C1600/C1625

HP SERIES 7600

MODELS 240D/E and 250/255 ELECTROSTATIC PLOTTERS

C1643-90010

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SECTION I

PRODUCT INFORMATION

1-1. PRODUCT DESCRIPTION

1-2. The Hewlett-Packard 7600 Model 240D/E and Model 250/255 Electrostatic Plotters are are high speed black and white electrostatic plotters capable of producing ANSI D (24 in.) and E (36 in.) width plots up to 15.3 m (50 ft.) in length. The plotters receive computer generated vector data through one of three standard interface ports, convert the data to raster format, and produce a hard copy picture of the data on the media.

1-3. The plotters receive the graphics data in vector format (Hewlett-Packard Graphics Language) from the host computer. The vector image is stored on a 40 megabyte internal disk until the the image is ready to print. At this time an internal vector-to-raster converter (VRC) changes the data to raster format. The raster image is transferred to the media by a writing head which consists of a series of electrodes. As the media is moved across the head, the electrodes transfer a charge to the media. The media is next moved across a reservoir of liquid toner. The toner particles are electrostatically attracted to the charged areas of the media while the liquid is drawn away by the plotter vacuum system. The vacuum system dries and fixes the image on the media, eliminating the need for a heater system to fuse the toner.

1-4. Models 240D and 240E have a manually operated front panel. Model 250 and Model 255 have a processor controlled front panel that includes a liquid crystal display (LCD) for set-up, plot management, and diagnostics. An on-line HELP menu is also included. The display may be programmed for English, French, or German, with panel overlays to define the panel buttons in each language.

1-5. Standard features of the the Model 250/255 plotters include an automatic single-axis cutter and built-in take-up reel. The automatic cutter will cut and stack plots as they are produced. The take-up reel is designed to handle a full roll of media. These features may be selected and enabled through the front-panel menu. Models 240D and 240E have a manual cutter, and may have an HP Model C1621A or HP Model 1622A take-up reel installed.

1-6. The plotters are equipped with three types of interface: RS-232-C/CCITT V.24 serial, IEEE-488 (HP-IB) 8-bit parallel bidirectional, and a Centronics 8-bit parallel interface. Each interface can be selected and configured from the plotter front panel on Models 250/255. On the Model 240D/E, the interface is selected and configured using switches on the VRC. These switches are also used to establish whether the plotter is a D-size (A1) or an E-size (A0) plotter.

1-7. In addition to this manual, other publications which apply to the HP 7600 electrostatic plotters are listed in Table 1-1.

Table 1-1. Other HP 7600 Publications

PUBLICATION	HP PART NUMBER
Models 240D & 240E	
Hardware Support Manual	C1600-90000
Programmer's Reference	C1600-90001
User's Guide	C1600-90002
Models 250/255	
Hardware Support Manual	*C1625-90003
Programmer's Reference	C1625-90001
User's Guide	C1625-90002

*NOTE: When you order using C1625-90003, you will receive both the 240D/E manual and the 250/255 appendix.

1-8. OPTIONS

1-9. There are no options for the electrostatic plotters, but Models 240D & 240E may have an installed take-up reel (HP Model C1621A or HP Model 1622A). Hardware support documentation for the HP Model C1621A/C1622A take-up reel can be ordered using part number C1621-90000.

1-10. PERFORMANCE SPECIFICATIONS

1-11. Table 1-2 lists the specifications for the HP 7600 plotters. These specifications include the performance standards against which the plotters are tested. Table 1-3 lists the general characteristics of the plotter which are included as additional information for the user. Physical specifications and environmental limits are given in Section 2 of this manual.

Table 1-2. Specifications

MAXIMUM ACCUMULATED ERROR: 0.2% RESOLUTION: Absolute: Horizontal: 16 dots/mm (406 dots/in.) Vertical: 16 dots/mm (406 dots/in.) Addressable 0.025 mm (0.00098 in.) ENVIRONMENTAL: HP Class C Normal Office
NOTE: Specifications apply only when using HP supplies.

Table 1-3. General Characteristics

PIN ELECTRODE:
- Diameter:
  - 0.0060 cm (0.0024 in.)
- Spacing:
  - 0.00625 cm (0.0025 in.)
- Per unit area:
  - 25 600 cm^2 (164 836/ in^2)

ELECTRODE VOLTAGE:
- Pin: −250 V ± 10 V fixed
- Control: +273 ± 15 V to +330 ± 10 V variable

POWER REQUIREMENTS:
- Source: 100, 120, 220, or 240 Vac ± 10%
- Frequency: 47 to 53 and 57 to 63 Hz
- Consumption: @ 120 V 390 W
  @ 220 V 440 W

WRITING HEAD:
- D/A1: 9600 electrodes (NA Model 355)
- E/A0: 14 336 electrodes

LINE WIDTH:
- Default: 3.2 mm (0.125 in.) 5 dots
- Range: 0.635 mm (0.025 in.) to 10.8 mm (0.428 in.)
- (1 to 17 dots in width for odd numbers only)

MEDIA WIDTH:
- D/A1: 609.0 mm ± 2.0 mm (NA Model 355) (24.0 ± 0.1 in.)
- E/A0: 914.0 mm ± 2.0 mm (36 ± 0.1 in.)

PLOT WIDTH:
- D/A1: 600.0 mm ± 2.4 mm (NA Model 355) (23.6 ± 0.1 in.)
- E/A0: 896.0 mm ± 3.6 mm (monochrome) (35.3 ± 0.1 in.)
  864.0 mm ± 3.6 mm) (color) (Model 355 only)

Table 1-3. General Characteristics (Continued)

MEDIA LENGTH:
- Paper: 152.4 m (500 ft.)
- Polyester: 61.0 m (200 ft.)

PLOT LENGTH:
- Take-Up Reel:
  - 10 m (32.8 ft.) (NA to Model 240D/E unless C1621A or C1622A Take-Up Reel installed)
- Automatic Cutter:
  - 1.2 m (4 ft.) (NA Model 240D/E)

PLOTTING SPEED: (Models 240D, 240E, 250, & 255)
- D/A1: 16 mm/s (0.64 in./s)
  8 mm/s (0.32 in./s) "Darker" ("Darker" applies to Model 240D only)
- E/A0: 22.0 mm/s (0.86 in./s)
  11.0 mm/s (0.453 in./s) "Darker" ("Darker" applies to Model 240E only)

MEMORY
- Hard Disk: 40 Mbyte
- I/O: 8 Kbyte

NOISE LEVELS:

Standby:	60 dB (A)	Sound power
Operating:	65 dB (A)	1 meter from the plotter

HEAT OUTPUT:
1 507 248 J/h (420 W) (360 kcal/h) (1429 BTU/h) maximum

1-12. RECOMMENDED TOOLS AND TEST EQUIPMENT

1-13. The tools required to maintain the HP 7600 Model 240D/E and Model 250/255 are listed in Table 1-4. Test equipment recommended to maintain these plotters is listed in Table 1-5.

Table 1-4. Tools Required

Screwdriver, Phillips #1, #2, #2 short
Screwdriver, common large & small
Nut Drivers 12 mm, 14 mm, 3/16 in. & 9/32 in.
Hex Wrenches - 1.5 mm, 2 mm, 3 mm, 4 mm, & 5 mm
Open-End Wrenches - 7 mm, 13 mm, & 19 mm
Pliers, Needle-Nose
Combination Spring Removal Tool
Magnifying lens (30x)
Metric Scale (150 mm)

Table 1-5. Recommended Test Equipment

TYPE	RECOMMENDED MODEL
HP Portable PLUS Personal Computer	HP 45711E
Disk Drive	HP 9114B
Service Disks Model 240D/E & 250/255	HP C1600-60401
Model 250/255 only	HP C1620-60011 HP C1620-60012
HP-IL/HP-IB Interface	HP 82169A
Centronics Interface Cable	40242D
Serial Interface Cable	92221P
Interface Cable	17355D
HP-IB Interface Cable	10833B or C
Serial to Parallel Converter	Black Box Corp. GG-PI005B 115 Vac GG-PI005B-E 230 Vac
Voltmeter	HP 427A or equivalent
Gram Gauge 0 – 700 grams	HP 8750-0324
RS-232-C Test Connector	07440-60302
Oscilloscope, 2 channel	HP 1741A or equivalent

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ILLUSTRATIONS (CONTINUED)

SECTION II

ENVIRONMENTAL/INSTALLATION/ PM

2-1. ENVIRONMENTAL SPECIFICATIONS

2-2. HP 7600 plotters are designed to meet the HP class C environmental specifications for a normal office environment. The environmental requirements for operating the HP 7600 plotters are listed in Table 2-1.

Table 2-1. Environmental Operating Range

OPERATING:	
Temperature:	5 to 40 °C 41 to 104 °F 50 to 86 °C
Humidity:	80 to 80% Relative *
Altitude:	4572 m (15 000 ft.)
STORAGE:	
Hardware:	
Temperature:	−10 to 60 °C 14 to 140 °F
Humidity:	15 to 85% Relative *
Altitude:	5487 (18 000 ft.) @ −40 °C
Media:	
Temperature:	−10 to 40 °C 14 to 104 °F
Humidity:	30 to 80% Relative *

* Non-condensing

2-3. CABLE RESTRICTIONS

2-4. Cable restrictions for the plotter are determined by the type of interface being used. Recommendations for each interface are supplied in the following paragraphs.

2-5. RS-232-C INTERFACE

2-6. The use of short cables (each less than 15 meters or 50 feet) is recommended for the RS-232-C Interface. Longer cables are permissible, provided the load capacitance does not exceed 2500 picofarads.

2-7. HP-IB INTERFACE

2-8. The HP-IB (Hewlett-Packard Interface Bus) allows up to 15 devices to be connected. However, the maximum cable length is restricted to 2 meters (6.6 ft.) per device up to a total of 20 meters (65.8 ft.). The devices may be connected in a star or linear bus network.

2-9. PARALLEL (CENTRONICS) INTERFACE

2-10. The use of short cables (each less than 15 meters or 50 feet) is recommended for the parallel (Centronics) interface. Longer cables are permissible, provided the load capacitance does not exceed 2500 picofarads.

2-11. UNPACKING AND INSPECTION

2-12. Inspect the shipping container for damage. If the shipping container shows signs of damage, it should be retained until the contents of the shipment have been checked and the performance of the plotter is verified. Procedures for checking the mechanical and electrical performance of the plotter are given later in this chapter. If the plotter is damaged in transit, notify the carrier as well as the nearest Hewlett-Packard Sales and Support Office. Retain the shipping material for the carrier's inspection.

2-13. UNPACKING THE HP 7600 PRINT ENGINE

2-14. To unpack and set up the Model 240D/E, follow the unpacking and set up instruction sheet on the shipping container, or refer to and perform the following steps:

2-15. Incoming inspection procedures are designed to detect any mechanical or electrical defects that may have occurred during transit.

2-16. To unpack the print engine, perform the following steps.

a. Remove the banding from around the print engine carton.

b. With one person on each end, lift the carton off the print engine.

c. Remove the packaging materials from around the print engine.

d. Remove the plastic bag covering the print engine. Leave the tape that secures the top cover and doors in place.

e. Remove the two large ramps from beneath the print engine, and set them off to the side (wooden side down).

f. Remove the two, smaller, wedge-shaped ramp supports from beneath the print engine.

g. Remove the backing from the double-sided tape on the ramp supports.

h. Install a ramp support on each ramp; so that the ramp support projection fits into the notch in the ramp. See Figure 2-1.

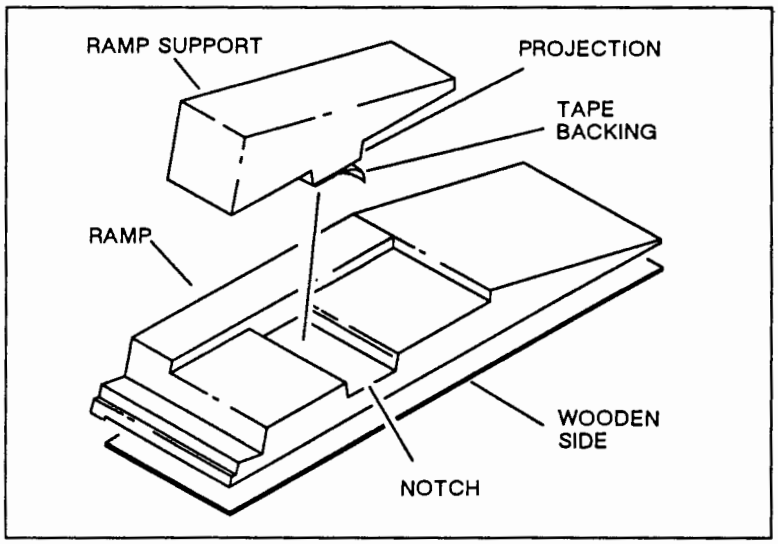


Figure 2-1. Ramp Support Installation

i. Using the shaft of a long screw driver, raise the feet of the print engine by turning them in a counter-clockwise direction. Raise them fully.

j. Position the ramps, wooden side up, in front of the casters on the print engine.

k. With one person on each side, carefully guide the print engine down the ramps.

2-17. STORAGE

2-18. If the HP 7600 is to be stored for an extended period of time, the following general procedures should be followed.

a. Switch OFF the HP 7600.

b. Disconnect the power and interface cables.

c. Cover the HP 7600 to protect it from dust.

d. Store the HP 7600 on a flat, level surface. Ensure that the storage area meets the non-operating environmental range characteristics.

2-19. INSTALLATION INSTRUCTIONS

WARNING

Do not connect the print engine ac power cord to a power source until you have completed the installation procedures in this chapter. Failure to observe this warning may result in personal injury or death.

2-20. *Before applying power*, ensure that the HP 7600 is configured for the line voltage being used and the rear panel switches are properly set. Review the following paragraphs to verify proper installation and configuration of the plotter.

2-21. MODEL 240D/E PRINT ENGINE INSTALLATION

2-22. To prepare the print engine for installation, perform the following steps:

a. Deliver the print engine to the room where it will be used.

b. Remove the tape securing the doors and covers.

c. Open the top cover by lifting the front edge.

d. Locate the S-shaped brackets at either end of the upper frame, which secure the upper frame during shipping. See Figure 2-2.

e. Using a stubby #2 Phillips screwdriver, remove the Bracket Securing Screw (bottom screw) in each S-shaped bracket. Save the screws for repacking or storing the plotter.

f. Raise the upper frame by pulling back on the clip release handle to the right and in front of the upper frame. See Figure 2-3.

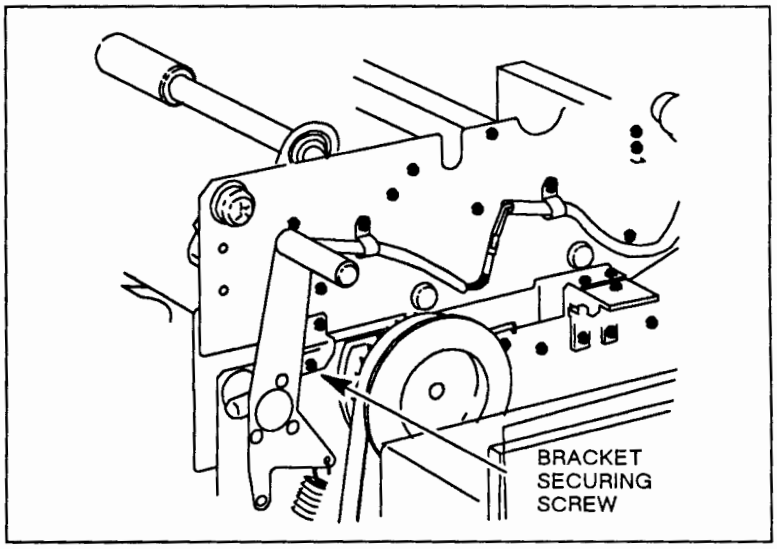


Figure 2-2. Upper Frame and S-shaped Bracket (Right Side)

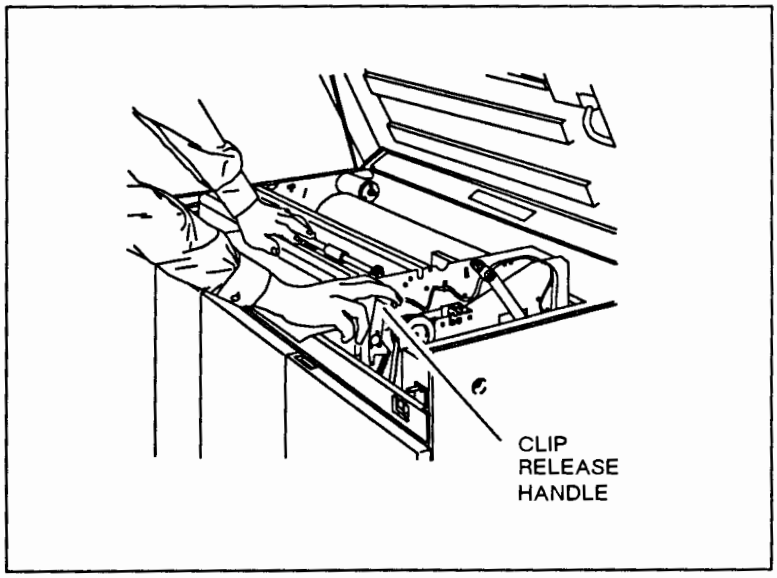


Figure 2-3. Clip Release Handle

g. Remove the packing material above the media spool, the spool, and the two desiccant packages.

h. See Figure 2-4. Push up on one end of the pinch roller and remove the plastic-capped, restraining screw located behind the pinch roller and just beneath the roller tension bar. Then push up on the end of the pad roller and remove the plastic-capped, restraining screw from behind the pad roller.

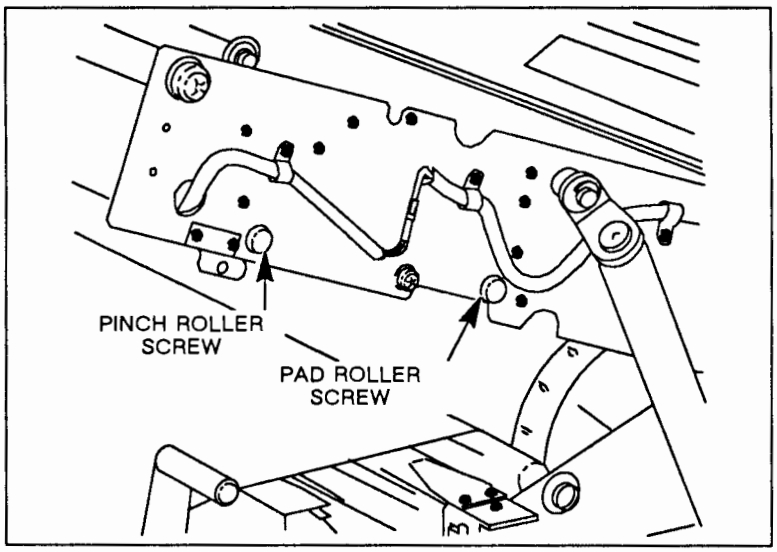


Figure 2-4. Pinch Roller and Pad Roller Restraining Screws (Right Side)

i. Remove the pinch roller and pad roller restraining screws from the other end of the upper frame.

j. See Figure 2-5. Stow the restraining screws removed in steps "h. " and "i. " in the vacant holes at the forward sides of the upper frame, and screw them down securely.

k. Push down on the upper frame until it latches. Ensure that it latches at both ends.

l. Close the top cover.

m. Install the media deflector by inserting the curved wire ends in the holes provided on top and at either end of the rear panel. The appearance of the media deflector after installation is shown in Figure 2-13.

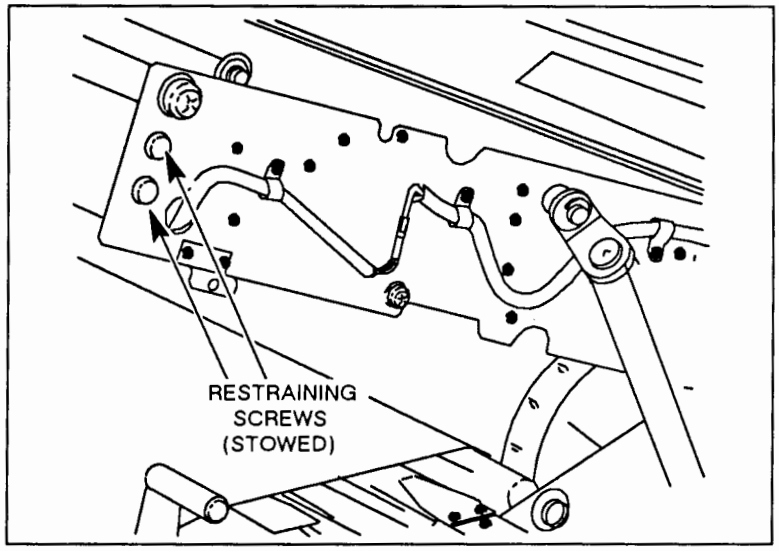


Figure 2-5. Restraining Screws (Stowed)

2-23. MODEL 250/255 PRINT ENGINE INSTALLATION

2-24. Perform the steps under paragraph "2-22. " for print engine installation and the following paragraph for cutter set-up.

2-25. To prevent possible damage in shipping, the "Y" cutter is locked in position at the right-hand end of the assemble. Before applying power, the locking screw must be removed. Proceed as follows:

a. Raise the top cover.

b. Locate the "Y" cutter at the right of the assembly.

c. Use a small Pozidriv screwdriver to remove the screw. See Figure 2-6.

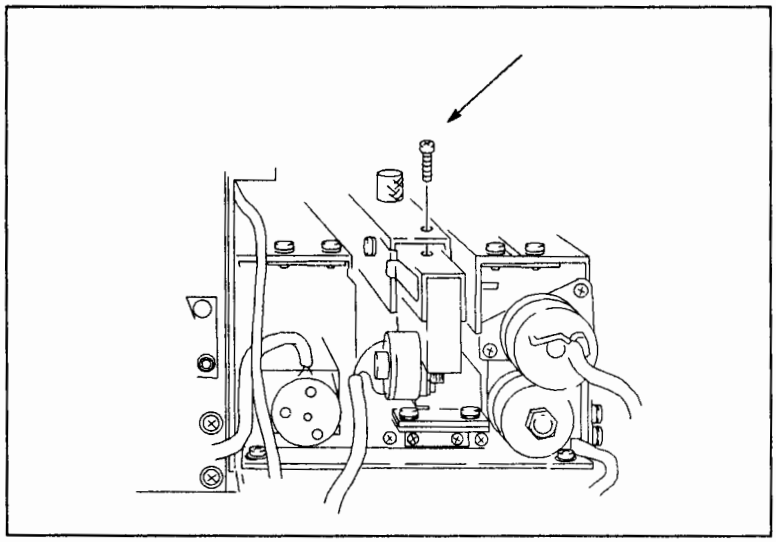


Figure 2-6. "Y" Cutter Lock

2-26. VRC INSTALLATION IN THE HP 7600

CAUTION

Handle the VRC carefully during installation to prevent possible damage to the hard disk.

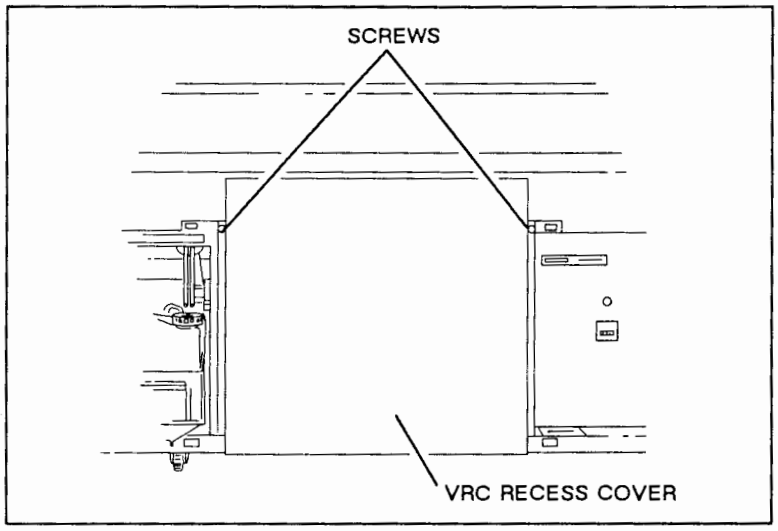


Figure 2-7. Center Cover Removal

a. Open the front doors of the print engine. There are two front doors on the print engine, one on the right and one on the left.

b. Unscrew the two screws at the upper sides of the center cover. See Figure 2-7. Pull the top of the cover toward you and lift to remove the cover. Set the center cover off to the side.

NOTE

Step "c. " below is not required for Models 250/255 shipped after December 1990.

c. Remove and discard the lower of the two shipping panels immediately behind the center cover.

d. Place the VRC on the floor in front of the print engine with the rear of the VRC toward the rear of the print engine.

NOTE

It may be necessary to remove the top shipping cover in order to perform step e.

e. Connect the VRC power cord to the VRC and to the ac receptacle on the User Panel inside the print engine. See Figure 2-8.

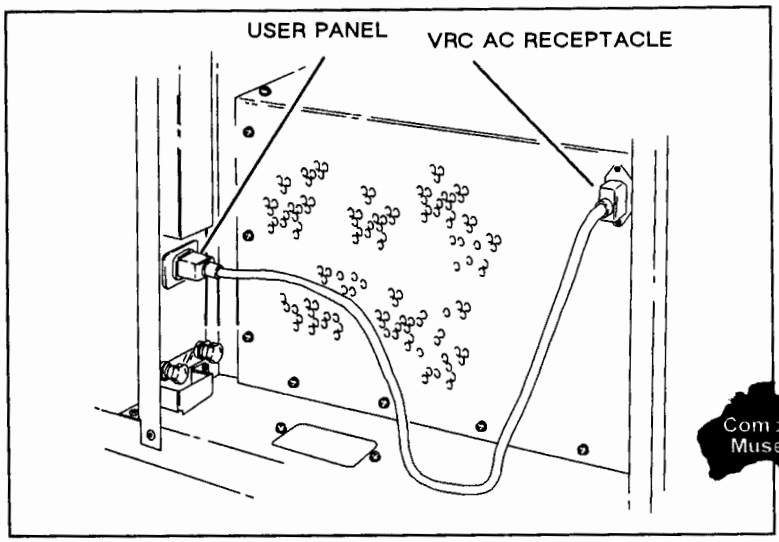


Figure 2-8. VRC Power Cord Connections

NOTE

Plotters shipped before December 1990 have two ac receptacles on the user panel, and the VRC power cord should be connected to the top receptacle.

f. Carefully lift the VRC and place it on the floor of the print engine in the space provided. Gently slide the VRC into the recess until the front plate is against the mounting brackets taking care not to damage the power cord.

g. Secure the front plate of the VRC to the VRC mounting brackets on either side of the VRC opening using the hardware supplied. See Figure 2-9. Ensure that a washer is mounted on each screw; so that the washer will be between the screw head and the front plate when the screw is installed.

h. Attach the straight-shaped end of a VRC-to-print engine cable to the VRC I/F connector on the VRC interface panel. The VRC interface panel is shown in Figure 2-10. Using a #1 Phillips screwdriver, secure the connector.

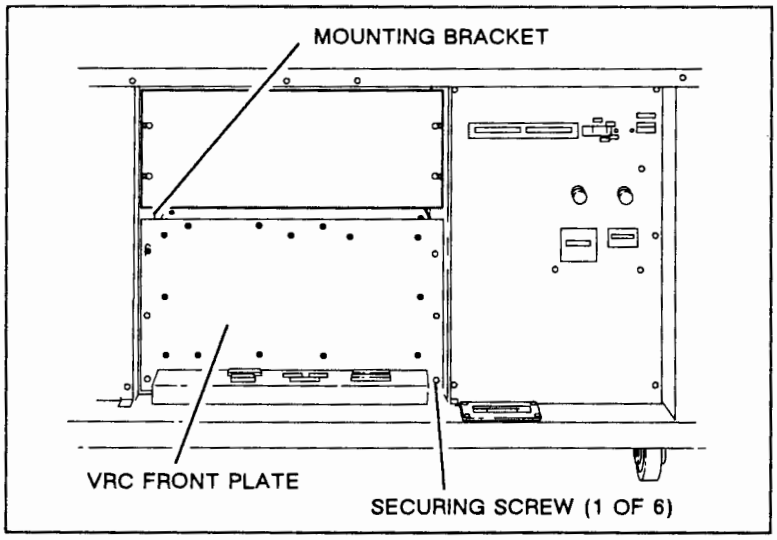


Figure 2-9. Securing the VRC Front Plate

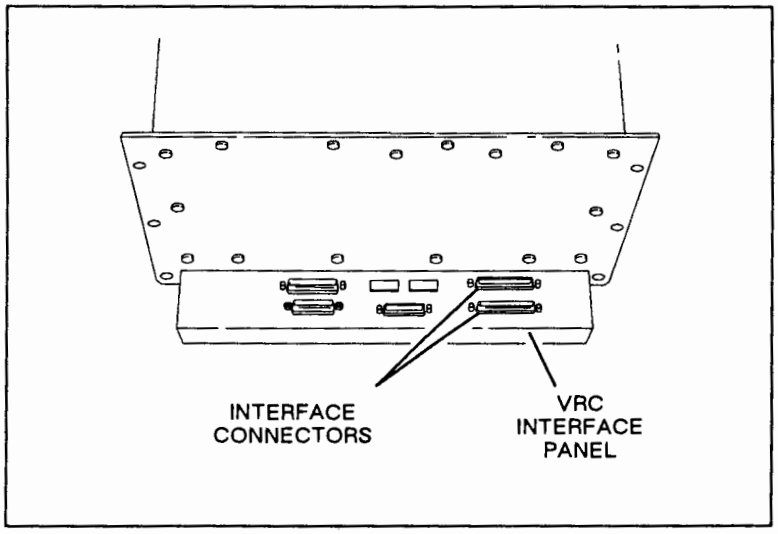


Figure 2-10. VRC Interface Connectors

i. Attach the L-shaped end of the cable to the VRC I/F connector on the test panel. The test panel is to the right of the VRC facing the front of the print engine. Secure the connector.

j. Attach the straight-shaped end of a VRC-to-print engine cable to the CTRL I/F connector on the VRC Interface Panel. Secure the connector.

k. Attach the L-shaped end of the cable to the CTRL I/F connector on the Test Panel. Secure the connector using the screws provided. The result of attaching the VRC to print engine interconnect cables is shown in Figure 2-11.

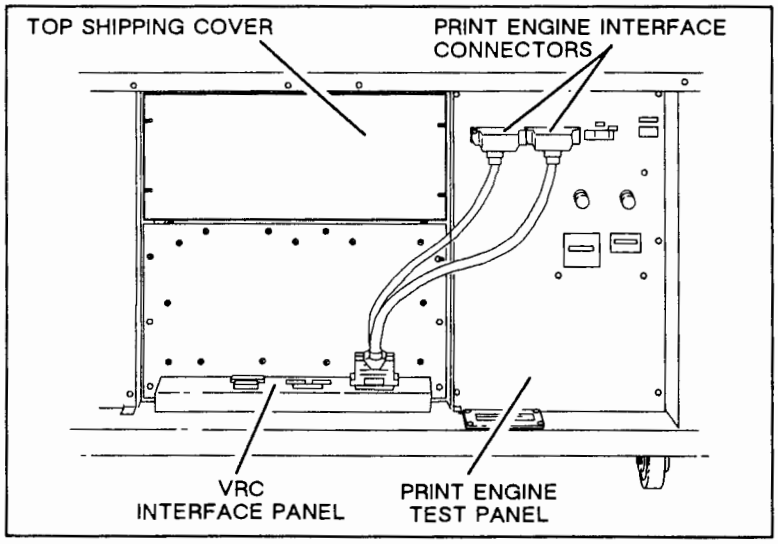


Figure 2-11. VRC to Print Engine Cables

l. Set the A0/A1 Switch to the A1 position for the HP 240D plotter or to the A0 position for the HP 240E plotter. See Figure 2-12.

m. Replace the upper panel, above the VRC, if it has been removed.

n. Replace the center cover. It will snap into place, and it is NOT necessary to install the screws.

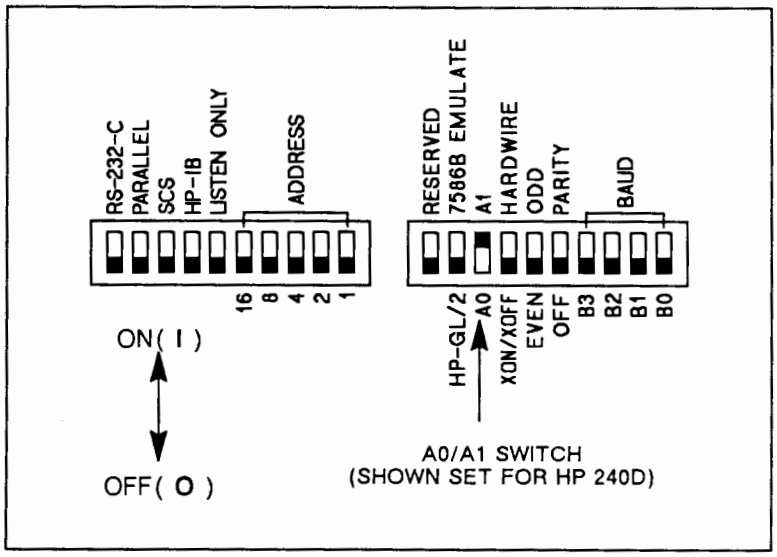


Figure 2-12. Setting the A0/A1 Switch

2-27. STACKER INSTALLATION (OPTIONAL)

a. Hang the stacker against the rear panel of the plotter by inserting the three hooks provided into the three center slots at the top of the rear panel. See Figure 2-13.

b. Fold down the table stand to firmly support the table.

c. If plots to be made are regular C-size, D-size, or E-size plots hook the media deflector into the vertical position shown in dashed-lines.

d. If the plots to be made are long-axis plots or plots smaller than C-size, unhook the media deflector and place it in the horizontal position as shown in solid-lines.

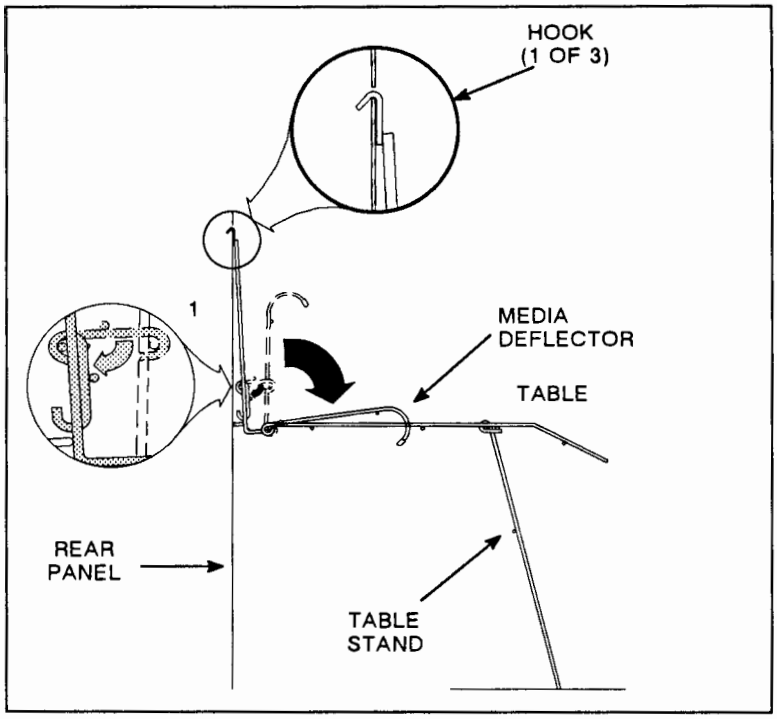


Figure 2-13. Stacker Installation

2-28. LINE VOLTAGE AND FUSING

2-29. The HP 7600 will operate from a power source of 110, 120, 220, or 240 Vac +/−10%, 47 to 63 Hz, single phase. Power consumption is 600 W maximum. When shipped from the factory, the HP 7600 voltage selector is set and an appropriate fuse installed for operating in the country of destination.

CAUTION

Applying line voltage of 220 or 240 volts to the plotter while the plotter is configured for 100 or 120 volt operation may damage the plotter circuits.

Table 2-2. Power Requirements

Voltage Vac	110	120	220	240
Range	100 - 120	108 - 132	198 - 242	216 - 264
Power (W) Nominal				
Model 240D/E		390	440	
Model 250/255	570	570	600	600
Current (A)				
Model 240D/E	NA	NA	NA	NA
Model 250/255	5.5	5.5	2.8	2.8

Table 2-2. Power Requirements (Cont'd)

Frequency (Hz)		
Model 240D/E	47 - 53	57 -63
Model 250/255	50 - 60	50 - 60

2-30. CONNECTING THE POWER

2-31. To connect the plotter to power, perform the following steps:

WARNING

The line power cord and power outlet must have a protective earth (ground) terminal. Serious shock hazard leading to injury or death may result if the plotter is not properly grounded.

Handle plotter covers carefully when removing or installing them. Sharp edges on the covers can cause personal injury.

CAUTION

Failure to properly perform the steps below can result in damage to the plotter when it is switched on. Do not plug the plotter into an ac receptacle before steps a. through l. have been performed. Damage to the plotter will result.

a. Switch off the main power circuit breaker located above ac receptacle at the rear of the print engine.

b. Connect the ac power cord supplied with the plotter to the ac receptacle at the rear of the print engine. Power cords

supplied with the print engine are described at the end of this procedure.

c. Measure your power source voltage, and write down its value.

d. Remove the cover from the voltage selection assembly. See Figure 2-14.

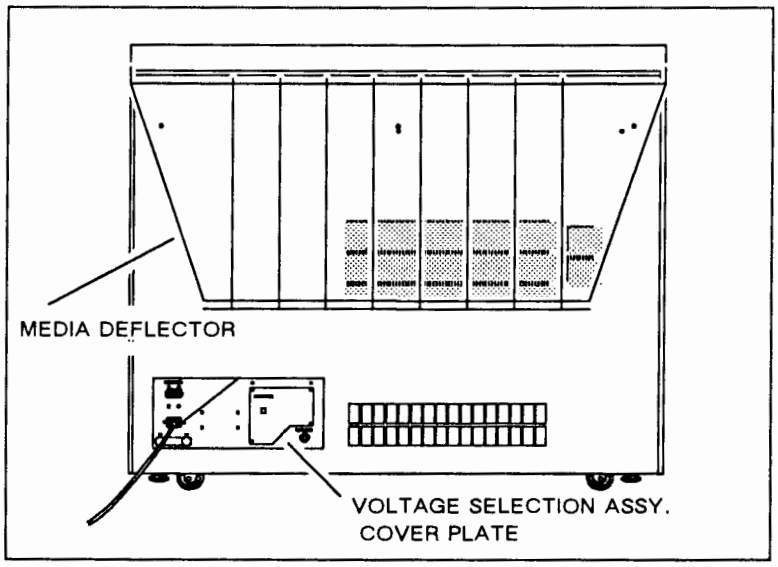


Figure 2-14. Removing the Cover Plate

e. Ensure that the voltage selector plug is plugged into the correct connector on the voltage selection assembly. The correct connector for each possible power source is described in the next three steps of this procedure. See Figure 2-15 while adjusting the position of the voltage selector plug.

f. If your power source is 106 to 115 Vac or 198 to 229 Vac, connect the voltage selector plug to the connector marked:
110V
220V

g. If your power source is 99 to 105 Vac, move the voltage selector plug to the connector marked 100V.

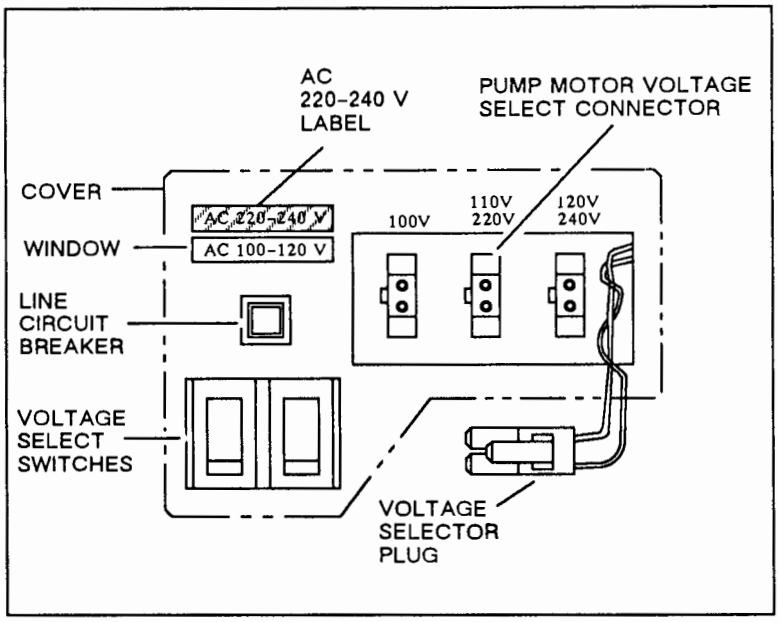


Figure 2-15. Voltage Selection Assembly

h. If your power source is 116 to 132 Vac or 230 to 252 Vac, move the voltage selector plug to the connector marked:
   120V
   240V

i. Install the cover so that the appropriate label is showing in the window.

j. Verify the position of the cover over the voltage select switches on the Main Power Panel. For 100 to 120 Vac, the cover must be fastened so that the label, AC 100–120 V, shows in the window. For 220 to 240 Vac, the cover must be fastened so that the label, AC 220–240 V, shows in the window. See Figure 2-15.

k. Remove the right side panel (viewed from the front) of the plotter. Do not remove the ground strap. Simply rotate the panel clear of the recess.

l. Verify that the hour meter switch is in the correct position. See Figure 2-16.

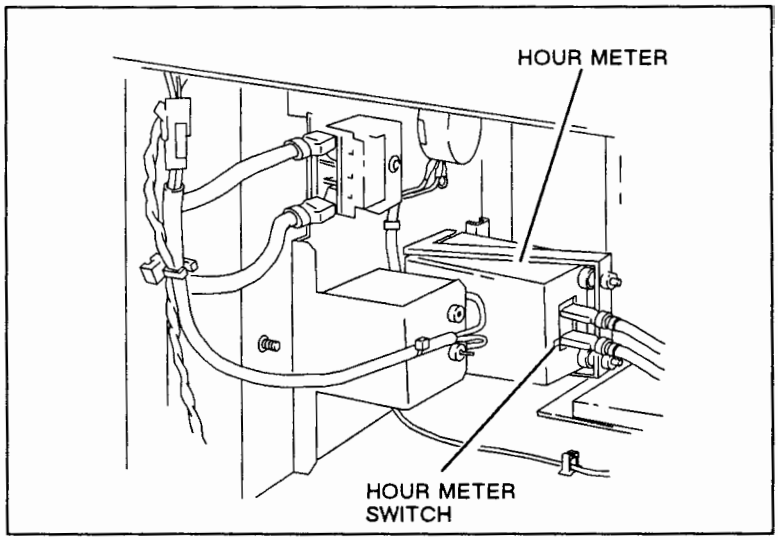


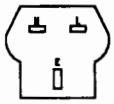
Figure 2-16. Setting the Hour Meter Switch

m. If your power source is 60 Hz ac, set the hour meter switch in the UP position. If your power source is 50 Hz ac, set the hour meter switch in the DOWN position.

n. Replace the right side panel (viewed from the front) of the plotter.

o. Plug the power cord into the ac outlet whose voltage you measured in step c.

p. See Figure 2-17 for a description of the available power cord connector configurations for the Model 240D/E Plotter.

		Option No.
BS 1363A 	250 Vac, 13 A, Single Phase plug rating. For use in United Kingdom, Cypress, Nigeria, Zimbabwe, Singapore.	900
AS C112 	250 Vac, 10 A, Single Phase plug rating. For use in Australia, New Zealand.	901
CEE 7-VII 	250 Vac, 10/16 A, Single Phase plug rating. For use in East and West Europe, Egypt.	902
NEMA 5-15P 	125 Vac, 15 A, Single Phase plug rating. For use in Canada, Mexico, Philippines, Taiwan, Saudi Arabia, UL approved in the United States	903
NEMA 6-15P 	250 Vac, 15 A, Single Phase plug rating. For use in Canada, UL approved in the United States.	904
SEV 1011 	250 Vac, 10 A, Single Phase plug rating. For use in Switzerland.	906
DHCK-107 	250 Vac, 10 A, Single Phase plug rating. For use in Denmark.	912

NOTE: All plugs are viewed from the power outlet connector end.
L = Line or Active Conductor (Also called "live" or "hot")
N = Neutral or Identified Conductor
E = Earth or Safety Ground

Figure 2-17. Power Cord Connector Configurations

		Option No.
SABS-164		
	250 Vac, 10 A, Single Phase plug rating. For use in India, Republic of South Africa.	917
MITI 41-9692		
	125 Vac, 12 A, Single Phase plug rating. For use in Japan.	918

NOTE: All plugs are viewed from the power outlet connector end.
L = Line or Active Conductor (Also called "live" or "hot")
N = Neutral or Identified Conductor
E = Earth or Safety Ground

Figure 2-17. Power Cord Connector Configurations (Cont'd.)

2-32. USER INFORMATION AND OPERATION

2-33. LOADING MEDIA

2-34. To load the media, perform the following steps:

WARNING

Take care to use proper lifting techniques when picking up and loading the rolls of media. The rolls are heavy and personal injury may result if the rolls are not properly handled.

a. Remove the roll of media from its box and plastic bag. Discard the plastic end caps.

b. Open the top cover of the print engine by lifting the front edge.

c. Raise the upper frame by pulling back on the clip release handle to the right and in front of the upper frame.

d. Wipe out the media compartment with a damp cloth, or use a hand-held vacuum cleaner if available. Assure that all debris is removed.

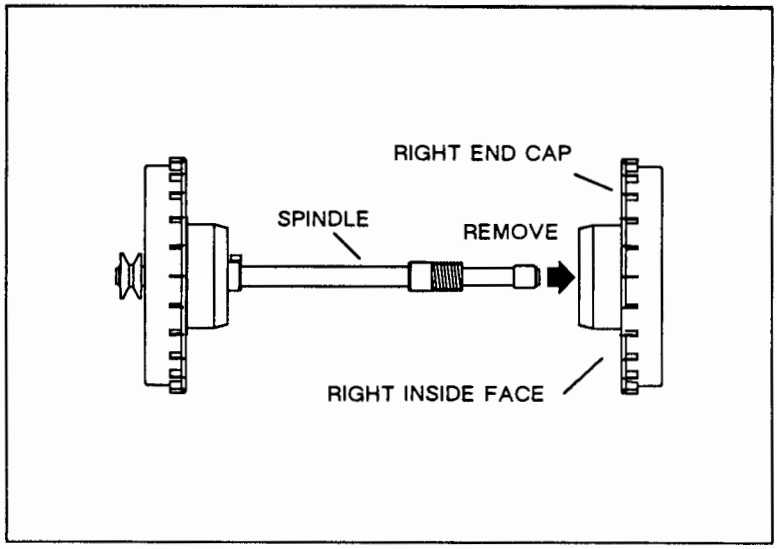


Figure 2-18. Spool End Cap Removal

e. Remove the right End Cap of the spool by unscrewing it. See Figure 2-18. (The spool was removed from the print engine during the procedure titled PRINT ENGINE INSTALLATION)

f. Install the roll of media on the spool so that, when the spool is installed, the media will be drawn from the bottom of the roll.

g. Install the End Cap removed in step e.

h. Install the spool into the media compartment of the print engine. Ensure that the media is drawn from the bottom of the roll.

i. Remove the anti-rust paper that protects the writing head and developer bar. Save the anti-rust paper for use when storing the plotter.

j. Route the media over the writing head and developer bar as shown in Figure 2-20.

k. Close the upper frame. See Figure 2-21. Ensure that both ends are latched.

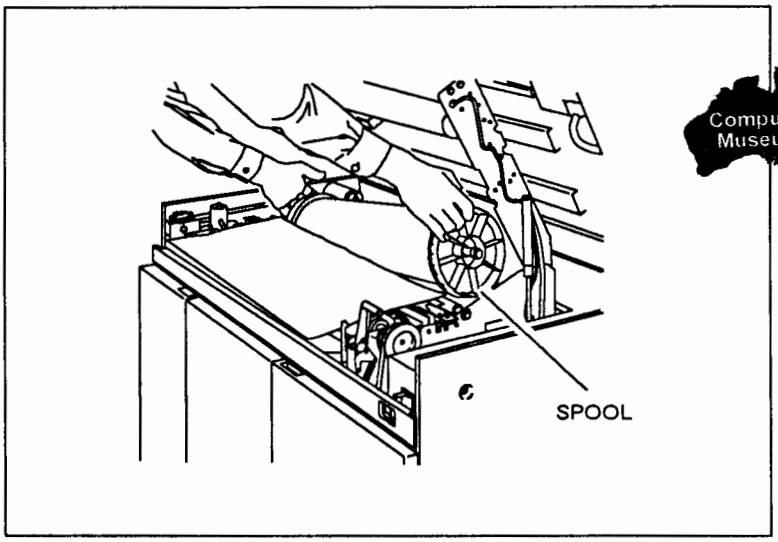


Figure 2-19. Installing the Spool

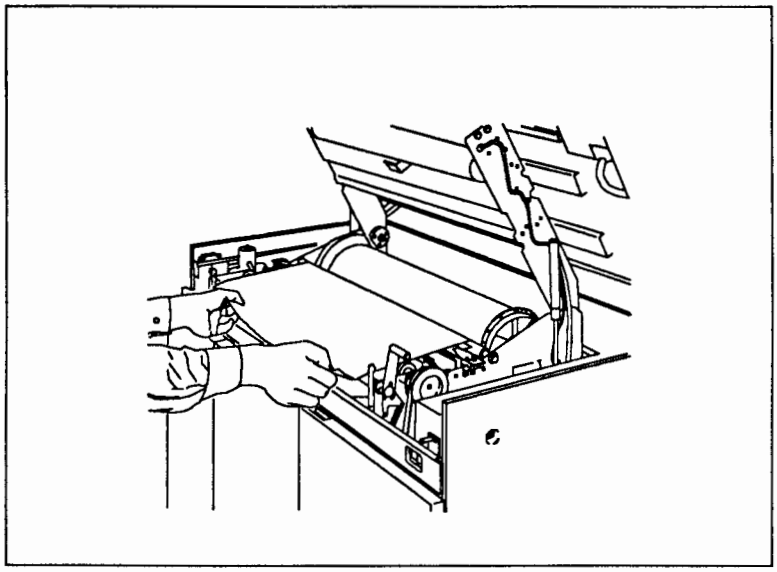


Figure 2-20. Media Routing

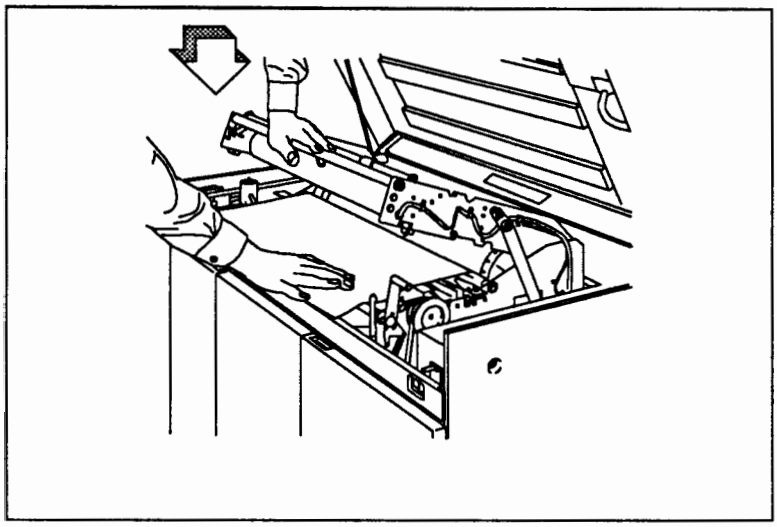


Figure 2-21. Closing the Upper Frame

l. Swing the media feed roller assembly (located at the front of the upper frame) up and forward into the locked-open position. See Figure 2-22.

m. Route the media between the the pinch roller and the media feed roller assembly. Swing the feed roller assembly back against the media. See Figure 2-23.

WARNING

Keep fingers, clothing, and jewelry out of the path of the media cutter while using it. Failure to do so can result in personal injury.

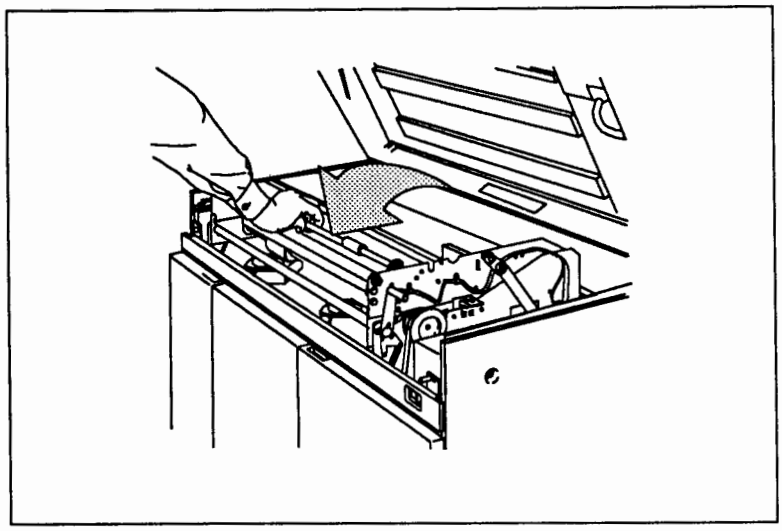


Figure 2-22. Locking the Feed Roller Assembly Forward

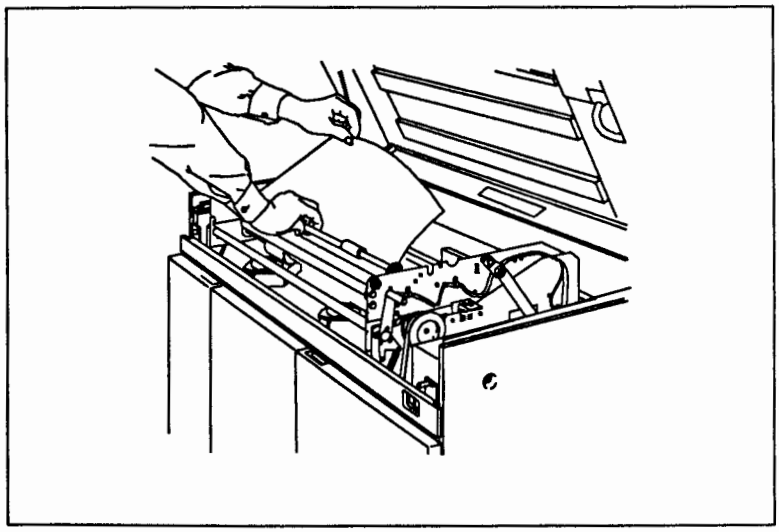


Figure 2-23. Routing the Media

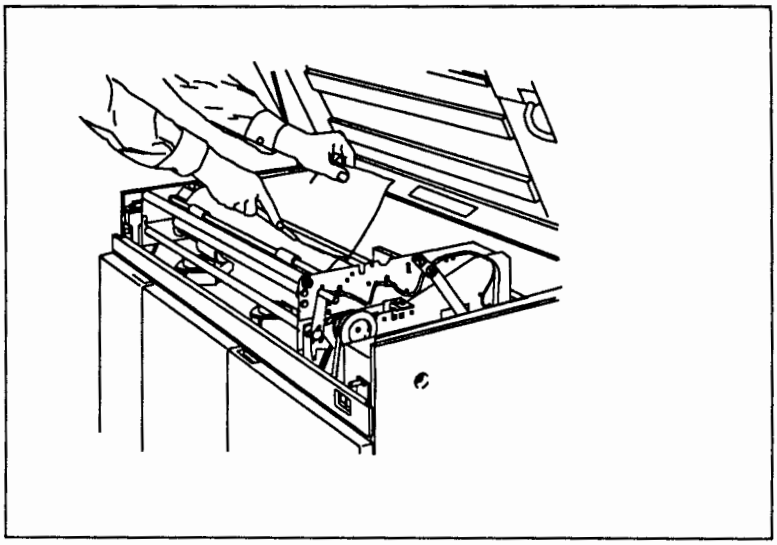


Figure 2-24. Cutting the Media

n. For the Model 240D or 240E, use the media cutter from the supplies box, and cut the excess media off flush along the groove in the guide as shown in Figure 2-24. For the Model 250/255 See Figure 2-25 for the different upper frame assembly, and determine whether the plots are to be rolled or cut into sheets. If the plots are to be rolled, follow the steps under paragraph 2-37. If the plots are to be cut into sheets, follow the steps under paragraph 2-40.

o. Close the top cover.

2-35. TAKE-UP REEL OPERATION

2-36. A motor driven take-up reel is located in the plotter upper frame assembly. When enabled, the spindle will automatically roll the plots as they are completed.

2-37. To use the take-up reel, proceed as follows:

a. Load media as indicated earlier in this section of the Handbook .

b. Route the media under the bar and over the spindle as indicated in Figure 2-26.

c. Using tape, attach the leading edge of the media to the spindle at the center.

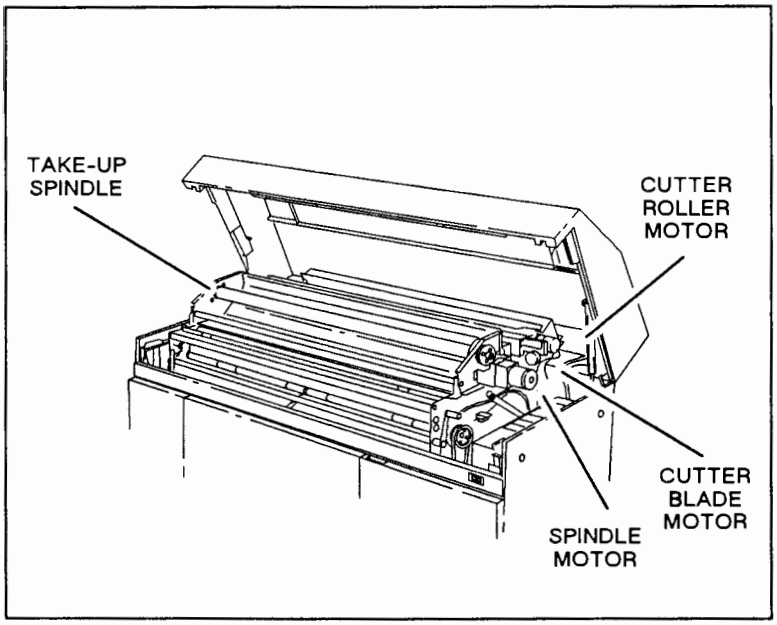


Figure 2-25. Upper Frame Assembly

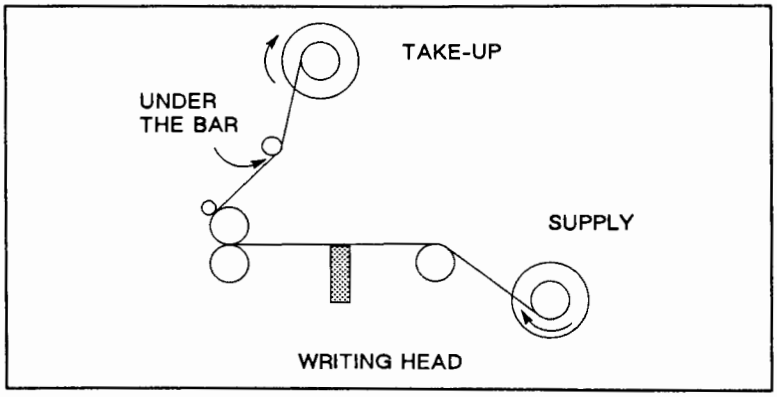


Figure 2-26. Take-Up Reel Loading

d. Manually advance the spindle to take up the slack in the media and make at least one complete wrap around the spindle. See Figure 2-27.

e. Close the top cover.

f. Apply power to the plotter.

g. Press the **Plotter Setup** button on the front panel.

h. The **MEDIA HDLG** menu is the default selection.

i. Press the **Value +** or **Value –** button to display **TAKE UP**.

j. Press **Enter** to select the **TAKE-UP** function.

k. The plotter is now configured for take-up reel operation.

NOTE

Media will not advance when the plotter is On-line. If the Online LED is ON, press the Online button to turn it OFF>

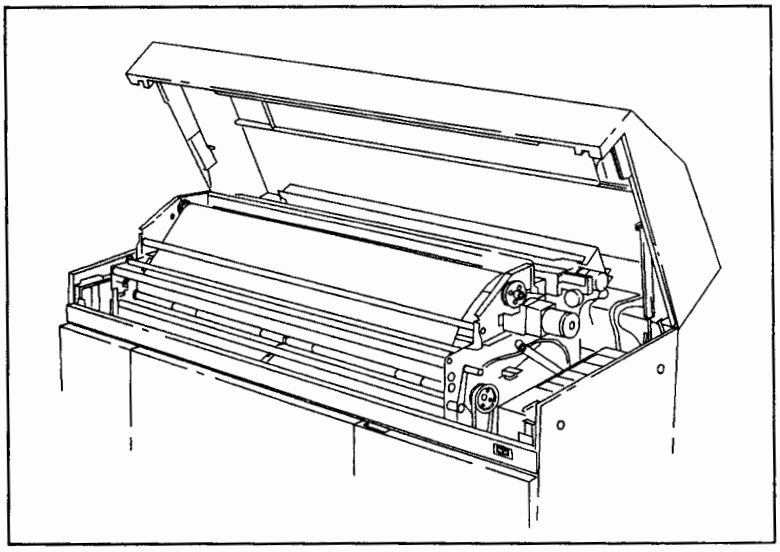


Figure 2-27. Take-Up Reel Operation

l. Press the **Advance** button to wind media on the take-up reel.

2-38. PLOT CUTTER OPERATION

2-39. The plotter is equipped with a motorized "Y"-axis cutter that will separate the plots as they are completed. The cut plots are ejected at the rear of the plotter.

2-40. To use the cutter, proceed as follows:

a. Load media as indicated earlier in this chapter.

b. Close the top cover.

c. Apply power to the plotter.

d. Press the **Plotter Setup** button on the front panel.

e. The **MEDIA HDLG** menu is the default selection.

f. Press the **Value+** or **Value -** button to display either **CUT&VSTK** or **CUT&HSTK**.

g. In VSTK (Vertical Stack) the media is cut a minimum of 610 mm (24 in.) in length. HSTK (Horizontal Stack) cuts immediately at the end of the plot.

h. Press **Enter** to select the desired function. The following message appears if the reel or cutter motors are in operation:

```
Please wait while
plotter changes
media handling.
```

i. The plotter is now configured for cutter operation.

NOTE

The plotter must be Offline when advancing media with the Advance Functions button.

j. Route the media over the bar and into the slot at the front of the cutter mechanism. See Figure 2-28 and Figure 2-29.

k. Press the **Advance** button on the front panel to move the media through the cutter.

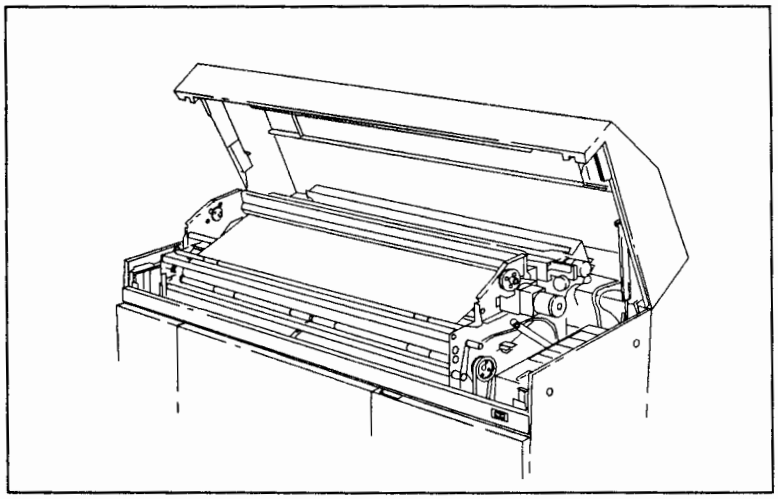


Figure 2-28. Cutter Operation

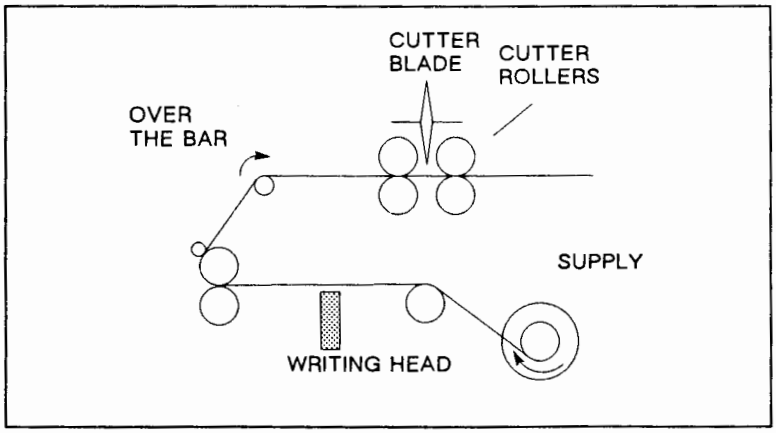


Figure 2-29. Cutter Loading

2-41. LOADING TONER

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 40.5 °C). Keep away from heat, sparks and open flame. Contains isoparaffinic petroleum solvent. Refer to the Material Safety Data Sheet shipped with the toner products.

Avoid contact with the skin or eyes.

FIRST AID

- **Eyes – Flush with water.**
- **Skin – Wash with soap and water.**
- **Inhalation – Move to fresh air.**
- **Ingestion – Dilute stomach contents with several glassesof water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

CAUTION

Toner solution contains isoparaffinic petroleum solvent. Special disposal methods must be used for spent toner. Refer to the Material Safety Data Sheet shipped with the toner products or contact the nearest Hewlett-Packard Sales and Service Office for information.

Disposal of the spent toner is subject to local regulation. In general it must be disposed of in a hazardous material landfill or by incineration.

For continued protection against fire and to prevent damage to the writing head, use only Hewlett-Packard certified toner and media.

Do not touch the writing head. Keep toner off the writing head. Use only recommended cleaning materials and procedures. Damage to the head and to the driver circuitry may result if these steps are not followed.

2-42. To install the toner, perform the following steps:

a. Open the toner compartment door. See Figure 2-30.

