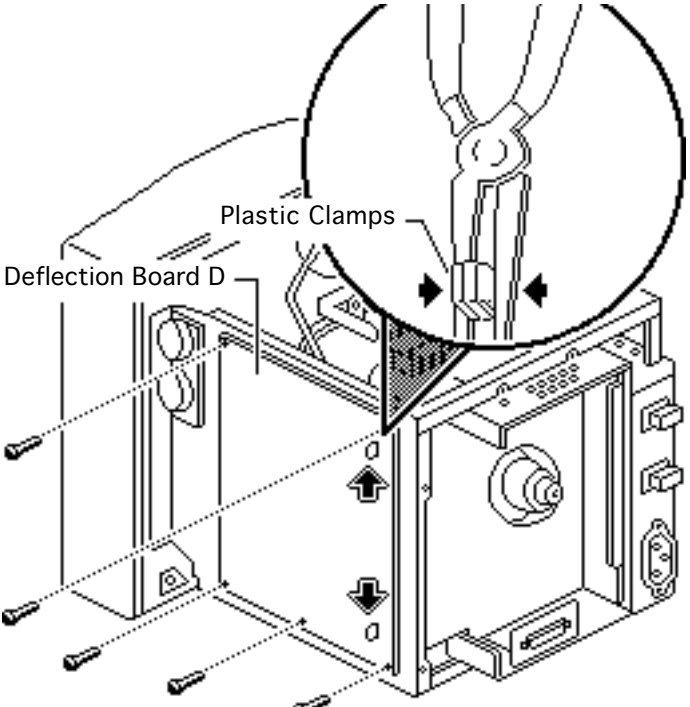
Deflection Board D, Rev. A

Before you begin,

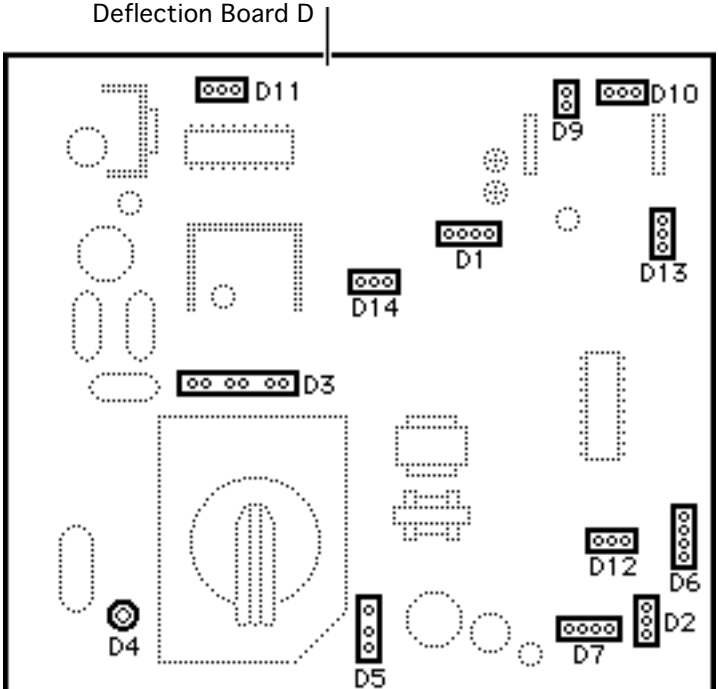
- Remove the rear cover
- Remove the EMI shield
- Discharge the CRT

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

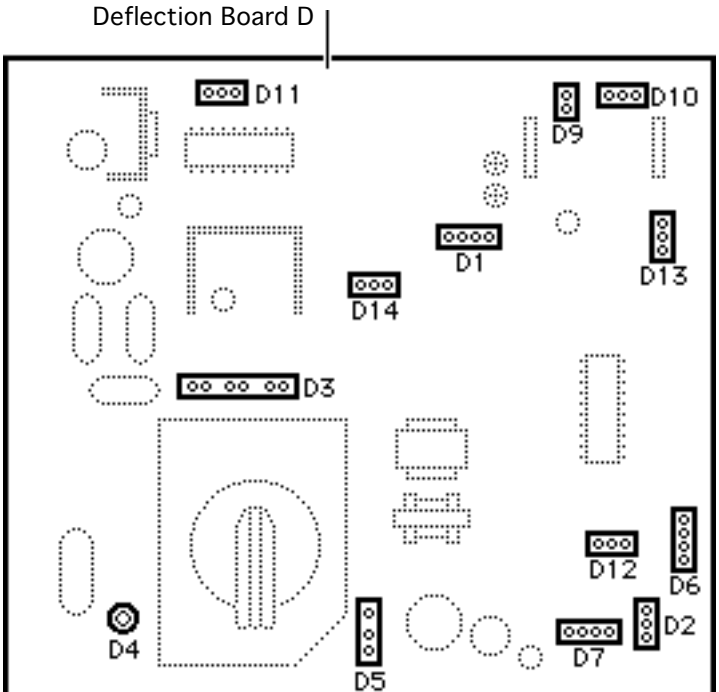
Warning: Never use a grounding wriststrap until after discharging the CRT.



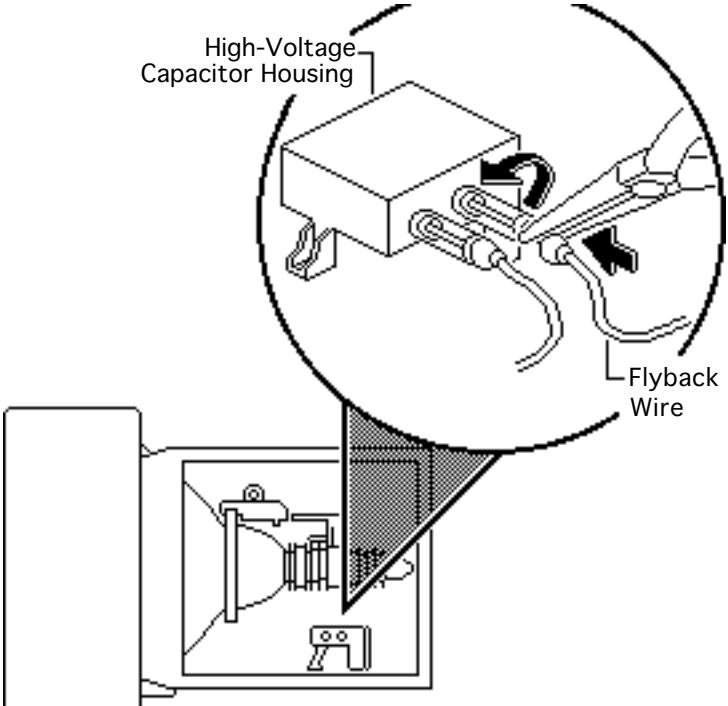
1. Remove the five screws that secure deflection board D to the metal chassis.
2. Squeeze together the plastic clamps and release the deflection board. Squeeze the clamps one at a time; if necessary, use needlenose pliers.
3. Pull deflection board D slightly away from the chassis.



4 Disconnect these connectors from the deflection board:
- White, 3-wire cable from D11
- White, 2-wire cable from D9
- Yellow, 3-wire cable from D10
- Black, 4-wire cable from D1
- Black, 3-wire cable from D13
- White, 3-wire cable from D14
- White(lg), 4-wire cable from D3

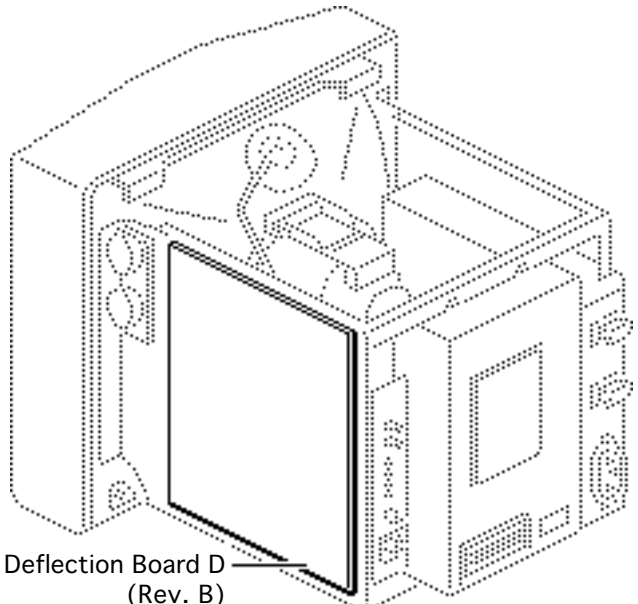


- Red, 4-wire cable from D6
- White, 3-wire cable from D2
- White, 4-wire cable from D7
- Red, 3-wire cable from D12
- White, 2-wire cable from D5
- Gray, 1-wire cable from D4



5 Peel back the rubber boot on the flyback wire in the high-voltage capacitor housing. Insert pliers into the opening in the capacitor housing and grasp the wire as close as possible to the capacitor. Push in (toward the capacitor) and rotate the wire 1/4 turn counter-clockwise; then pull out the wire.

6 Lift the deflection board free.

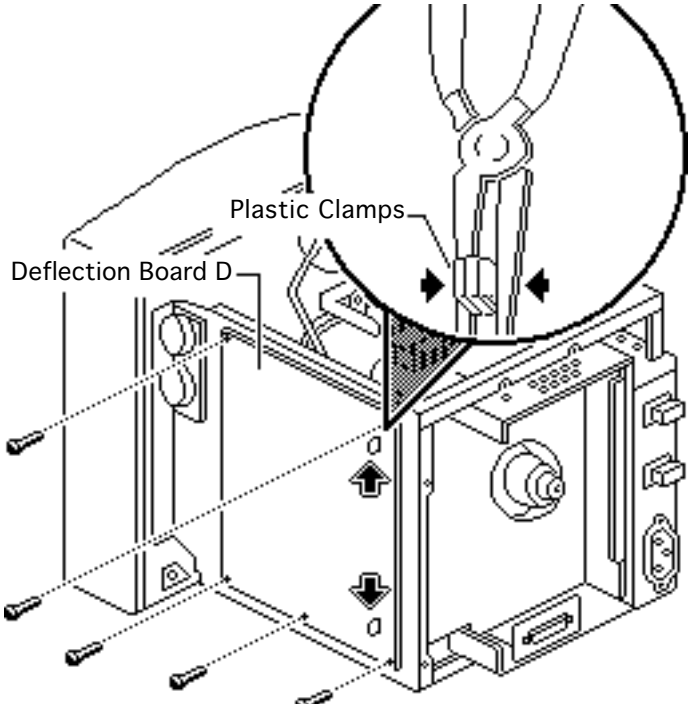


Deflection Board D, Rev. B

Before you begin,

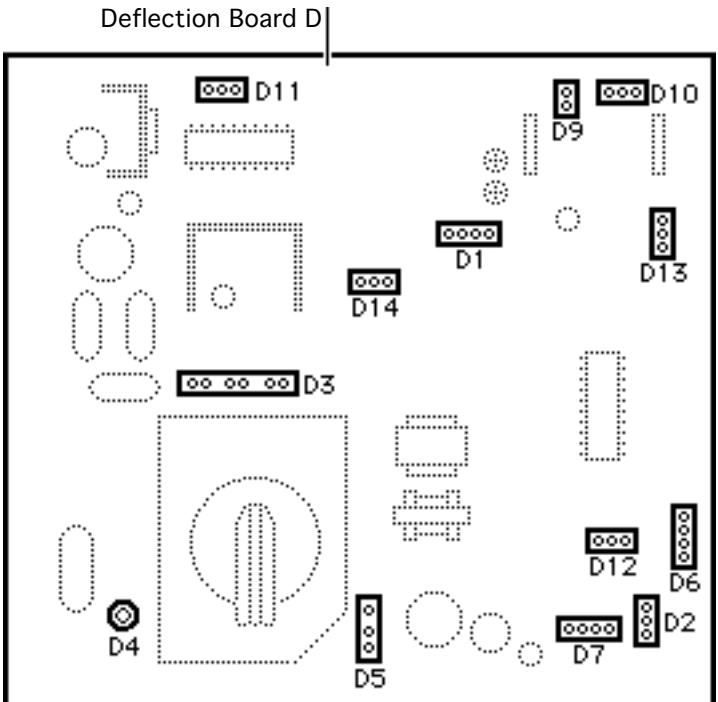
- Remove the rear cover
- Remove the EMI shield
- Discharge the CRT
- Disconnect anode cap

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.



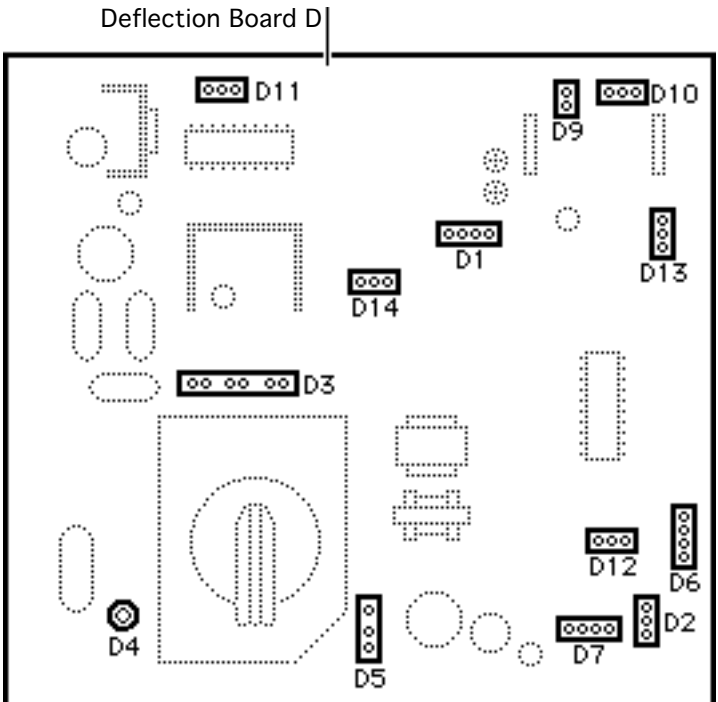
Warning: Never use a grounding wriststrap until after discharging the CRT.

1. Remove the five screws that secure deflection board D to the chassis.
2. Squeeze together the plastic clamps and release the deflection board. Squeeze the clamps one at a time; if necessary, use needlenose pliers.
3. Pull deflection board D slightly away from the chassis.

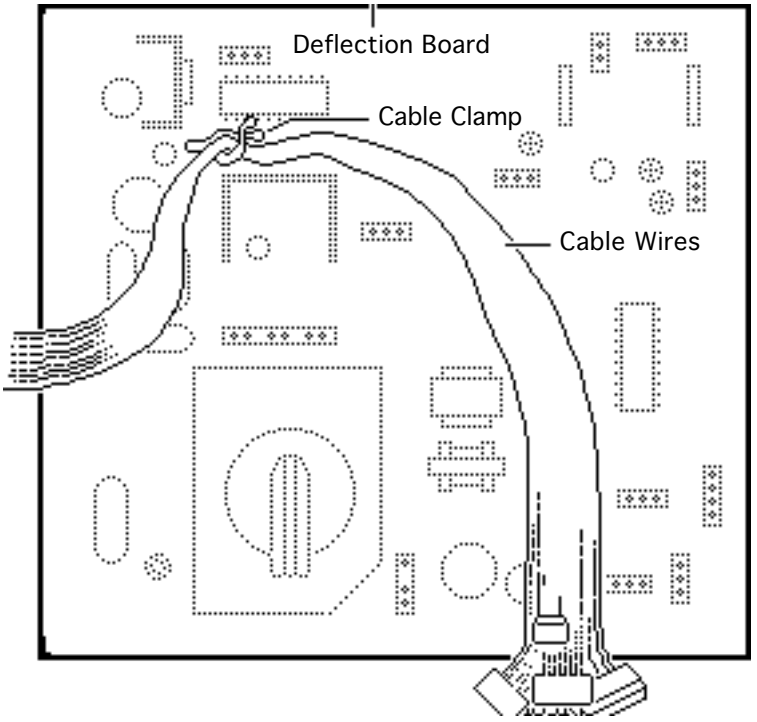


4 Disconnect these cables from the deflection board:

- White, 3-wire cable from D11
- White, 2-wire cable from D9
- Yellow, 3-wire cable from D10
- Black, 4-wire cable from D1
- Black, 3-wire cable from D13
- White, 3-wire cable from D14
- White(lg), 4-wire cable from D3

