

HP 98785A/98789A CE Handbook

HP 9000 Series 300 Computers

HP Part Number 98785-90040



Hewlett-Packard Company

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98785A/98789A

Printing History

New editions of this manual will incorporate all material updated since the previous edition. Update packages may be issued between editions and contain replacement and additional pages to be merged into the manual by the user. Each updated page will be indicated by a revision date at the bottom of the page. A vertical bar in the margin indicates the changes on each page. Note that pages which are rearranged due to changes on a previous page are not considered revised.

The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

July 1988...Edition 1

Notices

Radio Frequency Interference Statements

FCC Statement

**Federal Communications Commission
Radio Frequency Interference Statement
(U.S.A. Only)**

The Federal Communications Commission (in Subpart J of Part 15, Docket 20780) has specified that the following notice be brought to the attention of the users of this product.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

VCCI Statement (Japan Only)

この装置は、第一種情報装置(商工業地域において使用されるべき情報装置)で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

HP Computer Museum
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Manufacturers Declaration (Germany Only)

Herstellerbescheinigung

Hiermit wird bescheinigt, daß das Gerät/System HP 98785A in Übereinstimmung mit den Bestimmungen der Postverfügung 1046/84 funktentstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes /Systems angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Safety Considerations

WARNINGS, CAUTIONS, and Notes

Warnings, cautions and notes are used through out this document to alert the user to conditions of importance. They are used as follows:

- **WARNINGS** contain information which, if not observed, could result in injury to personnel or loss of life.
- **CAUTIONS** contain information which, if not observed, could result in damage to or destruction of equipment.
- **Notes** contain information that will assist you in accomplishing the job.

Examples:

X-RAY WARNING

Components identified by shading and this mark (on the block diagrams, exploded views, and in the parts lists)



are x-ray emission sensitive and are critical to safe operation. Replace these parts with Hewlett-Packard parts only. Do not replace parts at the component level except with those listed on the replacement parts list in this manual.

It is critical, for safe operation, to follow the circuit replacement and adjustment procedures listed in this manual.

Examples:

WARNING

The power supply presents a hazard to personnel. Extreme care must be taken when connecting voltmeter probes to the test points. De-energize the product by turning it off and removing its power cord before connecting or removing test probes.

CAUTION

The printed circuit assemblies in this product are susceptible to damage by electro-static discharge. Extreme care must be taken when handling printed circuit assemblies. Use an Anti-static Workstation while handling printed circuit assemblies.

Note

Hewlett-Packard supports repair of this product only to the assembly level. The fault is diagnosed to the assembly that is causing the problem. That assembly is then replaced with a new or rebuilt one.

Product Description

1

Introduction

This Service Handbook contains information about the HP 98785A and 98789A color monitors. Differences are noted as needed.

WARNING

Hazardous voltages exist in these monitors. Power must be removed before servicing. Switch the power switch to OFF and remove the power cord.

This manual should be used in conjunction with the Hardware Support Documentation for the host computer.



Specifications

Display features:

Cathode ray tube	40.64cm (16-inch) diagonal
Viewable area	29.7cm (11.7 inches) by 22.2cm (8.74 inches)
Scan	Non-interlaced
Frame rate	60 Hz
Raster	
98785A	1024 by 768 Pixels
98789A	1280 by 1024 Pixels
Horizontal Scan Frequency	
98785A	48.8 KHz
98789A	63.34 KHz
System	RGB input (RS 343A levels)
Band width	60 Hz to 70 MHz \pm 3db
DC Reproduce ratio	100%
Rise time	7 nano-seconds maximum
Fall time	7 nano-seconds maximum
Overshoot	Less than 10%
Undershoot	Less than 10%
Ringing	Less than 10%

Performance

Geometric distortion	Less than $\pm 1.0\%$ of Vertical picture height.
Convergence Error	Less than 0.3mm inside circle equal to picture height. Less than 0.5mm outside the circle
Brightness	110 nit minimum (100 IRE white signal input, Contrast maximum.)
Color temperature	9300° Kelvin +8MPCD.

Regulatory

Germany	Meets EMI conducted and radiated interference VDE 0730, CISPR publication 11
United States	FCC Class A standards, UL.
Canada	CSA, IEC.

4 Product Description

Environmental/Installation/PM **2**

Introduction

This chapter provides information about wiring, safety, unpacking, and installation.

Specifications

Environmental

Switch selected line voltage	90 through 125 Vac 195 through 250 Vac
Line fuse	
95 through 125 Vac	4 Amperes/125 V
195 through 250 Vac	T3.5 Amperes/250 V
Line frequency	48 through 66 Hz
Power consumption	200 Watts maximum
Heat dissipation	172 kcal/hr. (682.5 BTU/hr.)
Operating temperature	10°C to +40°C (50°F to 104°F)
Storage temperature	-40°C to +65°C (-40°F to +149°F)
Ambient humidity	10 through 80% relative humidity, non-condensing
Maximum altitude	3 352 metres (11 000 feet)

Physical:

Height	38.0cm (14.96 inches) 40.6cm (15.98 inches with tilt/swivel)
Width	40.6cm (15.98 inches)
Depth	45.0cm
Net Weight	26.5 Kg (58 pounds)

Wiring

Refer to HP 9000 Series 200/300/500 Site Preparation Manual, part number 09000-00041, to assist you in preparing for the installation of the monitor. Verify power receptacle wiring and contact retention force. **If wiring is not correct and safe, do not install equipment until corrected.**

Unpacking

Unpack the equipment and set it where it will be used. Leave accessories in their anti-static containers.

Monitor Installation

No special installation procedures are needed other than to assure adequate air circulation for cooling.

1. Position the monitor for ease of use and viewing.
2. Connect the co-ax cables with BNC connectors to the RGB (Red, Green, Blue) inputs to the monitor.
3. Connect the other ends of the cables to corresponding RGB output connectors on the Display Controller of the Graphics Display Station, or the RGB outputs of the video board in the host computer.
4. Ensure that the power cord is disconnected. Remove and inspect the fuse for proper value. Refer to Table 2-1.

Table 2-1. Fuse versus Voltage

Part Number	Ampere	Voltage
1-532-746-11SON	4 A/125 V	90 through 125 Vac
1-532-237-11SON	T3.5 A/250 V	198 through 250 Vac

5. Install the fuse.
6. Ensure that the power line select switch on the rear panel is set to the line voltage for your operation. See Table 2-2.

Table 2-2. Switch Setting versus Voltage

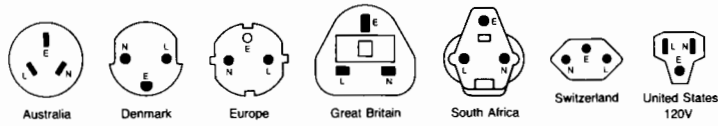
Switch setting	Voltage Range
RIGHT	90 through 125 Vac
LEFT	195 through 250 Vac

7. Ensure that the ON-OFF switch is in the OFF position.
8. Connect the power cord.
9. Ensure that the monitor is facing either East or West for first time turn ON, and turn the monitor ON.



Power Cord Options

HP monitors operate on most ac sources. Power cords are available to connect the monitors to local power outlets. Should a different power cord or a replacement be needed, the following cords are available.



Country	Part Number	Opt.	Voltage
Australia	8120-1369	901	250V, 6A
Denmark	8120-2956	912	250V, 6A
Europe	8120-1689	902	250V, 6A
Great Britain	8120-1351	900	250V, 6A
South Africa	8120-4211	917	250V, 10A
Switzerland	8120-2104	906	250V, 6A
United States	8120-1378	903	120V, 10A

Power cords supplied by HP have polarities matched to the power-input socket on the computer:

- L = Line or Active Conductor (also called "live" or "hot")
- N = Neutral or Identified Conductor
- E = Earth or Safety Ground

NOTE: Plugs are viewed from connector end. Shape of molded plug may vary within country.

Figure 2-1. Available Power Cord Options

Configuration

3

No special configuration is needed.

10 Configuration

Troubleshooting

Introduction

Troubleshooting the monitor consists of observing the symptoms on the screen (CRT) and diagnosing the problem from the visual information presented. Then replace the inoperative assembly.

Note

Hewlett-Packard supports repair only to the assembly level. The trouble is diagnosed to the assembly that is causing the problem. That assembly is then replaced with a new or rebuilt one.

Tools Required

1. number 1 POZIDRIV screwdriver, 3-inches long
2. number 2 POZIDRIV screwdriver, 4-inches long
3. standard .250 inch flat tip screwdriver, 4-inches long
4. VOM, HP 3435A or equivalent
5. tuning tool, non-metallic, non-magnetic
 - a. long, hex, HP 8710-1388
 - b. short, flat blade, HP 8710-1300

Let's divide the possible problems into these general categories:

- unit not working
- working unit without raster
- working unit with raster but with display problems

Assembly Function Chart

Here is a chart that gives the function of each assembly (PC board) used in the HP 98785A display. Use this chart as a troubleshooting aid to help locate the faulty assembly.

Table 4-1. Assembly Function Chart

Board	Function	Control	Adj
A	3 Channel video amplifier	Drive, Blanking	2
B	Signal interface	None	0
C	CRT Neck board (connector)	None	0
D	Deflection, HV ORegulator	Linearity, freq., HV Adj.	15
G	DC Regulators, AC Line filter	None	0
H	User Controls	V Centering, H & V Converge, Contrast	4
J	Power Indicator	None	0
K	H V Connector Board	None	0
L	Convergence Control	Horiz/Vert Convergence	8
M	Sync Mixer	None	0
		Total	29

X-RAY WARNING

Components in the parts list identified by shading are x-ray sensitive and are critical to safe operation. Replace these parts with Hewlett-Packard parts only.

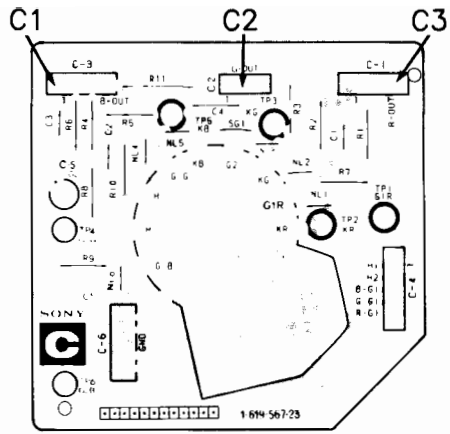


Figure 4-1. CRT Connector

Connector	Pin		Voltage Range
	+	-	
C1	1 to 4		19 to 32 Vdc
C2	1 to 4		19 to 32 Vdc
C3	1 to 4		19 to 32 Vdc

Troubleshooting Charts

Use Table 4-2 and verify that the power supply is functioning properly.