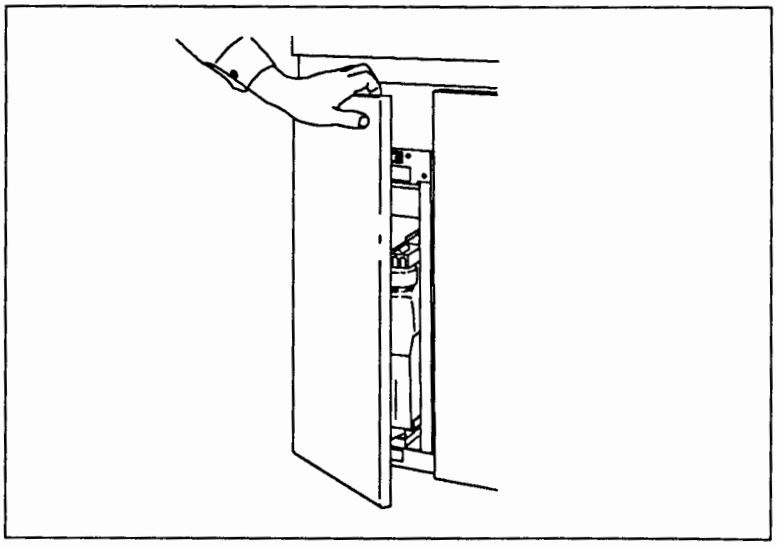


Figure 2-30. Toner Compartment Door

b. Remove the vertical shipping strap from the spare toner bottle.

NOTE

Take care not to splash toner on your clothing or skin when raising the ink tube assembly.

c. Unscrew the toner bottle cap securing the ink tube assembly and raise the assembly. See Figure 2-31.

d. Remove the plastic bag from the tube on the tube assembly.

e. Unscrew the toner drawer knob on the toner drawer. See Figure 2-31.

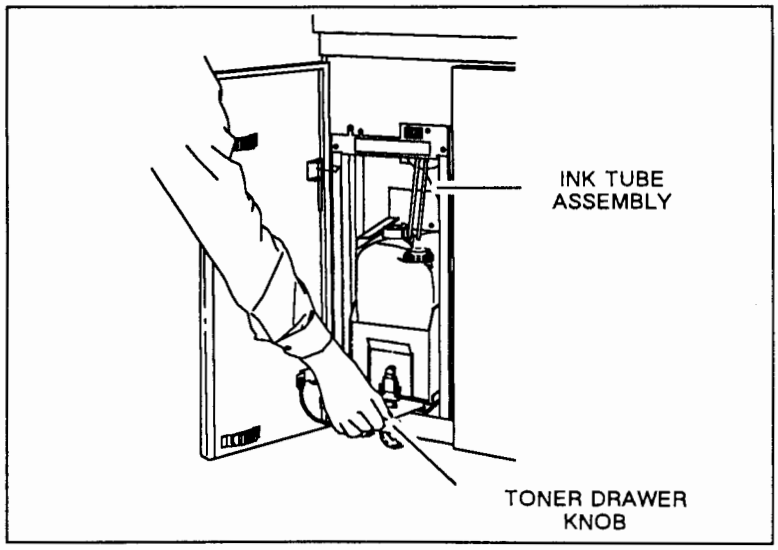


Figure 2-31. Toner Bottle Compartment

f. Pull the toner drawer out. See Figure 2-32.

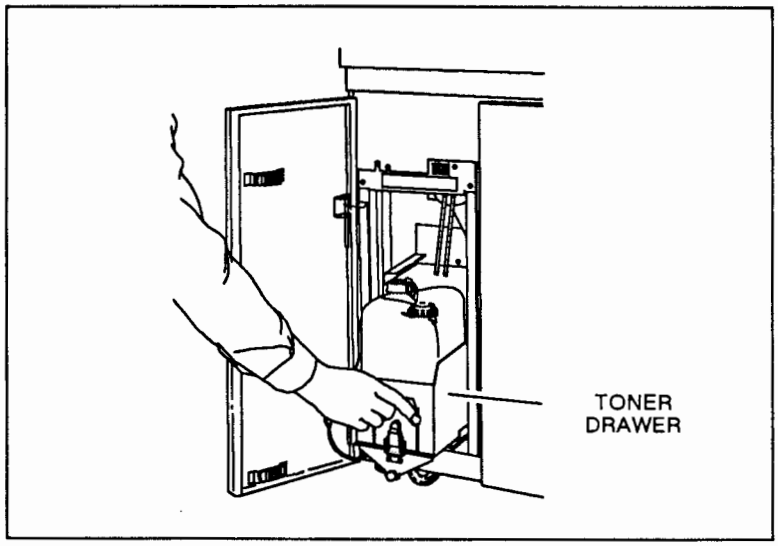


Figure 2-32. Toner Drawer

g. Remove the empty bottle of toner from its box. Save this bottle for use in flushing the developer system. The flush-

ing procedure is described in paragraph " 2-80. " of this section.

h. Shake a full capped bottle of fresh toner for about 30 seconds to thoroughly mix the toner and dispersant.

i. Set the bottle of toner carefully into the drawer with its large cap forward. Remove the larger of its caps. Save this cap in a safe place to re-cap the bottle when replacing toner.

j. Gently slide the drawer in and lower the ink tube assembly onto the bottle. Fasten it securely by screwing down the toner bottle cap.

k. Tighten the knob on the bottom of the toner drawer. Close the toner compartment door.

2-43. FRONT PANEL BUTTON FUNCTIONS ON THE MODEL 240D/E

2-44. See Figure 2-33 for a drawing of the front panel buttons.

2-45. Refer to Table 2-3 for functional descriptions of the front panel symbols.

2-46. TEST PANEL FEATURES ON MODELS 240D/E AND 250/255

2-47. See Figure 2-34 for an illustration of the test panel features.

2-48. Refer to Table 2-4 for a description of the test panel features.

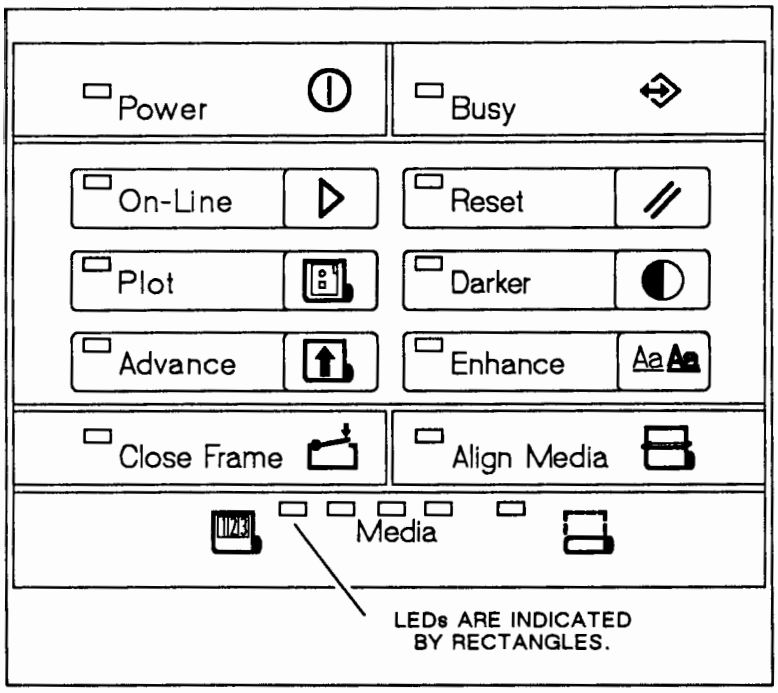


Figure 2-33. Front Panel Buttons

Table 2-3. Front Panel Symbol Functional Descriptions

SYMBOL	NAME	FUNCTION
	**Power**	Indicates that media is loaded, the top cover is closed, and the plotter is ready to receive data.
	**Busy**	Indicates the plotter is accessing the internal disk or the plotter is processing data.
	**On-Line**	Sets the plotter on-line so that it is ready to receive instructions from the computer and plot.
	**Plot**	Signals the end of incoming vector data. The plotter converts the vector data to raster data and begins plotting.
	**Advance**	Advances the media as long as the button is pressed
	**Reset**	Abruptly ends all graphics instructions and plotting, clears the buffer, resets the hard-clip limits and scaling points (refer to the Programmer's Reference for more information). Does not affect the storage of the current plot on the internal storage disk or the plotter's handshaking parameters.
	**Darker**	Darkens lines.
	**Enhance**	Widens lines.

Table 2-3. Front Panel Symbol Functional Descriptions (Cont'd.)

SYMBOL	NAME	FUNCTION
	**Close Frame**	Indicates the frame is not completely closed and takes the plotter off-line. Raise cover and press down firmly on the frame until it locks into place at both ends.
	**Align Media**	Indicates the media is not feeding smoothly. Raise the cover and remove any wrinkled or jammed media from the path
	**Media**	Indicates the relative amount of media used. a full roll of media is indicated by four lighted green LEDs. When the roll of media is one fourth full or less, the yellow LED lights and stays lit. When the roll of media is empty, the yellow LED flashes. (The plotter is taken off-line, and the alarm will sound.)

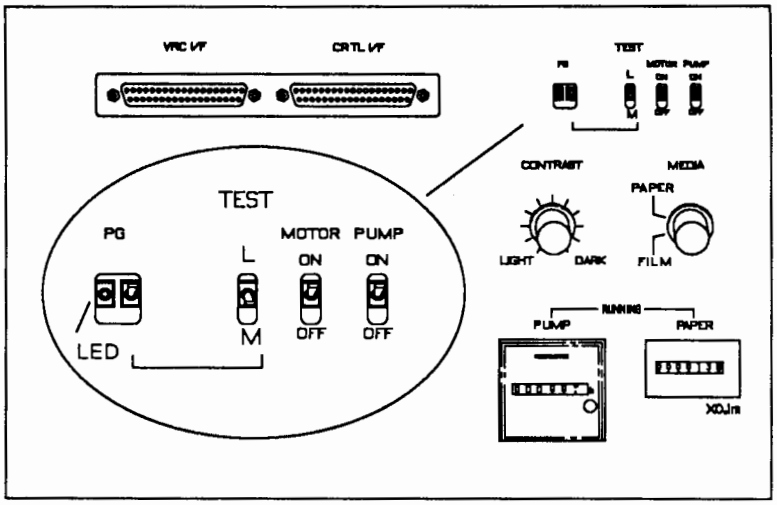


Figure 2-34. Test Panel

Table 2-4. Test Panel Features

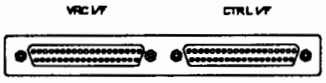
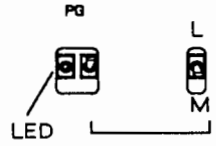
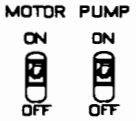
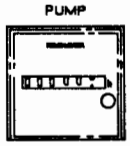
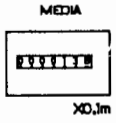
ITEM	DESCRIPTION
	CONNECTORS VRC I/F Used to connect the print engine to the VRC. CTRL I/F Used to connect the print engine to the VRC.
	L/M (Linear/Mixed) A switch used to select a linear or a mixed test pattern. PG (Page) A sprint-loaded switch used to start a test plot. When the PG switch is pressed and released, the LED lights, and the test plot starts. The test plot will continue until the PG switch is again pressed down and released.
	MOTOR ON/OFF A switch used to turn the stepper motor (Paper Advance) ON or OFF. PUMP ON/OFF A switch used to turn the pump motor (Toner) ON or OFF.

Table 2-4. Test Panel Features (Continued)

ITEM	DESCRIPTION
	CONTRAST A rheostat that controls the density of the plot produced by the print engine. Rotating the control counterclockwise decreases plot density.
	MEDIA Switch – A two-position switch usd to adjust print engine operation to the plot medium used. When polyester film is used, the MEDIA switch should be in the FILM position. For other media, the switch should be in the PAPER position.
	PUMP Hour meter – A meter that indicates the hours of print engine pump operation in hours and tenths of an hour.
	MEDIA Counter – Indicates the running length of media in tenths of a meter.

2-49. FRONT PANEL BUTTON FUNCTIONS ON THE MODEL 250/255

2-50. The plotter front panel is illustrated in Figure 2-35. Details of the button and LED functions are listed in Table 2-5.

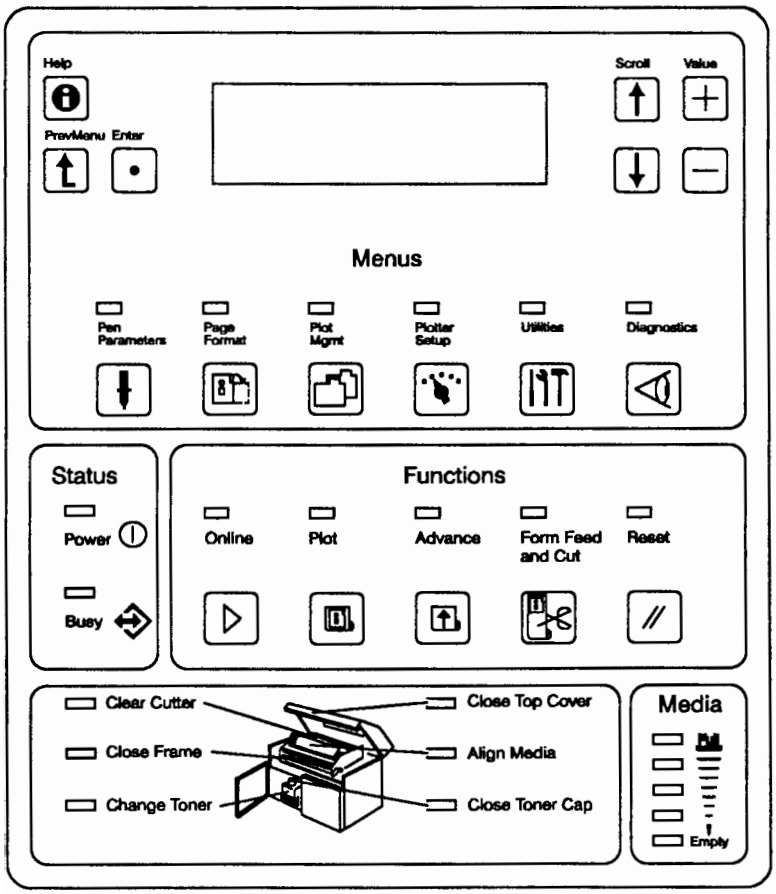


Figure 2-35. Front Panel

Table 2-5. Front Panel Symbol Functional Descriptions

SYMBOL	FUNCTION
Status	
Power	INDICATES THAT POWER IS APPLIED, MEDIA IS LOADED, THE TOP COVER IS CLOSED, AND THE PLOTTER IS READY TO RECEIVE DATA.
Busy	INDICATES THAT THE PLOTTER IS RECEIVING DATA FROM THE COMPUTER OR THAT THE VRC IS RASTERIZING VECTOR DATA AND PLOTTING IT. THE INDICATOR FLASHES AT A RATE IN PROPORTION TO HOW BUSY THE PLOTTER IS.
Functions	
Online	SETS THE PLOTTER ON-LINE SO THAT IT IS READY TO RECEIVE INSTRUCTIONS FROM THE COMPUTER AND PLOT. CERTAIN FRONT PANEL SUNCTIONS ARE IN A VIEW-ONLY MODE WHILE THE PLOTTER IS ONLINE.
Plot	SIGNALS THE END OF INCOMING DATA. THE PLOTTER CONVERTS THE VECTOR DATA TO RASTER DATA AND BEGINS PLOTTING. IF NO NEW PLOT IS BEING RECEIVED. THE LAST PLOT MAY BE REPEATED BY PRESSING PLOT.
Advance	ADVANCES THE MEDIUM AS LONG AS THE BUTTON IS PRESSED.
Form Feed and Cut	IF A CUT IS SCHEDULED, THIS BUTTON ADVANCES THE MEDIA SO THAT THE END OF THE PLOT IS THROUGH THE CUTTER. IF NO CUT IS SCHEDULED, THE USER IS PROMPTED TO ADVANCE TO THE DESIRED POINT AND PRESS ENTER. SCHEDULED CUTS WILL BE PERFORMED.

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

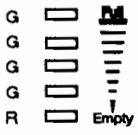
SYMBOL	FUNCTION
Functions Reset 	ABRUPTLY ENDS ALL GRAPHICS INSTRUCTIONS AND PLOTTING, CLEARS THE BUFFER, RESETS THE HARD-CLIP LIMITS AND SCALING POINTS. ALL HP-GL/2 INSTRUCTIONS ARE RESET TO DEFAULT PLOTS IN THE QUEUE ARE NOT AFFECTED. PARAMETERS ARE SET TO THE LAST SAVED CONFIGURATION.
Media  	INDICATES THE RELATIVE AMOUNT OF MEDIA AVAILABLE. A FULL ROLL OF MEDIA IS INDICATED BY FOUR LIGHTED GREEN LEDS. WHEN THE ROLL OF MEDIA IS ONE FOURTH FULL OR LESS, THE RED LED LIGHTS AND STAYS LIT. WHEN THE ROLL OF MEDIA IS EMPTY, THE RED LED FLASHES. (THE PLOTTER IS TAKEN OFF-LINE AND THE ALARM WILL SOUND.)
Menus (default)	STATUS <____>% : "CURRENT PLOT" 0-100 in Incr of 5 COPY : <__> OF <__> (0-99) (0-99) TOTL VECTRS : <_> K (0-9999) NEXT: < > "NEXT PLOT HERE" RECV: < > "RECEIVING PLOTN HERE" REPLC TONER : <___> NO YES

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

SYMBOL	FUNCTION
Menus Pen Parameters	Press "Enter" PEN PARAMETERS PEN NUMBER =<___> 0 - 255 LOAD PALETTE = <_> FACTRY (default) USER1 - 4 SAVE PALETTE = <_> USER1 - 4 OPAQUE MODE =<_> ON OFF DITHERING =<_> ON OFF PEN SOURCE =<_> SFTWRE PLOTTER NMBER OF PENS =<_> 2,4,8, 16,32, 64,128, 256 PEN PARAMETERS PEN NUMBER =<__> 0-255 COLOR NAME =<__> WHITE LT GRY MD GRY DK GRY BLACK COLOR NUMBER =<__> 8-72 WIDTH(mm) =<__> 0.06-100 PATTERN =<__> NONE, 1-24 LINE TYPE =<__> SOLID, -8 TO -1 +1 TO +8

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

SYMBOL	FUNCTION
Menus Page Format	PAGE FORMAT PAGE SIZE =<_> ANSI -A -B -C -D -E; ISO A4 A3 A2 A1 A0; ARCH -A -B -C -D MARGINS =<_> ON OFF (*ON = Cut Plot at Hardclip limits. *OFF = Cut Plot one inch past limits.) ROTATION =<_> 0 90 180 270 MIRROR IMAGE =<_> ON OFF
Plot Mgmt	PLOT MANAGEMENT QUEUE OPERATIONS QUEUEING =<_> 1-14 MAX QUEUE SIZE =<_> ON OFF NESTING SEE NEXT PAGE

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

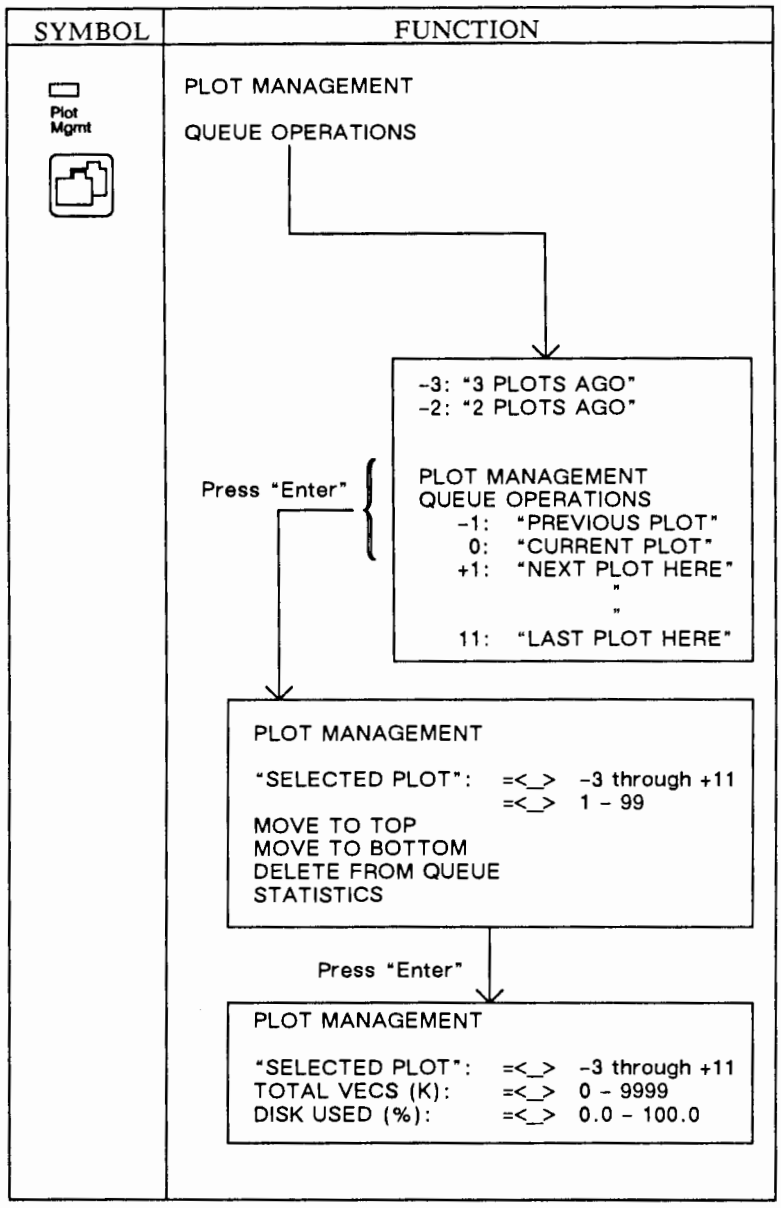


Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

SYMBOL	FUNCTION
Menus  	PLOTTER SETUP MEDIA HDLG =<_> CUT&HSTK CUT&VSTK TAKE-UP MEDIA TYPE =<_> FILM NON-FILM GRAPH LANG =<_> 7586B — See Pg. 62 HPGL/2 I/O CONFIG =<_> CENTRNCS — See Pg. 62 HP-IB — See Pg. 62 RS-232-C — See Pg. 62 DCI MODE =<_> ON OFF PANEL LANG =<_> ENGLISH FRENCH GERMAN ADVANCED SETUP PLOTTER SETUP ADVANCED SETUP SPEED CONTROL =<_> ON OFF MAX SPEED =<_> "D" 8, 17, 34 mm/s "E" 4, 11, 23 mm/s MAX NR TIME =<_> 0.1 TO 120 m COMPENSATION =<_> ON OFF

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

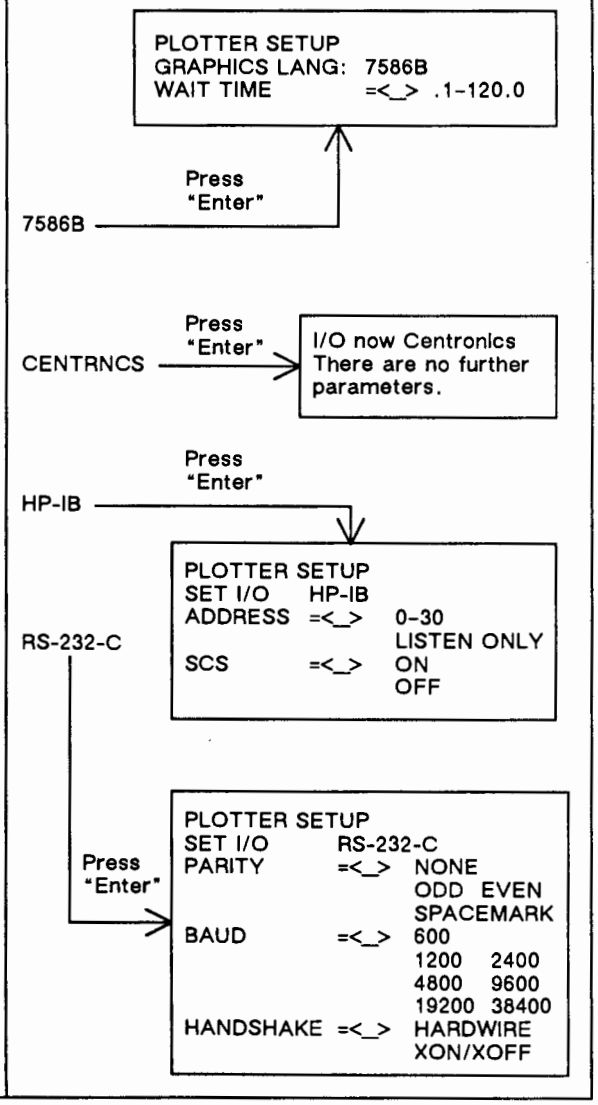
SYMBOL	FUNCTION
Menus  	

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

SYMBOL	FUNCTION
Menus Utilities	UTILITIES PILOT DEMO =<_> FACTRY MENUS COLORS USER1 OR 2 LOAD DEMO =<_> USER1 OR 2 LOAK CONFIG =<_> FACTRT USER 1 - 4 SAVE CONFIG =<_> USER 1 - 4
Diagnostics	DIAGNOSTICS PERFORMANCE PLOT VRC TESTS =<_> DISK LOOPBK PRT ENG TEST =<_> LED CUTTER BUTTON DISP FUNCTNS =<_> ON OFF RESET TGUAGE SHOW PLOTTER STATS Press "Enter" DIAGNOSTIC PLOTTER STATISTICS VRC CODE REV :<_> 1-NNN FP CODE REV :<_> 1-NNN NMBR OF CUTS :<_> 0-99999 At any point in the diagnostics menu, simultaneously press the down arrow and diagnostics buttons to enter the "SERVICE TECH DIAGS" Menu. DIAGNOSTICS SERVICE TECH DIAGS SET CAL %= <_> 90.00 - 110.00 FORMAT DISK VRDY: <_> READY NOT READY

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

SYMBOL	FUNCTION
Help 	DISPLAYS HELP TEXT RELATED TO THE CURRENT MENU SELECTION
PrevMenu 	DISPLAYS THE PREVIOUS MENU, MESSAGE, OR RAISES THE MENU PROGRAM TO THE NEXT HIGHER LEVEL
Enter 	IF THE DISPLAY POINTED TO IS A CHOICE (=), THEN PRESSING ENTER CAUSES THE CURRENT SELECTION TO BE ACCEPTED INTO THE PROGRAM; IF THE DISPLAY IS AN ACTION, IT IS EXECUTED IF A SUBMENU, IT IS OPENED.
Scroll  	MOVES UP OR DOWN THROUGH THE MENU SELECTIONS
Value  	PAGES UP AND DOWN THROUGH THE VARIOUS OPTIONS OR VALUES AVAILABLE FOR A PARTICULAR MENU SELECTION
LIQUID CRYSTAL DISPLAY	4 x 20 CHARACTER DISPLAY

Table 2-5. Front Panel Symbol Functional Descriptions (Continued)

SYMBOL	FUNCTION
	ERROR INDICATORS
Clear Cutter	INDICATES THAT THE DRIVE ROLLERS ARE TURNING, BUT THAT THE CUTTER ROLLERS ARE NOT. MEDIA JAM IN THE CUTTER. THE CUTTER BLADE DID NOT REACH THE OPPOSITE SIDE AFTER A CUT REQUEST.
Close Frame	INDICATES THE FRAME IS NOT COMPLETELY CLOSED AND TAKES THE PLOTTER OFF-LINE. RAISE COVER AND PRESS DOWN FIRMLY ON THE FRAME UNTIL IT LOCKS INTO PLACE AT BOTH ENDS.
Change Toner	INDICATES THAT THE TONER PARTICLES ARE PROBABLY DEPLETED. ACTIVATED BY DOT COUNTER FIRMWARE. REFER TO THE DIAGNOSTICS MENU
Close Top Cover	INDICATES THE TOP COVER IS NOT COMPLETELY CLOSED AND TAKES THE PLOTTER OFF-LINE. PRESS DOWN FIRMLY ON THE TOP COVER AT BOTH ENDS.
Align Media	INDICATES A LOSS OF VACUUM IN THE TONER SYSTEM. THE MEDIA IS NOT FEEDING SMOOTHLY. SET THE PLOTTER OFF LINE AND PRESS ADVANCE. IF THIS FAILS, RAISE COVER AND REMOVE ANY WRINKLED OR JAMMED MEDIA FROM THE PATH.
Close Toner Cap	A MICROSWITCH ON THE TONER CAP ARM DETECTED THAT THE ARM IS NOT IN A FULLY DOWN POSITION.

2-51. PEN PARAMETERS

2-52. A variety of patterns, line types, and shades of grey may be selected from the pen parameter menu on the front panel. These pen features are illustrated in Figure 2-36 through Figure 2-38 and may also be seen in the COLORS plot.

2-53. Pen Patterns. A series of 24 patterns are available. The area of the pattern visible on the plot will be determined by the line width selected. Orientation of the pattern is fixed.

2-54. Line types. See Figure 2-37. In addition to solid lines, 8 other types are available. If the line number is preceded by a plus symbol, the dash pattern is fixed, if preceded by a minus symbol the pattern is adaptive to the length of the line segment.

2-55. Gray Levels. 65 levels of shading from white through black may be selected in the pen parameter menu. Color numbers, the RGB triplet and the default pen number for the particular shade are illustrated in Figure 2-38.

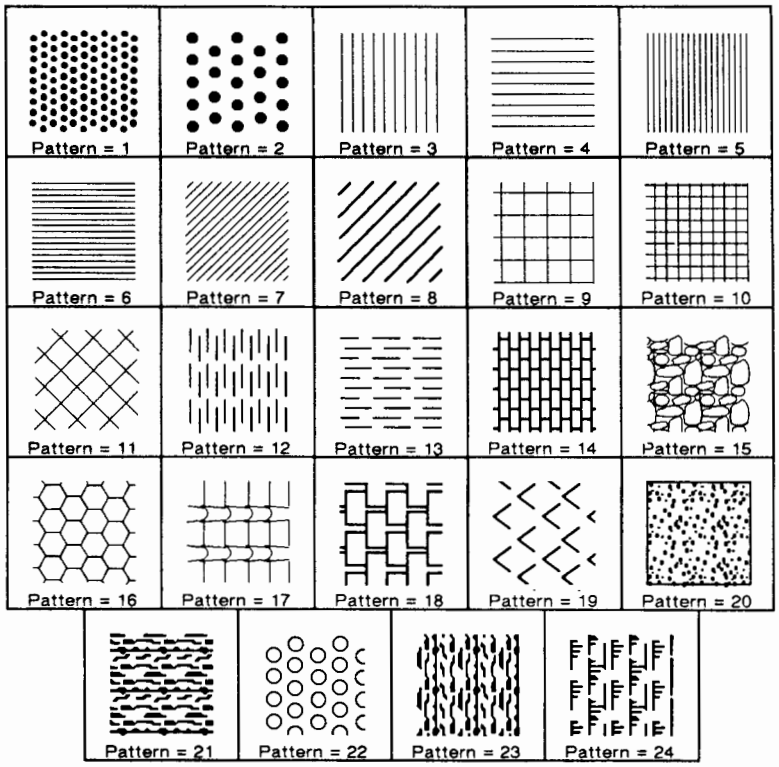


Figure 2-36. Pen Patterns

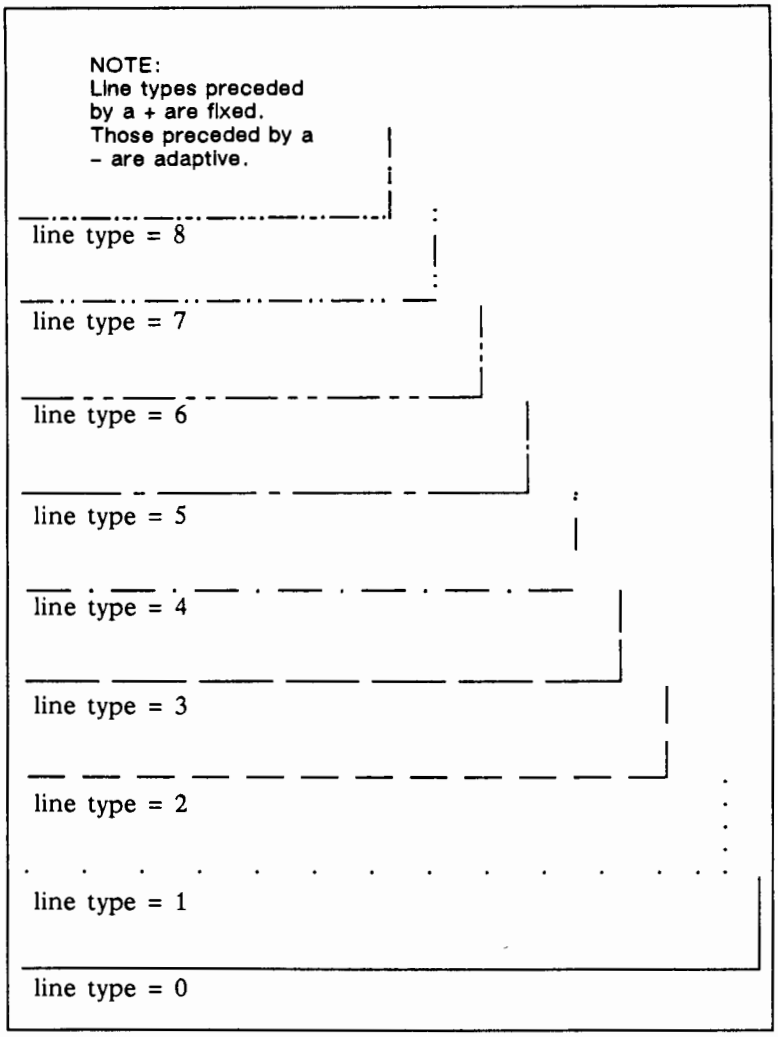


Figure 2-37. Line Types

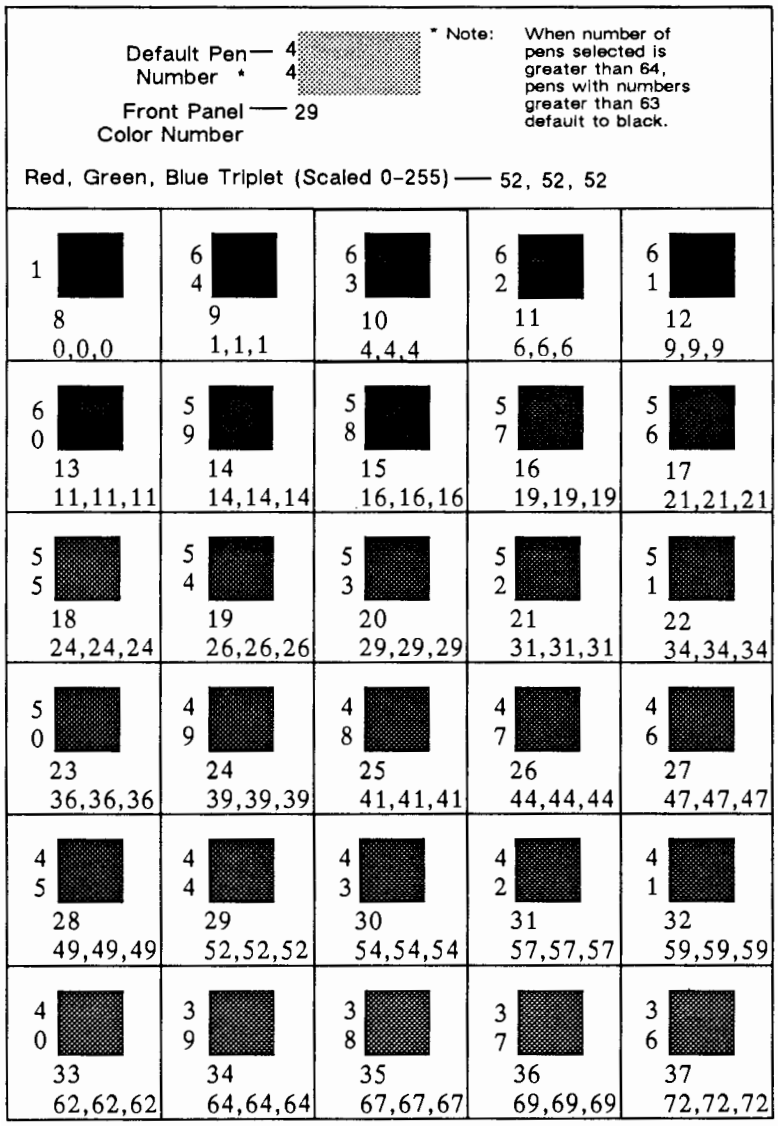


Figure 2-38. Gray Levels

35 38 74,74,74	34 39 77,77,77	33 40 80,80,80	32 41 83,83,83
31 42 86,86,86	30 43 89,89,89	29 44 92,92,92	28 45 95,95,95
27 46 99,99,99	26 47 102,102,102	25 48 106,106,106	24 49 110,110,110
23 50 114,114,114	22 51 118,118,118	21 52 123,123,123	20 53 127,127,127
19 54 132,132,132	18 55 137,137,137	17 56 142,142,142	16 57 147,147.147
15 58 152,152,152	14 59 158,158,158	13 60 164,164,164	12 61 170,170,170
11 62 176,176,176	10 63 182,182,182	9 64 189,189,189	8 65 196,196,196
7 66 203,203,203	6 67 211,211,211	5 68 218,218,218	4 69 226,226,226

Figure 2-38. Gray Levels (Continued)

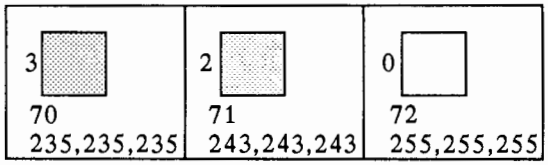


Figure 2-38. Gray Levels (Continued)

2-56. PREVENTIVE MAINTENANCE

2-57. This section contains information on keeping the Model 240D/E and 250/255 Electrostatic Plotters in the best operating condition. Included are preventive maintenance (PM) procedures and checks to be performed by the user.

WARNING

The toner (pre-mixed and clear dispersant) and vapors are combustible (flash point = 40.5 °C). Keep away from heat, sparks, and open flame. The toner contains isoparaffinic petroleum solvent.

Disconnect the plotter from the power source prior to performing any maintenance. DO NOT allow water to run on to electrical components and circuits, or through openings in the enclosure, as this can create a shock hazard.

CAUTION

The toner solution contains isoparaffinic petroleum solvent. Special disposal methods must be used for spent toner. Refer to the Material Safety Data Sheet shipped with the toner products or contact the nearest Hewlett-Packard Sales and Service Office for information.

Do not touch the writing head with your bare hands. Damage to the head may result. Wear plastic or rubber gloves. If the head is touched, clean it with approved head cleaner and a clean lint free cloth as quickly as possible.

Never use water or thinner to clean the writing head or other internal parts of the plotter. This will cause corrosion of the head and damage to plotter circuitry.

Never allow the pad roller to come in contact with the writing head. Always keep a piece of writing media or anti-rust paper over the writing head and the developer bar surface when the plotter is not in use.

To avoid damage to the plotter use only approved media and maintenance supplies.

Avoid getting toner on your clothing. It may not wash out.

Take care to prevent foreign objects from falling into the plotter. If not recovered, damage to the plotter mechanisms can occur.

2-58. EFFECT ON PRODUCT RELIABILITY

2-59. To keep the plotter in the best operating condition, and to obtain top quality plots, it is essential that the proper preventive maintenance schedule be followed. In addition to poor plot quality, a dirty or corroded writing head can lead to permanent damage to the head or to the plotter's internal circuitry.

2-60. The supplies for preventive maintenance are listed in Table 2-6. The schedule and procedures are listed in Table 2-7. Maintenance intervals specific to the toner system are listed in Table 2-8.

Table 2-6. Maintenance Supplies

DESCRIPTION	PART NUMBER
Head Cleaner	HP 92193F
Lint-Free Wipes	HP 92193W
Head Polish	HP 17290P
Clear Dispersant	HP 17297D
Protective Gloves	HP 92193G
Toner (premixed)	HP 17278T

Table 2-7. Maintenance Schedule

FREQUENCY	PROCEDURE
Initial Set-Up	Clean paper compartment Clean head Clean developer surface Clean and inspect rollers Clean exterior surfaces
Weekly or when changing media	Check output image quality Clean or polish and clean the head if necessary
Monthly	Clean paper compartment Polish and clean head Clean developer surface Clean and inspect rollers Clean exterior surfaces and filter.

Table 2-8. System Checks

PUMP ON HOURS PER MONTH	MAINTENANCE INTERVAL
100 hours or less	12 months
100 to 250 hours	6 months
250 hours or more	3 months

2-61. IMAGE QUALITY

2-62. Image quality is one of the best tools to determine the operating condition of the plotter. The following paragraph contains information which will help diagnose plotter conditions from the printed image.

2-63. Image quality is best checked by running the plotter's internal test pattern. Refer to the test pattern procedures in Section V of this handbook. Symptoms and required actions are indicated in Table 2-9. Additional information on plot quality is included in Section IV of this handbook.

Table 2-9. Quality Problems

PROBLEM	POSSIBLE CAUSE	ACTION
Low density image	Dirty or corroded writing head	Polish and clean the head
	Temperature or humidity out of optimal range: Temp. 15 to 25 °C Humidity 20 to 60 % relative	Test the plotter under correct environmental conditions
	Weak toner	Replace the toner (In typical applications a 5000 cc bottle of toner should be replaced after 500 to 700 meters of media.)
Stained image	Dirty or corroded writing head	Polish and clean the head
Fogged image	Weak toner	Replace the toner
Extraneous marks or excessive missing marks	Substandard media	Use approved supplies

2-64. CLEANING

WARNING

To prevent possible electrical shock or physical injury from moving mechanical parts, always turn the plotter OFF (O) and remove the ac line cord and the interface cable before performing any maintenance procedures.

Never allow water or other cleaning materials to come in contact with the electrical parts of the plotter.

2-65. The following cleaning procedures can be performed by the plotter user. Follow normal safety precautions, and prevent water or other cleaning materials from entering the electronics enclosure of the plotter.

2-66. GENERAL CLEANING

2-67. The exterior surfaces of the plotter should be cleaned with a soft clean cloth, dampened with warm water. Mild soap or detergent may be used if necessary. Wipe the surface dry after cleaning.

2-68. Cleaning of the paper compartment consists of removing all debris, dust and lint from the compartment with a damp cloth or with a hand held vacuum, if available.

2-69. The foam filter pad located at the lower edge of the rear cover must be removed and washed in warm water and mild soap every six months, or more often if local conditions warrant. Refer to the disassembly procedures in Chapter 6 if necessary to remove the rear cover and filter.

2-70. WRITING HEAD CLEANING AND POLISHING

2-71. The writing head should be wiped with a lint free wipe (P/N 92193W), or similar lint free cloth.

2-72. If dust, toner, or other foreign matter is stuck to the writing head, it must be cleaned with head cleaner. After cleaning, allow the head to air dry.

CAUTION

Failure to polish and clean the writing head on a regular basis can result in poor image quality and damage to the writing head.

2-73. The writing head is polished as follows:

a. Apply the approved head polish (P/N 17290P) to a lint free wipe, or similar cloth.

b. Using the wipe, apply the polish to the entire length of the writing head. See Figure 2-39.

c. Rub the entire length of the writing head, as if sanding it.

d. Wipe the polish from the head with a clean wipe.

e. Use the head cleaner (P/N 92193F) to remove all polish residue from the head.

f. Allow the head to air dry for a minimum of one minute before plotting.

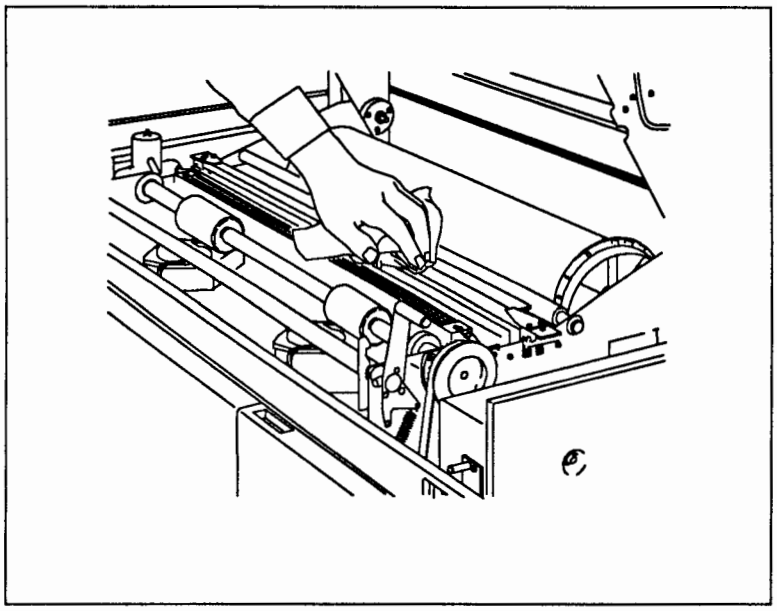


Figure 2-39. Head Cleaning

2-74. DEVELOPER BAR CLEANING

2-75. Clean the surface of the developer bar with head cleaner and a lint free wipe.

2-76. ROLLER CLEANING

2-77. The surface of the roller must be inspected for damage. It can also be cleaned with head cleaner and a lint free wipe.

2-78. TONER SYSTEM FLUSHING

2-79. The toner system must be flushed at the intervals indicated in Table 2-8. The procedure takes approximately 10 minutes.

2-80. The toner system is flushed as follows:

a. Remove the toner bottle and replace it with the bottle of clear dispersant.

b. Install media in the plotter.

c. Set the MOTOR switch to the OFF (**O**) position.

d. Press the PG switch to start the pump.

e. Allow the plotter to run for five minutes.

f. Press the PG switch again to stop the pump.

g. Remove the dispersant bottle and install the empty flushing bottle supplied with the plotter.

h. Press the PG switch to start the pump again.

i. Allow the remainder of the cleaning fluid to drain into the bottle. Stop the pump.

j. Remove the flushing bottle. Clean and store for next use.

k. Install a fresh bottle of the pre-mixed toner solution (P/N 17278T).

l. Reset all switches to their normal position.

m. Apply power (I) and run the internal test pattern to verify proper operation. Procedures for running the test pattern can be found in Section V of this handbook.

2-81. STORAGE AND HANDLING OF SUPPLIES

CAUTION

To ensure that the toner and media retain their electrical properties and high resolution imaging characteristics, the following storage and handling procedures must be followed.

2-82. The plotter media and the toner solution must be handled and stored according to certain procedures in order for the media to retain its electrostatic properties and high resolution characteristics.

2-83. MEDIA

2-84. The following procedures should be followed to assure the highest quality plots on the media:

a. Store the media in a cool, dry, well ventilated location.

b. The storage temperature for the media should not exceed 40 °C (104 °F) for more than 48 hours.

c. Media must be kept in its original packaging until ready for use.

d. Store media on end (vertical).

e. Return the media to its original packaging if not being used for 3 or more days.

f. Use the media in an operating environment of 5 to 40 °C (41 to 104 °F) and relative humidity of 30 to 80% relative.

2-85. TONER SOLUTION

WARNING

The toner (pre-mixed and clear dispersant) and vapors are combustible (flash point = 40.5 °C). Keep away from heat, sparks and open flame. The toner solution contains isoparaffinic petroleum solvent.

Not for internal use. Avoid breathing the vapors. Vapors may be hazardous to your health. Avoid contact with the skin or eyes.

FIRST AID

- **EYES – Flush with water.**
- **SKIN – Wash with soap and water.**
- **INHALATION – Move to fresh air.**
- **INGESTION – Dilute stomach contents with several glasses of water.**
  DO NOT INDUCE VOMITING.
  Seek medical assistance immediately.

CAUTION

The toner solution contains isoparaffinic petroleum solvent. special disposal methods must be used for spent toner. Refer to the Material Safety Data Sheet shipped with the toner products or contact the nearest Hewlett-Packard Sales and Service Office for information.

Disposal of the spent toner is subject to local regulation. In general it must be disposed of in a hazardous material landfill or by incineration.

2-86. The following procedure should be used for toner solution handling and storage.

a. Store in a cool, dry, well ventilated area.

b. Keep the toner solution away from exposure to direct sunlight.

c. The temperature of the toner should not be allowed to exceed 40 °C (104 °F) for more than 72 hours

d. The storage temperature should be kept between 5 and 40 °C (41 to 104 °F).

e. Shake the toner solution well before installing it in the plotter.

f. All toner spills should be cleaned up immediately.

g. Avoid inhalation of vapors.

h. Avoid toner contact with the skin. Protective gloves are recommended.

2-87. PLOTTER STORAGE

2-88. If the plotter will not be used for a month or more, the following procedures are recommended to protect the plotter from corrosion or damage.

a. Remove and properly store the media.

b. Polish and clean the writing head.

c. Clean the developer bar.

d. Cover the entire writing head and developer bar with a sheet of anti-rust paper.

e. Release the tension on the pinch roller and pad roller by installing the protective hardware used in shipping the plotter. Refer to installation procedures in this section of this handbook.

f. Close and lock the upper frame.

g. Close the top cover, and cover the plotter to protect it.

2-89. If the plotter is to be stored for an extended period of time (several months), in addition to the preceding steps, also flush the toner system. Refer to that procedure in this section.

2-90. DIAGNOSTIC AND SELF TEST

2-91. After cleaning or polishing the writing head the operation of the plotter should be checked. Refer to the procedures in Section V of this handbook for verification of operation.

NOTES

CONTENTS

TABLES

ILLUSTRATIONS

SECTION III

CONFIGURATION

3-1. CONNECTING THE COMPUTER

3-2. To connect your computer to the plotter, perform the following steps:

a. If you have not performed steps under the procedures in Section 2 of this handbook headed PRINT ENGINE INSTALLATION, VRC INSTALLATION, LINE VOLTAGE SELECTION, and CONNECTING POWER, perform them now.

b. Ensure that the plotter power switch is OFF.

WARNING

Handle plotter covers carefully when removing or installing them. Sharp edges on the covers can cause personal injury.

c. Remove the center cover. The cover can be removed by pulling it free of its snap connections.

d. Route an RS-232-C, PARALLEL, or HP-IB interface cable from the controller under the print engine and up through the access hole located just inside the front doors as shown in Figure 3-1.

e. Connect the interface cable to the appropriate connector on the front of the VRC as shown in Figure 3-1, Figure 3-2, or Figure 3-3.

f. Set the VRC interface for the appropriate interface options. Refer to paragraph "3-3. " through "3-23. " to set Models 240D/E and paragraph "3-24. " through "3-27. " to set Models 250/255.

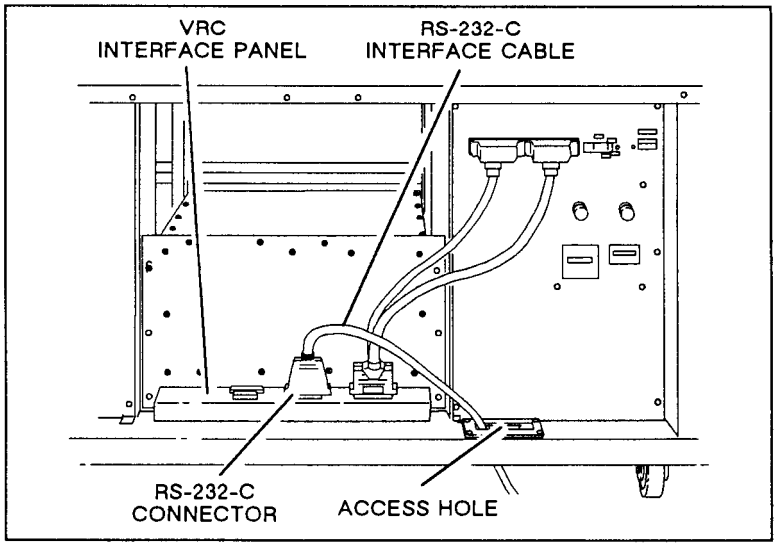


Figure 3-1. RS-232-C Cable Connection

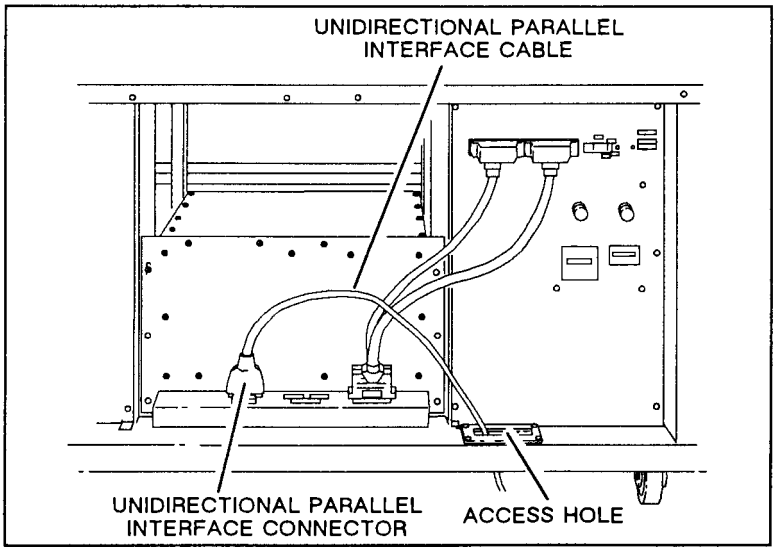


Figure 3-2. Unidirectional Parallel Interface Cable

g. The plotter is now configured to operate under the direction of the controller software.

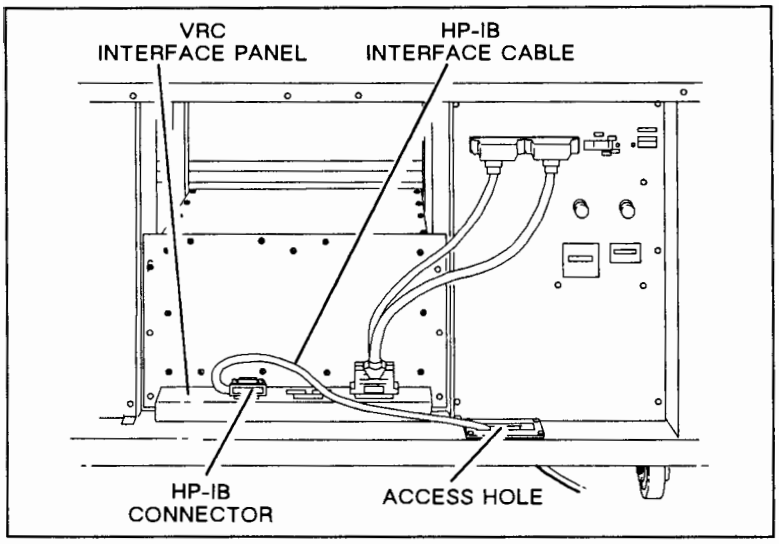


Figure 3-3. HP-IB Cable Connection

3-3. MODEL 240D/E VRC INTERFACE SWITCH SETTINGS

WARNING

Handle plotter covers carefully when removing or installing them. Sharp edges on the covers can cause personal injury.

3-4. Remove the front cover of the plotter to see the VRC Main Interconnect PCA switches. For a diagram of the switches, see Figure 3-4. If detailed troubleshooting of the plotter is necessary, the switches labeled Bench Run Selector Switch and Test Mode Switch must be set to the position shown on the figure in order to test the VRC. To find out how to run the VRC tests, refer to Section V.

3-5. The switches, RS-232-C, PARALLEL, SCS, and HP-IB are sensed at power-on. They are checked in right-to-left order. The

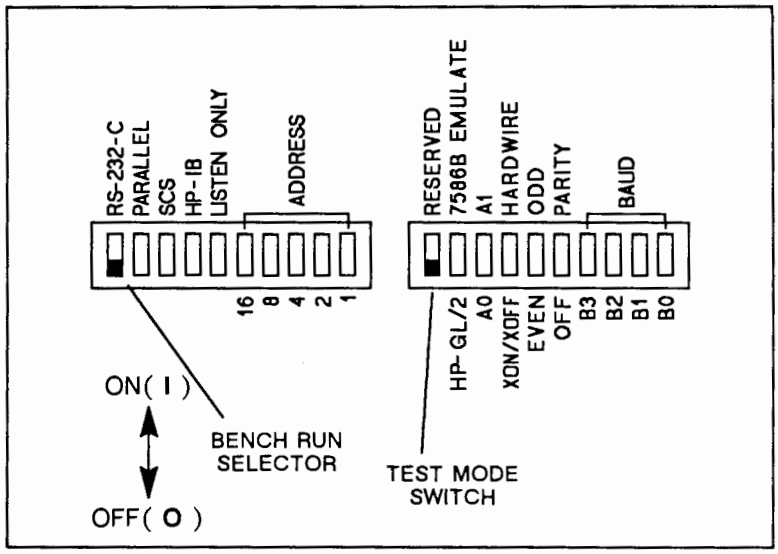


Figure 3-4. VRC Main Interconnect PCA Switches

first ON switch indicates the interface that will be activated. If all the switches are OFF, then the RS-232-C interface will be used. The switch labeled PARALLEL selects the Unidirectional Parallel interface. The Unidirectional Parallel interface is a Centronics-like interface that supports data transmission in one direction only.

3-6. The Secondary Command Support (SCS) protocol allows the plotter to use the HP-IB bus, but without monopolizing the bus in a multiuser environment.

3-7. RS-232-C INTERFACE

3-8. See Figure 3-5 for a diagram of typical switch settings for the RS-232-C interface.

3-9. Figure 3-5 shows the left group of switches with the RS-232-C switch in the ON position and the remaining switches in the OFF position. The diagram of the right group of switches shows the RESERVED switch in the OFF position. This switch is reserved for initiating diagnostic tests.

3-10. The second switch to the right is shown in the Hewlett-Packard Graphics Language/2 (HP-GL/2) position. With the switch in

the HP-GL/2 position, the plotter will carry out the core commands of the new, universal standard, single-quadrant language. If set to the "ON" position the plotter would, when polled by the controller, return the identity code of the HP 7586B.

3-11. The next switch to the right is in the A0 position. This position is valid for the HP 240E. For the HP 240D, the switch should be moved to the A1 position.

3-12. The interface is set up for HARDWIRE HANDSHAKE ON. If the controller is a personal computer, HARDWIRE HANDSHAKE should be ON. If the controller is a main frame, the XON/XOFF operation might be appropriate. Refer to your main frame computer manual for the appropriate configuration. The remaining switches are set for EVEN parity, parity ON, and a baud rate of 9600 baud.

3-13. See Table 3-1 for the baud switch settings for each baud rate. Ensure that the plotter is set for the baud rate used by the controller. To drive the RS-232-C interface with an external clock, set the baud rate switches for EXTERNAL (all switches OFF). Connect the clock signal to pin 15 or pin 17 of the RS-232-C connector. The external clock frequency range must be 15 baud through 19.2 kbaud.

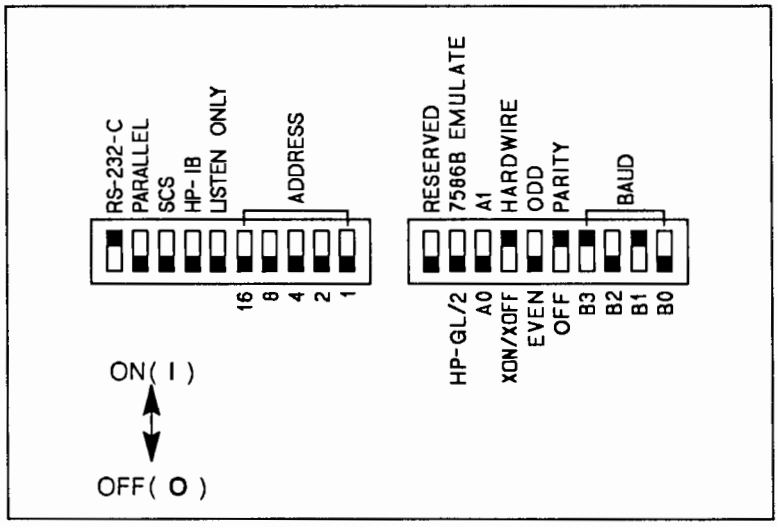


Figure 3-5. RS-232-C Interface Switch Settings

Table 3-1. Baud Rate Selection

BAUD	B3	B2	B1	B0
EXTERNAL	0	0	0	0
75	0	0	0	1
110	0	0	1	0
150	0	0	1	1
300	0	1	0	1
600	0	1	1	0
1200	0	1	1	1
2400	1	0	0	0
4800	1	0	0	1
9600	1	0	1	0
19200	1	0	1	1

3-14. The RS-232-C interface on the HP 240D/E plotter must be used in a standalone environment. Because the entire set of vectors representing the plot must be sent to the plotter before raster conversion begins, and the RS-232-C interface is relatively slow, there will be a long delay between the time the plot is sent to the plotter and the time that the image begins to be reproduced on the plotting medium.

3-15. PARALLEL INTERFACE

3-16. See Figure 3-6 for a diagram of switch settings for this mode of operation.

3-17. To set the interface switches for this mode of operation, only the second switch from the left (labeled PARALLEL) is placed in the ON position. All other switches should be in the OFF position, except for the HP-GL/2 and A0/A1, if appropriate.

3-18. HP-IB INTERFACE

3-19. See Figure 3-7 for a diagram of typical switch settings for this mode of operation.

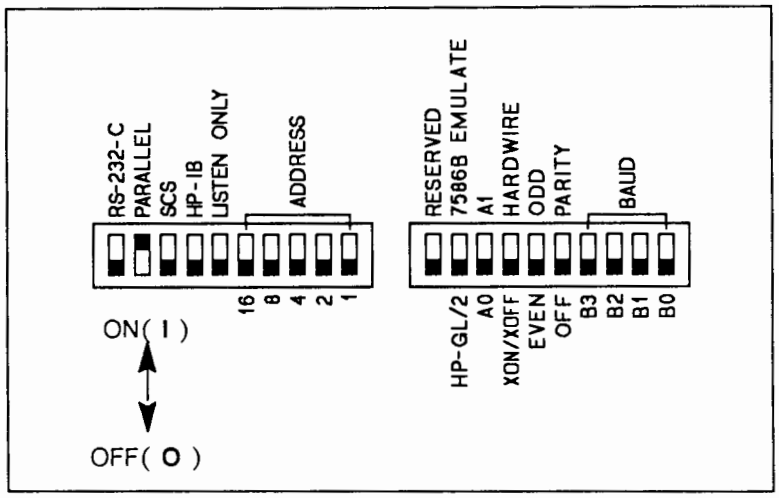


Figure 3-6. Unidirectional PARALLEL Interface Switch Settings

3-20. The HP-IB switch in the left group of switches is in the ON position, the SCS switch is in the OFF position. The ADDRESS switches are set for address 5. This address will be the one usually set for HP-IB operation. There are 32 possible settings of the ADDRESS switches (0 through 31). Refer to Table 3-2 for the available address switch settings. Ensure that the controller and plotter are set to the same address.

3-21. HP-IB INTERFACE (WITH SCS PROTOCOL)

3-22. See Figure 3-8 for a diagram of typical switch settings for this mode of operation.

3-23. The SCS switch in the left group of switches is in the ON position, the HP-IB switch is in the OFF position. Although the HP-IB switch is in the OFF position, the SCS switch indicates that the plotter will use the HP-IB interface. The ADDRESS switches are set for address 5. This address will be the one usually set for HP-IB operation, with or without SCS protocol. There are 32 possible settings of the ADDRESS switches (0 through 31). Refer to Table 3-2 for the available address switch settings. Ensure that the controller and plotter are set to the same address.

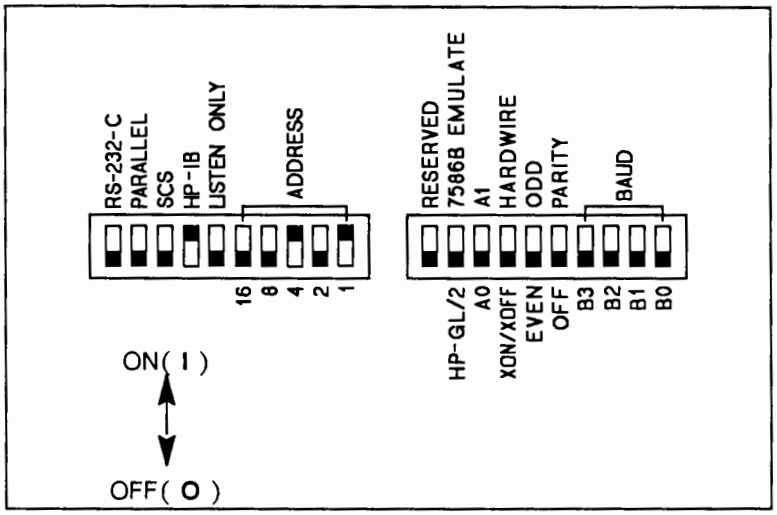


Figure 3-7. HP-IB Interface Without SCS

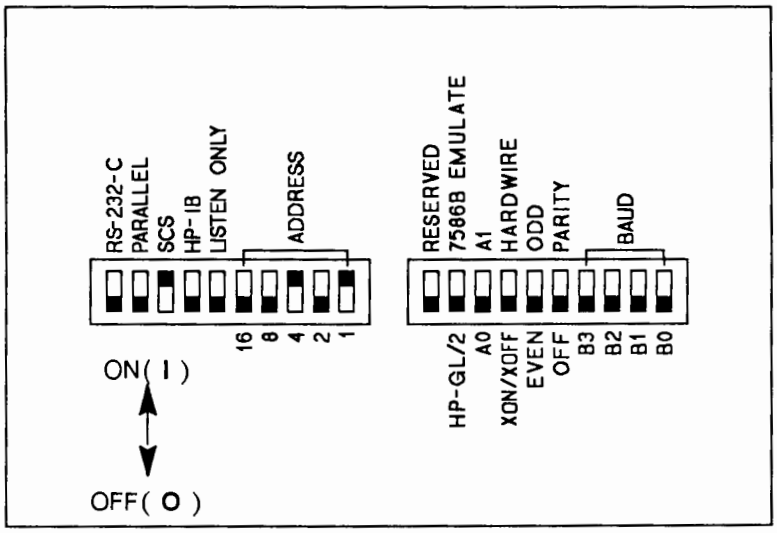


Figure 3-8. HP-IB Interface with SCS

Table 3-2. Address Switch Settings

Address	Switch Settings 1=ON/0=OFF 4	3	2	1	0
00	0	0	0	0	0
01	0	0	0	0	1
02	0	0	0	1	0
03	0	0	0	1	1
04	0	0	1	0	0
05	0	0	1	0	1
06	0	0	1	1	0
07	0	0	1	1	1
08	0	1	0	0	0
09	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0
25	1	1	0	0	1
26	1	1	0	1	0
27	1	1	0	1	1
28	1	1	1	0	0
29	1	1	1	0	1
30	1	1	1	1	0
31	1	1	1	1	1

All switch settings are binary format

3-24. MODEL 250/255 VRC INTERFACE FRONT PANEL SETTINGS

3-25. Interface functions for the Model 250/255 VRC are established through the plotter front panel. The plotter may be used with an RS-232-C, Centronics, or HP-IB interface. Refer to the appropriate paragraph for the type of interface desired.