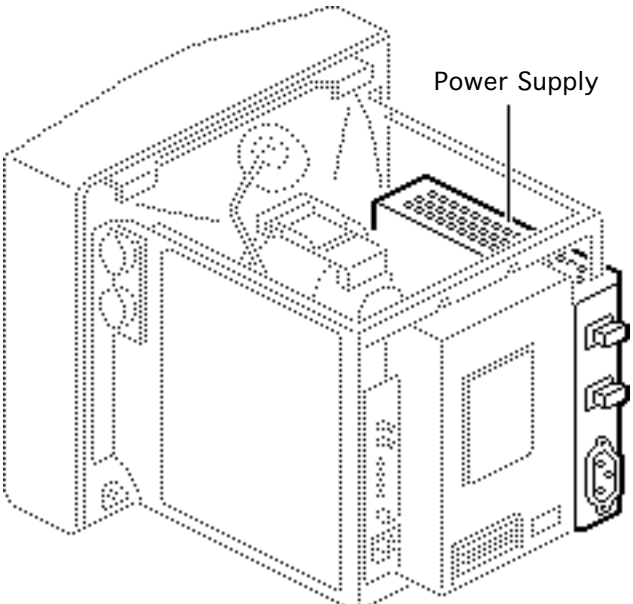


- White, 3-wire cable from D2
- White, 4-wire cable from D7
- Red, 3-wire cable from D12
- White, 2-wire cable from D5
- Gray, 1-wire cable from D4



5 Remove the wires from the cable clamp.

6 Lift the deflection board free.



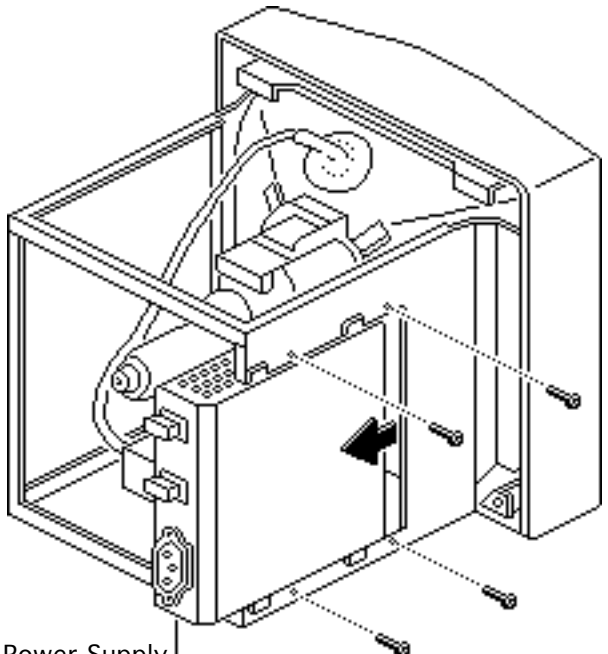
Power Supply

Before you begin,

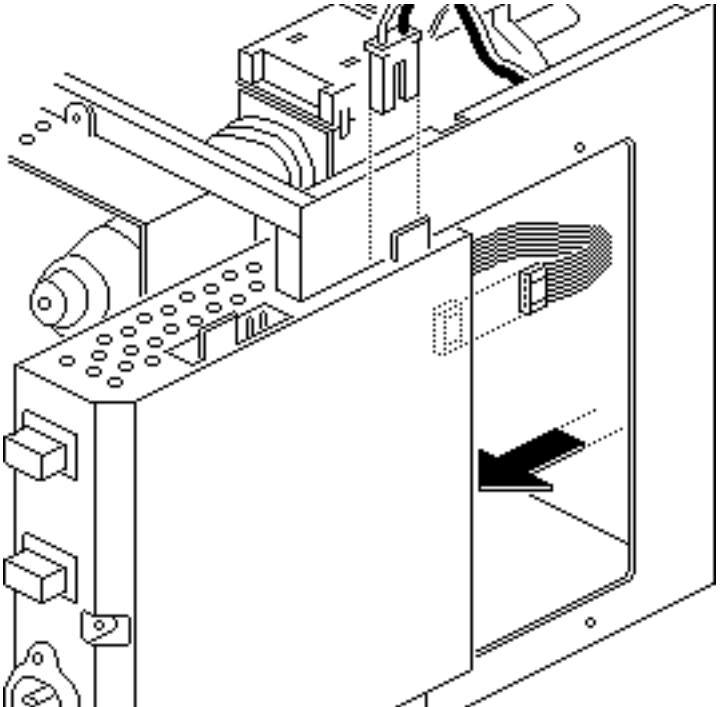
- Remove the rear cover
- Remove the EMI shield
- Discharge the CRT

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

Warning: Never use a grounding wriststrap until after discharging the CRT.

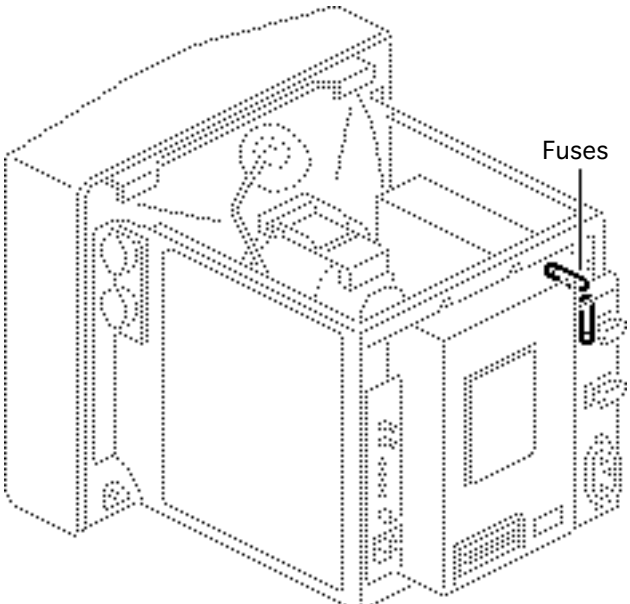


1 Remove the four mounting screws and slide the power supply back slightly.



2 Disconnect the large two-wire connector from the top of the power supply, and the small four-wire connector from the front of the power supply.

3 Slide the power supply back and out of the chassis.



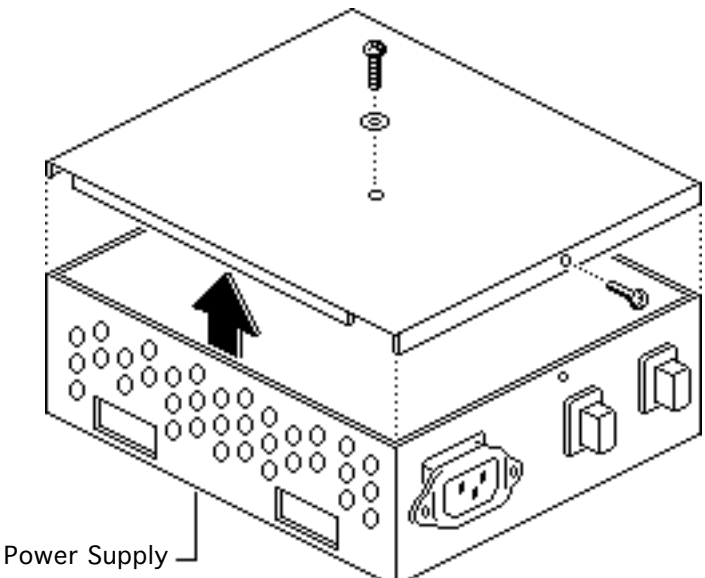
Fuses

Before you begin,

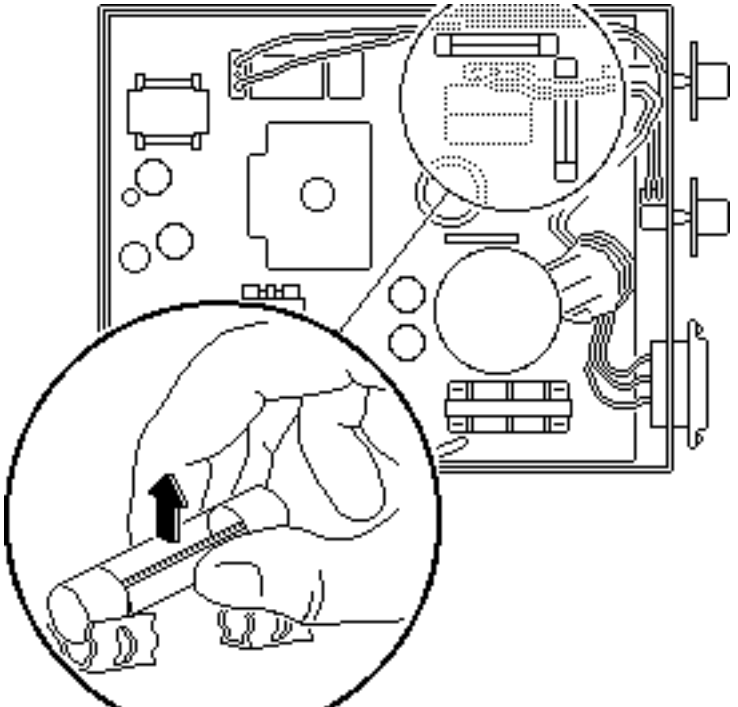
- Remove the rear cover
- Remove the EMI shield
- Discharge the CRT
- Remove the power supply

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

Warning: Never use a grounding wriststrap until after discharging the CRT.

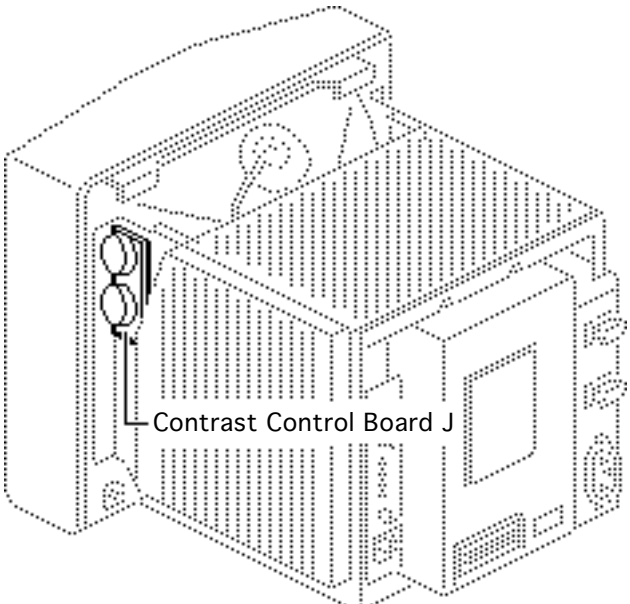


1 Remove the top screw and washer and the end screw from the power supply cover. Lift off the cover.



2 Remove a blown fuse by prying up one end of the fuse with your fingers or a small flat-blade screwdriver.

Note: There are two fuses in the power supply, F101 (6.3A/250V) and F102 (3.15A/250V). These fuses are not interchangeable.



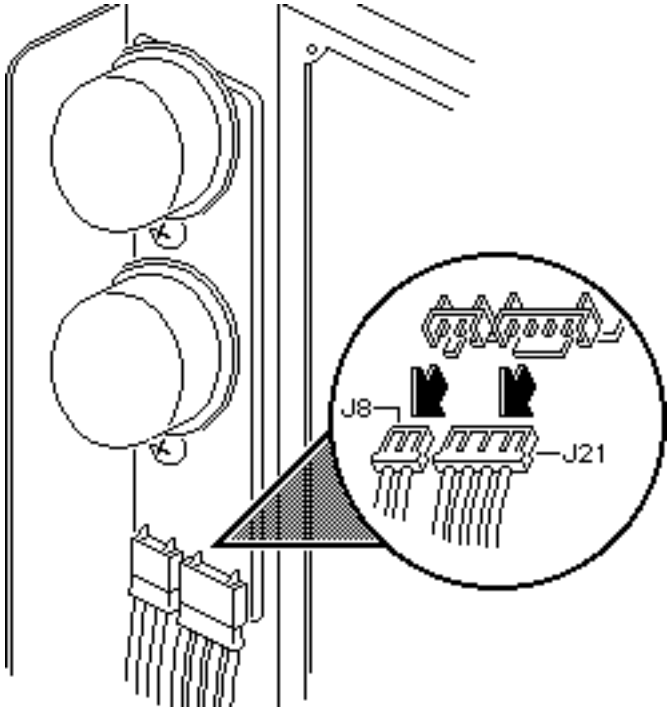
Contrast Control Board J

Before you begin,

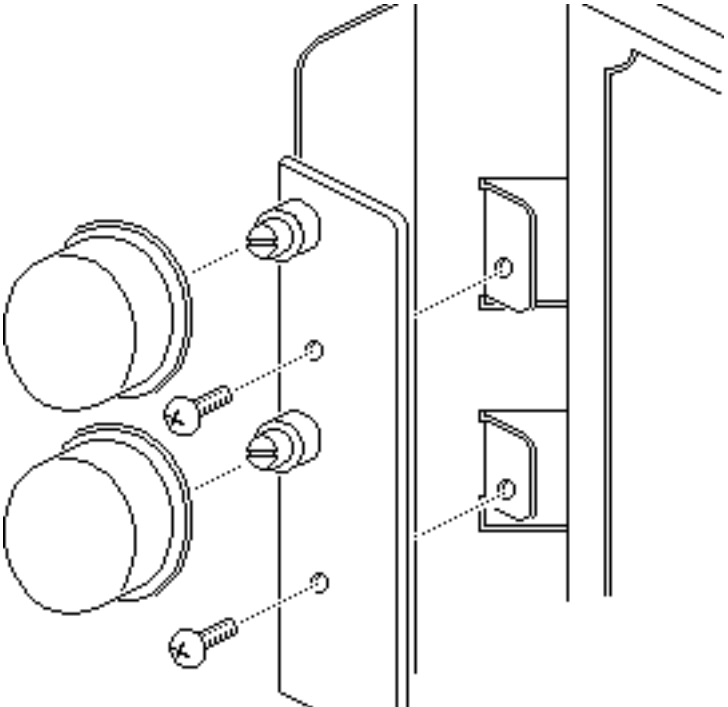
- Remove the rear cover
- Discharge the CRT

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

Warning: Never use a grounding wriststrap until after discharging the CRT.

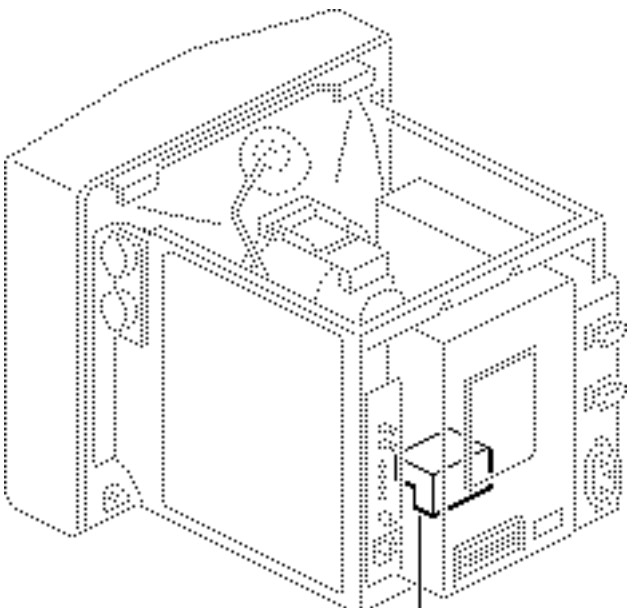


1 Disconnect the yellow 4-wire cable from connector J-21, and the white 2-wire cable from connector J-8.



2 Pull off the two knobs, and remove the two mounting screws and the contrast control board.

Replacement Note: Save the knobs to put on the replacement board.



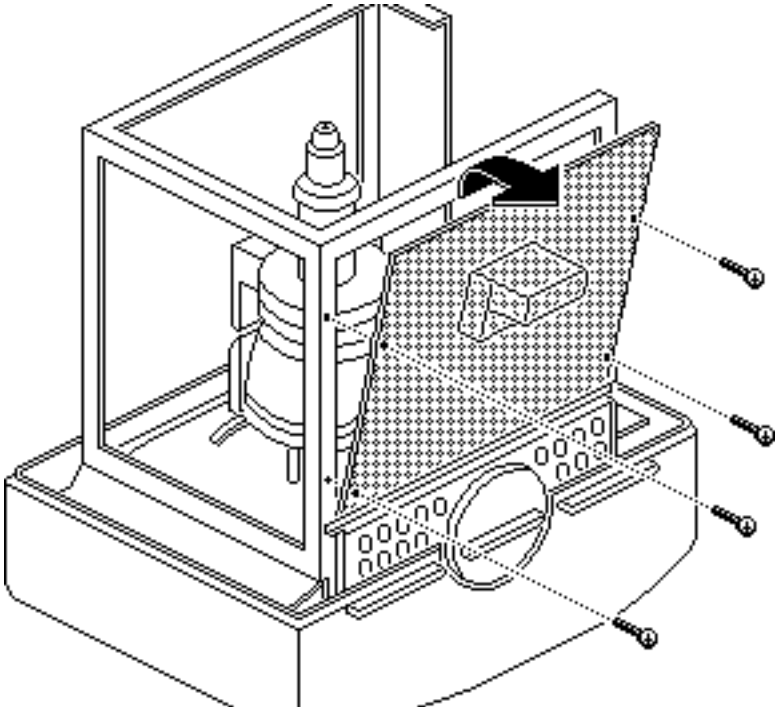
High-Voltage Capacitor

Before you begin,

- Remove the rear cover
- Discharge the CRT
- Disconnect anode cap

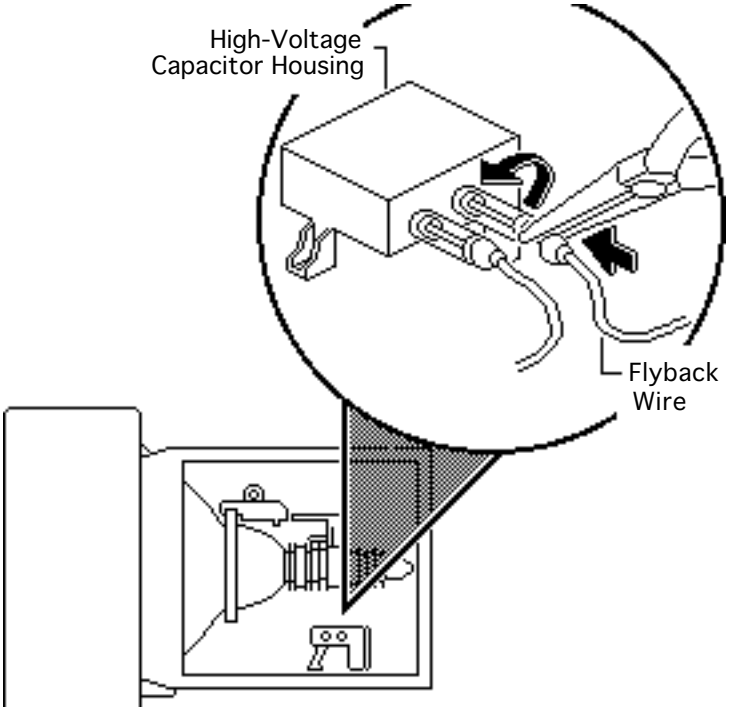
Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

Warning: Never use a grounding wriststrap until after discharging the CRT.