Table 4-2. Low-Voltage Power Supply Voltages

Voltage	Connector Pin Number	Voltage Range
+120	D1-1	118—122 Vdc
+60	D1-1, D1-2	56—66 Vdc
+12	B1-3, D1-4	11.5—12.5 Vdc
-12	B1-5, D1-6	-11.4—-12.6 Vdc
Ground	D1-3 and 4	

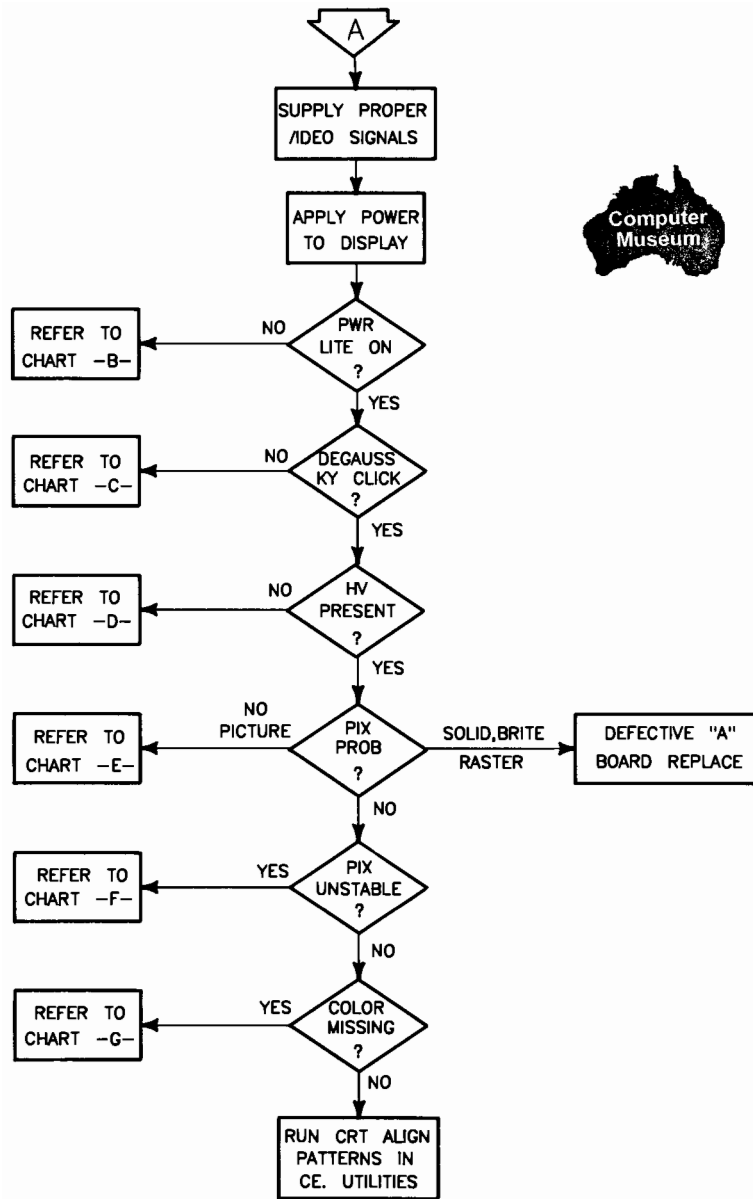


Figure 4-2. Chart A

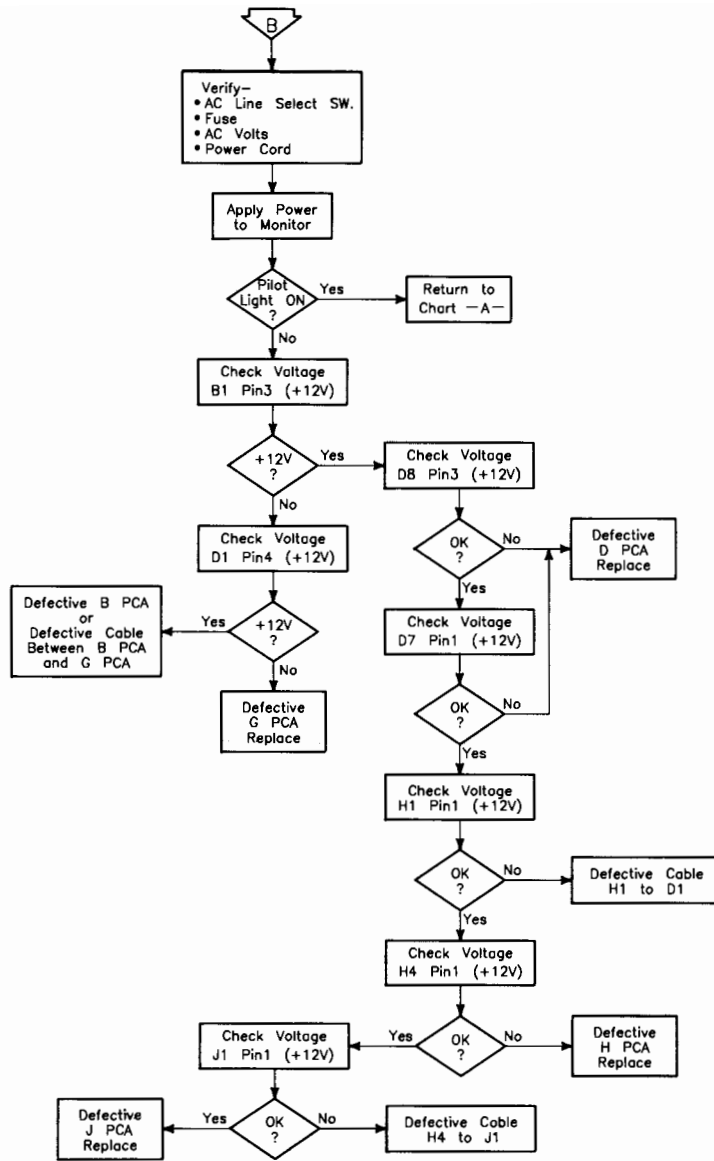


Figure 4-3. Chart B

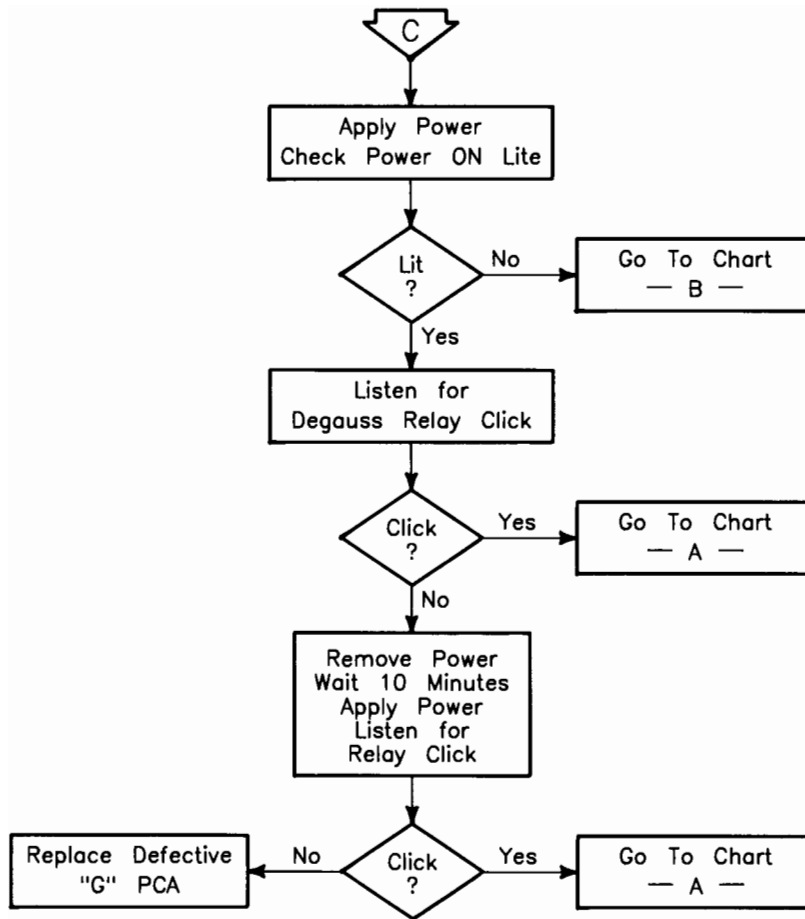


Figure 4-4. Chart C

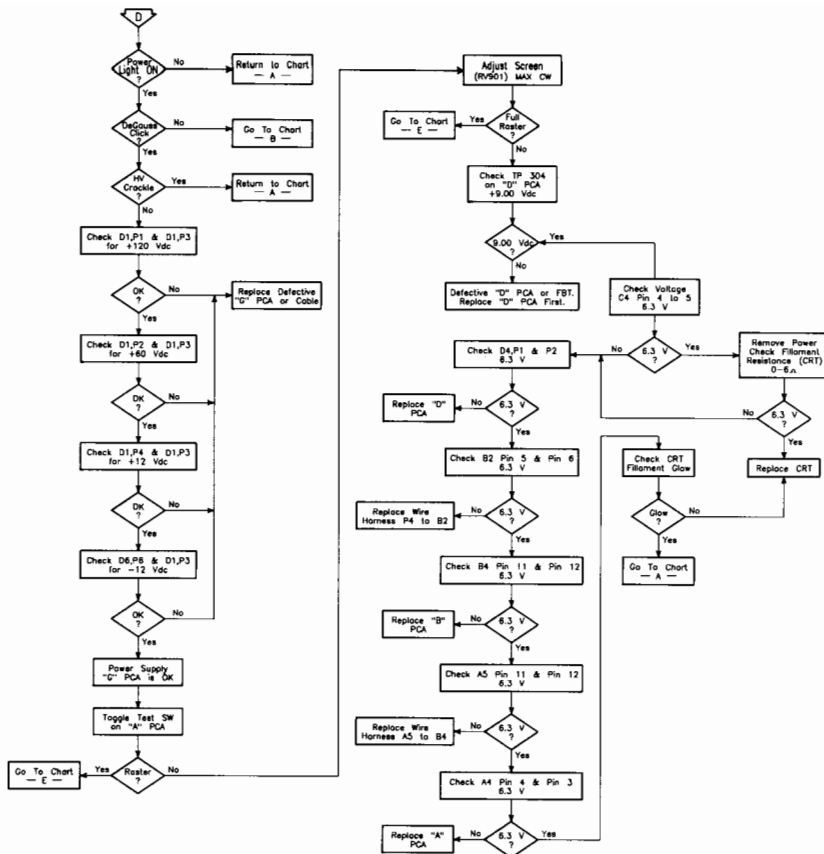


Figure 4-5. Chart D

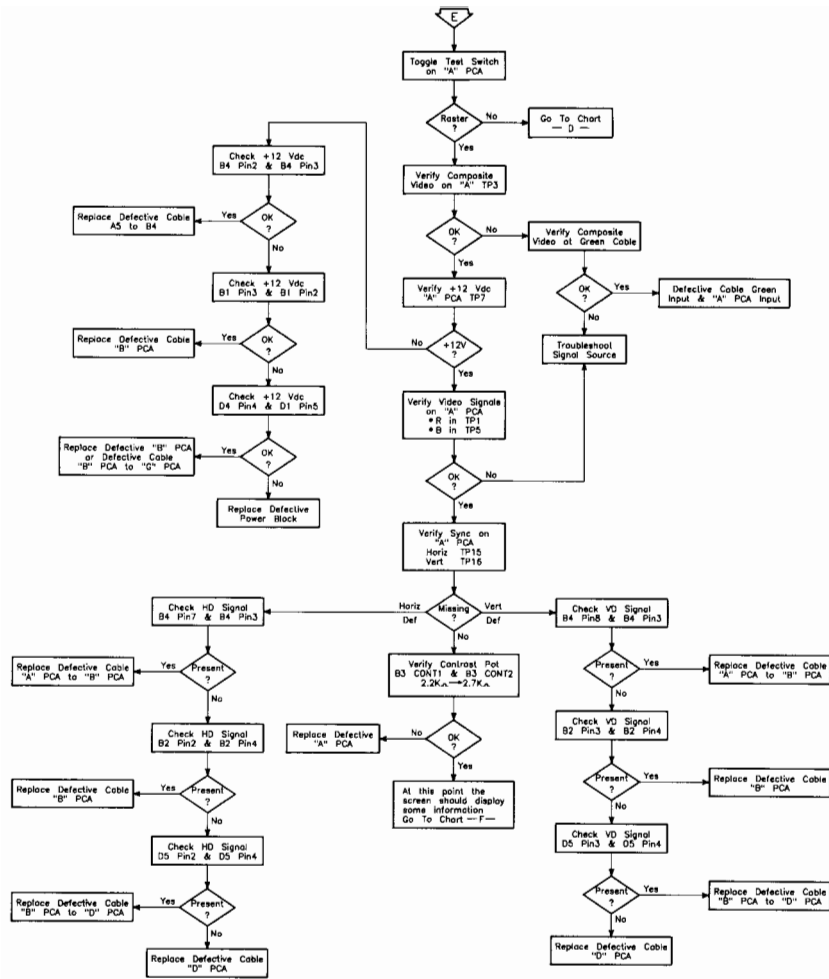


Figure 4-6. Chart E



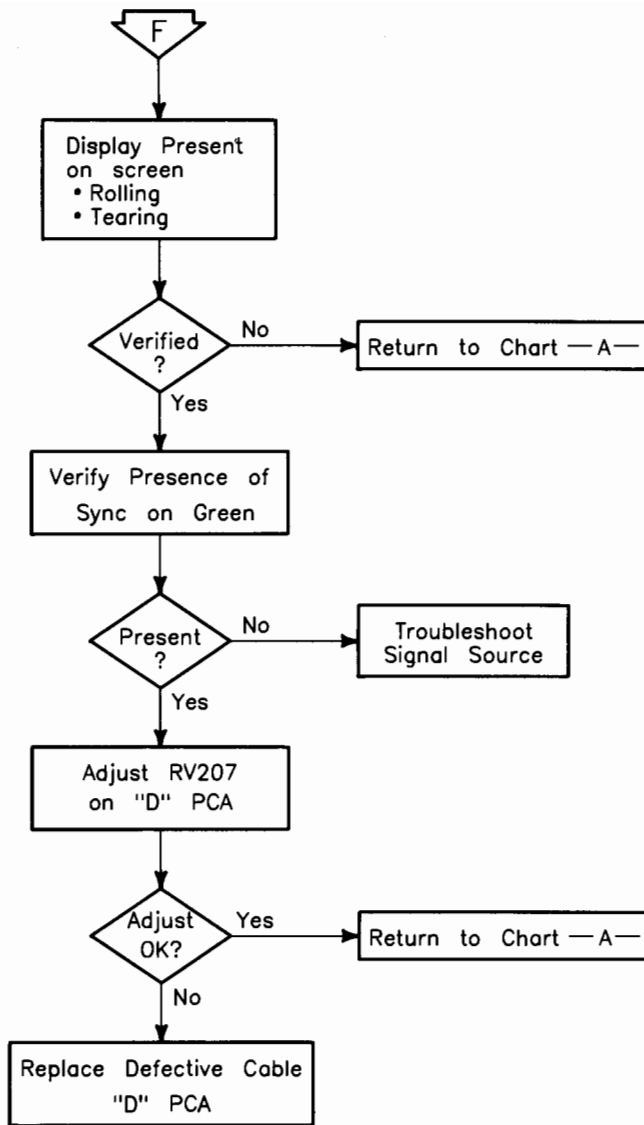


Figure 4-7. Chart F

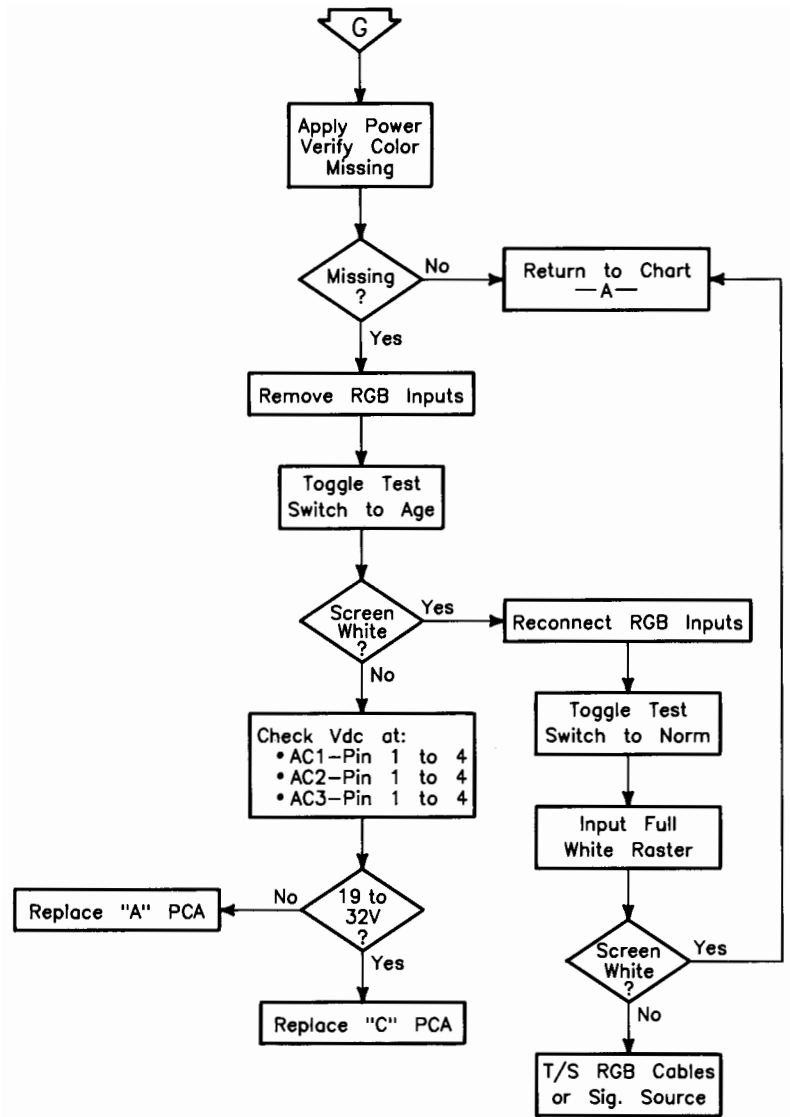


Figure 4-8. Chart G

There are no diagnostics for the monitors. Refer to the Series 300 Test Tools Manual for information about test patterns and how to access and use them.

Adjustments

6

Required Tools

Oscilloscope	HP 1740A or equivalent with a 10:1 probe.
Voltmeter	HP 3435A or equivalent.
Electronic Counter	HP 5314A or equivalent.
Color Analyzer	Minolta TV-2150, TV Color Analyzer or equivalent.
Scale (ruler).	381mm (15-inch)
Screwdriver	Number 1 Phillips
Tuning tool	HP Part Number 8710-1388
Tuning tool	HP Part Number 8710-1300
CRT Alignment Patterns	Series 300 Test Tools

X-RAY WARNING

The high voltage section of this monitor has been adjusted at the factory to minimize X-RAY radiation. Carefully follow the adjustment procedure presented here to maintain this level.

Circuit modifications or replacement of parts not approved by Hewlett-Packard is not supported.



Preliminary Adjustment Tests

1. Check that the power light lights when the power switch is switched to ON.
2. Load and run the Series 300 Test Tools. Refer to the Test Tools Manual for information.
3. Rotate the following controls and check that they are functioning:
 - a. Contrast control [CONT]: Contrast increases with cw rotation.
 - b. Brightness Control [BRIT]: Brightness increases with cw rotation. Return Brightness control to center click.