3-26. RS-232-C INTERFACE

3-27. This bit-serial interface is selected as follows:

a. Apply power to the plotter.

b. Press the **Plotter Setup** button.

c. Press **Scroll** ↓ until the pointer in the display is at the **I/O CONFIG** = line.

d. Press the **Value +** or **Value –** button until the configure line displays:

```
I/O CONFIG=RS-232-C
```

e. Press **Enter** to select the RS-232-C interface. The display will show.

```
PLOTTER SETUP                ↓
SET I/O      RS-232-C
  PARITY     =
→BAUD        =
```

f. Press the **Value +** or **Value –** button to display the desired parity mode. Choices are:

g. When the desired mode is displayed, press **Enter** to select.

h. Press **Scroll** ↓ once. The arrow will be at the **BAUD** selection, and the **HANDSHAKE** selection will appear.

i. Press the **Value +** or **Value -** button to display the desired baud rate. Choices are:

```
PARITY      =SPACE                ↓
              MARK
              OFF
              ODD
              EVEN
```



```
PLOTTER SETUP                     ↓
SET I/O       RS-232-C
→BAUD         =
 HANDSHAKE=
```

```
→BAUD       =   600               ↓
              1200
              2400
              4800
              9600
             19200
             38400
```

j. When the desired mode is displayed, press **Enter** to select.

k. Press **Scroll** ↓ once. The arrow will be at the **HANDSHAKE** selection.

```
PLOTTER SETUP                     ↑
SET I/O       RS-232-C
 BAUD         =
→HANDSHAKE=
```

l. Press the **Value +** or **Value –** button to display the desired handshake mode. Choices are:

```
→ HANDSHAKE=HARDWIRE
                XON/XOFF
```

m. When the desired mode is displayed, press **Enter** to select.

n. This completes the RS-232-C interface set-up. Press **Prev Menu** to exit.

3-28. CENTRONICS INTERFACE

3-29. This unidirectional 8-bit parallel interface is the plotter default. To set up the Centronics interface:

a. Apply power to the plotter.

b. Press the **Plotter Setup** button.

c. Press **Scroll** ↓ until the pointer in the display is at the **I/O CONFIG** = line.

d. Press the **Value +** or **Value –** button until the configure line displays:

```
PLOTTER SETUP                    ↓
  MEDIA HDLG  =
  GRAPH LANG  =
→ I/O CONFIG    =CENTRNCS
```

e. Press **Enter** to select the Centronics interface. The display will show:

```
I/O now Centronics
There are no further
parameters.
```

f. Press PrevMenu to exit.

g. This completes the Centronics interface set-up.

3-30. HP-IB INTERFACE

3-31. The Hewlett-Packard Interface Bus is an 8-bit parallel, byte-serial, bidirectional interface. The interface is set up as follows:

a. Apply power to the plotter.

b. Press the **Plotter Setup** button.

c. Press **Scroll** ↓ until the pointer in the display is at the **I/O CONFIG** = line.

d. Press the **Value +** or **Value –** button until the configure line displays:

```
I/O CONFIG=HP-IB
```

e. Press **Enter** to select the HP-IB interface. The display will show:

```
PLOTTER SETUP                    ↓
SET I/O      HP-IB
→ADDRESS=<nn>
 SCS         =<ON or OFF>
```

f. The scrolling arrow will indicate the Address line. The available selections are addresses **00** through **30** and **LISTEN ONLY.**

g. Press the **Value +** or **Value –** button until the address line displays the desired value.

h. Press **Enter** to select the desired address.

i. Press **Scroll** ↓ once. The display will be as follows:

j. Press the **Value +** or **Value –** button until the secondary Command Set line displays the desired state.

k. Press **Enter** to select the desired state.

```
PLOTTER SETUP                    ↓
SET I/O      HP-IB
  ADDRESS=05  (selected address)
→SCS         =<ON or OFF>
```

1. This completes the HP-IB interface set-up. Press **Prev Menu** to exit.

3-32. INTERCONNECTION

3-33. The interface cables and connectors required to connect the plotter to the controller are determined by the type of interface being used in the plotter and the type of controller being used. Refer to the HP Computer Users Catalog (HP P/N 5953-2450D) for available interface cables and connectors.

CONTENTS

TABLES

ILLUSTRATIONS

SECTION IV

TROUBLESHOOTING

4-1. INTRODUCTION

4-2. The HP 7600 Models 240D/E and 250/255 have an internal diagnostic routine that is performed upon every power-up sequence and comprehensive built-in operating tests that can be used as aids in troubleshooting. These diagnostic aids are described in Section V of this handbook. Use the diagnostic aids to quickly isolate a problem to a major assembly and as a guide in verifying proper operation after a repair is performed.

4-3. COMMON ERROR INDICATIONS

4-4. Table 4-1 lists some of the more common error indications that can be seen in the operation of the plotter. Check the possible causes and take the indicated corrective action.

Table 4-1. Troubleshooting Chart

INDICATION	POSSIBLE CAUSE	ACTION
Media indicator (yellow) flashing & horn beeping.	Recording media incorrectly loaded	Reload the media.
	Out of media	Load media. Refer to the troubleshooting flowchart in this section.

Table 4-1. Troubleshooting Chart (Continued)

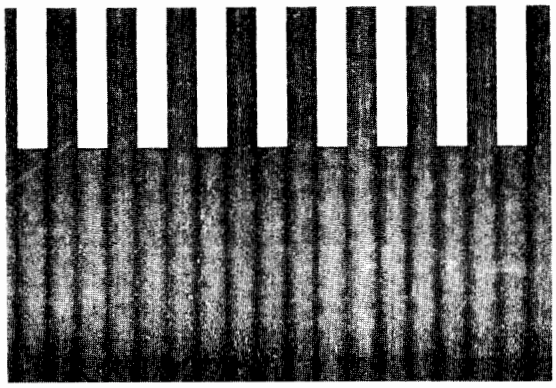
INDICATION	POSSIBLE CAUSE	ACTION
Close Frame indicator on	Upper frame not locked	Lock the upper frame.
	No toner bottle installed	Install toner bottle.
	Top cover open	Close top cover.
		Refer to the troubleshooting flowchart in this section.
Align Media indicator on & horn beeping	Recording media incorrectly loaded	Reload the media.
	Media skewed	Reload the media.
		Refer to the troubleshooting flowchart in this section.
First plot(s) very light	Low humidity environment	Use premium grade media
		Advance media 1 to 2 meters before plotting.
		Increase the humidity of the environment. (30% to 80% RH recommended)

Table 4-1. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Random streaking	Low humidity environment	Advance media 1 to 2 meters before plotting.
	Contrast set too high	Lower the contrast setting.
Excessive flaring	Low humidity environment	Advance media 1 to 2 meters before plotting. Increase the humidity of the environment. (30% to 80% RH recommended)
	Contrast set too high	Lower the contrast setting.
Smearing and smudging	Loss of vacuum	Refer to loss-of-vacuum troubleshooting Table 4-2 just after the descriptions of image quality problems that follow this table.

4-5. IMAGE QUALITY PROBLEMS

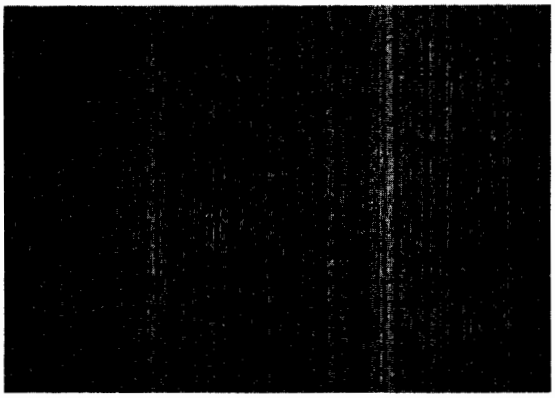
4-6. The actual output of the plotter can be used as an aid in isolating problems both internal to the plotter and those caused by external conditions. Compare a sample of the defective plot with the following illustrations to determine the probable cause of the problem and then take the suggested corrective action.



Solid black area not uniform in density

CAUSE	SOLUTION
1. Moisture content of the media is low.	a. Advance media up to 12 feet to reach protected media. b. Use premium grade media. c. Increase the humidity of the environment. For example, use a humidifier. For best results, run at 23 °C 40 to 60 % RH
2. Low conductivity	a. Use the Darker function, or upgrade to premium grade media.
3. Defective media	a. Replace the roll of media.
4. High humidity	a. Use report grade media or lower the humidity.

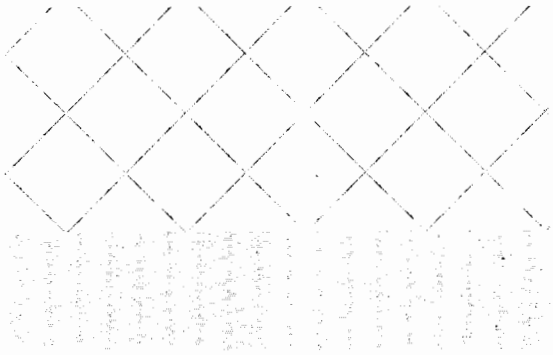
Figure 4-1. Print Sample-Excessive Banding



Dark uneven lines

CAUSE	SOLUTION
1. Writing head dirty	a. Clean the writing head.
2. Writing head corroded	a. Polish and clean the writing head.
3. Writing head defective	a. Troubleshoot the writing head.

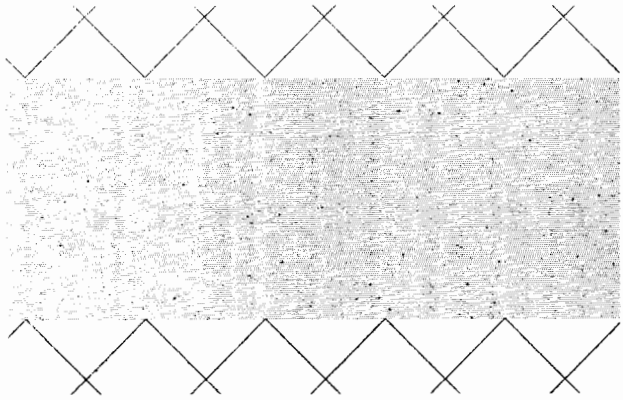
Figure 4-2. Print Sample-Streaking



Broken lines

CAUSE	SOLUTION
1. Writing head dirty	a. Clean the writing head.
2. Writing head corroded	a. Polish and clean the writing head.
3. Moisture content of the media is low.	a. Advance media up to 12 ft. to reach protected media. b. Use premium grade media c. Increase the humidity of the environment. For example, use a humidifier. For best results, run at 23 °C 40 to 60 % RH.
4. Contrast setting is too low.	a. Adjust the Contrast. (Section VI)
5. Defective media	a. Replace the roll of media.
6. Line width too thin for environmental conditions.	a. Use the Enhance feature.

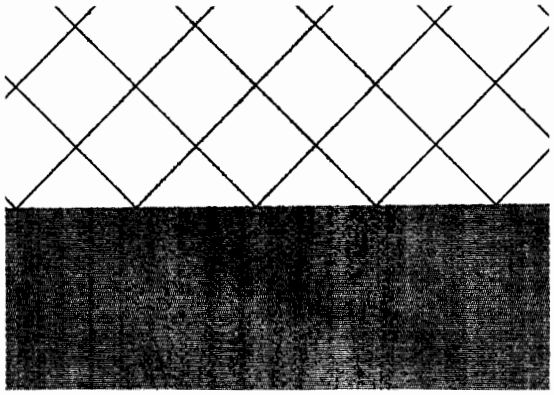
Figure 4-3. Print Sample-Excessive Dropouts



Toner deposited in background (white) areas

CAUSE	SOLUTION
1. Porous coating on media	a. Replace the roll of media
2. No image - only grey background	a. Media improperly installed. Reverse the roll of media.
3. Writing head dirty	a. Clean the writing head.
4. Contrast setting too high	a. Decrease the Contrast setting.

Figure 4-4. Print Sample-Fogging



Excess toner deposited (Flaring)

CAUSE	SOLUTION
1. Contrast setting too high	a. Decrease the Contrast setting.
2. Low humidity environment	a. Increase the humidity of the environment. For example, use a humidifier. For best results, run at 23 °C 40 to 60 % RH.
3. Apparent after head cleaning	a. Run a few plots or wait a period of time.
4. Defective media	a. Replace the roll of media.
5. High humidity environment	a. Use report grade media or lower humidity.
6. High voltage power supply failure	a. Troubleshoot the high voltage supply.

Figure 4-5. Print Sample-Flares

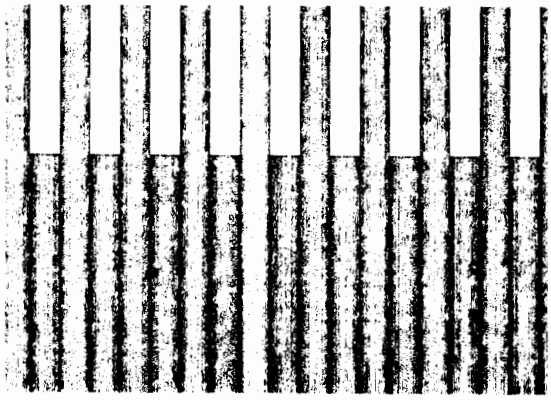


Image not dark enough

CAUSE	SOLUTION
1. Low humidity environment	a. Advance media up to 12 feet to reach protected media. b. Use premium grade media. c. Increase the humidity of the environment. For example, use a humidifier. For best results, run at 23 °C 40 to 60 % RH.
2. Low conductivity media	a. Use the Darker function or upgrade to premium grade media.
3. Toner depleted	a. Replace the toner.
4. Contrast setting too low	a. Increase the Contrast setting.

(Continued on next page)

Figure 4-6. Print Sample-Low Density

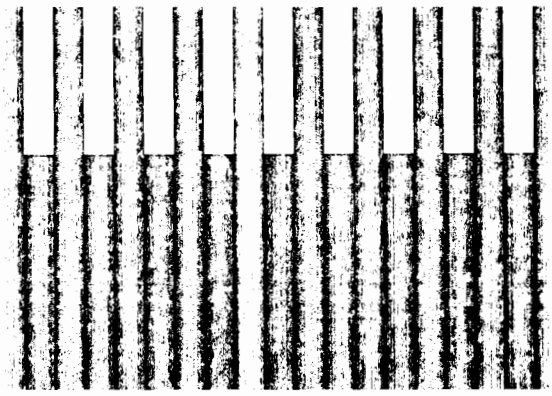
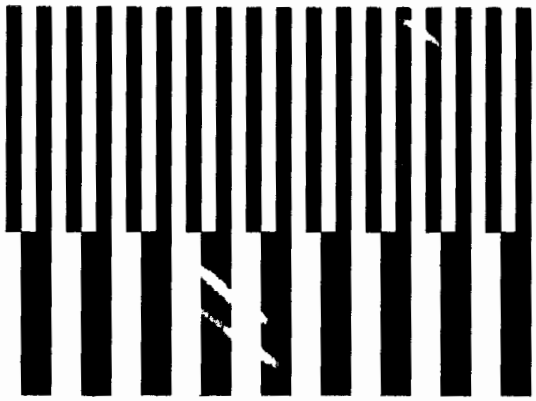


Image not dark enough (Continued)

CAUSE	SOLUTION
5. Defective media	a. Replace the roll of media.
6. Media switch in the wrong position	a. Set for the type of media loaded.

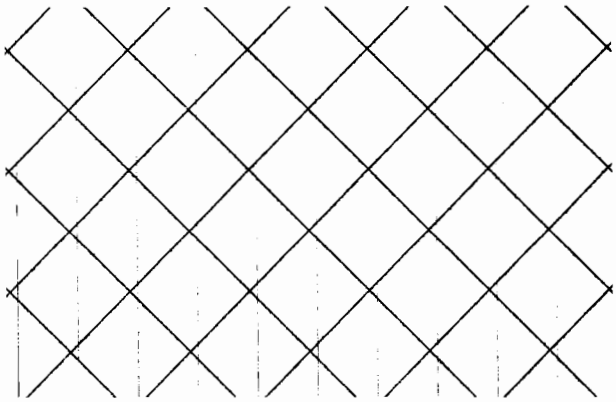
Figure 4-6. Print Sample-Low Density (Continued)



Toner not deposited at random spots

CAUSE	SOLUTION
1. Media defective	a. Advance the roll to determine if the problem exists throughout. Replace the roll.
2. Damaged media roll	a. Advance the roll to determine if the problem exists throughout. Replace the roll.
3. Media improperly loaded	a. Remove the media and reload it.
4. Media skewed	a. Troubleshoot the paper-feed system.

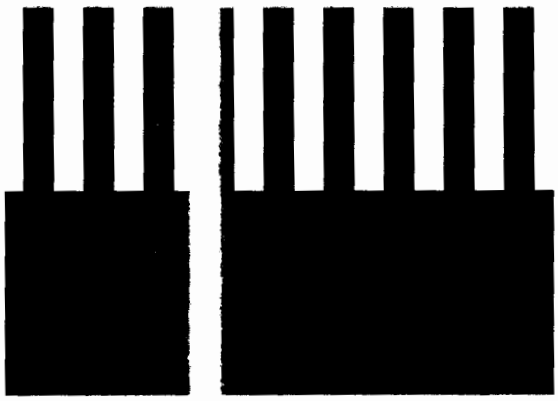
Figure 4-7. Print Sample-Random Breaks or Streaks



Toner deposited in background (white) areas

CAUSE	SOLUTION
1. Contrast setting too high	a. Decrease the Contrast setting.
2. Writing head dirty	a. Clean the writing head.
3. Developer Bar dirty	a. Clean the developer bar.
4. Pin electrode failure	a. Troubleshoot the pin electrode circuit.
5. High voltage power failure	a. Troubleshoot the high voltage supply.
6. Low humidity environment	a. Increase the humidity of the environment. For example use a humidifier. For best results, run at 23 °C 40 to 60 % RH.

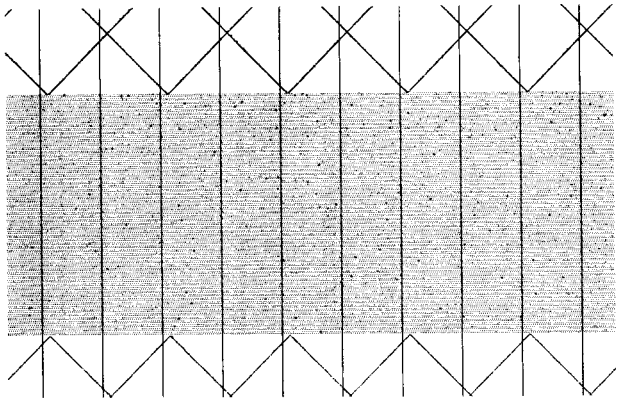
Figure 4-8. Print Sample-Background Graying



4 mm (Approx.) vertical white band

CAUSE	SOLUTION
1. Control electrode failure	a. Troubleshoot the control electrode circuit. (Procedure given later in this section.)

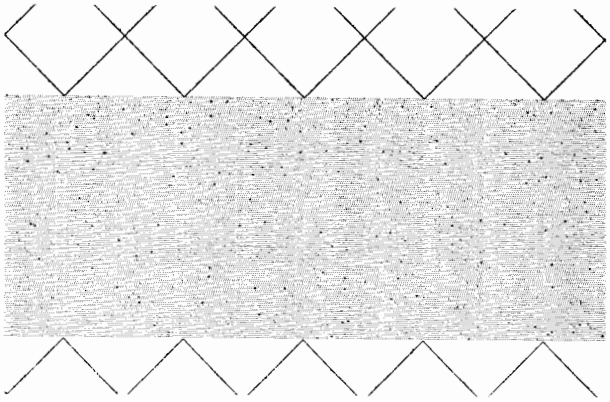
Figure 4-9. Print Sample-Control Electrode Failure



Black vertical lines at 8 mm intervals

CAUSE	SOLUTION
1. Pin electrode failure (ON)	a. Polish and clean the writing head. b. Troubleshoot the pin electrode circuitry. (Procedure given later in this section.)

Figure 4-10. Print Sample-Pin Electrode Failure (ON)



White vertical lines at 8 mm intervals

CAUSE	SOLUTION
1. Pin electrode failure (OFF)	a. Polish and clean the writing head. b. Troubleshoot the pin electrode circuitry.
2. Writing head failure	a. Troubleshoot the writing head. (Procedure given later in this section.)

Figure 4-11. Print Sample-Pin Electrode Failure (OFF)

Table 4-2. Loss of Vacumm Troubleshooting

INDICATION	POSSIBLE CAUSE	ACTION
Horn beeping at the beginning of plot	Dry, wrinkled media	Cycle power, Advance media six to eight inches before plotting.
Large toner smear across beginning of the plot	Dry wrinkled media	Advance media before plotting, or, if the environment is below 30% RH, increase humidity.
Plot start, media advances, but no image	Vacuum solenoid problem	Lightly tap on solenoid housing. If problem not solved, trouble–shoot per Figure 4-22 flowchart.
Media skews,	Pinch Roller Center Bearing our of adjustment	Adjust center bearing per the procedure in Section VI paragraph 6-18 of this handbook.

4-7. TROUBLESHOOTING FLOWCHARTS

4-8. The troubleshooting flowcharts include detailed information on fault isolation. When an error indication is noted, and the common or usual action will not correct the problem, follow the related flowcharts to isolate and eliminate other possible causes.

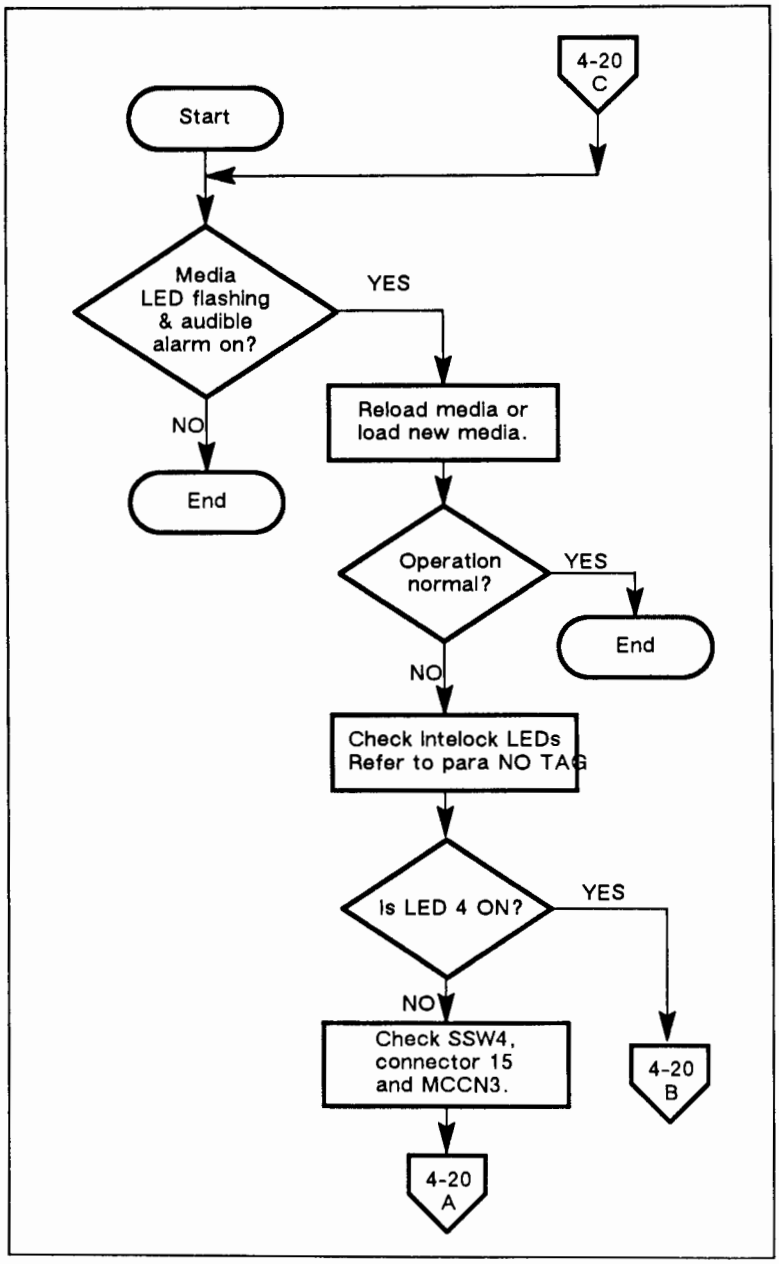


Figure 4-12. Media Quantity Error Troubleshooting

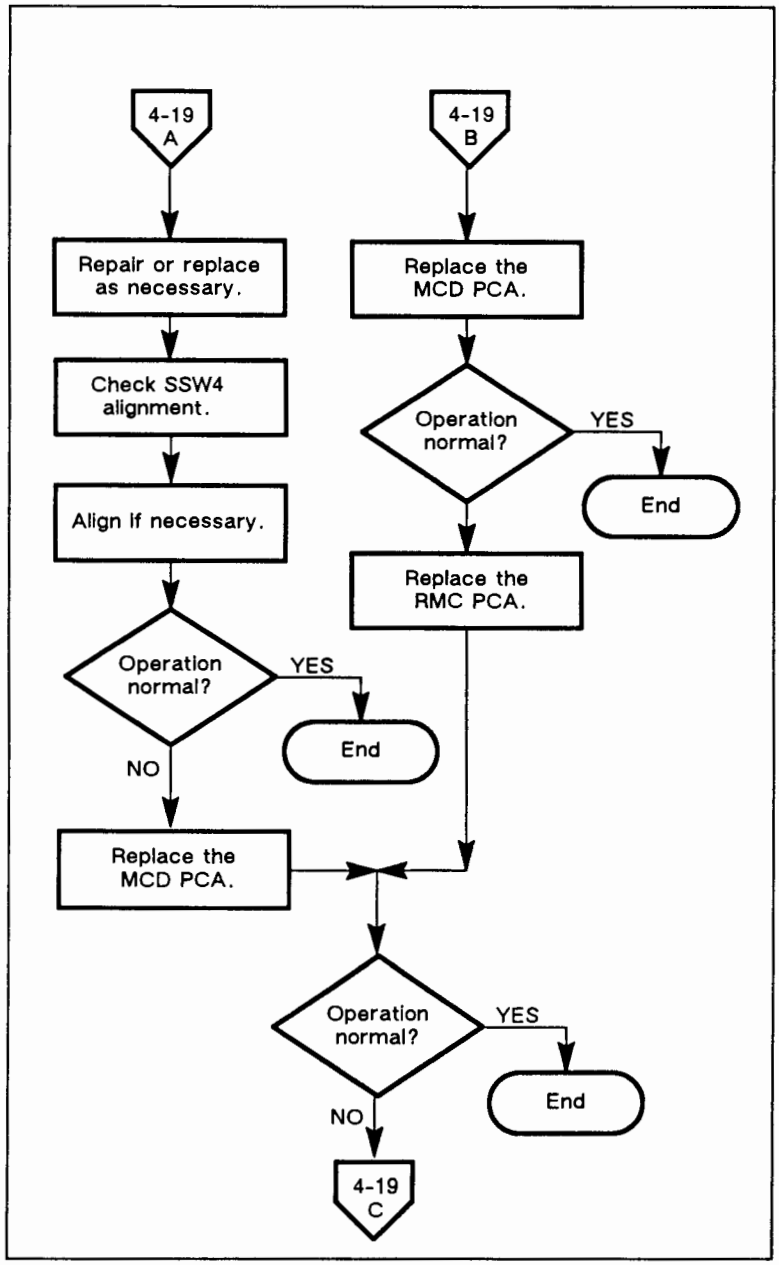


Figure 4-12. Troubleshooting Flow Chart (Continued)

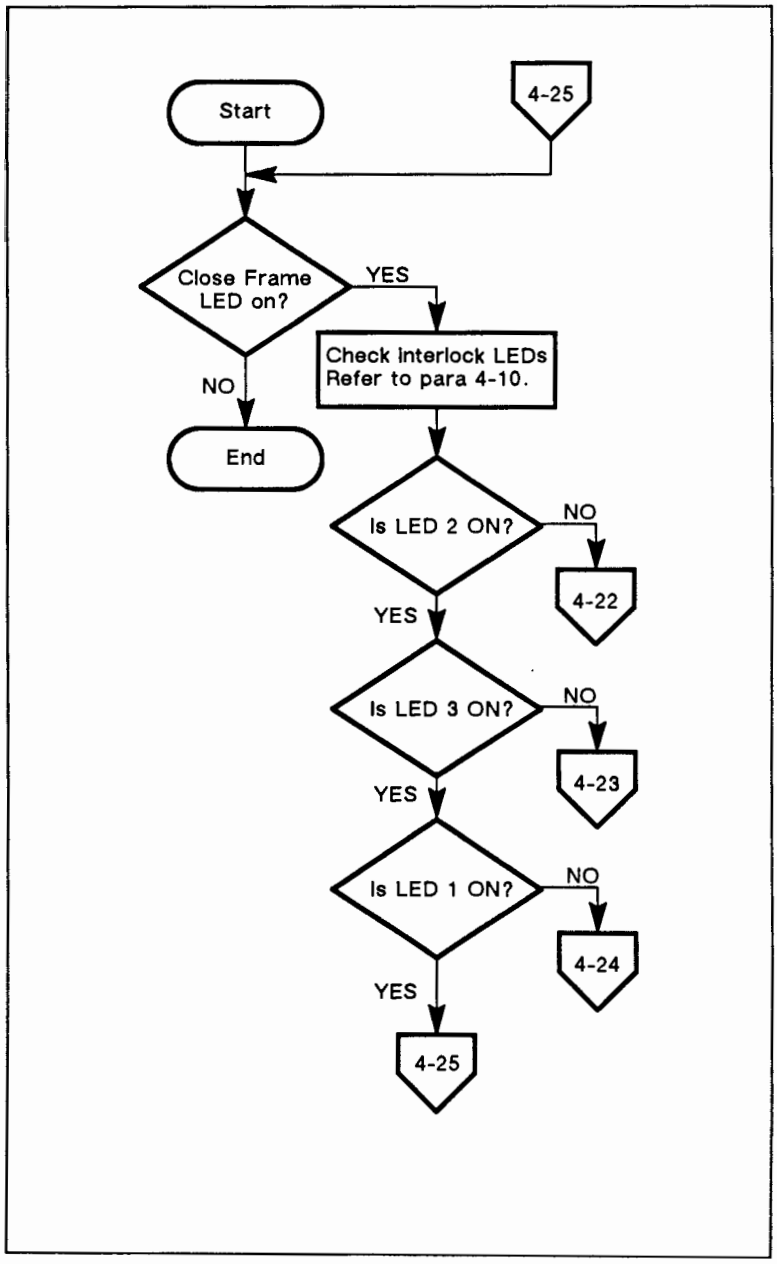


Figure 4-13. Close Frame Error Troubleshooting

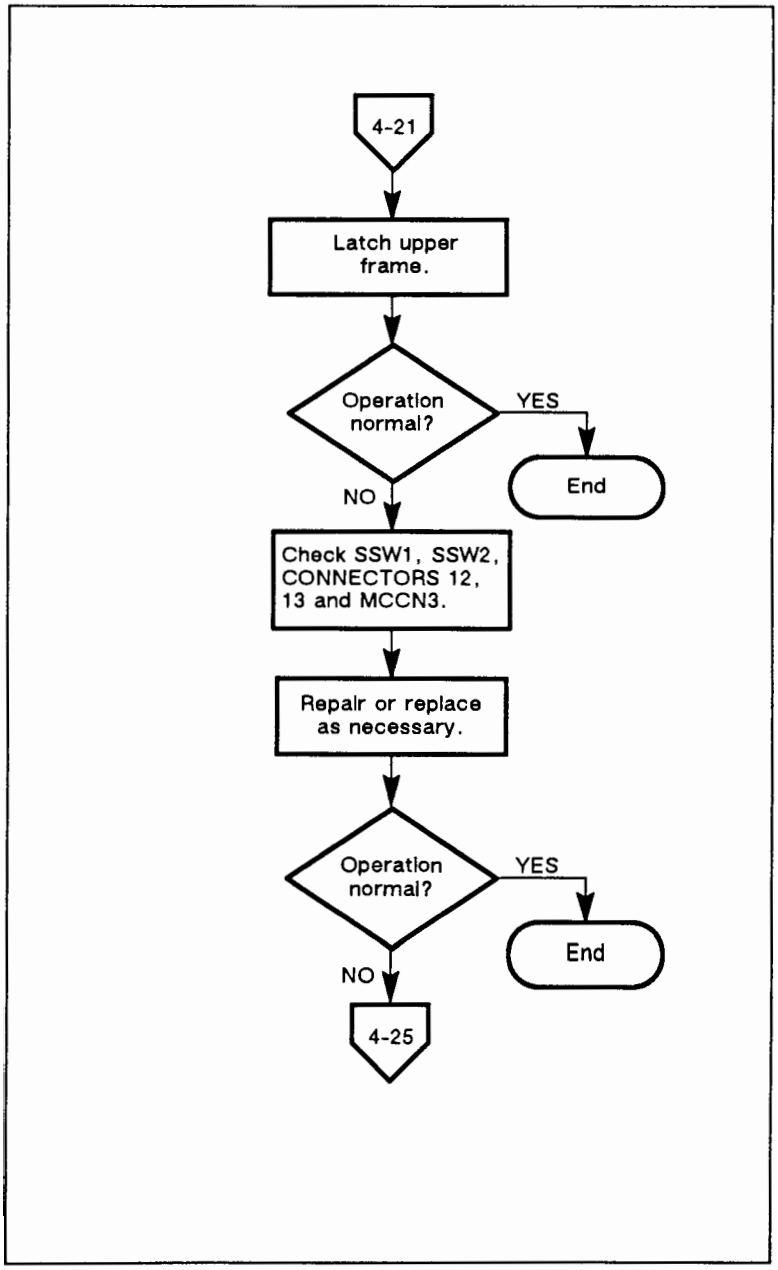


Figure 4-13. Close Frame Error Troubleshooting (Continued)

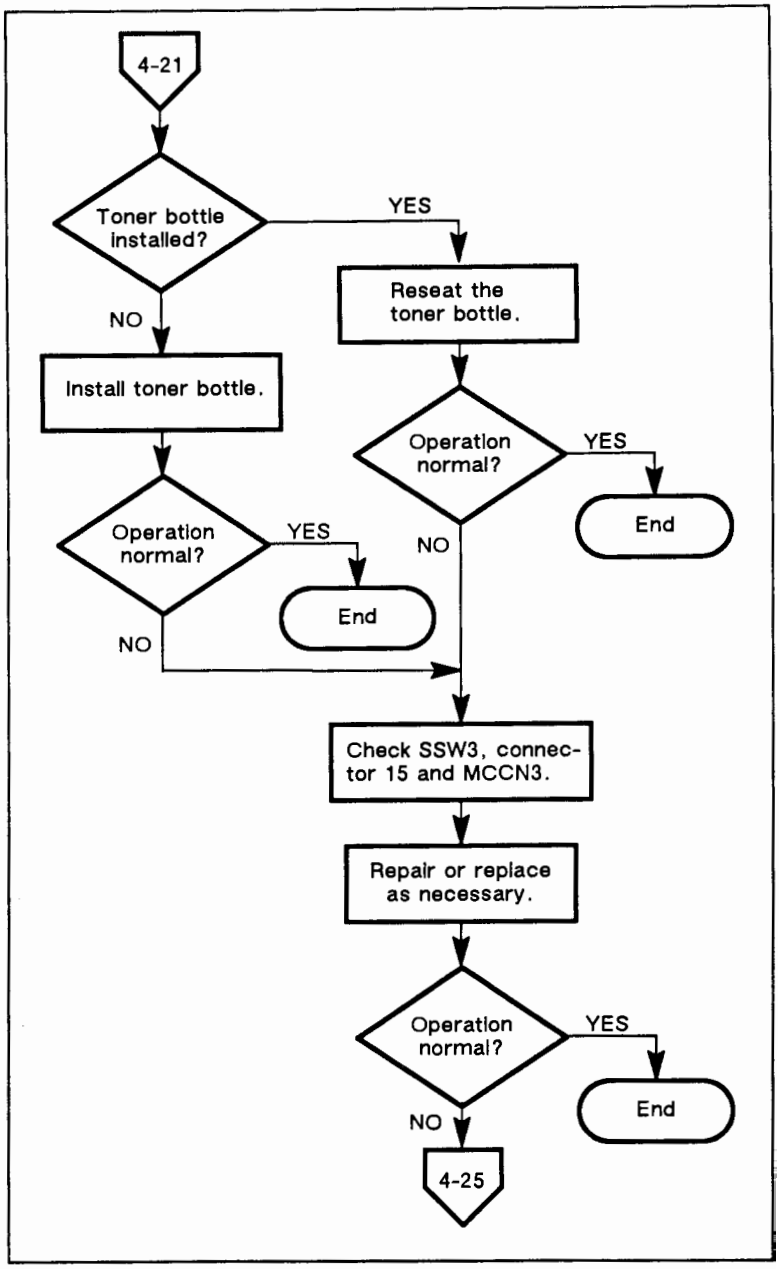


Figure 4-13. Close Frame Error Troubleshooting (Continued)

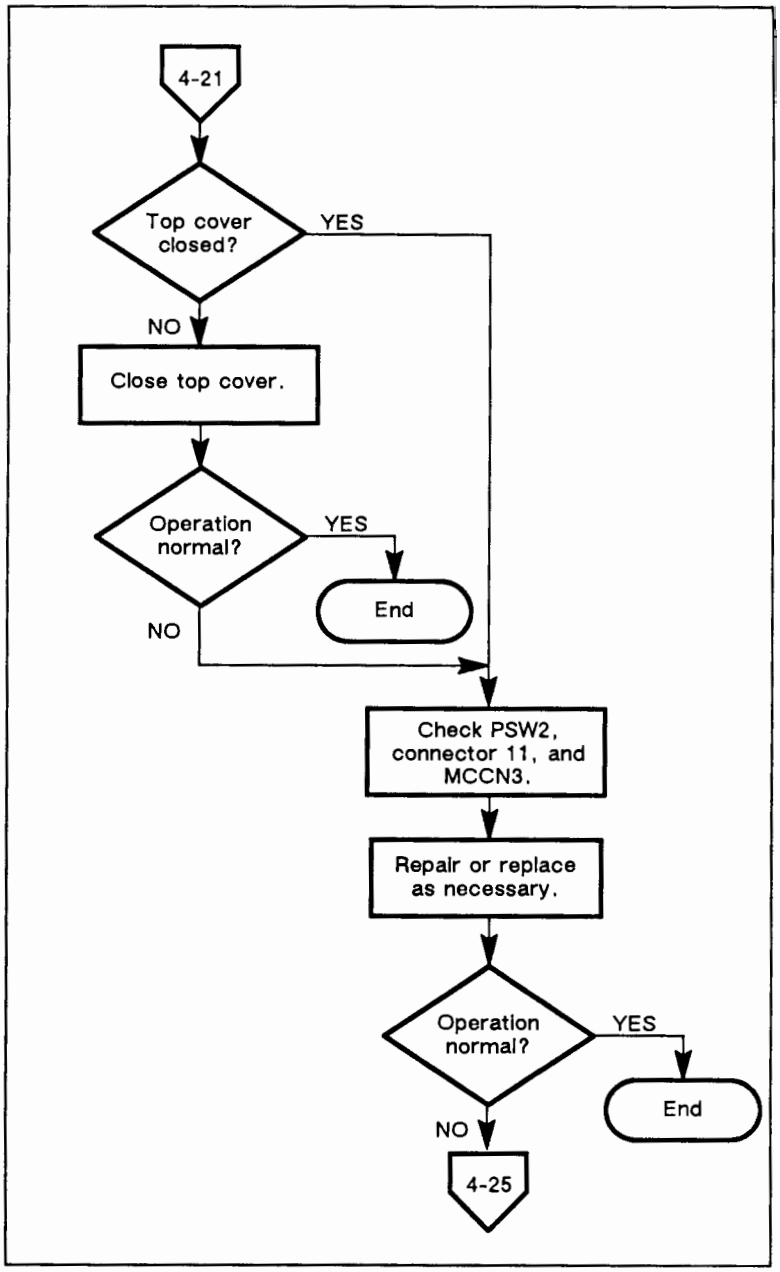


Figure 4-13. Close Frame Error Troubleshooting (Continued)

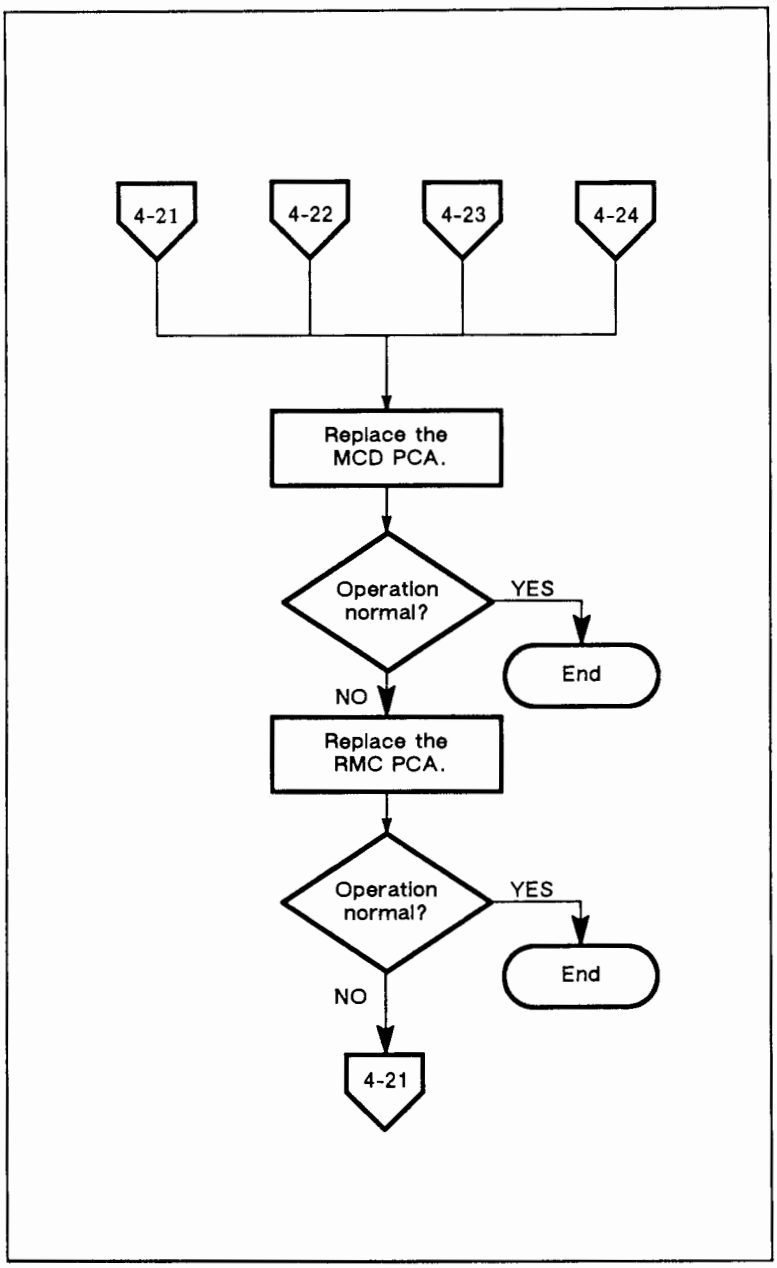


Figure 4-13. Close Frame Error Troubleshooting (Continued)

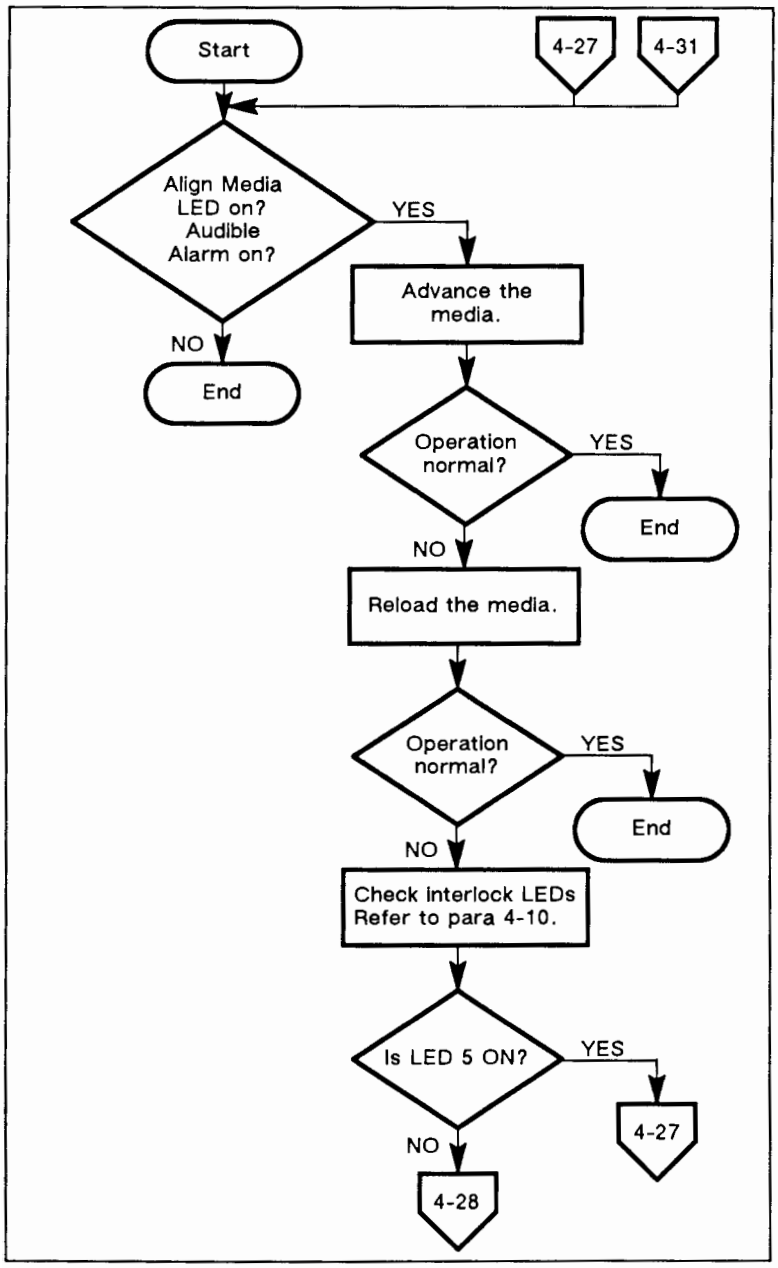


Figure 4-14. Align Media Error Troubleshooting

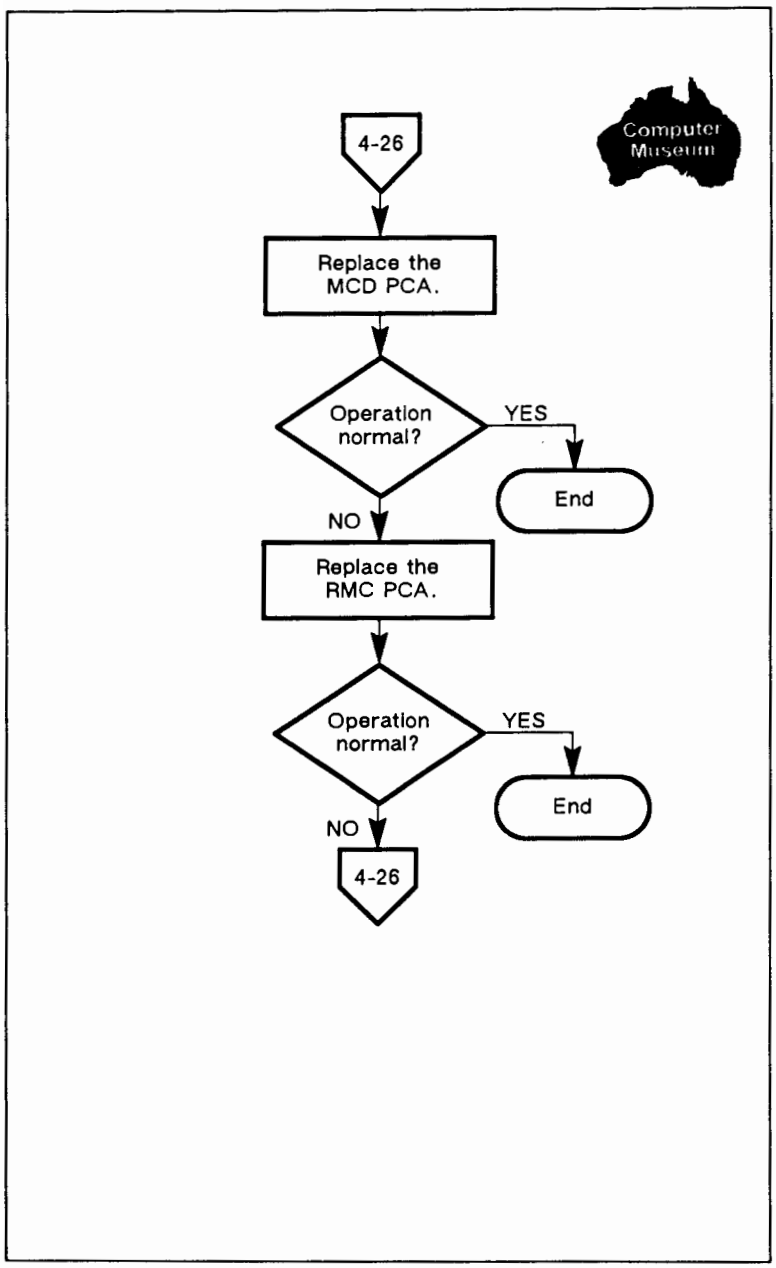


Figure 4-14. Align Media Error Troubleshooting (Continued)

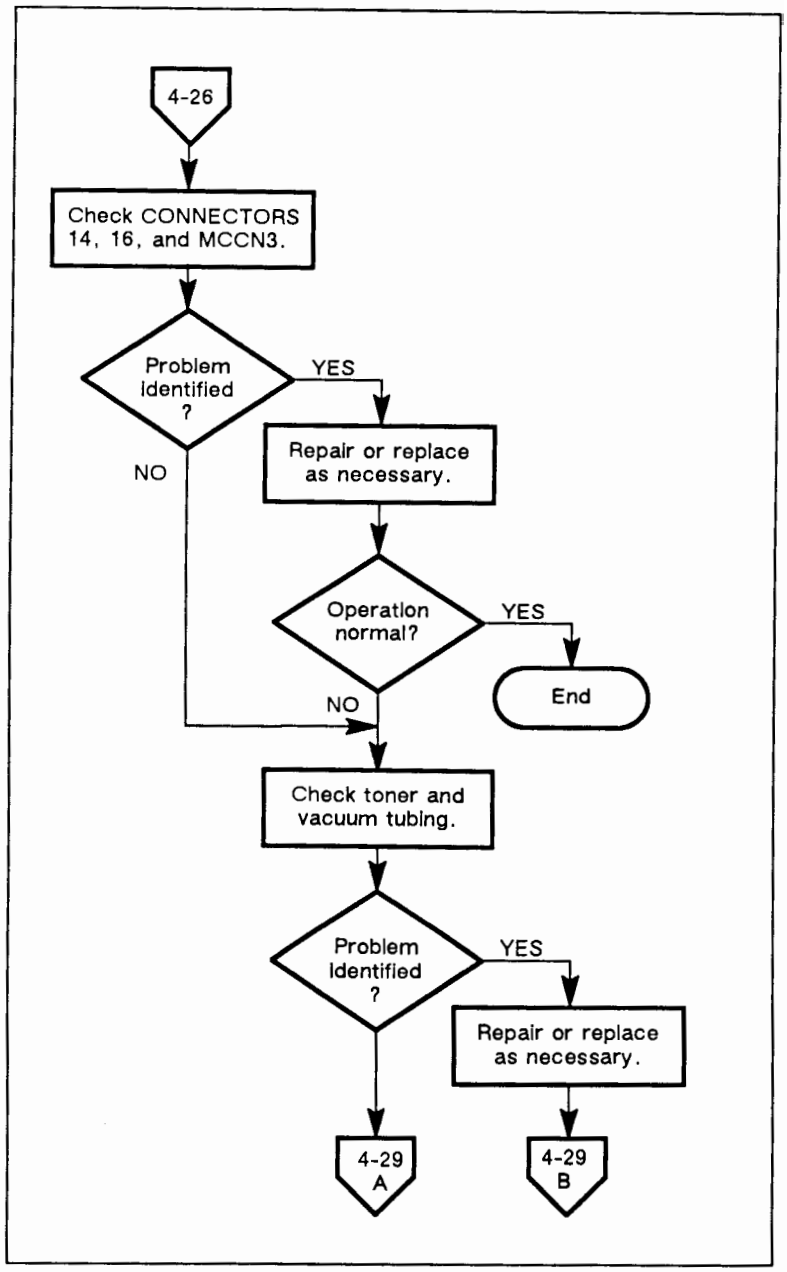


Figure 4-14. Align Media Error Troubleshooting (Continued)

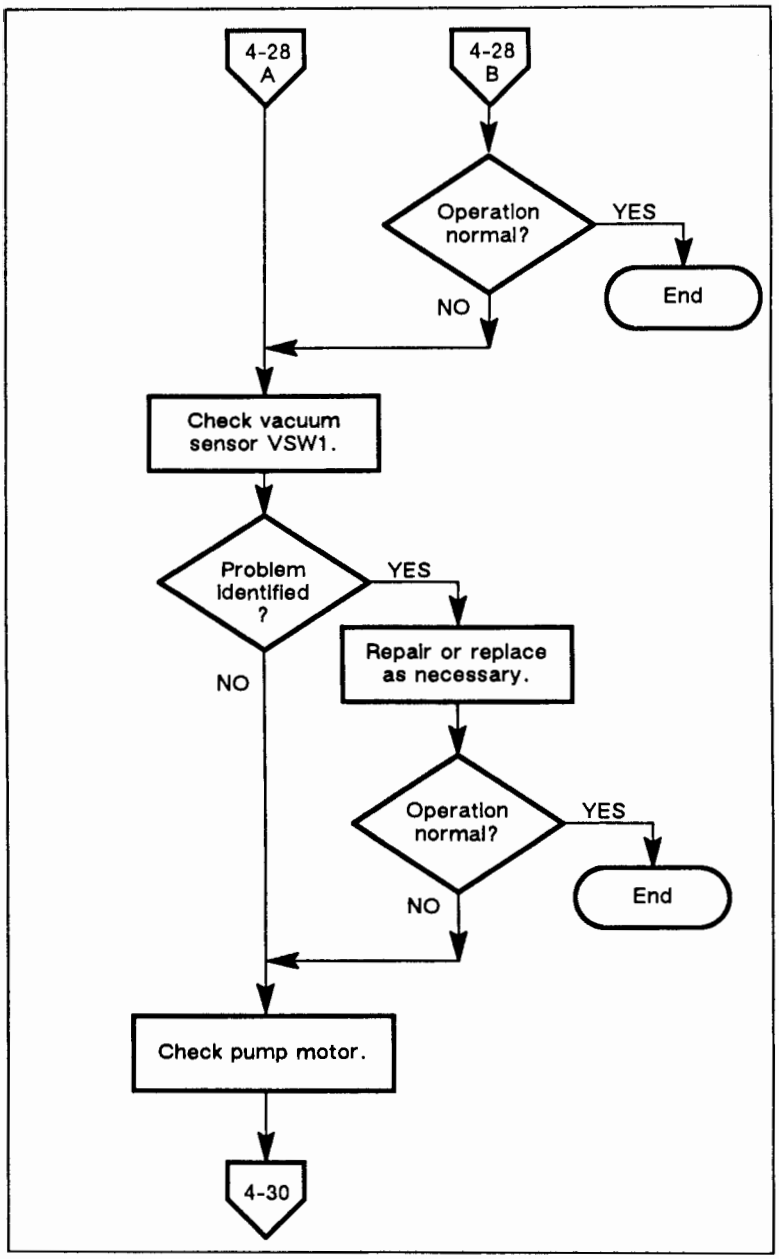


Figure 4-14. Align Media Error Troubleshooting (Continued)

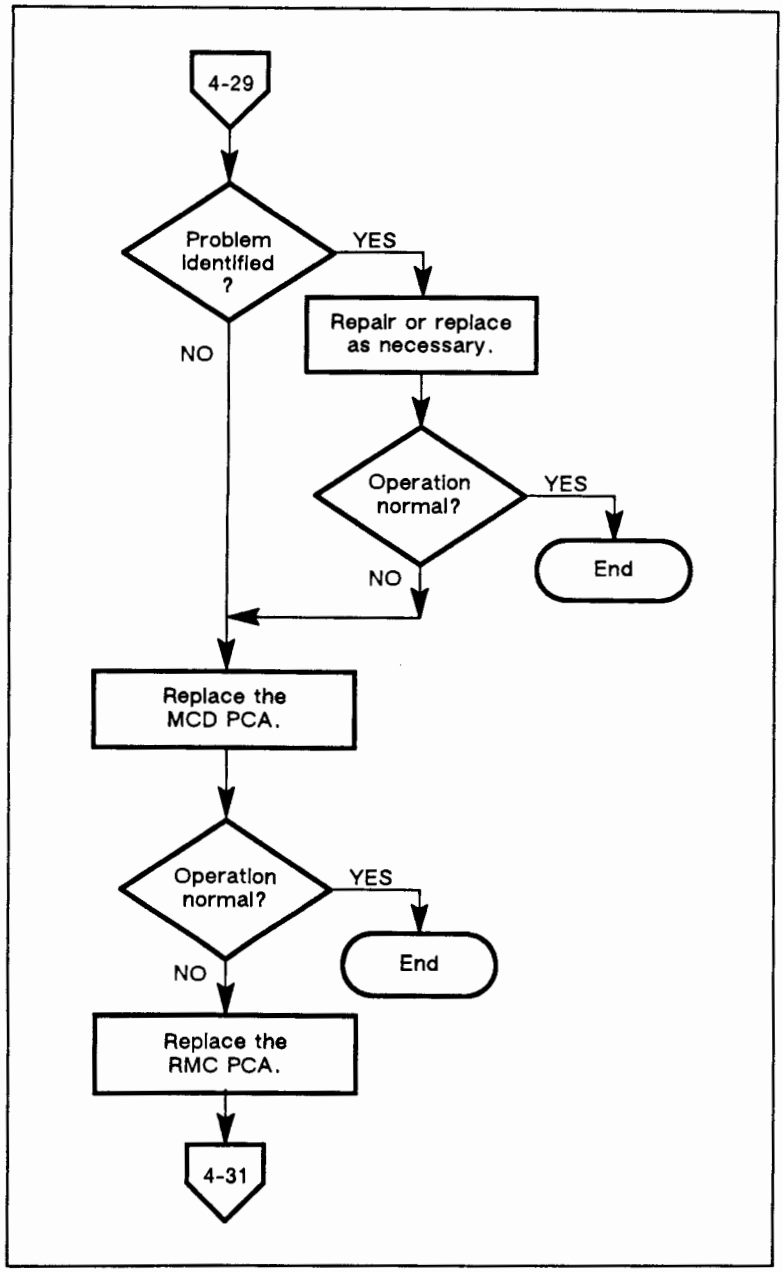


Figure 4-14. Align Media Error Troubleshooting (Continued)

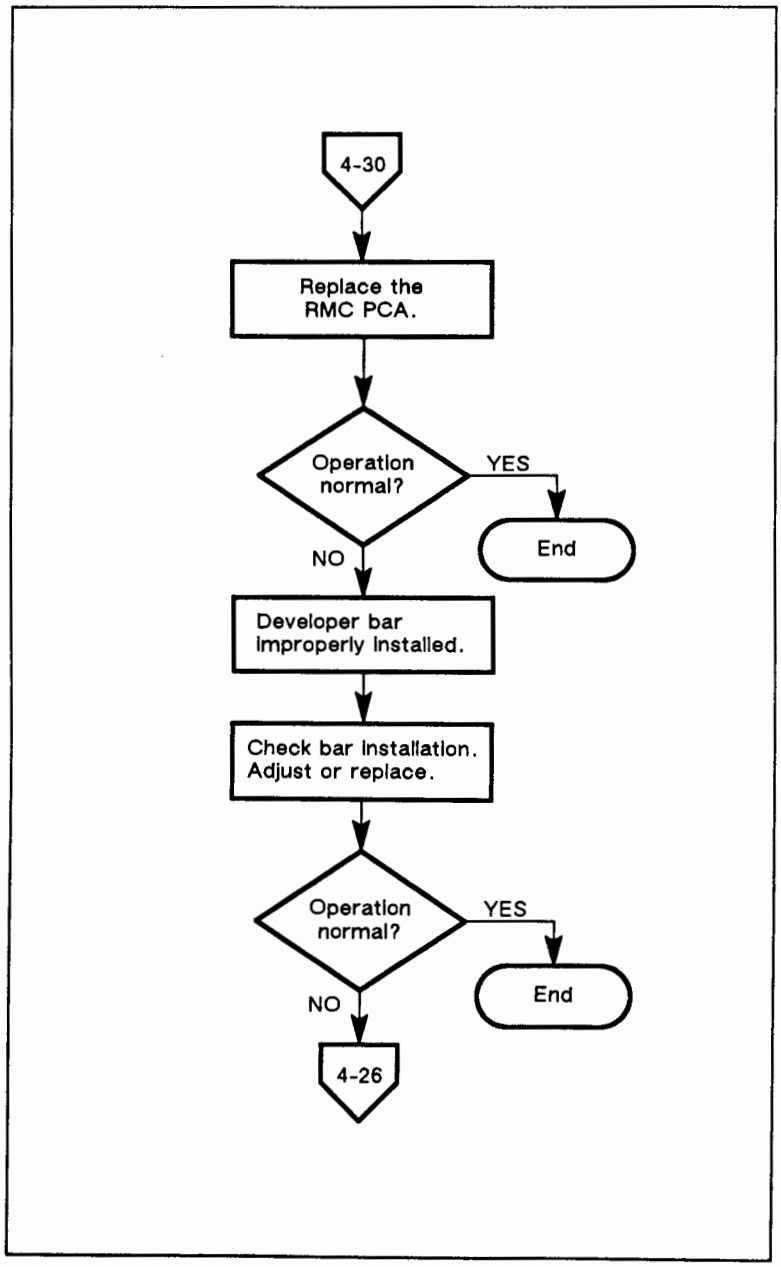


Figure 4-14. Align Media Error Troubleshooting (Continued)

4-9. INTERLOCK LEDS

4-10. The Mechanical Control Driver (MCD) PCA, inside the right-hand end of the plotter, has a row of 7 green LEDs along the lower edge. These LEDs are controlled by the various interlocks on the plotter. If an error indication is shown on the front panel LEDs and any difficulty is encountered determining the actual cause of the problem, refer to the MCD PCA LEDs for further information. This is accomplished as follows:

a. Turn the plotter OFF (**O**).

b. Remove the two screws securing the right-hand cover. Refer to the disassembly procedures if necessary.

c. Lift the cover slightly to disengage the tabs at the lower edge of the panel.

CAUTION

The grounding cable is still attached to the cover. Use caution not to snap the cable.

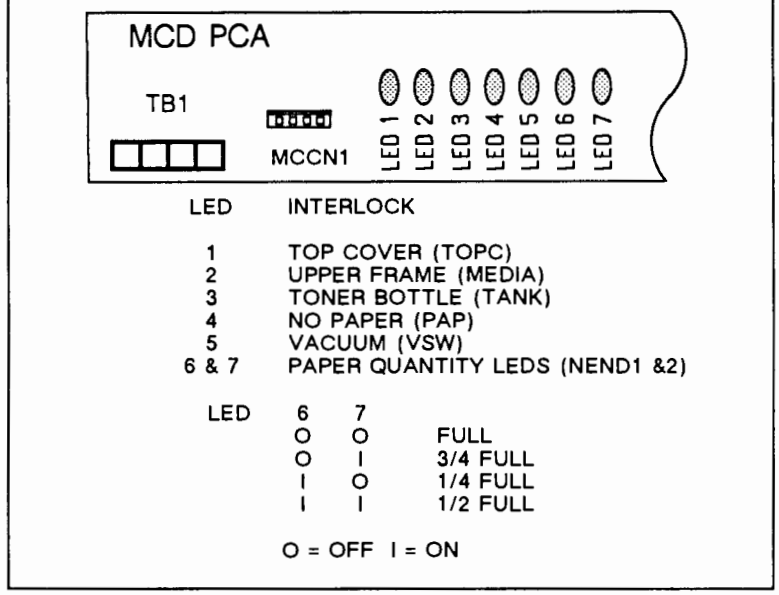
d. Move the panel aside so that the LEDs may be observed.

e. Turn the plotter ON (**I**).

WARNING

The MCD cooling fan is located immediately in front of the MCD PCA. When the plotter is ON this fan will be ON. Contact with the fan may cause injury.

f. Initiate the operational mode which caused the error and observe the LEDs on the MCD PCA. See Figure 4-15 to determine the interlock circuit involved.



LED	INTERLOCK
1	TOP COVER (TOPC)
2	UPPER FRAME (MEDIA)
3	TONER BOTTLE (TANK)
4	NO PAPER (PAP)
5	VACUUM (VSW)
6 & 7	PAPER QUANTITY LEDS (NEND1 &2)

LED 6	7	
O	O	FULL
O	I	3/4 FULL
I	O	1/4 FULL
I	I	1/2 FULL

O = OFF I = ON

Figure 4-15. MCD Interlock LEDs

4-11. POWER SUPPLY SYSTEM TROUBLESHOOTING

4-12. The plotter power supply consists of three units; LPS1 (+5V), LPS2 (+24V), (See Figure 4-16.), and HPS1, the high voltage power supply. LPS1 is used for logic, LPS2 for mechanical drive, and HPS1 is used to drive the control and pin electrodes on the writing head.

4-13. +5V POWER SUPPLY(LPS1). The following items can be checked to determine the operational status of the +5V power supply:

- Power Switch lamp.
- Control Panel LEDs.
- LPS1 LED ON (Inside the rear cover).

4-14. If any of the previous items do not appear to be functioning correctly, perform the following:

a. Using the voltmeter, check the ac line voltage. It must be between 99 and 132 Vac.

b. Disconnect the +5V leads at the RMC PCA TB1.

c. Using the voltmeter, measure the +5V at LPS1. See Figure 4-16. If not within specifications, replace the LPS1.

d. Reconnect the leads at TB1 and measure the +5V. If not within specifications, replace the RMC PCA.

4-15. +24V POWER SUPPLY(LPS2). The following items can be checked to determine the status of the +24V power supply:

- Media Counter.
- Fan operation.
- Manual media feed.
- Toner flow.
- LPS2 LED ON (Inside the rear cover). See Figure 4-16.

4-16. If any of the previous items do not appear to be functioning correctly, perform the following:

a. Using a voltmeter check the ac line voltage. It must be between 99 and 132 vac.

b. Check the power supply jumpers for proper location. See Figure 4-16.

c. Disconnect the +24V output leads at TB1 of the MCD PCA.

d. Using the voltmeter measure the output voltage (+24V).

e. If the LPS2 output is normal the power supply is good.

f. Reconnect the output leads at TB1 and check the voltage again.