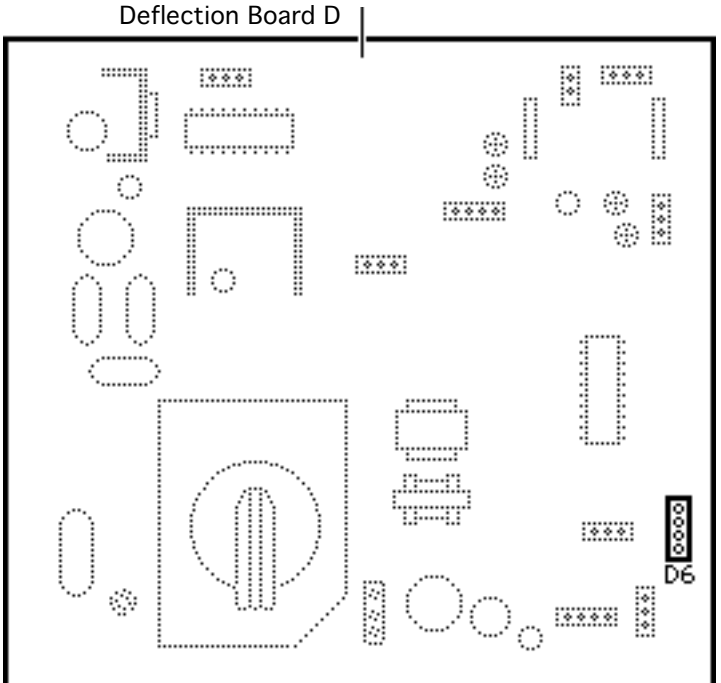


1 Remove the four screws that secure the metal screen to the bottom of the chassis.

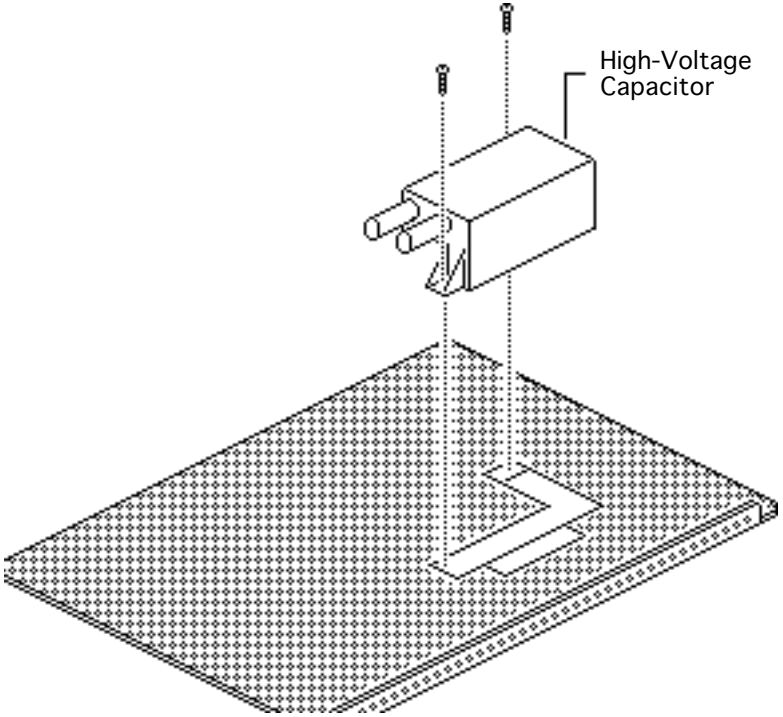
2 Tip out the metal screen and the attached high-voltage capacitor.



3 Peel back the flyback wire's rubber boot from the opening in the high-voltage capacitor housing. Insert pliers into the opening in the capacitor housing and grasp the wire as close as possible to the capacitor. Push in (toward the capacitor) and rotate the wire 1/4 turn counter-clockwise; then pull out the wire.

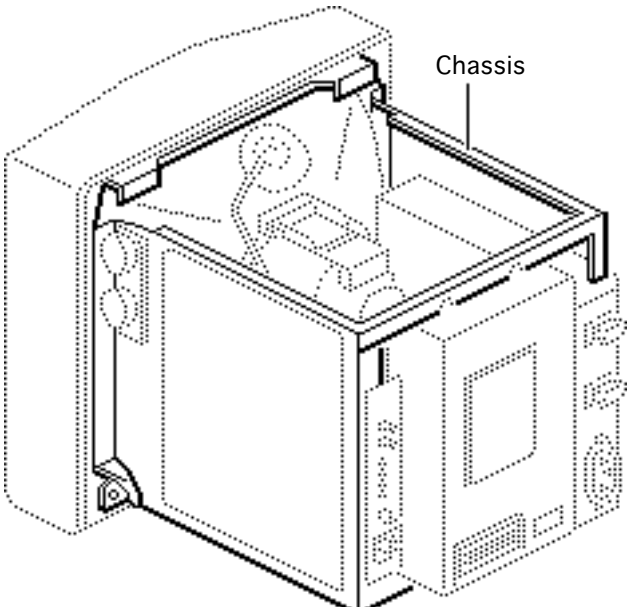


4 Disconnect the gray wire from its red 4-wire connector at D-6 on the deflection board.



5 Lift off the metal screen with attached high-voltage capacitor.

6 Remove the two mounting screws and the high-voltage capacitor from the screen.



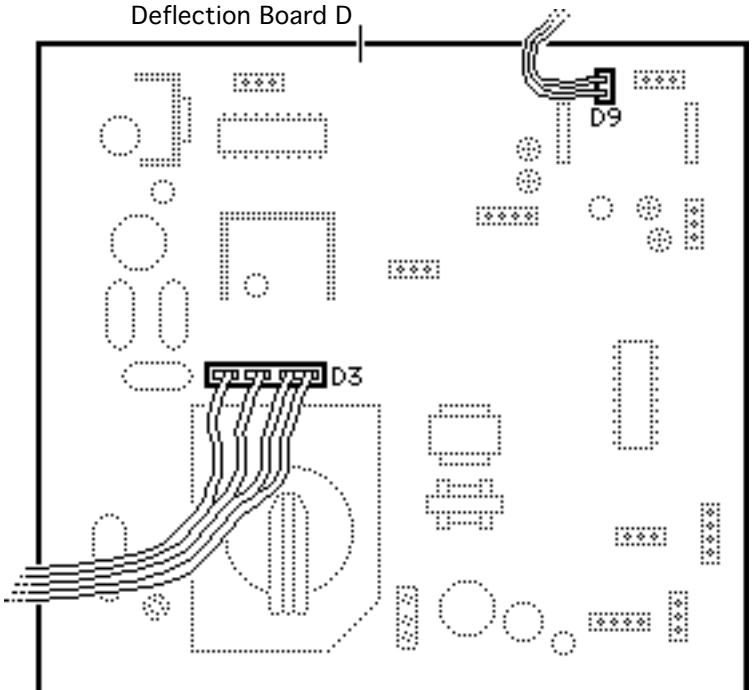
Chassis

Before you begin,

- Remove the rear cover
- Remove the EMI shield
- Discharge CRT
- Disconnect anode cap

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

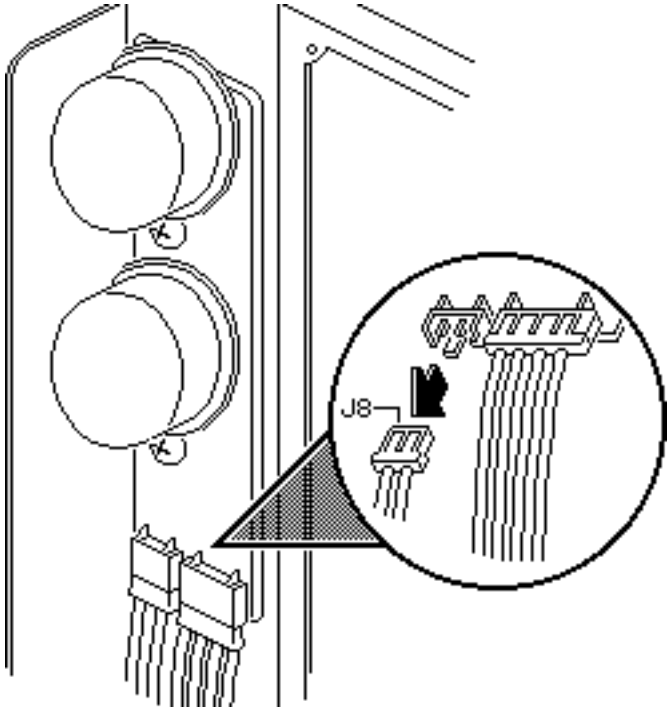
Warning: Never use a grounding wriststrap until after discharging the CRT.



Note: The chassis is not a replaceable part. Perform this procedure to access the CRT or the LED.

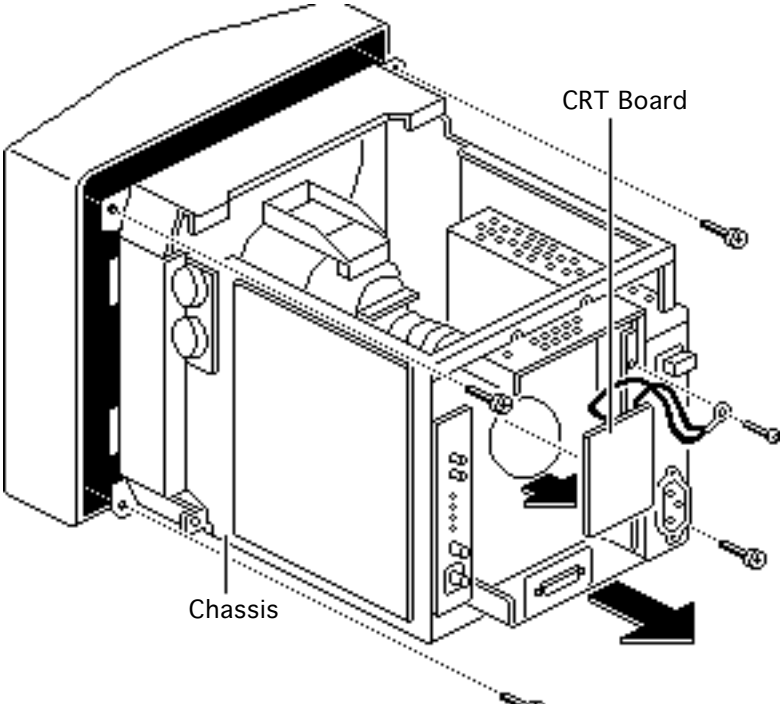
1 Disconnect the white 2-wire connector from D3 and the white 4-wire connector from D9 on deflection board D.

Note: On the Rev. B version of the deflection board the connectors may begin with the letter “B.”



2 Disconnect the white 2-wire connector from the contrast control board J8.

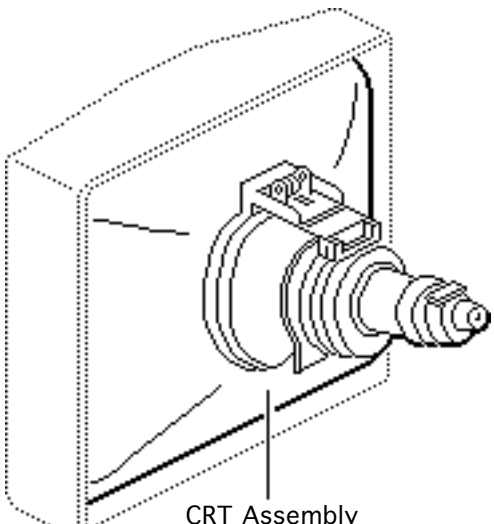
3 Remove the wires from the plastic cable clamps.



4 Pull the CRT board straight off the neck of the CRT.

5 Remove the four corner screws that secure the metal chassis to the bezel. Lift off the chassis with attached modules.

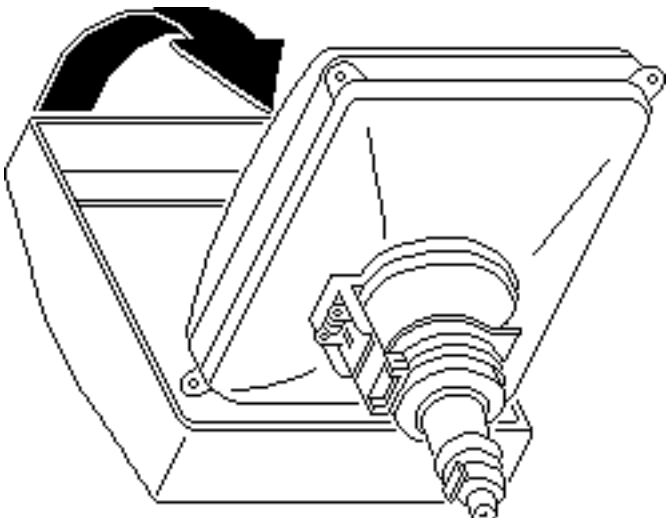
CRT Assembly



Before you begin,

- Remove the rear cover
- Remove the EMI shield
- Discharge the CRT
- Disconnect the anode cap
- Remove the chassis

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

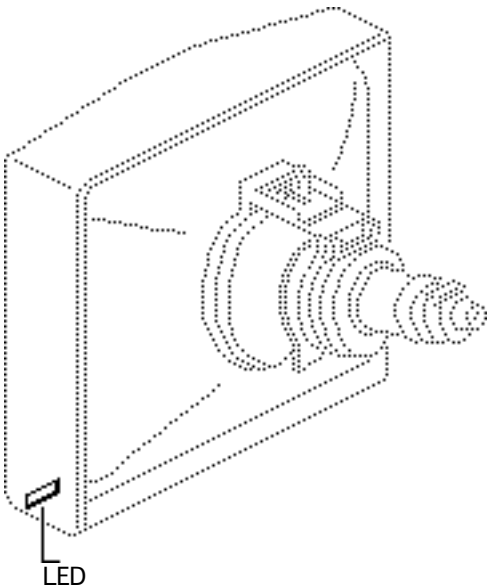


Warning: Never use a grounding wriststrap until after discharging the CRT.

Warning: If the CRT is cracked or damaged, refer to the CRT safety and disposal instructions in Bulletins/Safety.

Caution: The neck of the CRT is easily damaged. Do not grab the neck of the CRT to remove it from the bezel.

Support the side of the CRT with one hand, tip the bezel to one side, and carefully ease the CRT out of the bezel.

