HP 98751A/98752A CE Handbook

HP 9000 Series 300 Computers

HP Part Number 98751-90039

HEWLETT PACKARD

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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.

June 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.

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Manufacturer's Declaration (Germany Only)

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Safety Considerations

WARNINGs, CAUTIONs, and Notes

Warnings, cautions and notes are used throughout 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:

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 Information 1

Introduction

This CE Handbook contains information about both HP 98751A and HP 98752A. The differences are noted as needed.

Performance

Geometric distortion	Less than ±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.

HP 98751A Specifications

Display features:

Cathode ray tube	48.26cm (19 inch) diagonal
Viewable area	34.3cm (13.50 inches) by 27.4cm (10.75 inches)
Scan	Raster, Non-interlaced.
Frame rate	60 Hz
Raster	
98751A	1024 by 768 pixels
98752A	1280 by 1024 pixels
Horizontal Scan Frequency	
98751A	48.78 KHz
98752A	63.34 KHz
Vertical Scan Frequency	59.98 Hz
Dot Clock	
98751A	64.0 MHz (15.625 nsec)
98752A	108.18 MHz (9.24 nsec)
System	RGB input (RS 343A levels)
Band width	60 Hz to 100 MHz ±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%

Regulatory

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

Reference Documentation

Installation Note	98751-90602 98752-90602
Familiarization Guide	98751-90000

Environmental/Installation/PM 2

Wiring

Refer to HP 9000 Series 200/300/500 Site Preparation Manual, part number 09000-90041, to assist you in preparing for the installation of the HP 98751A or HP 98752A Monitor. Verify power receptacle wiring and contact retention force for all electrical receptacles supplying power to system devices. If wiring is not correct and safe, do not install equipment until corrected.

Unpacking

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

Site Preparation

Power Requirements

Switch selected line Voltage	90 through 132 Vac 198 through 264 Vac
Line fuse 95 through 125 Vac: 195 through 250 Vac:	 3.15 Amperes/125 V 3.15 Amperes/250 V
Line frequency	48 through 66 Hz
Power consumption	80 Watts maximum
Heat dissipation	68.8 kcal/hr. (273 BTU/hr.)

Environmental

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 ft.)

Physical:

Height	44.6 cm (17.56 inches)
Width	48.0 cm (18.90 inches)
Depth	53.5 cm (20.06 inches)
Net Weight	36.0 Kg (90 pounds, 6 ounces)

Power Cord Options

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

Installation

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

Make sure that the power cord is disconnected. Remove fuse/line switch cover and remove and inspect the fuse for proper value. Refer to the following chart:

Table 1-1. Fuse versus Voltage Chart

Switch Setting	Ampere	Voltage Range
RIGHT	4 A/250 V	90 through 125 Vac
LEFT	T3.5 A/250 V	198 through 250 Vac

Install the fuse.

Make sure that the power line select switch on the rear panel is set to the line voltage for your operation. See Table 1-1. Replace cover.

Make sure that the ON-OFF switch is in the OFF position. Connect the power cord. Ensure that the monitor is facing either East or West for first time turn ON. Now turn the monitor ON.

Preventive Maintenance

Cleaning

The HP 98751A/98752A have been painted with a durable, long lasting, non-toxic paint. It will preserve their appearance for many years. To clean the case, follow the instructions below.

CAUTION

Chemical spray on cleaners used for appliances and other household applications may damage the finish. These and other chemical cleaners should not be used. The CRT display should be cleaned only with clean water.

Before cleaning, unplug the power cord and remove any interconnecting cables. Dampen a clean, soft, lint free cloth with a solution of clean water and mild soap. Wipe the soiled areas, ensuring that no cleaning solution gets inside. For cleaning more heavily soiled areas, a 50% solution of clean water and isopropyl alcohol may be used. Then dry with a clean, soft, lint-free, dry cloth.

Configuration 3

The HP 98751 and 98752A Monitors are 19-inch color monitors for use with HP Computers. No special configuration is required.

10 Configuration

Troubleshooting 4

Introduction

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

WARNING

Lethal voltages exist in this monitor. Remove power from monitor before removing protective covers. If power must be applied for testing, use extreme caution when connecting or disconnecting test probes.

Tools Required

- Number 1 POZIDRIV screwdriver, 3 inches long.
- Number 2 POZIDRIV screwdriver, 4 inches long.
- Standard .250 inch flat-tip screwdriver, 4 inches long.
- VOM, HP 3435A or equivalent.
- HP 9000 Series 200/300 Test Tools:
  - 3.5-inch disc part number 09800-12300
  - 5.25-inch disc part number 09800-12500
- Tuning tool, non-metallic, non-magnetic.
  - Long, hex, HP 8710-1388
  - Short, flat blade, HP 8710-1300

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.

Procedures

Use the problem analysis procedures from Kepner Tregoe. Spend a little time and ask the user about symptoms; when the problem first appeared; when it has occurred since. Look for differences and changes. Then look for yourself.

Techniques

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

Inoperative unit	A monitor in which the power light does not light and the degauss relay is not heard. The low voltage power supply is probably not functioning.
Live unit without display	A monitor in which the power on light does light and the degauss relay is heard. The low voltage power supply is working but the high voltage supply may not be. The sweep circuits may not be functioning or the high voltage section may be shut down for some reason.
Live unit with display problems	A monitor in which the screen is lit. There may be a picture with distortion, or the sync may be free running (that is, no lock, picture rolling, either vertically or horizontally, or both), convergence may be lost, or one or more colors may be missing.

The first two will appear the same when the monitor is turned on. The screen will be dark (no raster) and no information displayed. The first one, however, will probably not have an output from the low voltage power supply. The second may have output from the low voltage (LV) power supply but the high voltage (HV) supply may be inoperative, or the CRT may be faulty.

Table 4-2. 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 Regulator	Linearity, Frequency, HV Adj.	15
G	DC Regulators, AC Line filter	None	0
H	User Controls	V Centering, H & V Convergence, Contrast	4
J	Power Indicator	None	0
K	H V Connector Board	None	0
L	Convergence Control	Horiz/Vert Convergence	15
M	Sync Mixer	None	0
		Total	36

Procedures

Use Table 4-3 and verify that the power supply is functioning properly.

Table 4-3. Low Voltage Power Supply Voltages

Voltage	Connector Pin Number	Voltage Range
+145	D1-1	143-147 Vdc
+60	D1-1, D1-2	56-66 Vdc
+15	B1-3, D1-4	14.5-15.5 Vdc
−15	B1-5, D1-6	−14.4 - −15.6 Vdc
Ground	D1-3 and 4	