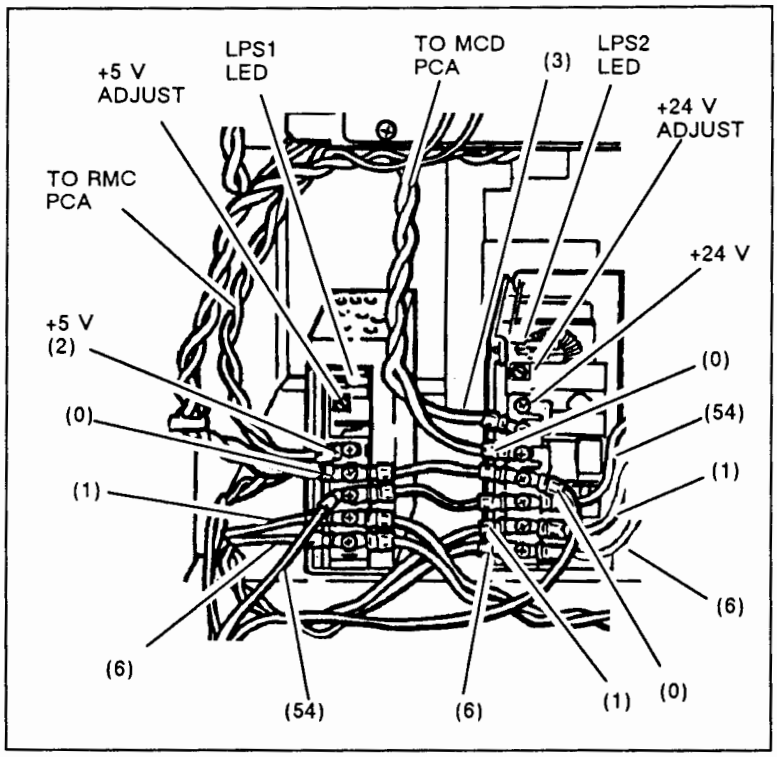


Figure 4-16. Low Voltage Power Supplies

g. If the output voltage is not within tolerance, disconnect other components in the +24V circuits to isolate the problem.

4-17. HIGH VOLTAGE POWER SUPPLY. The high voltage power supply must be functioning correctly for any image to be created on the media. If there is no image, proceed with troubleshooting of the high voltage supply. Also refer to Paragraph NO TAGDEVELOPING SYSTEM (TONER) FAILURES.

WARNING

The following procedures are intended to be performed by service trained personnel who are aware of the electrical shock hazards involved.

The following steps expose high voltage contacts with the interlocks bypassed. Use extreme caution to avoid electrical shock which could lead to serious injury or death.

NOTE

The high voltage power supply is deactivated when the top cover is open. The high voltage supply is activated only when recording conditions are met. VRC I/F REMOTE or TEST conditions must be set.

4-18. To troubleshoot the high voltage power supply, proceed as follows:

a. With the rear cover open, remove connectors PCN4 and PCN5 from from the back of the HPS1 power supply. See Figure 4-17.

b. Press the PG switch on the plotter test panel to start the plotter test mode. The high voltage supply is activated in the test mode.

c. Using the voltmeter, check the power supply output: See Figure 4-17.

1. PCN4 pin 1(+330V) to pin 3 (G)
2. PCN4 pin 4(+330V) to pin 6(G)
3. PCN5 pin 1(-250V) to pin 4(G)
4. PCN5 pin 2 (-250V) to pin 5 (G)

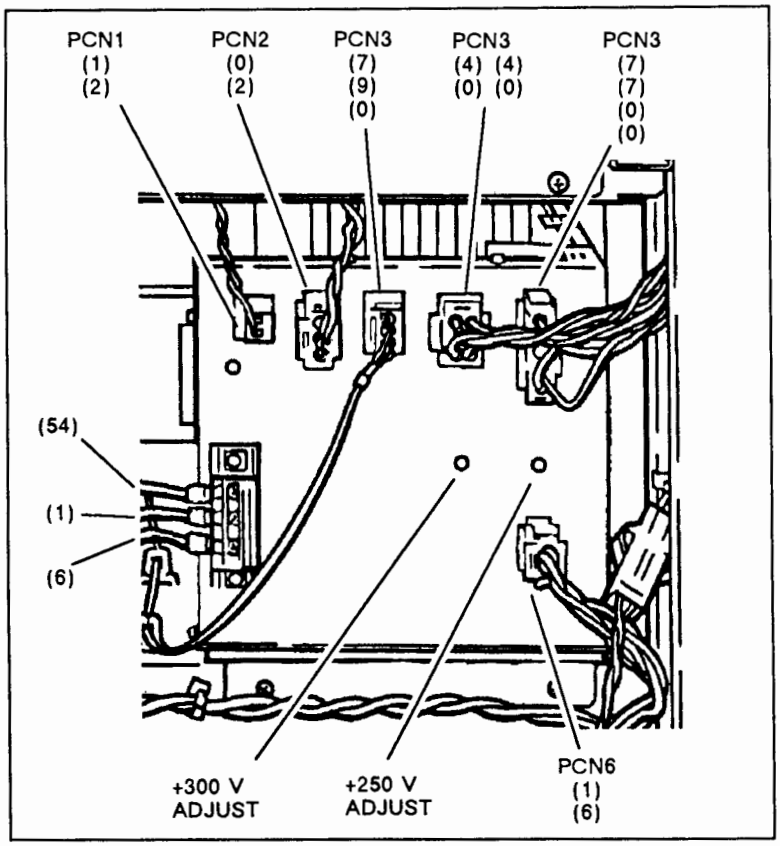


Figure 4-17. HPS1 Connectors

d. Again press the PG switch to stop the plotter test mode.

4-19. FAN OPERATION

4-20. There are five fans in the plotter. They are all driven by the +24V power supply. The functions are as follows: Fans 1 and 2 cool the recording driver PCAs, fans 3 and 4 dry the toner on the plotting media, while Fan 5 cools of the MCD PCA and Pulse Motor. See Figure 4-19. Noting fan operation may also help in isolation print engine failures. The following procedures can be used to verify proper fan operation.

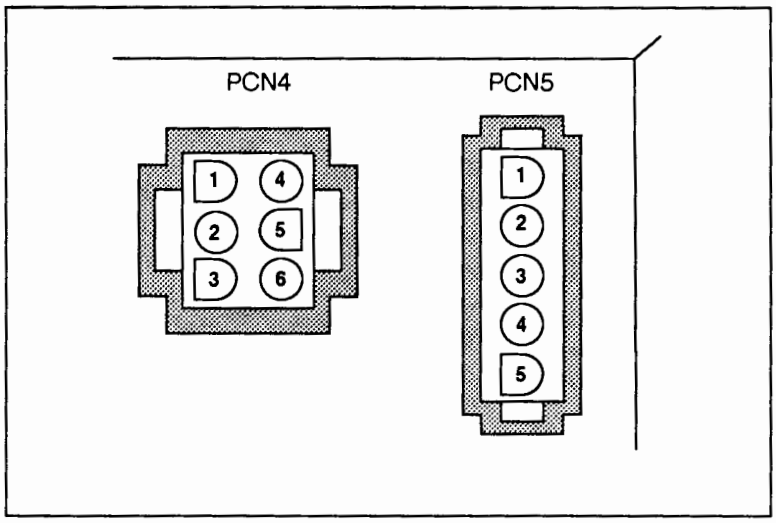


Figure 4-18. HPS Connector Pin Configuration

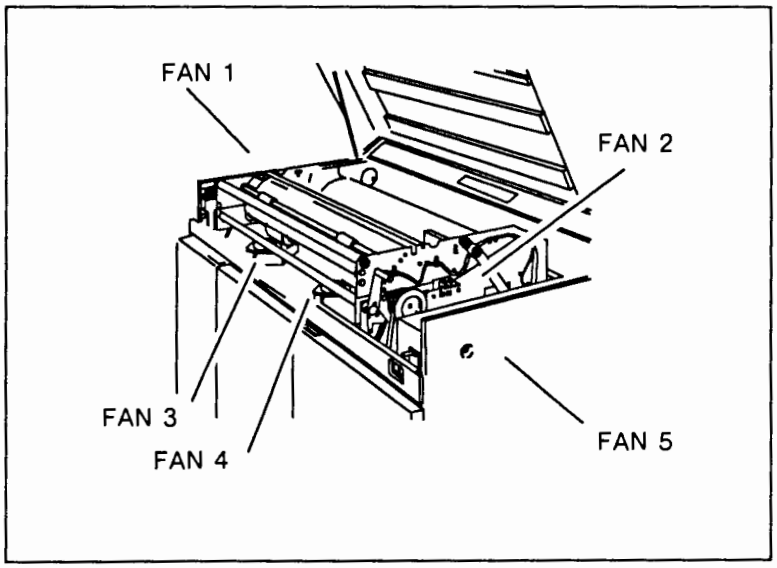


Figure 4-19. Fan Location

4-21. FANS 1 AND 2. Fan 1 and 2 operation is checked as follows:

a. If fans 1 and 2 run when the power is turned ON the fans are normal.

b. If the fans do not start when power is applied. Check for +24V at connector 7 located between the fans and the MCD PCA.

c. If +24V is present, replace the fans. If the voltage is not present proceed to step d.

d. Check the connection of MCCN8 at the MCD PCA.

e. Using the voltmeter check for +24V at MCCN8 pins 3(+) and 4(G) and pins 5(+) and 6(G). If the voltage is present replace the cabling to the fan. If the voltage is not present proceed to step f.

f. Using the voltmeter, check the +24V input to the MCD PCA at TB1 of the PCA.

g. If the +24V is normal at the input but not present at MCCN8 replace the MCD PCA.

h. If the voltage is not present at TB1, check the output of LPS2. Replace the power supply if necessary.

4-22. FANS 3 AND 4. To check the operation of fans 3 and 4 and their associated circuitry, proceed as follows:

a. Press the PG switch on the plotter test panel to start the plotter test mode.

b. Fans 3 and 4 should start. The active low FAN signal is required as a common to operate these fans.

c. If the fans do not operate, use the voltmeter to check for +24V across the pins of connector 7 located between the fans and the MCD PCA. If the reading is not correct, check for +24V between the white lead and the plotter chassis.

d. If +24V and the low FAN signal are present, replace the fans. If the voltage is not present proceed to step e.

e. Check the connection of MCCN8 at the MCD PCA.

f. Using the voltmeter check for +24V at MCCN8 pins 7(+) and 8(*FAN) and pins 9(+) and 10(*FAN). If the voltage is present replace the cabling to the fan. If the voltage is not present proceed to step g.

g. Using the voltmeter, check the +24V input to the MCD PCA at TB1 of the PCA.

h. If the +24V is normal at the input but not present at MCCN8 replace the MCD PCA.

i. If the voltage is not present at TB1, check the output of LPS2. Replace the power supply if necessary.

4-23. FAN 5

4-24. Fan 5 may be checked as follows:

a. Remove the right side cover from the plotter.

b. Turn on the plotter. Fan 5 should be running.

c. Using the voltmeter, check for +24V at connector 7 located between the fan and the MCD PCA. If +24V is present, replace the fan. If +24V is not present, proceed to step d.

d. Check the connection of MCCN8 at the MCD PCA.

e. Using the voltmeter, check for +24V at MCCN8 pins 1(+) and 2(G). If the voltage is present replace the cabling to the fan.

f. If the voltage is not present, check for +24V at TB1 of the MCD PCA.

g. If +24V is present, replace the MDRV PCA.

h. If the voltage is not present at TB1, check the output of LPS2. Replace the power supply if necessary.

4-25. MEDIA ADVANCE TROUBLESHOOTING

4-26. Media feed can be started in three ways: controller plotting, test pattern plotting, or by pressing the Front panel Advance button. The media drive motor is driven by the MDRV PCA. Refer to Table 4-3 for media advance troubleshooting. See Figure 4-20 for the block diagram of the media drive motor circuit.

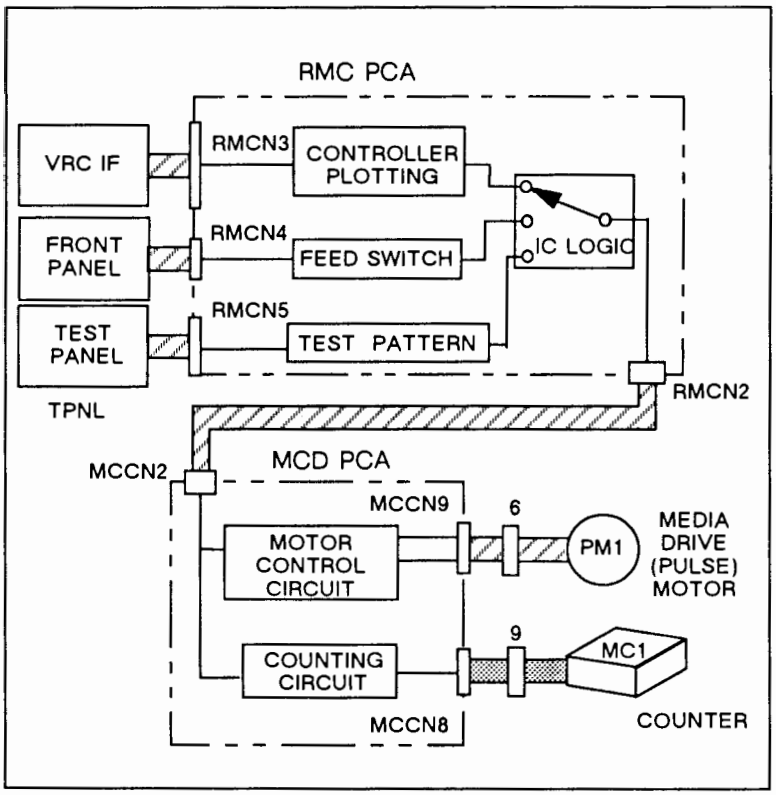


Figure 4-20. Media Drive Circuit

4-27. DEVELOPING SYSTEM (TONER) FAILURES

4-28. The following procedures will assist in fault isolation in the developer (toner) system. The circulation of the toner can be checked visually by opening the left front cover of the plotter and

Table 4-3. Media Advance Troubleshooting

SYMPTOM	CAUSE	ACTION
Media Counter, MC1 runs, but media does not advance.	MCD PCA or wiring is defective.	Check +24V at connector 6. Replace the MDRV PCA.
	Media advance motor, PM1, is defective.	Replace the motor, PM1.
Test patterns plot, but controller plotting is disabled.	RMC PCA is defective.	Replace the RMC PCA.
	Controller, VRC, or interface is defective.	Check controller, VRC, and interface.

observing the tubing from the toner bottle. See the Developing System Block Diagram in Figure 4-21.

4-29. Circulation of the toner is effected by the pump M1 and the solenoid valve SV1. Toner flow can be started either by the VRC I/F Remote signal, the TEST switch, or the front panel Advance button. It takes approximately 12 seconds for the system to reach full flow.

4-30. Most problems in the toner flow are indicated by the Align Media LED on the front panel and by the audible alarm. The first check that the recording media is free of wrinkles and properly covering the developer bar. Pressing the Advance button for several seconds will, at times, bring toner up into the system if the Align Media indicator has come on. There are no interlocks or error indicators for the solenoid valve SV1. If the valve fails to operate, no toner will reach the developer bar resulting in a total loss of image. This valve and the high voltage power supply are the two most likely causes if the image is lost and no other error condition is indicated. The flow charts in Figure 4-22 and Figure 4-23 will assist in troubleshooting the developer system.

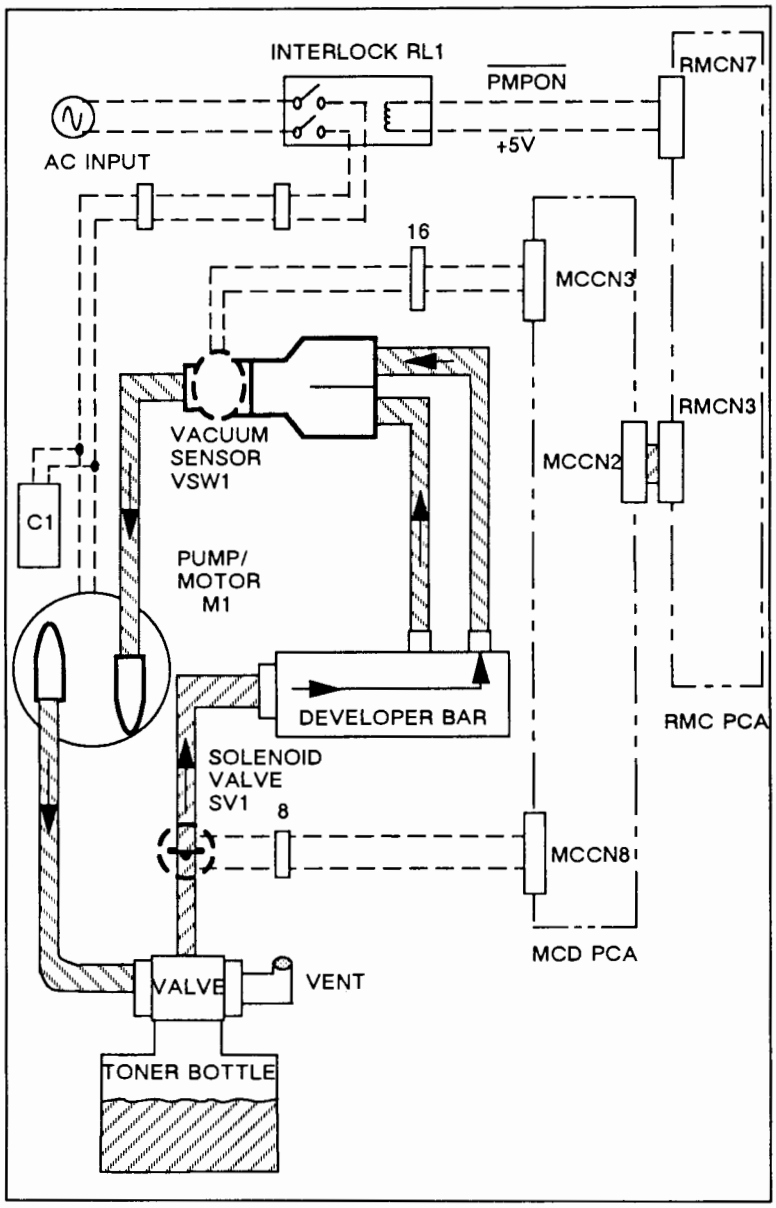


Figure 4-21. Developing System Block Diagram

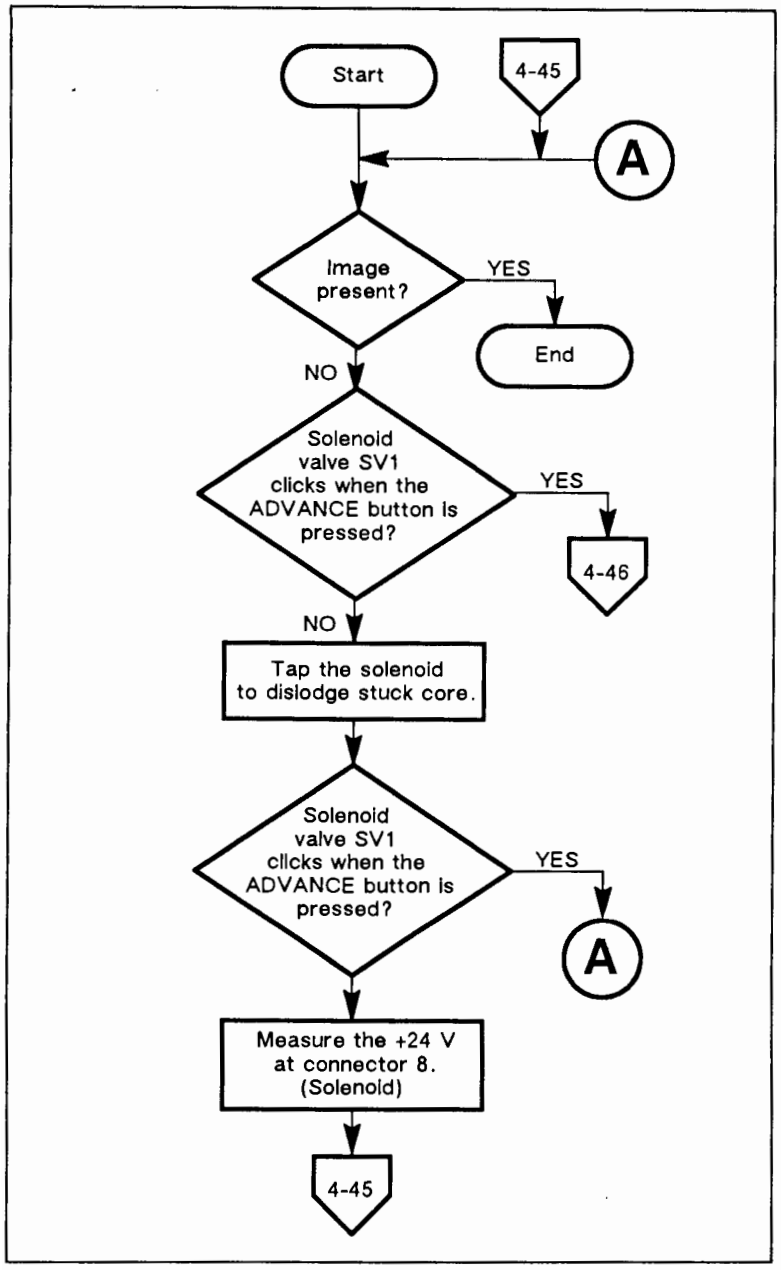


Figure 4-22. Solenoid Troubleshooting Flow Chart

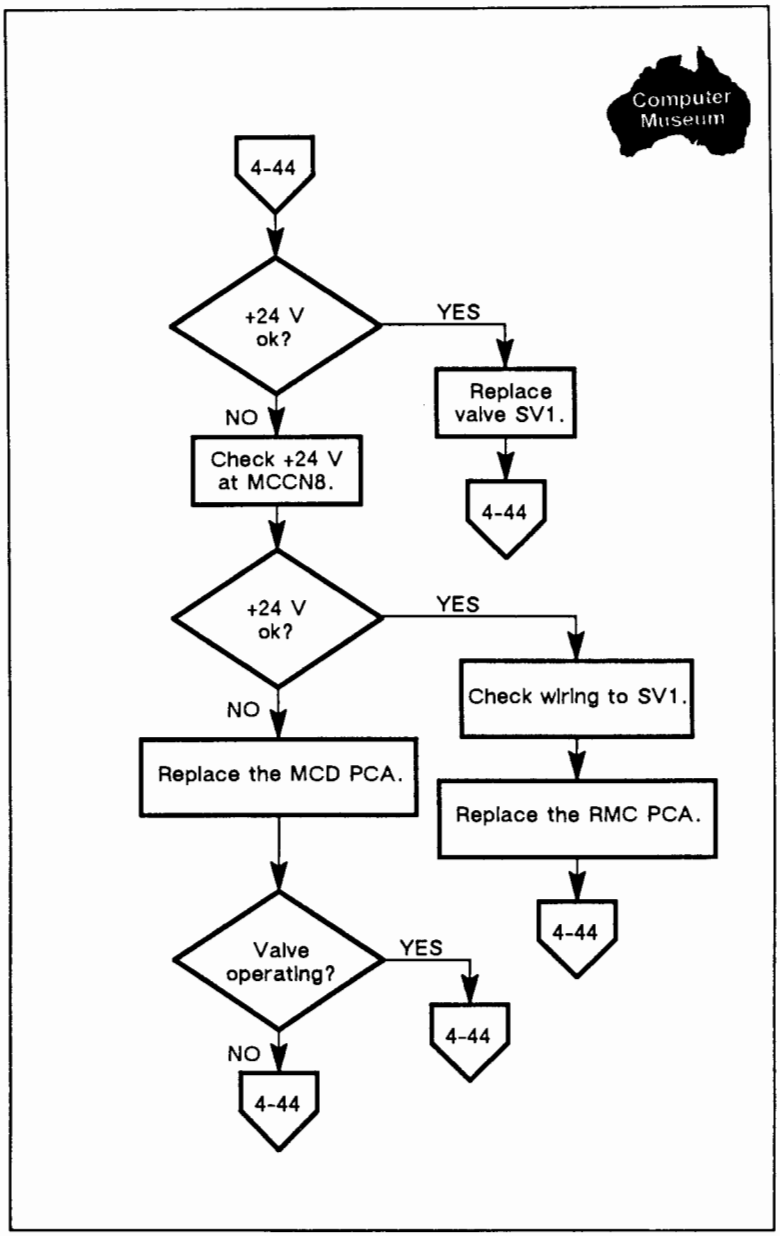


Figure 4-22. Solenoid Troubleshooting Flow Chart (Continued)

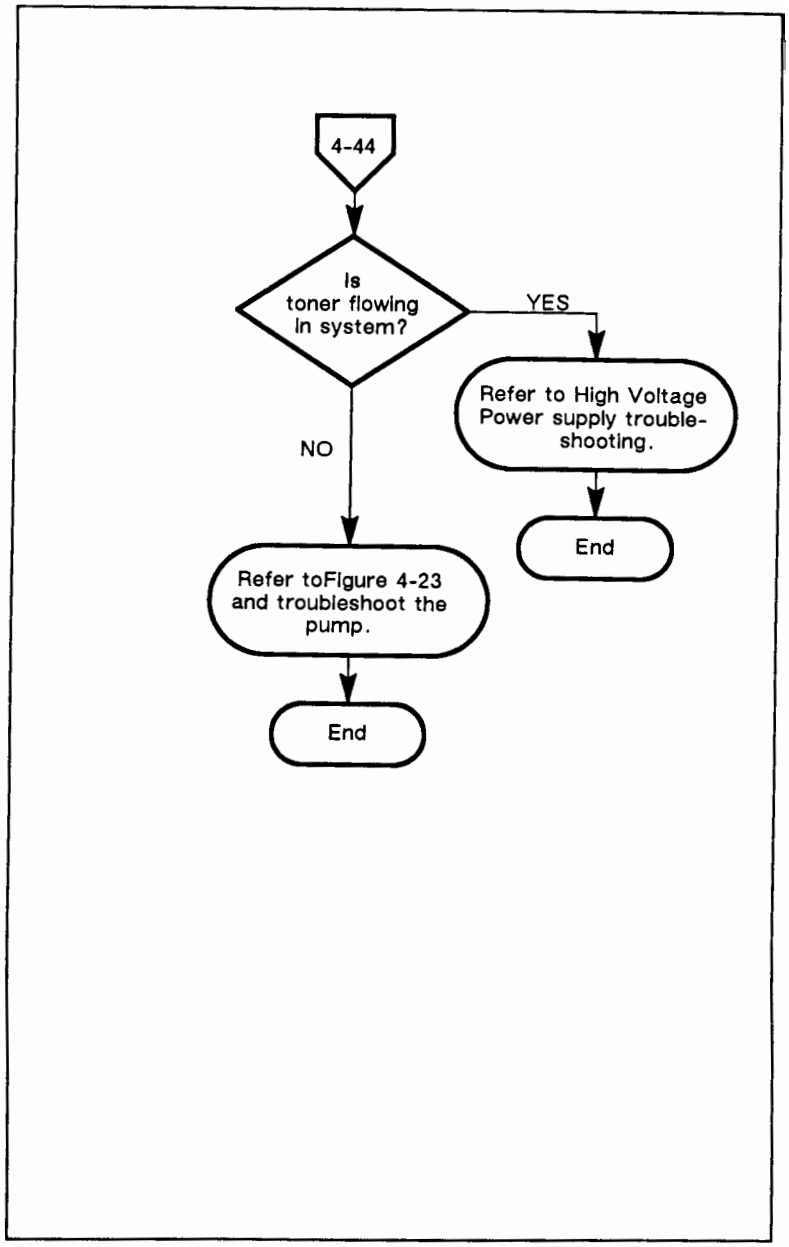


Figure 4-22. Solenoid Troubleshooting Flow Chart (Continued)

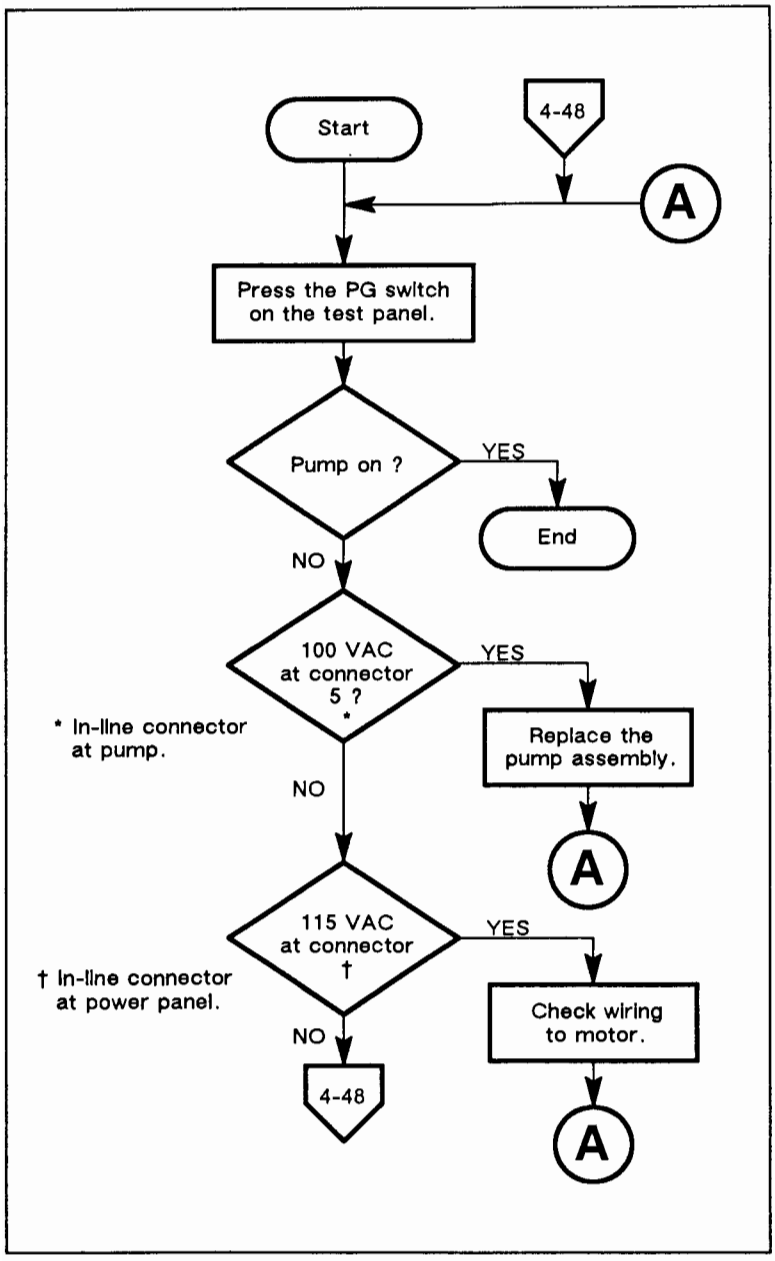


Figure 4-23. Toner Pump Troubleshooting Flow Chart

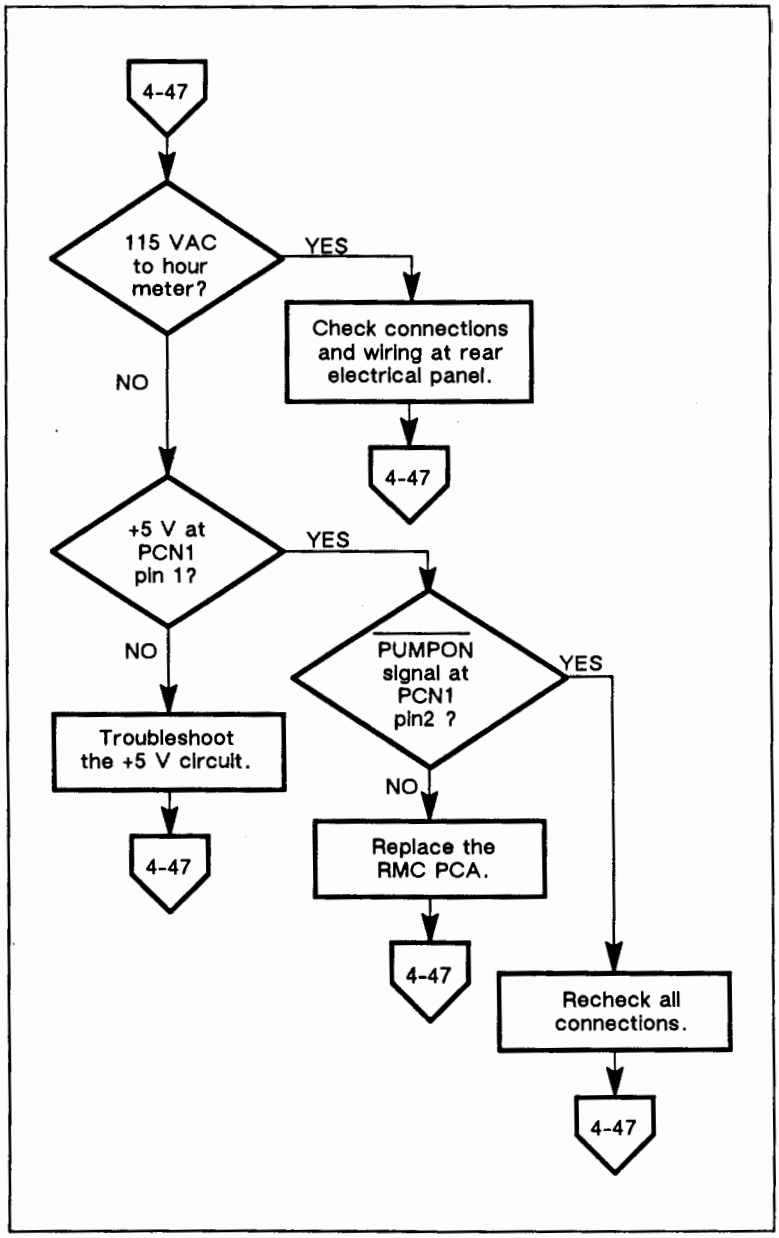


Figure 4-23. Toner Pump Troubleshooting Flow Chart (Continued)

4-31. PLOTTING FAILURES

4-32. Refer Figure 4-26 to while troubleshooting plotting failures. The first step in troubleshooting a plotting failure is to determine if the problem is internal to the plotter or caused by a controller or an interface failure. Plotting failure troubleshooting is presented in a general format in Figure 4-26 to support assembly level repair.

4-33. CONTROLLER OPERATION. Figure 4-24 illustrates the structure and signal flow for normal plotting operations. Refer to the controller service documentation for the specific controller in use to isolate a controller or a controller interface failure.

4-34. INTERNAL FAILURE TROUBLESHOOTING. When it has been determined that the plotting failure is internal to the plotter, refer to the following to isolate the defect. Table 4-1 and the flow charts in Figure 4-12, Figure 4-13, Figure 4-14, Figure 4-22, Figure 4-23, and Figure 4-26 list common plotting problems and also reference additional information.

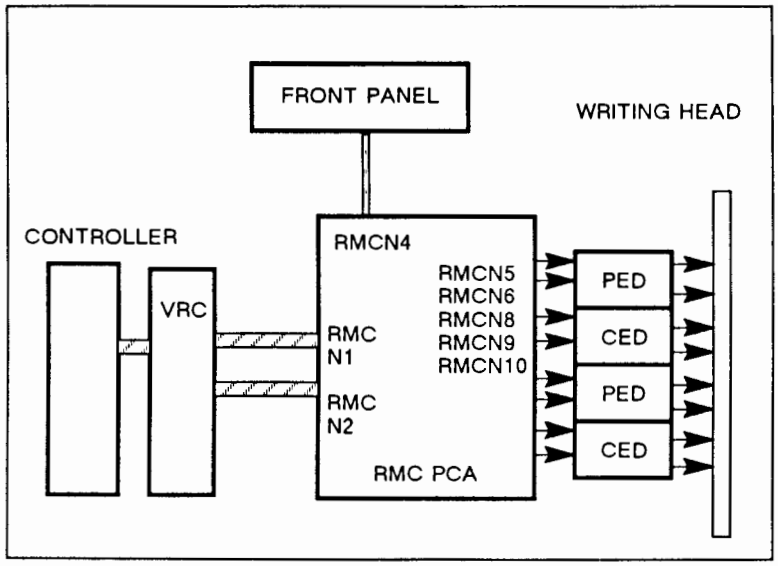


Figure 4-24. Controller Operation

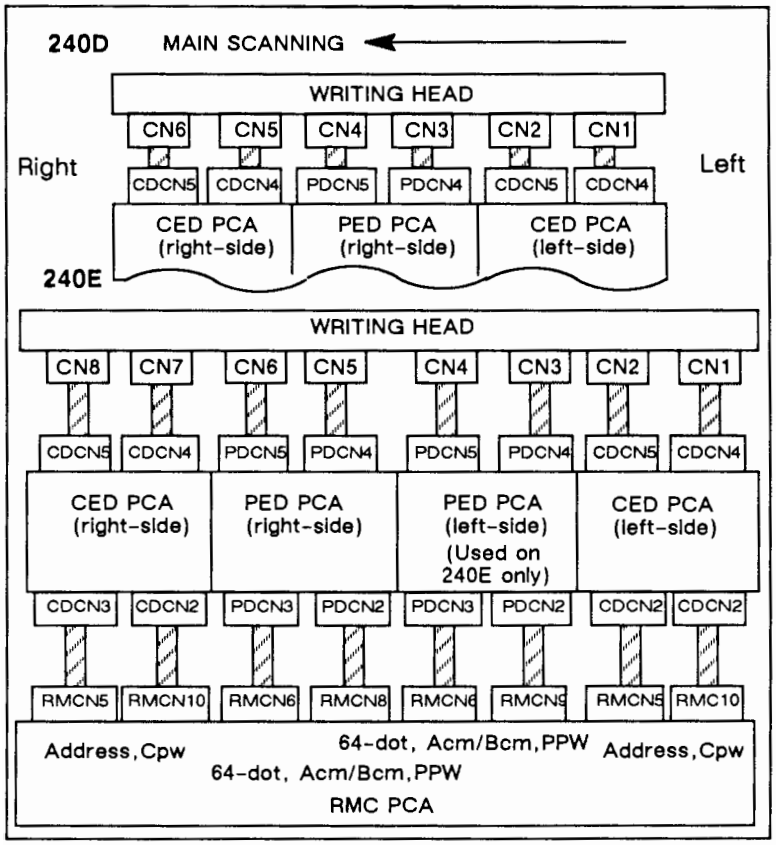


Figure 4-25. Writing Head Control

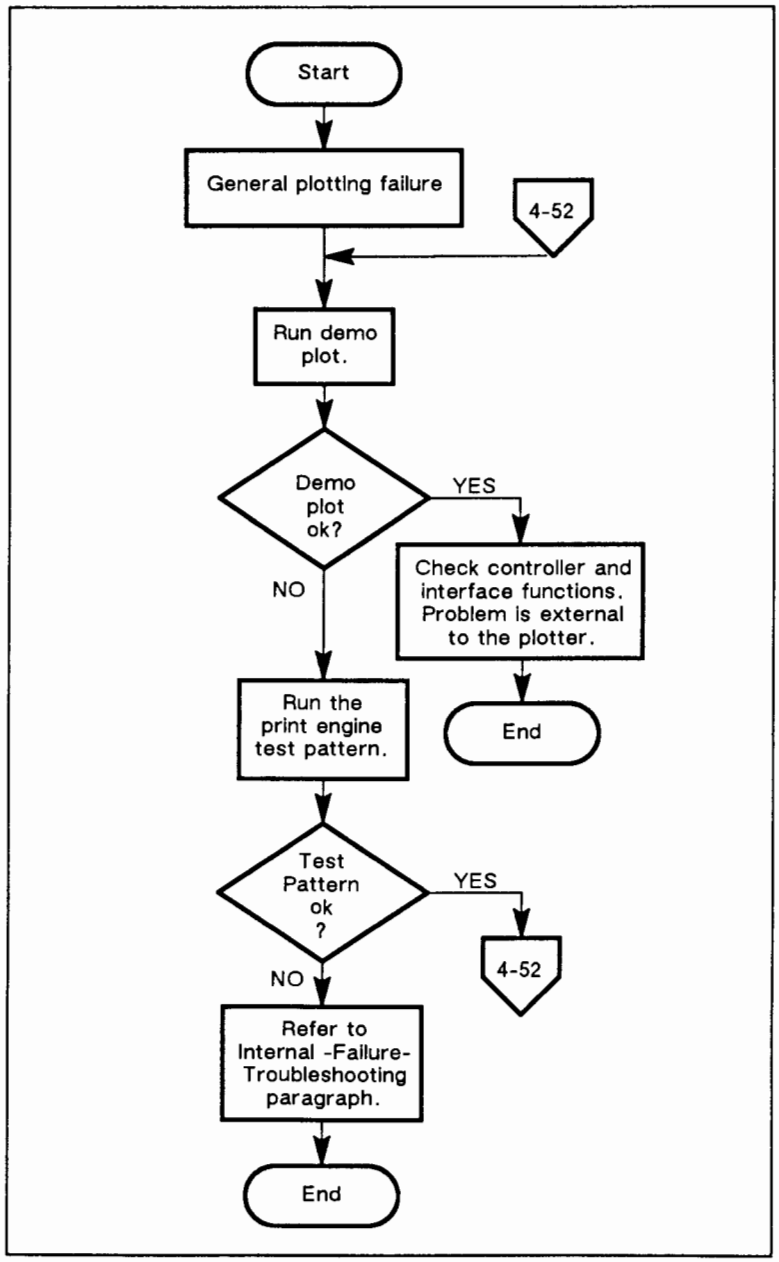


Figure 4-26. Plotting Failure Flow Chart

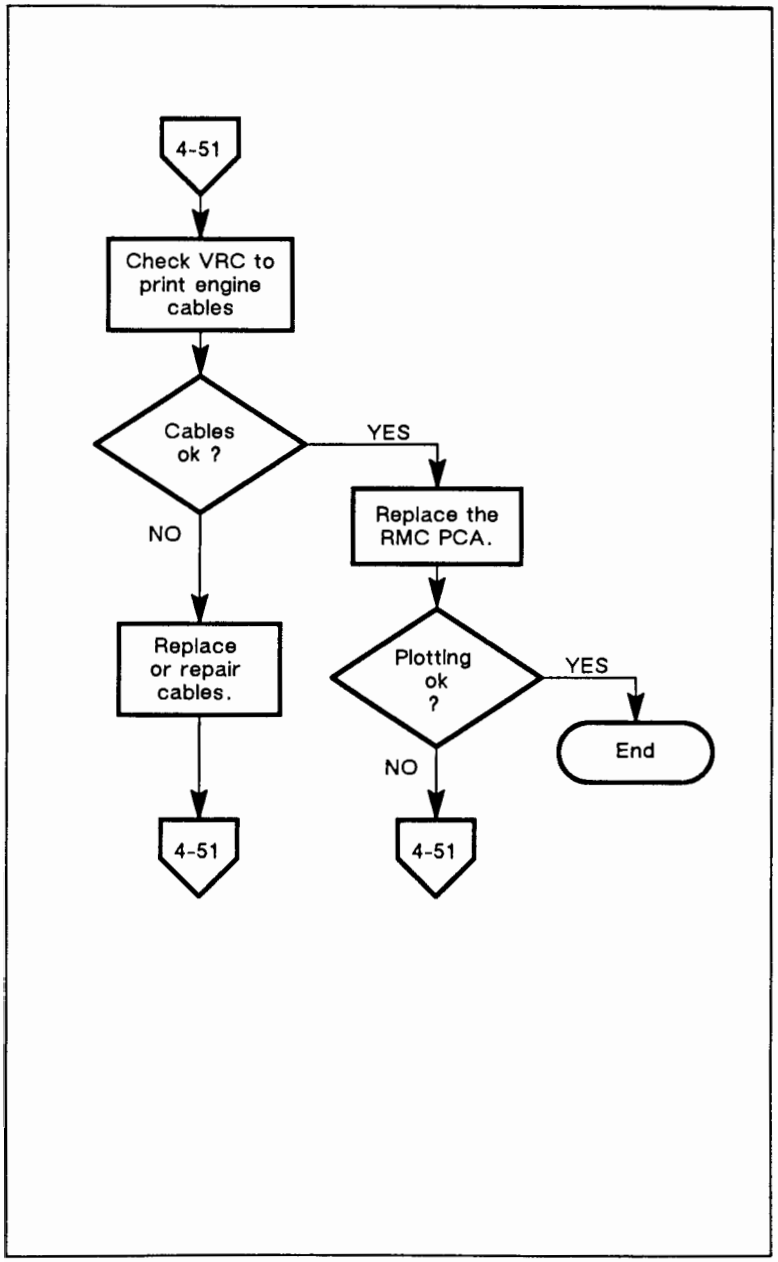


Figure 4-26. Plotting Failure Flow Chart (Continued)

4-35. Images are created on the media with electrostatic fields. The control electrodes establish a bias and the pin electrodes the actual image. These electrodes are controlled by driver PCAs as illustrated in Figure 4-25.

4-36. PCA TROUBLESHOOTING

WARNING

Dangerous voltages (+300 V and -250 V) are present on the writing head, pin electrode PCAs and control electrode driver PCAs. Turn OFF the plotter and remove the ac line cord before attempting any troubleshooting procedures. Serious injury or death can result if proper procedures are not followed.

4-37. PIN ELECTRODE DRIVER PCA (PED)TROUBLESHOOTING. Identical pin electrode driver PCAs are used for the left and right sides of the 240E. The 240D uses only 1. The 128-dot A and B channel drivers are in a matrix with the control electrodes. See Figure 12-24.

4-38. Pin electrode failure is characterized by a vertical stripe, one dot wide, which is either always present or always missing and repeats each 8 mm. This is caused by the fact that all channel "A" pin electrodes with the same number are connected in parallel. This is also true for the "B" electrodes. By inspecting the defective output, determine if the problem is in the "A" or "B" channel.

4-39. If the failure is in the pin itself, the dot will always be off. If the dot is always ON, the failure is located in the driver circuitry.

4-40. To troubleshoot a pin electrode failure on the 240E plotter, swap the two PED PCAs to see if the problem moves with the PCA. On the 240D exchange the PCA. If the problem is PCA related, replace the PCA. If the problem is not PCA related, troubleshoot the writing head.

4-41. CONTROL ELECTRODE DRIVER PCA (CDRV) TROUBLESHOOTING. Identical control electrode driver PCAs are used for the left and right sides.

4-42. A defective Control Electrode Driver is always characterized by a missing vertical line 4 mm (64 dots) wide as was shown in

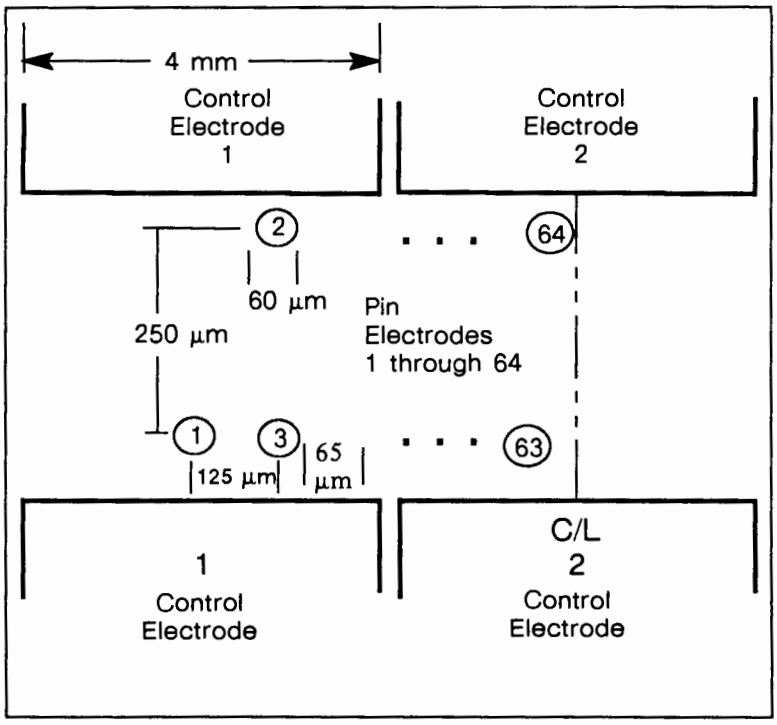


Figure 4-27. Electrode Configuration

Figure 4-9. Figure 4-27 illustrates the alignment of the control electrodes with the pin electrodes. To troubleshoot the circuit, swap the two CED PCAs. If the problem moves with the PCA swap, replace the defective PCA. If the problem does not move with the PCA swap, troubleshoot the writing head.

4-43. MODEL 250/255 TROUBLESHOOTING

4-44. Troubleshooting flowcharts included here cover logical troubleshooting for the cutter and the take-up reel. Troubleshooting flowcharts in the preceeding pages of this section apply to the remainder of the plotter.

4-45. CUTTER FLOWCHART

4-46. The following flowchart (See Figure 4-29) covers the sensors, motors and mechanics of the cutter. In addition to checking the for media jam as shown at the beginning of the flowchart, also check to ensure that the cutter blade position is correct as shown in Figure 4-28. If the cutter blade is riding on top of the blade guide rather than along the side of the blade guide, manually reposition the cutter blade.