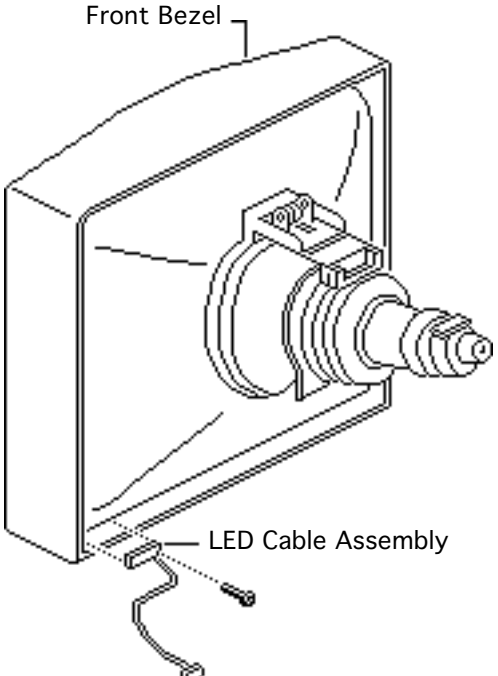


LED

Before you begin,

- Remove the rear cover
- Remove the EMI shield
- Discharge CRT
- Remove the anode cap
- Remove the chassis

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

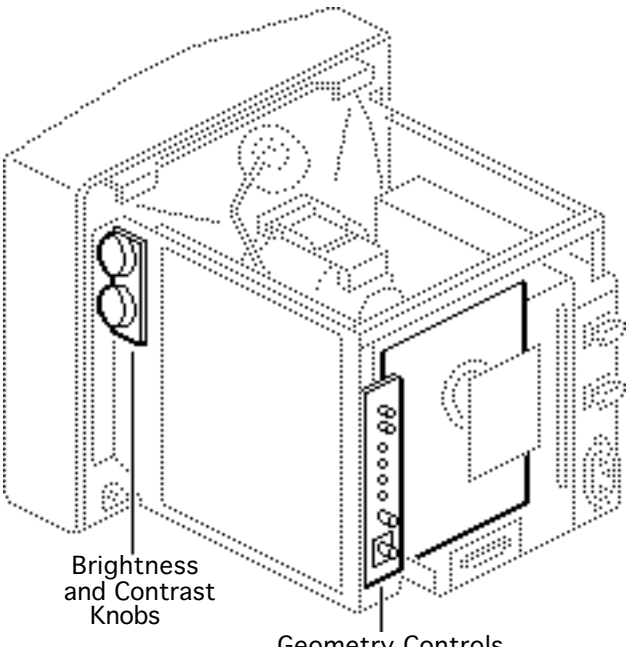


⚠**Warning:** Never use a grounding wriststrap until after discharging the CRT.

Remove the screw that secures the LED cable assembly to the front bezel. Lift out the LED.

Adjustments

AppleColor High-Resolution RGB Monitor



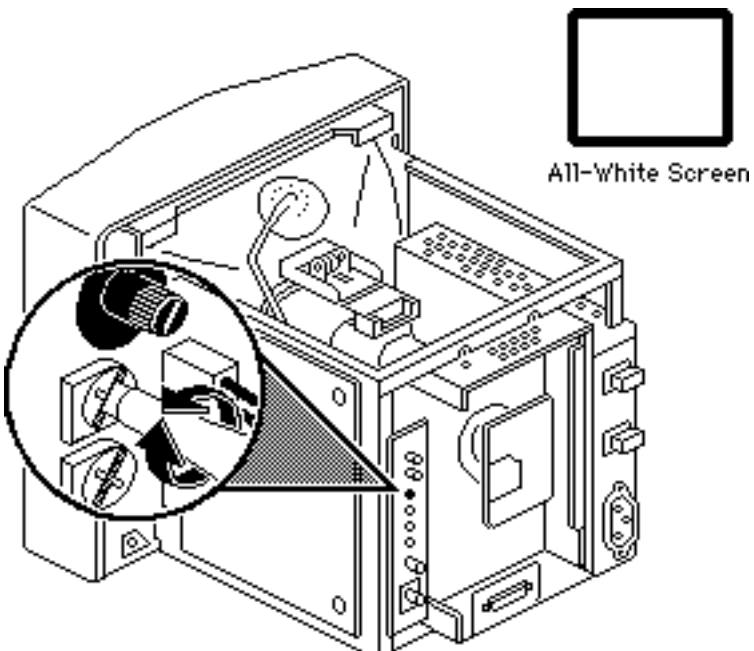
Geometry

No preliminary steps are required before you begin this procedure.

Note: Perform the geometry adjustments in order. Although the geometry controls are shown here with the rear cover removed, you can access them from the service access panel at the rear of the monitor.

⚠**Warning:** This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

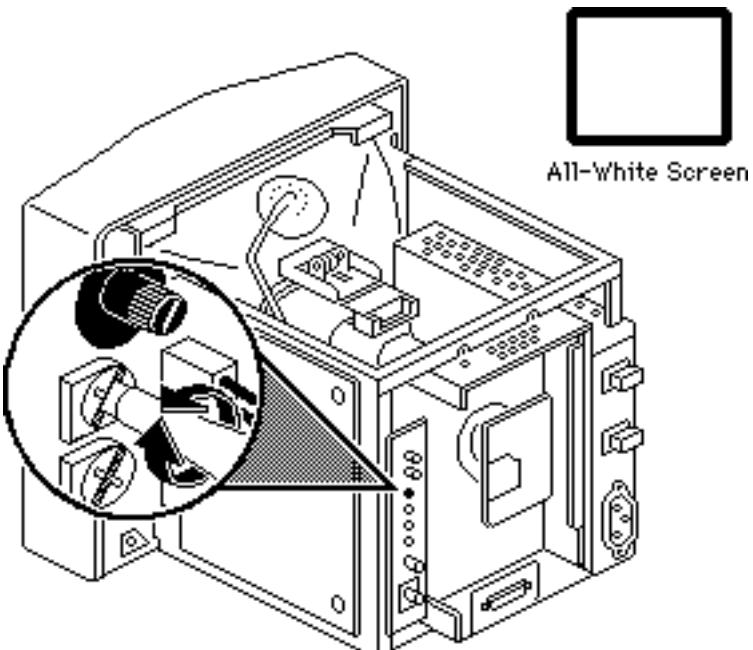
Caution: Do not attempt yoke adjustments on this monitor. All such adjustments have been set by the manufacturer.



Horizontal Size

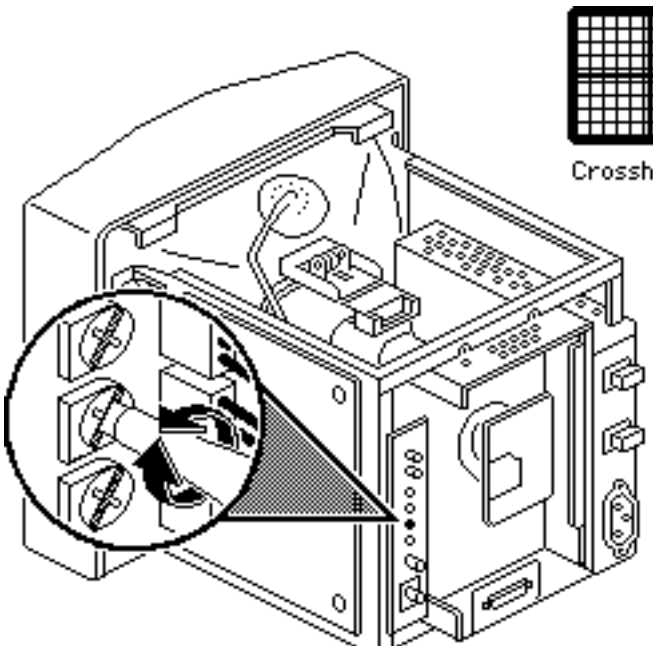
Note: Due to video features and timing differences across the Apple line of Macintosh computers, the width of the raster/image area on the Hi-Res RGB monitor may vary up to 3/16 inch at each side of the display. Perform the horizontal size adjustment to set the display to its proper width.

1 Use Display Service Utility to display the All-White Screen test pattern.



All-White Screen

2 Using a plastic screwdriver, adjust the horizontal size control until the raster width is 9 1/4 in. (± 1/8 in.) or 235 mm (± 2 mm).



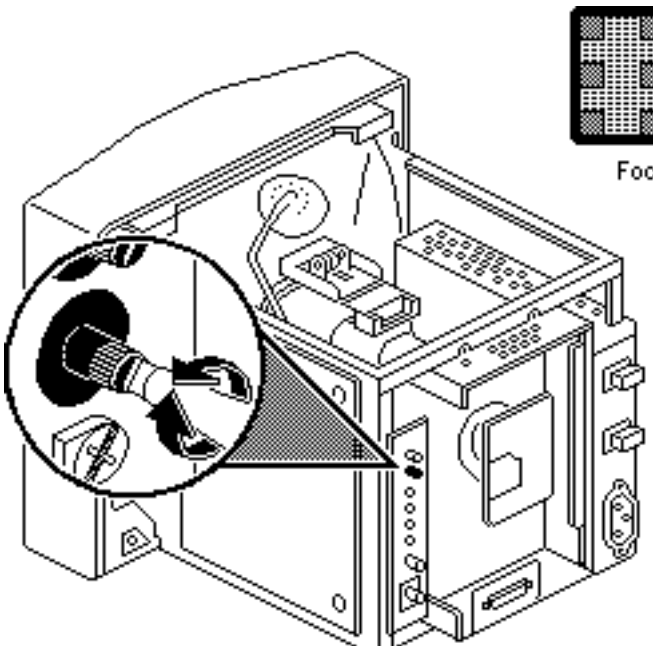
Vertical Size

Note: Adjust the horizontal size before you adjust the vertical size. The horizontal adjustment can affect the height of the raster.

1 Use Display Service Utility to display the Crosshatch II (white background) test pattern.

2 Using a plastic screwdriver, adjust the vertical-size control until the raster height is 7 in. (± 1/8 in.) or 176

mm (± 2 mm).

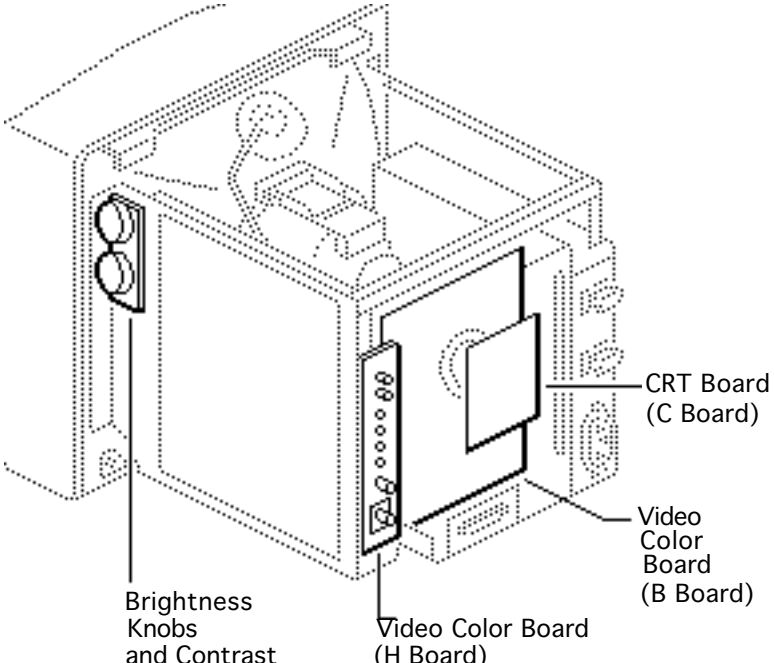


Focus

Focus

1 Use Display Service Utility to display the Focus test pattern.

2 Using a plastic screwdriver, adjust the focus control for the best clarity at points halfway between the center and the left and right edges of the screen.



Video

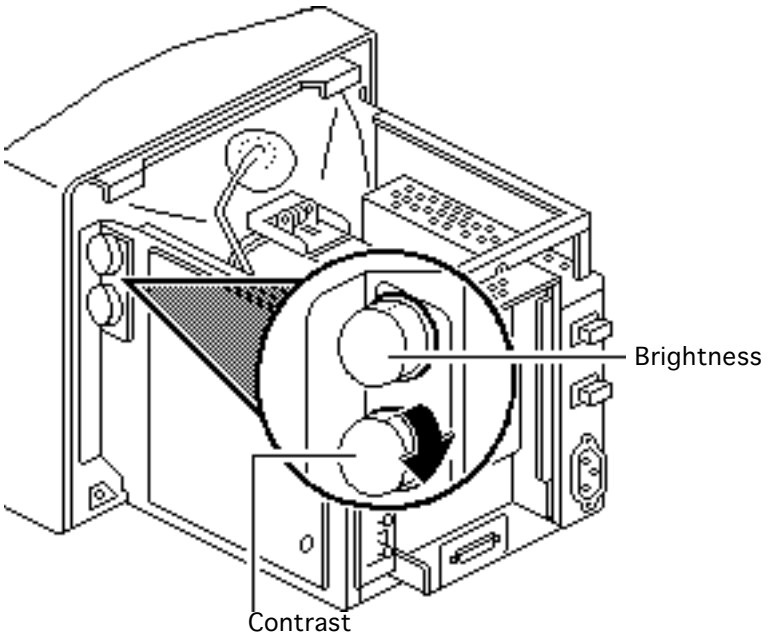
Before you begin, remove the following:

- Rear cover
- EMI shield
- Video board shield

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

⚠**Warning:** Because you make adjustments from the rear of the computer, position a mirror to view the computer screen. Do not reach around the computer to adjust the controls.

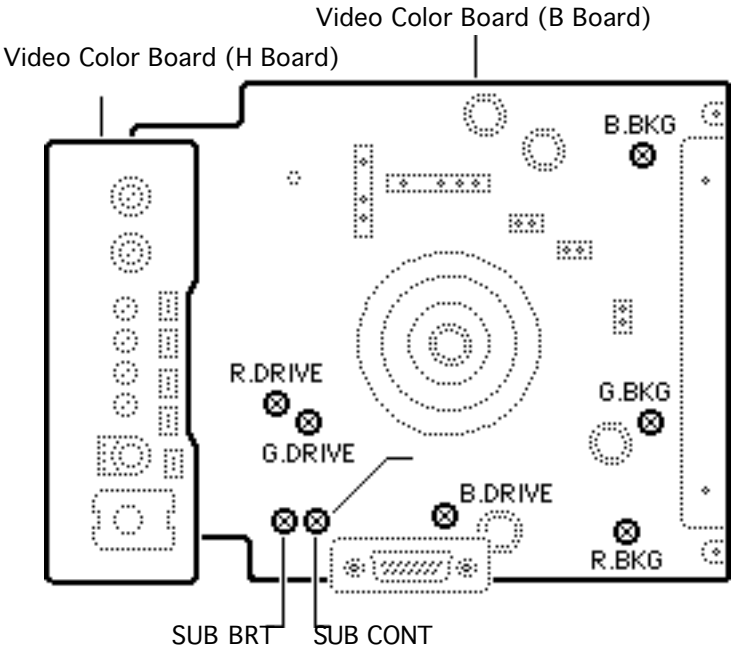
Note: Perform the cutoff adjustment whenever you replace the CRT assembly, deflection board D, or the video color board.



1 Remove the video cable from the back of the monitor. Switch on the monitor.

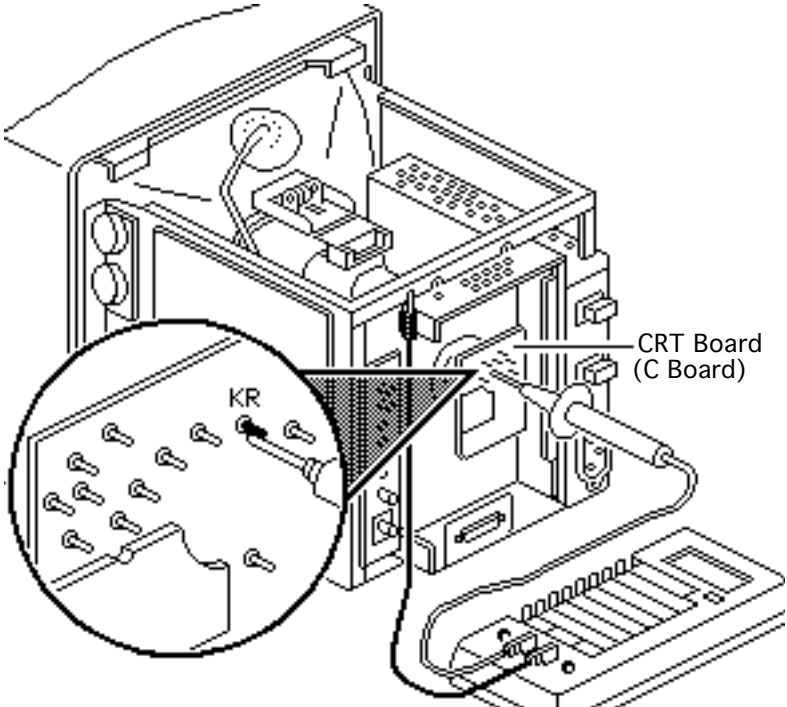
Note: Perform the cutoff and white balance adjustments in a dimly lit room after the monitor has been on for at least 10 minutes.