Chart A

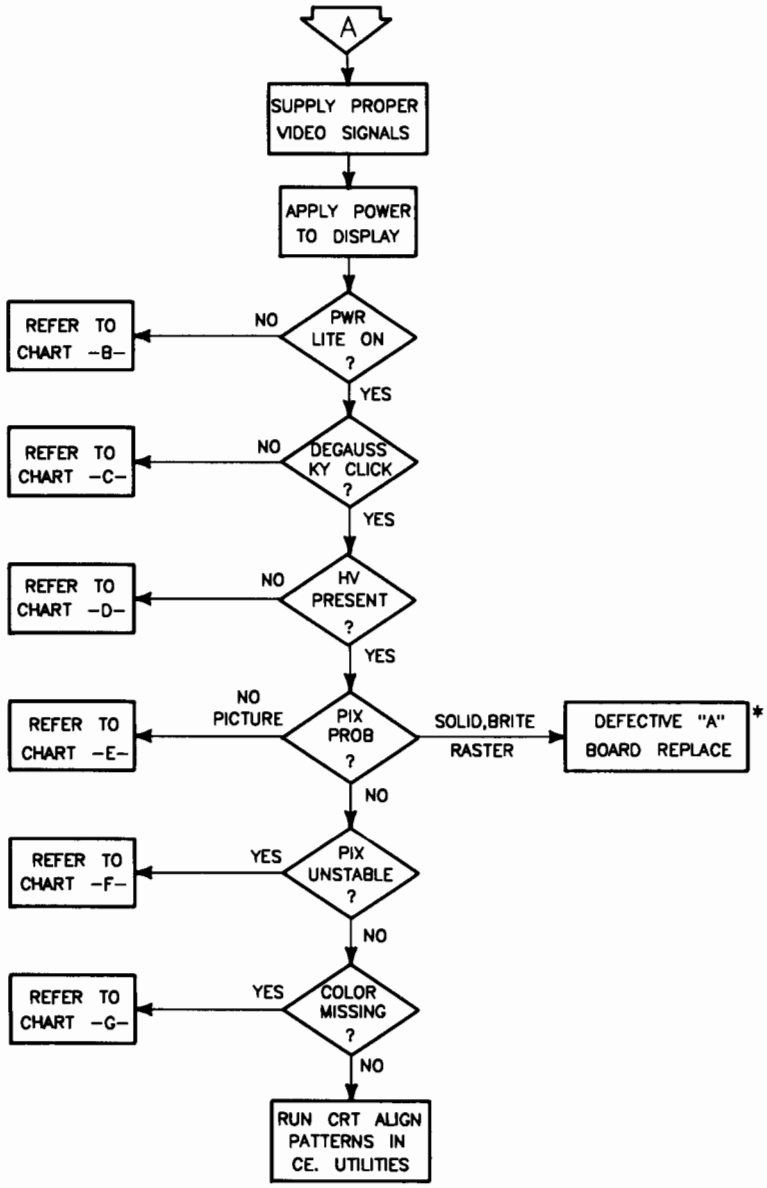


Figure 4-1. Chart A

Chart B

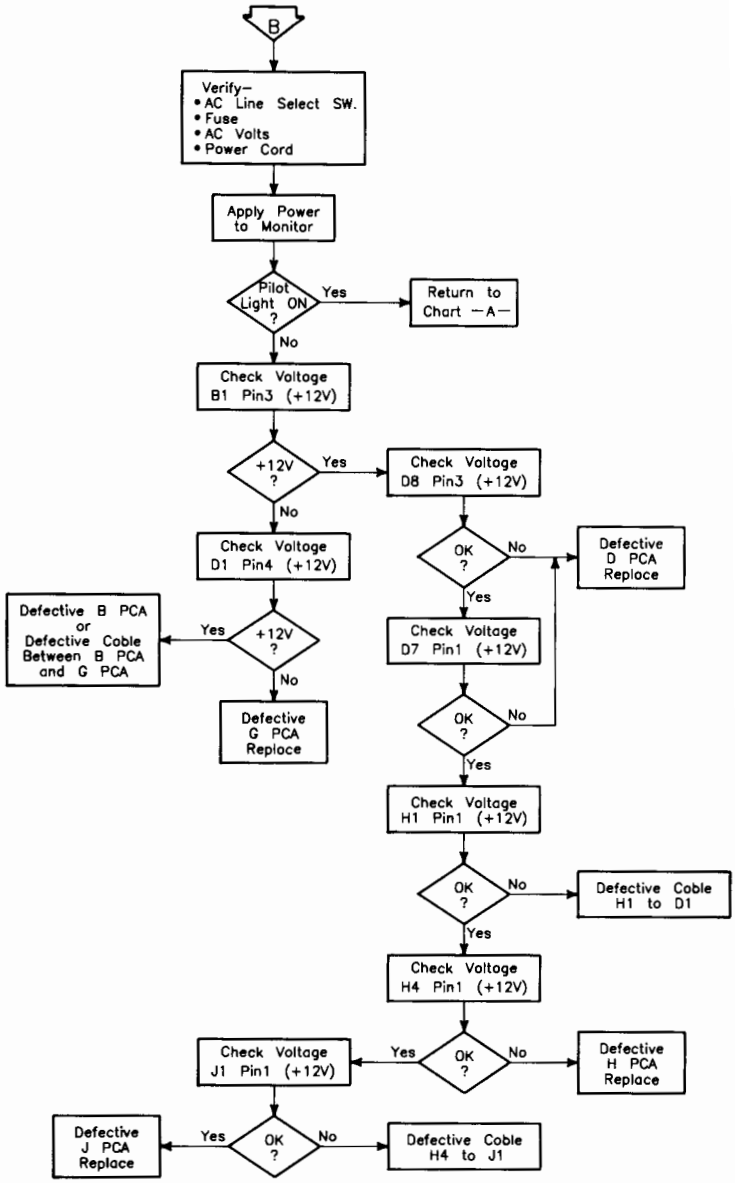


Figure 4-2. Chart B

Chart C

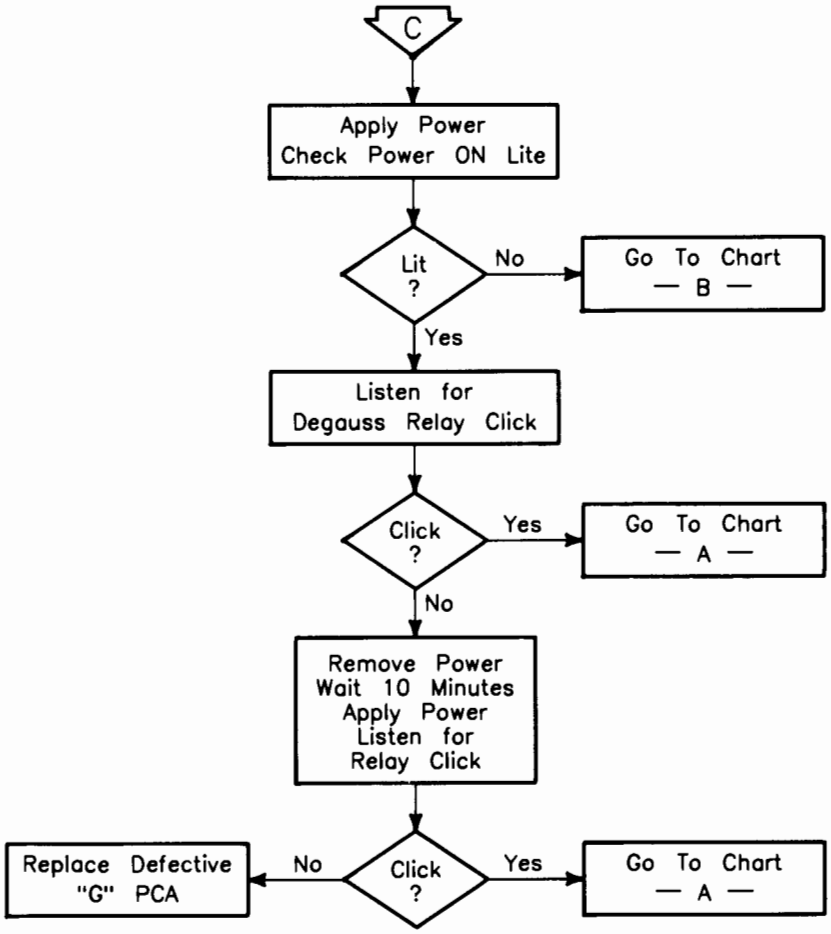


Figure 4-3. Chart C

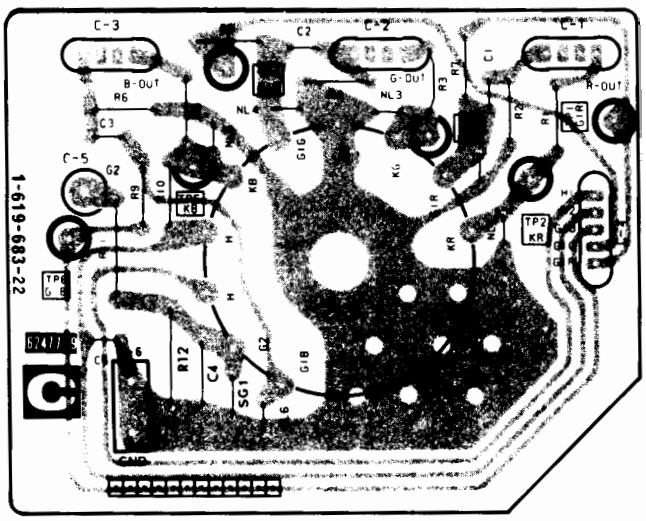


Figure 4-4. CRT Connector

Chart D

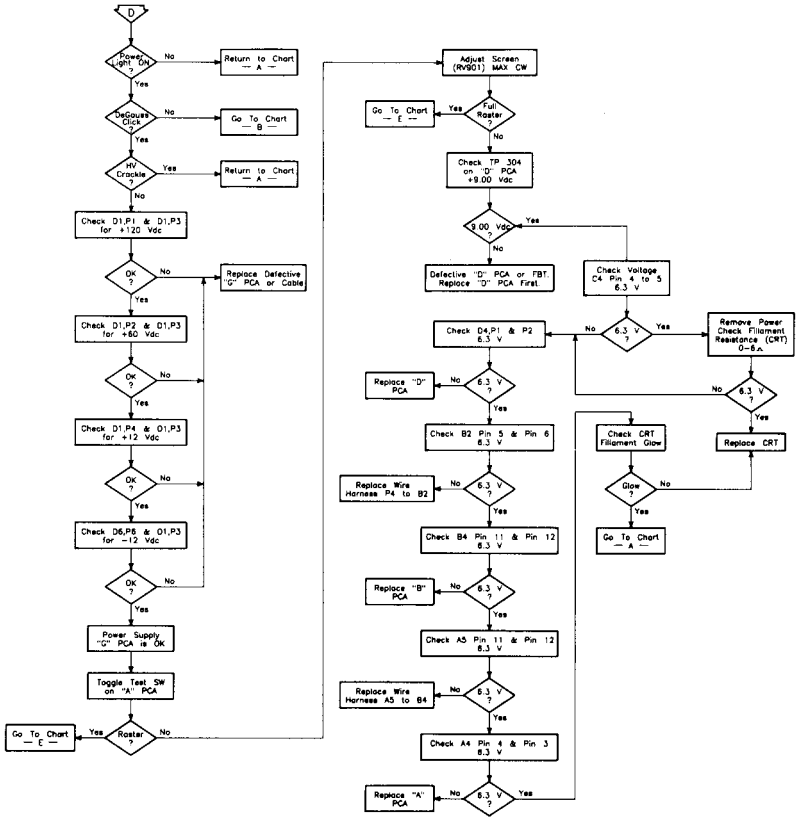


Figure 4-5. Chart D

Chart E

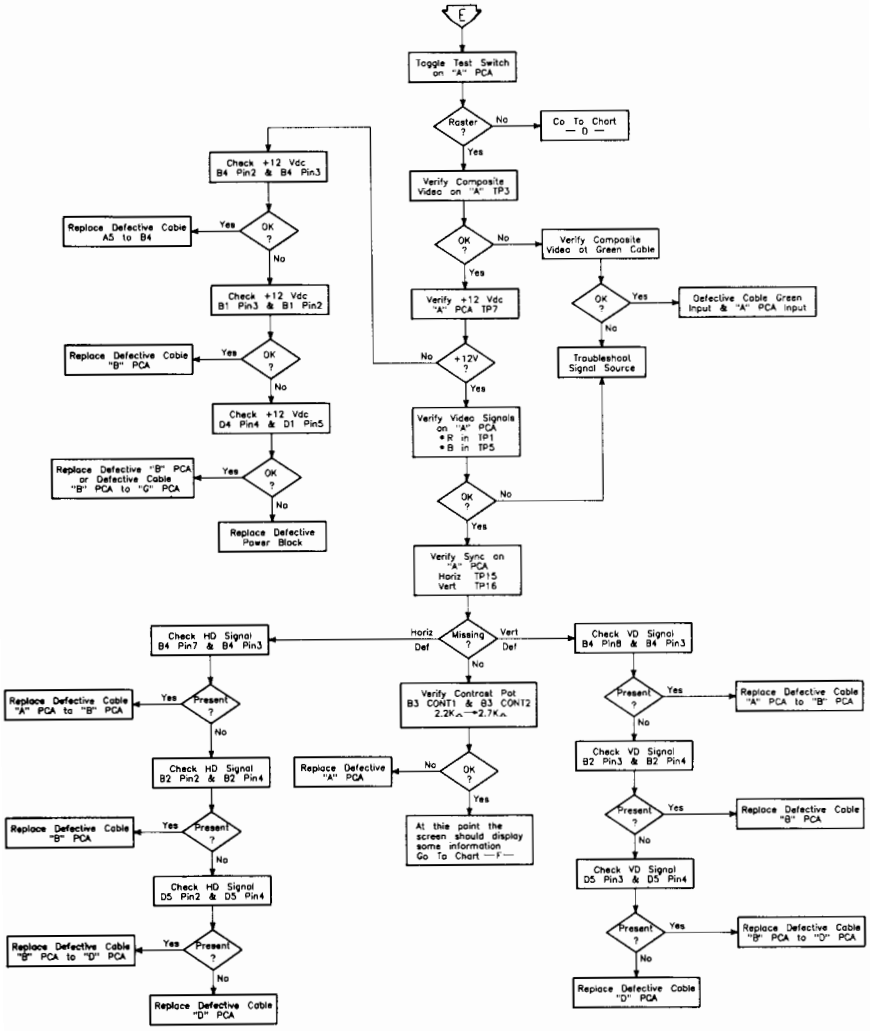


Figure 4-6. Chart E

Chart F

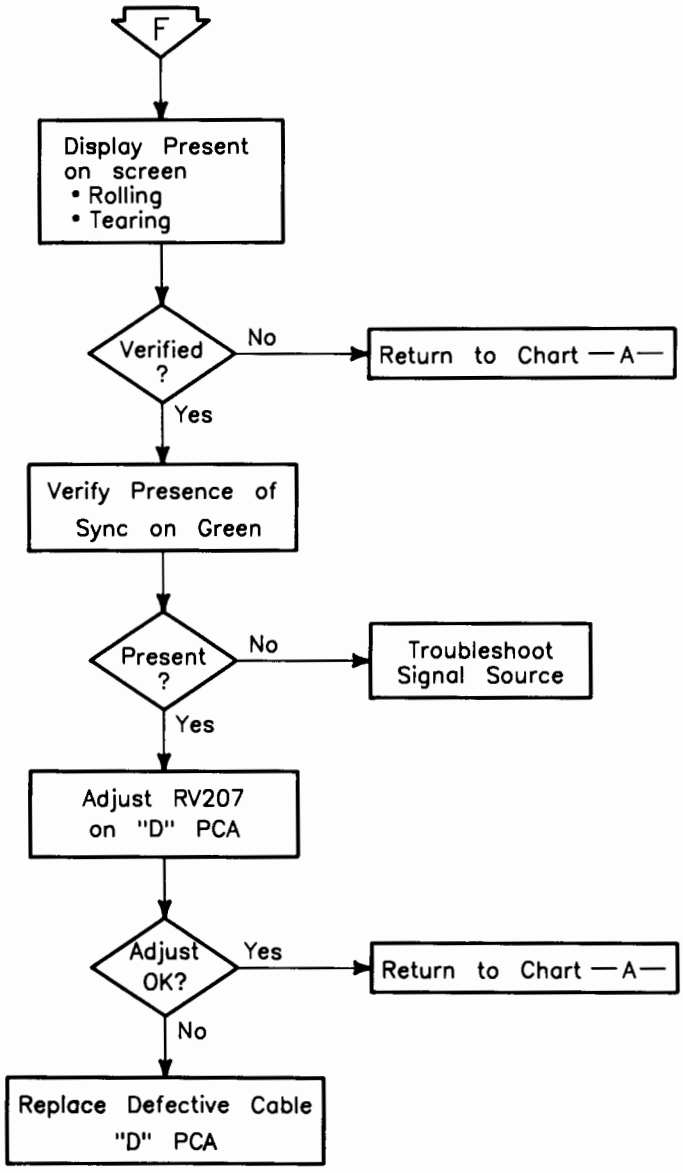


Figure 4-7. Chart F

Connector	Pin +	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

Chart G

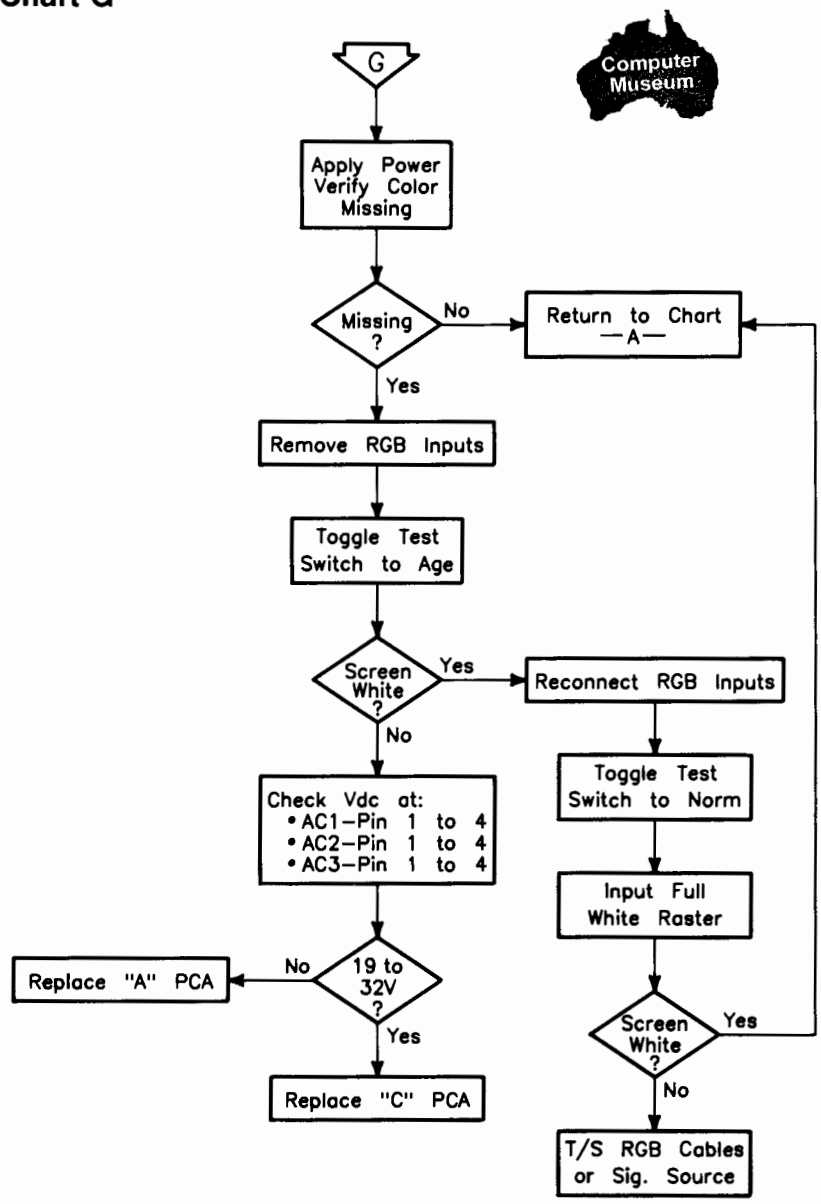


Figure 4-8. Chart G

Diagnostics and Utilities 5

HP 9000 Series 200/300 Test Tools contain methods to produce patterns on the display. Refer to the HP 9000 Series 200/300 Test Tools Manual, part number 09800-90001, for instructions to access and use.

Adjustments 6

Introduction

When you change or replace defective assemblies in the monitor you may have to make some adjustments. This section leads you through procedures, using minimum equipment, to make these adjustments.

Required Tools

Here is a list of 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	HP 9000 Series 200/300 Test Tools: 3.5-inch disc, 09800-12300 5.25-inch disc, 09800-12500

X-RAY WARNING

The high voltage section of this monitor has been factory adjusted 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

Operator Controls

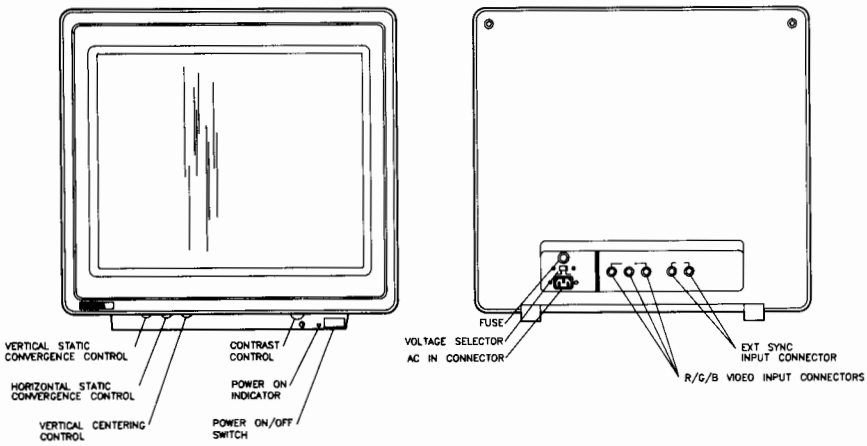


Figure 6-1. Operator Controls

Check that all operator controls operate as they should. Make sure the display is OFF and then install the power cord.

1. Check that the power light, lights when the power switch is switched to ON.
2. Load and run the Test Tools program.
    a. Insert disc into the disc drive.
    b. Turn the system ON.
3. Select the "Graphics Tests".