 - c. Vertical Centering [V-CENT]: Raster can be centered vertically.
 - d. Horizontal Static [H-STA]: Horizontal static convergence control.
 - e. Vertical Static [V-STA]: Vertical static convergence control.

Getting Inside

WARNING

Lethal voltages exist in this monitor. Remove power from monitor before removing protective covers.

Cathode ray tubes can retain an electric charge even though power is removed from the monitor. Hazardous potential could cause injury or death.

The cabinet covers must be removed to gain access to any board assembly.

Voltage Checks

Here are the locations and values for the voltages found in the display. The Anode voltage of the CRT is not measured.

1. Apply power to the monitor and check that the power-on light lights when the power switch is turned ON.
2. Input a white cross-hatch pattern and set contrast control to minimum.
3. Check these voltages on the "D" board:

DC Voltage	Tolerance	Location
+B	143.0 - 146.0 volts	Connector "D-1" Pin 1
+60 V	56V - 63V	Connector "D-1" Pin 2
+12V	+11.7 - 12.3V	Connector "D-1" Pin 4
-12V	-11.4 - -12.6V	Connector "D-1" Pin 6
+32V	+31.1 - +32.4V	Test Point 301
+9.60V	+9.4 - 9.8V	Test Point 302
+9.00V	+8.96 - +9.04V	Test Point 304

4. Adjust RV-301 on the "D" board to obtain +9.00Vdc at Test point TP-304 if necessary.

White Balance Adjustment

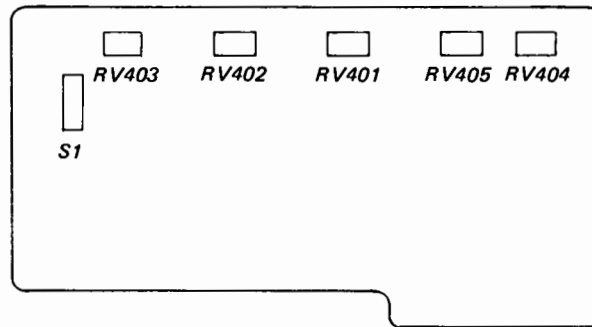


Figure 6-1. "A" Board Adjustment Locations

1. Input a full white signal.
2. Set contrast control to maximum.
3. Set RV-402 through RV-405, on the "A" board, to their mechanical center.
4. Connect the oscilloscope to Test Point TP-2 on the "C" board.
5. Check pedestal level for $+49.5 \text{ Vdc} \pm 1.5 \text{ Vdc}$. See Figure 6-2.

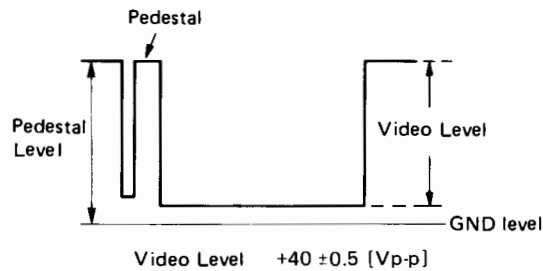


Figure 6-2. Video Signal Levels

6. Adjust RV-401 (R-DRV) on the "A" board for $+40 \pm 0.5 \text{ Vp-p}$ video amplitude. See Figure 6-2.
7. Connect oscilloscope to TP-1 on "C" board.