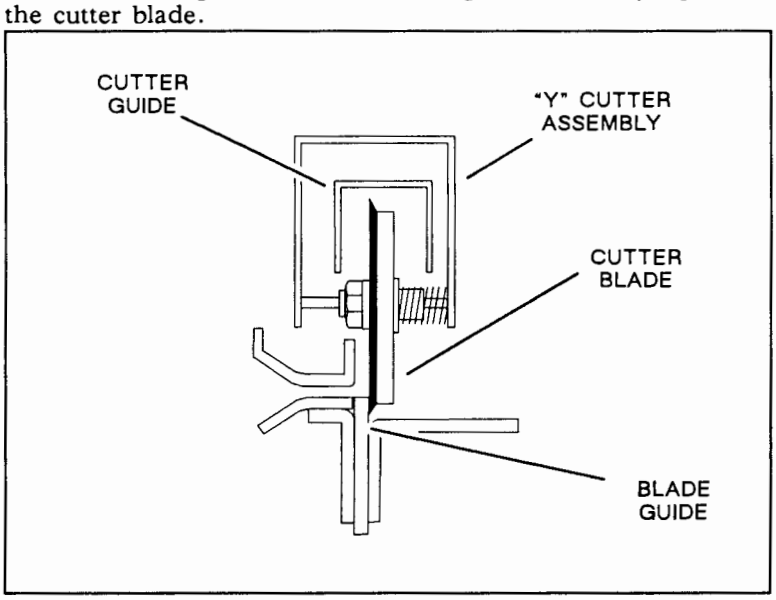


Figure 4-28. Cutter Blade Positioning

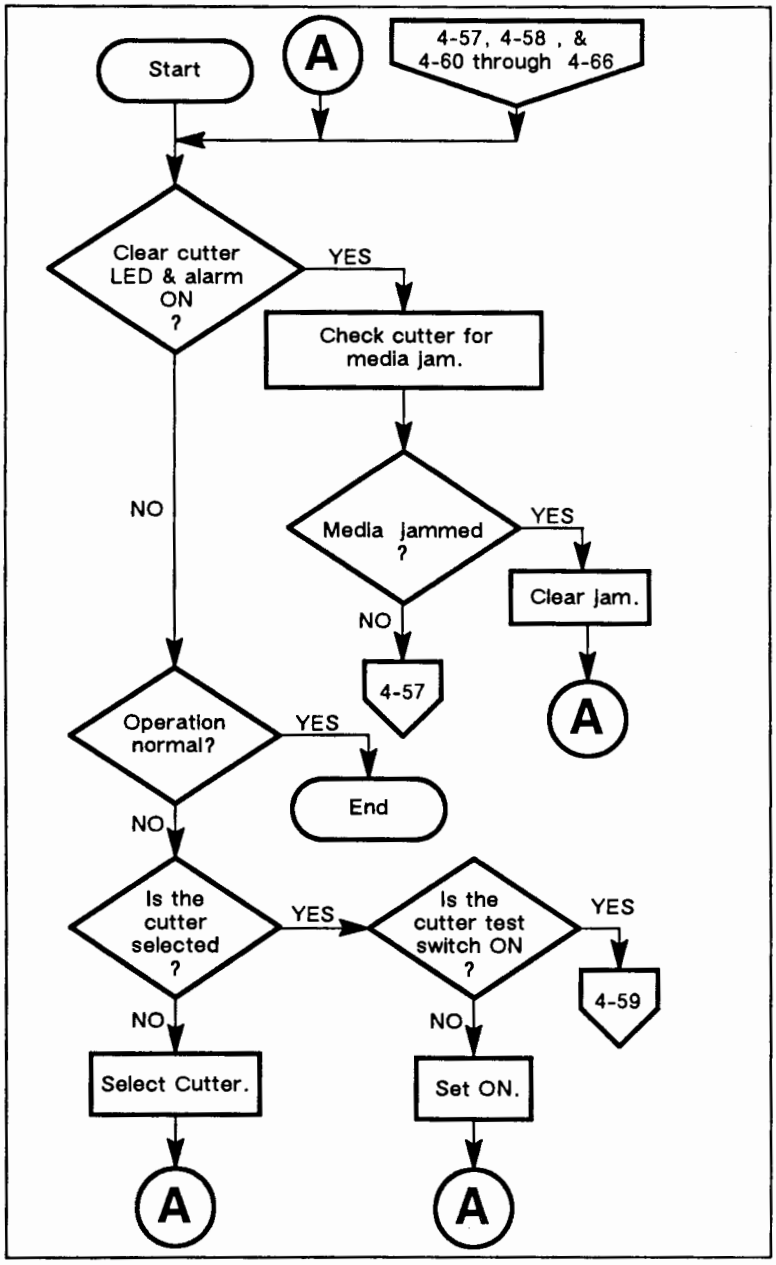


Figure 4-29. Cutter Troubleshooting Flowchart

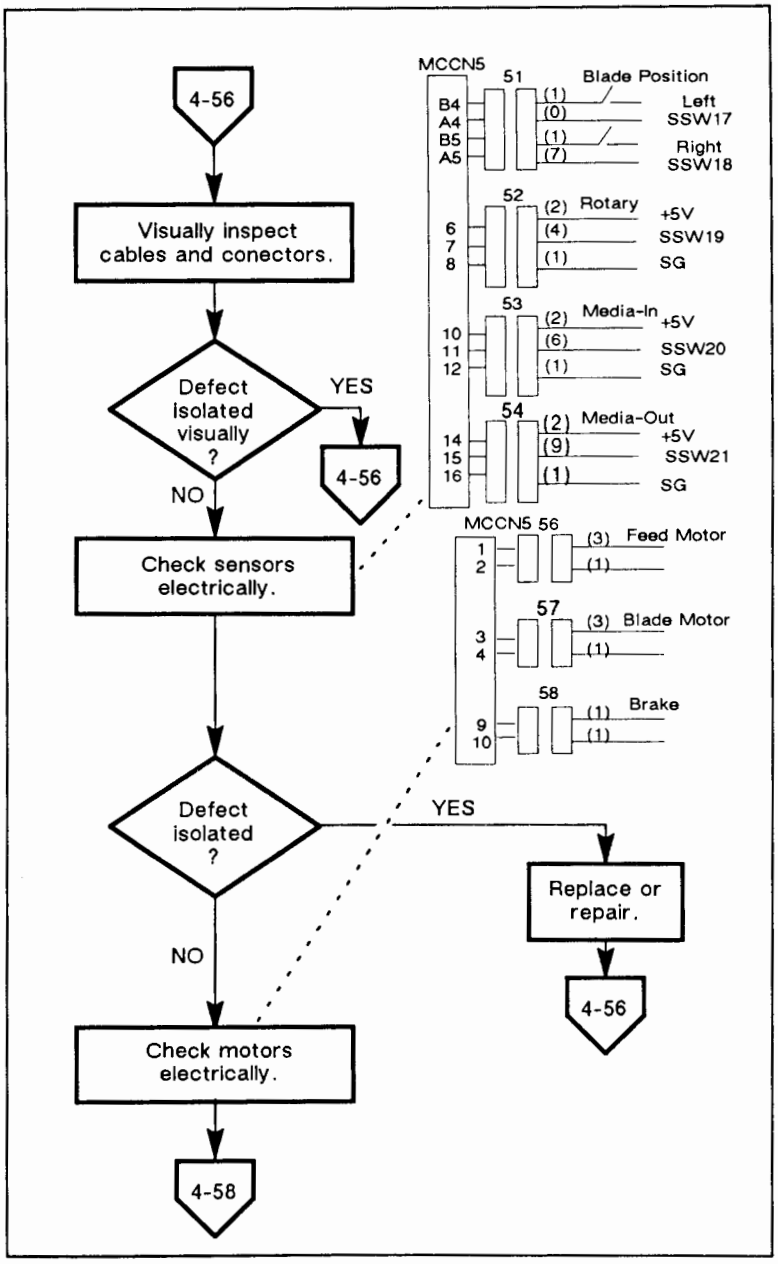


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

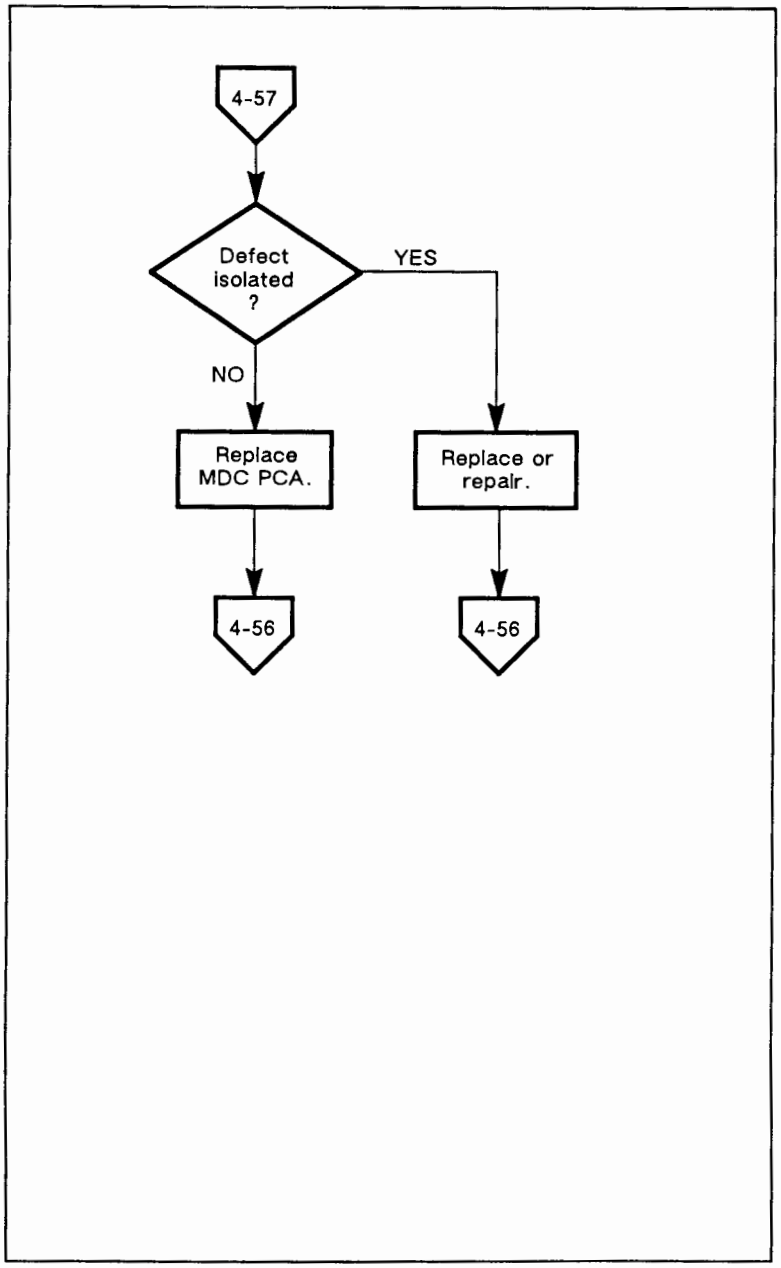


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

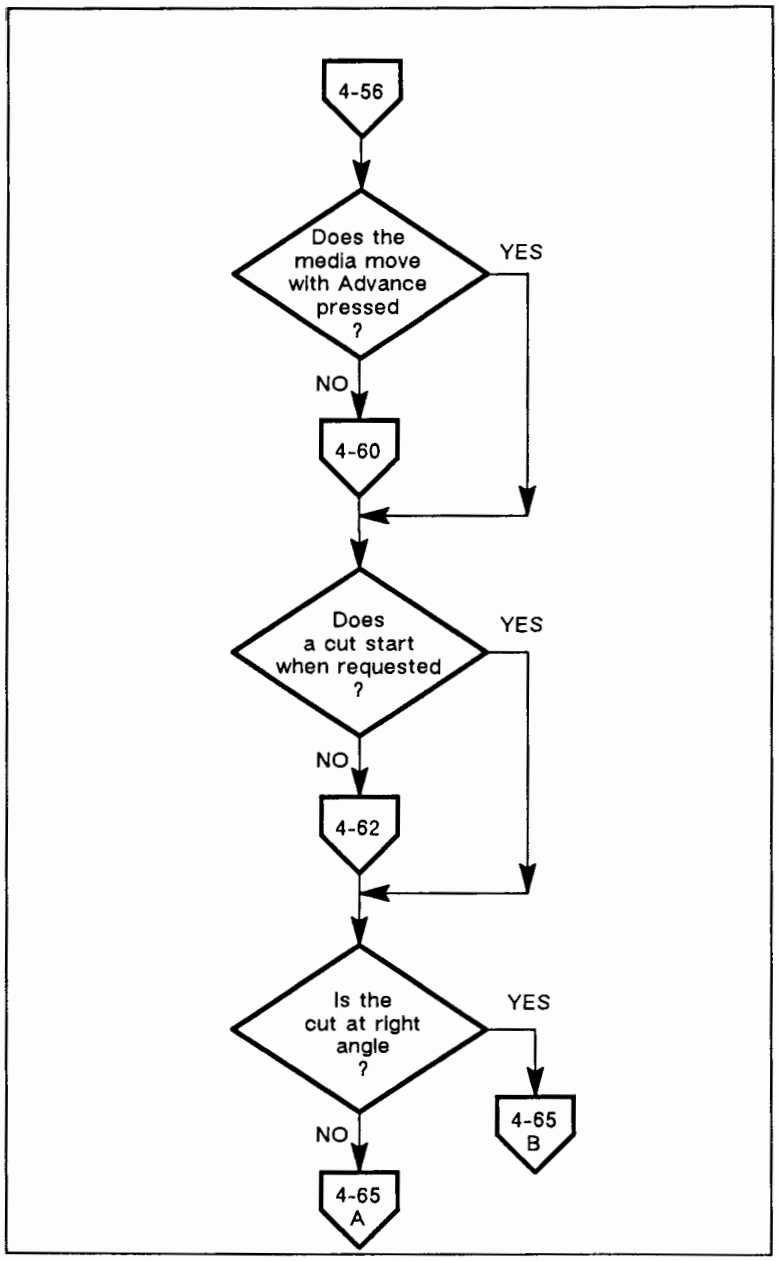


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

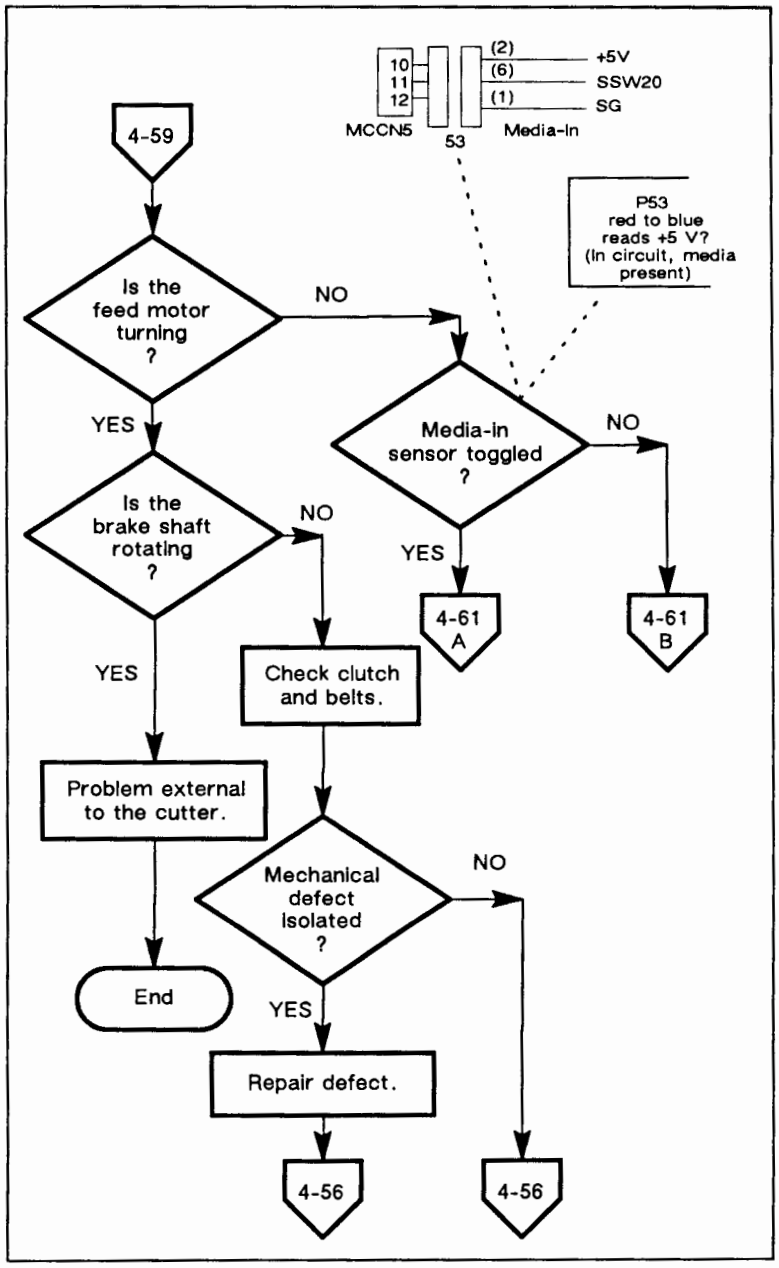


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

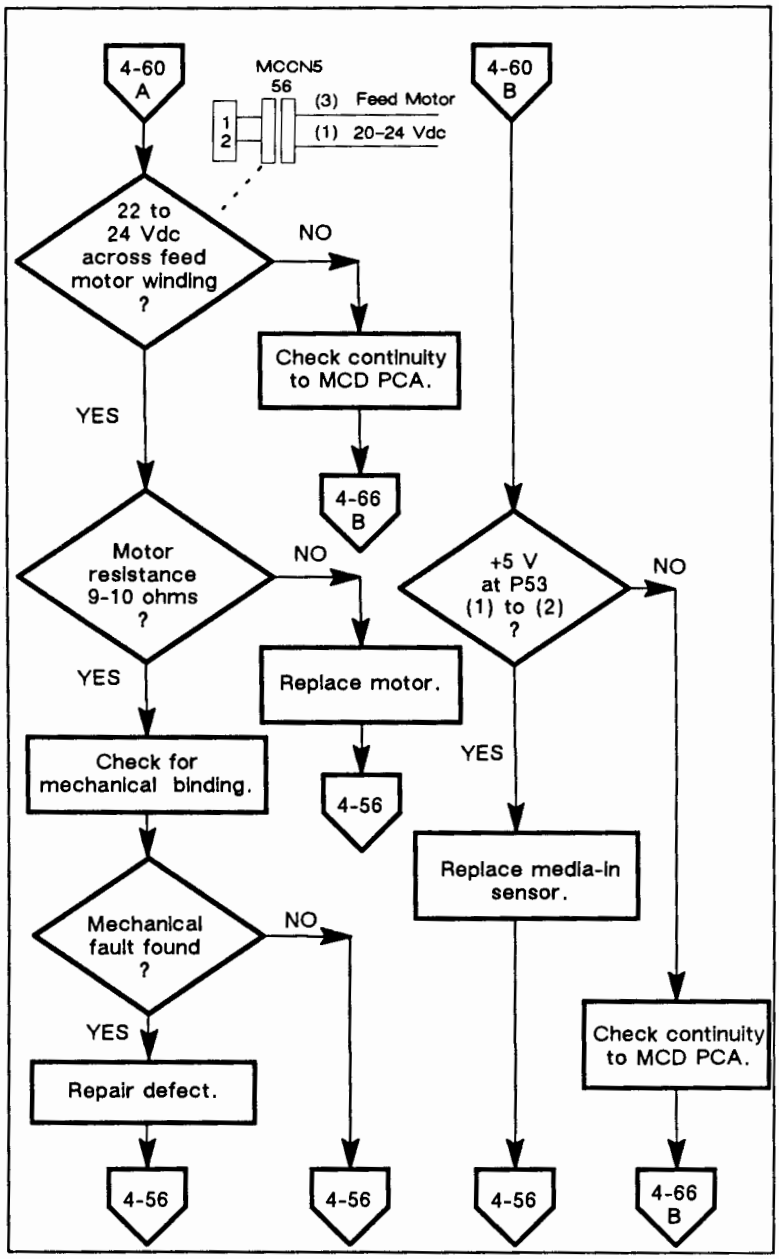


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

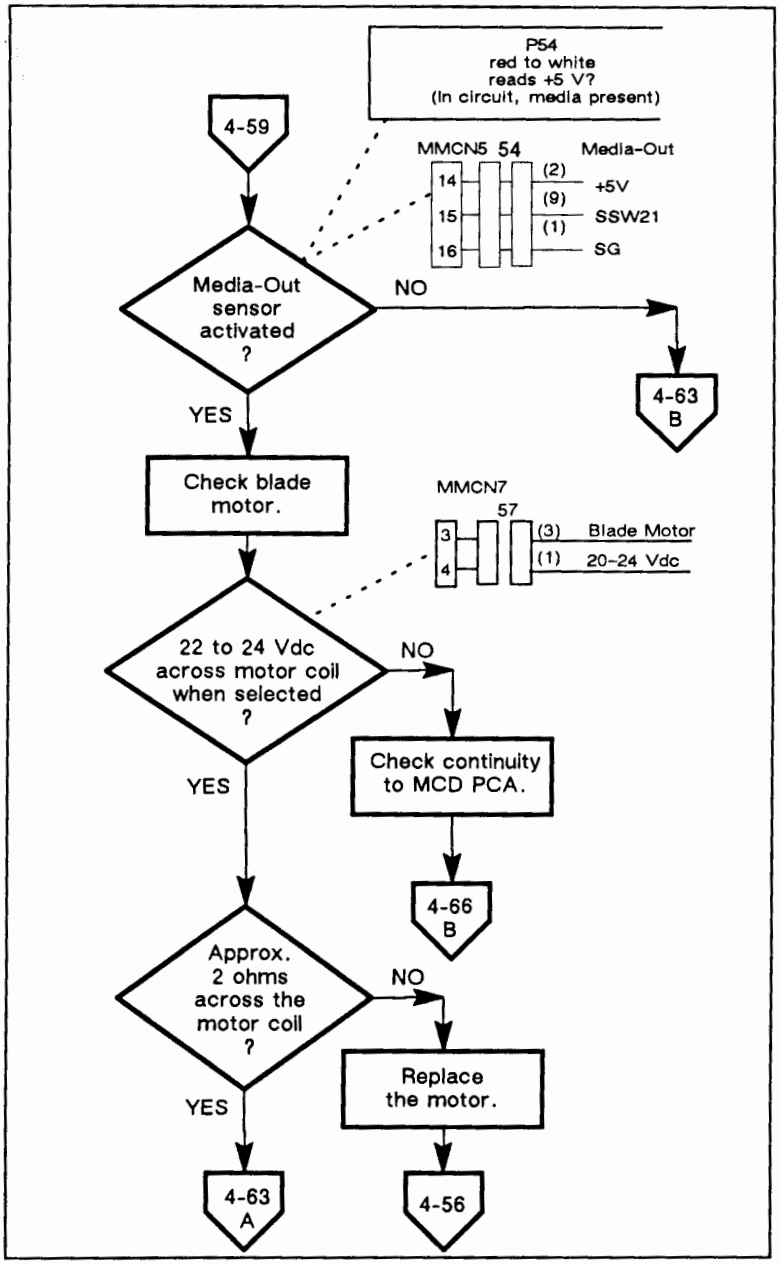


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

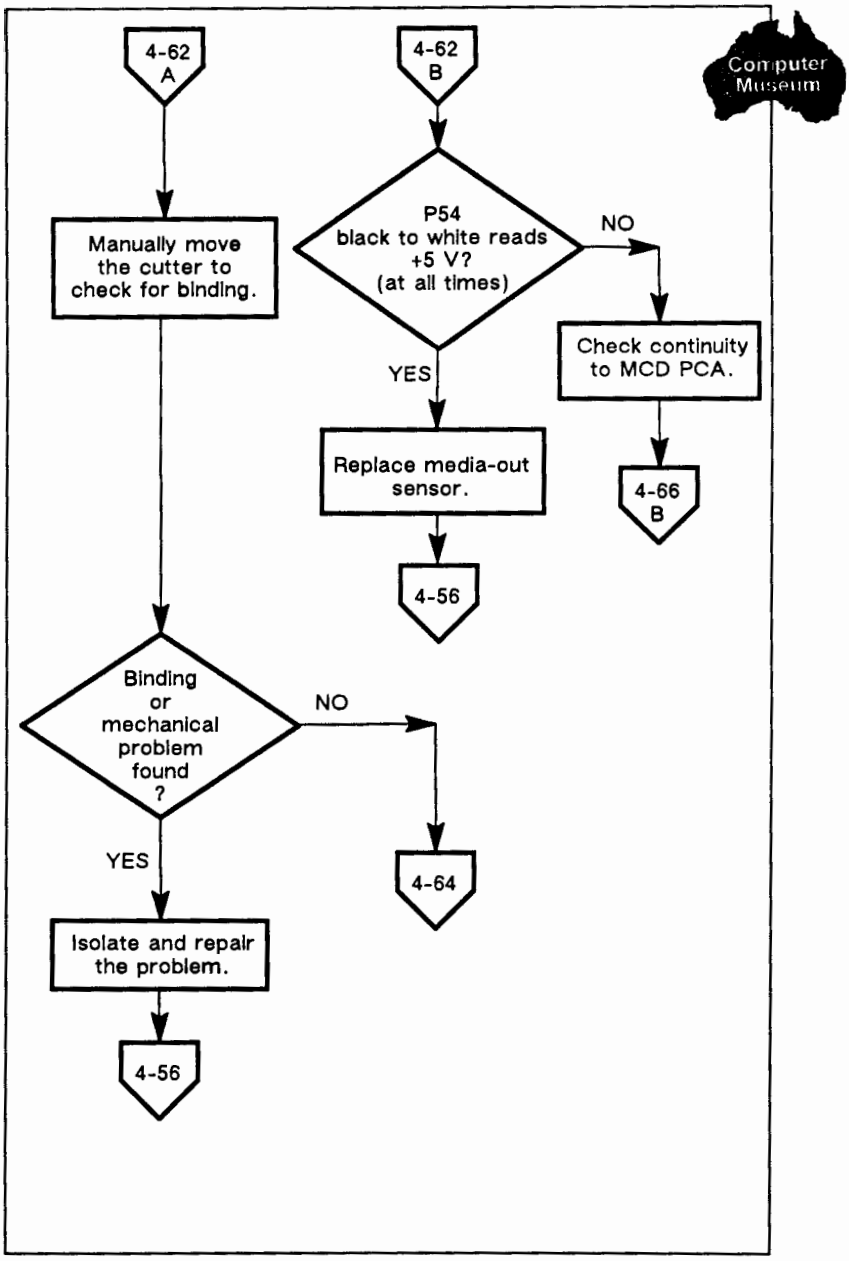


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

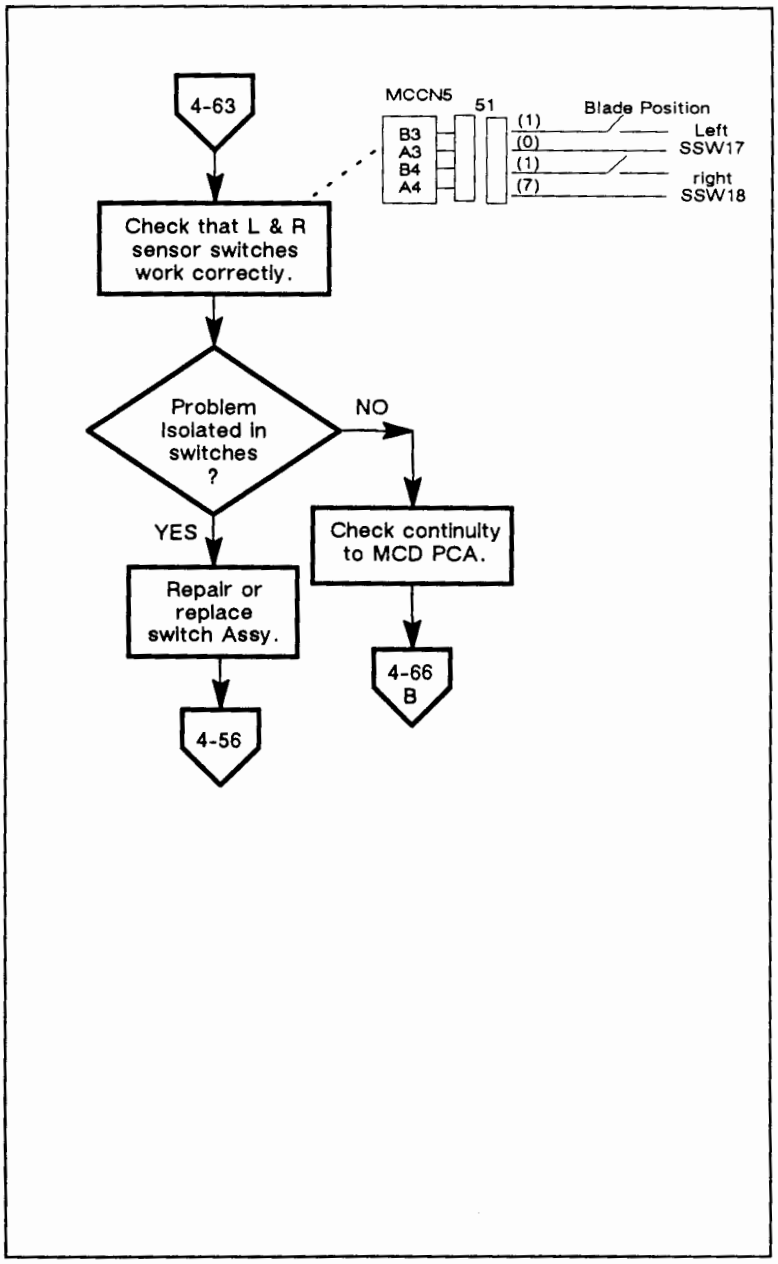


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

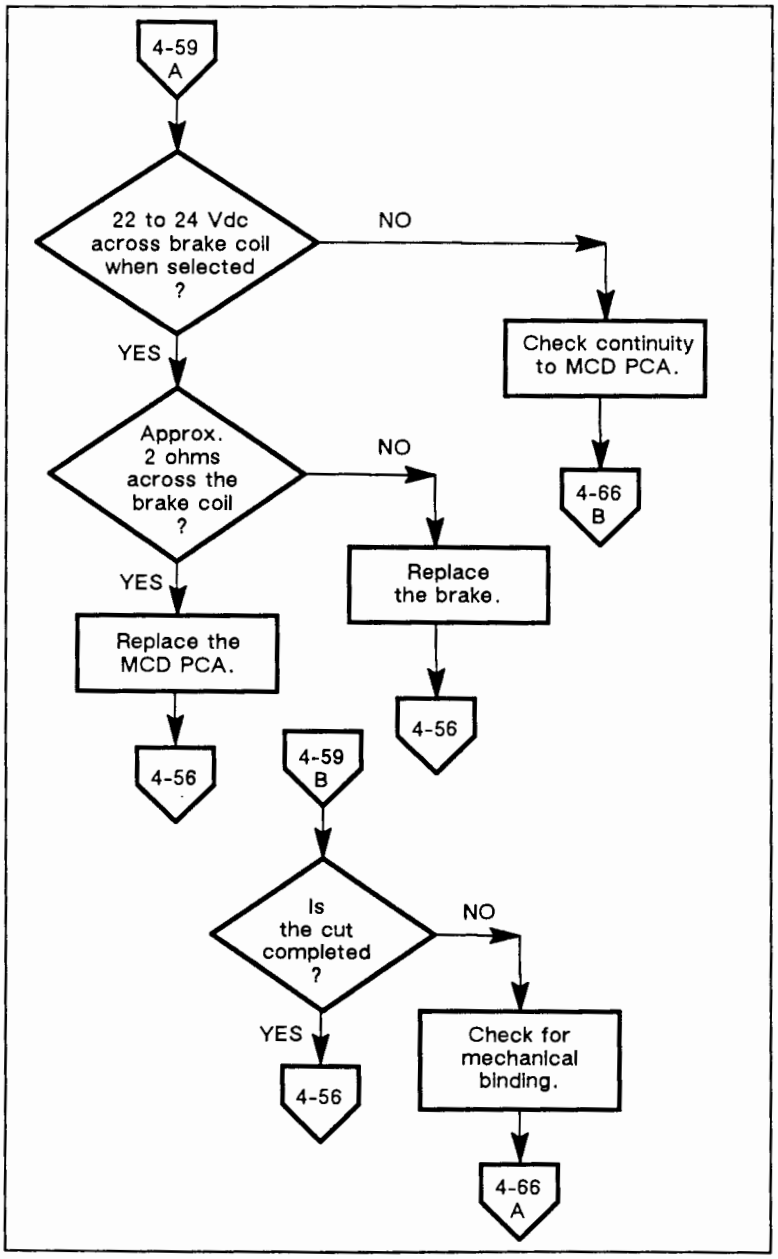


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

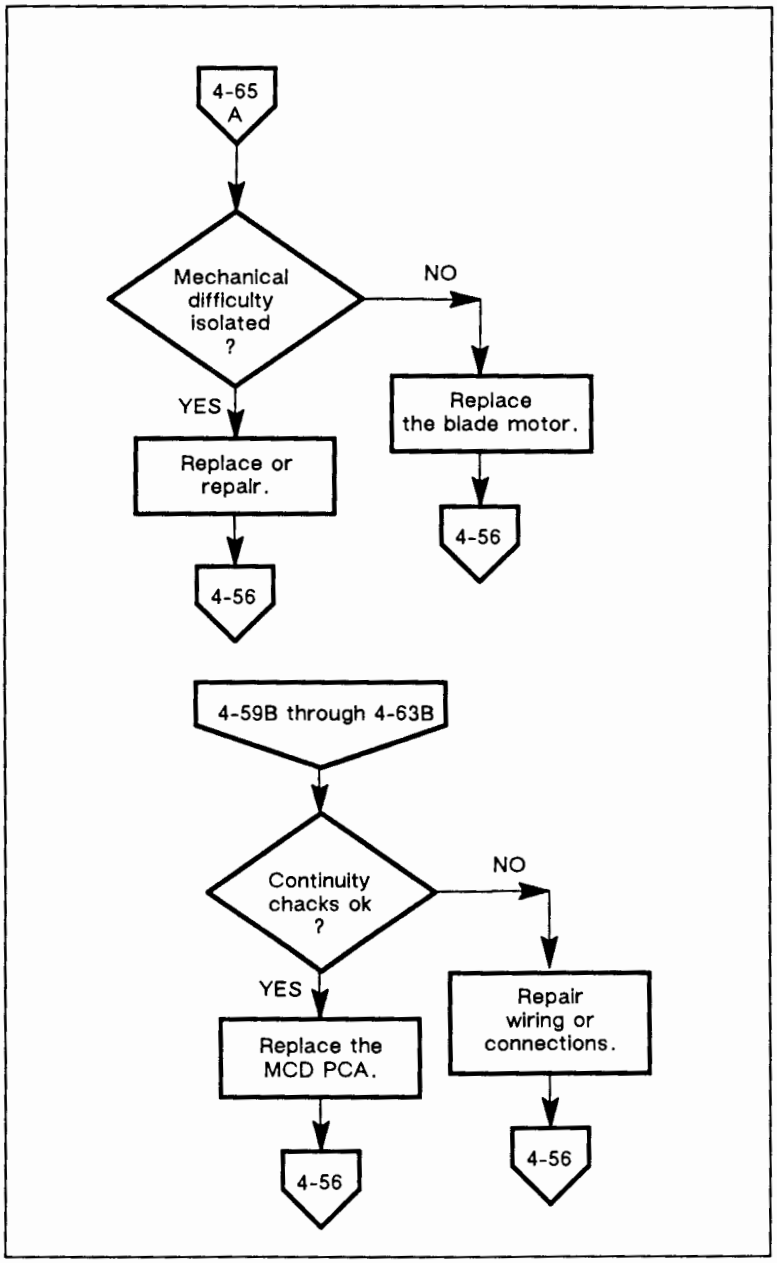


Figure 4-29. Cutter Troubleshooting Flowchart (Continued)

4-47. TAKE-UP REEL FLOWCHART

4-48. The following flowchart (See Figure 4-30) covers the mechanics and the motor of the take-up reel.

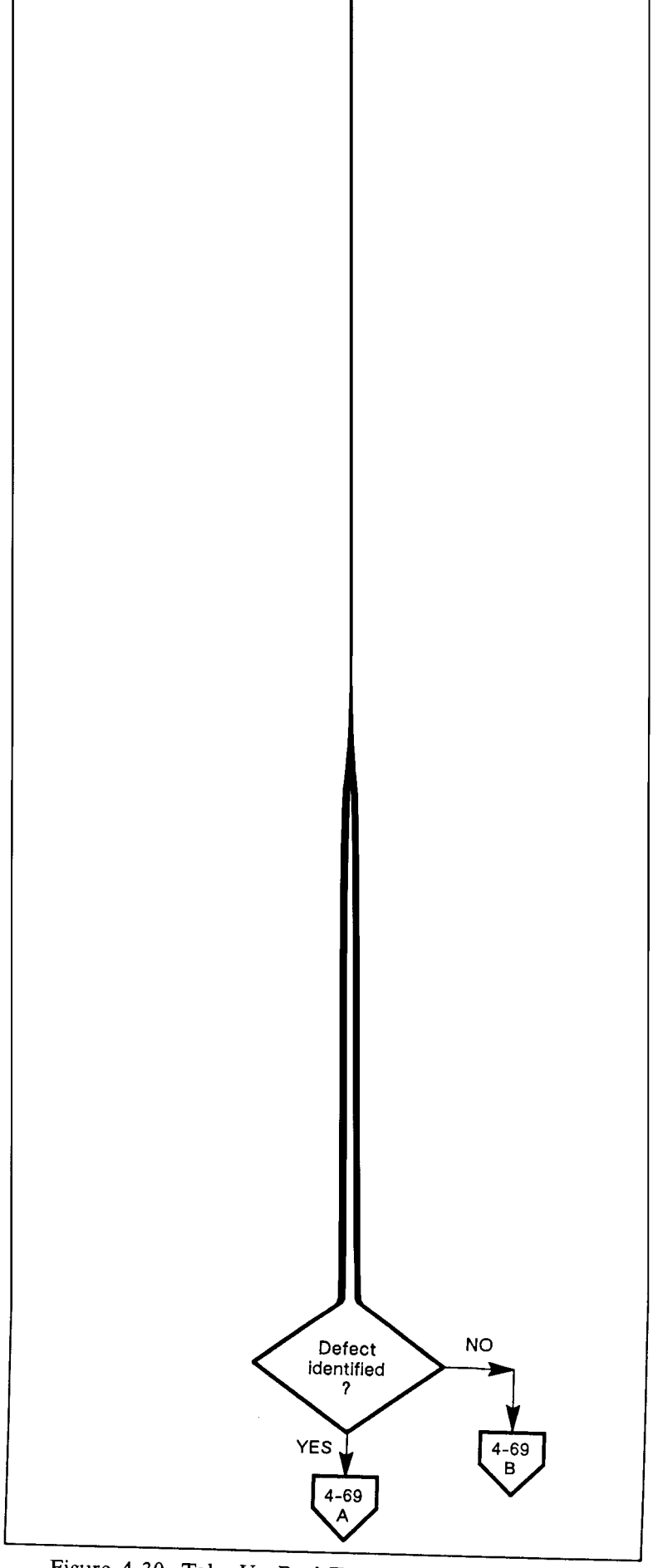


Figure 4-30. Take-Up Reel Troubleshooting Flowchart

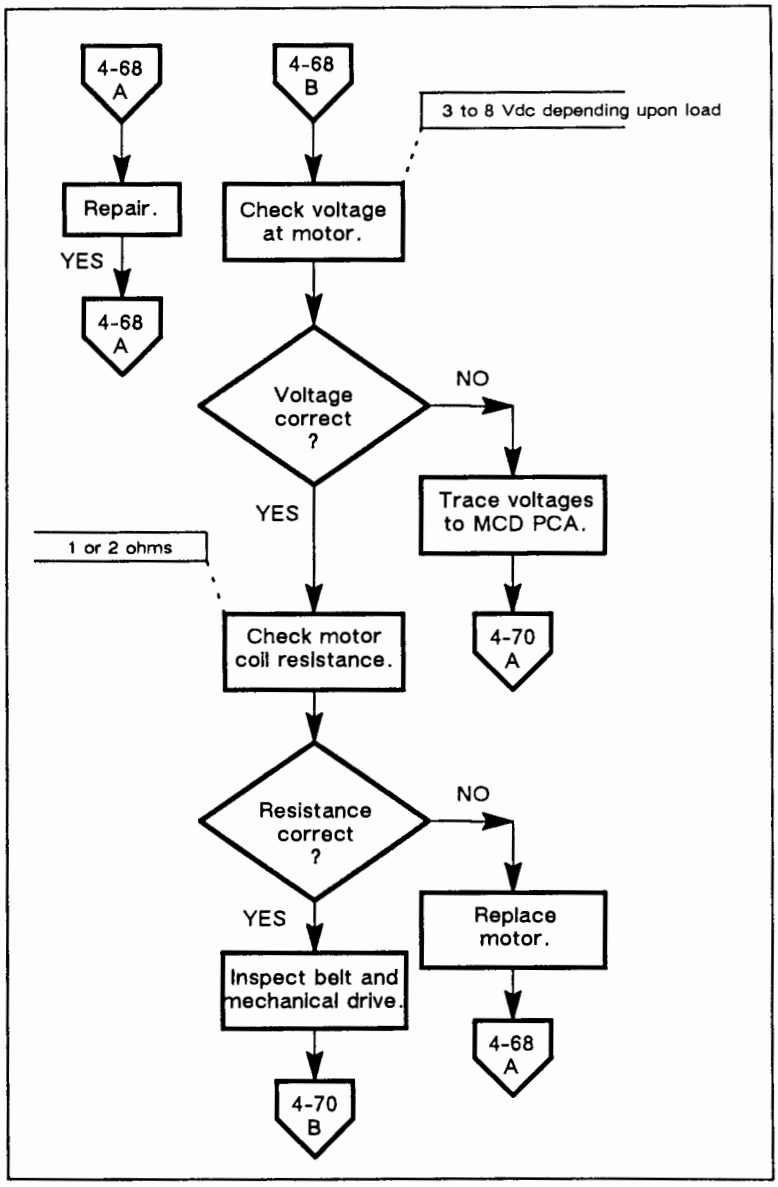


Figure 4-30. Take-Up Reel Troubleshooting Flowchart (Continued)

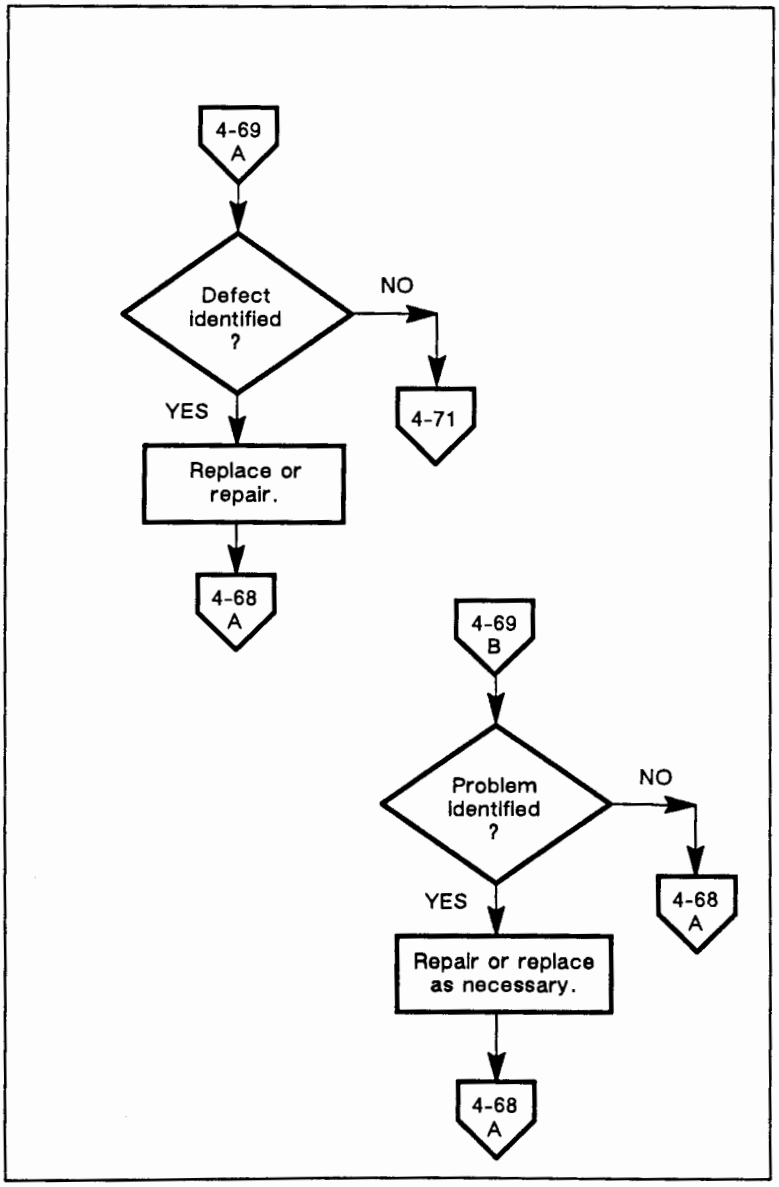


Figure 4-30. Take-Up Reel Troubleshooting Flowchart (Continued)

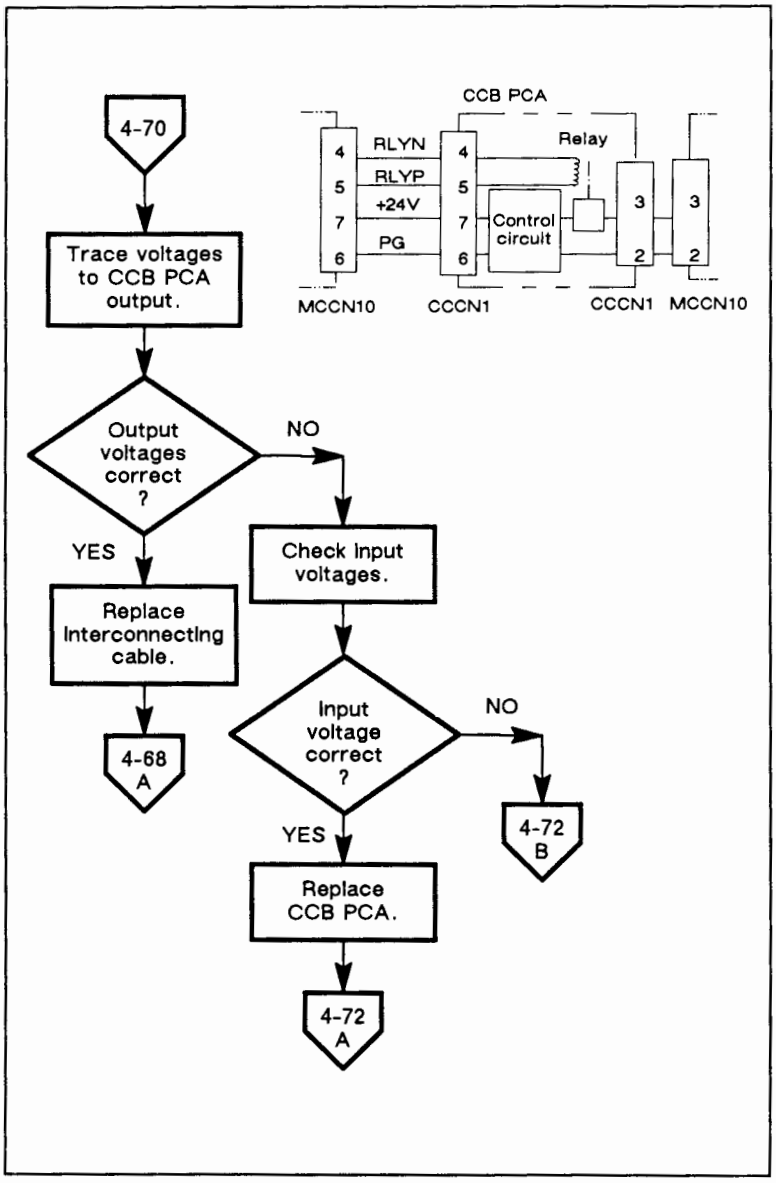


Figure 4-30. Take-Up Reel Troubleshooting Flowchart (Continued)

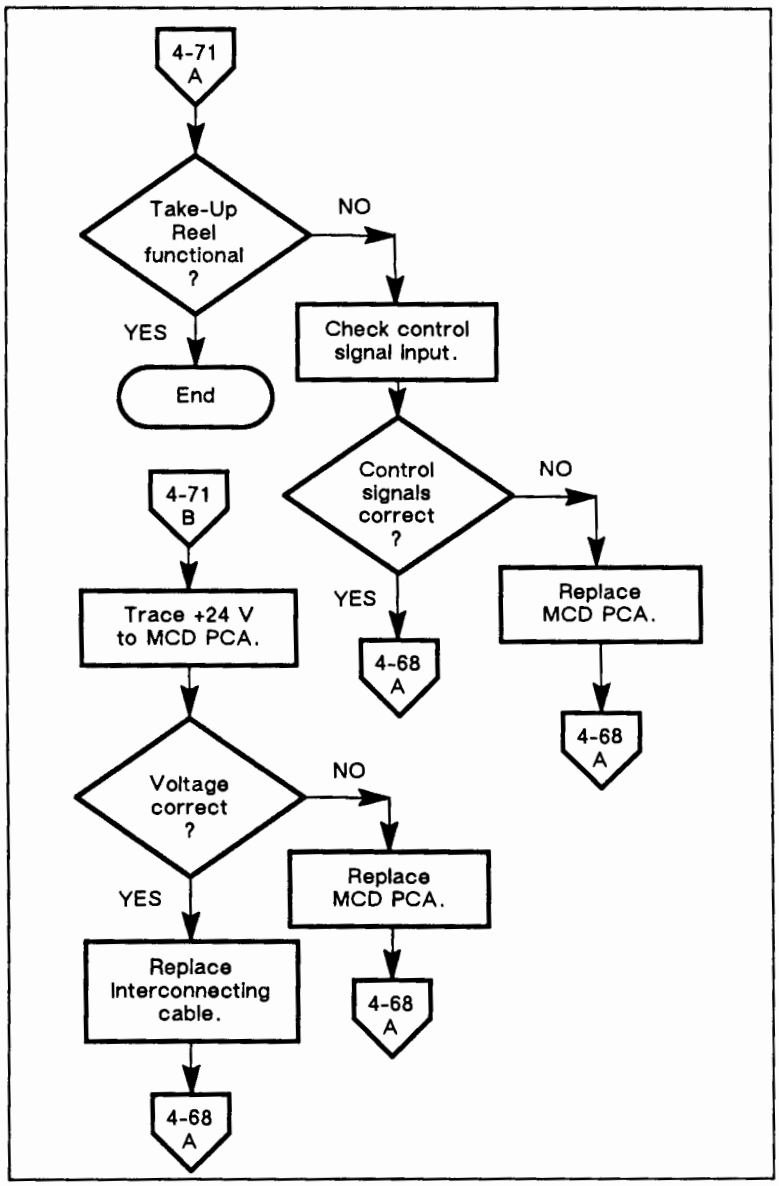


Figure 4-30. Take-Up Reel Troubleshooting Flowchart (Continued)

4-49. PROCESSOR LEDS

4-50. A series of 8 leds have been mounted on the Processor PCA to aid in troubleshooting and to serve as a back-up if communication with the front panel has been interrupted. The LEDS are illustrated in Figure 4-31. If a failure is suspected and the front panel LCD does not display an error indication, the VRC cover and the PCA retainer may be removed to view these LEDs. If necessary, refer to the disassembly procedures in this manual.

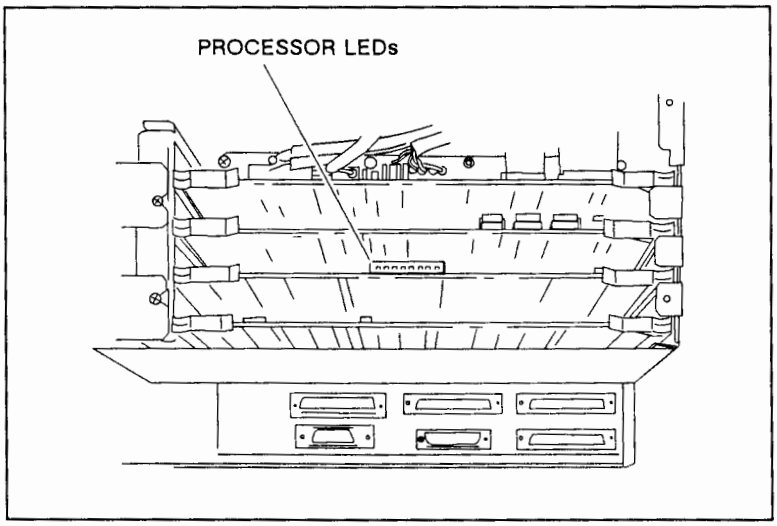


Figure 4-31. VRC LEDs

4-51. During normal operation, the LED's will indicate the VRC processes being run. Details of the Processor LEDs (See Figure 4-32) are as follows:

a. LED 7 - Not used on these models

b. LED 6 - Remains on for some time at power-up as the front panel language is being loaded and during Front Panel I/O.

c. LED 5 - Disk I/O ... Disk ACTIVE

d. LED 4 - Processing HP-GL plot data. Will toggle with LED 3 if plot data is being received while the VRC is rasterizing the previous plot.

e. LED 3 - Converting plot data to raster format. Will toggle with LED 4 if plot data is being received while the VRC is rasterizing the previous plot.

f. LED 2 - Busy LED. Indicates internal disk access or data processing.

g. LEDS 1 & 0 - Not used

4-52. If an error is encountered, these LED's will indicate the crash code messages which may not be displayed at the front panel. The crash code messages may not be displayed at the front panel if the panel fails, or the failure itself disables the panel. See Table 4-4.

4-53. With crash codes in the 7* series, address or instruction errors are indicated. The 3 least significant bits of the * are the board-select code in the bad address or program counter. A variety of sources can cause these errors. Indications are as follows:

a. Media moving - Hard disk suspected. Remove all plots from the queue and re-send the plot. Reformat disk.

b. Plot transmission - 68020 firmware bug likely. May also be a RAM error.

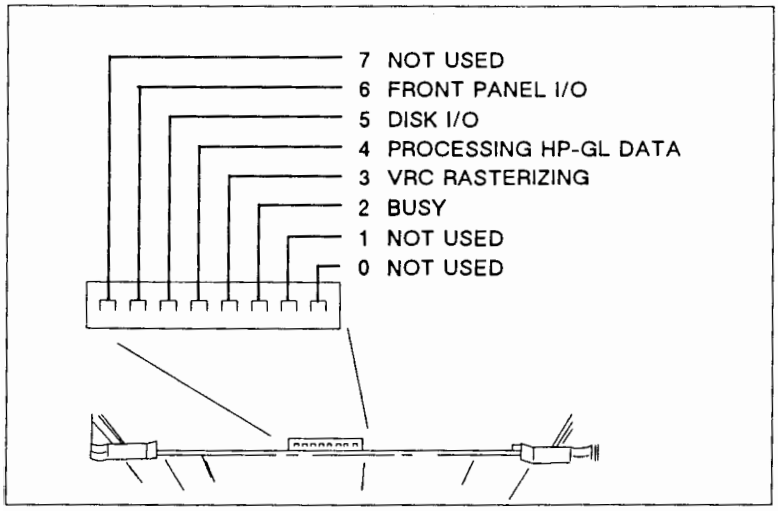


Figure 4-32. Processor LEDS

4-54. Refer to Table 4-4 for Processor PCA crash code indications and suggested remedies. Crash codes in the 8* series are most likely caused by the 6809 processor on the Disk Controller PCA. If the code is above 80, first subtract 80 and reference the remainder on the crash code table.

Table 4-4. Processor PCA Crash Indications

LED								HEX Code
7	6	5	4	3	2	1	0	
●	●	●	●	●	●	●	○	01
●	●	●	●	●	●	○	●	02
●	●	●	●	●	●	○	○	03
●	●	●	○	●	●	●	●	10
●	●	●	○	●	●	●	○	11
●	●	●	○	●	●	○	●	12
●	●	●	○	●	●	○	○	13
●	●	●	○	●	○	●	●	14
●	●	●	○	●	○	●	○	15
●	●	●	○	●	○	○	●	16
●	●	●	○	●	○	○	○	17
●	●	●	○	○	●	●	●	18
●	●	●	○	○	●	●	○	19
●	●	●	○	○	●	○	○	1B
●	●	●	○	○	○	●	●	1C
●	●	●	○	○	○	●	○	1D
●	●	●	○	○	○	○	●	1E
●	●	●	○	○	○	○	○	1F
●	●	○	●	●	●	●	●	20
●	●	○	●	●	●	●	○	21

TABLE EXTENDED ON NEXT PAGE

Table 4-4. Processor PCA Crash Indications (Extension)

HEX Code	Error	Suggested Remedy †
01	Operating system crash	1
02	Bad interrupt	1
03	Miscellaneous Exception	1, P
10	Bad System RAM	P
11	Bad System ROM	P
12	Bad Font ROM	P
13	Bad swath RAM (XBAR = 0)	S, I, M
14	Bad swath RAM (XBAR = 1)	S, I, M
15	Bad Refresh Circuit (swath RAM 0)	S
16	Bad Refresh Circuit (swath RAM 1)	S
17	Dynamic bus-sizing failed (swath RAM)	S
18	Bad cross-bar FF or Assoc. circuit	I, S
19	Bad pixel-mode circuitry	S
1B	Bad disk track buffer	C
1C	Disk communication failure (echo test)	C, P, M
1D	RS-232-C Loop-Back Test failed	I, M
1E	Disk read differs from disk write.	C
1F	Print Engine Loop-Back Test failed.	I
20	Front Panel loop-back test failed.	
21	Bad engine status during bench run	

○ = ON ● = OFF ✻ = Don't care

† SUGGESTED REMEDY – Perform in the order indicated in table column.

C = Disk Controller PCA
D = Disk Drive
I = I/O DMA PCA
M = Main/Interconnect PCA
P = Processor PCA
S = SWATH/RAM PCA
R = Reformat Disk, and retry.
1 = Clear queue, cycle power, and retry.

Table 4-4. Processor PCA Crash Indications (Continued)

LED								HEX Code
7	6	5	4	3	2	1	0	
●	●	○	●	○	●	●	●	28
●	●	○	●	○	●	●	○	29
●	●	○	●	○	●	○	●	2A
●	●	○	○	●	●	●	●	30
●	●	○	○	●	●	●	○	31
●	●	○	○	●	●	○	●	32
●	●	○	○	●	●	○	○	33
●	●	○	○	●	○	●	●	34
●	●	○	○	●	○	●	○	35
●	●	○	○	○	●	●	●	38
●	●	○	○	○	●	●	○	39
●	●	○	○	○	●	○	●	3A
●	●	○	○	○	●	○	○	3B
●	○	●	●	●	●	●	●	40
●	○	●	●	●	●	●	○	41

TABLE EXTENDED ON NEXT PAGE

Table 4-4. Processor PCA Crash Indications (Extension) (Continued)

HEX Code	Error	Suggested Remedy †
28	Absolute queque entry index out-of-range	1, P, R
29	No partitions	1, C, D, P
2A	No partitions	1, C, D
30	Size of left hole is negative.	1, P
31	Size of rightr hole is negative.	1, P
32	Attempt to grow left with N = 0	1, P
33	Attempt to grow right with N = 0	1, P
34	Attempt to grow left with ORDERED = TRUE	1, P
35	Attempt to move a clump to current location	1, P
38	Attempt to fetch a message for an inactive task	1, P
39	Mail and stack areas collided.	1, P
3A	Task not in a runable list	1, P
3B	Out of Memory	1, P
40	Bad disk address or length to R/W routine	1, P, C
41	Disk does not respond to commands.	1, C, P

○ = ON ● = OFF ✻ = Don't care

† SUGGESTED REMEDY – Perform in the order indicated in table column.

C = Disk Controller PCA
D = Disk Drive
I = I/O DMA PCA
M = Main/Interconnect PCA
P = Processor PCA
S = SWATH/RAM PCA
R = Reformat Disk, and retry.
1 = Clear queue, cycle power, and retry.

Table 4-4. Processor PCA Crash Indications (Continued)

LED								HEX Code
7	6	5	4	3	2	1	0	
●	○	●	●	●	●	○	●	42
●	○	●	●	●	●	○	○	43
●	○	●	●	●	○	●	●	44
●	○	●	●	●	○	○	●	46
●	○	●	●	●	○	○	○	47
●	○	●	●	○	●	●	●	48
●	○	●	●	○	●	●	○	49
●	○	●	●	○	○	○	○	4F
●	○	●	○	●	●	●	●	50
●	○	●	○	●	●	●	○	51
●	○	●	○	●	●	○	●	52
●	○	●	○	●	○	●	●	54
●	○	●	○	●	○	●	○	55
●	○	○	●	●	●	●	●	60
●	○	○	●	●	●	●	○	61
●	○	○	●	○	●	●	●	68
●	○	○	●	○	●	●	○	69

TABLE EXTENDED ON NEXT PAGE

Table 4-4. Processor PCA Crash Indications (Extension) (Continued)

HEX Code	Error	Suggested Remedy †
42	Disk expected to be idle, but isn't.	1, D
43	Spurious interrupt	1, C
44	Error in status register	C
46	Write retry limit exceeded	D, C
47	Spurious interrupt	C, P
48	Disk not ready after power-up	R, C, D
49	Disk error in demo during retry	R, C, D
4F	VRC encountered illegal opcode in vector data.	R, P
50	Boss-task received bad message.	1, P
51	Engine-task received bad message.	1, P
52	Panel-task received bad message.	1, P
54	VRC resumed after it was finished.	P
55	Byte arrived at engine UART.	I
60	UART output collision	1, I
61	INDONE indicated byte available. GETBYTE received none.	1, I
68	UART output collision	1, I
69	INDONE indicated byte available. GETBYTE received none.	1, I

○ = ON ● = OFF ✻ = Don't care

† SUGGESTED REMEDY – Perform in the order indicated in table column.

C = Disk Controller PCA
D = Disk Drive
I = I/O DMA PCA
M = Main/Interconnect PCA
P = Processor PCA
S = SWATH/RAM PCA
R = Reformat Disk, and retry.
1 = Clear queue, cycle power, and retry.

Table 4-4. Processor PCA Crash Indications (Continued)

LED								HEX Code
7	6	5	4	3	2	1	0	
●	○	●	●	●	●	○	●	6A
●	○	●	●	●	●	○	●	6B
●	○	●	●	●	●	○	○	7*

TABLE EXTENDED ON NEXT PAGE

Table 4-4. Processor PCA Crash Indications (Extension) (Continued)

HEX Code	Error	Suggested Remedy †
6A	Front panel reported SIO command error.	P
6B	I/O to Front Panel timed out.	F, I
7✻	If ✻ is less than eight a bad address is indicated. If ✻ is greater than eight a bad instruction is indicated.	

○ = ON ● = OFF ✻ = Don't care

† SUGGESTED REMEDY – Perform in the order indicated in table column.

C = Disk Controller PCA
D = Disk Drive
I = I/O DMA PCA
M = Main/Interconnect PCA
P = Processor PCA
S = SWATH/RAM PCA
R = Reformat Disk, and retry.
1 = Clear queue, cycle power, and retry.

4-55. SERVICE MENU

4-56. Within the Diagnostics Menu is a submenu for service technicians. This menu provides access to plotter calibration, disk format, and the VRDY display.

4-57. To enter the Service Menu:

a. Select the Diagnostic Menu.

b. At any point in this menu, press Scroll ↓ and the Diagnostic button at the same time.

c. The display appears as follows:

```
DIAGNOSTIC                    ↓
SERVICE TECH DIAGS
→SET CAL (%)= 100.00
  FORMAT DISK
```

d. Pressing Scroll ↓ twice will display:

```
DIAGNOSTIC                    ↑
SERVICE TECH DIAGS
→FORMAT DISK
  VRDY: NOT READY
```

4-58. SET CALIBRATION

4-59. To adjust the calibration of the plotter output in the axis of media movement (X-axis):

a. Plot a line in the x axis.

b. Measure that line and perform the following computation:

$$\frac{\text{ACTUAL LENGTH}\ \dagger}{\text{DESIRED LENGTH}} * 100 = \%\ \text{of desired}$$

† measured

c. Enter the service menu.

d. The select arrow will appear at the **SET CAL** line.

e. Press the **Value +** or **Value –** button to select the value computed.

f. The range is 90.00 to 110.00 in increments of hundredths.

g. When the desired value is displayed, press **Enter**. The display will show:

```
PROCESSING COMMAND
```

h. The value will be stored, and the display will return with the entered value.

```
DIAGNOSTIC                    ↓
SERVICE TECH DIAGS
→SET CAL (%)= 99.08
 FORMAT DISK
```

4-60. FORMAT DISK

CAUTION

Formatting the disk will delete all plots, front panel language, "help", and menus on the disk. No effect will be noticed until power is cycled, or the front panel language is changed.

An external controller and data files are required to restore the hard disk if it is formatted.

4-61. To reformat the hard disk drive in the VRC:

a. Select the Diagnostic Menu.

b. At any point in this menu, press **Scroll** ↓ and the **Diagnostic** button at the same time.

c. The display appears as follows:

```
DIAGNOSTIC                    ↓
SERVICE TECH DIAGS
→SET CAL  (%)= 100.00
  FORMAT DISK
```

d. Pressing **Scroll** ↓ once will display:

```
DIAGNOSTIC                    ↓
SERVICE TECH DIAGS
  SET CAL  (%)= 100.00
→FORMAT DISK
```

e. Press **Enter**. The display is as follows:

```
TAKES 20 MINUTES &
ERASES ALL DISK INFO
ENTER starts format,
PREV MENU exits
```

f. Press **Enter** to continue, or **Prev Menu** to exit.

g. During formatting, the display is:

```
DISK FORMATTING

Format takes 20 min
```

h. Cycle power.

i. After reformatting the disk, plots, language data, and Help Menus must be loaded again.

4-62. VRDY

4-63. The VRDY (VRC Ready) display of this menu is monitoring the status of the VRC. The status is derived from ANDing:

- On-Line
- No vacuum error
- No mechanical errors
- Cutter selected and media in cutter

4-64. To get a READY status and generate a plot there can be no error conditions, the media must be in the selected path, and the plotter On-Line. A NOT READY indication is given if any conditions are not met.

```
DIAGNOSTIC                    ↑
SERVICE TECH DIAGS
→FORMAT DISK
  VRDY:  NOT READY
```

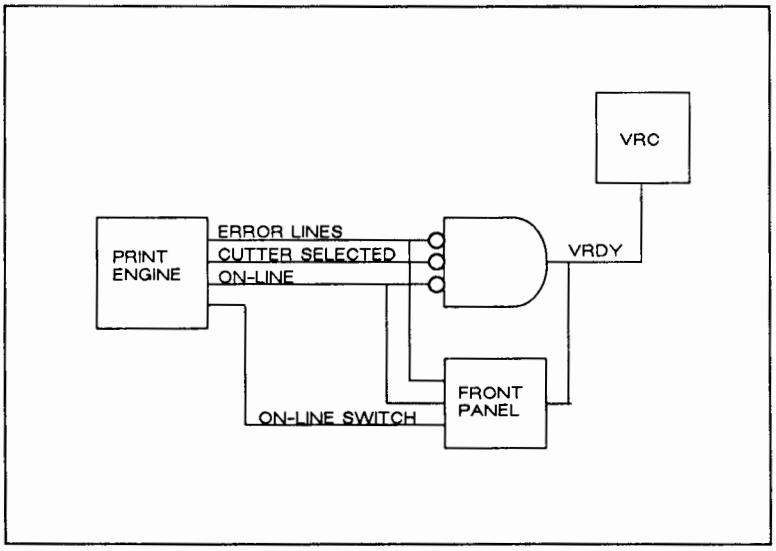


Figure 4-33. VRDY Block Diagram

CONTENTS

TABLES

TABLES (CONTINUED)

ILLUSTRATIONS

SECTION V
DIAGNOSTICS

5-1. DIAGNOSTICS MODEL 240D/E

5-2. SELF TEST

5-3. When ac line voltage to the plotter is turned ON (I) a series of built-in tests are automatically performed to verify proper plotter operation.

5-4. Within the VRC the two microprocessors are running their individual system tests in parallel. The following steps are being performed in the 68020 microprocessor Power-Up Self-Test:

a. System RAM Test

1. Writing and reading random data.

2. Inverting and reading the random data.

3. Address bus cross talk test.

4. Data bus cross talk test.

5. Worst case transceiver timing test.

b. System ROM checksum.

c. Font ROM checksum.

d. Swath RAM and crossbar circuit test.

e. Swath RAM refresh circuit test.

f. Swath RAM in pixel mode test.

g. Pixel loop-back test.

NOTE

The 68020 microprocessor test must stop at this point until the 6809 microprocessor test has been completed.

h. Disk with disk echo test

i. Disk track buffer test.

5-5. The 6809 microprocessor tests which are being run at power-up are as follows:

a. 6809 Microprocessor function

b. 6809 ROM Checksum

c. RAM (2K) Walking 1's, 0's

d. Shared RAM (8K) Walking 1's, 0's

e. Configuration Jumper

f. Disk Controller Register Check

g. Disk drive spindle speed

h. Disk track 0 indicator

i. Seek/Scan ID on drive

j. Drive size verification of jumpers

k. READ/WRITE ECC check

1. Write pattern.

2. Verify pattern.

3. Verify ECC bytes.

4. Write error to disk.

5. Read and verify error found.

6. Correct the error.

7. Verify data corrected.

l. Check disk drive hysteresis with successive seeks.

m. Read/verify the spare tables.

5-6. At the completion of the spare tables check the 6809 releases the disk so that the 68020 tests may be completed.

5-7. Error indications for the 6809 microprocessor are given by 2 LEDs on upper edge of the Disk PCA. This is the rear most PCA in the VRC. See Figure 5-1.

5-8. When the power-on sequence is started, both the LEDs will turn ON. If the test is sucessfully completed, both LEDs will turn OFF. If a failure is encountered in the 6809 microprocessor test, the green LED (DS1) will turn OFF and the yellow LED (DS2) will give an error indication. Refer to Table 5-1 for the error codes. The error code display is an endless loop, causing the error code to repeat until the plotter is turned OFF. All errors are also reported in the status register and, except for those indicated by the flashing yellow LED (DS2), have specific error codes. The error code is written into status bytes of the system RAM. The REQUEST STATUS command allows the 68020 microprocessor access to these status bytes.

5-9. The Power-On test sequence will run either to completion, at which time normal plotter operation will begin, or to an error condition. An error will cause the test to stop, which prevents normal plotter operation. The front panel ON LINE LED will flash, and the Busy, Reset, and Media (yellow) LEDs will display failure information. Eight LEDS on the Processor PCA inside the VRC will also display an eight-bit error code. See Figure 5-2 and Table 5-2. The front panel LEDs are illustrated in Figure 5-3.

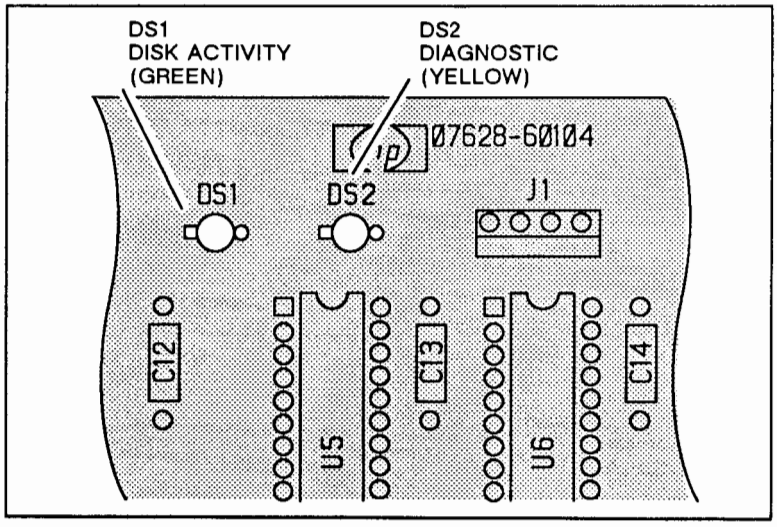


Figure 5-1. Disk Drive LEDs

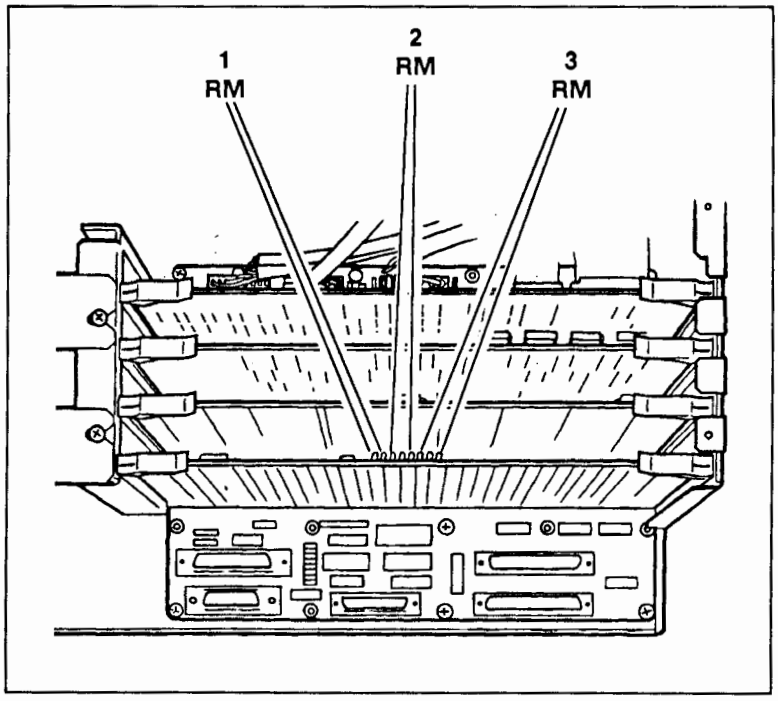


Figure 5-2. Processor PCA Self-test Error Code LEDs

Table 5-1. 6809 Self-Test Codes

ERROR INDICATION	FAILURE
5 flashes	6809 microprocessor failure
4 flashes	Configuration jumper
3 flashes	8K Buffer RAM
2 flashes	2K System RAM
1 flash	ROM checksum
ON steadily	Use Table 5-2. Self-Test Error Codes.

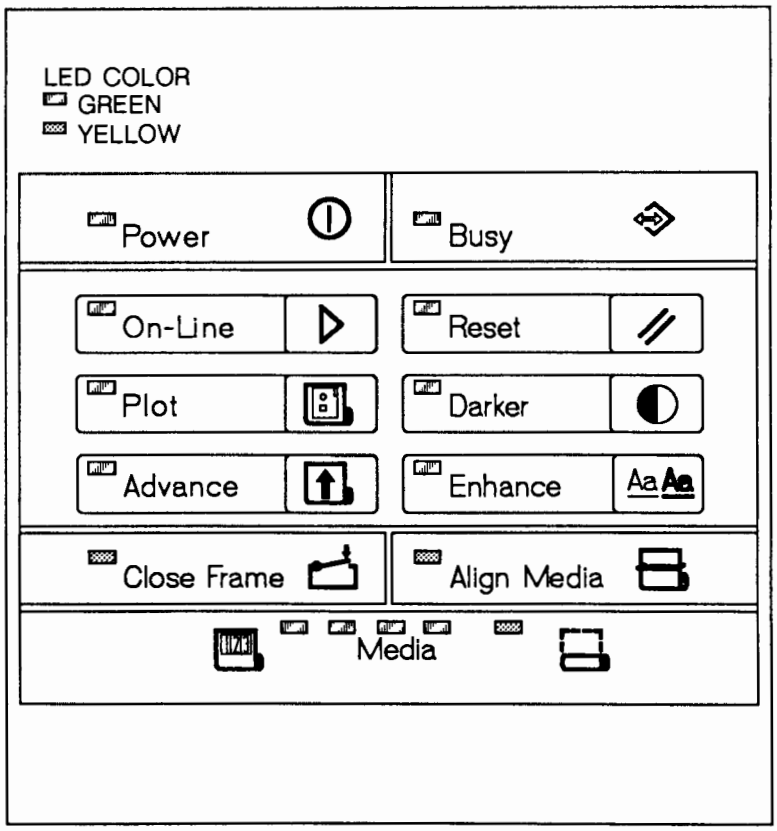


Figure 5-3. Front Panel LEDs

5-10. In the error condition, pressing the Reset button will cause the plotter to restart a power-up sequence. The power-up sequence (hard restart) may also be caused by sending an exclamation mark (!) from the controller. A soft restart is caused by sending the plotter a vertical bar (|). To exit the error state the plotter ac power must be cycled OFF (O).

5-11. The error code will be presented in the form of three, 3-bit displays. The error code will be the lower 7 bits of the 9 bit number. The eighth bit (Reset LED during the first display) will be used to define either a disk error (1) or fault in another area of the VRC (0).

5-12. The steps performed in the self test are follows:

a. Apply ac power to the plotter. The test begins.

b. A successful self-test indication is as follows:

1. Power LED - ON steadily
2. On-Line LED - OFF
3. Advance LED - OFF
4. Reset LED - ON momentarily, then OFF
5. Busy LED - flashing momentarily,then OFF
6. Media LED (yellow) - OFF
7. Close Frame LED - OFF
8. Align Media LED - OFF

c. Press the Advance button. The toner pump activates, and the media advances.

d. Upon successful completion of this portion, perform the Demonstration Plot, described later in this section.

e. If the plotter self test is not successfully completed, the On-Line LED on the front panel will flash to indicate an error.

f. To read the error code, proceed as follows:

1. While the On-Line LED is flashing, note the status of the Busy, Reset, and yellow Media LEDs. This is the first digit (high 3 bits) of an octal error code.

2. Press the Plot button on the front panel one time. The On-Line LED will be OFF.

3. Again note the status of the Busy, Reset, and Media (yellow) LEDs. This is the second digit (middle 3 bits) of the error code.

4. Again press the Plot button on the front panel once. The On-Line LED will be OFF.

5. Note the status of the Busy, Reset, and Media (yellow) LEDs for the third digit (low 3 bits) of the code.

6. Refer to Table 5-2 for the codes and the error conditions of the self test.

g. The code may also be read over the HP-IB.

1. In the self-test failed state, if a read is done from the HP-IB controller the plotter will output error data as two alpha characters.
<hi char> <lo char> CR LF.

2. The HP-IB failure code is computed by subtracting 65 from the ASCII decimal equivalents of the characters as follows:
Code = 16 x (hi char-65) + (lo char -65)

Table 5-2. Self-Test Error Codes

DIGIT 1 B R M	DIGIT 2 B R M	DIGIT 3 B R M	OCTAL CODE	FIX
0 0 0	0 0 0	0 0 0	0 00	
0 0 0	0 0 0	0 0 1	0 01	1
0 0 0	0 0 0	0 1 0	0 02	1
0 0 0	0 0 0	0 1 1	0 03	P
0 0 0	0 1 0	0 0 0	0 20	P
0 0 0	0 1 0	0 0 1	0 21	P
0 0 0	0 1 0	0 1 0	0 22	P
0 0 0	0 1 0	0 1 1	0 23	S
0 0 0	0 1 0	1 0 0	0 24	S
0 0 0	0 1 0	1 0 1	0 25	S
0 0 0	0 1 0	1 1 0	0 26	S
0 0 0	0 1 0	1 1 1	0 27	S
0 0 0	0 1 1	0 0 0	0 30	S
0 0 0	0 1 1	0 0 1	0 31	S
0 0 0	0 1 1	0 1 0	0 32	I
0 0 0	0 1 1	0 1 1	0 33	C
0 0 0	0 1 1	1 0 0	0 34	C, P
0 0 0	0 1 1	1 0 1	0 35	I
0 0 0	0 1 1	1 1 0	0 36	C
0 0 0	0 1 1	1 1 1	0 37	
Code 37 means that the VRC switch test failed. Octal codes 040 through 057 are not used.				

B = Busy R = Reset M = Media (yellow)

1 = LED ON 0 = LEDOFF X = Don't Care

Fix Codes – Replace the suggested assembly(s) in the order listed.

C = Disk Controller
M = Disk Controller
D = Disk Drive
P = Processor PCA
I = I/O DMA PCA
S = Swath/RAM PCA
1 = Clear queue, cycle power, & retry.

Table 5-2. Self-Test Error Codes (Continued)

DIGIT 1 B R M	DIGIT 2 B R M	DIGIT 3 B R M	OCTAL CODE	FIX
0 0 0	1 1 0	0 0 0	0 60	P, S, C
0 0 0	1 1 0	0 0 1	0 61	P, S, C
0 0 0	1 1 0	0 1 0	0 62	P, S, C
0 0 0	1 1 0	0 1 1	0 63	P, S, C
0 0 0	1 1 0	1 0 0	0 64	P, S, C
0 0 0	1 1 0	1 0 1	0 65	P, S, C
Codes 066 through 077 are not used.				
0 0 1	0 0 0	0 0 0	1 00	C
0 0 1	0 0 0	0 0 1	1 01	Not used.
0 0 1	0 0 0	0 1 0	1 02	C, P
0 0 1	0 0 0	0 1 1	1 03	D
0 0 1	0 0 0	1 0 0	1 04	Not used.
0 0 1	0 0 0	1 0 1	1 05	Not used.
0 0 1	0 0 0	1 1 0	1 06	D, C
0 0 1	0 0 0	1 1 1	1 07	C, P
Codes 110 through 116 are not used.				
0 0 1	0 0 1	1 1 1	1 17	Bad data read from disk.
0 0 1	1 1 0	X X X	1 6X	I, S, P
0 0 1	1 1 1	X X X	1 7X	P

B = Busy R = Reset M = Media (yellow)

1 = LED ON 0 = LEDOFF X = Don't Care

Fix Codes – Replace the suggested assembly(s) in the order listed.

C = Disk Controller
M = Disk Controller
D = Disk Drive
P = Processor PCA
I = I/O DMA PCA
S = Swath/RAM PCA

Table 5-2. Self-Test Error Codes (Continued)

DIGIT 1 B R M	DIGIT 2 B R M	DIGIT 3 B R M	OCTAL CODE	FIX
0 1 0	0 0 0	0 0 1	2 01	C
0 1 0	0 0 0	0 1 0	2 02	C
0 1 0	0 0 0	0 1 1	2 03	P, C
0 1 0	0 0 0	1 0 0	2 04	C
0 1 0	0 0 0	1 0 1	2 05	C
0 1 0	0 0 0	1 1 0	2 06	C
0 1 0	0 0 0	1 1 1	2 07	C
0 1 0	0 0 1	0 0 0	2 10	D, C
0 1 0	0 0 1	0 0 1	2 11	D, C
0 1 0	0 0 1	0 1 0	2 12	D, C
0 1 0	0 0 1	0 1 1	2 13	D, C
0 1 0	0 0 1	1 0 0	2 14	D, C
0 1 0	0 0 1	1 0 1	2 15	D, C
0 1 0	0 0 1	1 1 0	2 16	D, C
0 1 0	0 0 1	1 1 1	2 17	D, C
0 1 0	0 1 0	0 0 0	2 20	C
0 1 0	0 1 0	0 0 1	2 21	D, C
0 1 0	0 1 0	0 1 0	2 22	D, C
0 1 0	0 1 0	0 1 1	2 23	C
0 1 0	0 1 0	1 0 0	2 24	C
0 1 0	0 1 0	1 0 1	2 25	1
0 1 0	0 1 0	1 1 0	2 26	D, C
0 1 0	0 1 0	1 1 1	2 27	2
0 1 0	0 1 1	0 0 0	2 30	2

B = Busy R = Reset M = Media (yellow)

1 = LED ON 0 = LEDOFF X = Don't Care

Fix Codes – Replace the suggested assembly(s) in the order listed.

C = Disk Controller
M = Disk Controller
D = Disk Drive
P = Processor PCA
I = I/O DMA PCA
S = Swath/RAM PCA
1 = Reformat disk.
2 = Send plot again.