    a. Refer to the Test Tools Manual, part number 09800-90001, for instructions.
4. 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.

Check that all color guns are operational by removing the RED and BLUE video cables in turn and observing the effect on the display. If the GREEN video cable is removed the display will go dark due to loss of SYNC.

Voltage Checks

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	143.0-147.0 volts	Connector "D-1" Pin 1
+145 V	143 V - 147 V	Connector "D-1" Pin 2
+60.0 V	+56.0 - 62.0V	Connector "D-1" Pin 4
+15V	+14.7 - +15.3 V	Connector "D-1" Pin 6
−15 V	−15.6 - −14.4 V	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 304 if necessary.

White Balance Adjustment

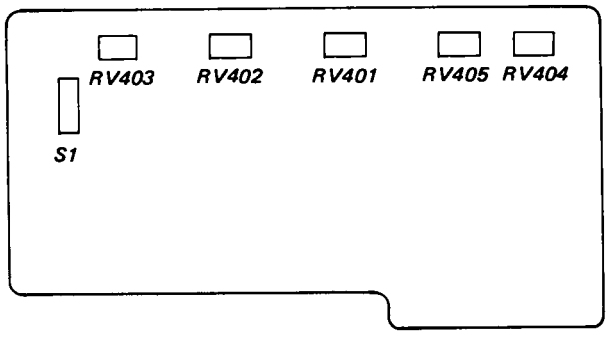


Figure 6-2. "A" Board Adjustment Locations

1. Input a full white signal.
2. Set contrast control to maximum.
3. Set RV-401 through RV-405, on the "A" board, to minimum.
4. Connect the oscilloscope to Test Point TP-2 on the "C" board.
5. Check pedestal level for +40 Vdc ±1.5 Vdc (Figure 6-3).

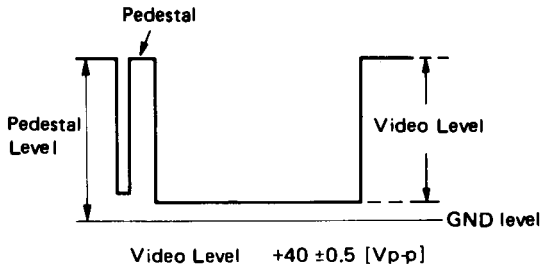


Figure 6-3. Video Signal Levels

6. Adjust RV-401 (R-DRV) on the "A" board for +40 ±0.5 Vp-p video amplitude (Figure 6-3).
7. Connect oscilloscope to TP-1 on "C" board.
8. Check that G1 (Grid 1 in CRT) level is −45 ±2.0 Vdc (Figure 6-3).

9. Input grey scale pattern
10. Adjust RV-901 (SCREEN), located on the fly-back transformer (FBT), so that the background just disappears.
11. Set CONT control to minimum. Adjust RV-404 (G-BKG) and RV-405(B-BKG) on the "A" board for low-level white balance.
12. Set CONT control to maximum. Adjust RV-402 (G-DRV) and RV-403 (B-DRV) on the "A" board for high-level white balance.
13. Repeat steps 10 through step 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 Vp-p (Figure 6-3).
5. Set contrast control to minimum.
6. Check that video amplitude is 13.2_16.0 Vp-p.