8. Check that G1 (Grid 1 in CRT) level is -45 ± 2.0 Vdc. See Figure 6-2.
9. Input grey scale pattern
10. Adjust RV-901 (SCREEN), located on the fly-back transformer (FBT), to set cutoff (BLACK) level of the display.
11. Adjust RV-404 (G-BKG) and RV-405 (B-BKG) on the "A" board for low-level white balance.
12. Adjust RV-402 (G-DRV) and RV-403 (B-DRV) on the "A" board for high-level white balance.
13. Repeat steps 10 through 12 as required to obtain proper tracking from low level to high level.

Contrast Check

1. Input a full white pattern.
2. Connect the oscilloscope to TP-2 on the "C" board.
3. Set contrast control to maximum.
4. Check that video amplitude is 40 ± 0.5 V_{p-p}. See Figure 6-2.
5. Set contrast control to minimum.
6. Check that video amplitude is 13.2-16.0 V_{p-p}.

Focus Rough Adjustment

1. Input white cross-hatch or character (black background) pattern.
2. Adjust RV-902 (FOCUS), located on FBT, to obtain optimum overall focus.



Landing Check

1. Input full white signal.
2. Allow the monitor to operate a minimum of 30 minutes.
3. Cycle power to degauss the monitor.
4. Check landing and color uniformity with the monitor facing the compass points (North, South, East, and West).
5. Input single color, red, green, and blue signals and check landing of each color.

Horizontal Synchronization Check

1. Input white cross-hatch pattern.
2. Remove sync signal.
3. Adjust RV-207 (H FREQ) on the "D" board to match the free-running frequency of the monitor to the signal generator (minimize horizontal roll) as closely as possible.
4. Connect sync signal to monitor.
5. Adjust RV-901 (SCREEN), located on the FBT, to obtain a bright background.
6. Adjust RV-205 (H PHASE) on the "D" board to center the cross-hatch pattern with respect to the background raster. See Figure 6-3.

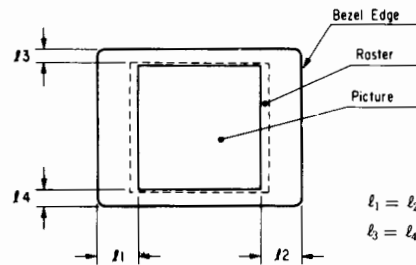


Figure 6-3. Centering the Picture.

7. Adjust RV-901 (SCREEN) to eliminate background raster.

Geometric Distortion Adjustment

1. Input a green cross-hatch pattern.
2. Face the monitor in a north-south direction.
3. Turn the V CENT control to its center detent position.
4. Adjust RV-108 (V CENT) to center the display in a vertical direction.
5. Face monitor in an east-west direction.
6. Adjust RV-101 (V SIZE) for a vertical size of 221mm (8.7 inches) $\pm 1\%$ at horizontal center of the screen.
7. Adjust RV-104 (BOT AMP), RV-105 (BOT PHASE), RV-106 (TOP AMP), and RV-107 (TOP PHASE) to minimize distortion at top and bottom of display. See Figure 6-4.

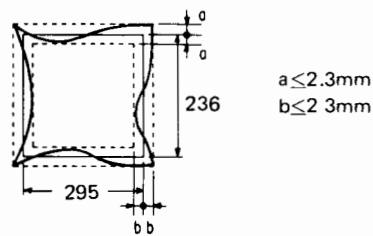


Figure 6-4. Top and Bottom Distortion

8. Adjust RV-103 (V-LIN BAL) to equalize the height (vertical dimension) of the squares in the cross-hatch pattern in the upper and lower sections. See Figure 6-5.

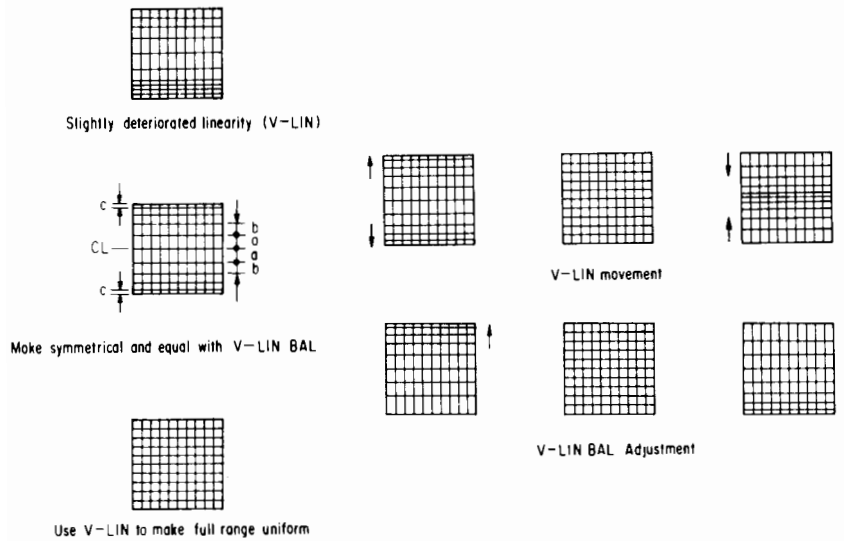


Figure 6-5. Vertical Balance and Linearity

9. Adjust RV-102 (V LIN) to equalize the square dimensions in the upper, center, and lower sections of the display.
10. Repeat steps 6 through 9 until vertical size and linearity are optimized.
11. Adjust RV-208 (H CENT) to center the display in the horizontal direction.
12. Adjust RV-204 (H SIZE) for a horizontal size of 295mm (11.6 inches) $\pm 1\%$ at the vertical center of the screen.

- Adjust RV-202 (KEY BAL), RV-201 (KEY), RV-206 (SIDE PIN BAL), and RV-203 (PIN AMP) to minimize horizontal distortion. See Figure 6-6.

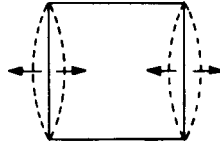


Figure 6-6. Side Distortion

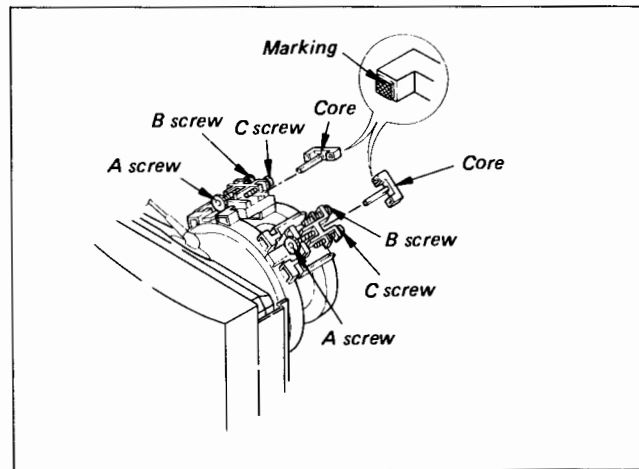
- Repeat steps 12 and 13 to optimize horizontal size and linearity.

Convergence

As you face the front of the monitor the CRT neck reactor on the right is called “XBV” & “XCV”; the reactor on the left is called “H AMP” & “H TILT”. The reactors consist of coils and adjustable position pole/core pieces that can be adjusted for vertical tilt (to ensure that the three guns operate in the same horizontal plane), “Y” bow distortion (to ensure the three gun’s beams are linear and not curved as they traverse the face of the CRT), horizontal amp (to ensure the red and blue traces are on opposite sides of the green trace), and Horizontal tilt (to ensure equal separation of the traces). This is SONY’s procedure:

- Select a white cross-hatch with dark background pattern.

2. Pick your situation from Figure 6-7 and make the required adjustment(s):



(a) XBV positive balance correction

Set the N pole (white paint mark) on the core on the Screw B side and rotate the Screw A.

(b) XBV negative balance correction

Set the N pole (white paint mark) on the core on the Screw C side and rotate the Screw A.

(c) XCV positive balance correction

Rotate the Screw B so that the coil can move forward.

(d) XCV negative balance correction

Rotate the Screw C so that the coil can move forward.

(a) H AMP positive balance correction

Set the N pole (white paint mark) on the core on the Screw C side and rotate the Screw A.

(b) H AMP negative balance correction

Set the N pole (white paint mark) on the core on the Screw B side and rotate the Screw A.

(c) H TILT positive balance correction

Rotate the Screw B so that the coil can move forward.

(d) H TILT negative balance correction

Rotate the Screw C so that the coil can move forward.

Figure 6-7. Reactor Adjustment

Now continue with this procedure:

1. Select a white cross-hatch with dark background pattern.
2. Set H STAT and V STAT controls on front panel to their center detent position.
3. Face monitor in an East-West direction and turn ON.
4. Adjust H STAT control, white pot on bracket located at left rear as you face front of monitor, for horizontal convergence at vertical center of display.
5. Adjust RV-4 (Y BOW TOP) on the "L" board for horizontal convergence at top of display.
6. Adjust RV-5 (Y BOW BOTTOM) on the "L" board for horizontal convergence at the bottom of the display.
7. Adjust RV-2 (V STAT CENT) on the "L" board for vertical convergence at the horizontal center of the display.
8. Adjust RV-1 (V STAT TOP) on the "L" board for vertical convergence at the top of the display.
9. Adjust RV-3 (V STAT BOTTOM) on the "L" board for vertical convergence at the bottom of the display.
10. Repeat steps 4 through 9 to optimize convergence over entire display.

Focus Final Adjustment

1. Select a white cross-hatch or character pattern (dark background).
2. Connect the oscilloscope to the junction of L2 and C41 on the "L" board.
3. Turn the monitor to ON.
4. Adjust the core of L2, using a plastic hex tool, to maximize the amplitude of the sine wave signal.
5. Adjust the core of L2, while watching the display, to balance the focus at the sides of the display.



6. Adjust RV-7 (DQP CENT), while watching the display, to optimize focus at center of the display.
7. Adjust RV-6 (DQP TOP), while watching the display, to optimize focus at top of the display.
8. Adjust RV-8 (DQP BOTTOM), while watching the display, to optimize focus at bottom of the display.
9. Adjust RV-902 (FOCUS), located on the FBT, and repeat steps 5 through 8 to obtain uniform focus over the entire display.

White Balance

1. Select a full white pattern (signal).
2. Set contrast control to minimum.
3. Turn monitor ON.
4. Using a color analyzer, set the color coordinates at screen center to specifications by adjusting RV-404 (G BKG) and RV-405 (B BKG) on the "A" board.

Color Coordinate Specification

Temp	X	Y
9300°K	0.283±0.02	0.298±0.02

5. Set contrast control to maximum.
6. Set color coordinates the specification by adjusting RV-402 (G DRV) and RV-403 (B DRV) on the "A" board.
7. Repeat steps 1 through 6 to obtain correct white balance tracking.
8. Select a grey scale pattern.
9. Check the cutoff (black) level and video tracking.
10. Select full white pattern (signal).