Table 5-2. Self-Test Error Codes (Continued)

DIGIT 1 B R M	DIGIT 2 B R M	DIGIT 3 B R M	OCTAL CODE	FIX
0 1 0	0 1 1	0 0 1	2 31	1
0 1 0	0 1 1	0 1 1	2 33	C, D
0 1 0	0 1 1	1 0 0	2 34	C
0 1 0	0 1 1	1 0 1	2 35	C, D
0 1 0	0 1 1	1 1 0	2 36	C
0 1 0	0 1 1	1 1 1	2 37	C
0 1 0	1 0 0	0 0 0	2 40	D, C
0 1 0	1 0 0	0 0 1	2 41	1
0 1 0	1 0 0	0 1 0	2 42	D, C
0 1 0	1 0 0	0 1 1	2 43	1, D, C
0 1 0	1 0 0	1 0 0	2 44	C
0 1 0	1 0 0	1 0 1	2 45	D, C
0 1 0	1 0 0	1 1 0	2 46	D, C
0 1 0	1 0 0	1 1 1	2 47	D, C
0 1 0	1 0 1	0 0 0	2 50	D, C
0 1 0	1 0 1	0 0 1	2 51	D, C
0 1 0	1 0 1	0 1 0	2 52	P, C
0 1 0	1 0 1	0 1 1	2 53	3, C
0 1 0	1 0 1	1 0 0	2 54	1
0 1 0	1 0 1	1 0 1	2 55	1
0 1 0	1 0 1	1 1 0	2 56	2
0 1 0	1 0 1	1 1 1	2 57	D, C
0 1 0	1 1 0	0 0 0	2 60	D, C
0 1 0	1 1 0	0 0 1	2 61	D, C
0 1 0	1 1 0	0 1 0	2 62	C
0 1 0	1 1 0	0 1 1	2 63	D, C

B = Busy R = Reset M = Media (yellow)

1 = LED ON 0 = LEDOFF X = Don't Care

Fix Codes – Replace the suggested assembly(s) in the order listed.

C = Disk Controller
M = Disk Controller
D = Disk Drive
P = Processor PCA
I = I/O DMA PCA
S = Swath/RAM PCA
1 = Reformat disk. 2 = Send plot again.
3 = Reset jumpers.

5-13. DEMONSTRATION PLOT

5-14. The demonstration plot checks the majority of the mechanical and electrical portions of the plotter. The plot is an internal plotter confidence test. There is no need to disconnect the plotter from the computer in order to run the test.

5-15. To run the HP 240D/E demonstration plot, proceed as follows:

a. Apply ac power to the plotter (I).

b. Set the On-Line button OFF (LED OFF).

CAUTION

Generating a demonstration plot will destroy any plot data presently in the memory.

NOTE

If the 40 Mbyte hard disk has been replaced or reformatted, the demonstration plot may not have been loaded. In this case, attempting to run the demonstration plot will cause the plotter to revert to code stored in ROM. This will generate the back-up plot illustrated in Figure 5-5. This plot still confirms that all major functions of the plotter are operational. The procedure for loading the demonstration plot is found immediately after paragraph " NO TAG" in this handbook.

c. Wait for the successful completion of the internal self-test.

d. Press the front panel Plot button. Follow this by pressing the On-Line button immediately (Must be done within 2 seconds).

e. The back-up ROM plot is illustrated in Figure 5-4. The demonstration plot is illustrated in Figure 5-5.

f. When the plot is completed press the Advance button to advance the plot for viewing.

g. The plot may be repeated by pressing the Plot button on the front panel.

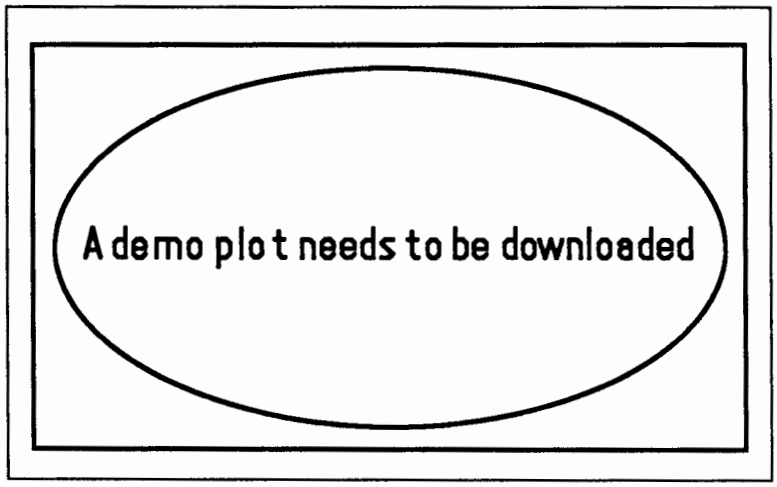


Figure 5-4. Back-up ROM Plot

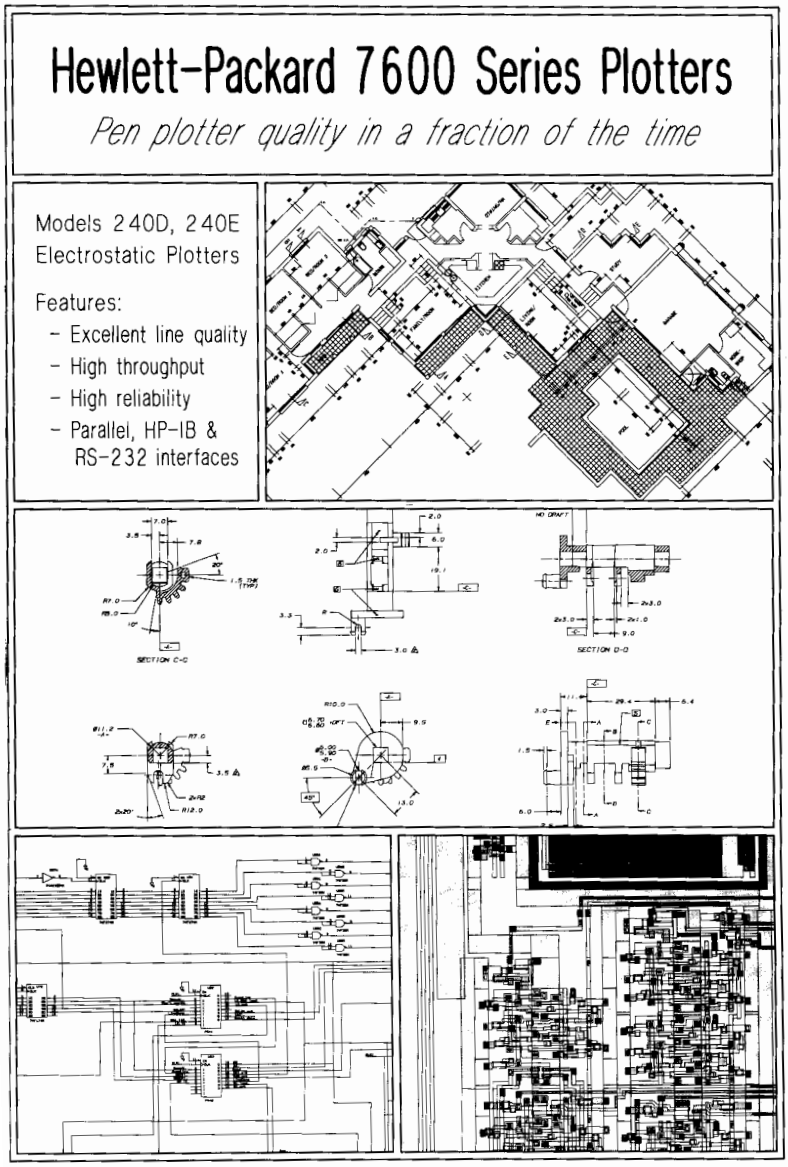


Figure 5-5. Demonstration Plot

5-16. LOADING THE DEMONSTRATION PLOT

5-17. If you tried to run the demonstration plot and found that the demonstration plot had not been loaded onto the 40 Mbyte disk, use the following procedure to load the plot data:

a. Equipment Required.

1. Portable PLUS Personal Computer
2. Disk Drive HP 9114B
3. Interface Cables 92221P , 17355D, and 82169A
4. HP 7600 Series Service Disk P/N C1600-60401

b. The Portable PLUS is configured as follows:

1. Datacom Configuration	Serial
2. Transmission Rate (BPS)	19200
3. Word Length (bits)	8
4. Stop Bits	1
5. Parity	None
6. XON/XOFF Pacing	On
7. CTS Line	Ignore
8. DSR Line	Ignore
9. DCD Line	Ignore
10. Power to Interface	ON
11. Plotter Interface	Serial

c. The plotter set-up is as follows:

1. Mode	RS-232-C
2. 7586 EMULATE /HP-GL/2	HP-GL/2

3. XON/XOFF/HARDWIRE	XON/XOFF
4. PARITY	OFF
5. BAUD	19200

d. Connect the Portable PLUS as shown in Figure 5-6.

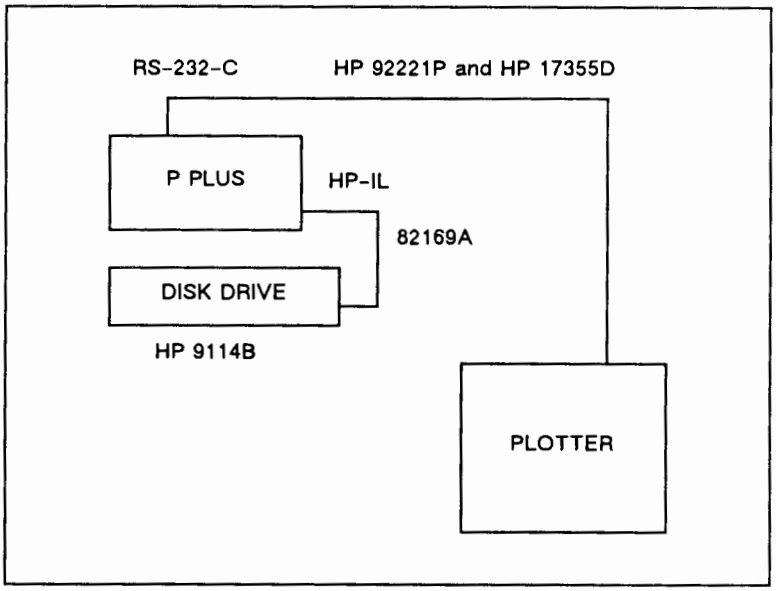


Figure 5-6. Demo Plot Setup

e. Turn the Portable PLUS and the disk drive ON (I). If the service disk programs are already loaded onto the internal "E" drive, go to step g.

f. Install the service disk in the drive.

g. Turn the plotter ON (I).

h. Enter DOS on the Portable PLUS, select drive C and type README.

i. Follow the instructions given on the display.

j. Run the program.

k. Upon successful completion of the program, the screen will display the message, END OF PROGRAM.

1. Turn OFF (O) all equipment before diskonnecting the cabling.

5-18. INTERNAL SERVICE TESTS

5-19. A wide variety of service diagnostics has been built into the HP 240D/E Plotters. These diagnostics are divided into groups as follows:

a. Those performed automatically at Power-Up.

b. Those that test the print engine.

c. Those that test the VRC (including I/O).

d. Those that test the entire plotter (except for I/O). The Demonstration Plot is an example

5-20. PRINT ENGINE TESTS

5-21. Operation of the print engine may be verified independently of all other plotter operations. No interface or VRC is required to ensure that the engine electronics and mechanics are in operational order.

5-22. To verify operation, proceed as follows:

a. Turn the plotter OFF (O).

b. Ensure that media and toner are loaded.

c. Turn the plotter ON (I).

d. Open the right-front door of the plotter.

e. Press and release the PG switch on the plotter test panel once. See Figure 5-7. The LED beside the switch will light. The test will run continuously until the PG switch is pressed again.

f. In a few seconds the plotter will begin to print a test pattern on the media. The pattern will be determined by the setting of the TEST L/M switch. See Figure 5-8 for samples of the test plots.

g. Printing of the test pattern assures that the mechanical and electrical areas of the print engine are functional.

h. If the test plot is not generated or is of poor quality, refer to specific headings in this chapter dealing with the indicated problem.

5-23. VRC TESTS

5-24. The two sets of slide switches on the front of the VRC are used to select a variety of tests and functions involving the VRC. The tests are as follows:

a. Continuous Bench-Run Test

b. Power-Up

c. Disk Test

d. RS-232-C Loop-Back Test

e. Switch Test

f. Disk Format

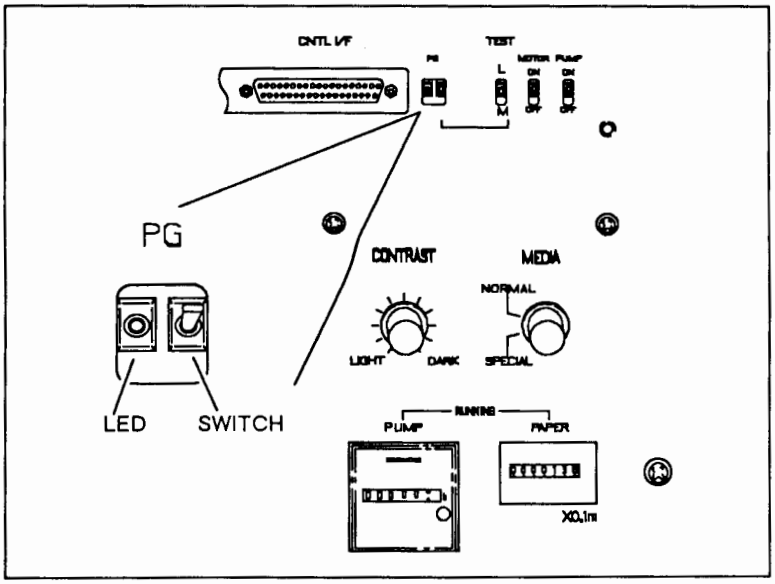


Figure 5-7. Print Engine Test Switches

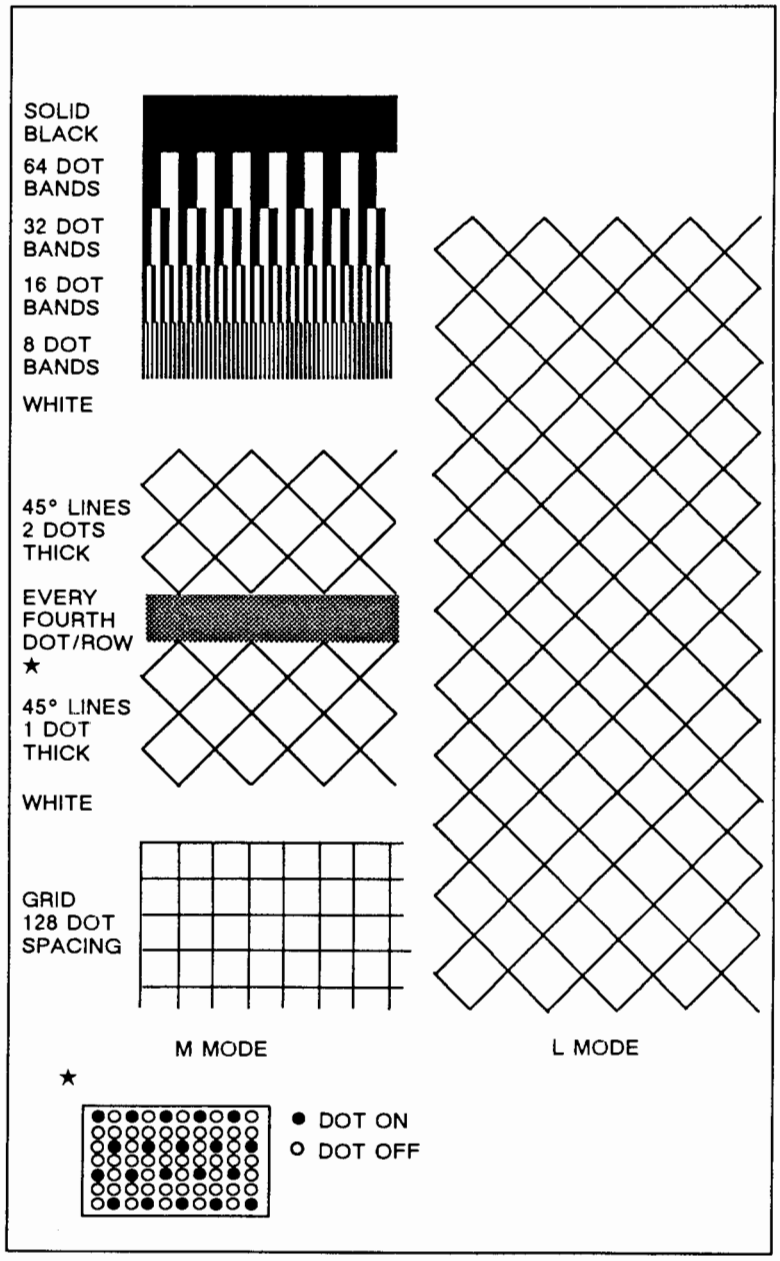


Figure 5-8. Print Engine Test Plots

5-25. The bench-run test continuously runs the power-up test, RS-232-C Loop-back Test, and the one minute disk test. This is an effective way to isolate an intermittent problem. Each time the test loop cycles, the eight LEDs inside the VRC will flash. Refer to the disassembly procedures in Chapter 6 of the Model 240D/E Hardware Support Manual for access to these LEDs. If a failure occurs during the bench run test, a failure code will be displayed on the VRC internal LEDs. The bench-run test is begun as follows:

a. Turn the plotter OFF (**O**).

b. Install the RS-232-C Test Connector in the VRC Serial Interface Port.

c. Set the Test Mode and Bench-Run Switches ON (I). See Figure 5-9.

d. Turn the plotter ON (**I**).

e. The test will begin and continue until the plotter is turned OFF (**0**).

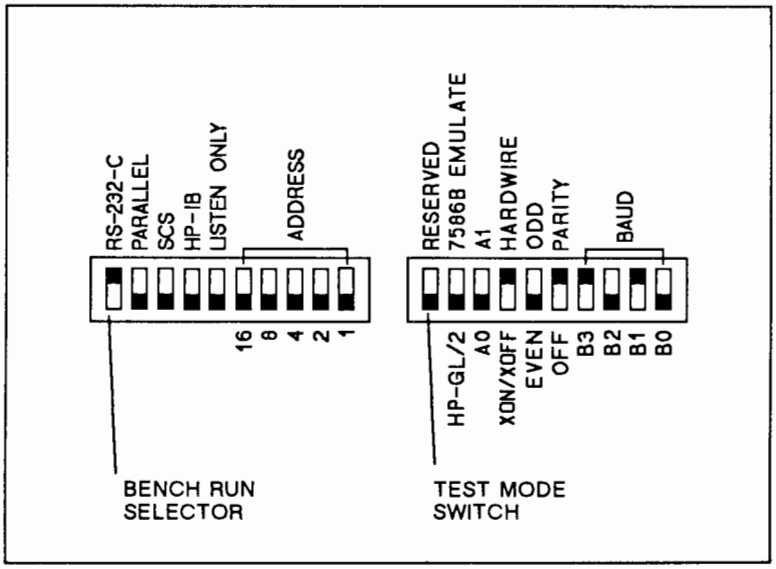


Figure 5-9. VRC Panel Switches

f. During the test the Busy LED will flash and the Reset LED will remain on unless an error is encountered.

5-26. Other tests are also built in to the VRC. These are begun by setting the VRC Test Mode switch ON (I) and the Bench-Run Switch OFF (O) before applying power to the plotter. The front panel Plot and Reset buttons are redefined in this mode to allow selection of the various tests. The Busy, Reset, and Media (yellow) LEDs are also redefined to indicate the selected test mode. The LED indications and test modes are listed in Table 5-3.

Table 5-3. VRC Tests

LED B R M	TEST
0 0 0	Power-Up Test
0 0 1	Disk Test (infinite write read loop)
0 1 0	RS-232-C Loop-Back Test
0 1 1	VRC Switch Test
1 0 0	Disk Format (complete)* Takes 20 minutes

B = Busy R= Reset M = Media

* The demo plot must be downloaded after disk formatting.

5-27. To enter the selectable tests, proceed as follows:

a. Turn the plotter OFF (O).

b. Set the VRC Test Switch to the ON (I) position and the Bench Run selector OFF (O).

c. diskonnect the external computer interface cable from the VRC.

d. Turn the plotter ON(I).

e. The front panel indicators Busy, Reset, and Media will indicate the number of the test selected.

f. Press the Plot button to step through to the desired test.

NOTE

For the VRC switch test proceed to step k. , and continue with the test.

g. When the LEDs indicate the desired test, press the reset button to start the test.

CAUTION

Disk tests may destroy information stored on the disk. If a disk test is selected all front panel LEDs will flash as a warning. The Reset button must be pressed a second time to verify selection of the test.

NOTE

Tests may run in an infinite loop. To end the test turn OFF (**O**) the plotter.

h. In the Power-Up Test the Busy, Reset and Media LEDs flash and the On-Line LED is ON steadily.

i. In the Disk Test the Busy, Reset and Media LEDs are on steadily. The Disk Activity LED (green) on the disk controller PCA flashes unless an error is encountered, in which case the plotter will enter a failure mode.

j. In the RS-232-C Loop-Back Test, the Busy, Reset, and Media LEDs flash once, then remain OFF if the test is successful. If the test connector is missing or defective, the Busy, Reset, and Media LEDs remain ON for approximately five seconds. If a failure occurs, the plotter enters a standard failure mode.

k. The VRC Switch Test is an interactive test performed as follows:

1. Set all VRC interface switches ON(I).

2. Press the Reset button twice to start the test.

3. The Reset LED will be ON.

4. Working from left to right set each VRC interface switch OFF (O).

5. As each switch is turned OFF, the Busy, Reset and Media LEDs will flash ON and OFF.

6. If an error occurs, the plotter will go to a standard error indication.

l. During the complete Disk Format the Busy, Reset, and Media LEDs will remain ON. At the end of the test (approximately 20 minutes) these LEDs will turn OFF and the On-Line LED will turn ON steadily. If an error occurs, the plotter will go to a standard error indication.

m. After formatting the disk, the Demo Plot must be downloaded.

5-28. DATA COMMUNICATION TESTS

5-29. The following tests verify data communication and operation of the plotter from an external controller for any of the interface options. The equipment required for these tests is listed in Table 1-5 in Section I of this handbook. If the service disk is not available, simple basic programs listed with the procedures in this manual may be used to verify proper interface operation. The following tests are on the disk:

- RS-232-C Basic Communication Test.
- HP-IB Parallel Communication Test.
- Unidirectional PARALLEL Communication Test.
- Hardwire Handshake Test.
- XON/XOFF Handshake Test.

5-30. If the HP-85 Service System is used to perform the following tests, select the 758X option for the QA program and set the plotter VRC switches for the 7586 EMULATE mode.

5-31. RS-232-C COMMUNICATION TEST. The RS-232-C Test is performed as follows:

a. Equipment Required:

1. Portable PLUS Personal Computer.
2. Disk Drive HP 9114B.
3. Interface Cables 92221P & 17355D

b. The Portable PLUS is configured as follows:

1. Datacom Configuration	Serial
2. Transmission Rate (BPS)	19200
3. Word Length (bits)	8
4. Stop Bits	1
5. Parity	None
6. XON/XOFF Pacing	On
7. CTS Line	Ignore
8. DSR Line	Ignore
9. DCD Line	Ignore
10. Power to Interface	ON
11. Plotter Interface	Serial

c. Plotter Set Up

1. Mode	RS-232-C
2. 7586 EMULATE/ HP-GL/2	HP-GL/2
3. XON/XOFF/HARDWIRE	XON/XOFF
4. PARITY	OFF
5. BAUD	19200

d. Connect the Portable PLUS as shown in Figure 5-10.

e. Turn the Portable PLUS and the disk drive ON (I). If the service disk (HP P/N C1600-60401) is not being used go to step j.

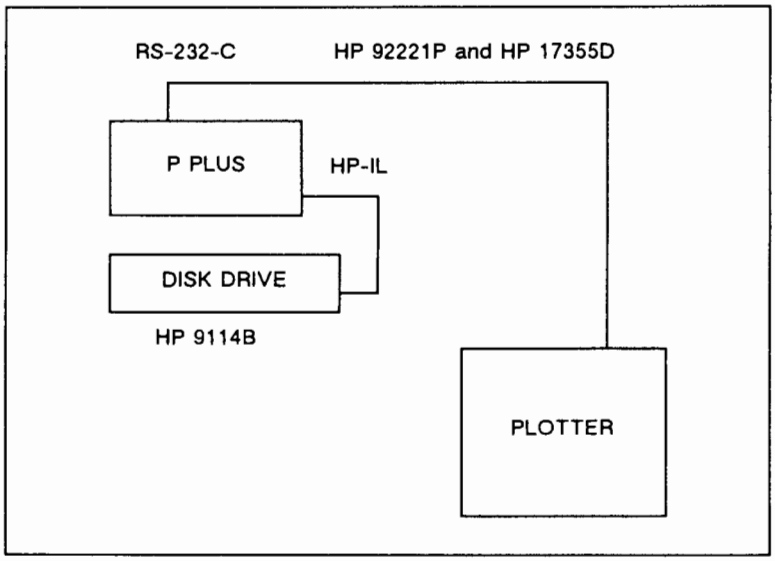


Figure 5-10. RS-232-C Test

f. Install the service disk in the drive.

g. Turn the plotter ON (I).

h. Enter DOS on the Portable PLUS, select drive C, and type README.

i. Follow the instructions given on the display.

j. If the diagnostic disk is not available use GWBASIC and enter the program listed in Table 5-4.

k. Run the program. This is similar to the program on the service disk.

l. Successful completion of the test will result in the plotting of a square containing the words "PLOTTER OK". The controller screen will display "TEST COMPLETED".

m. Upon successful completion of the test turn OFF (O) all equipment before diskonnecting the cabling.

n. If the test is not successfully completed refer to Section IV, TROUBLESHOOTING, in this handbook.

Table 5-4. RS-232-C Program

```
10      CLS
20      PRINT
30      PRINT "*** RS-232-C COMMUNICATION TEST ***"
40      PRINT
50      PRINT "TEST RUNNING..."
60      PRINT
70      OPEN "COM1:19200,N,8,1" AS #1
80      PRINT #1, CHR$(27)+".M50;0;0;13;0;0:"
90      PRINT #1, "IN;RO270;PS10000,10000;SC0,1,0,1;OI;"
100     INPUT #1, ID$
110     PRINT #1, "SP1;PW1;PA0,0;PD1,0,1,1,0,1,0,0;PU;"
120     PRINT #1, "PA.3,.5;"
130     PRINT #1, "LB";ID$;"PLOTTER OK"+CHR$(3)
140     PRINT #1, SP0;PA0,O;PW;PG;"
150     PRINT
160     PRINT "TEST COMPLETED"
170     PRINT
180     PRINT "TO RETURN TO DOS, TYPE: SYSTEM <cr>."
190     PRINT
200     PRINT "TO REPEAT TEST, TYPE: RUN <cr>"
210     END
```

5-32. HP-IB COMMUNICATION TEST. The HP-IB Test is performed as follows:

a. Equipment Required:

1. Portable PLUS Personal Computer.
2. Disk Drive HP 9114B.
3. HP-IL/HP-IB Interface HP 82169A.
4. Interface Cable HP 10833B or C.

b. The Portable PLUS is configured as follows:

1. System Configuration	HP-IB:05

c. Plotter Set Up

1. Mode	HP-IB
2. ADDRESS	05
3. 7586 EMULATE/ HP-GL/2	HP-GL/2

d. Connect the Portable PLUS as shown in Figure 5-11.

e. Turn the Portable PLUS and the disk drive ON (I). If the service disk (HP P/N C1600-60401) is not being used go to step j.

f. Install the service disk in the drive.

g. Turn the plotter ON (I).

h. Enter DOS on the Portable PLUS, select drive C and type README.

i. Follow the instructions given on the display.

j. If the service disk is not available use GWBASIC and enter the program listed in Table 5-5.

k. Run the program. This is similar to the program on the service disk.

l. Successful completion of the test will result in the plotting of a square containing the words "PLOTTER OK". The controller screen will display "TEST COMPLETED".

m. Upon successful completion of the test turn OFF (O) all equipment before diskonnecting.

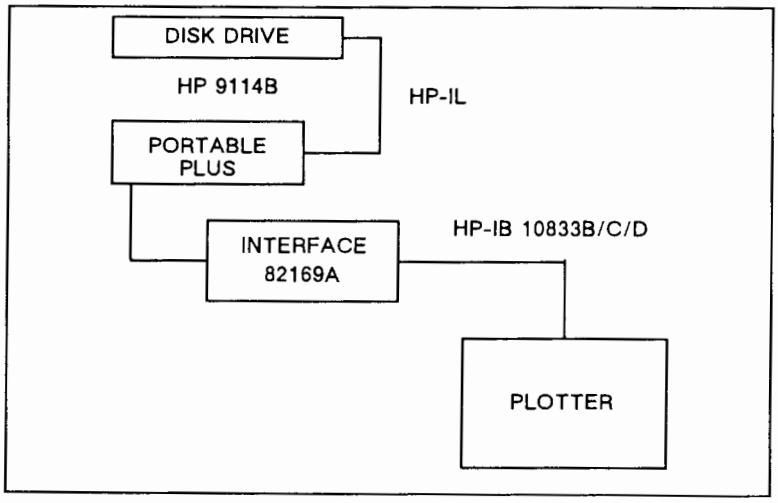


Figure 5-11. HP-IB Test

Table 5-5. HP-IB Program

```
10          CLS
20          PRINT
30          PRINT "*** HP-IB COMMUNICATION TEST ***"
40          PRINT
50          PRINT "TEST RUNNING..."
60          PRINT
70          OPEN "O",1,"PLT"
80          PRINT #1, "IN;RO270;PS10000,10000;SC0,1,0,1;OI;"
90          CLOSE #1
100         OPEN "I",1,"PLT"
110         INPUT #1, ID$
120         CLOSE #1
130         OPEN "O",1,"PLT"
140         PRINT #1, "SP1;PW1;PA0,0;PD1,0,1,1,0,1,0,0;PU;"
150         PRINT #1, "PA.3,.5;"
160         PRINT #1, "LB";ID$;"PLOTTER OK"+CHR$(3)
170         PRINT #1, SP0;PA0,O;PW;PG;"
180         PRINT
190         PRINT "TEST COMPLETED"
200         PRINT
210         PRINT "TO RETURN TO DOS, TYPE: SYSTEM <cr>."
220         PRINT
230         PRINT "TO REPEAT TEST, TYPE: RUN <cr>"
240         END
```

n. If the test is not successfully completed refer to Section IV, TROUBLESHOOTING, in this handbook.

5-33. PARALLEL COMMUNICATION TEST. The PARALLEL Test is performed as follows:

a. Equipment Required:

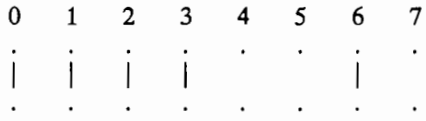
1. Portable PLUS Personal Computer.
2. Disk Drive HP 9114B.
3. Serial-to-Parallel converter.
4. Interface Cable HP 92221A.
5. Interface Cable HP 40242D.
6. Interface Cable HP 82169A

b. The Portable PLUS is configured as follows:

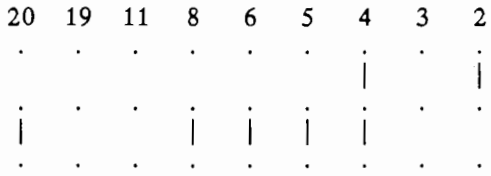
1. Datacom Configuration	Serial
2. Transmission Rate (BPS)	19 200
3. Word Length (bits)	8
4. Stop Bits	1
5. Parity	None
6. XON/XOFF Pacing	On
7. CTS Line	Ignore
8. DSR Line	Ignore
9. DCD Line	Ignore
10. Power to Interface	ON
11. Plotter Interface	Serial

c. Serial-to-Parallel Converter Set Up

1. Communication Jumpers



2. Configuration Jumpers



d. Plotter Set Up

1. Mode	PARALLEL

2. 7586 EMULATE
/HP-GL/2 HP-GL/2

e. Connect the Portable PLUS as shown in Figure 5-12.

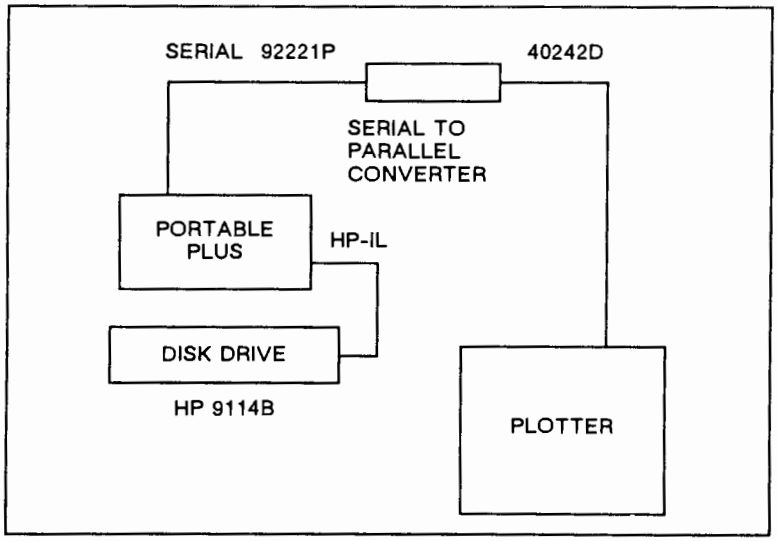


Figure 5-12. Parallel Test

f. Turn the Portable PLUS and the disk drive ON (I). If the service disk (HP P/N C1600-60401) is not being used go to step j.

g. Install the service disk in the drive.

h. Turn the plotter ON (I).

i. Enter DOS on the Portable PLUS, select drive C and type README.

j. Follow the instructions given on the display.

k. If the service disk is not available use GWBASIC and enter the program listed in Table 5-6.

l. Run the program. This is similar to the program on the service disk.

m. Successful completion of the test will result in the plotting of a square containing the words "PLOTTER OK". The controller screen will display "TEST COMPLETED".

n. Upon successful completion of the test turn OFF (O) all equipment before diskonnecting the cabling.

o. If the test is not successfully completed refer to the TROUBLESHOOTING section in this section.

Table 5-6. PARALLEL Test Program

```
10          CLS
20          PRINT
30          PRINT "*** PARALLEL COMMUNICATION TEST ***"
40          PRINT
50          PRINT "TEST RUNNING..."
60          PRINT
70          OPEN "COM1:19200,N,8,1" AS #1
80          PRINT #1, "IN;RO270;PS10000,10000;SC0,1,0,1;OI;"
90          PRINT #1, "SP1;PW1;PA0,0;PD1,0,1,1,0,1,0,0;PU;"
100         PRINT #1, "PA.3,.5;"
110         PRINT #1, "LB";ID$;"PLOTTER OK"+CHR$(3)
120         PRINT #1, SP0;PA0,O;PW;PG;"
130         PRINT
140         PRINT "TEST COMPLETED"
150         PRINT
160         PRINT "TO RETURN TO DOS, TYPE: SYSTEM <cr>."
170         PRINT
180         PRINT "TO REPEAT TEST, TYPE: RUN <cr>"
190         END
```

5-34. DIAGNOSTICS MODEL 250/255

5-35. SELF TEST

5-36. When the plotter is turned ON (I), a series of built-in tests are automatically performed to verify proper plotter operation. The following message will be displayed as the tests are performed:

```
INITIALIZING. . .
   PLEASE WAIT
```

a. System RAM Test

1. Writing and reading random data.
2. Inverting and reading the random data.
3. Address bus cross talk test.
4. Data bus cross talk test.
5. Worst case transceiver timing test.

b. System ROM checksum.

c. Font ROM checksum.

d. Swath RAM and crossbar circuit test.

e. Swath RAM refresh circuit test.

f. Swath RAM in pixel mode test.

g. Disk echo test

h. Disk track buffer test.

5-37. The microprocessor tests which are being run at power-up are as follows:

a. 6809 Microprocessor function

b. 6809 ROM Checksum

c. RAM (2K) Checksum

d. Shared RAM (8K) Checksum

e. Configuration Jumper

f. Register Check

g. Disk drive spindle speed

h. Disk track 0 indicator

i. Seek/Scan ID on drive

j. Drive size verification of jumpers

k. READ/WRITE ECC check

1. Write pattern.
2. Verify pattern.
3. Verify ECC bytes.
4. Write known pattern.
5. Verify pattern (long read command).
6. Write error to disk.
7. Read and verify error found.
8. Read with error correction.
9. Verify data corrected.

l. Check disk drive hysteresis with successive seeks.

5-38. Upon completion of the testing the plotter will up-load the selected front panel language and display the following:

```
Please wait while
front panel language
is loaded.
```

5-39. FRONT-PANEL ERROR CODES

5-40. The Front-Panel Liquid Crystal Display will present error codes for failures in a variety of modes.

a. Print-Engine error message. If the cutter is selected in the Plotter Setup menu, and the media is not in the cutter, the following message will appear in the display. Either reset the menu selection, or route the media into the cutter.

```
Media not in chosen
path. Load media in
correct path.
PREV MENU to exit
```

b. Alignment error message caused by vacuum loss in the toner system. Align Media LED on, Horn beeping. Correct the problem and press Reset or cycle power. May be misaligned media or problem in the toner system. Solenoid valve failure, power, or wiring problems can all cause these symptoms.

```
Alignment error
Press ADVANCE. If
error recurs, refer
to User's Guide.
```

c. RS-232-C device control error messages. These only occur when the RS-232-C Interface is selected.

```
NONFATAL RS-232
ERROR. Check parity
and baud rate.
```

```
RS-232 ERROR: Buffer
Overflow. Check
handshake.
```

d. Crash-code error messages. The display nn is a hexadecimal code. Refer to Table 5-7. Also refer to Table 4-4 which lists Processor PCA crash indications. In a case where the front panel LCD is not functioning, the error code may be read in binary format from the LEDs in the VRC.

CRASH CODE <nn> Cycle power and if error recurs call service.

Table 5-7. Front-Panel Error Codes

Hex Code	Error and Possible Cause	Suggested Remedy †
Illegal Exceptions		
01	Firmware crash (bug likely) (RAM error possible)	
02	Bad Interrupt	1
03	Miscellaneous Exception (protocol - privacy violation)	1, P
Self-Test Errors		
10	Bad System RAM	P
11	Bad System ROM	P
12	Bad Font ROM	P
13	Bad swath RAM (XBAR =0)	S, I, M
14	Bad swath RAM (XBAR =1)	S, I, M
15	Bad Refresh Circuit (swath RAM 0)	S
16	Bad Refresh Circuit (swath RAM 1)	S
17	Dynamic bus-sizing failed (swath RAM)	S
18	Bad cross-bar flip flop or associated circuitry	I, S
19	Bad pixel mode circuitry	S
1B	Bad disk track buffer	C
1C	Disk communication failed (echo test)	C, P, M
1D	RS-232-C Loop-Back Test failed	I, M
1E	Disk Read different from disk Write	C
1F	Print engine loop-back test failed	
20	Front Panel loop-back test failed	
21	Bad engine status during bench run	

† SUGGESTED REMEDY Perform in the order indicated.

C = Disk Controller
D = Disk Drive
F = Front Panel PCA
I = I/O DMA PCA
M = Main/interconnect PCA
P = Processor PCA
S = SWATH RAM PCA
R = Reformat disk & retry.
1 = Clear queue, cycle power & retry.

Table 5-7. Front-Panel Error Codes (Continued)

Hex Code	Error and Possible Cause	Suggested Remedy †
Queuing Errors		
28	Absolute queue entry index out-of-range	1, P, R
29	No partitions	1, C, D P, R
Run Time Errors		
30	Size of left hole is negative	1, P
31	Size of right hole is negative	1, P
32	Attempt to grow left with N=0	1, P
33	Attempt to grow right with N=0	1, P
34	Attempt to grow left with ORDERED=TRUE	1, P
35	Attempt to move a clump to current location	1, P
38	Attempt to fetch a message for an inactive task	1, P
39	Mail and stack areas collided	1, P
3A	Task not in a list that can be run	1, P
3B	Out of Memory	1, P
Hard Disk		
40	Bad disk address or length to R/W routine	1, P, C
41	Disk does not respond to commands	1, C, P
42	Disk expected to be idle, but isn't	1, D
43	Time out - Disk did not respond in time.	1, C
44	Error in status register	C

† SUGGESTED REMEDY Perform in the order indicated.

C = Disk Controller
D = Disk Drive
F = Front Panel PCA
I = I/O DMA PCA
M = Main/interconnect PCA
P = Processor PCA
S = SWATH RAM PCA
R = Reformat disk & retry.
1 = Clear queue, cycle power & retry.

Table 5-7. Front-Panel Error Codes (Continued)

Hex Code	Error and Possible Cause	Suggested Remedy †
46	Write retry limit exceeded	D, C
47	Spurious interrupt	C, P
48	Disk not ready after Power-Up	C, D
49	Disk error in demo during retry	C, D, R
4F	VRC encountered illegal opcode in vector data	P, C, D R
	May be RAM problem - Cycle power and check for RAM failure on power-up. Reformat disk. Transmit plot. If error repeats, go to PCA replacement.	
Communication		
50	Boss-task received bad message	1, P
51	Engine-task received bad message	1, P
52	Panel-task received bad message	1, P
54	VRC resumed after it was finished	I
55	Byte arrived at engine UART	
	Cycle power. Check VRC to engine cabling	
60	UART output collision	1, I
61	INDONE indicated byte available.	
	GETBYTE received none.	1, I
68	UART output collision	1, I
69	INDONE indicated byte available.	
	GETBYTE received none.	1, I

† SUGGESTED REMEDY Perform in the order indicated.

C = Disk Controller M = Main/interconnect PCA
D = Disk Drive P = Processor PCA
F = Front Panel PCA S = SWATH RAM PCA
I = I/O DMA PCA R = Reformat disk & retry.
1 = Clear queue, cycle power & retry.

Table 5-7. Front-Panel Error Codes (Continued)

Hex Code	Error and Possible Cause	Suggested Remedy †
6A	Front panel reported SIO command error	P
6B	I/O to Front panel timed out Cycle power. Retry. Check VRC to engine cabling	F, I
70-77	Bad address During transmission - firmware or RAM During plot - hard disk	1, I, S, P
70		P
71		P
72		P
73		I
74		S
75		S
76		P
77		C, P
78-7F	Bad instruction	1, P

† SUGGESTED REMEDY Perform in the order indicated.

C = Disk Controller
D = Disk Drive
F = Front Panel PCA
I = I/O DMA PCA
M = Main/interconnect PCA
P = Processor PCA
S = SWATH RAM PCA
R = Reformat disk & retry.
1 = Clear queue, cycle power & retry.

5-41. FRONT-PANEL TESTS

5-42. A variety of diagnostic information is available through the front-panel indicators. The panel is illustrated in Figure 5-13. Table 5-8 lists the functions of the error indicators.

5-43. COMMON ERROR INDICATIONS

5-44. Table 5-9 lists some of the more common error indications that can be seen in the operation of the plotter. Check the possible causes and take the appropriate corrective action.

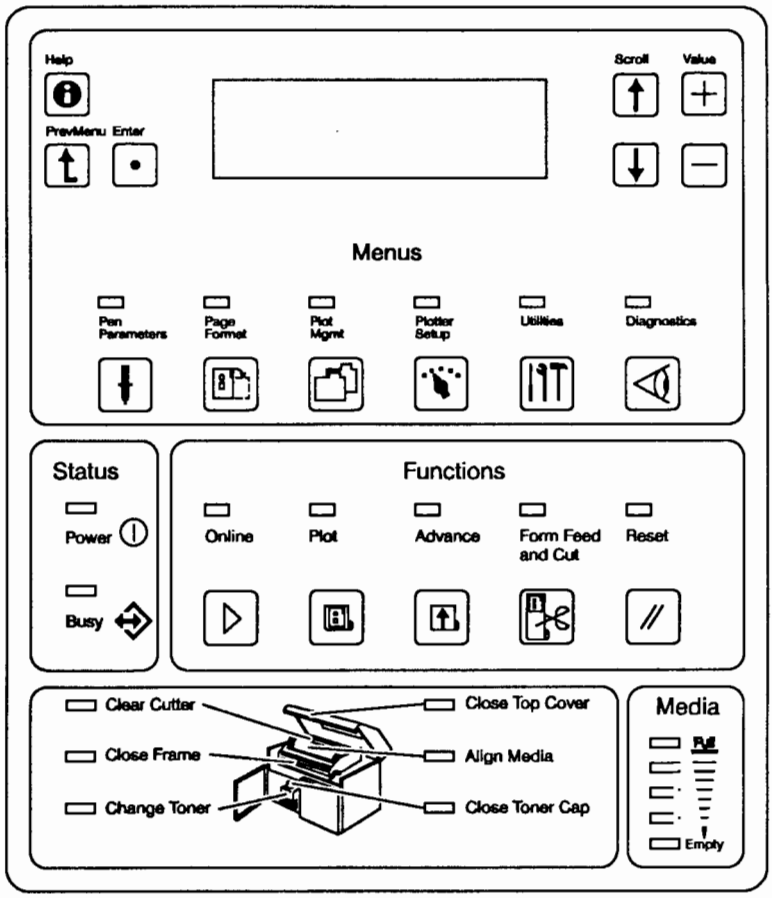


Figure 5-13. Front-Panel Indicators

Table 5-8. Front-Panel Error Indicators

SYMBOL	FUNCTION
Clear Cutter	INDICATES THAT THE DRIVE ROLLERS ARE TURNING, BUT THAT THE CUTTER ROLLERS ARE NOT. MEDIA JAM IN THE CUTTER. HORN SOUNDS.
Close Frame	INDICATES THE FRAME IS NOT COMPLETELY CLOSED AND TAKES THE PLOTTER OFF-LINE. RAISE COVER AND PRESS DOWN FIRMLY ON THE FRAME UNTIL IT LOCKS INTO PLACE AT BOTH ENDS.
Change Toner	INDICATES DEPLETED TONER. DETERMINED BY A DOT COUNTING PROCESS.
Close Top Cover	INDICATES THE TOP COVER IS NOT COMPLETELY CLOSED, AND TAKES THE PLOTTER OFF-LINE. PRESS DOWN FIRMLY ON THE TOP COVER AT EACH END.
Align Media	INDICATES A LOSS OF VACUUM IN THE TONER SYSTEM. THE MEDIA IS NOT FEEDING SMOOTHLY. SET THE PLOTTER OFF LINE AND PRESS ADVANCE. IF THIS FAILS, RAISE COVER AND REMOVE ANY WRINKLED OR JAMMED MEDIA FROM THE PATH.
Close Toner Cap	A MICROSWITCH ON THE TONER CAP ARM DETECTED THAT THE ARM IS NOT IN A FULLY DOWN POSITION.

Table 5-9. Troubleshooting Chart

INDICATION	POSSIBLE CAUSE	ACTION
Front Panel Error Indication		
Align Media indicator flashing incorrectly loaded & horn beeping	Recording media	Reload the media.
	Out of media	Load media.
	Loss of vacuum in the toner system	Troubleshoot the vacuum system.
	Circuit defect	Troubleshoot the system.
Message "Please wait while front panel language is loaded" does not appear	Disk reformatted and not reloaded	Data must be loaded from an external source.
Close Frame Indicator on	Upper frame not locked	Lock the upper frame.
	Switch misaligned	Troubleshoot the system and repair.
Close Toner Cap Indicator on	No toner bottle installed	Install toner bottle.
	Siphon arm not fully down	Fully seat the siphon arm.
	Circuit defect	Troubleshoot the system.

Table 5-9. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Front Panel Error Indication		
Close Top Cover Indicator on	Top Cover open	Close top cover.
	Circuit defect	Troubleshoot the system.
Clear Cutter Indicator flashing & horn beeping	Media jam in cutter	Clear the media from the cutter.
	Circuit defect	Troubleshoot the system.
Operational Error Indication		
Internal plot (Demo or Performance) attempted. "Plot needs to be downloaded" is plotted.	Disk reformatted and not reloaded	Data must be loaded from an external source.
French or German language, or "Help" menus not available for the front panel	Disk reformatted and not reloaded	Data must be loaded from an external source.
Take-Up Reel (TUR) not operational	Not selected	Select Take-Up Reel.
	Loose belt	Adjust belt tension.

Table 5-9. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operational Error Indication		
Take-Up Reel (TUR) not operational (Continued)	Loose connection	Check electrical connections.
	Bad motor	Check coil resistance (1-2 ohms). Check voltage J59 with TUR driving. (6 Vdc under load) (9-10 Vdc open circuit)
	CCB PCA bad	Remove and replace.
	MCD PCA bad	Remove and replace.
Cutter not operational	Not selected	Select cutter.
	CUTTER OFF at test panel	Set test panel CUTTER switch ON.
	Media Out sensor defect	Troubleshoot the Media Out sensor.

Table 5-9. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operational Error Indication * = the following causes will typically make the horn sound	*	
	Loose connection	Check electrical connections.
	Bad roller motor	Check voltage and resistance.
	Belt loose or missing	Replace belt.
	Drive cable loose, broken, or disconnected	Replace cable
	Cutter motor bad	Troubleshoot motor circuit.
	L and R sensor switches	Troubleshoot sensor circuits.
	Time out indication. Blade didn't complete its travel in allocated time A1 1.0s, A2 1.2s	Troubleshoot cutter.
	MCD PCA bad	Replace the PCA.

Table 5-9. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operational Error Indication		
Cut not straight (at right angles to the media)	Electric brake inoperative	Troubleshoot the brake circuit.
No display on LCD panel	Connection or cabling to front panel PCA bad. Wrong disk files.	Check connector at panel and RMC PCA. Data must be loaded from an external source.
Initializing message on LCD panel remains	Connection or cabling to front panel PCA bad. VRC connection bad. I/O DMA or Processor PCA bad. VRC crash.	Troubleshoot and repair or replace.
No Media Advance	Stepper motor or drive circuit	Troubleshoot motor and connectors. MCD PCA 3 fuses. (1/phase) on MCD PCA 2A each
First plot(s) very light	Low humidity environment	Use premium grade media. Advance media 1 to 2 meters before plotting. Increase humidity to 30% to 80% RH.

Table 5-9. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operational Error Indication		
Random streaking	Low humidity environment	Advance media 1 to 2 meters before plotting. Increase humidity to 30% to 80% RH.
	Contrast setting too high	Lower the contrast setting.
Excessive flaring	Low humidity environment	Advance media 1 to 2 meters before plotting. Increase humidity to 30% to 80% RH.
	Contrast setting too high	Lower the contrast setting.

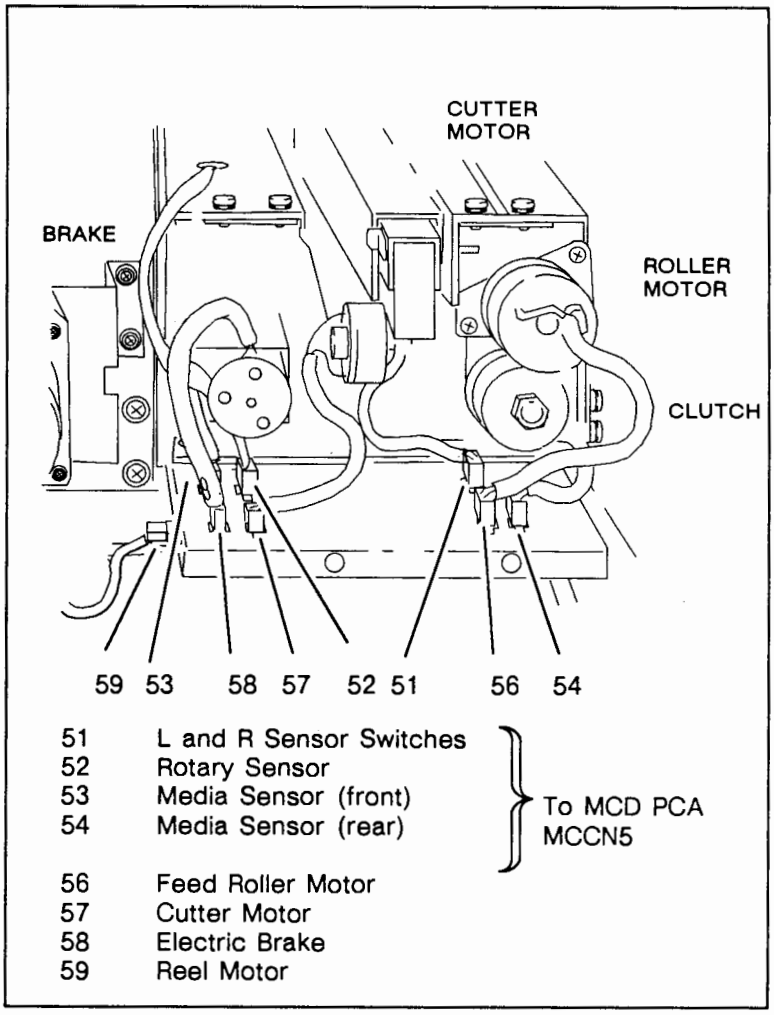


Figure 5-14. Cutter and Take-Up Reel Interconnection

5-45. DIAGNOSTIC HELP MENU

5-46. Within the Diagnostic Menu, "Help" displays are available to provide additional information about the menu selection.

5-47. To view the "Help" commands:

a. Press the **Diagnostic** button at the right-hand side of the panel.The diagnostic display will be:

```
DIAGNOSTICS                    ↓
→PERFORMANCE PLOT
 VRC TESTS    =DISK
 PRT ENG TEST      =LED
```

b. Select the desired diagnostic by pressing the **Scroll** ↓ button. The horizontal arrow at the left indicates the selectable line of the menu and is moved up or down by using the **Scroll** buttons.

c. When the horizontal arrow → points to the desired menu selection, press the **Help** button at the upper left-hand corner of the front panel.

d. The four-line Help display will be shown. Up ↑ or down ↓ arrows will indicate if additional lines of "help" are available.

NOTE

All the lines of a particular Help display are shown here in one frame.

e. The various Diagnostic Help displays are as follows:

f. Press **Prev Menu** or **Help** again to return to the main Diagnostic menu.

HELP:
PERFORMANCE PLOT
Press ENTER to copy
the performance plot
to the queue.

HELP:
VRC TESTS
Tests are for
qualified service
personnel only.

HELP:
PRT ENG TESTS
Tests are for
qualified service
personnel only.

HELP:
DISP FUNCTNS
Select ON to print
but not execute
plotter commands.
Select OFF to
execute plotter
commands normally.

HELP:
RESET TGAUGE
Press ENTER to reset
the toner gauge.
Only reset toner
gauge when you
change toner.

HELP:
SHOW PLOTTER STATS
Press ENTER to show
various plotter
statistics.

5-48. FRONT-PANEL MENU

5-49. Several levels of diagnostic and service information are available through the Diagnostic Menu of the front panel. To enter this menu press the Diagnostic Button at the right-hand side of the panel. See Figure 5-13. The following menu will be displayed:

```
DIAGNOSTICS                    ↓
→PERFORMANCE PLOT
 VRC TESTS      =DISK
 PRT ENG TEST =LED
```

5-50. The arrow in the upper right-hand corner indicates that additional information is available by pressing the **Scroll** ↓ button. The horizontal arrow at the left indicates the selectable line of the menu and is moved up or down by using the **Scroll** buttons. The **Enter** button will select the indicated line.

5-51. Pressing the **Scroll** ↓ button once will move the arrow to the VRC TESTS. The = symbol indicates that additional options are available for this menu line. Pressing the **Value +** or **Value –** button will show the various selections. The default or selected option will be displayed in a steady state. A flashing option must be selected by pressing **Enter.**

```
DIAGNOSTICS                    ↓
 PERFORMANCE PLOT
→VRC TESTS      =DISK
 PRT ENG TEST =LED
```

5-52. The information available in the Diagnostic menu is listed in Table 5-10.

Table 5-10. Diagnostic Menu

TEST	OPTIONS	RESULT
PERFORMANCE PLOT	none	Generates the performance plot.
VRC TESTS	DISK	1 minute read write loop test of the VRC hard disk
	LOOPBACK	Tests RS-232-C I/O circuit. Reqires loopback connector. (07440-60302)
PRT ENG TEST	LED	Lights all front panel LEDs.
	BUTTON	Interactive test of FP buttons
	CUTTER	
	CUT ONCE	Auto cutter makes one cut with each press of the button.
	CUT REPETITIVELY	Auto cutter cuts at five inch intervals.
	EXIT	Exit cutter test.
DISP FUNCTNS	OFF	Normal operating mode
	ON	Prints the HP-GL codes. Control character is indicated by ^ .

Table 5-10. Diagnostic Menu (Continued)

TEST	OPTIONS	RESULT
FLUSH TONER	none	Interactive maintenance procedure. Refer to Section II paragraph "2-78. " in this handbook.
RESET TGUAGE	none	Resets dot counter circuits.
SHOW PLOTTER STATS	none	Displays revision level of Front Panel and VRC code and number of automatic cuts performed.
SET CAL	% of original size from 90.00 to 110.00	Calibration procedure for accuracy, set in 0.01% increments. Refer to Section VI.
FORMAT DISK	none	Reformats the hard disk; 20 minute process. Removes all plots, language files, "help" messages, and ROM based messages.
VRDY	none	VRC Ready or Not Ready

5-53. PERFORMANCE PLOT

5-54. The built-in performance plot may be used to check plotter performance, check print quality problems and to measure plot accuracy. The procedure is as follows:

a. Ensure that no plot is being received.

b. Ensure that the Online LED is off. If ON, pressing the Online button once will toggle the LED.

c. The performance plot is the default selection in the Diagnostic menu. The display will appear as follows:

```
DIAGNOSTICS                    ↓
→PERFORMANCE PLOT
  VRC TESTS      =DISK
  PRT ENG TEST =LED
```

d. Press **Enter**.

e. The LCD display will prompt the user to go "Online".

```
Plot ready to load.

Go ONLINE to copy to
queue and plot.
```

f. Press Online. The Online LED will go on and the busy LED will flash.

g. The performance plot will be generated. See Figure 5-15.

WARNING

Keep fingers, clothing, and jewelry out of the path of the media cutter while using it. Failure to do so can result in personal injury.

h. When the performance plot is complete, set the plotter OffLine; press and hold down the Advance button until the plot is completely visible. To remove the plot from the plotter, carefully cut the medium along the groove provided using the media cutter or advance and cut through the automatic cutter.

i. If you desire to run the plot again, set the plotter OnLine and press the Plot button.

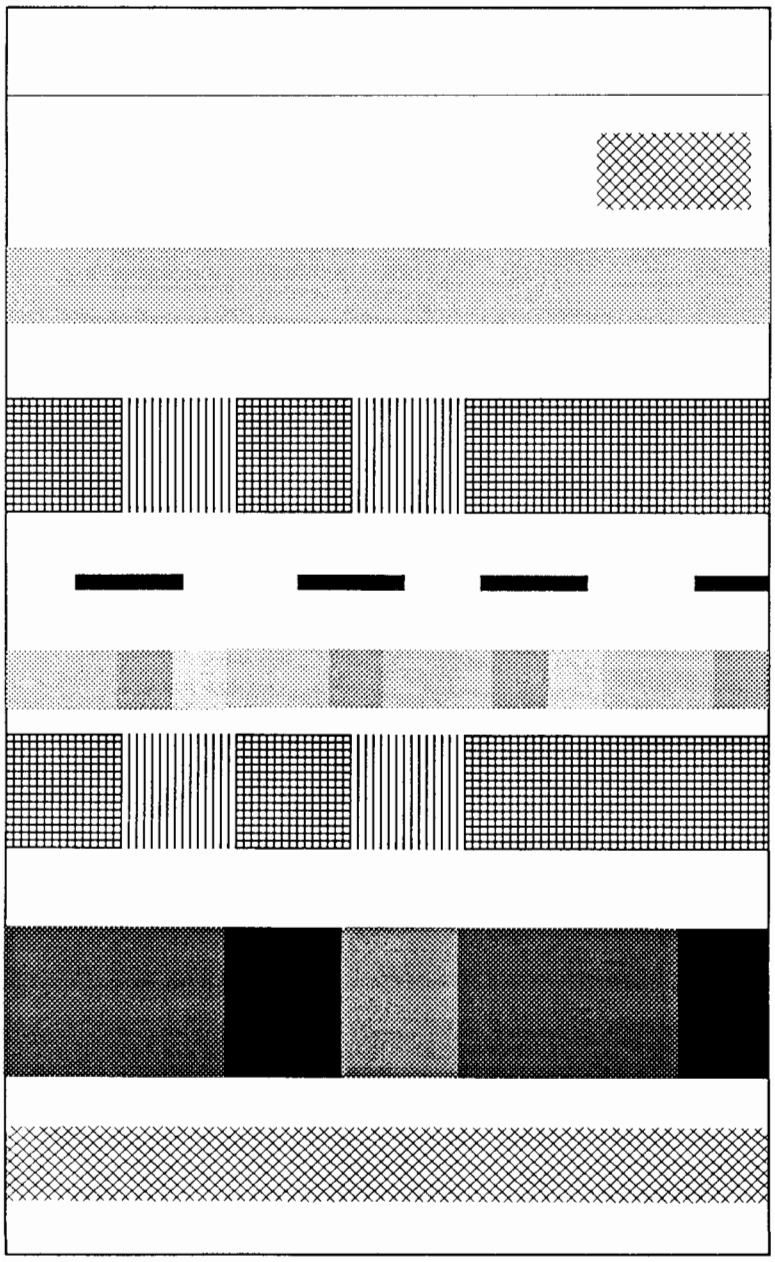
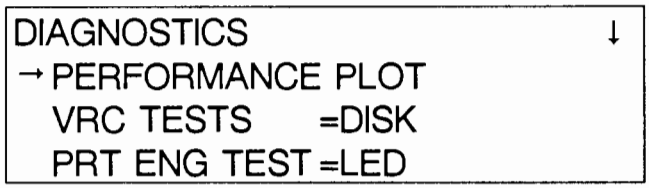


Figure 5-15. Performance Plot

5-55. VRC TESTS

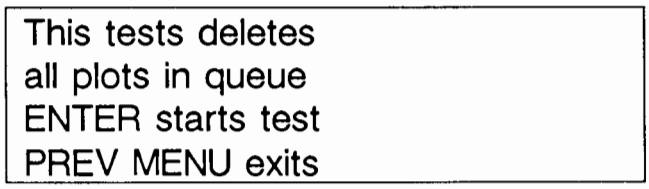
5-56. DISK TEST. The disk test is a 1 minute read/write test of the VRC hard disk. To perform the test, proceed as follows:



a. **Scroll ↓** to the **VRC TESTS.**

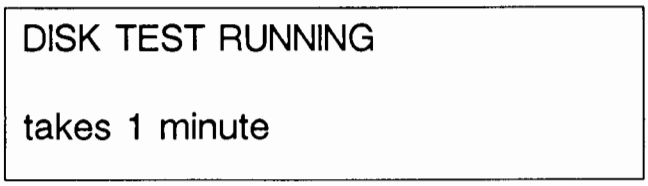
b. Press **Value +** or **Value –** button until the **DISK** selection appears.

c. Press **Enter.** The following display will appear:



d. Press **Enter** to start the test.

e. While running, the LCD will display:



f. A pass is indicated by:

```
Disk Test passed

PREV MENU exits
```

g. If an error is encountered during the test, the display will show a crash code. Refer to Table 4-4.

```
CRASH CODE <nn>
Cycle power and if
error recurs call
service
```

5-57. RS-232-C LOOPBACK TEST. To perform the loopback test, proceed as follows:

```
DIAGNOSTICS                    ↓
→ PERFORMANCE PLOT
  VRC TESTS      =DISK
  PRT ENG TEST   =LED
```

a. Scroll ↓ to the **VRC TESTS.**

b. Press **Value +** or **Value –** button until the **LOOPBK** selection appears.

c. Press **Enter.** The following display will appear:

```
Install the RS-232-C
loopback connector
ENTER starts test
PREV MENU exits
```

d. Install the loopback connecter (HP P/N 07440-60302) in the RS-232-C Interface connecter on the VRC.

e. Press **Enter**.

f. A pass is indicated by:

```
LOOPBACK TEST PASSED

ENTER repeats test
PREV MENU EXITS
```

g. If an error is encountered during the test, the display will show a crash code.Refer to Table 4-4. The code will be displayed as a hexidecimal number.

5-58. PRINT ENGINE TESTS (PRT ENG TEST)

5-59. LED TEST. To perform the LED test, proceed as follows:

```
DIAGNOSTICS                    ↓
→PERFORMANCE PLOT
 VRC TESTS      =DISK
 PRT ENG TEST =LED
```

a. **Scroll ↓** to the **PRT ENG TEST.**

b. Press **Value +** or **Value –** button until the **LED** selection appears.

c. Press **Enter**.

d. All front panel LEDs will light. The following display will be seen:

```
LED TEST: ALL LED's
should be ON.

ENTER exits test
```

e. If panel LEDs do not light, replace the front panel assembly.

5-60. BUTTON TEST. To perform the BUTTON test, proceed as follows:

```
DIAGNOSTICS                    ↓
→PERFORMANCE PLOT
  VRC TESTS      =DISK
  PRT ENG TEST   =LED
```

a. **Scroll** ↓ to the **PRT ENG TEST.**

b. Press **Value +** or **Value –** button until the **BUTTON** selection appears.

c. Press **Enter**. The following display will appear:

```
BUTTON TEST: Press
any button to test.
↓ and PREV MENU
together exit test
```

d. When the button press is sensed, the display reads:

```
BUTTON PRESSED
```

e. The button test display returns when the button is released.

f. Failure of a button is indicated by the absence of the BUTTON PRESSED display.

g. To exit from the button test, press any button and the **Prev Menu** button simultaneously.

h. If any front panel buttons fail, replace the front panel assembly.

5-61. CUTTER TEST. To perform the CUTTER test, proceed as follows:

NOTE

Media must be in the cutter and the cutter selected from the Plotter Setup Menu.

```
DIAGNOSTICS                    ↓
→PERFORMANCE PLOT
  VRC TESTS      =DISK
  PRT ENG TEST =LED
```

a. **Scroll** ↓ to the **PRT ENG TEST.**

b. Press **Value +** or **Value –** button until the **CUTTER** selection appears.

c. Press **Enter**. This will display the following submenu:

```
CUTTER TEST
→CUT ONCE
  CUT REPETITIVELY
  EXIT cutter test
```

d. With CUT ONCE selected, an immediate cut is created each time **Enter** is pressed.

e. For multiple cuts, **Scroll** ↓ to the CUT REPETITIVELY.

```
CUTTER TEST
  CUT ONCE
→CUT REPETITIVELY
  EXIT cutter test
```

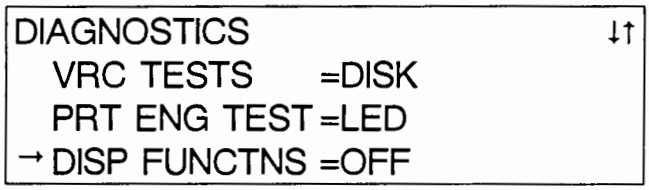
f. Press **Enter.**

g. The plotter will automatically make a cut approximately every 125 mm (5 in.) of media.

h. Cutting will continue until EXIT is selected and **Enter** is pressed.