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 (Figure 6-4).

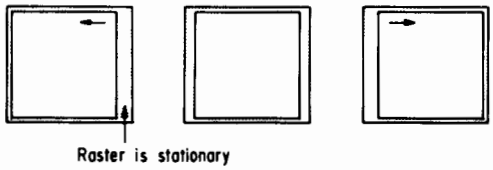


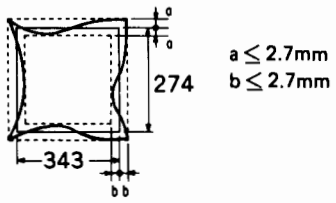
Figure 6-4. Centering the Picture.

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 274mm (10.79 inches) ±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 (Figure 6-5).



Size Standard and Total Geometric Distortion

Figure 6-5. 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 (Figure 6-6).

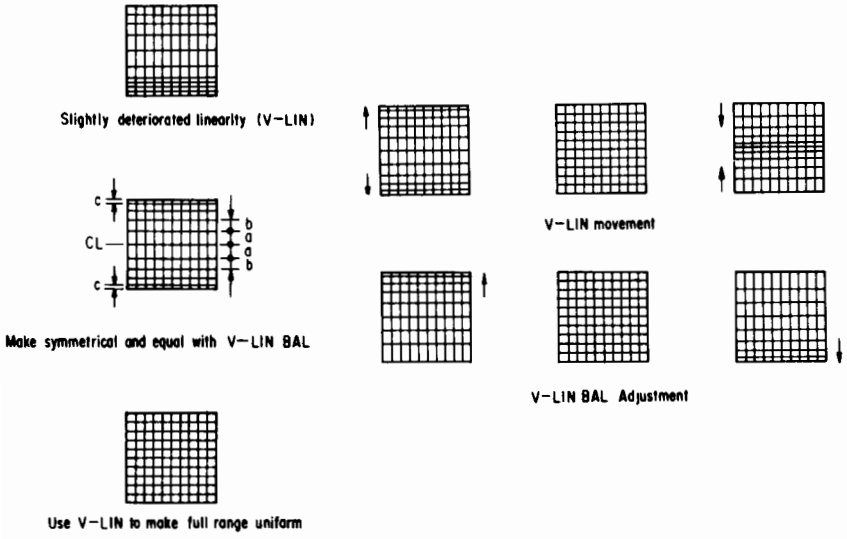


Figure 6-6. Vertical Balance and Linearity

9. Adjust RV-102 (V LIN) to equalize the square dimensions in upper, center, and lower sections of the display.

10. Repeat steps 6 through step 9 until vertical size and linearity are optimized.
11. Adjust RV-208 (H CENT) to center display in the horizontal direction.
12. Adjust RV-204 (H SIZE) for a horizontal size of 343mm (13.5 inches) ±1% at the vertical center of the screen.
13. Adjust RV-202 (KEY BAL), RV-201 (KEY), RV-206 (SIDE PIN BAL), and RV-203 (PIN AMP) to minimize horizontal distortion (Figure 6-7).

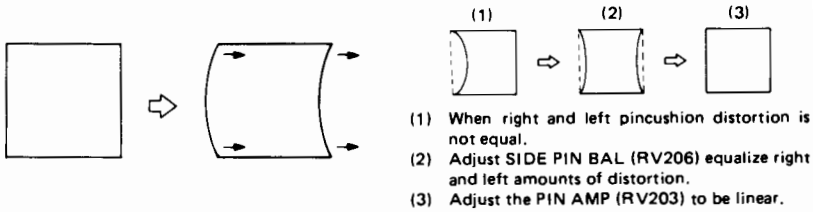


Figure 6-7. Side Distortion

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

Convergence

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, to minimize horizontal misconvergence at vertical center of display.
5. Adjust vertical convergence while watching the horizontal line at the center of the display. Make adjustments on the "L1" board in this order: RV-8, RV-6, RV-10, RV-7, and RV-9.
6. Adjust vertical convergence while watching the horizontal line at top edge of the display. Make adjustments on the "L1" board in this order: RV-3, RV-1, RV-5, RV-2, and RV-4.

7. Adjust vertical convergence while watching the horizontal line at bottom edge of the display. Make adjustments on the "L1" board in this order: RV-13, RV-11, RV-15, RV-12, and RV-14.
8. Adjust horizontal convergence while watching the vertical line at center of the display. Make adjustments on the "L1" board in this order: RV-23, RV-21, RV-25, RV-22, and RV-24.
9. Adjust horizontal convergence while watching the vertical line at left edge of the display. Make adjustments on the "L1" board in this order: RV-18, RV-16, RV-20, RV-17, and RV-19.
10. Adjust horizontal convergence while watching the vertical line at right edge of the display. Make adjustments on the "L1" board in this order: RV-28, RV-26, RV-30, RV-27, and RV-29.
11. Repeat step 4 through step 10 to optimize convergence over entire display.

Focus Final Adjustment

1. Select a white cross-hatch or character pattern (dark background).
2. Set CONT control to about 80% of maximum.
3. Turn the monitor to ON.
4. Adjust FOCUS control for best over-all focus; center and corners.

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 (GDRV) and RV-403 (B DRV) on the "A" board.
7. Repeat step 1 through step 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 four locations shown in Figure 6-8.

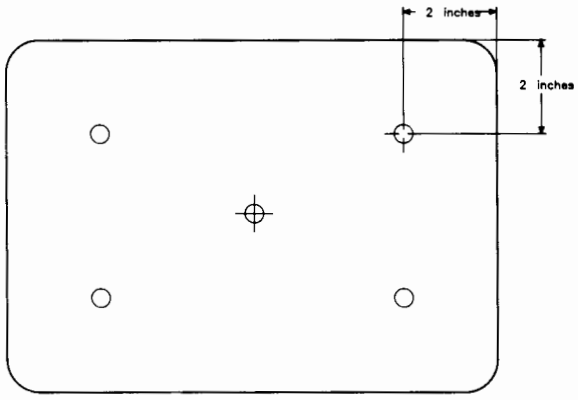


Figure 6-8. Color Coordinate Check Locations

Peripherals 7

Introduction

The HP 98751A and 98752A monitors do not have peripherals.

Replaceable Parts 8

Introduction

This chapter contains lists of replacement parts and exchange assemblies included in the HP 98751A and 98752A Monitors. Parts are available from Corporate Parts Center at this address:

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

Table 8-1. Fuse

Description	HP Part No.
Fuse, 4.0A/125 Vac	A-1499-501-ASON
Fuse, T3.5A/250 Vac	A-1499-502-ASON

Table 8-2. HP 98751A and 98752A Common Parts

Description	HP Part No.
CRT Assembly	A-1020-457-ASON
"A" Video Assembly	A-1296-180-ASON
"B" EMI Filter	A-1130-505-ASON
"C" CRT Connector	A-1330-736-ASON
"H,J" Control Panel	A-1477-601-ASON
"K" Hi Voltage Block	A-1465-158-ASON
"M" External Sync Assembly	A-1301-758-ASON
"L1" Convergence Controls	A-1233-065-ASON
Rear Cabinet	X-4367-039-ASON
Internal Video Cable	A-1499-495-ASON
Main Wiring Harness	1-937-754-11SON
Cable Assembly	A-1499-522-ASON
Potentiometer Alignment Tool	4-381-826-01
Cable Clamps	A-1499-499-ASON
Misc. Screws	A-1499-500-ASON

Table 8-3. HP 98751A Parts

Description	HP Part No.
"D" Deflection Assembly	A-1345-703-ASON
"L" Convergence Assembly	A-1235-014-ASON
"G" Switching Regulator	A-1477-484-ASON
Bezel	X-4367-040-2SON

Table 8-4. HP 98752A Parts

Description	HP Part No.
"D" Deflection Assembly	A-1345-641-ASON
"L" Convergence Assembly	A-1235-009-ASON
"G" Switching Regulator	A-1477-275-ASON
Bezel	X-4367-040-1SON

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.

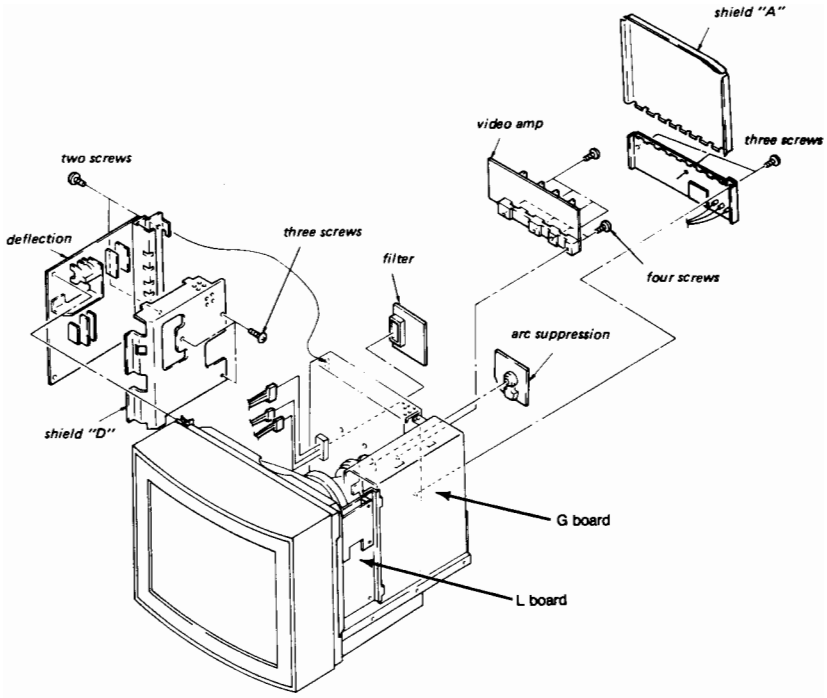


Figure 8-1. Assembly location

Tools Needed

- 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.