11. Check that the color coordinates are within specification at the five locations shown in Figure 6-8.

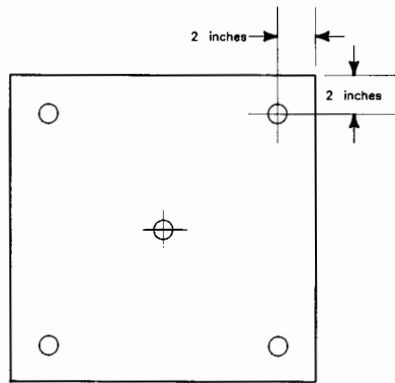


Figure 6-8. Color Coordinate Check Locations

38 Adjustments

Introduction

HP 98785A and 98789A are supported on HP 9000 Series 300 Computers.

Replaceable Parts

Introduction

This chapter contains lists of replacement parts and exchange assemblies included in the HP 98785A. Parts are available from Corporate Parts Center. The address is:

Corporate Parts Center
 333 Logue Avenue
 Mountain View, California, 94042
 Telephone (415) 968-9200

All printed circuit assemblies listed are fully loaded boards. Empty printed circuit boards are not available.

X-RAY WARNING

Components in the parts list identified by shading are x-ray sensitive and are critical to safe operation. Replace these parts with Hewlett-Packard parts only.

Table 8-1. Fuse

Description	HP Part No.
Fuse, 4.0A/125 Vac	
98785A	A-1499-359-ASON
98789A	A-1499-501-ASON
Fuse, T3.15A/250 Vac	
98785A	A-1499-360-ASON
98789A	A-1499-502-ASON

Table 8-2. Replaceable Parts

Description	HP Part No.
"A" Video Assembly	A-1296-180-ASON
"B" EMI Filter	A-1130-505-ASON
"C" CRT Connector	A-1330-733-ASON
"G" Switching Regulator	A-1477-251-ASON
"H,J" Control Panel	A-1477-250-ASON
"K" Hi Voltage Block	A-1465-154-ASON
Rear Cabinet	4-381-947-01SON
Internal Video Cable	A-1499-495-ASON
Cable Assembly	A-1499-505-ASON

Table 8-3. Unique Parts

Description	HP Part No.
CRT Assembly	
98785A	8-738-552-70SON
98789A	8-738-552-92ASON
"D" Deflection Assembly	
98785A	A-1345-637-ASON
98789A	A-1345-676-ASON
"L" Convergence Assembly	
98785A	A-1235-011-ASON
98789A	A-1235-013-ASON
"M" External Sync Assembly	
98785A	A-1301-736-ASON
98789A	A-1301-758-ASON
Bezel	
98785A	X-4381-911-1SON
98789A	X-4381-911-3SON
Main Wiring Harness	
98785A	1-937-755-11SON
98789A	1-937-755-12SON

Table 8-4. Miscellaneous Parts

Description	HP Part No.
Safety cover, for PC boards.	
Cover "D"	4-381-975-12
Shield "A"	4-381-929-02
Shield "L"	4-381-997-01
Shield "D"	4-381-979-02
Preformed Metal Shield	4-381-979-01
Adjustment/Alignment Tool	4-381-826-01
PC Board Plastic Parts	A1499-498-ASON
Cable clamps	A-1499-499-ASON
CRT Hardware	A-1499-304-ASON
Misc. Screws	A-1499-500-ASON

Parts Replacement

Note

For the RFI shielding to be effective, all of the chassis parts must be in place and all screws must be tight.

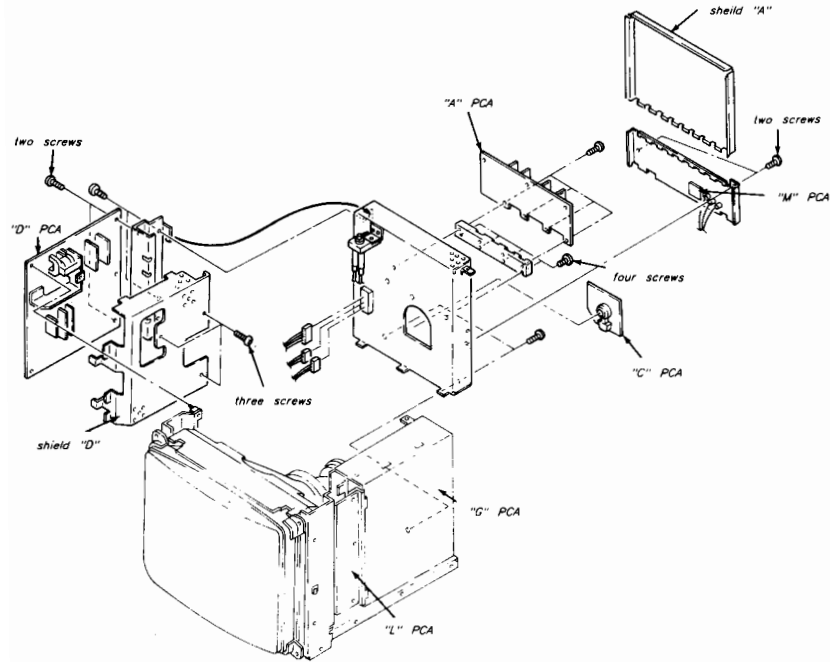


Figure 8-1. Assembly location

Tools Needed

No special tools are required for removing or replacing any assembly in the monitor. Here is a list of tools that will prove useful:

- Number 1 Phillips Screwdriver
- Needle Nose Pliers
- 10mm Box Wrench



Getting Inside

WARNING

Lethal voltages exist in this monitor. Remove power from monitor before removing protective covers.

Cathode ray tubes can retain an electric charge even though power is removed from the monitor. Hazardous potential could cause injury or death.

Refer to Figure 8-2 and remove the cover.

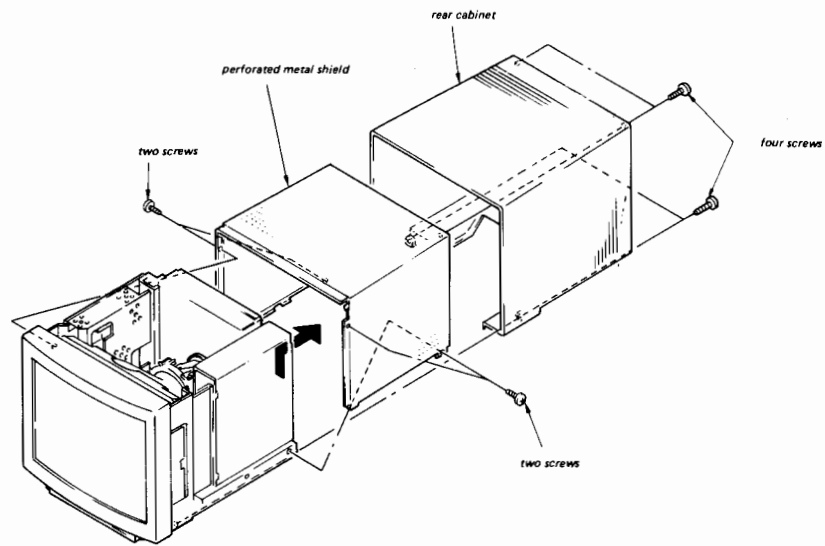


Figure 8-2. Cabinet Cover Removal

Refer to Figure 8-2 and remove the RFI shield.

“A” Video Assembly Removal

To remove the “A” video assembly, refer to Figures 8-1 and 8-2.

“B” EMI Filter Removal

To remove the “B” assembly, refer to Figures 8-1 and 8-2.

“C” CRT Connector Assembly Removal

The “C” CRT connector assembly board is held in place by the CRT. To remove, refer to Figures 8-1 and 8-2.

“D” Deflection Assembly Removal

To remove the “D” board, refer to Figures 8-1 and 8-3.

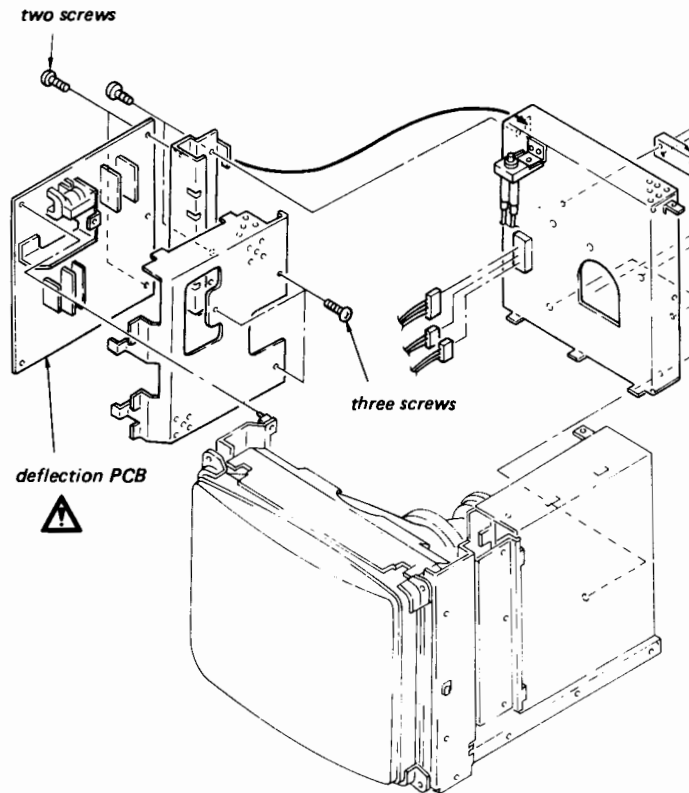



Figure 8-3. “D” Location and Removal

X-RAY WARNING

Components with the mark  are x-ray emission sensitive. Replace these parts with Hewlett-Packard parts only.

“G” Switching Regulator Removal

To remove the G switching regulator, refer to Figure 8-4.

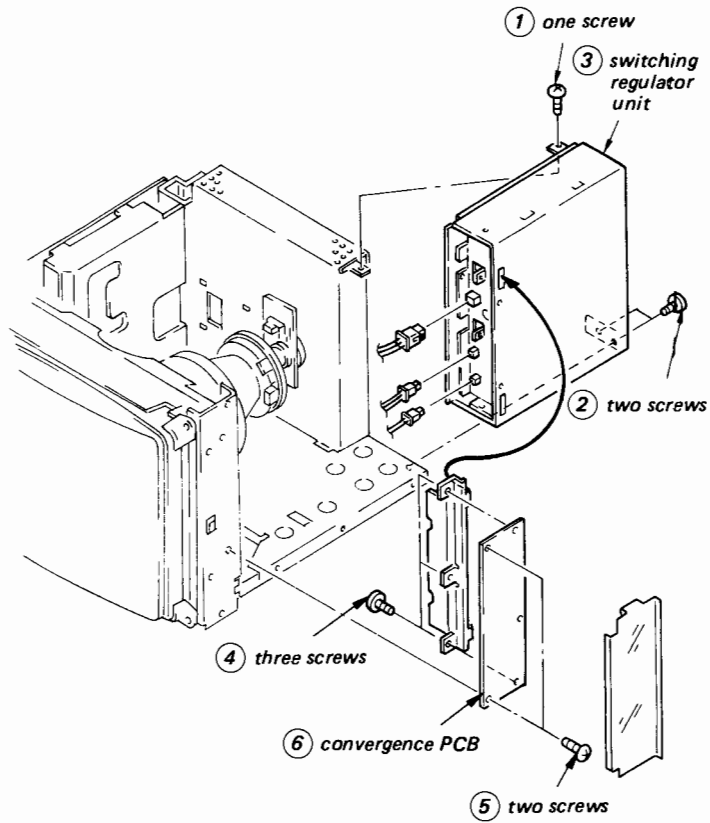


Figure 8-4. “G” Location and Removal



“L” Convergence Assembly Removal

To remove the “L” assembly, refer to Figure 8-5.