2 Set the external (user) contrast knob to maximum and the external brightness knob to the center (detent) position.



Cutoff

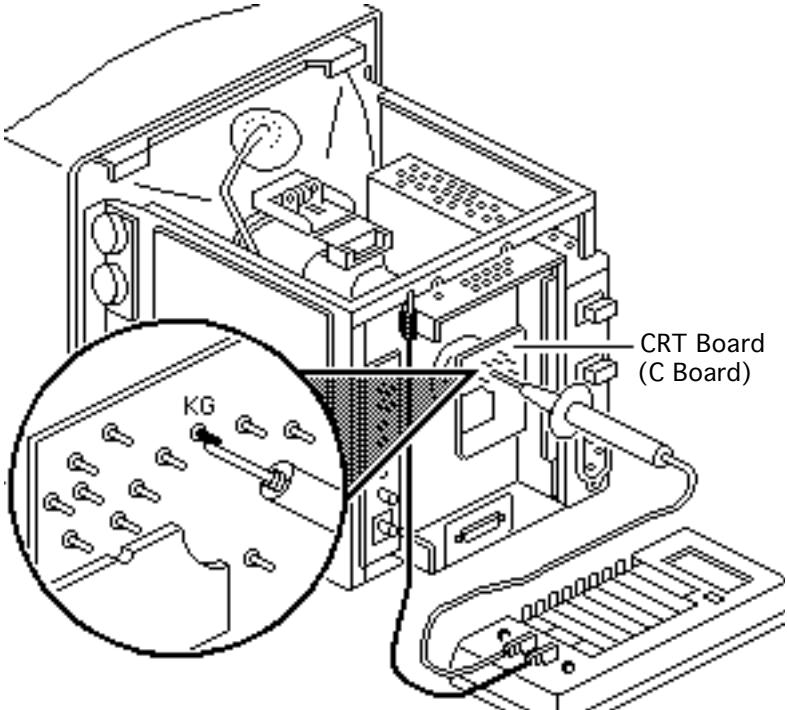
1 Using the plastic screwdriver, adjust the following controls on the video color board (B board) to midrange:
- B.BKG (R.BKG on Rev. B version)
- G.BKG
- R.BKG (B.BKG on Rev. B version)
- R.DRIVE
- G.DRIVE
- B.DRIVE
- SUB CONT
- SUB BRT



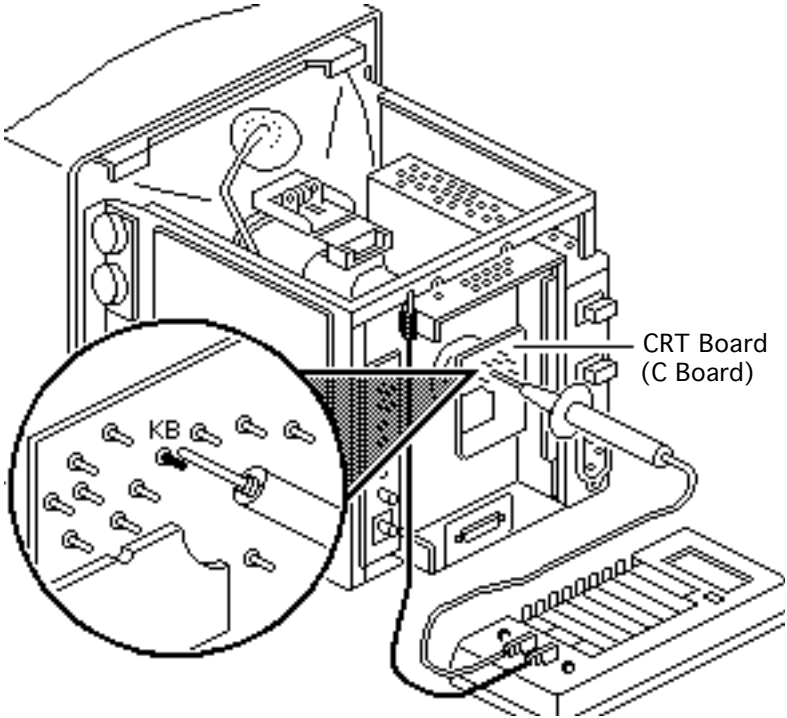
2 Set the voltmeter to measure 140 volts DC.

3 Attach the voltmeter ground lead (black lead) to the monitor chassis.

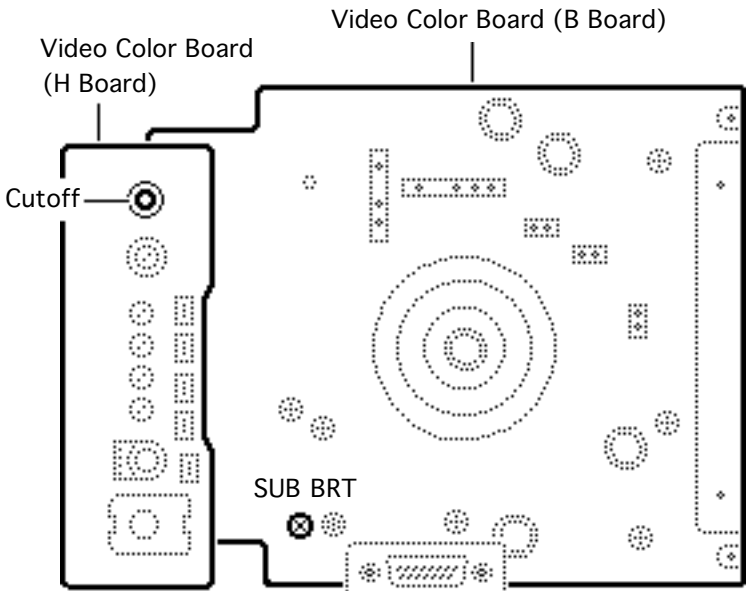
4 Connect the voltmeter red lead to the cathode marked KR on the CRT board (C board). Gradually adjust the R.BKG control until the voltage measures 140 V (± 2 V).



5 Connect the voltmeter red lead to the pin marked KG on the CRT board (C board). Gradually adjust the G.BKG control until the voltage measures 140 V (± 2 V).

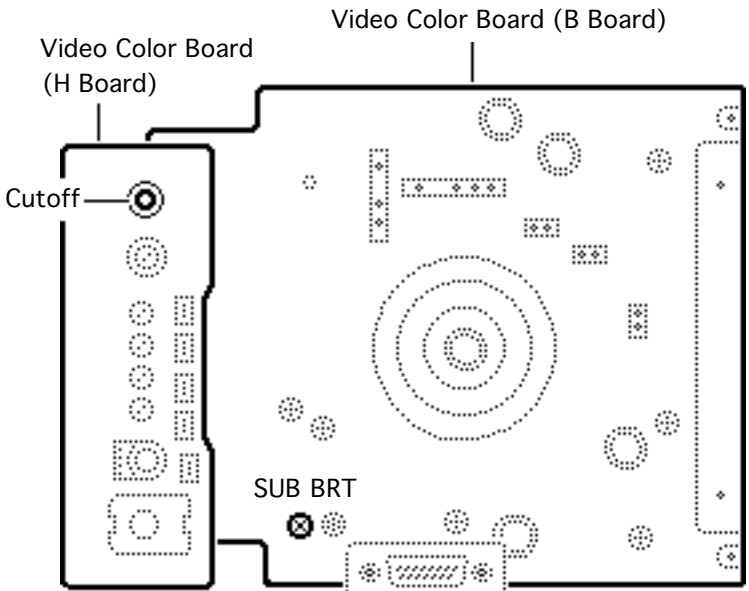


6 Connect the voltmeter red lead to the pin marked KB on the CRT board (C board). Gradually adjust the B.BKG control until the voltage measures 140 V (± 2 V).



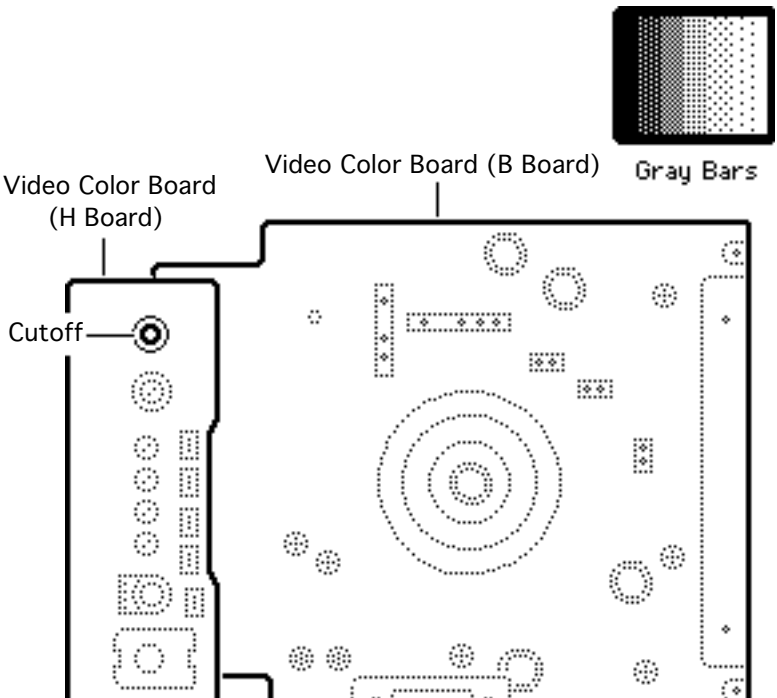
7 **Note:** If you increase the cutoff control (clockwise) too far, the monitor might shut down. If this happens, switch off the monitor and turn the cutoff control all the way down (counterclockwise). Wait 30 seconds, switch on the monitor, and resume the adjustment.

Using a plastic screwdriver, adjust the cutoff control until the raster is just visible.



8 Turn the cutoff control counterclockwise until the raster just disappears.

Caution: Once the cutoff control on the video color board (H board) is correct, do not move it again unless you repeat the cutoff adjustment. The life of the picture tube decreases severely if the cutoff adjustment is incorrect.

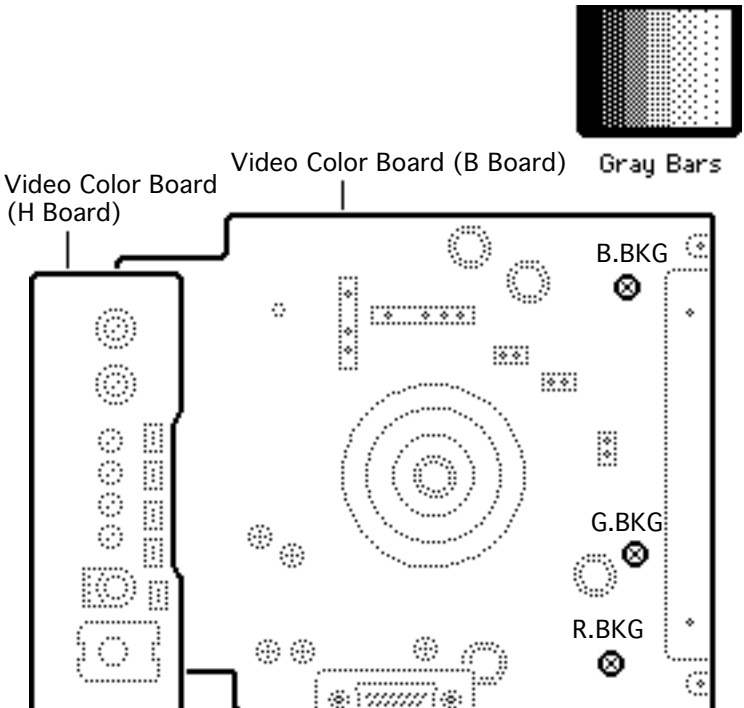


White Balance

Caution: Make sure the cutoff is correct before you proceed. The life of the picture tube decreases severely if the cutoff adjustment is incorrect.

1 Switch off the monitor, connect the video cable, and switch the monitor back on.

2 Use Display Service Utility to display the Gray Bars test pattern.



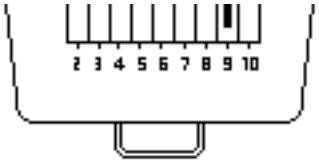
3 Using the plastic screwdriver, alternately adjust the B.BKG, G.BKG, and R.BKG controls until
- The left (dark) three bars have no colored tint
- The leftmost bar is as black as the screen border
- You can barely distinguish the second bar from the black bar
- The third bar is a dark gray

Note: To achieve good

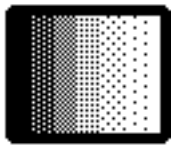
color balance, try reducing the background of the predominant color. If necessary, increase the other background controls until you see no color tint.

4 **Important:** Readings from light meter model L-248 and 246 differ. Please note which meter you are using before making adjustments. (See “Light Meter Setup.”)

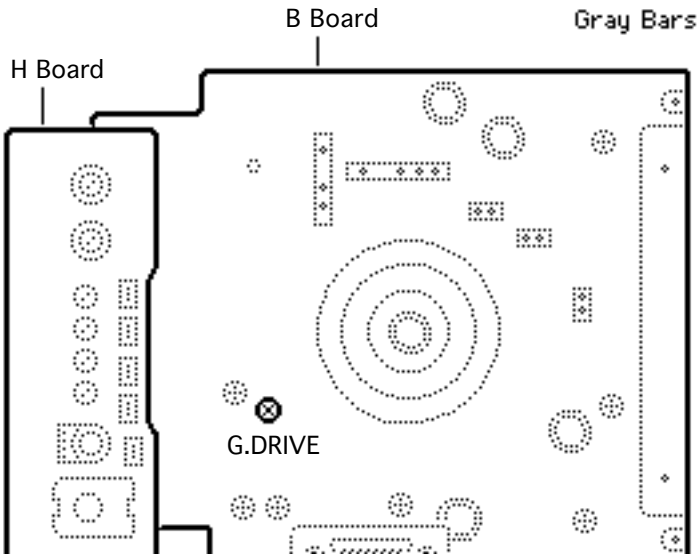
Using the light meter and a two-inch plastic



Light Meter



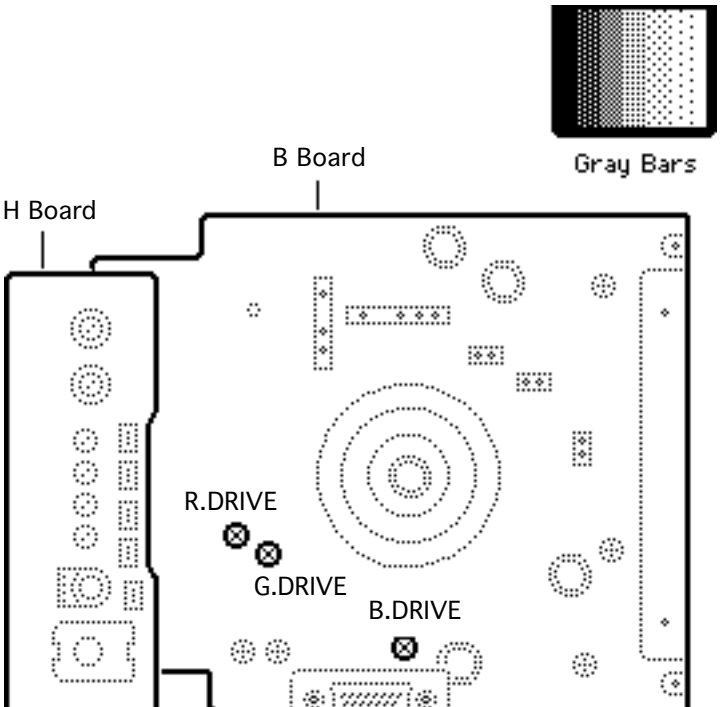
Gray Bars



screwdriver, adjust the G.DRIVE control until the luminance of the rightmost (brightest) bar measures 24 foot lamberts (± 3 foot lamberts), which on the light meter is

- Model L-248: 9 to 10 on the 2-10 scale
- Model 246: 19 on the red scale

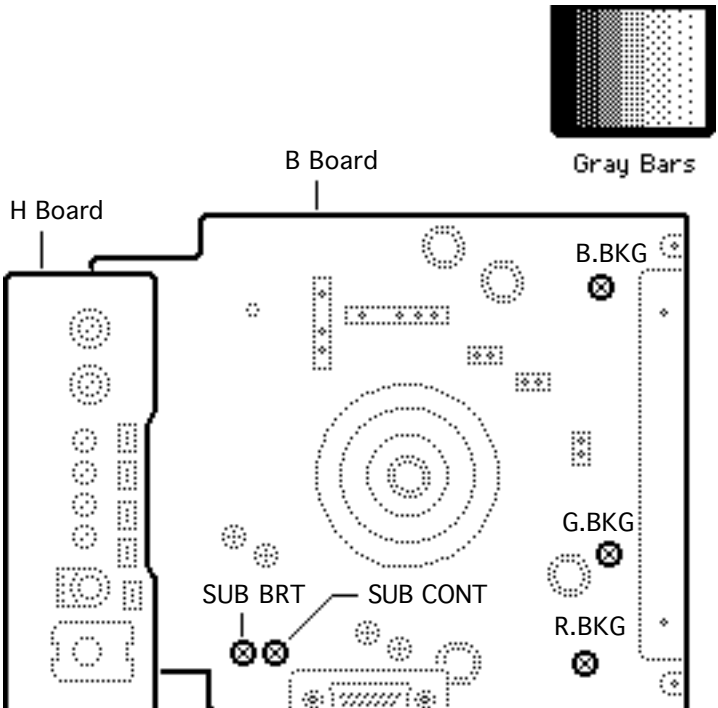
Important: Over time, light meter tolerances can vary. If you doubt your meter's accuracy, verify the readings with



a known-good light meter or photometer.