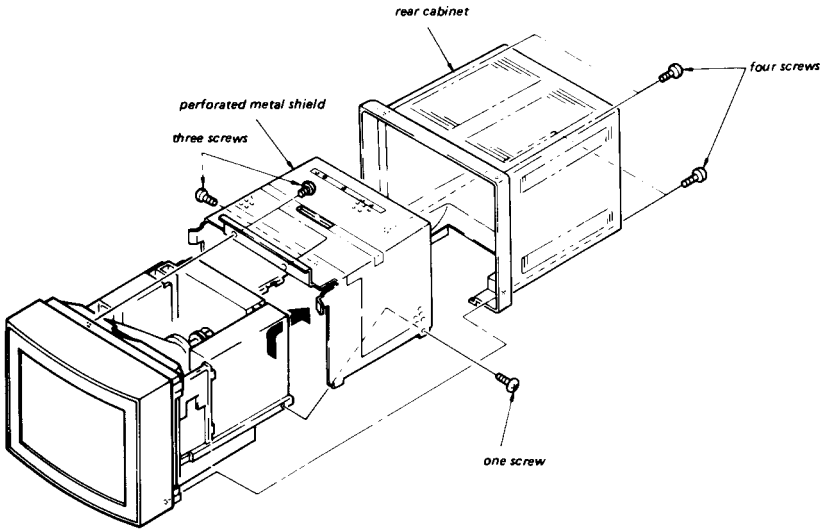


Figure 8-2. Cabinet Cover Removal

"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" EMI Filter assembly, refer to Figures 8-1 and 8-2.

"C" CRT Connector Assembly Removal

To remove the "C" assembly, refer to Figures 8-1 and 8-2.

"D" Deflection Assembly Removal

To remove the "D" assembly, refer to Figures 8-1 and 8-3.

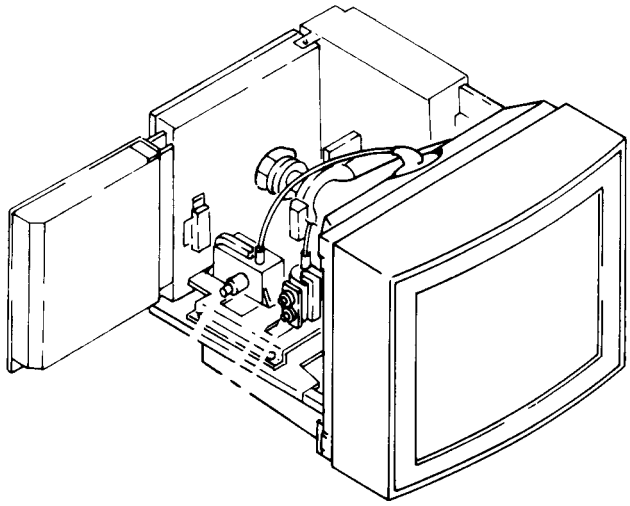


Figure 8-3. "D" Deflection Assembly Location and Removal

"G" Switching Regulator Removal

To remove the "G" assembly, refer to Figures 8-1 and 8-4.

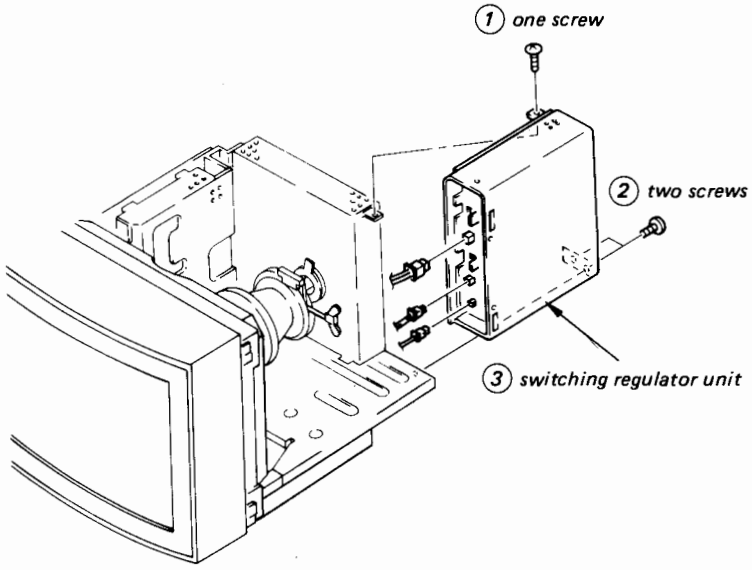


Figure 8-4. "G" Assembly Location and Removal

"L" Convergence Assembly Removal

To remove the "L" assembly, refer to Figures 8-1 and 8-5.

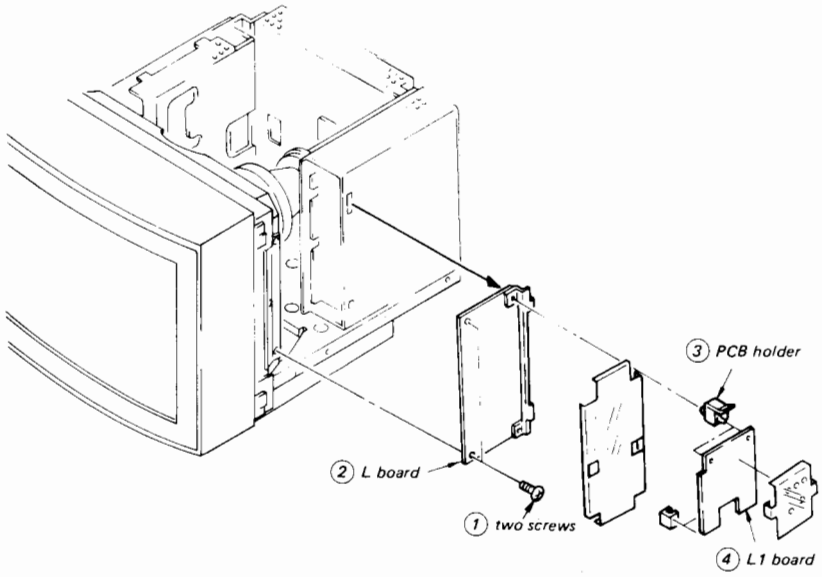


Figure 8-5. "L" Assembly Location and Removal

"M" External Sync Assembly Removal

To remove the "M" board, refer to Figures 8-1 and 8-2.

High Voltage Block Removal

To remove the H.V. block, refer to Figures 8-6 and 8-7.

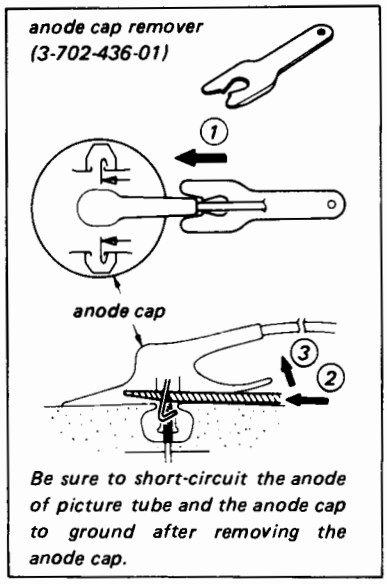


Figure 8-6. Anode Connector Removal

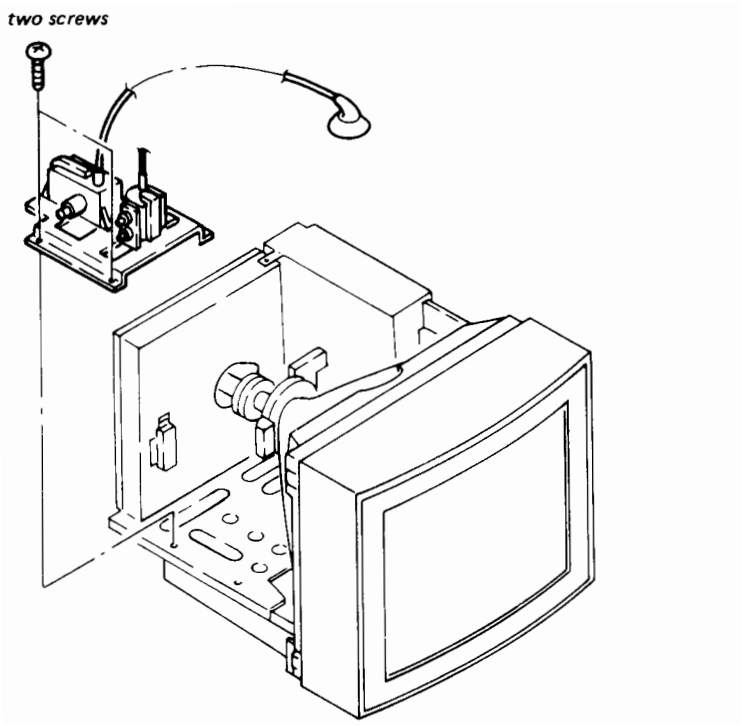


Figure 8-7. High Voltage Block Removal

Bezel Removal

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

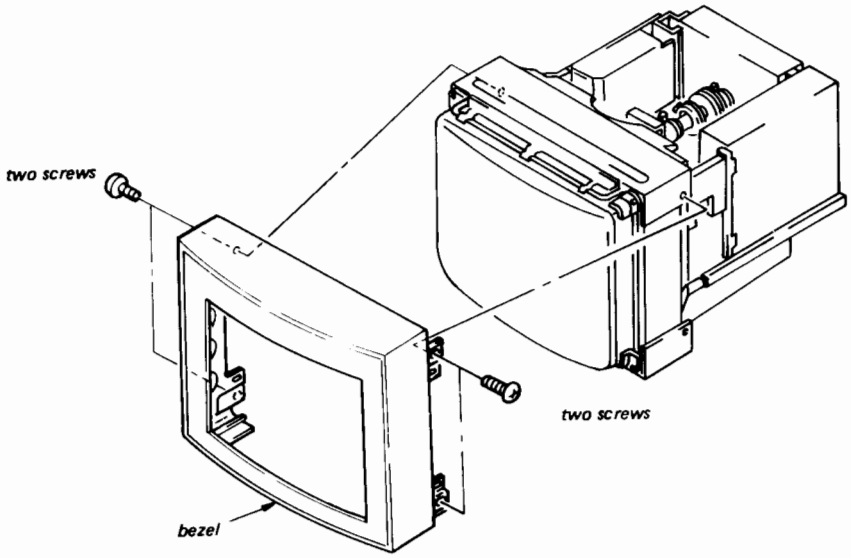


Figure 8-8. Bezel Removal

"H and J" Control Panel Removal

To remove the control panel, refer to Figures 8-1 and 8-9.