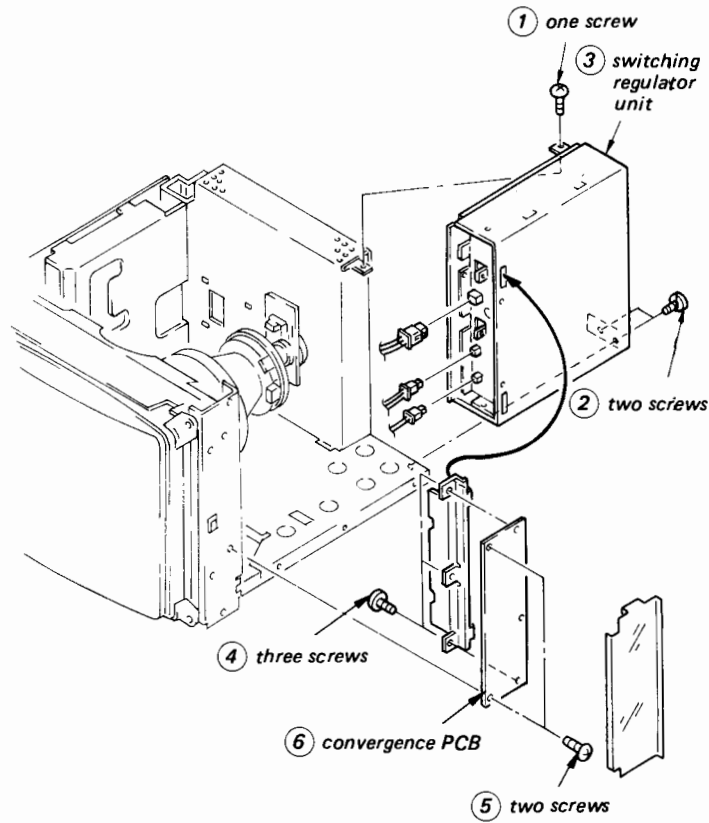


Figure 8-5. “L” Location and Removal

“M” External Sync Assembly Removal

To remove the “M” board, refer to Figure 8-1.

High Voltage Block Removal

Refer to Figures 8-1 and 8-6 to remove the high voltage block.

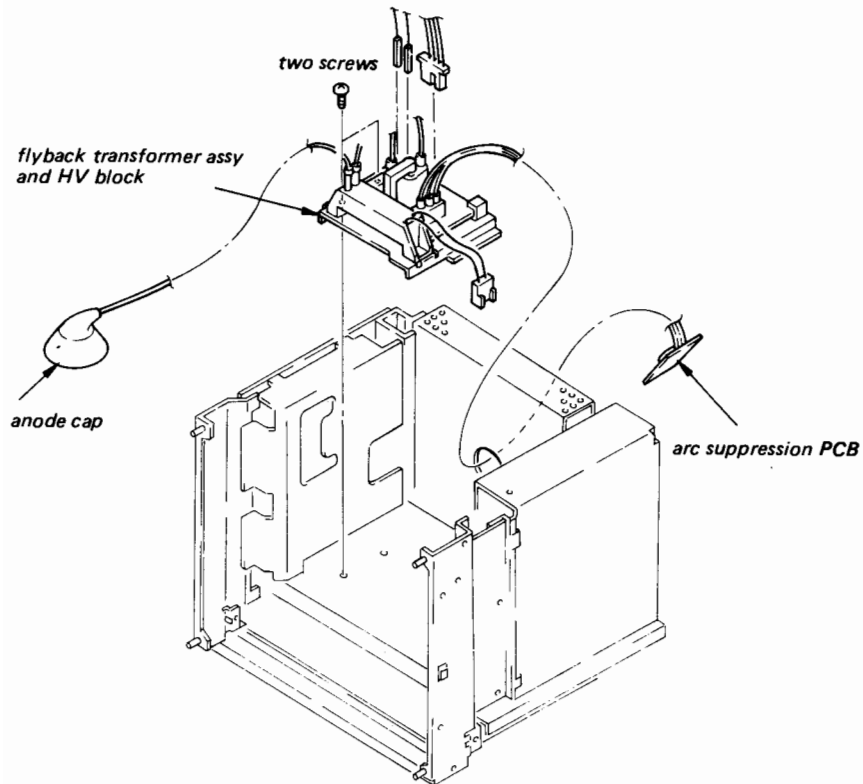



Figure 8-6. High Voltage Block Removal

X-RAY WARNING

Components with the mark  are x-ray emission sensitive. Replace these parts with Hewlett-Packard parts only.

Bezel Removal

To remove the bezel, refer to Figures 8-1 and 8-7.

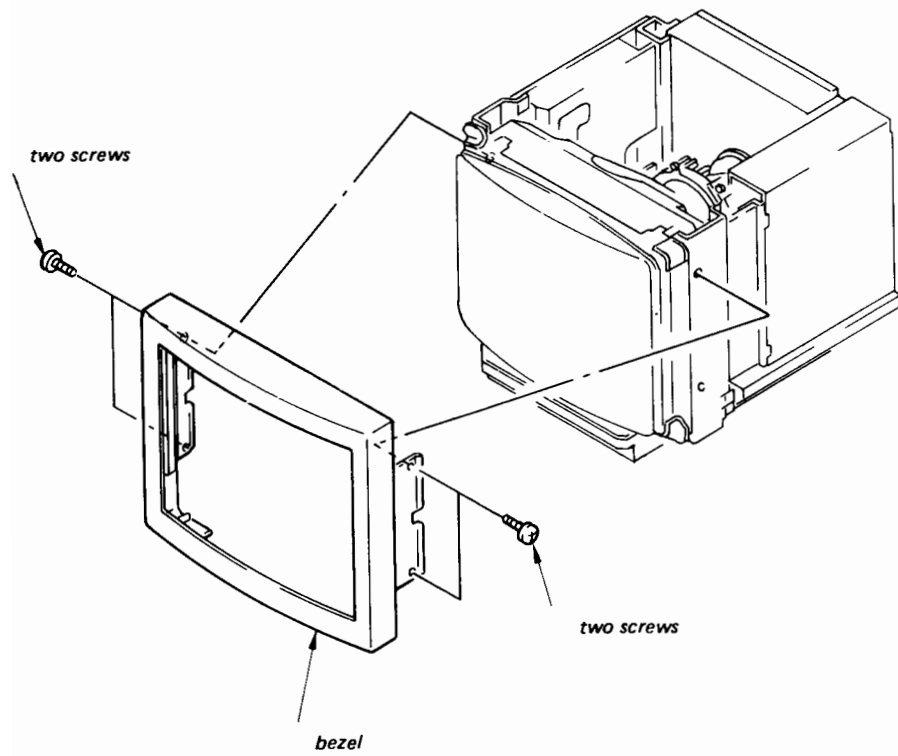


Figure 8-7. Bezel Removal

“H and J” Control Panel Removal

To remove the control panel, see “Getting Inside” on page 45 and Figure 8-8, below.

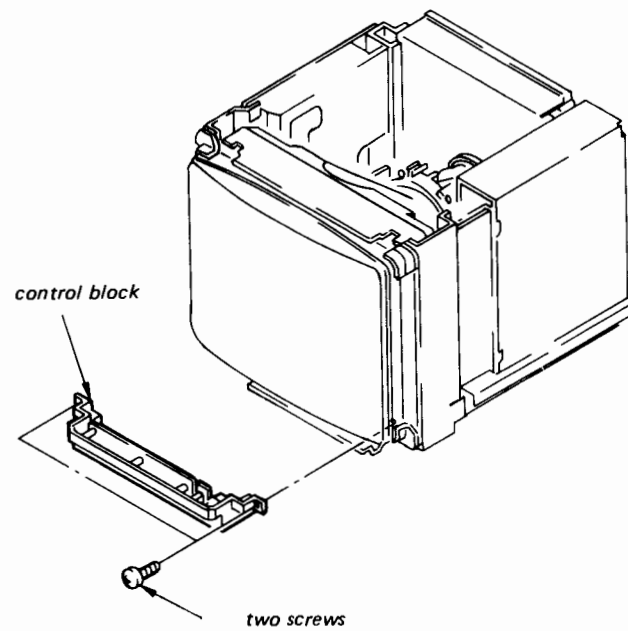


Figure 8-8. Control Panel Removal



CRT Assembly Removal

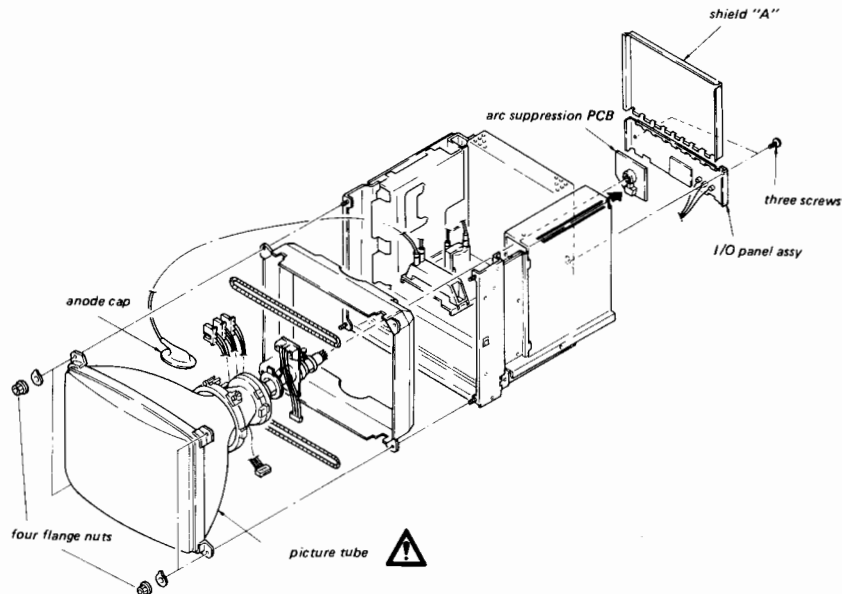


Figure 8-9. CRT/Yoke Assembly Removal.

WARNING

The CRT is a high vacuum device and is subject to implosion if dropped or the glass is over stressed in any way. Wear a face protector and gloves when handling the CRT. Do not lift the CRT by the neck.

If the degauss/shield assembly moves with the CRT, prevent it from falling and damaging the CRT or Yoke.