5 Adjust the R.DRIVE and B.DRIVE until you see no predominant color in the three right (brightest) bars.

6 As necessary, repeat the G.DRIVE, R.DRIVE, and B.DRIVE adjustments.



7 If the left (darkest) bars now show a predominant color, readjust the background controls (B.BKG, G.BKG, and R.BKG) of the two nonpredominant colors until you see only shades of black and gray.

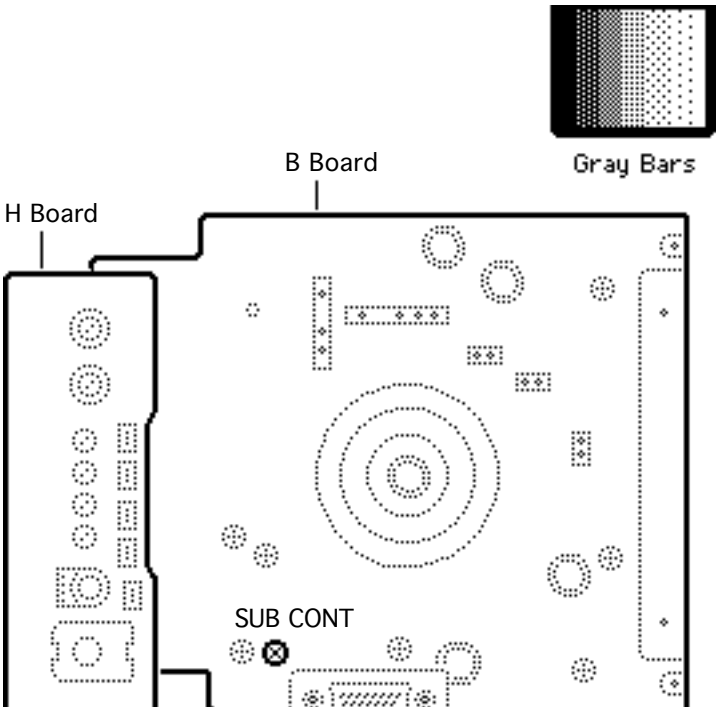
Note: The white balance is correct if

- You see no predominant color
- The brightest bar measures 24 foot lamberts (± 3 foot lamberts) or 9 to 10

on light meter Model L-248 or 19 on light meter Model 246

- The left (darkest) bars are black, barely distinguishable, and dark gray.

If you desire additional fine tuning, adjust the sub-contrast and sub-brightness controls in the next steps.

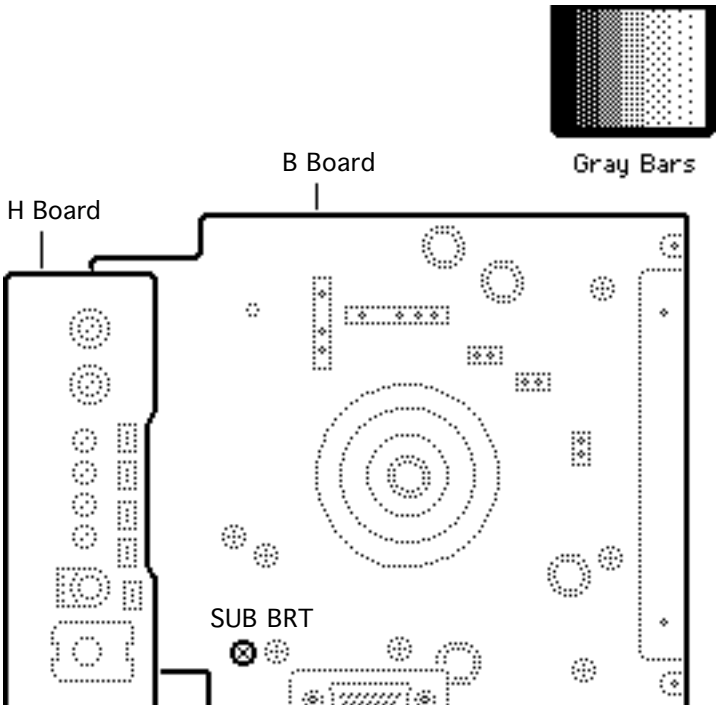


Sub-Contrast

Adjust the SUB CONT control so that the luminance in the middle of the rightmost (brightest) bar measures 24 foot lamberts (± 3 foot lamberts), which is

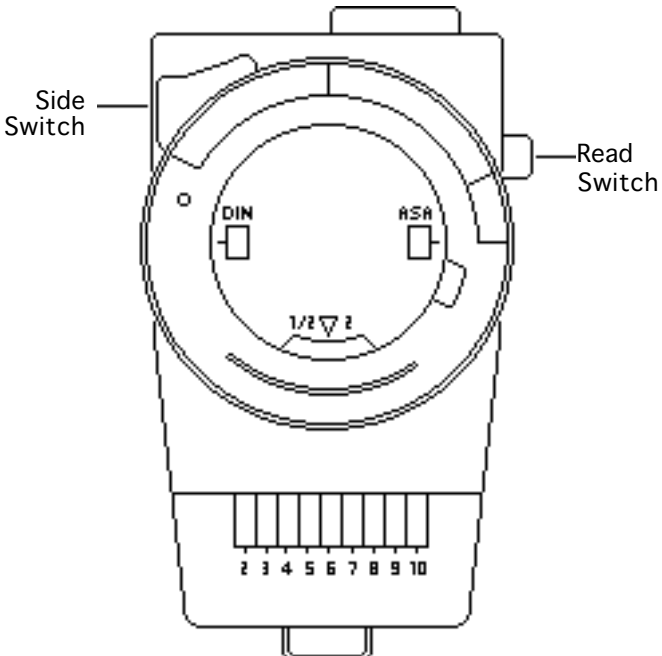
- Model L-248: middle of the 9 scale
- Model 246: 19 on the red scale

Important: Over time, light meter tolerances can vary. If you doubt your meter's accuracy, verify the readings with a known-good light meter or photometer.



Sub-Brightness

Adjust the SUB BRT control so that the leftmost bar is completely black and the next bar is barely distinguishable from the black bar.

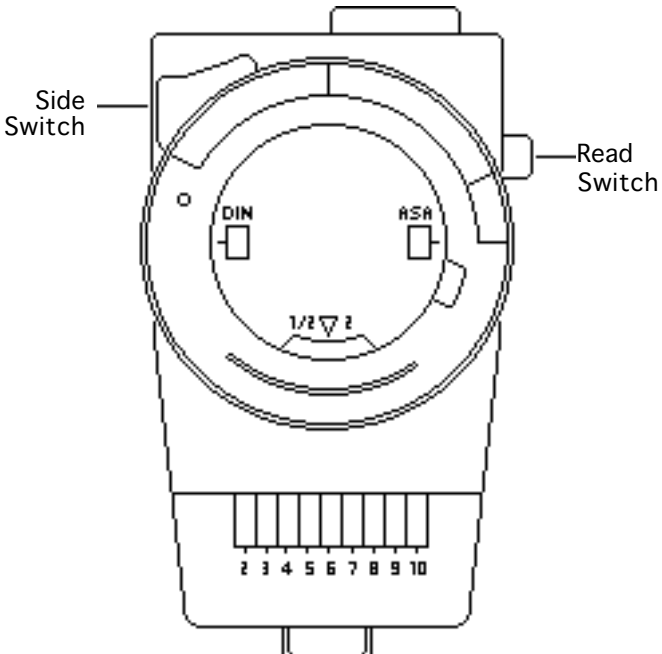


Light Meter Setup

Note: This topic covers setup for two light meters: Models L-248 and 246.

Model L-248

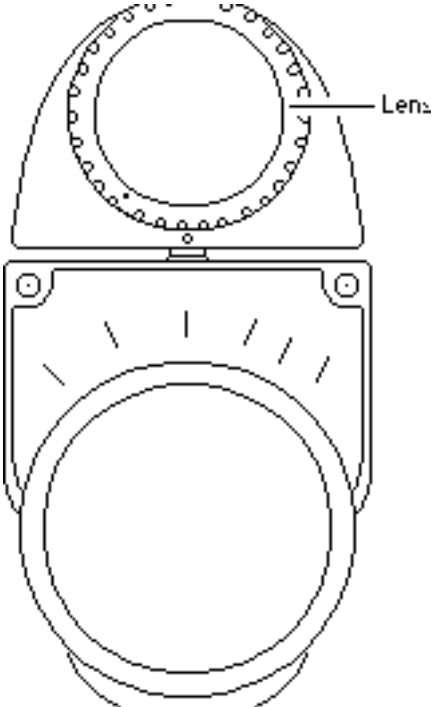
1 Press the red button on the back of the light meter. If the readings is out of the red area, replace the battery.



2 Move the side switch to its lower position so that the scale reads 2-10.

3 Uncover the lens of the meter.

4 Place the lens against the middle of the screen and press the read switch.

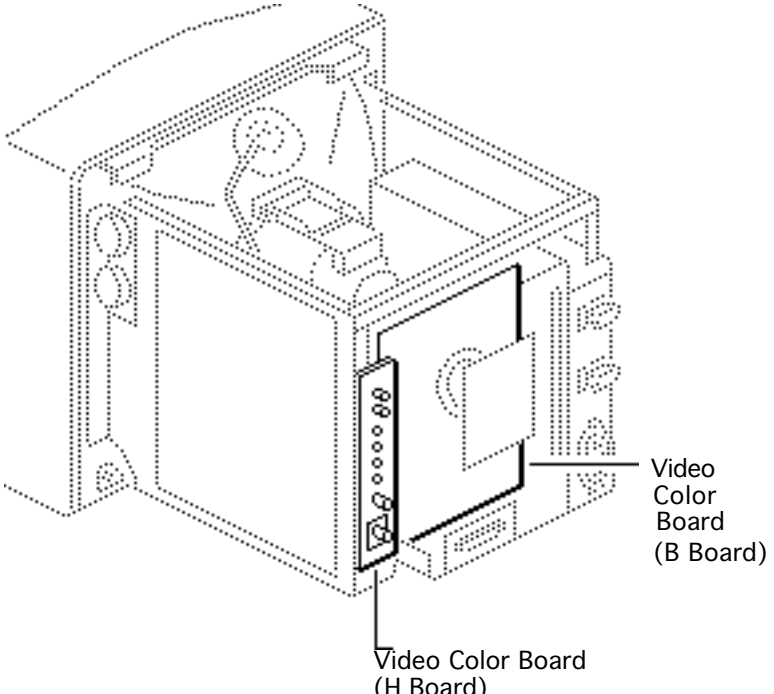


Model 246

Note: Remove the metal slide, if installed, from the top of the light meter. Install the white lens with the red dot.

1 Rotate the lens of the meter to face the monitor.

2 Place the lens against the middle of the screen and read the scale.



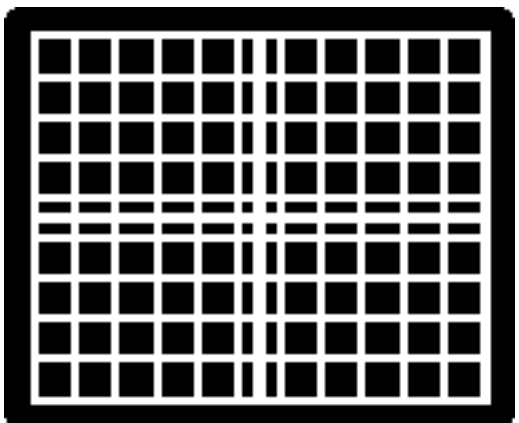
Convergence

Before you begin, remove the following:

- Rear cover
- EMI shield

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

Caution: This adjustment differs from geometric convergence, which is a factory adjustment of the

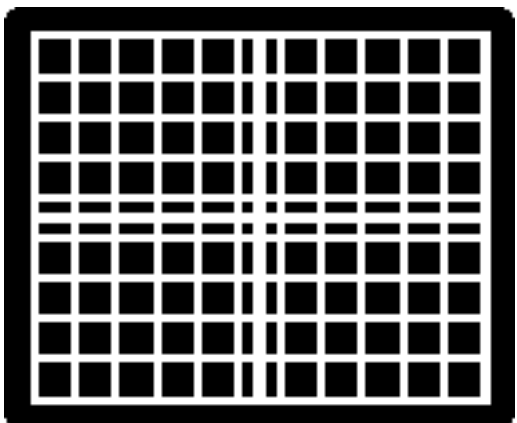


Crosshatch I

magnets on the yoke of the CRT. Do not attempt to set convergence by tampering with the yoke magnets.

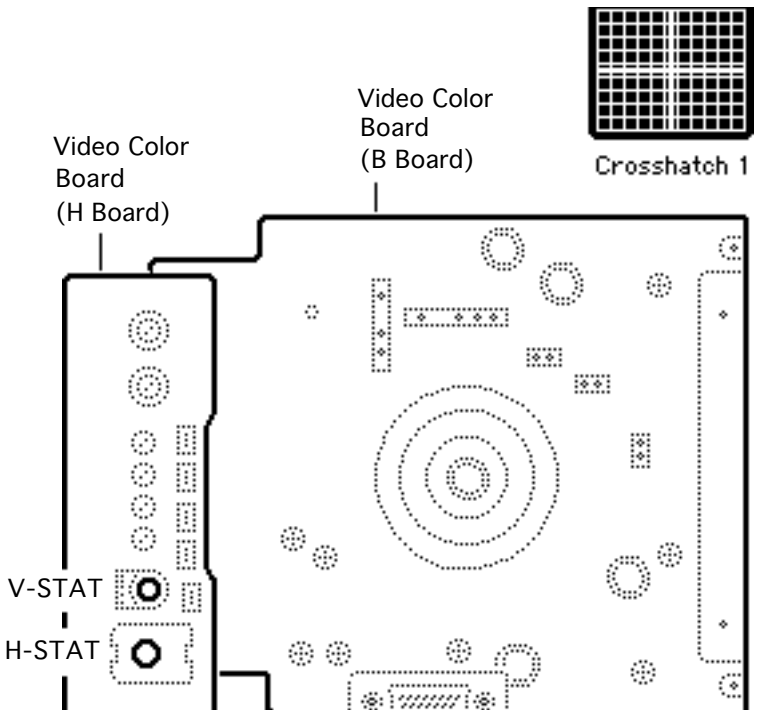
1 Use Display Service Utility to display the Crosshatch I test pattern.

2 Allow the monitor to warm up for 15 to 20 minutes.



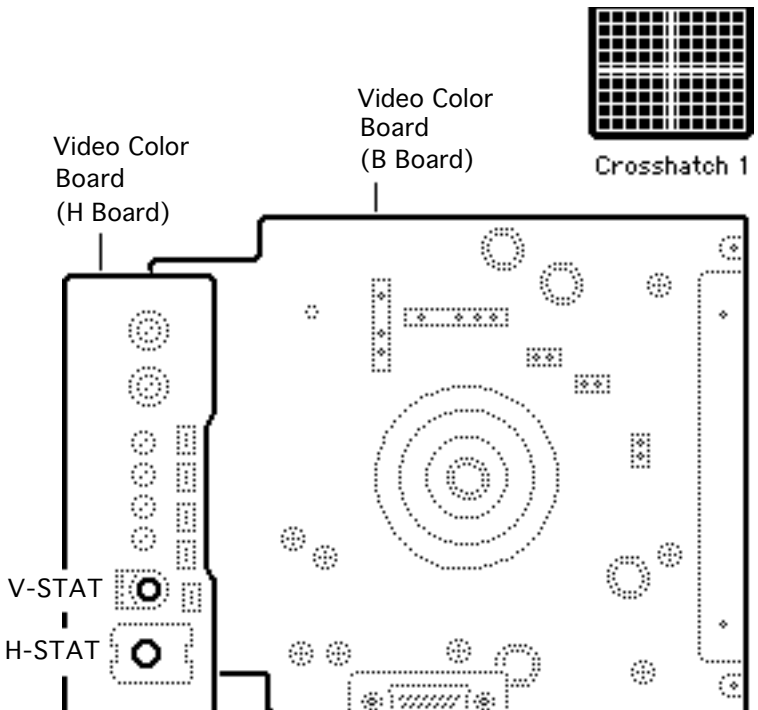
Crosshatch I

3 Check the crosshatch lines on the test pattern for the following conditions:
- If the lines are pure white, the monitor color convergence does not need adjusting.
- If the lines show colored shadows at the edges, go to the next step.



4 **Note:** Use the following adjustment if the monitor's red, blue, and green color beams do not align properly and the images on the screen are shadowed or out of focus. The convergence adjustment controls are behind the service access panel.