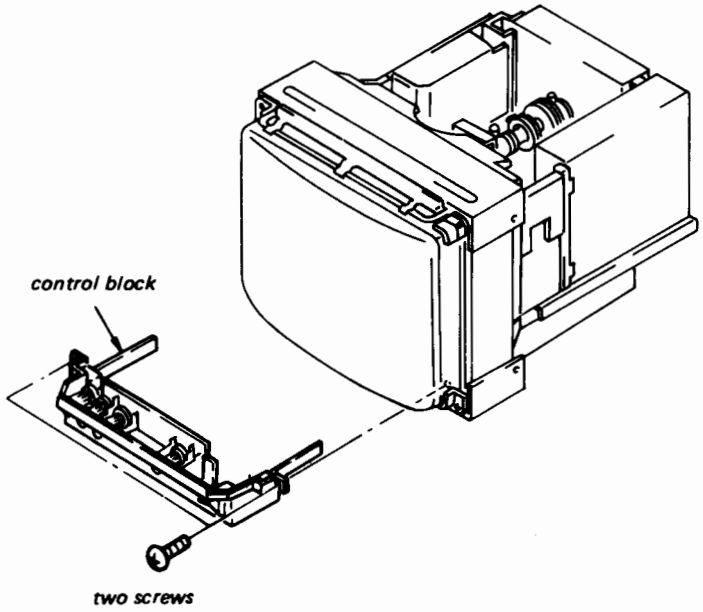


Figure 8-9. Control Panel Removal

CRT Assembly Removal

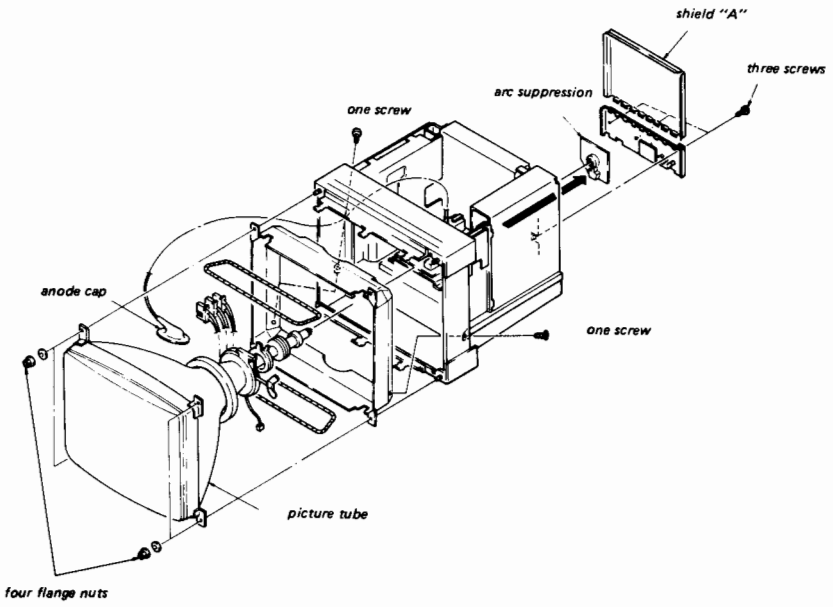


Figure 8-10. CRT/Yoke Assembly Removal.

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.

To remove the CRT, refer to Figures 8-10 and 8-11.

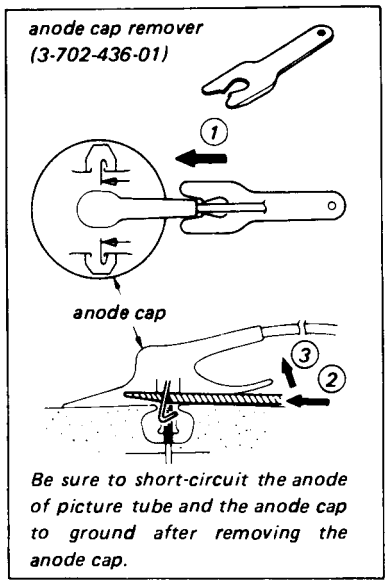


Figure 8-11. Anode Connector Removal

CAUTION

The front surface of the CRT is a transmission filter and is very soft. Do not set known good CRTs face down on any surface. Never set a new or exchange CRT on its face.

WARNING

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

After the new or replacement CRT is installed, its container is a good place for the old CRT. Do not attempt to break the old CRT. Check with local authorities and dispose of it properly.

Diagrams 9

Introduction

This section contains helpful diagrams such as troubleshooting flowcharts.

Chart A

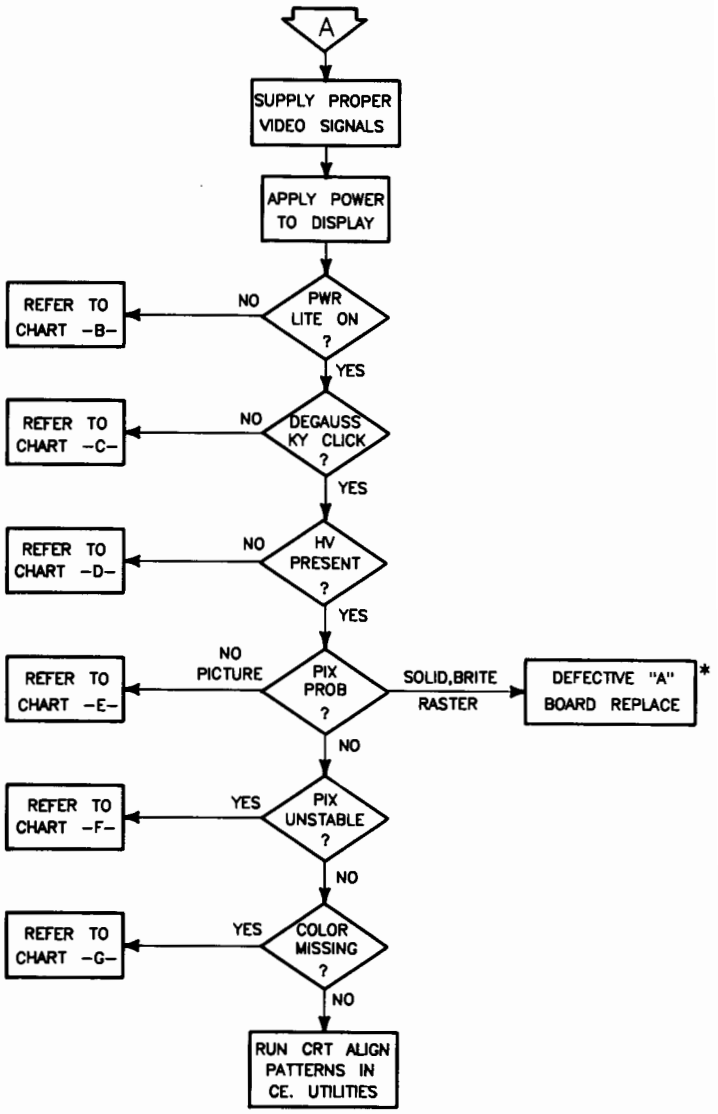

A
SUPPLY PROPER VIDEO SIGNALS
APPLY POWER TO DISPLAY
PWR LITE ON ?
NO
REFER TO CHART -B-
YES
DEGAUSS KY CLICK ?
NO
REFER TO CHART -C-
YES
HV PRESENT ?
NO
REFER TO CHART -D-
YES
PIX PROB ?
NO PICTURE
REFER TO CHART -E-
SOLID, BRITE RASTER
DEFECTIVE "A" BOARD REPLACE *
NO
PIX UNSTABLE ?
YES
REFER TO CHART -F-
NO
COLOR MISSING ?
YES
REFER TO CHART -G-
NO
RUN CRT ALIGN PATTERNS IN CE. UTILITIES