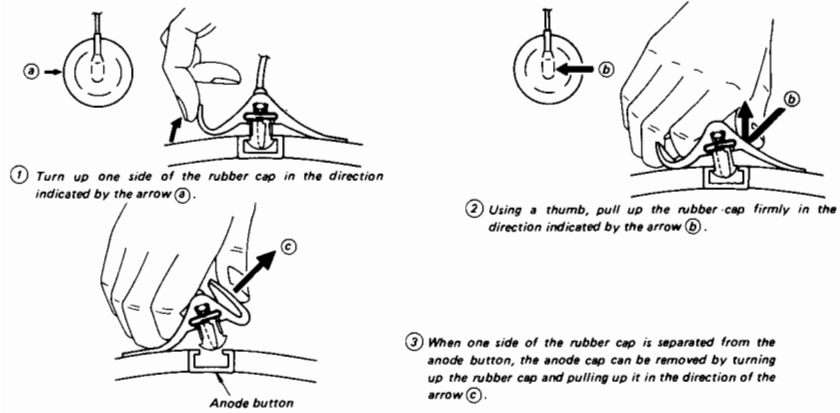


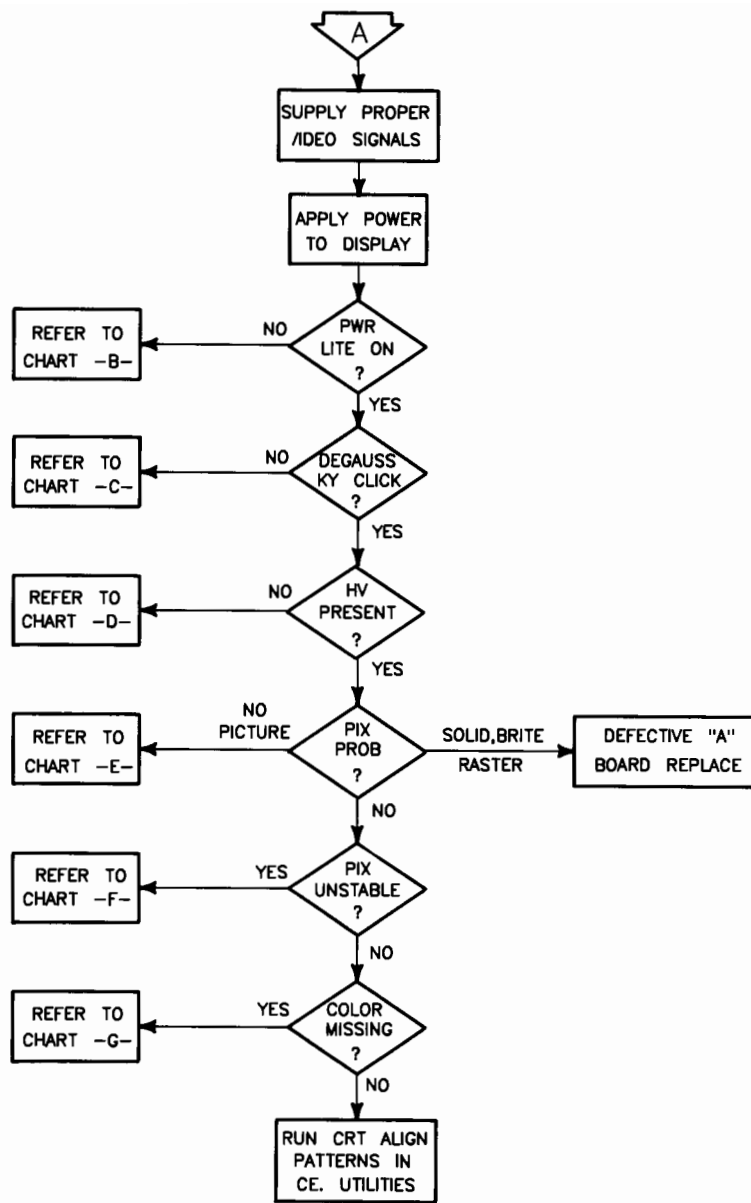
Figure 8-10. Anode Connector Removal

WARNING

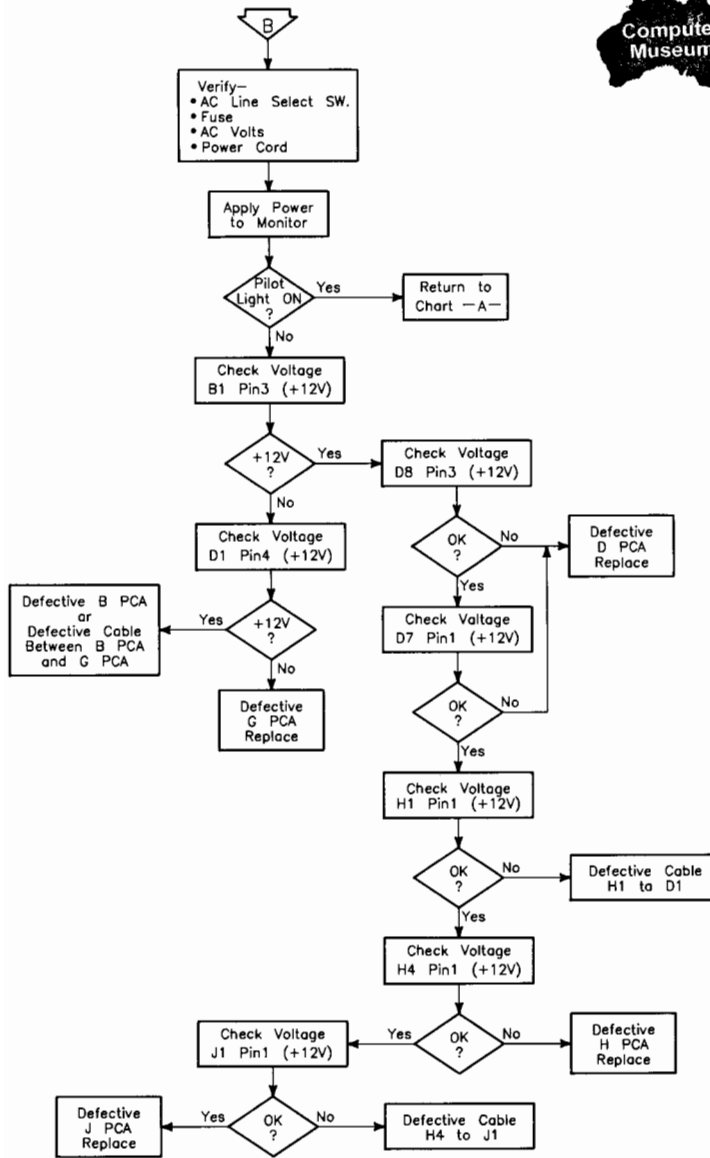
CRT assemblies must be disposed of in a manner consistent with local regulations.

Introduction

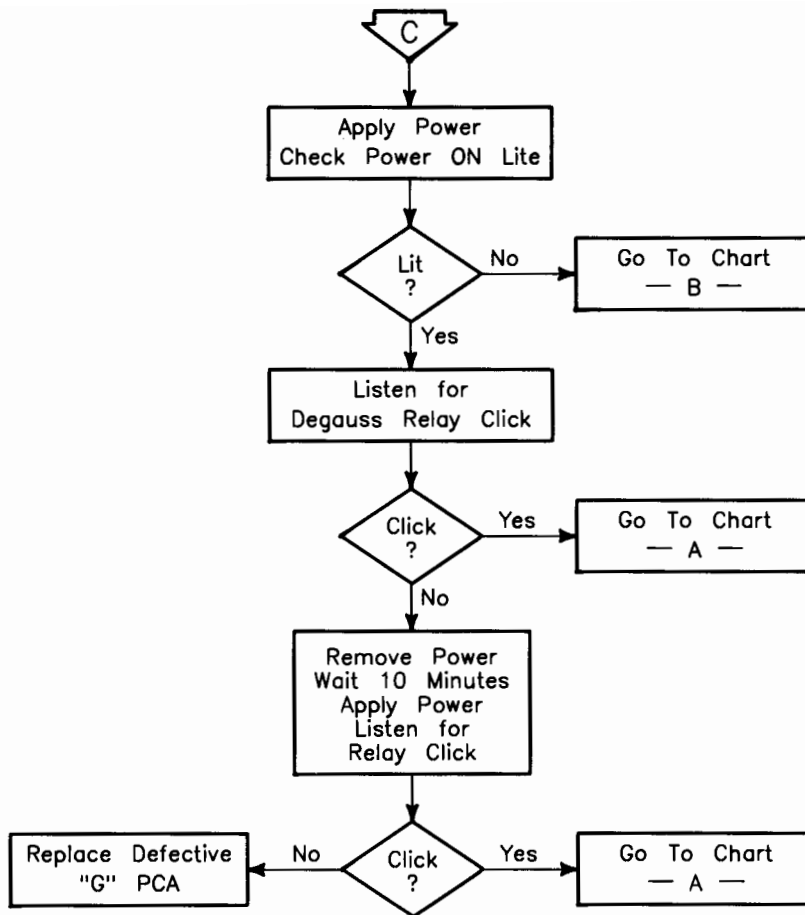
This section contains Troubleshooting Charts and other Diagrams that will be helpful.