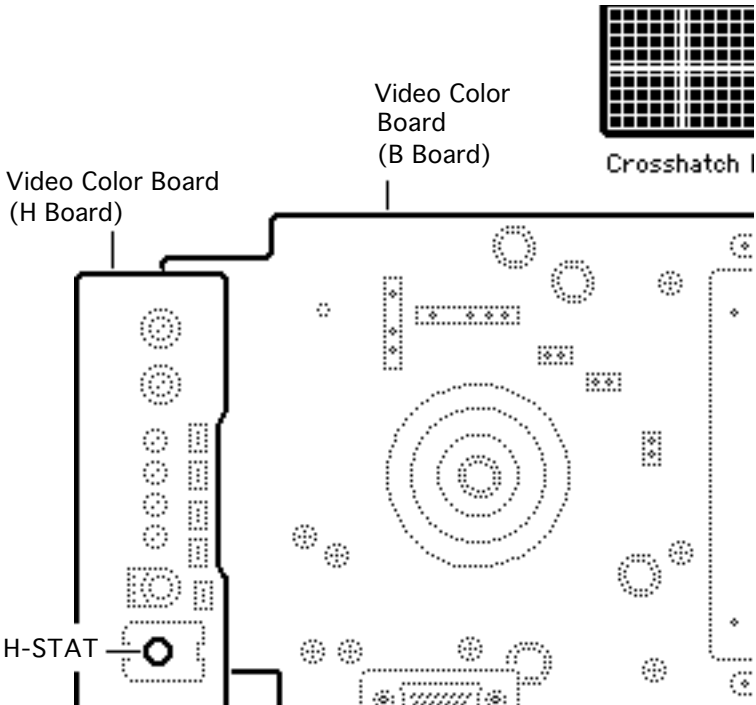
Press the degauss switch and remove the service panel cover.



5 Turn the V-STAT control until the color-shadowed horizontal lines blend to solid white lines.

6 Turn the H-STAT control until the color-shadowed vertical lines blend to solid white lines.

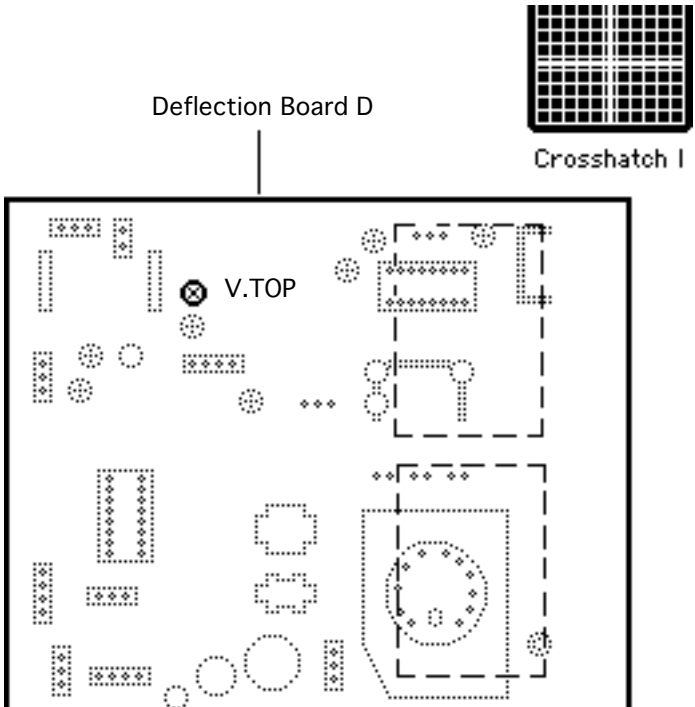
Note: Perform the next step only if you cannot adjust the horizontal convergence using the H-STAT control.



7 Switch off monitor power and remove the monitor cover, the EMI shield, and the metal video board shield.

8 Adjust the H-STAT control until the color-shadowed vertical lines blend to solid white lines.

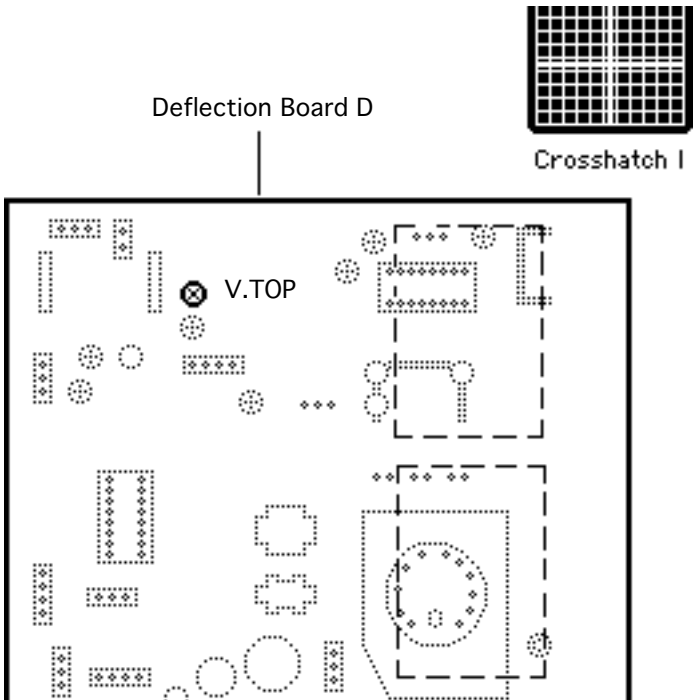
9 If the lines still show color, go to the next step.



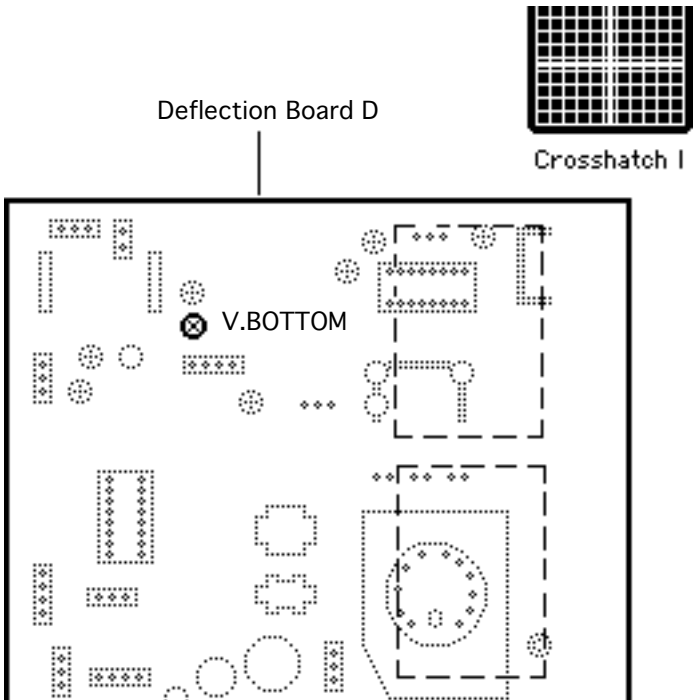
10 **Note:** Perform the following steps only if you could not adjust the monitor's color convergence with the previous steps. Make sure the monitor has been on for at least 15 to 20 minutes.

Use Display Service Utility to display the Crosshatch I or II pattern.

11 **Warning:** Avoid the very high voltage areas shown in the drawing by the dashed lines.

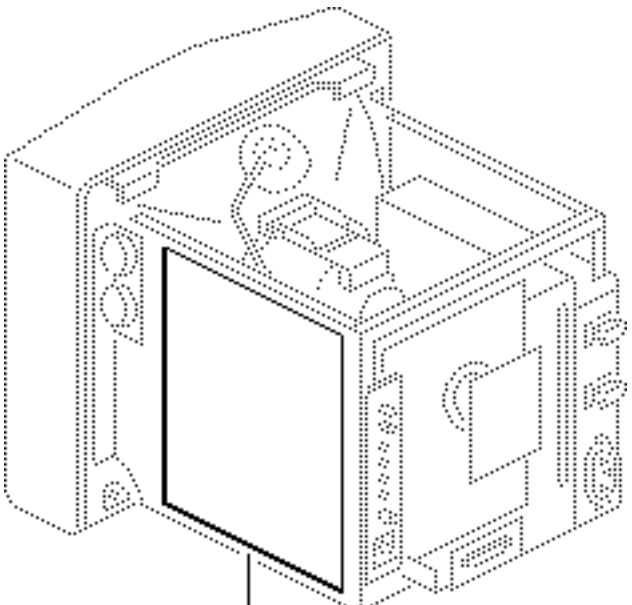


If the horizontal lines at the top of the monitor are out of adjustment, use the adjustment tool (part number 949-0386) to adjust the V-TOP (RV518) control until the color-shadowed lines blend to solid white lines.



12 **Warning:** Avoid the very high voltage areas shown in the drawing by the dashed lines.

If the horizontal lines at the bottom of the monitor are out of adjustment, use the adjustment tool (part number 949-0386) to adjust the V-BOTTOM (RV517) control until the color-shadowed lines blend to solid white lines.

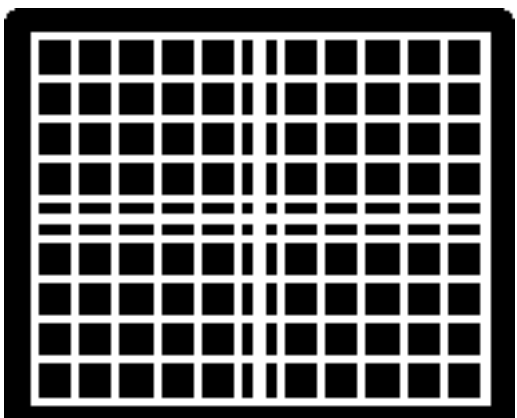


Geometric Distortion

Before you begin, remove the following:

- Rear cover
- EMI shield

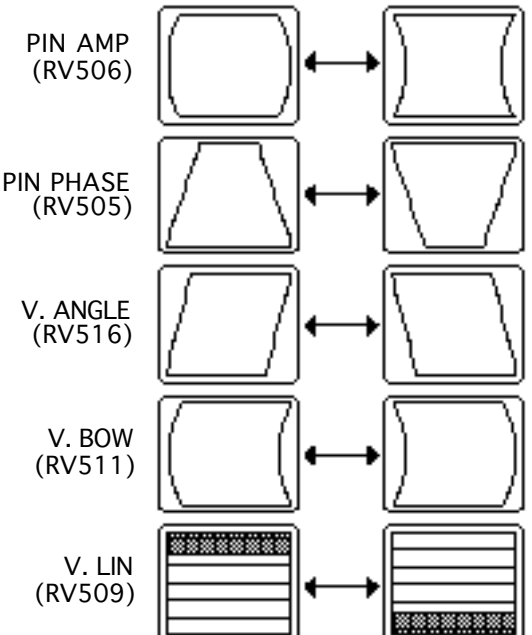
Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.



Note: Perform the following adjustments only if your attempts to adjust raster distortions with the external controls did not produce the results you wanted.

1 Use Display Service Utility to display the Crosshatch I or II test pattern.

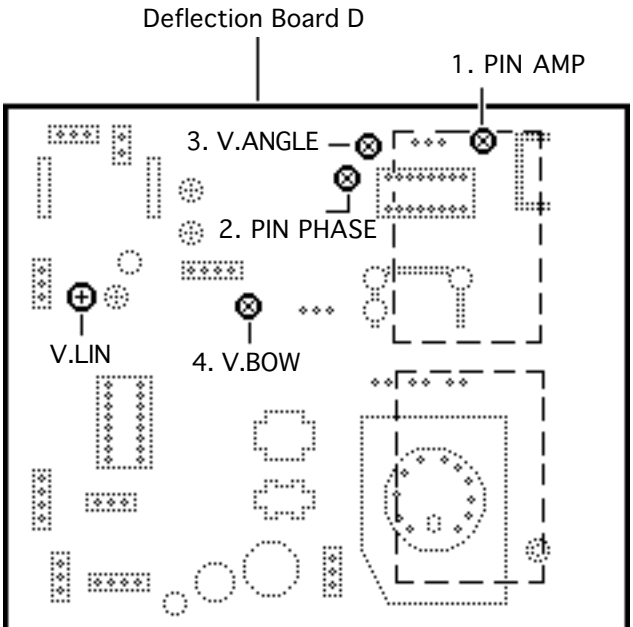
2 Make sure the boxes on the top row are the same size as the boxes on the bottom row, and the boxes on the left side are the same as the boxes on the right side.



⚠**Warning:** The entire yoke assembly has very high voltage. To prevent electrical shock, do not touch the yoke assembly, the anode wire, or the yoke wires.

3 To determine which pot to adjust, compare the display with the distortions shown.

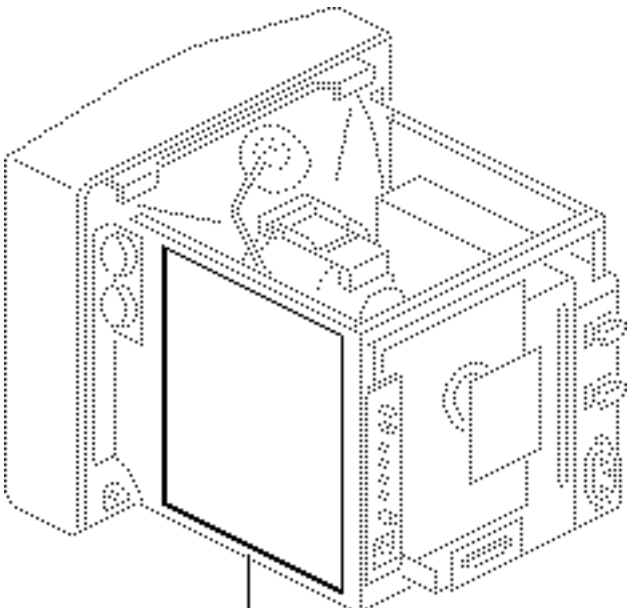
4 Using the adjustment tool (Apple part number 949-0386), adjust the pot (see next page for pot locations).



5 If the display is so distorted that you can't tell which adjustments to make, using the adjustment tool (part number 949-0386), perform the adjustments in the following sequence:

- PIN AMP
- PIN PHASE
- V. ANGLE
- V. BOW
- Repeat V. ANGLE
- Repeat PIN PHASE

6 If you can't correct the distortion, replace deflection board D. See "Deflection Board D" in the Take Apart chapter.



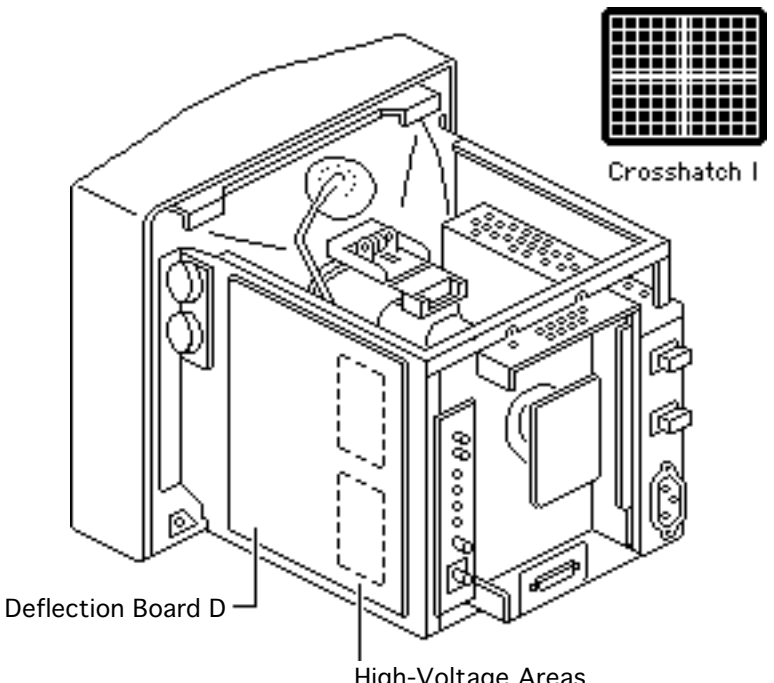
Jitter Correction

Before you begin, remove the following:

- Rear cover
- EMI shield

Warning: This product contains high voltage and a high-vacuum picture tube. To prevent serious injury, review CRT safety in Bulletins/Safety.

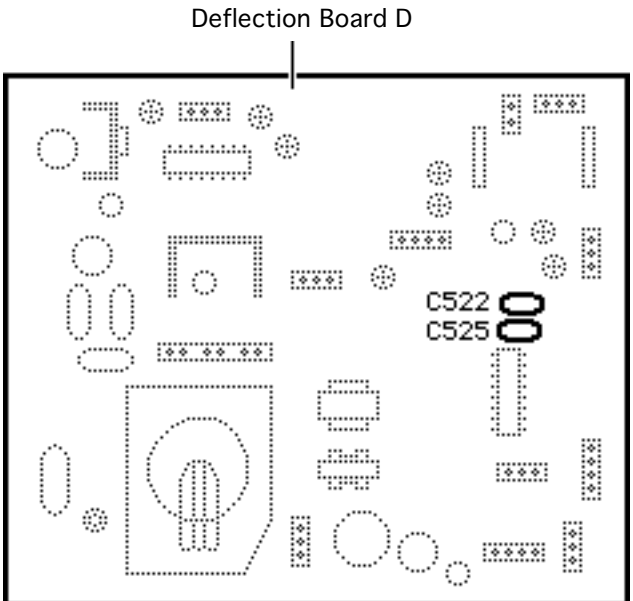
Note: Monitors may exhibit a jitter problem in which the raster moves vertically, alternately stretching and shrinking. The problem may occur immediately after you switch on the monitor or after the monitor is warm; the problem is often intermittent. This topic tells you how to correct the jitter by adding a capacitor to the Rev. A deflection board D and by adjusting the vertical hold.