Chart B

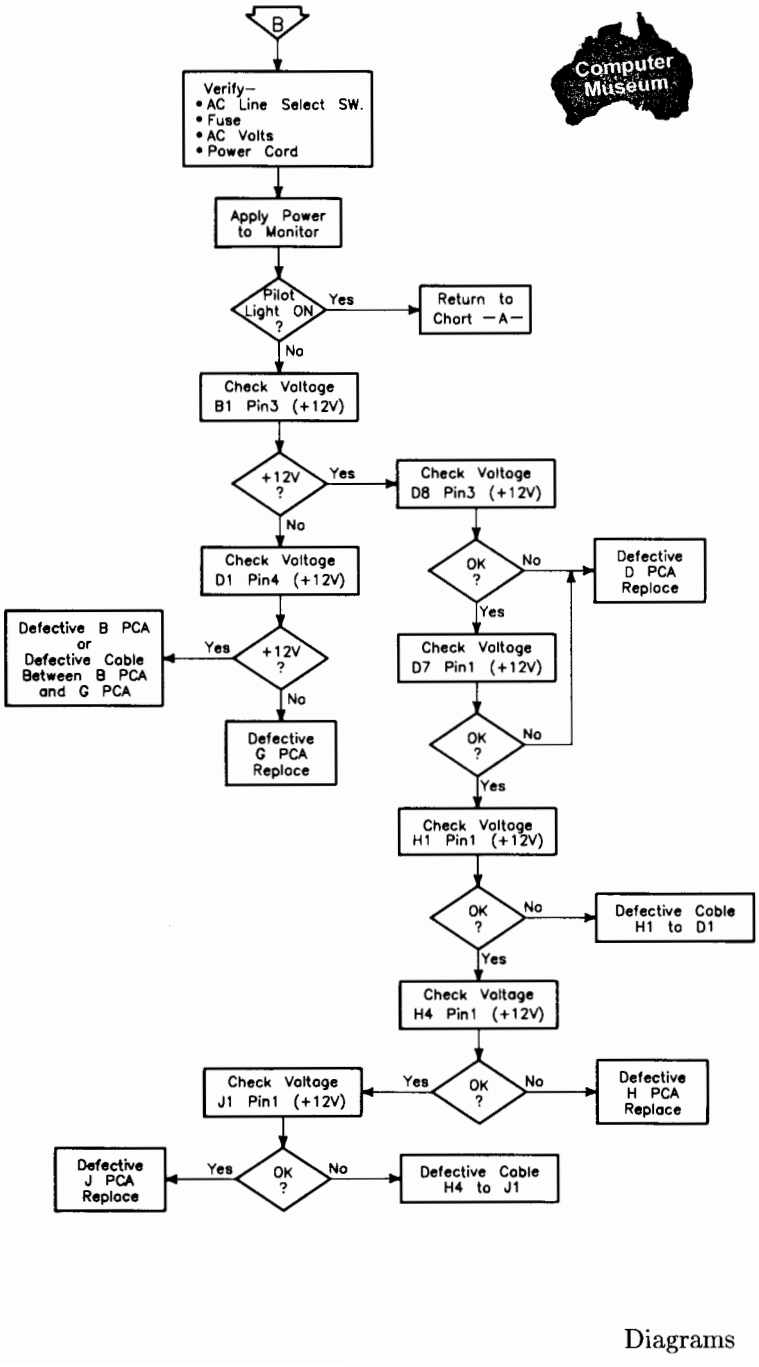


Chart C

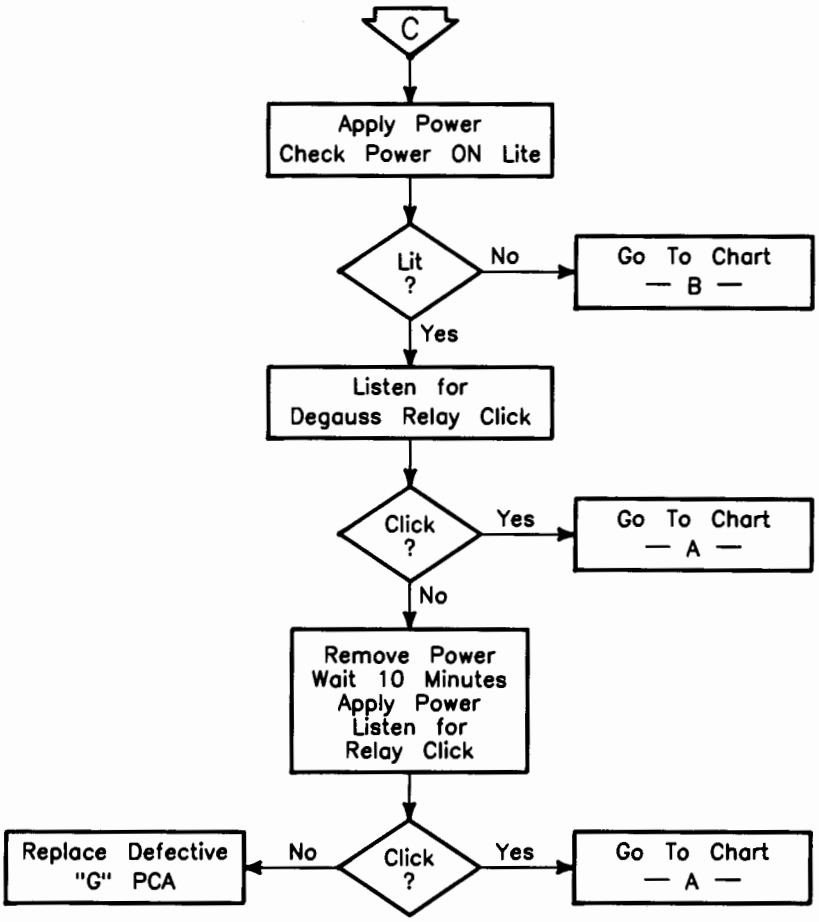

C
Apply Power
Check Power ON Lite
Lit
?
No
Go To Chart
— B —
Yes
Listen for
Degauss Relay Click
Click
?
Yes
Go To Chart
— A —
No
Remove Power
Wait 10 Minutes
Apply Power
Listen for
Relay Click
Replace Defective
"G" PCA
No
Click
?
Yes
Go To Chart
— A —

Chart D

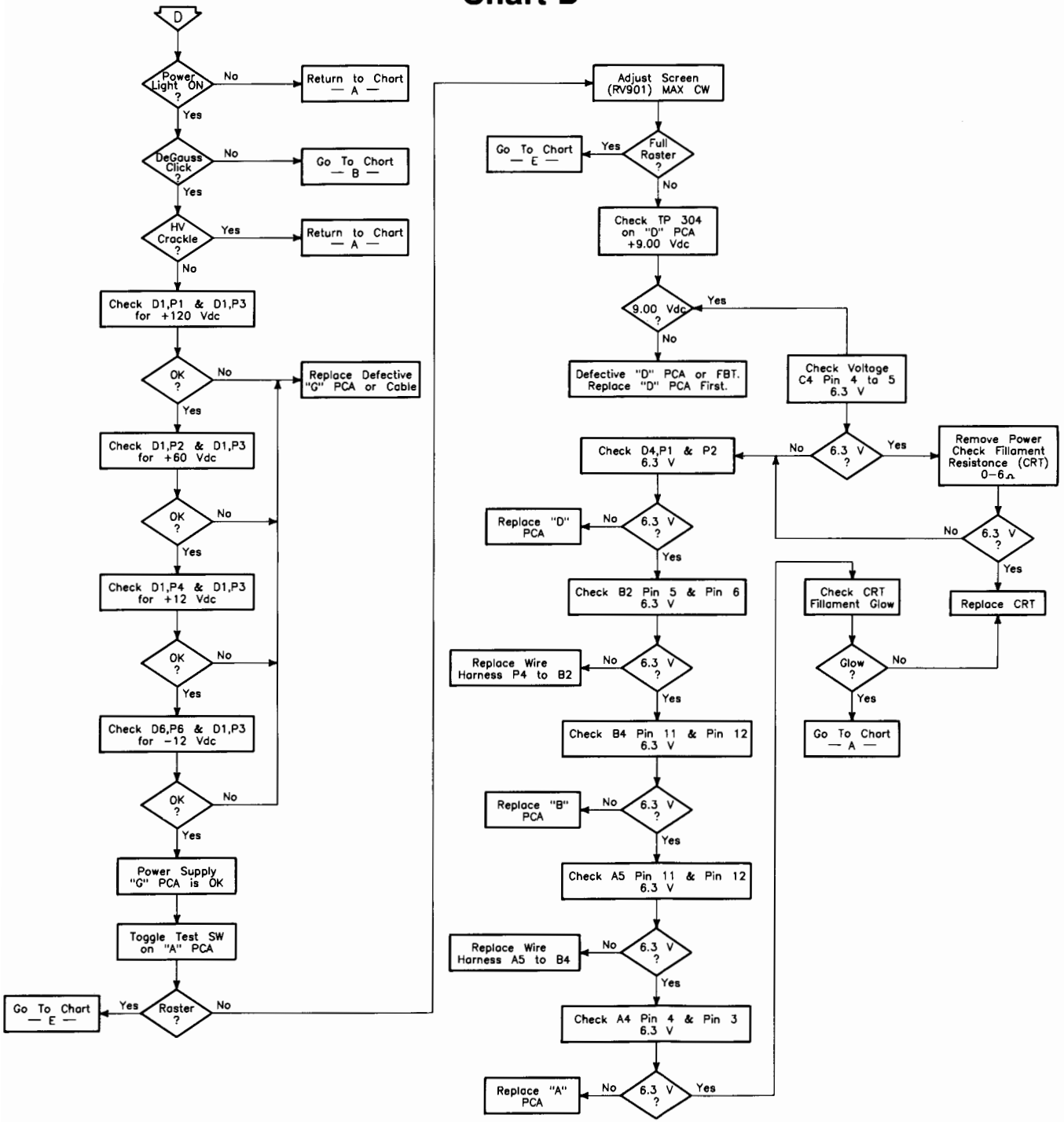

D
Power Light ON ?
No
Return to Chart — A —
Yes
DeGauss Click ?
No
Go To Chart — B —
Yes
HV Crackle ?
Yes
Return to Chart — A —
No
Check D1,P1 & D1,P3 for +120 Vdc
OK ?
No
Replace Defective "G" PCA or Cable
Yes
Check D1,P2 & D1,P3 for +60 Vdc
OK ?
No
Yes
Check D1,P4 & D1,P3 for +12 Vdc
OK ?
No
Yes
Check D6,P6 & D1,P3 for −12 Vdc
OK ?
No
Yes
Power Supply "G" PCA is OK
Toggle Test SW on "A" PCA
Go To Chart — E —
Yes
Raster ?
No
Adjust Screen (RV901) MAX CW
Go To Chart — E —
Yes
Full Raster ?
No
Check TP 304 on "D" PCA +9.00 Vdc
9.00 Vdc ?
Yes
No
Defective "D" PCA or FBT. Replace "D" PCA First.
Check Voltage C4 Pin 4 to 5 6.3 V
6.3 V ?
No
Yes
Remove Power Check Filament Resistance (CRT) 0−6Ω
Check D4,P1 & P2 6.3 V
Replace "D" PCA
No
6.3 V ?
Yes
No
6.3 V ?
Yes
Replace CRT
Check B2 Pin 5 & Pin 6 6.3 V
Check CRT Fillament Glow
Replace Wire Harness P4 to B2
No
6.3 V ?
Yes
Glow ?
No
Yes
Go To Chart — A —
Check B4 Pin 11 & Pin 12 6.3 V
Replace "B" PCA
No
6.3 V ?
Yes
Check A5 Pin 11 & Pin 12 6.3 V
Replace Wire Harness A5 to B4
No
6.3 V ?
Yes
Check A4 Pin 4 & Pin 3 6.3 V
Replace "A" PCA
No
6.3 V ?
Yes