5-62. DISPLAY FUNCTIONS

5-63. The HP-GL/2 instructions being sent to the plotter are displayed by enabling display functions. This is done as follows:



a. Scroll ↓ to **DISP FUNCTNS**.

b. Press **Value +** or **Value –** button to toggle the display to **ON**.

c. Press **Enter**.

d. All future instructions will be displayed rather than plotted.

e. To turn off the display functions repeat the instructions and toggle the display to **OFF**.

5-64. RESET TGAUGE

5-65. When the toner is replaced in the plotter, the reset function is performed to restart the dot counter firmware. This is used to give an indication of possibly depleted toner.

CAUTION

Do not reset the Toner Gauge unless the toner has been replaced.

```
DIAGNOSTICS                    ↓↑
  DISP FUNCTNS =OFF
→ RESET TGAUGE
  SHOW PLOTTER STATS
```

a. Scroll ↓ to **RESET TGAUGE.**

b. Press **Enter.**

c. The display will show:

```
Press ENTER only if            ↓↑
toner just changed.
PREV MENU exits but
doesn't reset gauge.
```

5-66. SHOW PLOTTER STATS

5-67. To check the revision level of the VRC and front panel firmware and to check the number of cuts made by the automatic cutter, this menu may be selected.

```
DIAGNOSTICS                     ↑
  RESET TGAUGE
→ SHOW PLOTTER STATS
```

a. Scroll ↓ to **SHOW PLOTTER STATS.**

b. Press **Enter.**

c. The display will show:

```
DIAGNOSTIC                    ↓
PLOTTER STATISTICS
  VRC CODE REV:<nnn>
  FP CODE REV  :<nnn>
```

d. Press **Scroll ↓** once.

e. The number of cuts completed will be displayed.

```
DIAGNOSTIC                    ↓
PLOTTER STATISTICS
  FP CODE REV  :<nnn>
  NMBR OF CUTS: <nnnnnn>
```

NOTES

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TABLES

ILLUSTRATIONS

SECTION VI

ADJUSTMENTS

6-1. INTRODUCTION

6-2. This section describes the adjustments used to maintain the HP 240D/E and HP 250/255 plotters, or to return the plotters to a proper operating condition after repairs have been made.

6-3. SAFETY CONSIDERATIONS

6-4. The HP 240D/E and HP 250/255 plotters have been designed in accordance with accepted safety standards. Review the safety symbols in the front matter and the ESD considerations in Chapter 6 of the HP 240D/E Hardware Support Manual before performing service work.

WARNING

To avoid personal injury, turn the plotter line switch to OFF (O) and disconnect the ac power cord before attempting any adjustments given in this chapter.

6-5. REQUIRED TOOLS AND EQUIPMENT

6-6. The tools and equipment required for the following adjustment procedures are listed in Table 6-1.

6-7. ORDER OF ADJUSTMENTS

6-8. The following adjustments are not interactive, and can be performed singly or in any sequence.

Table 6-1. Required Tools and Equipment

TOOLS/EQUIPMENT	DESCRIPTION
Screwdrivers	Phillips #2
Screwdrivers	Common large
Allen Wrench	3 mm and 4 mm
Metric Scale	150 mm
Gram Gauge	HP P/N 8750-0324
Voltmeter	HP 427A or equivalent

6-9. MECHANICAL ADJUSTMENTS

6-10. MOTOR BELT TENSION

6-11. To adjust the motor belt, perform the following procedure:

a. Turn the plotter line switch to OFF (**O**) and disconnect the ac power cord.

b. Remove the right-side cover. If necessary, refer to the Right-Side Cover Removal procedure given in Chapter 6 of the HP 240D/E Hardware Support Manual.

c. Using a 4 mm Allen wrench, loosen the four screws on the motor mounting plate. See Figure 6-1.

d. Adjust the belt tension by moving the motor position until the belt can be flexed 2 mm ± 0.5 mm at 170 grams.

e. Tighten the motor mounting screws.

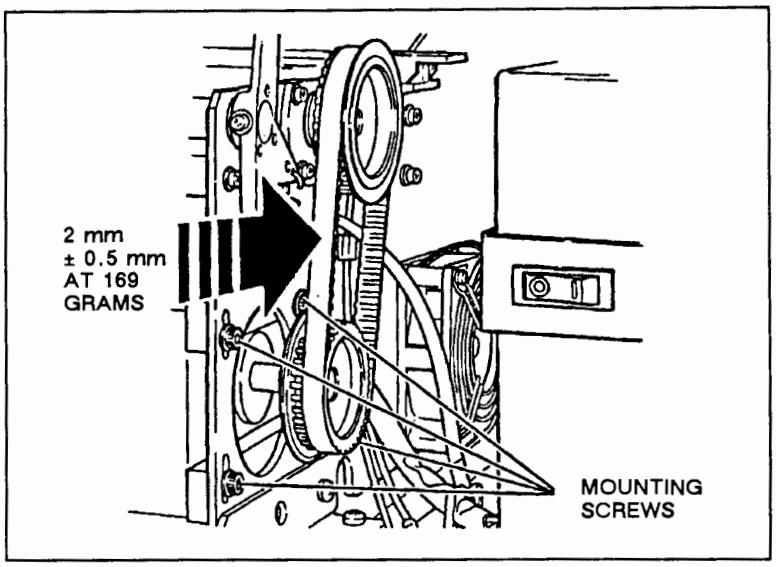

Figure 6-1. Motor Belt Adjustment

6-12. WRITING HEAD ADJUSTMENT

6-13. To adjust the writing head, perform the following procedure:

NOTE

Except where noted, all measurements are for the HP 240E and 255 plotters only.

a. Load medium into the plotter.

b. Switch the plotter line switch to ON (I) and perform the demonstration plot. If necessary, refer to the procedure (Running the Demonstration Plot) given in Section V.

c. Using a metric ruler, measure the distance between the left edge of the medium and the left edge of the image area.

NOTE

The left edge of the image area must be 9 mm from the edge of the medium (4.5 mm for the HP 240D and 250). If not, adjust the writing head to the amount equal to the difference between the actual distance and 9 mm (4.5 mm for the HP 240D and 250).

d. Turn the plotter line switch to OFF (O) and disconnect the ac power cord.

e. Raise the top cover to the fully opened position.

f. Raise the upper frame by pulling the release lever, located in the near right corner of the upper frame, towards you. See Figure 6-2.

g. Using a #2 Phillips screwdriver, loosen the mounting screw located at each end of the writing head.

h. Using a 3 mm Allen wrench, loosen the two center bracket mounting screws.

i. Adjust the writing head to the amount equal to the difference between the actual distance from the edge of the medium to the image area, and 9 mm (4.5 mm for the HP 240D and 250).

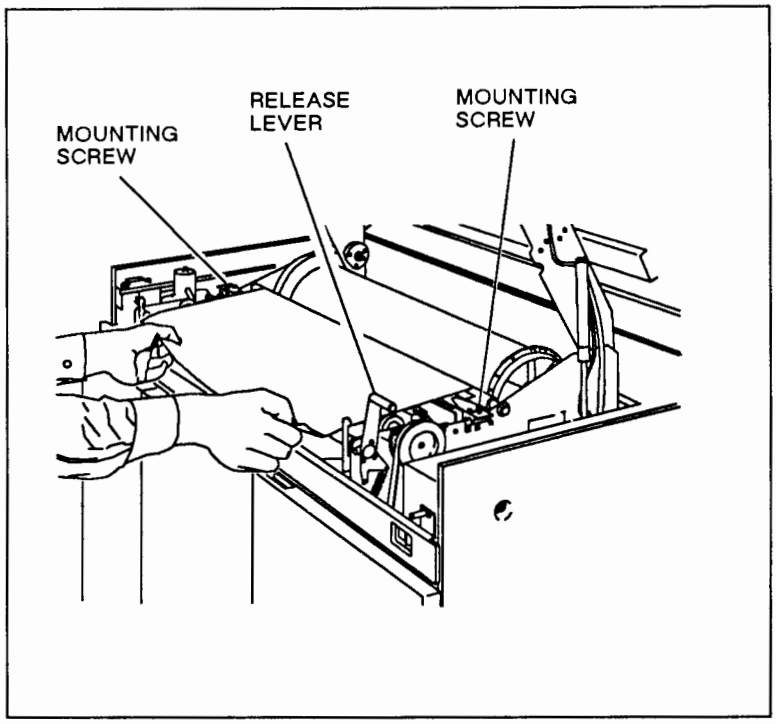

Figure 6-2. Writing Head Adjustment

j. Tighten the mounting screw at each end of the writing head and the two Allen screws on the center bracket.

k. Load medium into the plotter.

l. Switch the plotter line switch to ON (I) and perform the demonstration plot again.

m. If necessary, repeat steps d. through l. until the adjustment is correct.

6-14. TAKE-UP REEL BELT TENSION ADJUSTMENT

6-15. A need for adjustment is indicated if the take-up reel is stalled and the motor is turning. To adjust the belt tension, proceed as follows:

a. Turn the plotter line switch to OFF (O) and disconnect the ac power cord.

b. Using a Phillips screwdriver, loosen the Take-up reel motor mount. See Figure 6-3.

CAUTION

Over tightening of the belt may lead to damage of the motor.

c. Move the motor to adjust the belt tension so that approximately 2 mm (0.8 in.) of slack exists.

d. Tighten the screws in the motor mount and recheck the belt.

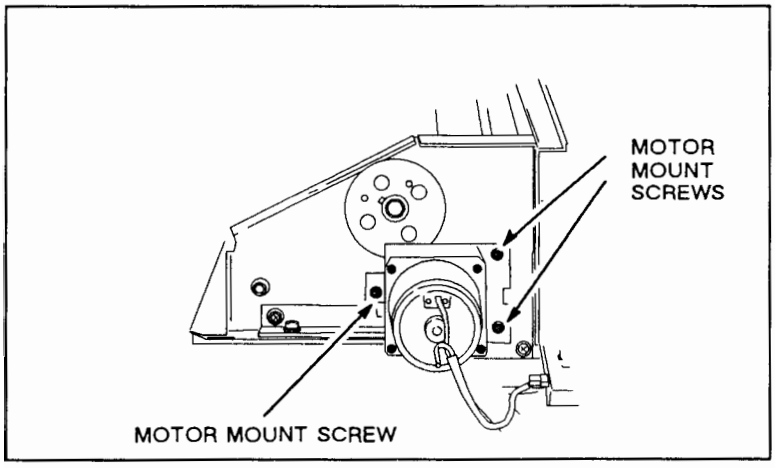

Figure 6-3. Take-Up Reel Motor Mount

6-16. CUTTER CLUTCH TENSION

6-17. The clutch on the cutter assembly may require adjustment if the cutter rollers are unable to maintain tension on the media as it passes through the cutter.

CAUTION

Tension on the cutter clutch must be set so that the clutch will slip when the media is not being advanced by the plotter. Over tightening of the clutch will cause the motor to stall and possibly burn out.

a. Turn the plotter line switch to OFF (**O**) and disconnect the ac power cord.

b. Turn the clutch so that the set screw in the adjusting nut can be reached. See Figure 6-4.

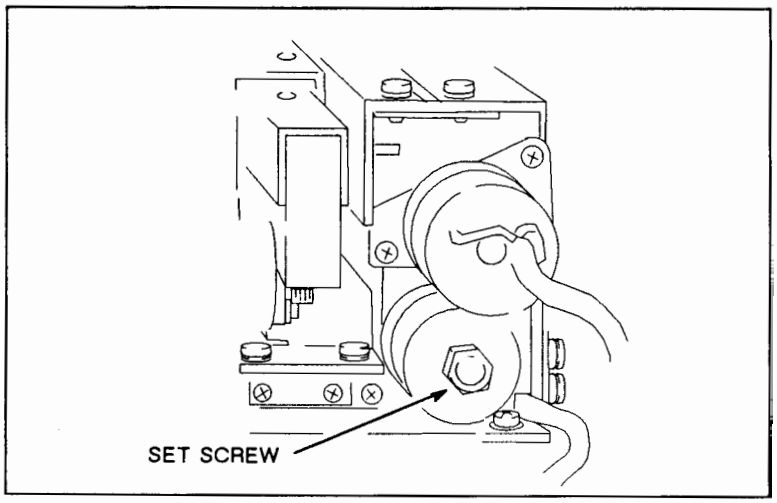

Figure 6-4. Roller Clutch

c. Use a 2 mm Allen wrench to loosen the set screw.

NOTE

The adjusting nut must always be turned so that the set screw comes in contact with the flat side of the shaft.

d. With a 13 mm open-end or socket wrench, turn the adjusting nut 180 degrees clockwise to tighten the clutch.

e. Tighten the set screw.

f. Connect the line cord and apply power to the plotter.

g. Run media through the cutter, advancing and stopping, to check the clutch performance.

6-18. CENTER BEARING ADJUSTMENT (E/A0 only)

6-19. Media skewing problems may be caused by a misaligned center bearing. To minimize future problems the center bearing must be checked and adjusted at installation. The procedure is as follows:

a. Turn the plotter OFF (O) and disconnect the ac line cord.

NOTE

While working on the plotter, always leave a section of plotting media over the writing head to prevent any possible damage to the head.

b. Raise the upper frame.

c. Place a strip of media over one of the pinchrollers (illustrated in Figure 6-5).

d. Close and latch the upper frame, making certain that the drive gears are properly meshed.

e. Slowly pull on the strip of media.

f. There should be sufficient pressure on the media that the rollers to rotate.

g. Repeat steps c. through f. for each of the rollers.

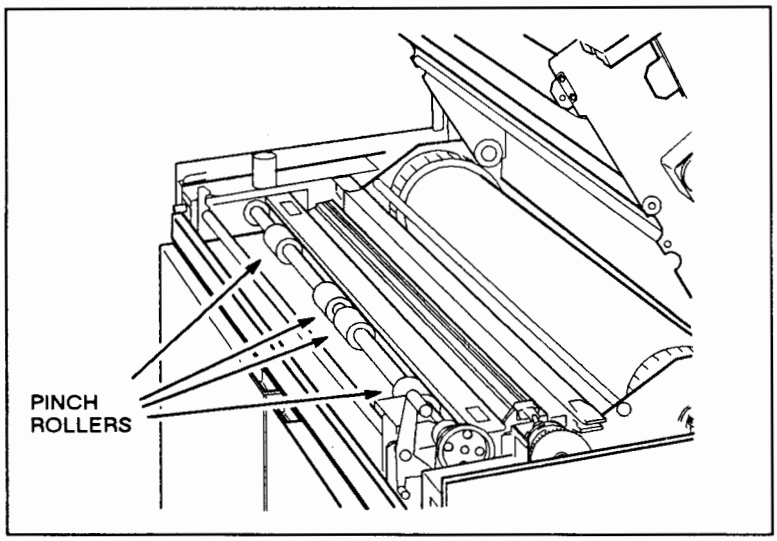

Figure 6-5. Media Pinch Rollers

h. If the media slips, the center bearing must be adjusted.

i. Loosen the 3 mm Allen head lock screw (Figure 6-6 #1) and the 3 adjusting screws (Figure 6-6 # 2, 3 & 4) in the center bearing support.

j. Slowly raise the center bearing support (Figure 6-6 #2) while moving the entire support assembly front to back.

k. Raise the support until there is no front to back play in the assembly. See Figure 6-7.

l. When the center bearing is resting firmly on both supports tighten the front to back adjusting screws (items 3 & 4 in Figure 6-6).

m. Repeat steps c. through f. for each of the rollers.

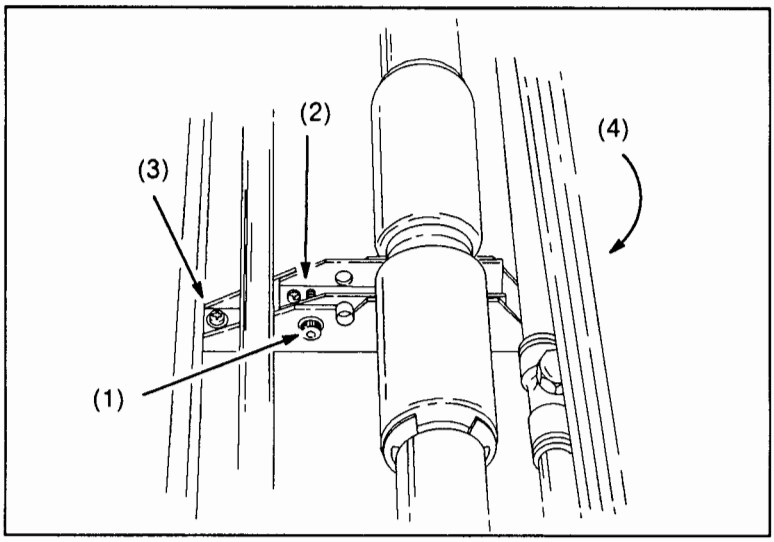

Figure 6-6. Center Bearing Adjustment

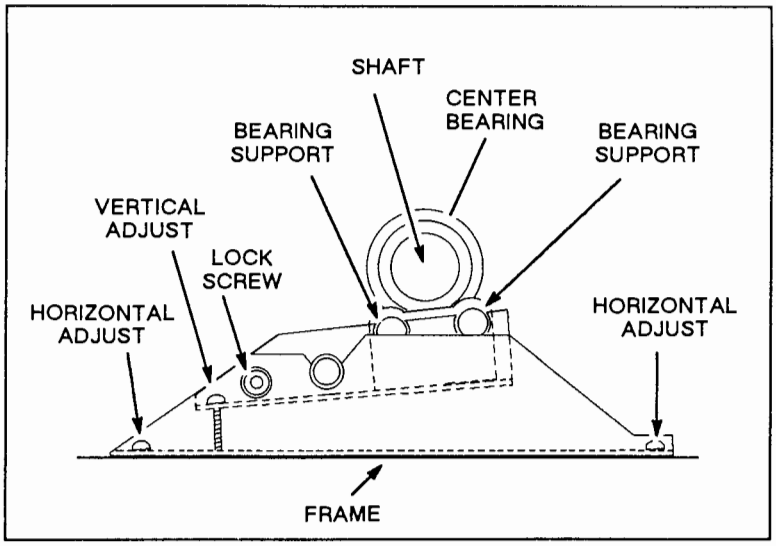

Figure 6-7. Center Bearing Support

n. If the media slips at the center pinch rollers, raise the bearing support.

o. If the media slips at the outer pinch rollers, lower the center bearing support.

p. When even pressure is achieved at each roller without slippage, tighten the locking screw.

q. Recheck all settings.

6-20. ELECTRICAL ADJUSTMENTS

6-21. HPS1 ADJUSTMENT

6-22. The high-voltage power supply unit is located above the power panel. HPS1 has two possible adjustments, +330 V and −250 V, that are not interactive. To adjust either voltage, perform the following procedure:

WARNING

To avoid personal injury, observe proper electrical shock precautions. These adjustments involve operating the internal plotter controls with the power ON (I).

a. Set the plotter line switch to OFF (O).

b. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure given in Chapter 6 of the HP 240D/E Hardware Support Manual.

c. Disconnect the cable at PCN4. See Figure 6-8.

d. Set the voltmeter to a range above the +330 volts used by the power supply.

e. Insert the probes (+ to Pin 1 and – to Pin 3) into the female side of the plug.

f. Turn the potter line switch to ON (I).

g. Set the MOTOR switch on the test panel to OFF.

h. Press the PG switch on the test panel to initiate a plotting mode.

i. Set the CONTRAST control to the fully clockwise position DARK.

j. With a small common screwdriver, adjust the control marked +330 V ADJ until the voltmeter measures +330 ± 10 V.

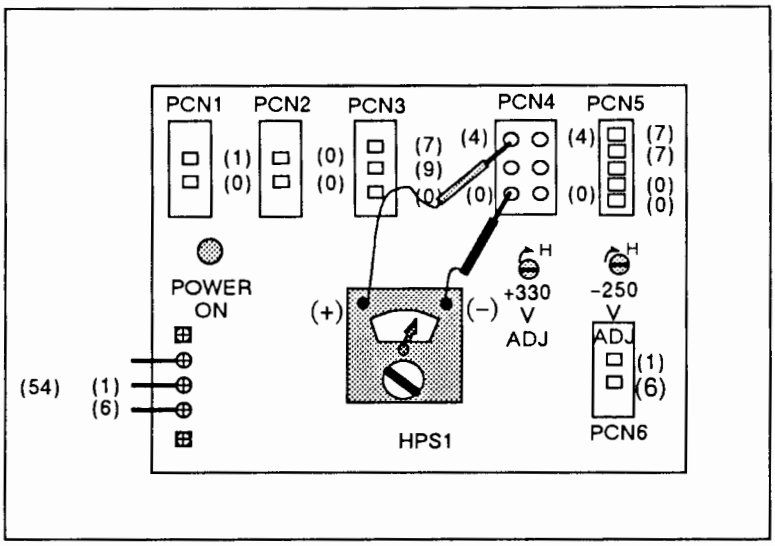

Figure 6-8. +330 V Power Supply Adjustment

WARNING

Voltage is still present for approximately 40 seconds after power is turned off.

k. Turn the plotter line switch to OFF (**O**) and remove the voltmeter probes.

l. Reconnect the cable at PCN4.

m. Reset the MOTOR switch.

n. Disconnect the cable at PCN5.

o. Set the voltmeter to a range above the -250 volts used by the power supply.

p. Insert the voltmeter probes (+ to Pin 1 and – to Pin 4) into the female side of the plug. See Figure 6-9.

q. Turn the plotter line switch to ON (**I**).

r. Press the PG switch on the test panel to initiate a plotting mode.

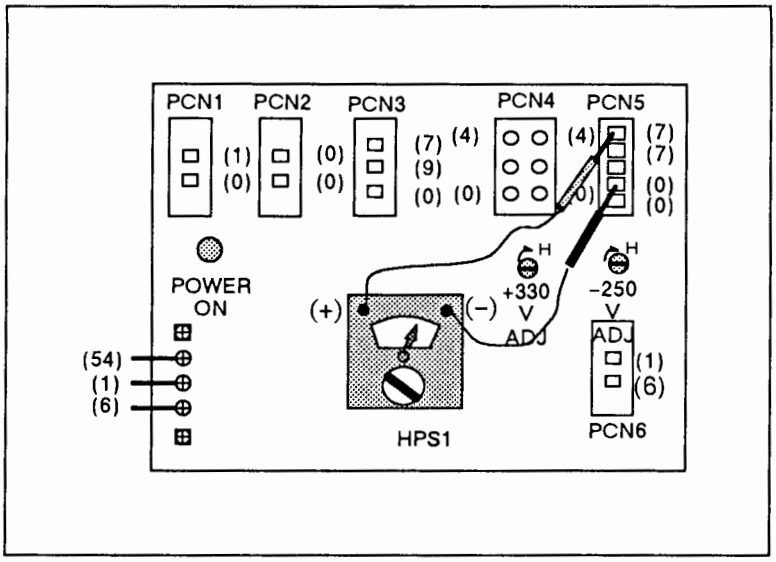

Figure 6-9. -250 V Power Supply Adjustment

s. Using a small common screwdriver, adjust the control marked -250 V ADJ until the voltmeter measures -250 ±10 V.

WARNING

Voltage is still present for approximately 40 seconds after power is turned off.

t. Turn the plotter line switch to OFF (O) and remove the voltmeter probes.

u. Reconnect the cable at PCN5.

v. Install the rear cover. If necessary, refer to the Rear Cover Replacement procedure given in Chapter 6 of the HP 240D/E Hardware Support Manual.

6-23. LPS1 ADJUSTMENT

6-24. LPS1 is located above the power panel next to HPS1. To adjust the +5 V low-voltage power supply, perform the following procedure:

a. Turn the plotter line switch to OFF (O).

b. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure given in Chapter 6 of the HP 240D/E Hardware Support Manual.

c. Set the voltmeter to a range above the +5 volts used by the power supply.

d. Connect the voltmeter probes to the two screw terminals as shown in Figure 6-10.

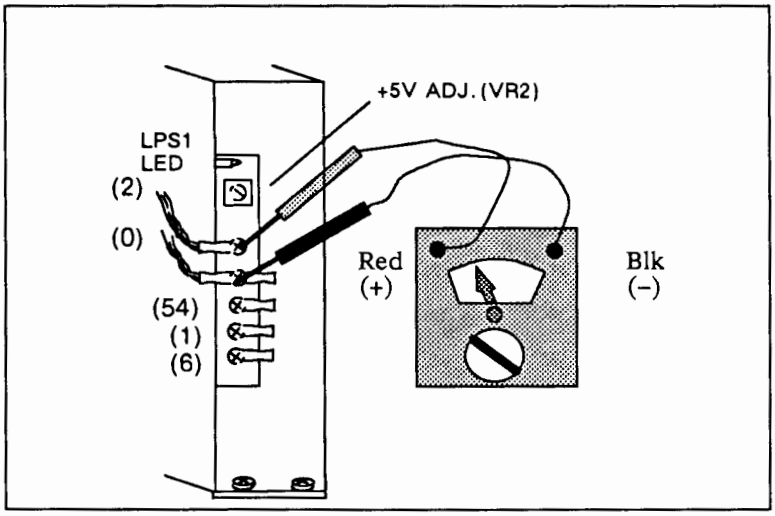

Figure 6-10. +5 V Power Supply Adjustment

e. Turn the plotter line switch to ON (I).

f. Using a small common screwdriver, turn the adjustment pot until the voltmeter measures +5 ± 0.25V.

g. Switch the plotter OFF (O) and remove the voltmeter probes.

h. Install the rear cover. If necessary, refer to the Rear Cover Replacement procedure given in Chapter 6 of the HP 240D/E Hardware Support Manual.

6-25. LPS2 ADJUSTMENT

6-26. LPS2 is located above the power panel next to LPS1. To adjust the low-voltage power supply, perform the following procedure:

a. Turn the plotter line switch to OFF (O).

b. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure given in Chapter 6 of the HP 240D/E Hardware Support Manual.

c. Set the voltmeter to a range above the +24 volts used by the power supply.

d. Connect the voltmeter probes to the two screw terminals as shown in Figure 6-11.

e. Turn the plotter line switch to ON (I).

f. Using a small common screwdriver, turn the +24 V adjustment pot until the voltmeter measures +24 ± 1.2 V.

g. Switch the plotter OFF (O) and remove the voltmeter probes.

h. Install the rear cover. If necessary, refer to the Rear Cover Replacement procedure given in Chapter 6 of the HP 240D/E Hardware Support Manual.

6-27. HP 250/255 FRONT-PANEL LCD ADJUSTMENT

6-28. The contrast of the front panel liquid crystal display can be adjusted as follows:

a. Raise the plotter top cover.

b. Locate the adjustment opening in the front panel assembly cover. See Figure 6-12.

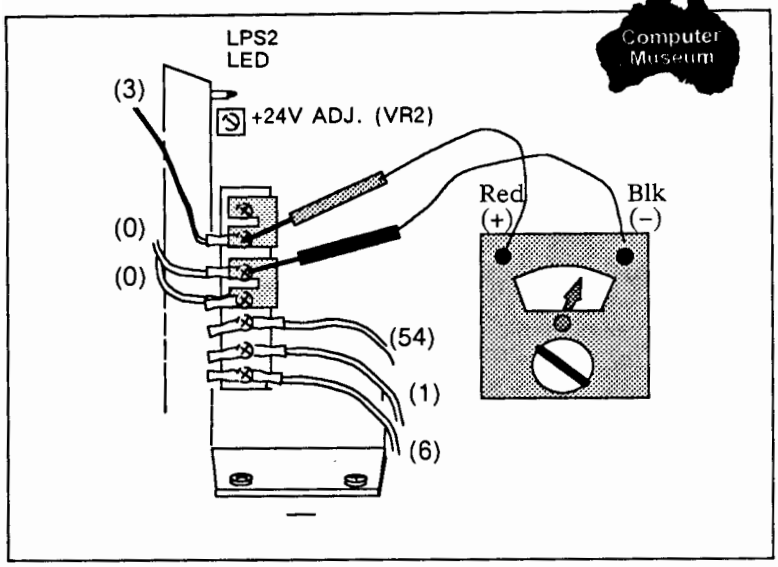

Figure 6-11. +24 V Power Supply Adjustment

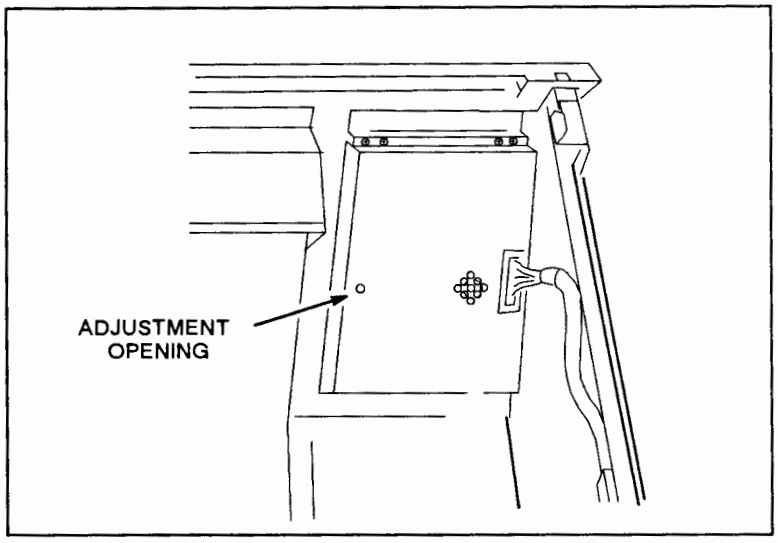

Figure 6-12. LCD Contrast Adjustment

CAUTION

It is possible to short out components on the front panel PCA. Use only a plastic or insulated tool to perform the adjustment.

c. Insert a plastic adjustment tool or a small insulated screw driver through the opening into the control resistor (VR1). See Figure 6-13.

d. Clockwise rotation will increase the contrast; counter-clockwise rotation will decrease it.

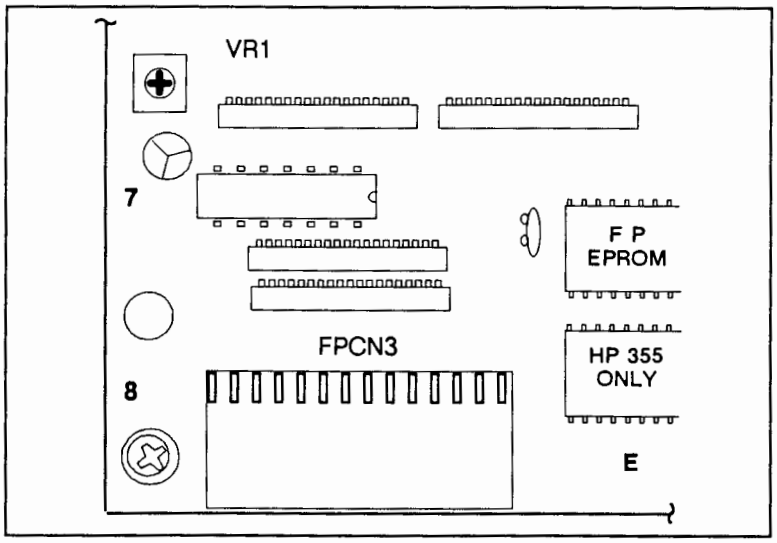

Figure 6-13. Front-Panel Contrast Control

6-29. RMC PCA REPLACEMENT

6-30. When installing the RMC PCA in the plotter, the DSW1 and DSW2 switches must be set according to the model of the plotter. Refer to Table 6-2 for switch segment designations. The settings are as follows:

Table 6-2. RMC Switches

SWITCH	FUNCTION	NORMAL POSITION
DSW1		
1	Media Sensor Logic	↑
2	Cutter Logic	↑
3	Cutter Logic	↑
4	PPW to CPW logic	↑
5	PPW to CPW logic	↓
6	PPW Logic	↑
7	Print Head Type	↑
8	Plotter Size	
	A0/E	↑
	A1/D	↓
DSW2		
1	Not Used	↑
2	Plot Test Pattern 0	↑
3	Plot Test Pattern 1	↑
4	Plot Test Pattern 2	↑
5	Plot Test Pattern 3	↑
6	Pattern Lock	↑
7	Cutter Test Pattern	↑
8	Cutter Test Pattern	↑

a. Prior to installing the PCA be certain that DSW1 segment 5 is down for either plotter.

b. For the E/A0 plotter Model 255, all other switch segments are in the up position.

c. For the D/A1 plotter Model 250, also set DSW1 segment 8 to the ON (down) position. See Figure 6-14.

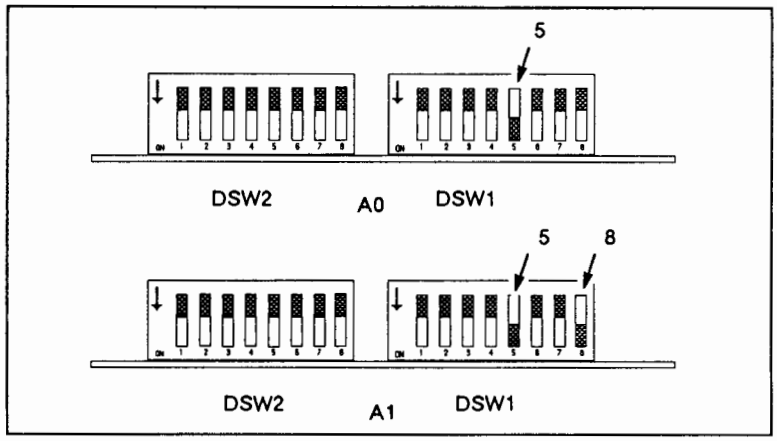

Figure 6-14. RMC PCA Switch Positions

6-31. CUTTER TIMING ADJUSTMENT

6-32. Two rotary switches on the edge of the RMC PCA must be adjusted to set the timing of the cutter. This sets the position of the cut after the end of the plot. See Figure 6-15.

6-33. When replacing the RMC PCA, set the rotary switches on the new PCA to the same position as those on the PCA being removed.

6-34. Adjustment of the timing is made as follows:

a. Turn the plotter OFF (**O**).

b. Disconnect the ac line cord and the interface cable.

c. Remove the right-hand end cover.

d. Set DSW2 segment 8 ON.

e. Apply power and turn the plotter ON (**I**).

f. Press the spring loaded cutter test switch on the test panel once. Refer to the Test Panel Features in Section B-3. The red LED will light.

g. The plotter will generate a cutter test pattern (see Figure 6-16), advance and cut the media at 90 mm (3.54 in.).

h. Adjust the rotary switches, RSW1 and RSW2, to position the cut on the center line of the pattern. RSW1 moves the cut by 1/8 mm. RSW2 adjusts the cut by 1 mm.

i. When the cut is properly positioned press the cutter test switch again.

j. Turn the plotter OFF (**O**).

k. Set DSW2 segment 8 OFF.

l. Replace the right-hand end cover.

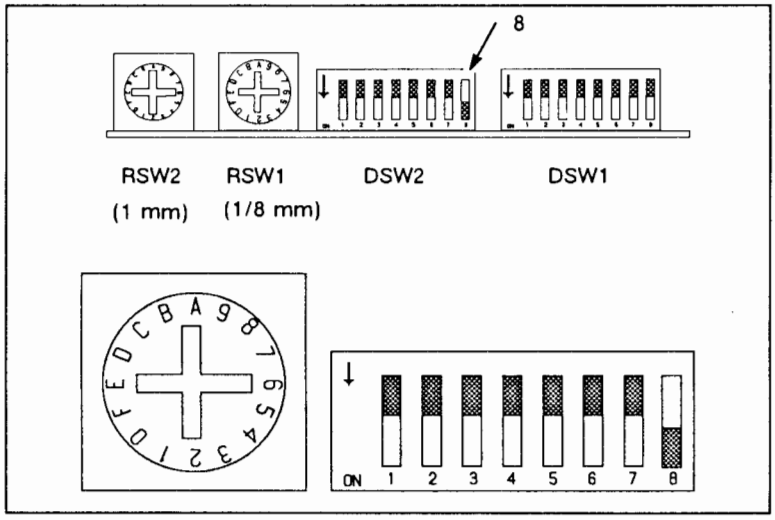

Figure 6-15. Cutter Position Adjustment

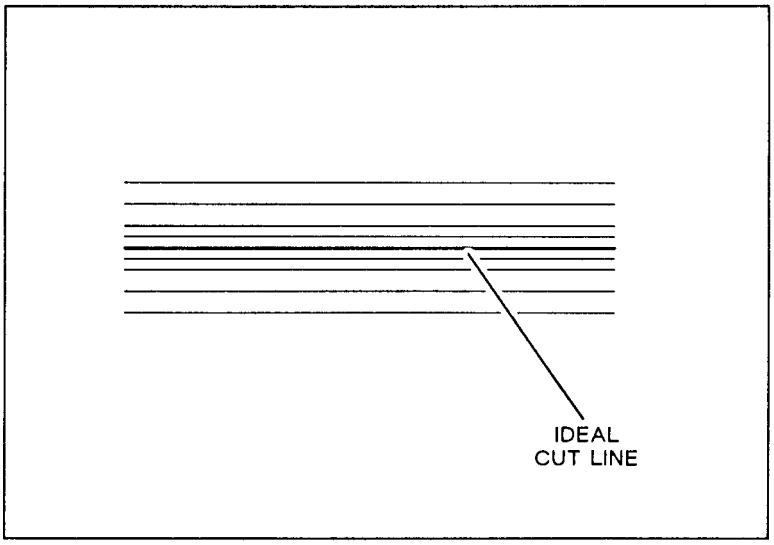

Figure 6-16. Cutter Test Pattern

6-35. SET CALIBRATION

6-36. To adjust the calibration of the plotter output in the axis of media movement (X-axis), perform the following steps:

a. Plot a line in the x axis.

b. Measure that line and perform the following computation:

$$\frac{\text{ACTUAL LENGTH } \dagger}{\text{DESIRED LENGTH}} * 100 = \% \text{ of desired}$$

† measured

c. Enter the service tech diagnostic menu.

d. The select arrow will appear at the **SET CAL** line.

e. Press the **Value +** or **Value –** button to select the value computed in step b.

f. The calibration range is 90.00 to 110.00 in increments of hundredths.

g. When the desired value is displayed press **Enter**. The display will show:

```
PROCESSING COMMAND
```

h. The value will be stored and the display will return with the entered value.

```
DIAGNOSTIC                    ↓
SERVICE TECH DIAGS
→SET CAL (%)= 99.08
  FORMAT DISK
```

NOTES:

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SECTION VII

PERIPHERALS

7-1. INTRODUCTION

7-2. Not applicable to the HP 7600 Models 240D/E and 250/255.

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TABLES (CONTINUED)

ILLUSTRATIONS (240D/E)

ILLUSTRATIONS (250/255)

SECTION VIII

REPLACEMENT PARTS

8-1. EXCHANGE ASSEMBLIES

8-2. Exchange assemblies for the HP 7600 Models 240D/E are listed in Table 8-10.

8-3. Exchange assemblies for the HP 7600 Models 250/255 are listed in Table 8-27.

8-4. REPLACEABLE PARTS

8-5. Replaceable parts in the HP 7600 Models 240D/E are listed in Table 8-1 through Table 8-9 and illustrated in Figure 8-1 through Figure 8-9. Replaceable parts in the HP 7600 Models 250/255 are listed in Table 8-11 through Table 8-26 and illustrated in Figure 8-10 through Figure 8–23.

Table 8-1. Parts List, Frame Assembly 1

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X8SMWBNI	2	7	DXZP4X8SMWBNI	2	7	SCREW, P4 X 8 SMW BNI
2	TM-147-2	7	7	TM-147-2	7	7	WASHER-PLASTIC
3	K1310300B-H	3	1	K1310300B-H	3	1	COVER-LEFT SIDE
4	DXZP4X8SMW	7	55	DXZP4X8SMW	7	55	SCREW, P4 X 8 SMW
5	K4H10248	4	2	K4H10248	4	2	FG STRAP 8
6	DXZWC4B	6	3	DXZWC4B	6	3	WASHER-STAR, M4
7	DXZP3X10SMW	1	4	DXZP3X10SMW	1	4	SCREW, P3 X 10 SMW
8	DXZ1520	0	2	DXZ1520	0	2	CATCH-MAGNETIC
9	K3310685B	1	1	K3310685B	1	1	SUPPORT BAR-LEFT SIDE (B)
10	DXZ1H75	0	1	DXZ1H75	0	1	HOLDER-ROD
11	K1310265	7	1	K1310264	5	1	MAIN FRAME
12	K3310698	8	1	K3310698	8	1	PLATE-HARNESS
13	K3M10294	1	1	K3M10294	1	1	SWITCH-POWER
14	K4311295	7	1	K4311295	7	1	BRACKET-POWER SWITCH
15	K2310416	0	1	K2310416	0	1	COVER-MCD
16	K4311368	2	1	K4311368	2	1	BRACKET-INTERLOCK SWITCH
17	K3M10297	7	1	K3M10297	7	1	SWITCH-INTERLOCK
18	K3310684	9	1	K3310683	7	1	BAR-SUPPORT, REAR
19	SEE NOTES		1	SEE NOTES		1	BRACKET-MCD, UPPER
20	SEE NOTES		1	SEE NOTES		1	BRACKET-MCD, LOWER

Table 8-1. Parts List, Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
21	K3M10248	4	1	K3M10248	4	1	PCA-MECHANICAL CONTROL DRIVER (MCD)
	C1600-69306	2	1	C1600-69306	2	1	PCA-MCD (EXCHANGE)
22	DXZP3X6SMW	4	6	DXZP3X6SMW	4	6	SCREW, P3 X 6 SMW23
23	K1310302-H	1	1	K1310304-H	5	1	COVER-REAR
24	K4H10249	6	1	K4H10249	6	1	FG STRAP 9
25	K3310785	3	1	K3310785	3	1	PLATE-PRESSURE, FILTER
26	K4311421	6	1	K4311421	6	1	FILTER
27	TM-96-6	7	6	TM-96-6	7	6	CUSHION-RUBBER
28	K1310306-H	9	1	K1310307-H	1	1	SHIELD-FRONT, PCA
29	N/A			K3310692	6	1	PLATE-SHIELDING, FRONT
30	0515-0780	6	86	0515-0780	6	86	SCREW-METRIC
31	N/A			N/A			VECTOR-TO-RASTER CONVERTER
32	DXZF3X8	8	8	DXZF3X8	8	8	SCREW, F3 X 8
33	DXZ1521	1	4	DXZ1521	1	4	CATCH, MAGNETIC
34	K4311423	0	2	K4311423	0	2	SPACER-DOOR LATCH
35							TEST PANEL ASSEMBLY (REFER TO TABLE 8-5)
36	DXZ105-N	5	4	DXZ105-N	5	4	CASTER
37	SEE NOTES		16	SEE NOTES		16	SCREW ASSEMBLY
38	K4310103	1	4	K431010			
39	DXZB3X8	0	2	DXZB3X8	0	2	SCREW, B3 X 8
40	K3M10268	6	1	K3M10268	6	1	RELAY

Table 8-1. Parts List, Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
41	AR1800	6	1	AR1800	6	1	BRACKET-RELAY
42	DXZP3X6SW	0	1	DXZP3X6SW	0	1	SCREW, P3 X 6 SW
43	K3M10267	4	1	K3M10267	4	1	RESISTOR
44	MAS-1215-33	1	1	MAS-1215-33	1	1	FILTER-NOISE
45	K4310977	2	4	K4310977	2	4	CAP-INSULATION
46	DXZP4X35SW	4	2	DXZP4X35SW	4	2	SCREW, P4 X 35 SW
47	K3M10252	3	1	K3M10252	3	1	FAN1
48	K3310685A	0	1	K3310685A	0	1	SUPPORT BAR-RIGHT SIDE (A)
49	K3310300A-H	2	1	K3310300A-H	2	1	COVER-RIGHT SIDE
50	8120-5118	5	1	8120-5118	5	1	AC POWER CORD (VRC TO PRINT ENGINE)
51	C1600-60005	0	1	C1600-60005	0	1	MEDIA DEFLECTOR
52	C1600-60001	6	1	C1600-60001	6	1	CABLE ASSEMBLY, CTRL IF
53	C1600-60230	3	1	C1600-60230	3	1	CABLE ASSEMBLY, VRC IF
54	K3310836	2	1	K3310836	2	1	PLATE-SHIELD

Table 8-1. Parts List, Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
55	MAS-1215-33	1	1	MAS-1215-33	1	1	FILTER-NOISE
56	DXZB4X8	1	4	DXZB4X8	1	4	SCREW, B4X8
							NOTES
							ITEMS 19 AND 20 ARE PART OF THE MCD PCA ASSEMBLY (ITEM 21). ITEM 37 INCLUDES PART NUMBERS DXZCS6X10 (SCREW), DXZWA6B (SPRING WASHER)(, AND DXZWG6 (FLAT WASHER).

THE PART LIST FOR FRAME ASSEMBLY 2 IS ON THE PREVIOUS FOUR PAGES OF THIS HANDBOOK.

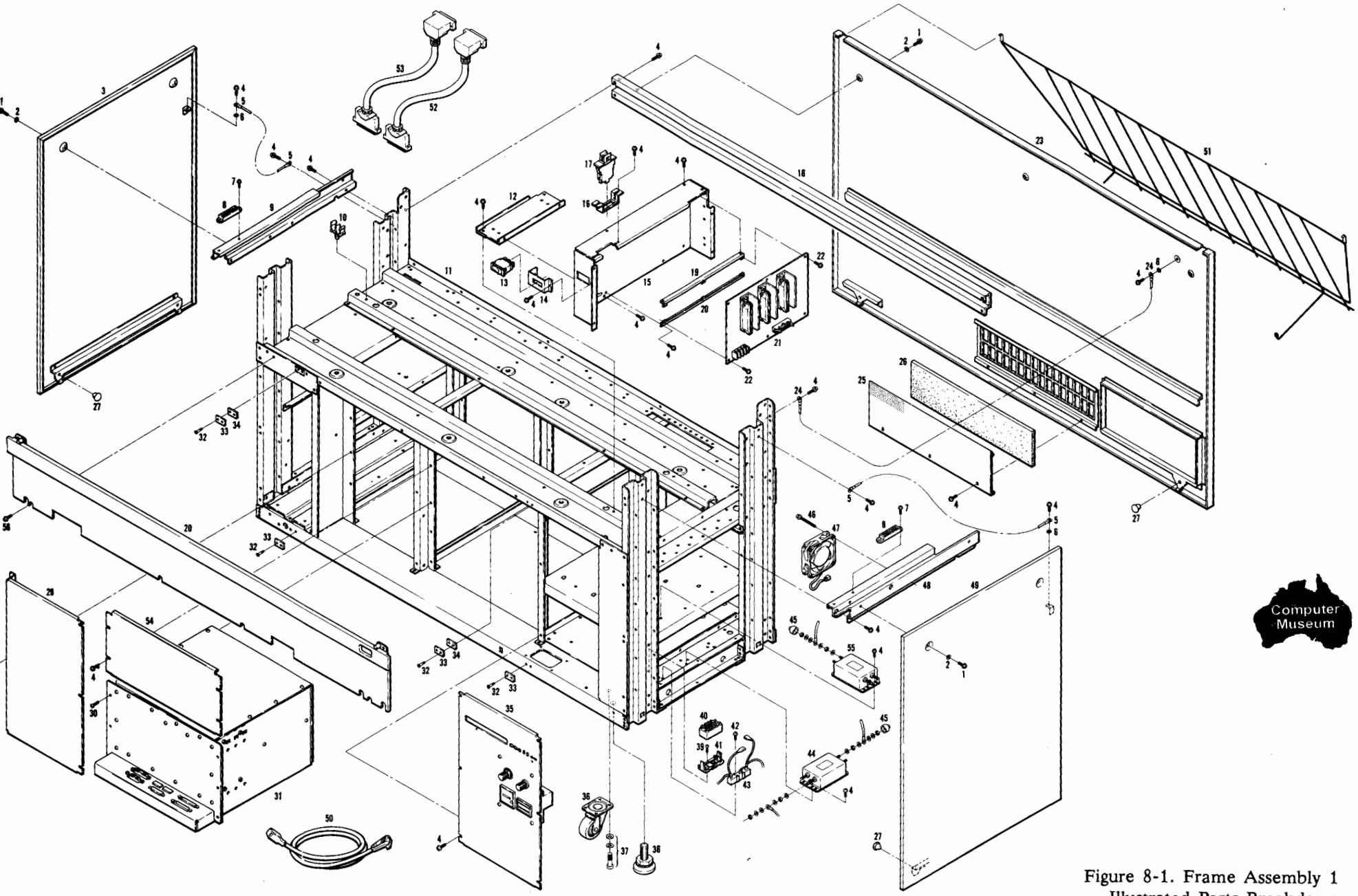


Figure 8-1. Frame Assembly 1
Illustrated Parts Breakdown

Table 8-2. Parts List, Frame Assembly 2

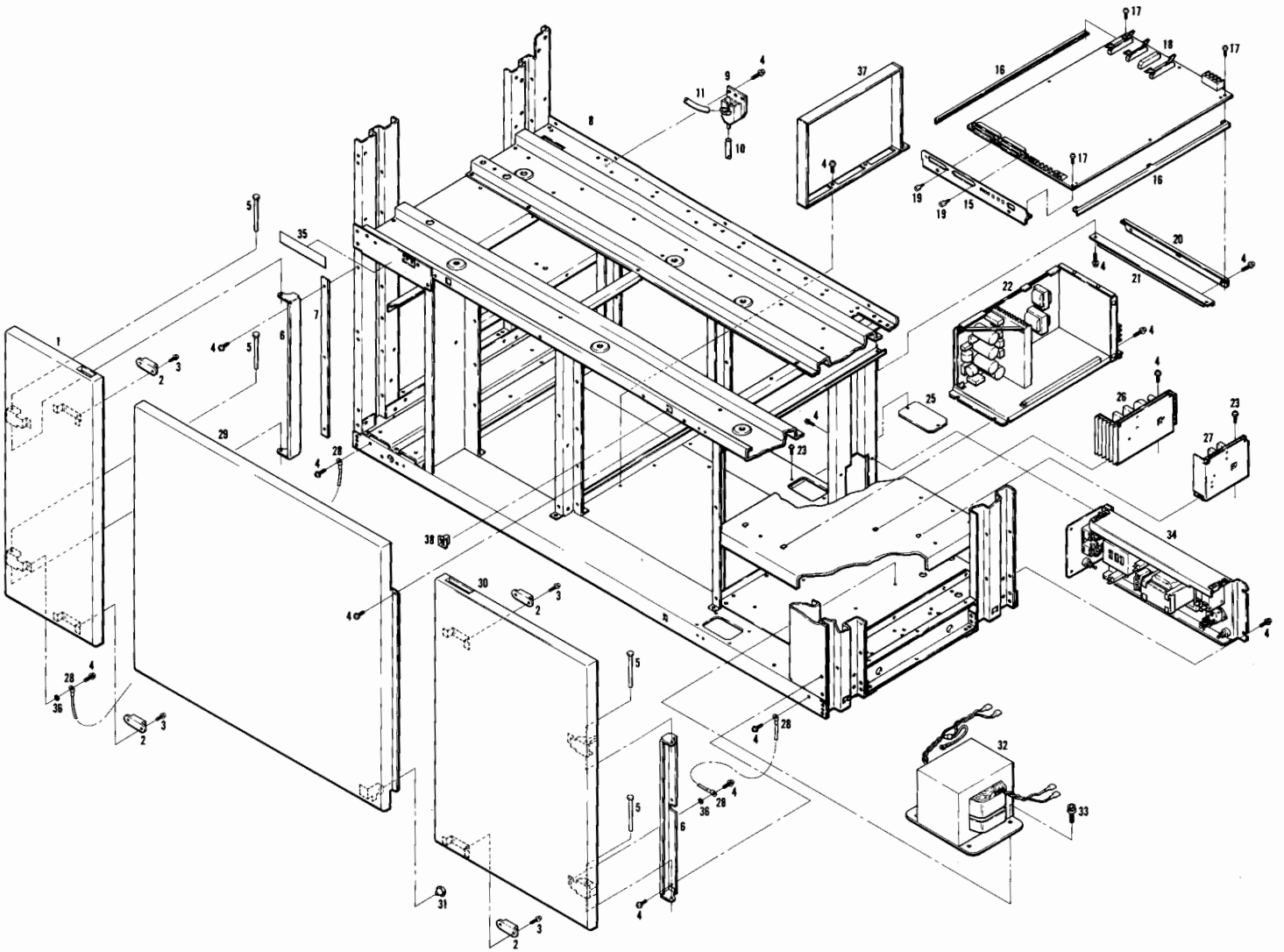
REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	K1310305-H	9	1	K1310305-H	9	1	DOOR-TONER
2	DXZ1521	1	4	DXZ1521	1	4	CATCH-MAGNETIC
3	DXZP3X10SMW	1	8	DXZP3X10SMW	1	8	SCREW, P3 X 10 SMW
4	DXZP4X8SMW	7	20	DXZP4X8SMW	7	20	SCREW, P4 X 8 SMW
5	DXZB-99-3	3	4	DXZB-99-3	3	4	PIN-HINGE
6	K3310786	5	2	K3310786	5	2	BAR-HINGE
7	K4311422	8	1	K4311422	8	1	SPACER-HINGE BAR
8	K1310265	7	1	K1310264	5	1	MAIN FRAME
9	UH30-08	3	1	UH30-08	3	1	TUBE 4 (530 MM)
10	UH30-06	1	1	UH30-06	1	1	TUBE 2 (240 MM)
11	K4311455	7	1	K4311455	7	1	VENT-AIR
12	DXZGRM8	6	1	DXZGRM8	6	1	GRIP RING
13	K4311285	6	1	K4311285	6	1	COVER-AIR VENT
14	DXZB3X6TTB	7	3	DXZB3X6TTB	7	3	SCREW, P3 X 6 TTS
15	SEE NOTE	7	1	SEE NOTE	7	1	BRACKET-FRONT, RMC
16	SEE NOTE	9	2	SEE NOTE	9	2	BRACKET-SIDE, RMC
17	DXZP3X6SMW	4	12	DXZP3X6SMW	4	12	SCREW, P3 X 6 SMW
18	K3M10246	0	1	K3M10247	2	1	PCA-RECORDING MECHANICAL CONTROL (RMC)
	C1600-69304	0	1	C1600-69305	1	1	PCA-RMC (EXCHANGE)
19	SEE NOTE		4	SEE NOTE		4	STANDOFF-INTERFACE CONNECTOR
20	SEE NOTE	2	1	SEE NOTE	2	1	BRACKET-REAR, RMC

Table 8-2. Parts List, Frame Assembly 2 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
21	K3310687	5	1	K3310587	5	1	BAR-SUPPORT, RMC
22	K3M10249	6	1	K3M10249	6	1	HIGH VOLTAGE POWER SUPPLY UNIT E
23	DXZP3X8SMW	6	4	DXZP3X8SMW	6	4	SCREW, P3 X 8 SW
24	DXZP3X6SMW	4	4	DXZP3X6SMW	4	4	SCREW, P3 X 6 SMW
25	K4311100	6	1	K4311100	6	1	COVER-REAR, CABLE HOLE
26	K3M10250	9	1	K3M10250	9	1	LOW VOLTAGE POWER SUPPLY UNIT J (+5V)
27	K3M10251	1	1	K3M10251	1	1	LOW VOLTAGE POWER SUPPLY UNIT K (+24V)
28	K4H10248	4	2	K4H10248	4	2	FG STRAP 8
29	K2310475-H	0	1	K2310274-H	8	1	COVER-CENTER
30	K1310299-H	2	1	K1310299-H	2	1	DOOR-TEST PANEL
31	TM-96-6	7	2	TM-96-6	7	2	CUSHION-RUBBER
32	DXZ70743A	8	1	DXZ70743A	8	1	TRANSFORMER-MAIN, T1
33	DXZFSCS5X12	8	4	DXZFSCS5X12	8	4	SCREW, FSCS 5 X 12
34							PANEL ASSEMBLY-AC POWER (REFER TO TABLE 9-7)
35	K3310661	1	1	K3310661	1	1	LABEL-CAUTION

Table 8-2. Parts List, Frame Assembly 2 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
36	DXZM4	9	2	DXZM4	9	2	WASHER-STAR, M4
37	K3210174	7	1	K3210174	7	1	BAFFLE, VRC
38	DXZTL-165	2	2	DXZTL-165	2	2	CATCH
							NOTES
							ITEMS 15, 16, 19, AND 20 ARE PART OF THE RMC PCA (ITEM 18).



NOTE:

ITEM 34 PART NUMBER IS FOR THE PANEL ONLY. SEE FIGURE 8-7 FOR DETAILED VIEW.

Figure 8-2. Frame Assembly 2
Illustrated Parts Breakdown

Table 8-3. Parts List, Frame Assembly 3

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	K1310310-H	8	1	K1310311-H	0	1	COVER-TOP
2	DXZFSN4	1	8	DXZFSN4	1	8	SCREW, B3 X 8
3	K3310791	6	1	K3310792	8	1	PLATE-CUTTING, TOP COVER
4	K4311424	2	1	K4311425	4	1	BAR-CUTTING, TOP COVER
5	K3310660	9	1	K3310660	9	1	LABEL-CAUTION
6	DXZ1520	0	1	DXZ1520	0	1	CATCH-MAGNETIC
7	DXZF3X8	8	2	DXZF3X8	8	2	SCREW, F3 X 8
8	K3310787	7	1	K3310787	7	1	SPRING-TOP COVER
9	DXZWE8	6	3	DXZWE8	6	3	WASHER, HW 8
10	K3310784B	1	1	K3310784B	1	1	BRACKET-LEFT, TOP COVER
11	K4311429	2	1	K4311429	2	1	PLATE-MOUNTING, SPRING
12	DXZP5X14SW	1	10	DXZ5X14SW	1	10	SCREW, P5 X 14 SW
13	K3310652	2	1	K3310652	2	1	PLATE-PUMP SHIELDING
14	DXZP4X8SMW	7	10	DXZP4X8SMW	7	10	SCREW, P4 X 8 SMW
15	K4311286	8	1	K4311286	8	1	CAP-SYPHON
16	K4311279	3	1	K4311279	3	1	SEAL-TEFLON
17	K4311415	3	1	K4311415	3	1	SPLASH GUARD
18	K4311456	9	1	K4311456	9	1	SEAL-RUBBER
19	K4311280	6	1	K4311280	6	1	PIPE JOINT
20	DXZPOC8-01	5	3	DXZPOC8-01	5	3	TUBE JOINT 7

Table 8-3. Parts List, Frame Assembly 3 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
21	UH30-08	3	1	UH30-08	3	1	TUBE 4 (530 MM)
22	UH30-08	3	2	UH30-08	3	2	TUBE 5 (630 MM)
23	UH30-08	3	1	UH30-08	3	1	TUBE 7 (1200 MM)
24	DXZB3X6TTB	7	3	DXZB3X6TTB	7	3	SCREW, B3 X 6 TTB
25	K3210168	4	1	K3210168	4	1	ARM-PIPE JOINT
26	TM-96-6	7	1	TM-96-6	7	1	CUSHION-RUBBER
27	K4311283	2	1	K4311283	2	1	HOLDER-SPRING
28	K4311282	0	1	K4311282	0	1	SPRING-SYPHON ASSEMBLY
29	DXZ1H75	0	2	DXZ1H75	0	2	HOLDER-ROD
30	DXZP3X6SMW	4	4	DXZP3X6SMW	4	4	SCREW, P3 X 6 SMW
31	K3M10254	7	1	K3M10254	7	1	PUMP ASSEMBLY
32	UH30-08	3	1	UH30-08	3	1	TUBE 6 (650 MM)
33	DXZP4X18SMW	8	4	DXZP4X18SMW	8	4	SCREW, P4 X 18 SMW
34	DXZQ-04	1	4	DXZQ-04	1	4	MOUNT-SOUND
35	K3310653	4	1	K3310654	4	1	PLATE-MOUNTING, PUMP
36	DXZP4X8TTS	6	1	DXZP4X8TTS	6	1	SCREW, P4 X 8 TTS
37	K4H10251	1	1	K4H10251	1	1	FG STRAP 11
38	SEE NOTE		1	SEE NOTE		1	SHEET-CONTROL PANEL
39	SEE NOTE		1	SEE NOTE		1	PLATE-CONTROL PANEL
40	SEE NOTE		1	SEE NOTE		1	PCA, CONTROL PANEL

Table 8-3. Parts List, Frame Assembly 3 (Continued)

REF DES	240D PART NUMBER	CD	QTY	240E PART NUMBER	CD	QTY	DESCRIPTION
41	DXZP3X8SMW	6	11	DXP3X8SMWZ	6	11	SCREW, P3 X 8 SMW
42	SEE NOTE	4	1	SEE NOTE	4	1	COVER-BOTTOM, CONTROL PANEL
43	DXZSSP-8	1	2	DXZSSP-8	1	2	PIN-SNAP
44	K4311420	4	1	K4311420	4	1	ACTUATOR-INTERLOCK
45	K3310784A	0	1	K3310784A	0	1	BRACKET-RIGHT, TOP COVER
46	K3M10289	1	1	K3M10290	3	1	DAMPER
47	K4945002	4	1	K4945002	4	1	BOTTLE-TONER
48	DXZP3X14SW	9	1	DXZP3X14SW	9	1	SCREW, P3 X 14 SW
49	K3M10299	1	1	K3M10299	1	1	SWITCH-SENSOR, TANK (SSW3)
50			1			1	PLATE-MOUNTING, SSW3 (PART OF ITEM 25)
51	K1310265	7	1	K1310264	5	1	FRAME-MAIN
52	K2310400	7	1	K2310400	7	1	TANK HOUSING
53	DXZTL-11F	5	1	DXZTL-11F	5	1	LATCH-TANK
54	K2310401	9	1	K2310401	9	1	PLATE-SLIDE
55	KT-B1L20	3	1	KT-B1L20	3	1	KNOB-BOLT
56	TM-147-3	9	1	TM-147-3	9	1	WASHER-PLASTIC
57	DXZB4X6	9	8	DXZB4X6	9	8	SCREW, B4 X 6
58	DXZ330-12	6	2	DXZ330-12	6	2	SLIDE RAIL
59	K3310691	4	1	K3310691	4	1	PLATE-SHIELDING
60	DXZP4X10SMW	2	11	DXZP4X10SMW	2	11	SCREW, P4 X 10 SMW

Table 8-3. Parts List, Frame Assembly 3 (Continued)

REF DES	240D PART NUMBER	CD	QTY	240E PART NUMBER	CD	QTY	DESCRIPTION
61	K4311190	5	1	K4311190	5	1	BRACKET-RUBBER PLATE
62	K310251	4	1	K310251	4	1	PLATE-RUBBER
63	DXZ5359	1	1	DXZ5359	1	1	HOLDER-ROD
64				K4311460	8	1	GUIDE-SPRING
65	STW-PM8.0X1.0	4	2	STW-PM8.0X1.0	4	2	WASHER-NYLON
							NOTE
							ITEMS 38, 39, 40, AND 42 MAY BE ORDERED USING HP PART NUMBER K3M10283.

THE PART LIST FOR FRAME ASSEMBLY 2 IS ON THE PREVIOUS FOUR PAGES OF THIS HANDBOOK.