Chapter 9-1. Chart A



Chapter 9-2. Chart B



Chapter 9-3. Chart C

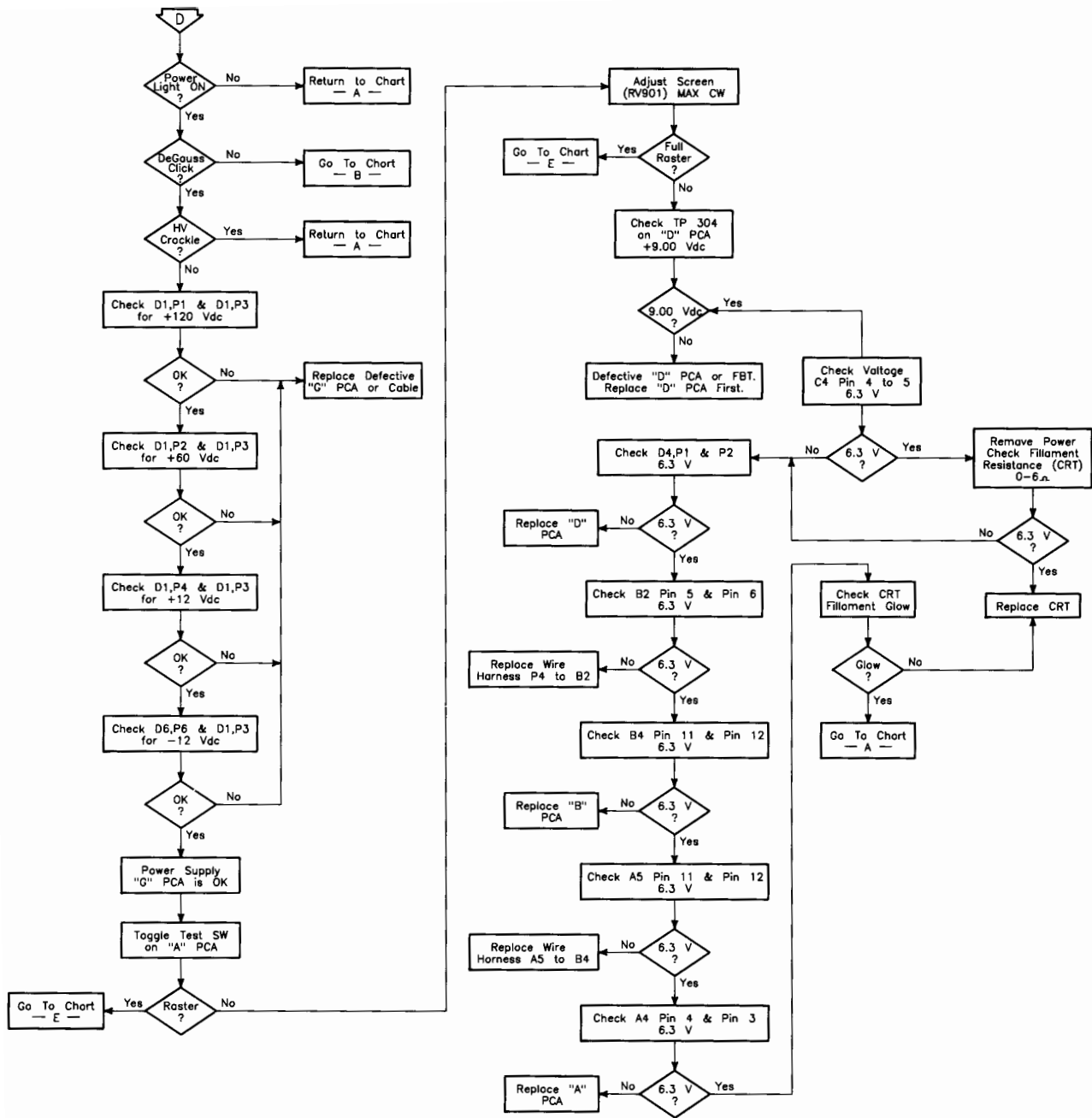
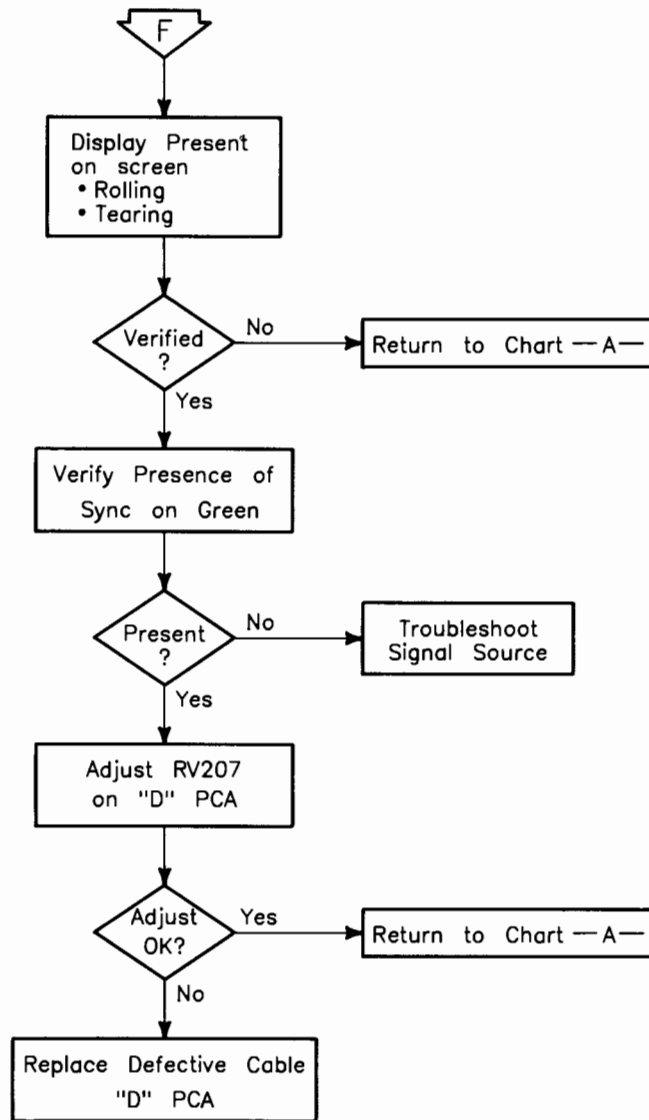
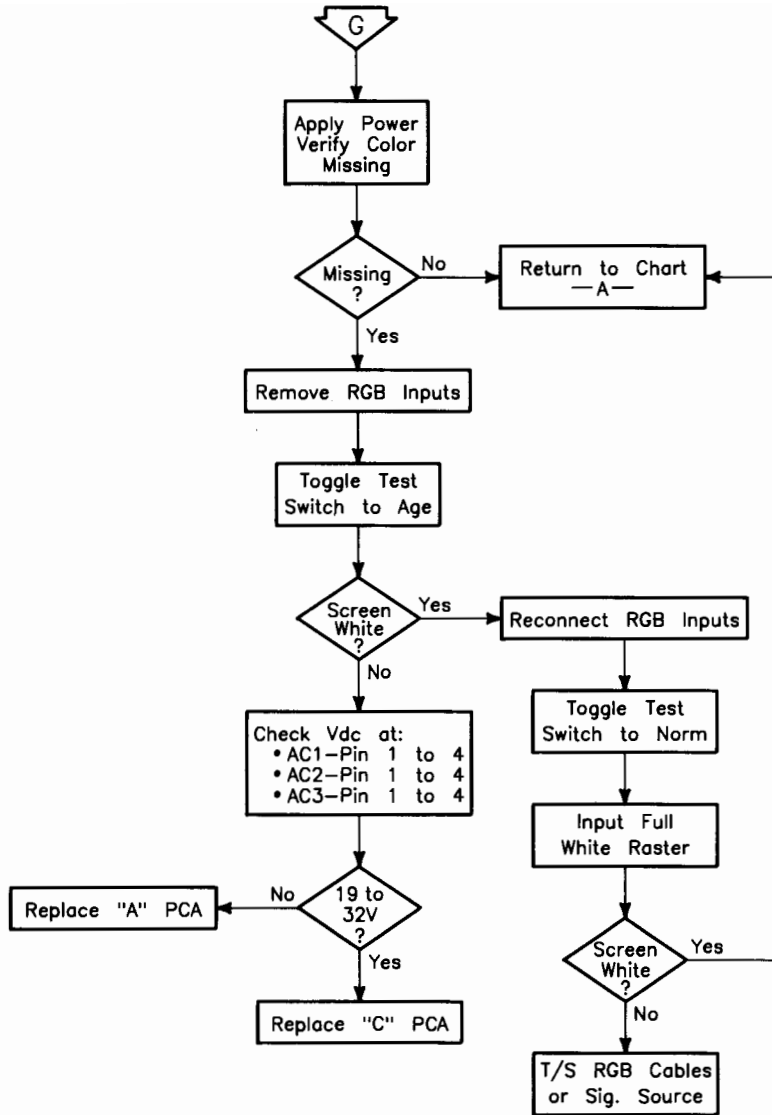


Figure 9-4. Chart D

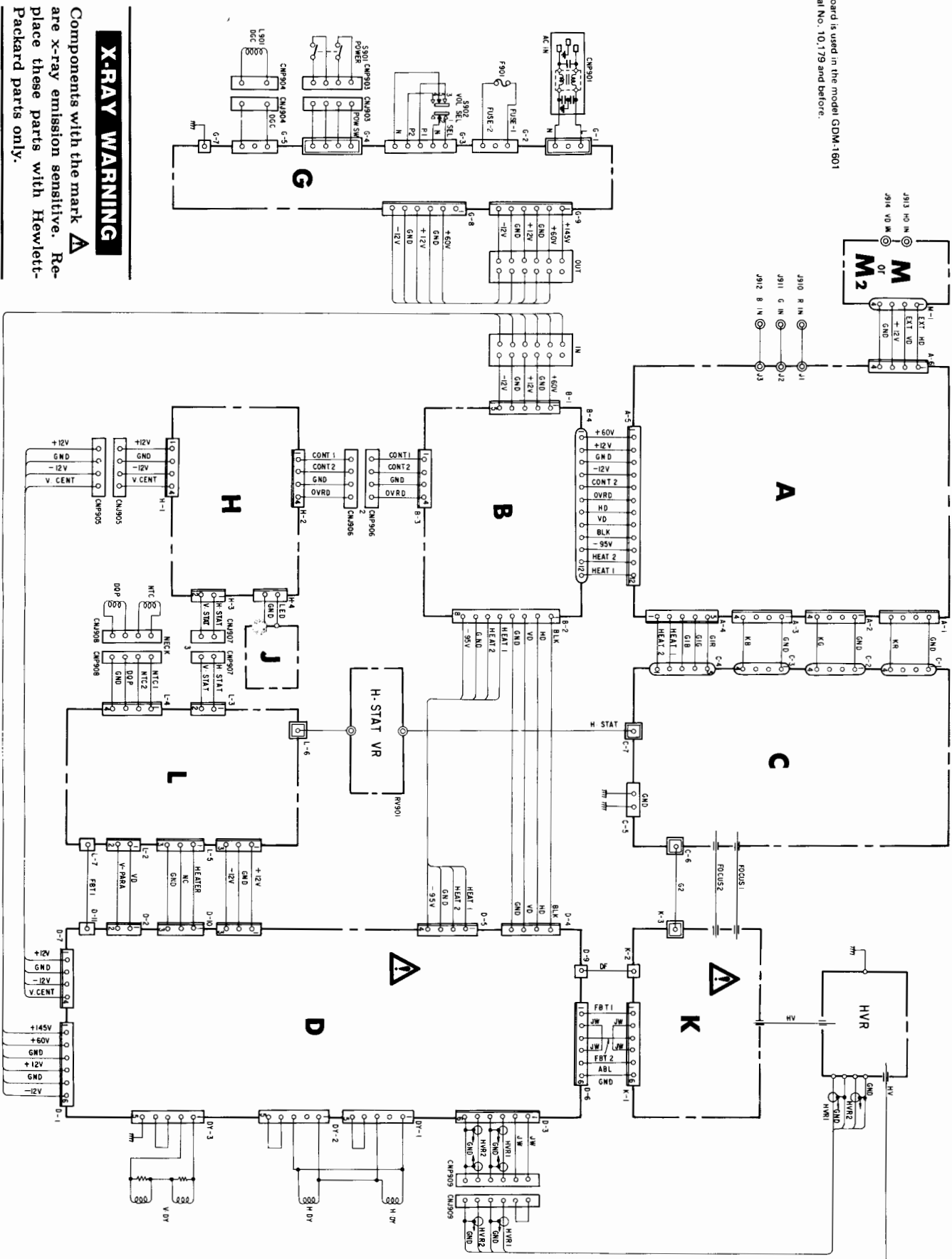


Chapter 9-6. Chart F



Chapter 9-7. Chart G

Note: M board is used in the model GDM-1601
Serial No. 10,179 and before.



X-RAY WARNING

Components with the mark **A** are x-ray emission sensitive. Replace these parts with Hewlett-Packard parts only.

Chapter 9-10. Block Diagram