Capacitor Installation

Warning: Take care to avoid high-voltage areas on the solder side of deflection board D. In particular, avoid the very high-voltage areas shown at left.

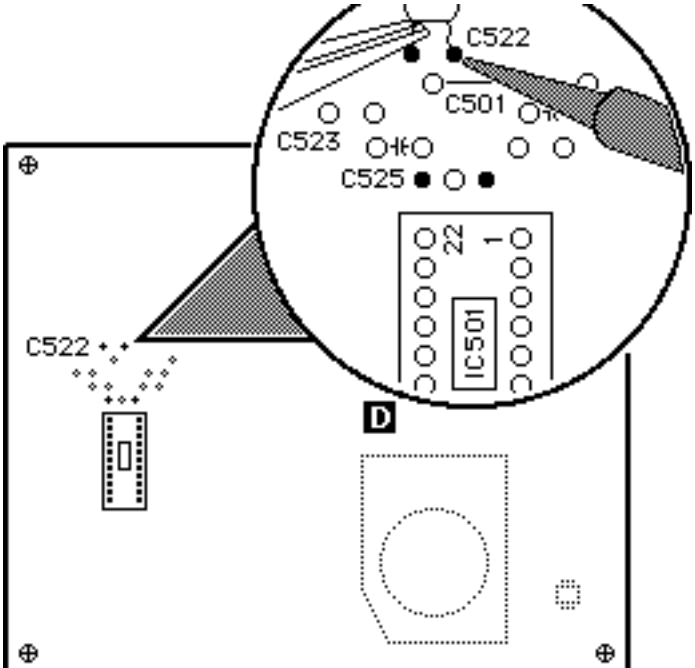
1. Use Display Service Utility to display the Crosshatch I or II test pattern.
2. Switch off monitor power and remove the monitor cover and EMI shield.



Note: If capacitor C525 is not installed on the deflection board D, you will not find a label or terminal holes on the board.

3 Check deflection board D for capacitors C522 and C525.

4 If both capacitors are installed, perform the Geometry adjustments in this chapter.

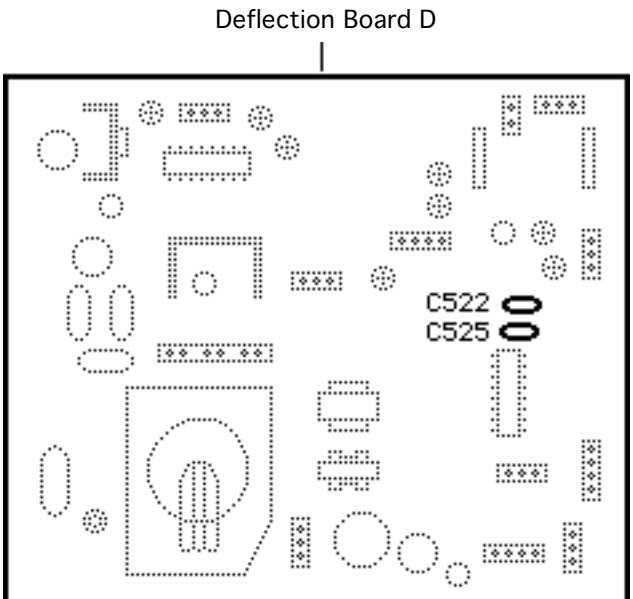


Solder Side of Deflection Board D

5 If capacitor C522 is missing, install a new capacitor.

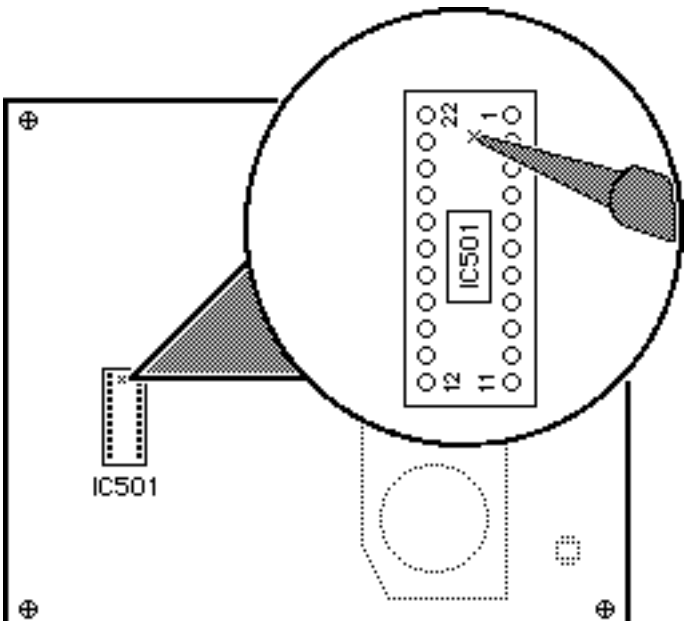
6 Using a low-wattage soldering iron and needlenose pliers, solder capacitor C522 (0.022 µF) to the two holes marked C522.

7 Perform the Geometry adjustments.



Caution: When installing capacitor C525, be careful not to damage the board. Do not overheat the board. Scrape away only the top layer of insulating material from the surface of the board and leave the copper layer intact.

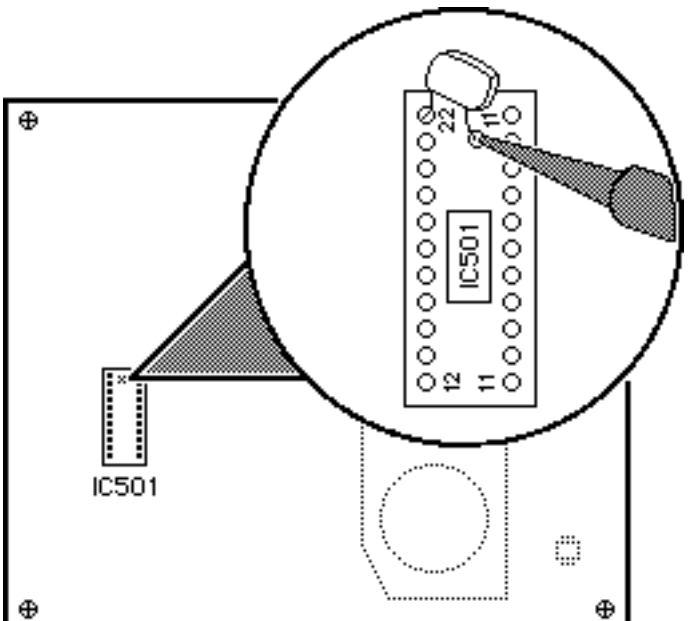
8 If capacitor C525 is missing, install a new capacitor.



Solder Side of Deflection Board D

9 Using a small knife, scrape away a small section of insulating material at point X.

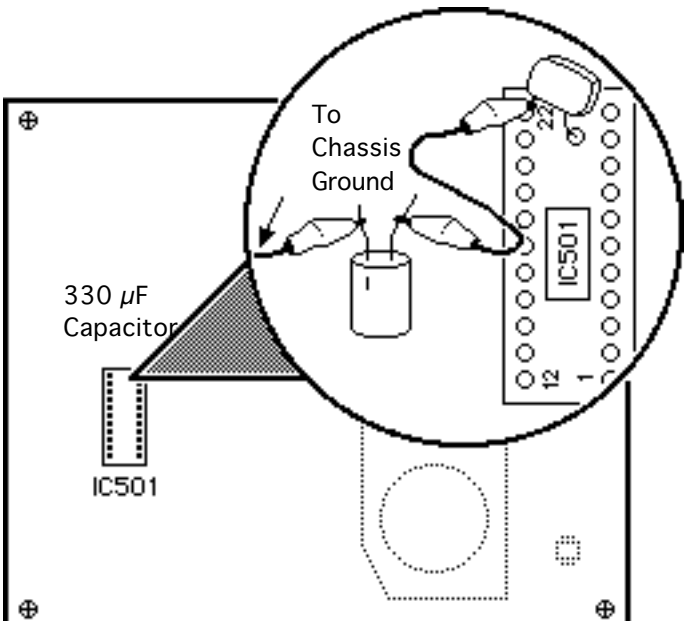
10 Using a low-wattage soldering iron, place a small bead of solder at point X.



Solder Side of Deflection Board D

11 **Caution:** Be careful not to short the capacitor leads to any other solder connections.

Lay capacitor C525 (0.047 μF) on its side, and solder it between IC501 pin 22 and point X.

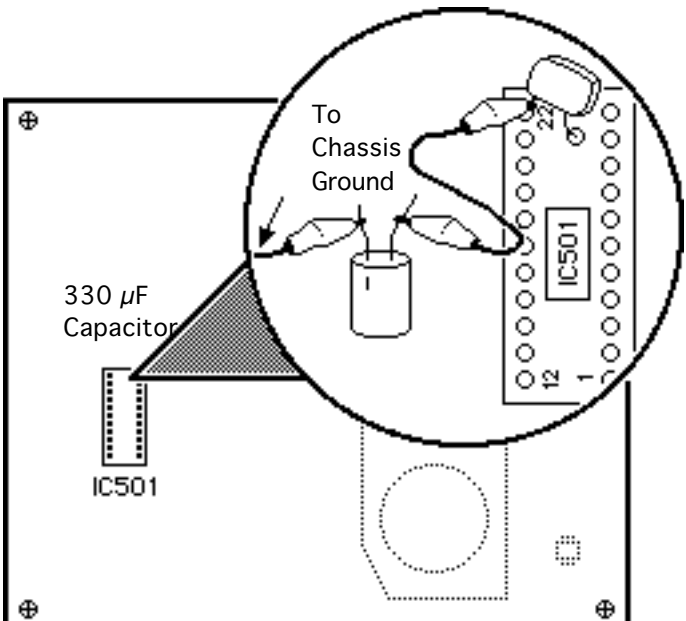


Solder Side of Deflection Board D

Vertical Alignment

1 Connect an alligator lead between the negative end of a 330 µF capacitor and the monitor chassis ground.

Caution: Make sure the alligator clip does not slip off pin 22 and touch the surface of the board. Contact with the board can prevent you from properly adjusting the vertical alignment.



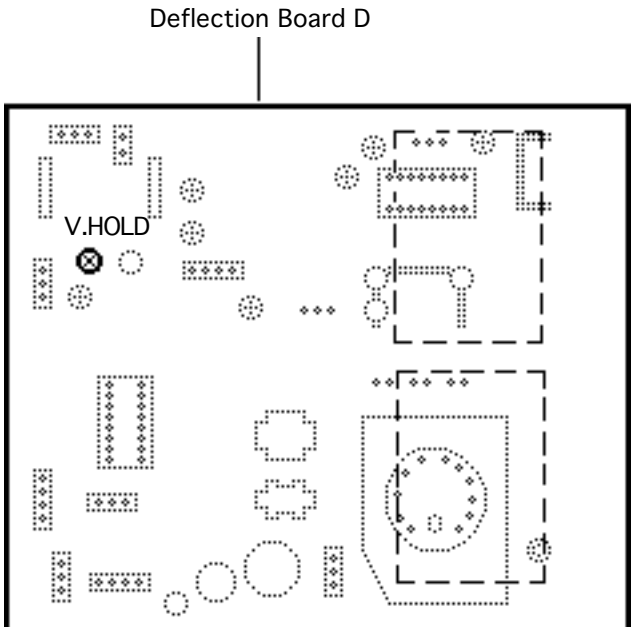
Solder Side of Deflection Board D

2 Connect a second alligator lead between the positive (unmarked) end of the 330 µF capacitor and pin 22 on IC501.

3 Switch on monitor power.

Warning: The entire yoke assembly has very high voltage. To prevent electrical shock, do not touch the yoke assembly, the anode wire, or the yoke wires.

4 **Note:** If you have difficulty determining how many bars are on the screen, step away from the monitor and view the screen from a distance.

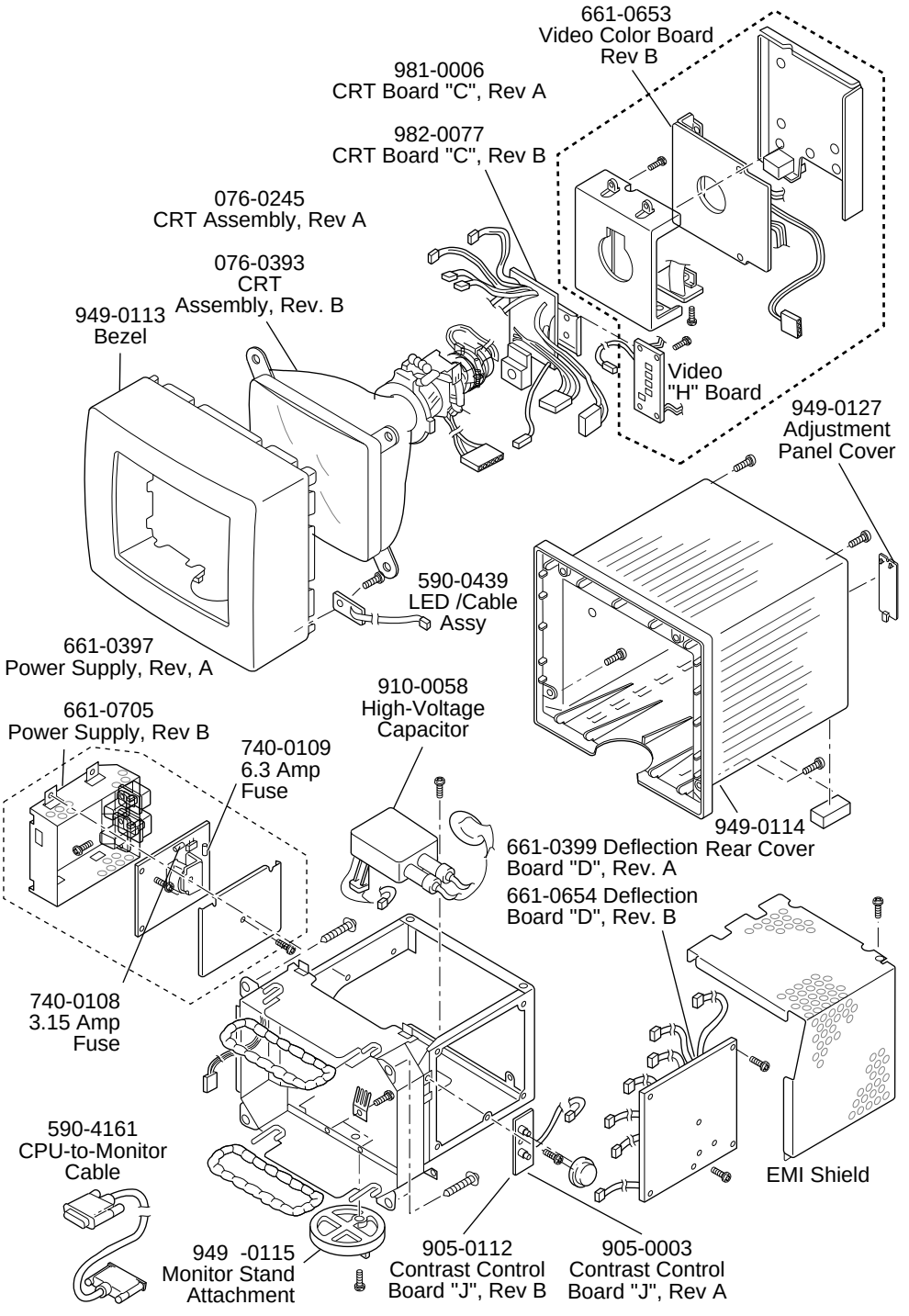


Use the adjustment tool (part number 949-0386) to carefully adjust the V-HOLD control until 4 or 5 horizontal gray bars appear on the monitor screen.

5 Remove the 330 µF capacitor.

Exploded View

AppleColor High-Resolution RGB Display


661-0653
Video Color Board
Rev B
981-0006
CRT Board "C", Rev A
982-0077
CRT Board "C", Rev B
076-0245
CRT Assembly, Rev A
076-0393
CRT
Assembly, Rev. B
949-0113
Bezel
Video
"H" Board
949-0127
Adjustment
Panel Cover
590-0439
LED /Cable
Assy
661-0397
Power Supply, Rev, A
910-0058
High-Voltage
Capacitor
661-0705
Power Supply, Rev B
740-0109
6.3 Amp
Fuse
949-0114
Rear Cover
661-0399 Deflection
Board "D", Rev. A
661-0654 Deflection
Board "D", Rev. B
740-0108
3.15 Amp
Fuse
590-4161
CPU-to-Monitor
Cable
EMI Shield
949 -0115
Monitor Stand
Attachment
905-0112
Contrast Control
Board "J", Rev B
905-0003
Contrast Control
Board "J", Rev A