Chart E

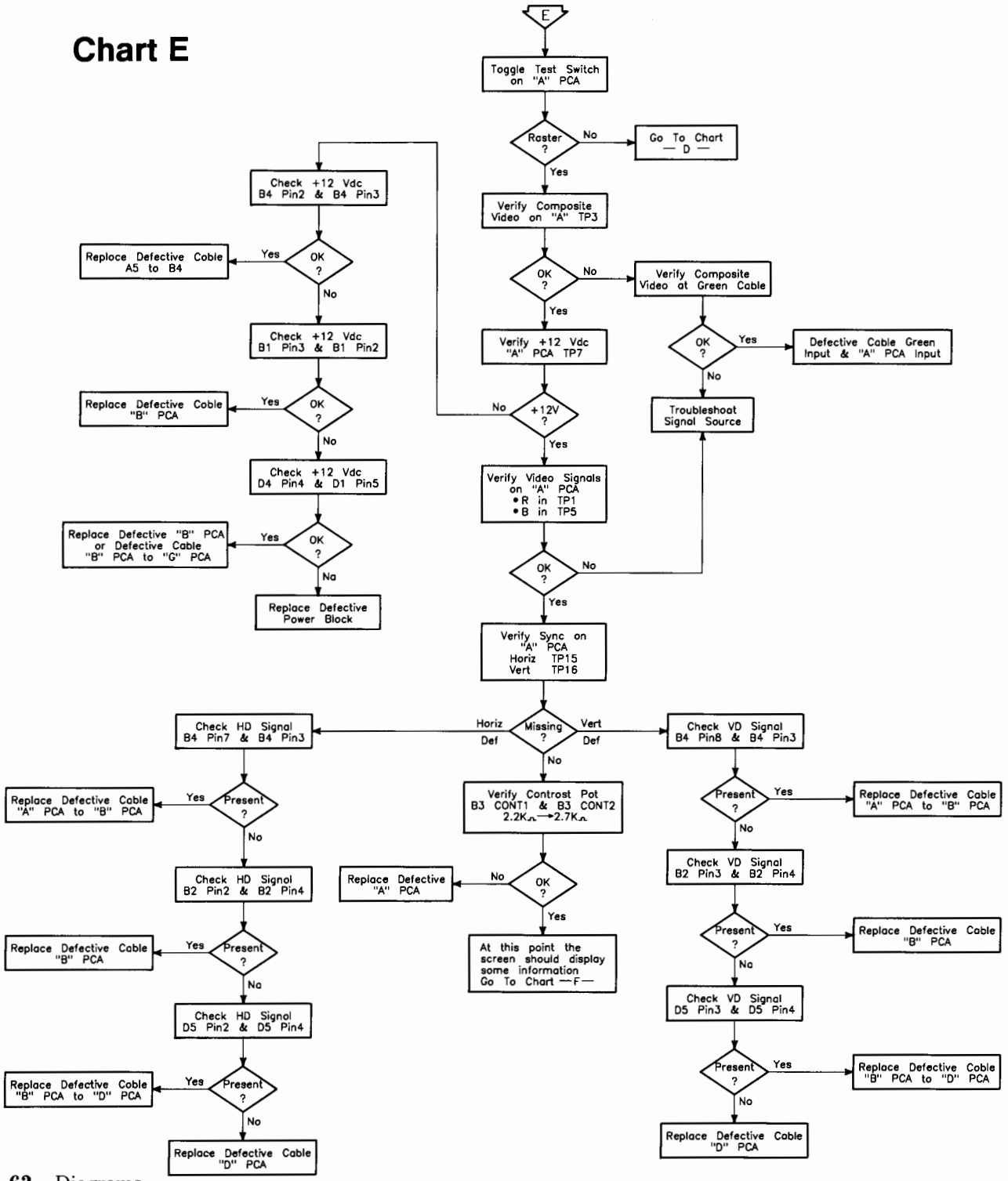

E
Toggle Test Switch on "A" PCA
Raster ?
No
Go To Chart — D —
Yes
Verify Composite Video on "A" TP3
OK ?
No
Verify Composite Video at Green Cable
Yes
Verify +12 Vdc "A" PCA TP7
OK ?
Yes
Defective Cable Green Input & "A" PCA Input
No
Troubleshoot Signal Source
+12V ?
No
Yes
Verify Video Signals on "A" PCA
• R in TP1
• B in TP5
OK ?
No
Yes
Verify Sync on "A" PCA
Horiz TP15
Vert TP16
Missing ?
Horiz Def
Vert Def
No
Check +12 Vdc B4 Pin2 & B4 Pin3
Reploce Defective Coble A5 to B4
OK ?
Yes
No
Check +12 Vdc B1 Pin3 & B1 Pin2
Replace Defective Coble "B" PCA
OK ?
Yes
No
Check +12 Vdc D4 Pin4 & D1 Pin5
Replace Defective "B" PCA or Defective Cable "B" PCA to "G" PCA
OK ?
Yes
No
Replace Defective Power Block
Check HD Signal B4 Pin7 & B4 Pin3
Replace Defective Cable "A" PCA to "B" PCA
Present ?
Yes
No
Check HD Signal B2 Pin2 & B2 Pin4
Replace Defective Cable "B" PCA
Present ?
Yes
No
Check HD Signal D5 Pin2 & D5 Pin4
Replace Defective Coble "B" PCA to "D" PCA
Present ?
Yes
No
Replace Defective Cable "D" PCA
Verify Controst Pot B3 CONT1 & B3 CONT2 2.2KΩ→2.7KΩ
Replace Defective "A" PCA
OK ?
No
Yes
At this point the screen should display some information Go To Chart — F —
Check VD Signal B4 Pin8 & B4 Pin3
Present ?
Yes
Replace Defective Cable "A" PCA to "B" PCA
No
Check VD Signal B2 Pin3 & B2 Pin4
Present ?
Yes
Replace Defective Cable "B" PCA
No
Check VD Signal D5 Pin3 & D5 Pin4
Present ?
Yes
Replace Defective Coble "B" PCA to "D" PCA
No
Replace Defective Cable "D" PCA

Chart F

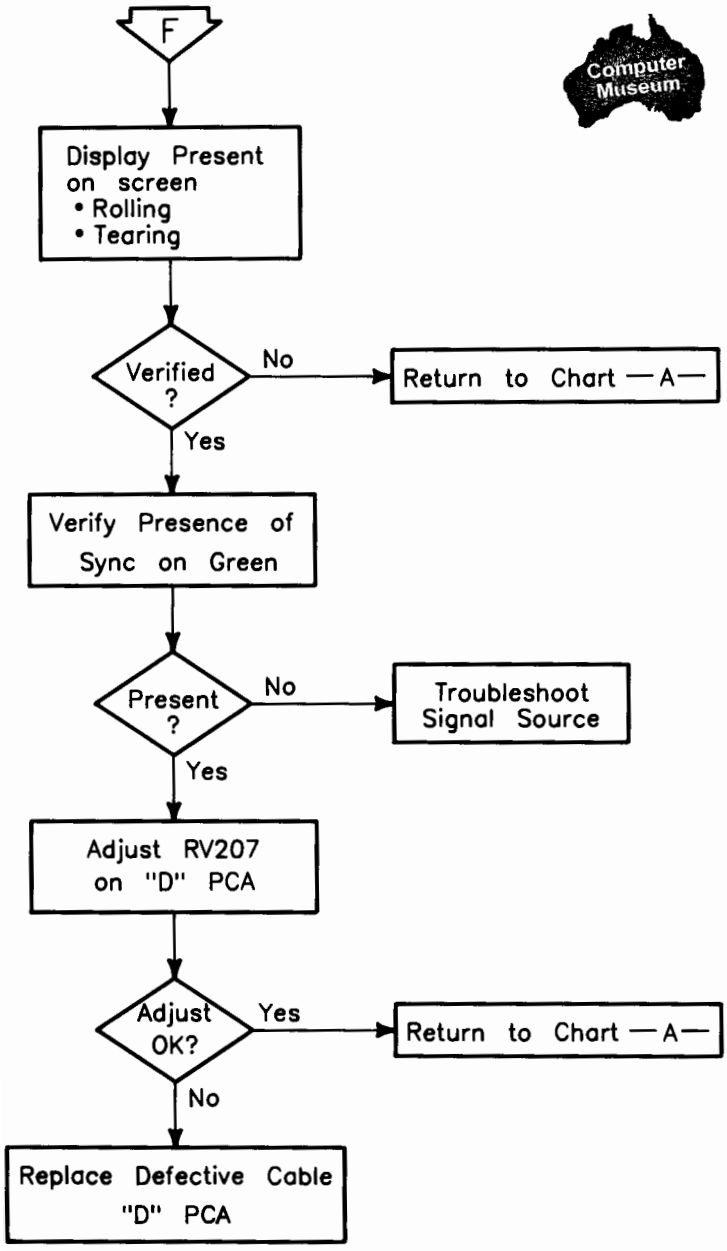
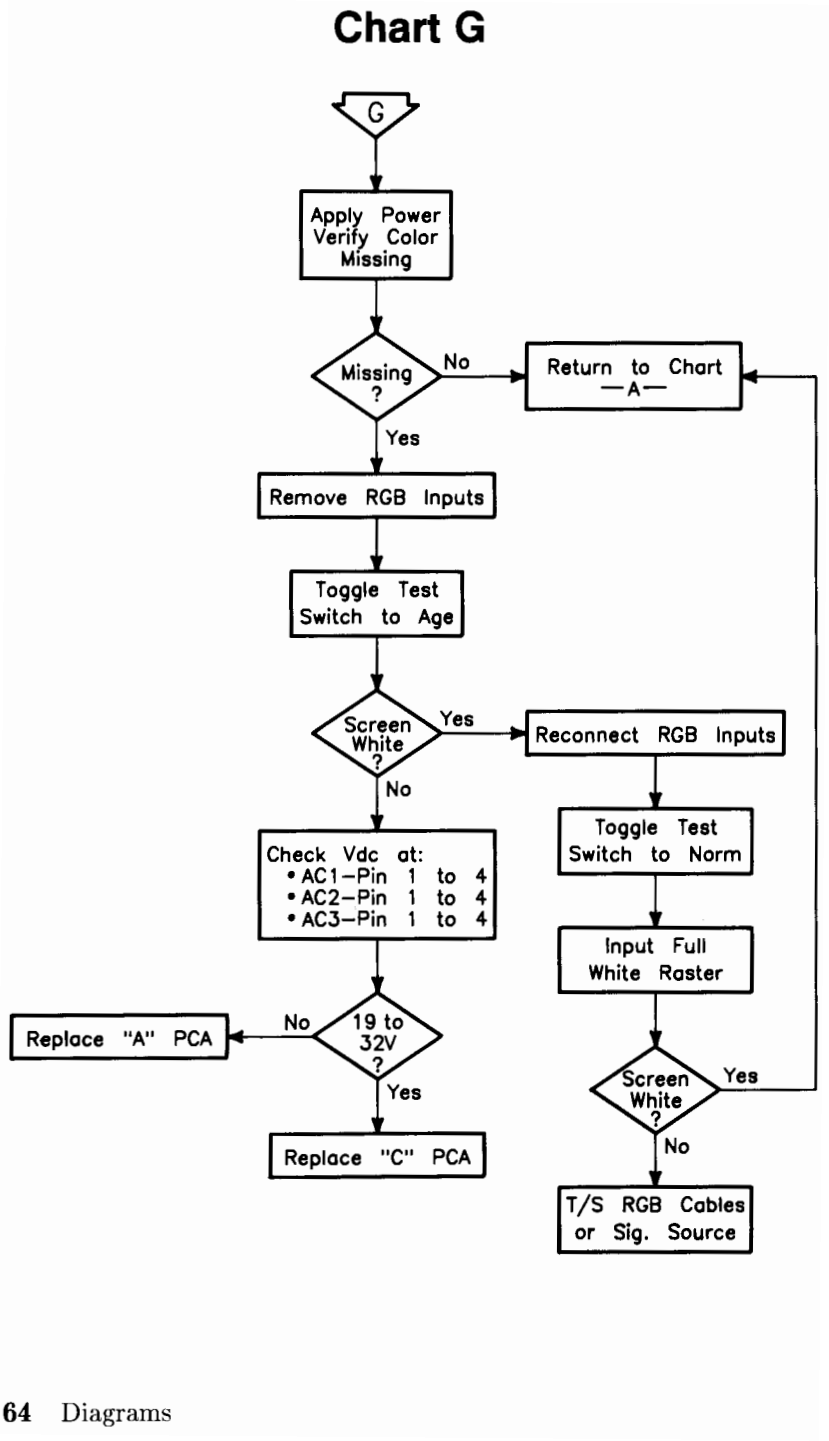


Chart G


G
Apply Power Verify Color Missing
Missing ?
No
Return to Chart —A—
Yes
Remove RGB Inputs
Toggle Test Switch to Age
Screen White ?
Yes
Reconnect RGB Inputs
No
Toggle Test Switch to Norm
Check Vdc at:
• AC1—Pin 1 to 4
• AC2—Pin 1 to 4
• AC3—Pin 1 to 4
Input Full White Raster
19 to 32V ?
No
Replace "A" PCA
Screen White ?
Yes
Yes
Replace "C" PCA
No
T/S RGB Cables or Sig. Source

Reference 10

Introduction

This section provides space to put reference information and other notes you may wish to include.

Service Notes 11

Introduction

This section is provided for you to include Service Notes as you receive them.