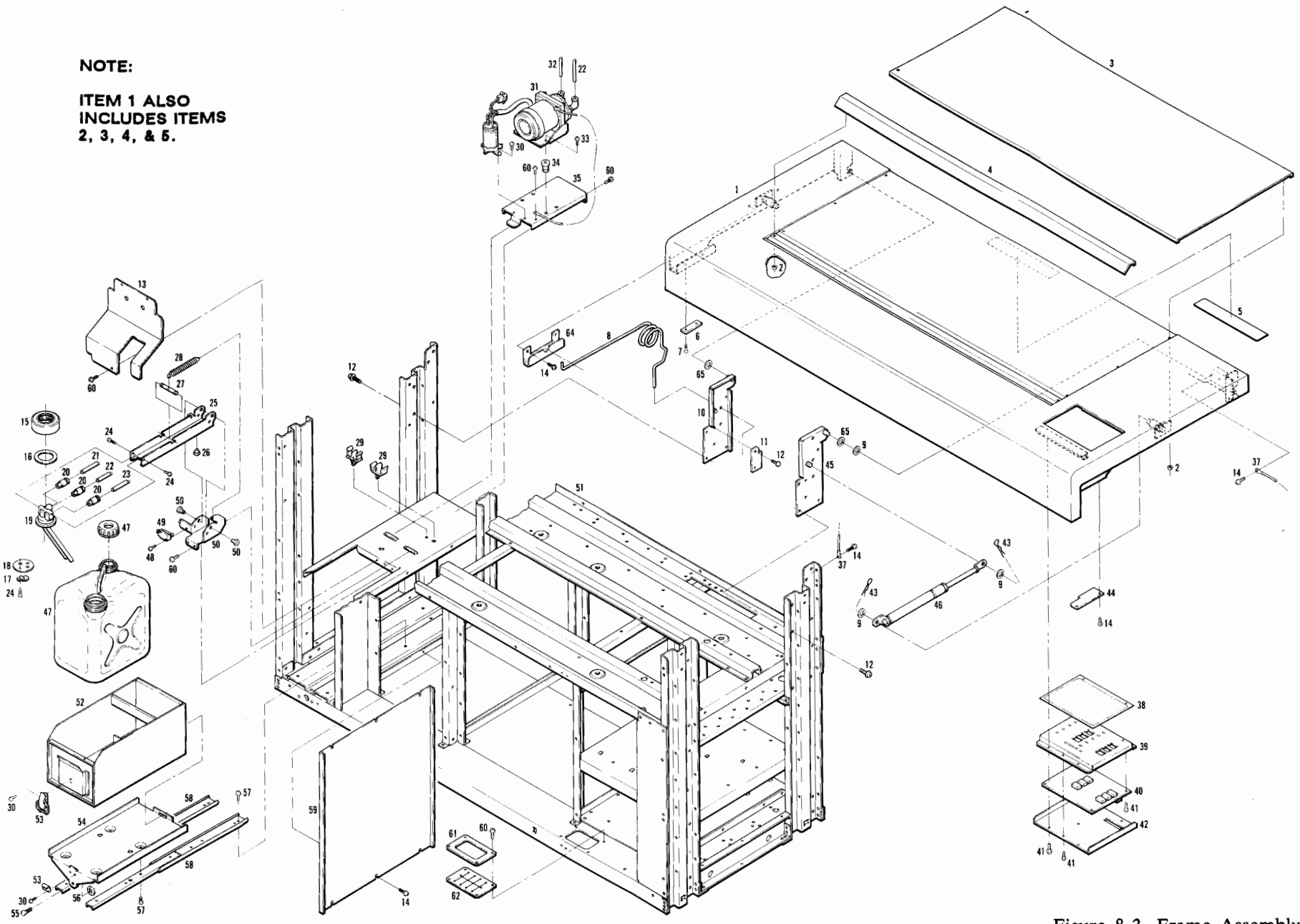


Figure 8-3. Frame Assembly 3
Illustrated Parts Breakdown

Table 8-4. Parts List, Upper Frame Assembly

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X10SMW	2	30	DXZP4X10SMW	2	30	SCREW, P4 X 10 SMW
2	DXZSN-4A	8	6	DXZSN-4A	8	6	CLAMP-NYLON
3	DXZJE-6	2	4	DXJE-6Z	2	4	E-RING, JE-6
4	DXZFSCS8X14	6	4	DXZFSCS8X14	6	4	SCREW, FSCS 8 X 14
5	DXZDM5-15R	0	4	DXZDM5-15R	0	4	SCREW (SAM)
6	DXZP5X14SW	1	4	DXZP5X14SW	1	4	SCREW, P5 X 14 SW
7	K3M10304	4	2	K3M10304	4	2	DAMPER
8	DXZN10	0	2	DXZN10	0	2	NUT, N10
9	DXZWA10B	4	2	DXZWA10B	4	2	WASHER-SPRING, S10
10	K4311260	4	2	K4311260	4	2	SPRING-PINCH ROLLER
11	K2210198B	5	1	K2210198B	5	1	PLATE, LEFT-SIDE
12	K4311249	0	2	K4311249	0	2	SHAFT-COUPLING
13	K4311265	4	2	K4311265	4	2	SHAFT-CONNECTOR
14	DXZSP4X36	5	2	DXZP4X36	5	2	PIN-SPRING, SP 4 X 36
15	K4311373	3	1	K4311261	6	1	SPRING-PAD
16	K4210144B	6	2	K4210144B	6	2	ARM-ROLLER (B)
17	K4311214A	6	4	K4311214A	6	4	SCREW-SUPPORT (A)
18	FLW688ZZ	5	6	FLW688ZZ	5	6	BEARING-BALL
19	K3M10298	9	2	K3M10298	9	2	SWITCH-SENSOR
20	DXZP2X10SMW	0	4	DXZP2X10SMW	0	4	SCREW, P2 X 10 SMW

Table 8-4. Parts List, Upper Frame Assembly (Continued)

REF DES	240D PART NUMBER	CD	QTY	240E PART NUMBER	CD	QTY	DESCRIPTION
21	K4210143	4	2	K4210143	4	2	ARM-ROLLER SHAFT
22	K4311259	1	2	K4311259	1	2	SPRING-ROLLER ARM
23	K3310636	8	1	K3310619	2	2	SHAFT
24	K4311214B	7	4	K4311214B	7	4	SCREW-SUPPORT (B)
25	K3310639	4	1	K3310622	9	1	SHAFT-FEED ROLLER
26	DXZC-12	9	4	DXZC-12	9	4	C-RING, C-12
27	K4311250	3	2	K4311250	3	2	ROLLER-FEED
28	K4210144A	5	2	K4211144A	5	2	ARM-ROLLER (A)
29	K3M10261	2	1	K3M10262	4	1	PINCH ROLLER
30	K3310748	5	1	K3310730	8	1	PLATE-GUIDE
31	DXZP3X6SMW	4	4	DXZP3X6SMW	4	6	SCREW, P3 X 6 SMW
32	K3M10302	0	2	K3M10302	0	3	BRUSH-CONDUCTIVE
33	K3310632	0	1	K3310615	4	1	PLATE-MOUNTING, BRUSH
34	K3310633	2	1	K3310616	6	1	STAY
35	K3310640	7	1	K3310623	1	1	SHAFT-GUIDE
36	K3M10259	7	1	K3M10260	0	1	ROLLER-PAD
37	DXZWC3B	4	4	DXZWC3B	4	6	WASHER-STAR, M3
38	DXZWC4B	6	4	DXZWC4B	6	4	WASHER-STAR, M4
40	K4311371	9	1	K4311371	9	1	GEAR-PINCH ROLLER

Table 8-4. Parts List, Upper Frame Assembly (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
41	K4311262	8	1	K4311262	8	1	ACTUATOR-SWITCH
42	K3310618	0	1	K3310618	0	1	PLATE-MOUNTING, SWITCH
43	K3M10097	3	1	K3M10097	3	1	SWITCH-SENSOR, NO-PAPER (SSW4)
44	DXZP3X14SW	9	1	DXZP3X14SW	9	1	SCREW, P3 X 14 SW
45	K2H10032	3	1	K2H10032	3	1	HARNESS, NO-PAPER SWITCH
46	DXZ4035	8	48	DXZ4035	8	49	CLIP-WIRE
47	K2210198A	4	1	K2210198A	4	1	PLATE-RIGHT SIDE, UPPER FRAME
48	K4H10247	2	1	K4H10247	2	1	FG STRAP 7
49	K4311255	3	2	K4311255	3	2	STOPPER
50	DXZFSCS8X14	0	2	DXZFSCS8X14	0	2	SCREW, FSCS 8 X 14
51	K4311497	5	2	K4311497	5	2	SPACER
52	DXZB5X14TTB	4	4	DXZB5X14TTB	4	4	SCREW-B5X14TTB
53	DXZSN-6A	0	1	DXZSN-6A	0	1	CLAMP-NYLON

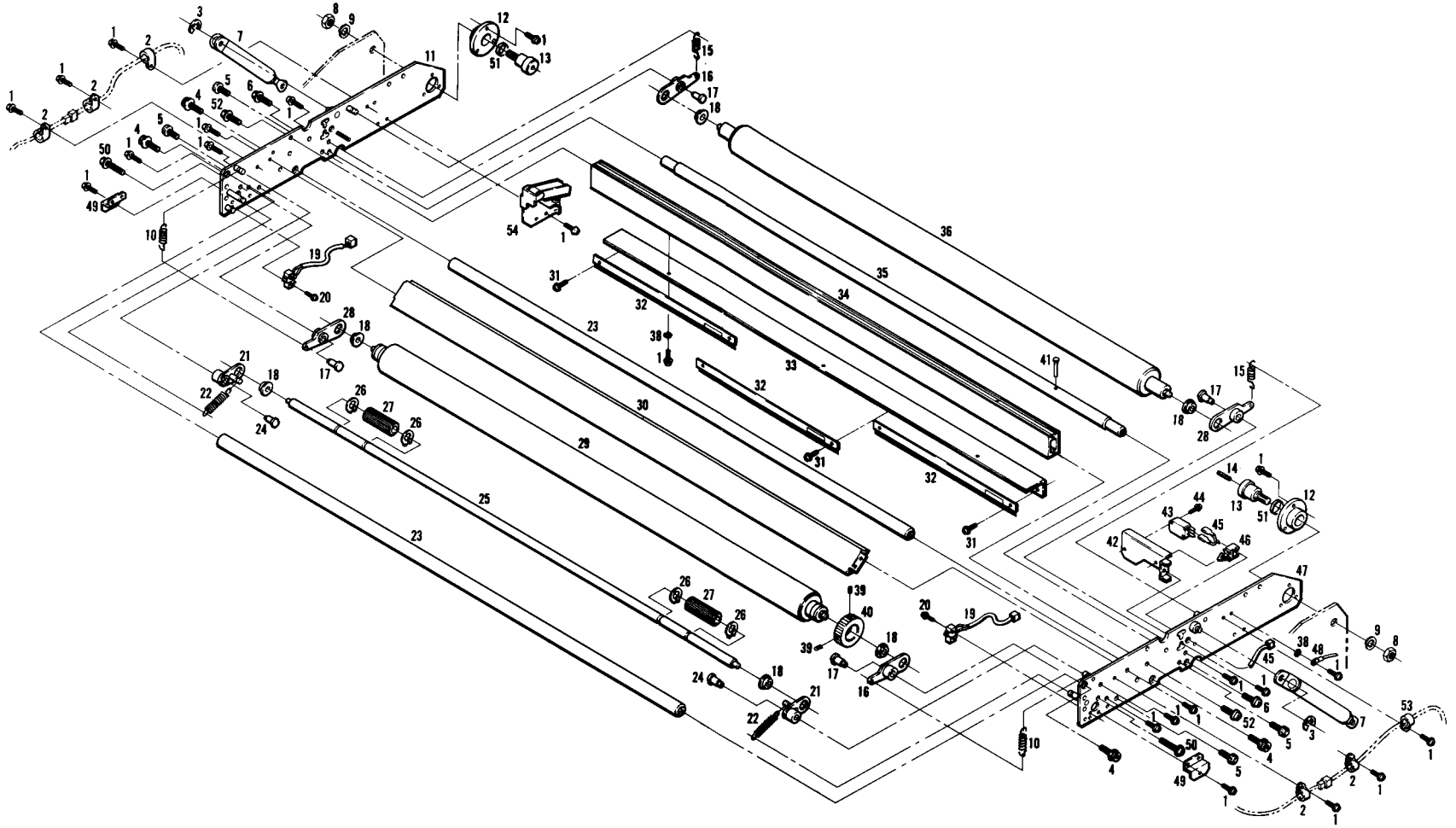


Figure 8-4. Upper Frame Assembly
Illustrated Parts Breakdown

Table 8-5. Parts List, Lower Frame Assembly 1

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	DXZPVU8	2	1	DXZPVU8	2	1	TUBE JOINT 6
2	UH30-08	3	1	UH30-08	3	1	TUBE 3 (45 MM)
3	DXZPMF8-01	9	1	DXZPMF8-01	9	1	TUBE JOINT 5
4	DXZFSCS6X10	8	2	DXZFSCS6X10	8	2	SCREW, FSCS 6 X 10
5	K3310613	0	1	K3310613	0	1	PLATE-MOUNTING, SOLENOID
6	DXZP4X10SMW	2	45	DXZP4X10SMW	2	49	SCREW, P4 X 10 SMW
7	DXZPL8-01	1	1	DXZPL8-01	1	1	TUBE JOINT 2 (SEE NOTES)
8	K3M10258	5	1	K3M10258	5	1	VALVE-SOLENOID (SEE NOTES)
9	DXZPL6-01	7	2	DXZPL6-01	7	2	TUBE JOINT 1 (SEE NOTES)
10	K3M10257	3	1	K3M10257	3	1	SWITCH-VACUUM
11	K3H10108	6	1	K3H10108	6	1	VSW STRAP
12	DXZSN-4A	8	2	DXZSN-4A	8	2	CLAMP-NYLON
13	DXZJE-6	2	4	DXZJE-6	2	4	E-RING, JE-6
14	K4311228	6	2	K4311228	6	2	BRACKET-DEVELOPER BLOCK
15	DXZP5X14SW	1	4	DXZP5X14SW	1	4	SCREW, P5 X 14 SW
16	K4311222	4	2	K4311222	4	2	CASE-BEARING
17	K2210193B	5	1	K2210193B	5	1	PLATE-LEFT SIDE
18	DXZP4X20SMW	3	4	DXZP4X20SMW	3	4	SCREW, P4 X 20 SMW
19	K4311229	8	2	K4311229	8	2	MOUNT-HEAD
20	K4311234	9	2	K4311234	9	2	PLATE-MEDIA SUPPORT

Table 8-5. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	CD	QTY	240E PART NUMBER	CD	QTY	DESCRIPTION
21	DXZISTW-12	8	3	DXZISTW-12	8	3	RING, ISTW-12
22	SEE NOTES	7	1	SEE NOTES	7	1	WHEEL-MEDIA ALIGNMENT
23	DXZCS4X14	8	3	DXZCS4X14	8	3	SCREW, CS 4 X 14
24	DXZWA4B	4	3	DXZWA4B	4	3	WASHER-SPRING, S4
25	SEE NOTES	5	1	SEE NOTES	5	1	SPOOL-LEFT
26	P-8000-051B	6	2	P-8000-051B	6	2	INSERT-BEARING
27	K3310627	9	1	K3310751	3	1	SHAFT-GUIDE
28	SEE NOTES	1	1	SEE NOTES	9	1	SHAFT-MEDIA
29	K3M10255	9	1	K3M10256	1	1	HEAD-WRITING
	C1600-69307	3	1	C1600-69308	4	1	HEAD-WRITING (EXCHANGE)
30	UH30-06	1	1	UH30-06	1	1	TUBE 1 (105 MM)
31	DXZSP3X15	8	2	DXZSP3X15	8	2	PIN-SPRING, SP 3 X 15
32	K4311416	5	2	K4311416	5	2	PLATE-ISOLATION, DEVELOPER
33	K4311227	4	2	K4311227	4	2	BLOCK-DEVELOPER
34	K2310471	6	1	K2310472	8	1	BAR-DEVELOPER
35	N/A			DXZ1257	0	1	CLIP-CANOE
36	N/A			K4311267	8	1	SUPPORTER-DEVELOPER
37	K3310625	5	1	K3310606	5	1	STAY #2
38	DXZFSCS4X8	3	2	DXZFSCS4X8	3	2	SCREW, FSCS 4 X 8
39	K4311231	3	1	K4311231	3	1	PLATE-CENTER, RECORDING HEAD
40	SEE NOTES	7	1	SEE NOTES	7	1	SPOOL-RIGHT

Table 8-5. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
41	DXZP4X35SW	4	4	DXZPP4X35SW	4	4	SCREW, P4 X 35 SW
42	K3M10252	3	2	K3M10252	3	2	FAN 3, 4
43	K4210141B	0	1	K4210141B	9	0	LATCH-LIFT (B)
44	K4311239	9	2	K4311239	9	2	SPRING-LATCH
45	K4311214B	7	2	K4311214B	7	2	SCREW-SUPPORT (B)
46	DXZ4035	8	2	DXZ4035	8	2	CLIP-WIRE
47	6001ZZ	9	2	6001ZZ	9	2	BEARING-BALL
48	K3310631	8	1	K3310752	4	1	SHAFT-CAM
49	K3310630	6	1	K3310612	8	1	SHAFT-ROLLER
50	DXZJE-19	7	4	DXZJE-19	7	6	E-RING, JE-19
51	K4311414	1	2	K4311414	1	4	ROLLER
52	UH30-08	3	1	UH30-08	3	1	TUBE 8 (MODEL 240D: 440 MM), (MODEL 240E: 590 MM) (SEE NOTES)
53	DXZPB8-01	9	1	DXZPB8-01	9	1	TUBE JOINT 4 (SEE NOTES)
54	UH30-08	1	1	UH30-08	1	1	TUBE 9 (MODEL 240D: 230 MM), (MODEL 240E: 390 MM)
55	DXZPL8-02	2	1	DXZPL8-02	2	1	TUBE JOINT 3 (SEE NOTES)
56	K4H10244	6	1	K4H10244	6	1	FG STRAP 4
57	N/A			K4311223	6	1	SUPPORT-CENTER (1)
58	N/A			K4311224	8	1	SUPPORT-CENTER (2)
59	N/A			608ZZ	3	2	BEARING-BALL
60	N/A			K4311226	2	2	SHAFT-BEARING

Table 8-5. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	CD	QTY	240E PART NUMBER	CD	QTY	DESCRIPTION
61							NOT ASSIGNED
62	K2310393	0	1	K2310391	6	1	PLATE-FAN
63	SEE NOTES		4	SEE NOTES		4	SCREW-STEPPING MOTOR
64	SEE NOTES		1	SEE NOTES		1	FG STRAP 10
65	SEE NOTES		1	SEE NOTES		1	WASHER-STAR, M5
66	K3M10253	5	1	K3M10253	5	1	MOTOR-STEPPING ASSEMBLY (SEE NOTES)
67	SEE NOTES		2	SEE NOTES		2	MOUNT-MOTOR
68	K4210141A	5	1	K4210141A	5	1	LATCH-LIFT A
69	DXZJE-12	3	1	DXZJE-12	3	1	E-RING, JE-12
70	DXZSSK4X4	5	2	DXZSSK4X4	5	2	SCREW-SET, SSK 4 X 4
71	K4311413	9	1	K4311413	9	1	GEAR-ROLLER SHAFT
72	6001ZZ	9	2	6001ZZ	9	2	BEARING-BALL
73	K4311215	9	1	K4311215	9	1	LEVER-RELEASE
74	K2210193A	4	1	K2210193A	4	1	PLATE-RIGHT SIDE
75	DXZFSCS5X12	8	4	DXZFSCS5X12	8	4	SCREW, FSCS 5 X 12
76	K2310397	8	1	K2310396	6	1	SPRING-RELEASE LEVER
77	K4311220	0	1	K4311220	0	1	PULLEY-MOTOR
78	K4311219	7	1	K4311219	7	1	PULLEY-ROLLER
79	K3M10293	9	1	K3M10293	9	1	BELT-DRIVE MOTOR
80	K4H10247	2	1	K4H10247	2	1	FG STRAP 7

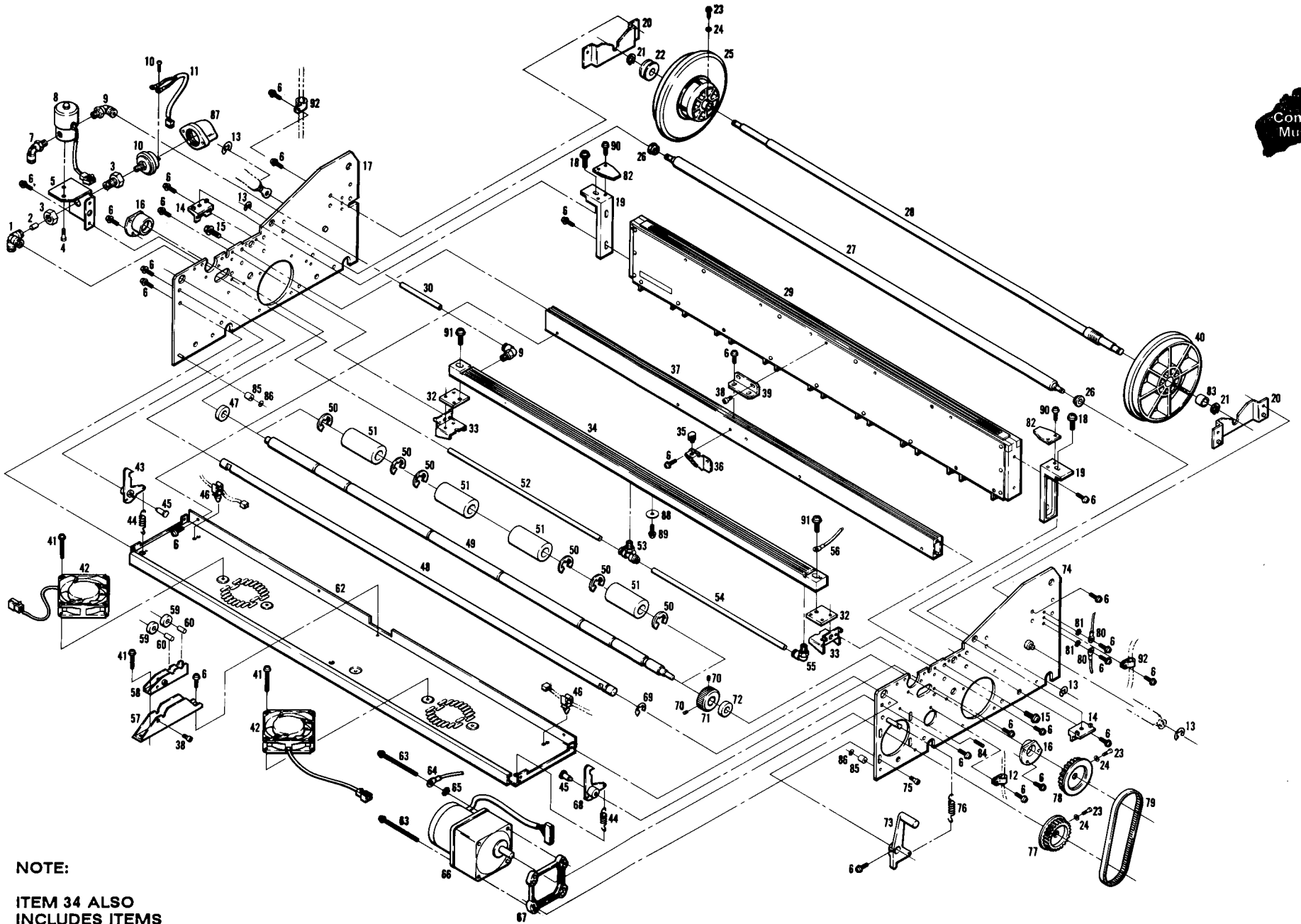
Table 8-5. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
81	DXZWC4B	4	2	DXZWC4B	4	2	WASHER-STAR, M4
82	K4311270	5	2	K4311270	5	2	PLATE-ADJUSTMENT, RECORDING HEAD
83	SEE NOTES	9	1	SEE NOTES	9	1	WHEEL-MEDIA ALIGNMENT, RIGHT
84	SP4X24	4	1	SP4X24	4	1	PIN-SPRING
85	K4311251	5	2	K4311251	5	2	ROLLER-LATCH
86	DXZSPN-2.6	9	2	DXZSPN-2.6	9	2	NUT-PUSH
87	DXZM-3321	1	1	DXZM-3321	1	1	COVER-VACUUM SWITCH
88				K4311493	7	1	SPACER-DEVELOPER
89				DXZF4X10	4	1	SCREW F4X10
90	DXZB4X8CR	6	4	DXZB4X8CR	6	4	SCREW-B4X8CR
91	DXZP4X30SMW	4	2	DXZP4X30SMW	4	2	SCREW-P4X30SMW
92	DXZSN-6A	0	2	DXZSN-6A	0	2	CLAMP-NYLON
				NOTES			
	K3M10263	6	1	K3M10264	8	1	ITEMS 22, 25, 28, 40, AND 83 ARE PART OF THE SPOOL ASSEMBLY AND CAN BE ORDERED USING THE PART NUMBERS LISTED TO THE LEFT.

Table 8-5. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
							NOTES (Cont'd.)
							ITEMS 7 AND 9 ARE SUPPLIED AS PART OF THE SOLENOID VALVE ASSEMBLY (ITEM 8).
	K3M10287	6	1	K3M10288	8	1	ITEMS 9, 52, 53, 54, AND 55 MAY BE ORDERED AS A KIT USING THE PART NUMBERS LISTED TO THE LEFT.
	K3M10253	5	1	K3M10253	5	1	ITEMS 63, 64, 65, 66, AND 67 ARE SUPPLIED AS AN ASSEMBLY AND CAN BE ORDERED USING THE PART NUMBERS LISTED TO THE LEFT.
	K3M10287	6	1	K3M10288	8	1	ITEMS 9, 18, 32, 33, 34, 52, 53, 54, AND 55 ARE PART OF THE DEVELOPER BAR ASSEMBLY ITEM 34.

THE PART LIST FOR FRAME ASSEMBLY 2 IS ON THE PREVIOUS SIX PAGES OF THIS HANDBOOK.



NOTE:

ITEM 34 ALSO INCLUDES ITEMS 9, 18, 32, 33, 34, 52, 53, 54, & 55.

Figure 8-5. Lower Frame Assembly 1
Illustrated Parts Breakdown

Table 8-6. Parts List, Lower Frame Assembly 2

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X35SW	4	4	DXZP4X35SW	4	4	SCREW, P4 X 35 SW
2	DXZPG-36	7	2	DXZPG-36	7	2	GUARD-FAN
3	K3M10252	3	2	K3M10252	3	2	FAN 1, 2
4	DXZN08	5	4	DXZN08	5	4	NUT
5	DXZWA8B	2	4	DXZWA8B	2	4	WASHER-SPRING
6	DXZWG8	6	4	DXZWG8	6	4	WASHER-FLAT
7	DXZP5X14SW	1	24	DXZP5X14SW	1	24	SCREW, P5 X 14 SW
8	K4311211	1	4	K4311211	1	4	BRACKET-ANGLE
9	EA2003	3	2	EA2003	3	2	SPACER
10	K4311235	1	1	K4311235	1	1	PLATE-MOUNTING, SENSOR
11	K4311241	4	1	K4311241	4	1	SPRING-ACTUATOR
12	K4311448	2	1	K4311448	2	1	SPACER-SENSOR
13	EE-SG3-B	8	2	EE-SG3-B	8	2	SWITCH-SENSOR, NEAR END OF PAPER (SEE NOTE)
14	DXZP3X6SW	0	4	DXZP3X6SW	0	4	SCREW, P3 X 6 SW
15	K2210193B	5	1	K2210193B	5	1	PLATE-LEFT SIDE
16	K4311244	0	1	K4311244	0	1	BRAKE-RUBBER
17	OPL0.3-12	8	1	OPL0.3-12	8	1	LIMITER-TORQUE
18	K4311245	2	1	K4311245	2	1	LIMITER-SPRING
19	DXZP4X10SMW	2	15	DXZP4X10SMW	2	15	SCREW, P4 X 10 SMW
20	K4311232	5	1	K4311232	5	1	ACTUATOR-MEDIA

Table 8-6. Parts List, Lower Frame Assembly 2 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
21	DXZJE-6	2	2	DXZJE-6	2	2	E-RING, JE-6
22	P-8000-051B	6	2	P-8000-051B	6	2	INSERT-BEARING
23	K4311216	1	1	K4311216	1	1	PLATE-MOUNTING, SENSOR
24	K4311236	3	1	K4311236	3	1	PLATE-SENSING, MEDIA
25	K4311237	5	1	K4311237	5	1	SHAFT-ACTUATOR
26	K2310403	3	1	K2310402	1	1	SHIELD-REAR, PCA
27	K3310624	3	2	K3310605	3	2	STAY #1
28	K2310394	2	1	K2310392	8	1	BOX-MEDIA
29	K2310451	4	1	K2310450	2	1	PLATE-COVER
30	K3310799	2	1	K3310799	2	1	LABEL-CAUTION
31	K3M10244	6	2	K3M10245	8	2	PCA-CONTROL ELECTRODE DRIVER (CED)
	C1600-69302	8	2	C1600-69303	9	2	PCA-CED (EXCHANGE)
32	K3M10243	4	1	K3M10243	4	2	PCA-PIN ELECTRODE DRIVER (PED)
	C1600-69301	7	1	C1600-69301	7	1	PCA-PED (EXCHANGE)
33	K2310397	8	1	K2310396	6	1	PLATE-BASE
34	DXZFSCS6X10	8	5	DXZFSCS6X10	8	5	SCREW, FSCS6 X 10
35	N/A			N/A			FRAME-MAIN
36	K2210193A	4	1	K2210193A	4	1	PLATE-RIGHT SIDE
37				DXZWG10	0	2	WASHER
38	DXZB5X14TTB	4	4	DXZB5X14TTB	4	4	SCREW
39	K3M10301	8	1	K3M10301	8	1	SWITCH-SENSOR, NEAR END OF PAPER (SSW6)

PARTS LISTS FOR LOWER FRAME ASSEMBLY 2 ARE ON THE TWO PREVIOUS PAGES OF THIS HANDBOOK.

NOTE:

MODEL 240D CONTAINS ONLY ONE PED PCA (ITEM 32).

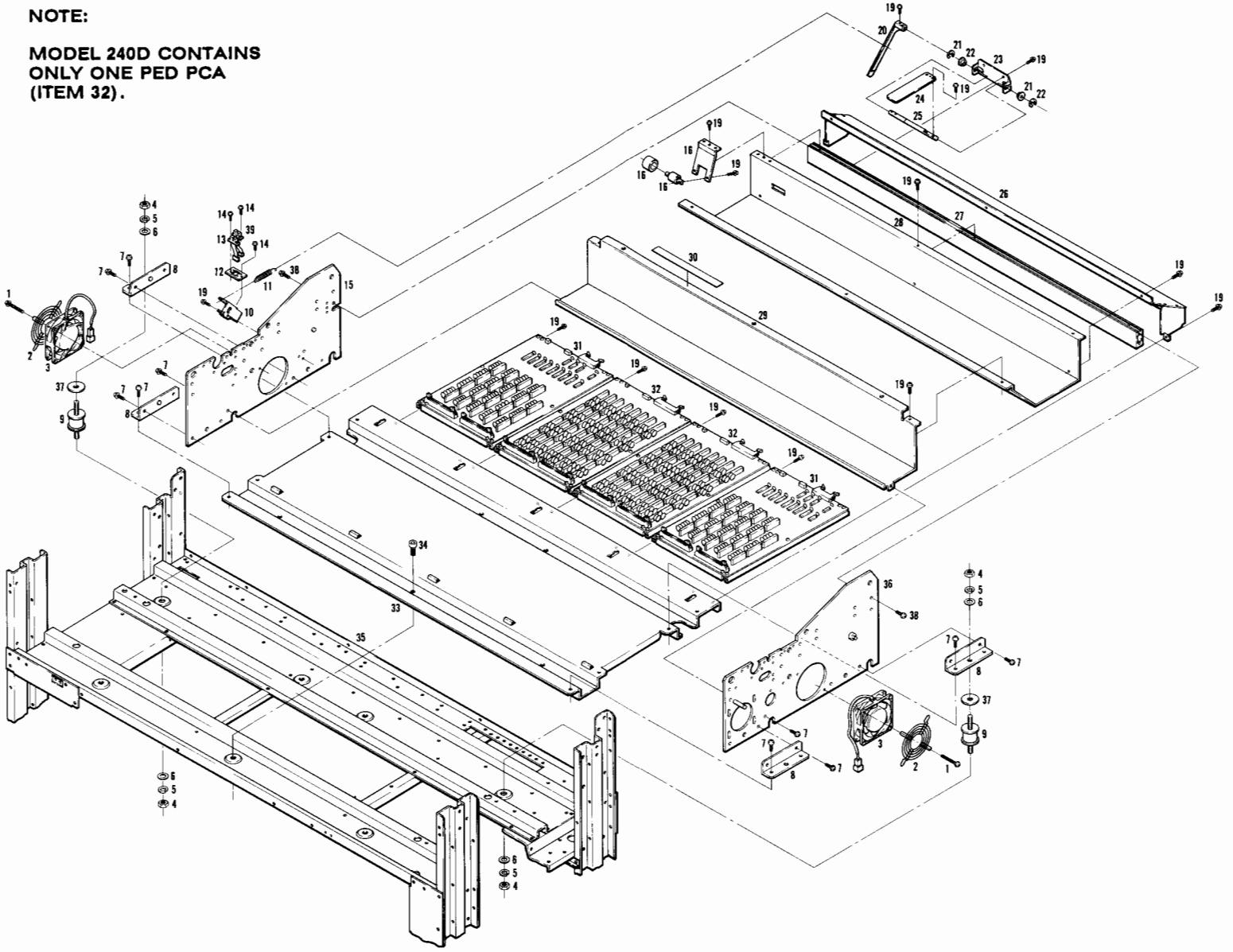
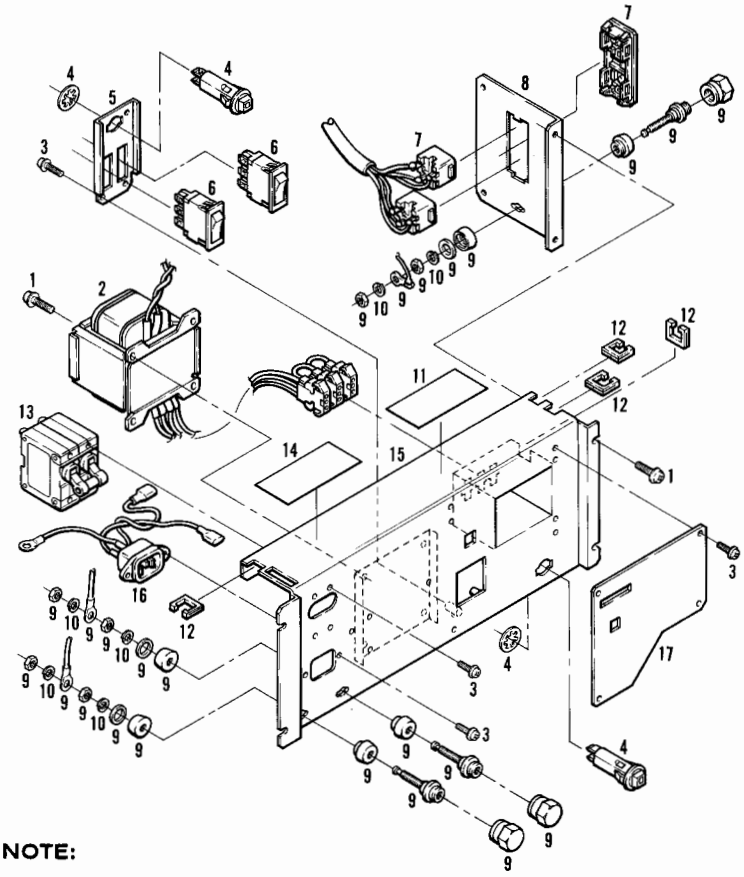


Figure 8-6. Lower Frame Assembly 2
Illustrated Parts Breakdown

Table 8-7. Parts List, Power Panel Assembly

REF DES	240D PART NUMBER	CD	QTY	240E PART NUMBER	CD	QTY	DESCRIPTION
1	DXZP4X8SMW	7	8	DXZP4X8SMW	7	8	SCREW, P4 X 8 SMW
2	DXZ70888	5	1	DXZ70888	5	1	TRANSFORMER-PUMP, T2
3	DXZP3X6SW	0	14	DXZP3X6SW	0	14	SCREW, P3 X 6 SW
4	NRF110-8A	9	2	NRF110-8A	9	2	CIRCUIT BREAKER
5	K4311299	5	1	K4311299	5	1	SWITCH PLATE-AC PANEL
6	AJ921100R3	8	2	AJ921100R3	8	2	SWITCH-VOLTAGE SETTING
7	WCF1042B	8	1	WCF1042B	8	1	HARNESS-AC
8	K4311417	7	1	K4311417	7	1	PANEL-OUTLET
9	T-6500-16-BK	1	3	T-6500-16-BK	1	3	TERMINAL
10	DXZWA5B	6	6	DXZWA5B	6	6	WASHER-SPRING, S5
11	K3310800	7	1	K3310800	7	1	LABEL-POWER UNIT CONNECTION
12	DXZEDS-1	1	4	DXZEDS-1	1	4	EDGE SADDLE
13	BAB2-215-411	2	1	BAB2-215-411	2	1	CIRCUIT BREAKER, CB1
14	K4311447	0	1	K4311447	0	1	LABEL-WARNING
15	K2310473	0	1	K2310473	0	1	PANEL-POWER
16	K4210196	5	1	K4210196	5	1	INLET-AC
17	K3310783	9	1	K3310783	9	17	COVER-VOLTAGE SWITCH
18	K4311482	4	1	K4311482	4	1	LABEL-VOLTAGE



NOTE:

VIEW ROTATED 90 DEGREES FROM FIGURE 8-2.

Figure 8-7. Power Panel Assembly Illustrated Parts Breakdown

7600-A-107-1R

Table 8-8. Parts List, Test Panel Assembly

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	K2310489	3	1	K2310489	3	1	TEST PANEL
2	DXZP3X8SMW	6	4	DXZP3X8SMW	6	4	SCREW, P3 X 8 SMW
3	K-11-20KNURL	0	2	K-11-20KNURL	0	2	KNOB-CONTROL
4	K4210199	1	1	K4210199	1	1	CONTROL-VOLUME, RV1
5	ARA25	9	1	ARA25	9	1	SWITCH-ROTARY, RSW1
6	K3310755	0	1	K3310755	0	1	PLATE-MOUNTING, VOLUME
7	DXZP3X6SW	0	2	DXZP3X6SW	0	2	SCREW, P3 X 6 SW
8	TH-147U	9	1	TH-147U	9	1	METER-HOUR, HM1
9	K4210200	6	1	K4210200	6	1	COUNTER-MAGNETIC, MC1
10	DXZSSK4X4	5	2	DXZSSK4X4	5	2	SCREW-SET SSK4X4

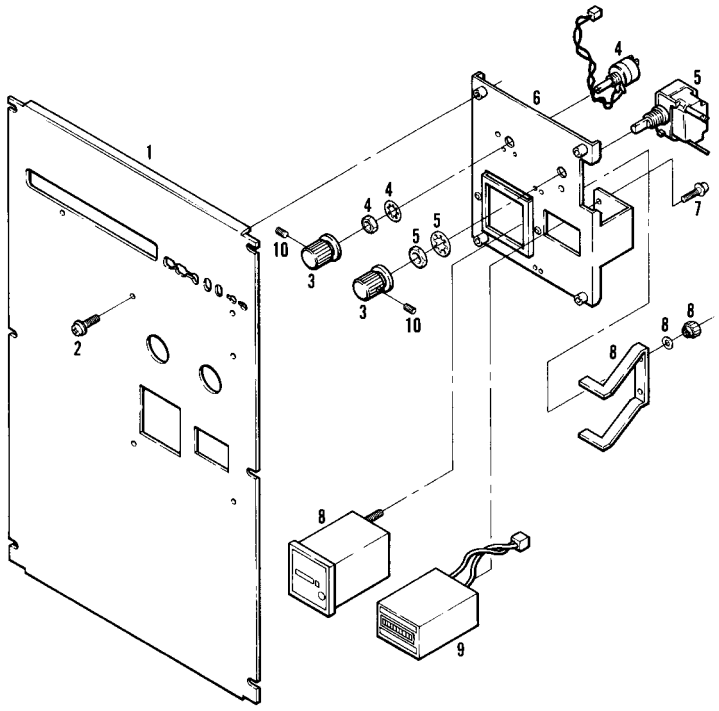


Figure 8-8. Test Panel Assembly
Illustrated Parts Breakdown

7600-A-108-2

Table 8-9. Parts List, Vector-to-Raster Converter Assembly

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	C1600-00070	3	1	C1600-00070	3	1	RETAINER-PCA
2	4324-0135	4	2	4324-0135	3	2	PAD-FOAM
3	0515-0780	6	86	0515-0780	6	86	SCREW-METRIC
4	3050-1179	6	2	3050-1179	6	2	WASHER-FLAT
5	C1600-00080	5	1	C1600-00080	5	1	GUIDE SUPPORT-LH
6	C1600-00010	1	1	C1600-00010	1	1	PLATE-FRONT
7	C1600-00035	0	1	C1600-00035	0	1	PANEL-INTERFACE
8	0380-0644	4	2	0380-0644	4	2	STANDOFF-METRIC
9	0515-0055	8	2	0515-0055	8	2	SCREW, M3X 0.5 X 6
10	1251-7828	8	2	1251-7828	8	2	STANDOFF-RS232
11	C1600-00016	7	1	C1600-00016	7	1	GUIDE-PCB, LH
12	0403-0639	7	8	0403-0639	7	8	GUIDE-PCB
13	C1600-60100	6	1	C1600-60100	6	1	PCA-MAIN
14	C1600-20001	2	4	C1600-20001	2	4	STANDOFF-I/F CONNECTOR
15	0380-1941	3	2	0380-1941	3	2	STANDOFF
16	C1600-00015	6	1	C1600-00015	6	1	GUIDE-PCB, RH
17	0515-0413	2	4	0515-0413	2	4	SCREW-PCB
18	C1600-60230	3	1	C1600-60230	3	1	CABLE-DISC, 34
19	C1600-60225	6	1	C1600-60225	6	1	CABLE-DISC, 20
20	C1600-60205	2	1	C1600-60205	2	1	CABLE-DISC, POWER

Table 8-9. Parts List, Vector-to-Raster Converter Assembly (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
21	C1600-60200	7	1	C1600-60200	7	1	CABLE-POWER SUPPLY
22	C1600-68103	5	1	C1600-68103	5	1	PCA-DMA I/O
	C1600-68101	3	1	C1600-68101	3	1	PCA-DMA I/O (EXCHANGE)
23	C1600-68102	4	1	C1600-68102	4	1	PCA-PROCESSOR
	C1600-68102	2	1	C1600-68102	2	1	PCA-PROCESSOR (EXCHANGE)
24	C1600-60107	3	1	C1600-60107	3	1	PCA-SWATH/RAM
	C1600-69107	1	1	C1600-69107	1	1	PCA-SWATH/RAM (EXCHANGE)
25	C1600-60104	0	1	C1600-60104	0	1	PCA-DISC CONTROL
	C1600-69104	8	1	C1600-69104	8	1	PCA-DISC CONTROL (EXCHANGE)
26	C1600-60215	4	1	C1600-60215	4	1	CABLE-FAN
27	0535-0006	1	3	0535-0006	1	3	NUT-HEX, M4 X 0.7
28	3160-0539	3	2	3160-0539	3	2	FAN-ALUMINUM FRAME
29	C1600-00050	9	2	C1600-00050	9	2	NUT PLATE
30	C1600-00030	5	1	C1600-00030	5	1	SHELF-POWER SUPPLY
31	0400-0318	3	2	0400-0318	3	2	GROMMET-SPLIT
32	0950-1958	4	1	0950-1958	4	1	POWER SUPPLY
33	C1600-00020	3	1	C1600-00020	3	1	COVER
34	C1600-00500	4	1	C1600-00500	4	1	LABEL-SERIAL
35	0515-1597	5	8	0515-1597	5	8	SCREW-METRIC, M4X 0.7 X 14

Table 8-9. Parts List, Vector-to-Raster Converter Assembly (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
36	3150-0544	9	2	3150-0544	9	2	FILTER SCREEN
37	1400-1405	2	1	1400-1405	2	1	CLAMP-CABLE, .750D
38	2360-0117	6	4	2360-0117	6	4	SCREW, 6-32 X .37
39	C1600-00060	1	2	C1600-00060	1	2	MOUNT-DISC
40	0950-1892	5	1	0950-1892	5	1	DISC DRIVE
	0957-0031	6	1	0957-0031	6	1	DISC DRIVE (EXCHANGE)
41	C1600-00005	3	1	C1600-00005	3	1	BASE
42	C1600-00007	6	1	C1600-00007	6	1	BAFFLE-VRC
43	0515-0406	3	2	0515-0406	3	2	SCREW, M3X O.5 X 8
44	8120-5118	5	1	8120-5118	5	1	AC POWER CORD (VRC TO PRINT ENGINE)
45	C1600-60001	6	1	C1600-60001	6	1	CABLE ASSEMBLY, CTRL IF
46	C1600-60230	3	1	C1600-60230	3	1	CABLE ASSEMBLY, VRC IF

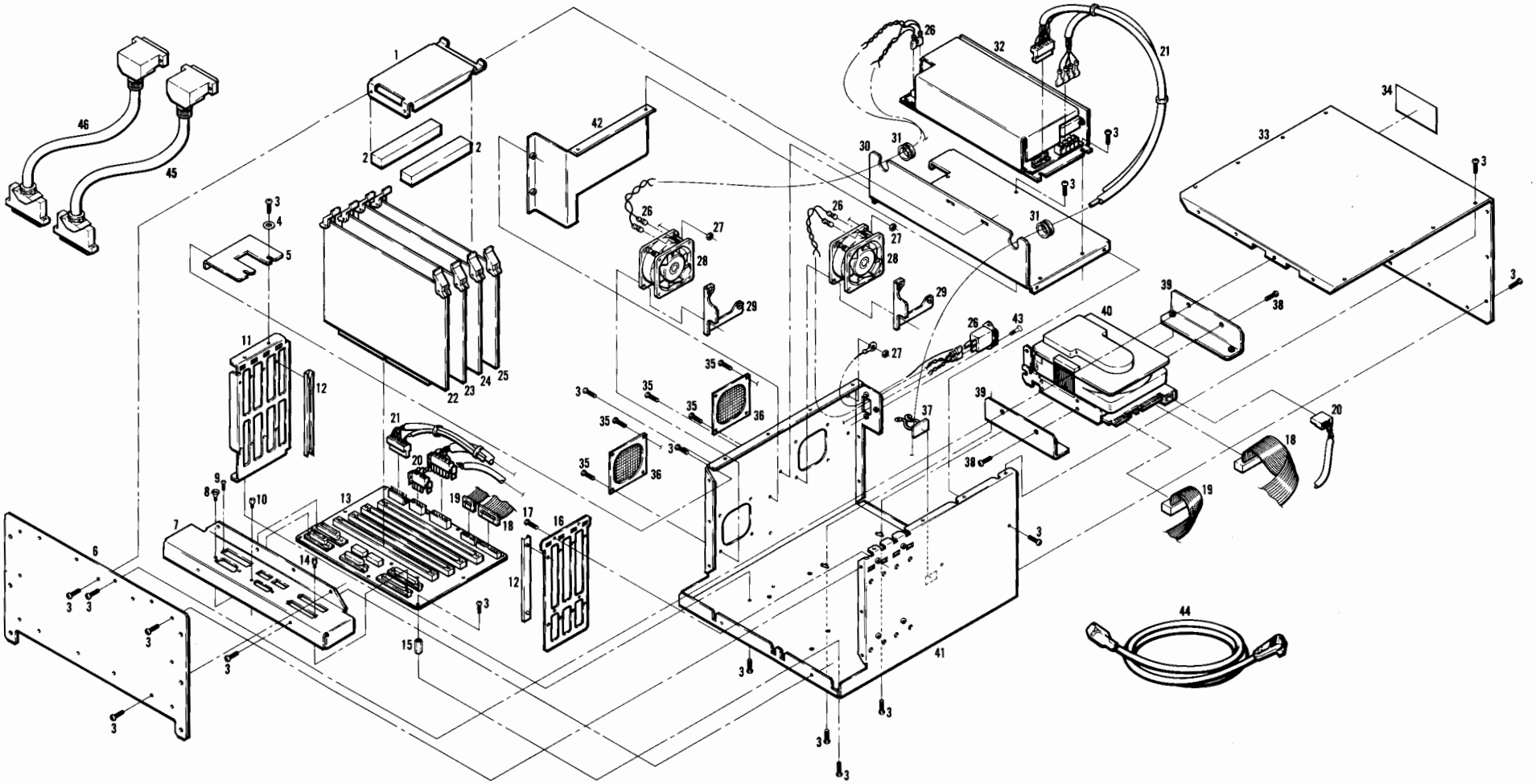


Figure 8-9. Vector-to-Raster Converter Assembly Illustrated Parts Breakdown

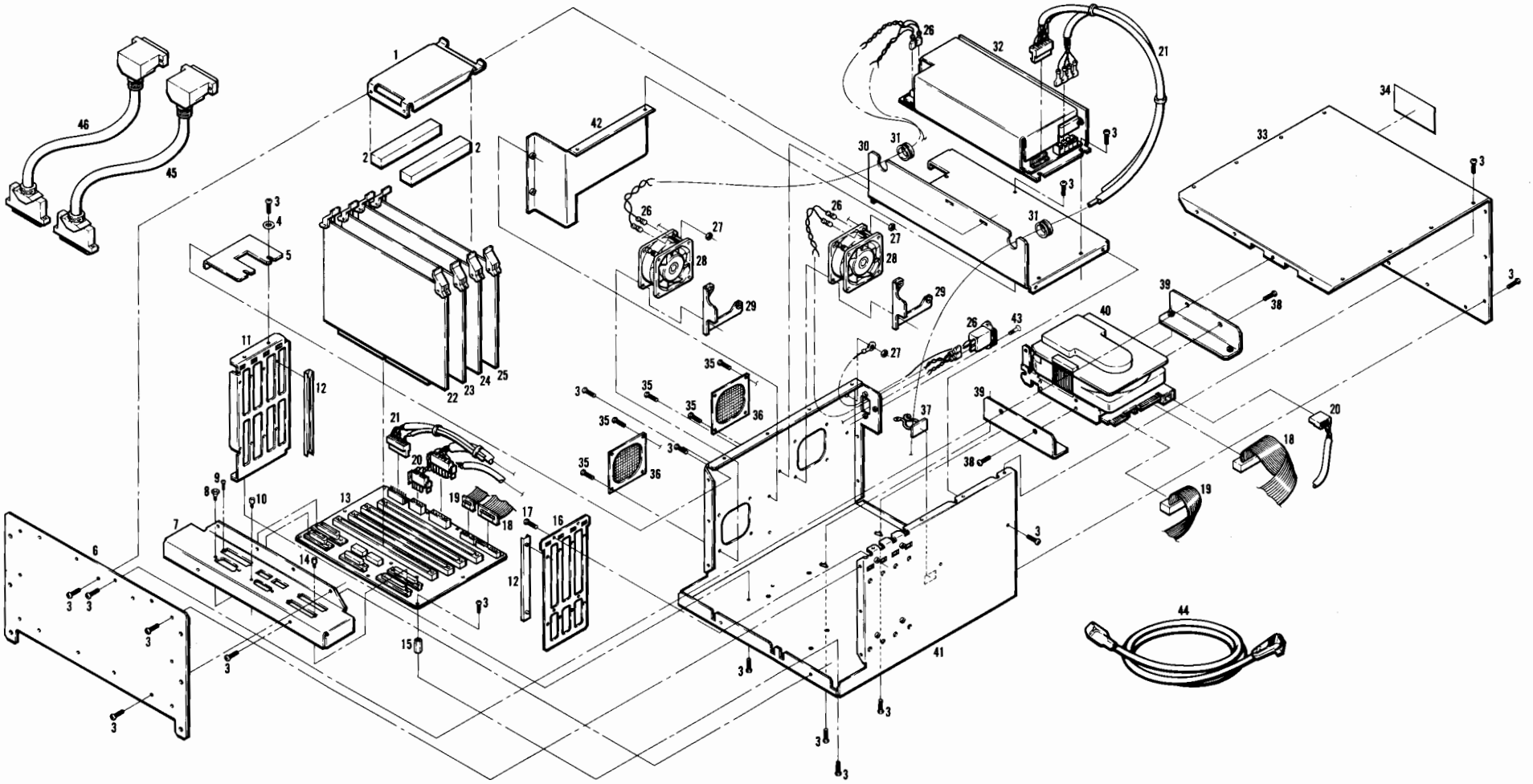


Figure 8-9. Vector-to-Raster Converter Assembly Illustrated Parts Breakdown

Table 8-10. Parts List, Exchange Assemblies (Model 240D/E)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
	C1600-69301	7	1	C1600-69301	7	1	PCA-PIN ELECTRODE DRIVER (PED)
	C1600-69302	8	1	C1600-69303	9	1	PCA-CONTROL ELECTRODE DRIVER (CED)
	C1600-69304	0	1	C1600-69305	1	1	PCA-RECORDING MECHANICAL CONTROL (RMC)
	C1600-69306	2	1	C1600-69306	2	1	PCA-MECHANICAL CONTROL DRIVER (MCD)
	C1600-69307	3	1	C1600-69308	4	1	WRITING HEAD
	C1600-69101	5	1	C1600-69101	5	1	PCA-PROCESSOR, VRC
	C1600-69103	7	1	C1600-69103	7	1	PCA-I/O DMA, VRC
	C1600-69104	8	1	C1600-69104	8	1	PCA-DISC CONTROL, VRC
	C1600-69107	1	1	C1600-69107	1	1	PCA-SWATH RAM, VRC
	0957-0033	8	1	0957-0033	8	1	DISC DRIVE, VRC

Table 8-11. Parts List, Frame Assembly 1

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X8SMWBNI	2	7	DXZP4X8SMWBNI	2	7	SCREW, P4 X 8 SMW BNI
2	TM-147-2	7	7	TM-147-2	7	7	WASHER-PLASTIC
3	K1310345-H-L1	7	1	K1310345-H-L1	7	1	COVER-LEFT SIDE (INCLUDES LABEL)
4	DXZP4X8SMW	7	49	DXZP4X8SMW	7	49	SCREW, P4 X 8 SMW
5	K4H10248	4	2	K4H10248	4	2	FG STRAP 8
6	DXZWC4B	6	3	DXZWC4B	6	3	WASHER-STAR, M4
7	DXZP3X10SMW	1	4	DXZP3X10SMW	1	4	SCREW, P3 X 10 SMW
8	DXZ1520	0	2	DXZ1520	0	2	CATCH-MAGNETIC
9	K3310685B	1	1	K3310685B	1	1	SUPPORT BAR-LEFT SIDE (B)
10	DXZ1H75	0	1	DXZ1H75	0	1	HOLDER-ROD
11	K1310265	7	1	K1310264	5	1	MAIN FRAME
12	K3310698	8	1	K3310698	8	1	PLATE-HARNESS
13	K3M10294	1	1	K3M10294	1	1	SWITCH-POWER
14	K4311295	7	1	K4311295	7	1	BRACKET-POWER SWITCH
15	K2310416	0	1	K2310416	0	1	COVER-MCD
16	K4311368	2	1	K4311368	2	1	BRACKET-INTERLOCK SWITCH
17	K3M10297	7	1	K3M10297	7	1	SWITCH-INTERLOCK
18	K3310684	9	1	K3310683	7	1	BAR-SUPPORT, REAR
19	SEE NOTES		1	SEE NOTES		1	BRACKET-MCD, UPPER
20	SEE NOTES		1	SEE NOTES		1	BRACKET-MCD, LOWER

Table 8-11. Parts List, Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	K3M10366	4	1	K3M10366	4	1	PCA-MECHANICAL CONTROL DRIVER (MCD)
22	DXZP3X6SMW	4	6	DXZP3X6SMW	4	6	SCREW, P3 X 6 SMW
23							COVER-REAR
.	K3310986	9	1	K3310987	1	1	U.S.A.
.	K3M10430	1	1	K3M10431	3	1	EUROPE
24	K4H10249	6	1	K4H10249	6	1	FG STRAP 9
25	K3310785	3	1	K3310785	3	1	PLATE-PRESSURE, FILTER
26	K4311421	6	1	K4311421	6	16	FILTER
27	TM-96-6	7	6	TM-96-6	7	6	CUSHION-RUBBER
28	K1310306-H	9	1	K1310307-H	1	1	SHIELD-FRONT, PCA
29							DELETED
30	0515-0780	6	86	0515-0780	6	86	SCREW-METRIC
31	N/A			N/A			VECTOR-TO-RASTER CONVERTER
32	DXZF3X8	8	8	DXZF3X8	8	8	SCREW, F3 X 8
33	DXZ1521	1	4	DXZ1521	1	4	CATCH, MAGNETIC
34	K4311423	0	2	K4311423	0	2	SPACER-DOOR LATCH
35							TEST PANEL ASSEMBLY (REFER TO TABLE 9-9.)
36	DXZ105-N	5	4	DXZ105-N	5	4	CASTER
37	SEE NOTES		16	SEE NOTES		16	SCREW ASSEMBLY
38	K4310103	1	4	K4310103	1	4	LEVEL
39	DXZB3X8	0	2	DXZB3X8	0	2	SCREW, B3 X 8

Table 8-11. Parts List, Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
40							RELAY
	K3M10368	8	1	K3M10369	0	1	U.S.A.
	K3M10368	8	1	K3M10369	0	1	EUROPE
41							DELETED
42	DXZP3X6SW	0	1	DXZP3X6SW	0	1	SCREW, P3 X 6 SW
43							RESISTOR
	K3M10267	4	1	K3M10267	4	1	U.S.A.
	K3M10369	0	1	K3M10369	0	1	EUROPE
44	MAS-1215-33	1	1	MZS-1215-33	1	1	FILTER-NOISE
45	K4310977	2	4	K4310977	2	4	CAP-INSULATION
46	DXZP4X35SW	4	2	DXZP4X35SW	4	2	SCREW, P4 X 35 SW
47	K3M10252	3	1	K3M10252	3	17	FAN 1
48	K3310685A	0	1	K3310685A	0	1	SUPPORT BAR-RIGHT SIDE (A)
49	K3310300A-H	2	1	K3310300A-H	2	1	COVER-RIGHT SIDE
50	8120-5118	5	1	8120-5118	5	1	AC POWER CORD (VRC TO PRINT ENGINE)
51	C1600-60005	0	1	C1601-60005	1	1	MEDIA DEFLECTOR
52	C1600-60001	6	1	C1600-60001	6	1	CABLE ASSEMBLY, CTRL IF
53	C1600-60230	3	1	C1600-60230	3	1	CABLE ASSEMBLY, VRC IF
54	K3310836	2	1	K3310836	2	1	PLATE-SHIELD

Table 8-11. Parts List, Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
55	MAS-1215-33	1	1	MAS-1215-33	1	1	FILTER-NOISE
56	DXZB4X8	1	4	DXZB4X8	1	4	SCREW, B4X8
							NOTES
							ITEMS 19 AND 20 ARE PART OF THE MCD PCA ASSEMBLY (ITEM 21).
							ITEM 37 INCLUDES PART NUMBERS DXZCS6X10, (SCREW, DXZWA6B (SPRING WASHER), AND DXZWG6 (FLAT WASHER).

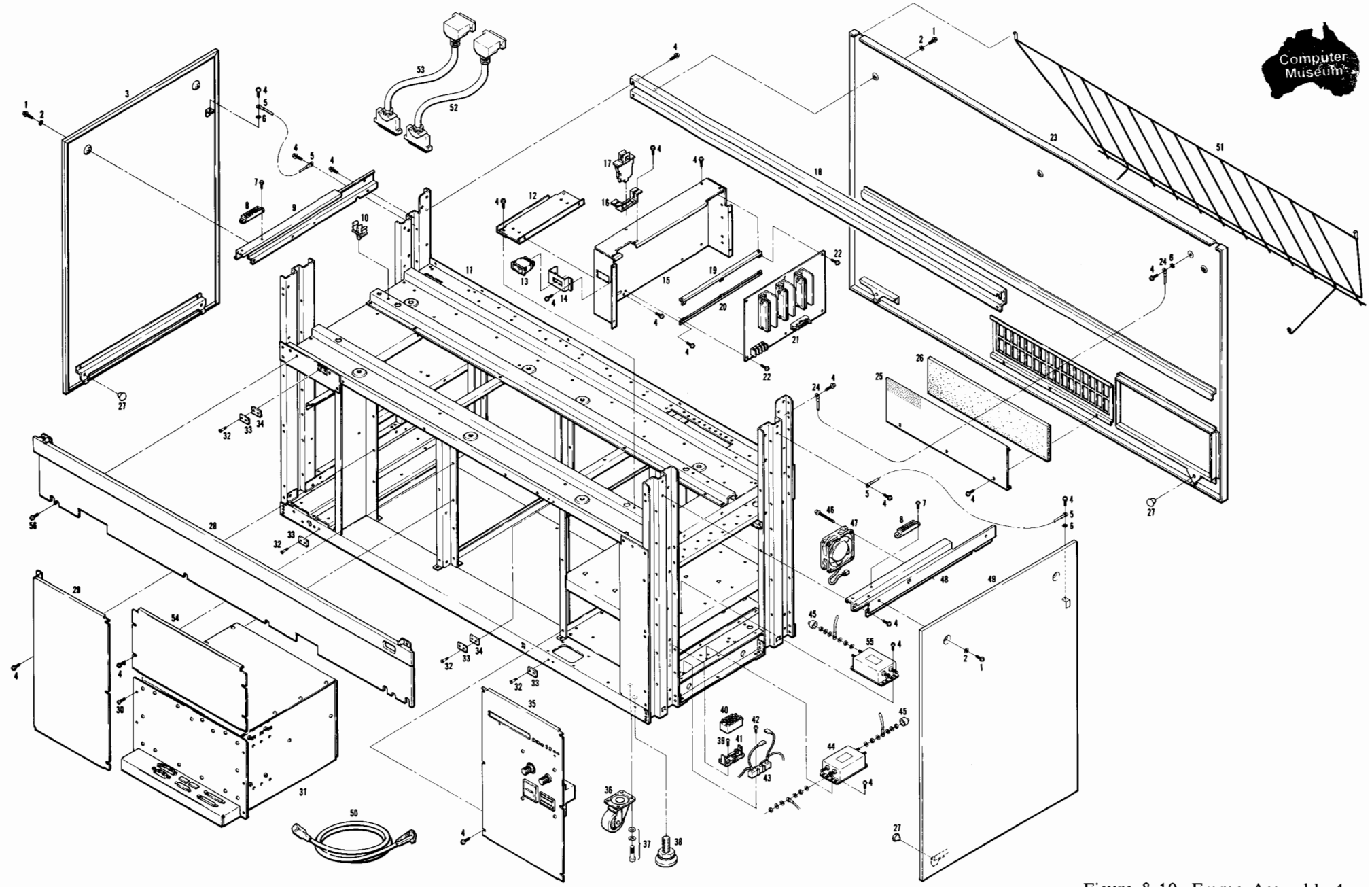


Figure 8-10. Frame Assembly 1
Illustrated Parts Breakdown

Table 8-12. Parts List, Frame Assembly 2

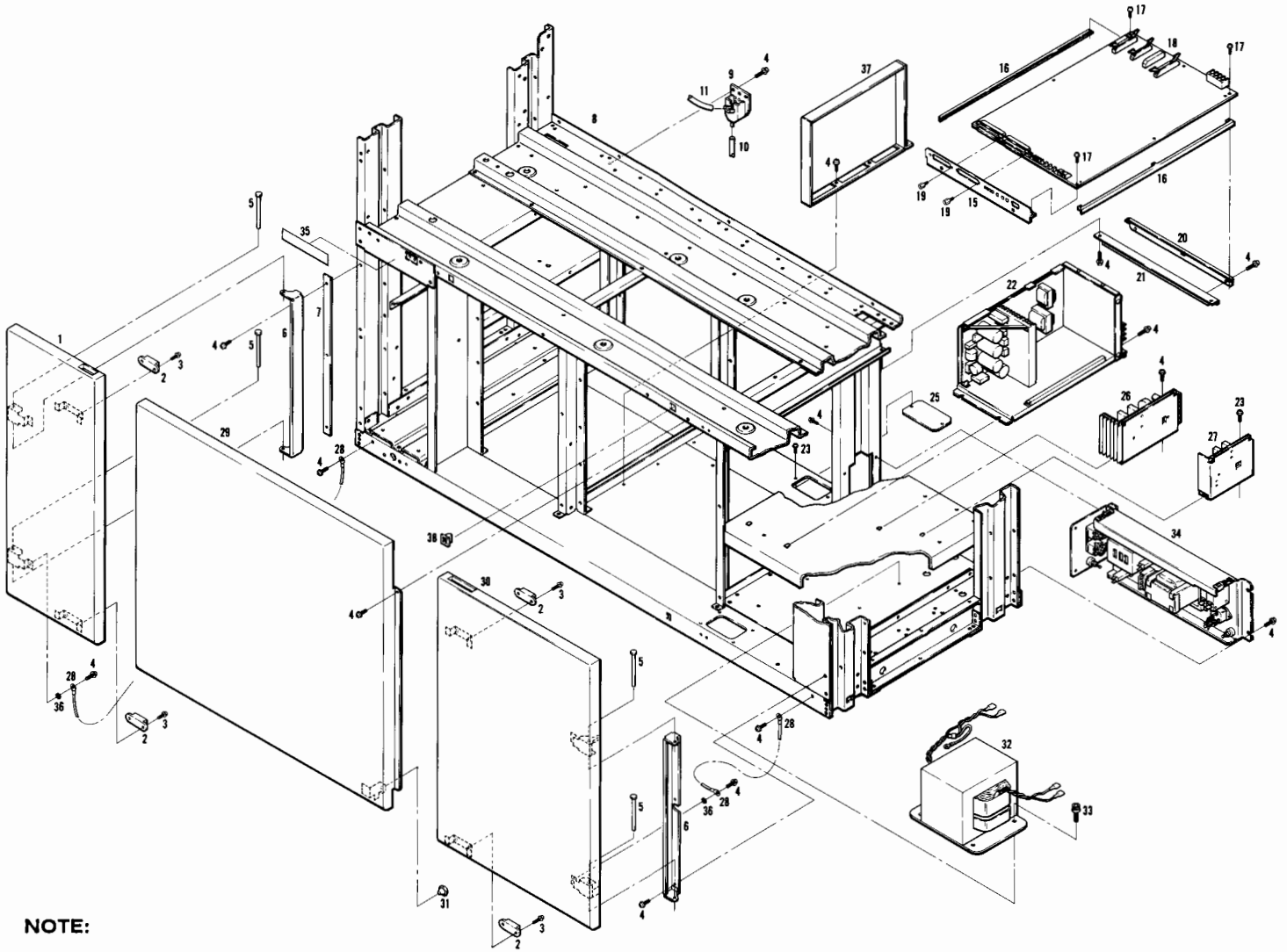
REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K1310305-H	9	1	K1310305-H	9	1	DOOR-TONER
2	DXZ1521	1	4	DXZ1521	1	4	CATCH-MAGNETIC
3	DXZP3X10SMW	1	8	DXZP3X10SMW	1	8	SCREW, P3 X 10 SMW
4	DXZP4X8SMW	7	20	DXZP4X8SMW	7	20	SCREW, P4 X 8 SMW
5	DXZB-99-3	3	4	DXZB-99-3	3	4	PIN-HINGE
	1304801-10050	9	4	1304801-10050	9	4	PIN SNAP (LOCKING)
6	K3310786	5	2	K3310786	5	2	BAR-HINGE
7	K4311422	8	1	K4311422	8	1	SPACER-HINGE BAR
8	K1310265	7	1	K1310264	5	1	MAIN FRAME
9	UH30-08	3	1	UH30-08	3	1	TUBE 4 (530 MM)
10	UH30-06	1	1	UH30-06	1	1	TUBE 2 (240 MM)
11	K4311455	7	1	K4311455	7	1	VENT-AIR
12	DXZGRM8	6	1	DXZGRM8	6	1	GRIP RING
13	K4311285	6	1	K4311285	6	1	COVER-AIR VENT
14	DXZB3X6TTB	7	3	DXZB3X6TTB	7	3	SCREW, P3 X 6 TTS
15	SEE NOTE	7	1	SEE NOTE	7	1	BRACKET-FRONT, RMC
16	SEE NOTE	9	2	SEE NOTE	9	2	BRACKET-SIDE, RMC
17	DXZP3X6SMW	4	12	DXZP3X6SMW	4	12	SCREW, P3 X 6 SMW
18	K3M10364	0	1	K3M10365	2	1	PCA-RECORDING MECHANICAL CONTROL (RMC)
19	SEE NOTE		4	SEE NOTE		4	STANDOFF-INTERFACE CONNECTOR
20	SEE NOTE	2	1	SEE NOTE	2	1	BRACKET-REAR, RMC

Table 8-12. Parts List, Frame Assembly 2 (Continued)

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
21	K3310687	5	1	K3310587	5	1	BAR-SUPPORT, RMC
22	K3M10249	6	1	K3M10249	6	1	HIGH VOLTAGE POWER SUPPLY UNIT E
23	DXZP3X8SMW	6	2	DXZP3X8SMW	6	2	SCREW, P3 X 8 SW
24	DXZP3X6SMW	4	4	DXZP3X6SMW	4	4	SCREW, P3 X 6 SMW
25							DELETED
26	K3M10250	9	1	K3M10250	9	1	LOW VOLTAGE POWER SUPPLY UNIT J (+5V)
27	K3M10251	1	1	K3M10251	1	1	LOW VOLTAGE POWER SUPPLY UNIT K (+24V)
28	K4H10248	4	2	K4H10248	4	2	FG STRAP 8
29	K2310475-H	0	1	K2310274-H	8	1	COVER-CENTER
30	K1310346-H	3	1	K1310346-H	3	1	DOOR-TEST PANEL
31	TM-96-6	7	2	TM-96-6	7	2	CUSHION-RUBBER
32	DXZ70743A	8	1	DXZ70743A	8	1	TRANSFORMER-MAIN, T1
33	DXZFSCS5X12	8	4	DXZFSCS5X12	8	4	SCREW, FSCS 5 X 12
34							PANEL ASSEMBLY-AC POWER (REFER TO TABLE 9-7.)
35	K3310661	1	1	K3310661	1	1	LABEL-CAUTION

Table 8-12. Parts List, Frame Assembly 2 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
36	DXZM4	9	2	DXZM4	9	2	WASHER-STAR, M4
37	K3210174	7	1	K3210174	7	1	BAFFLE, VRC
38	DXZTL-165	2	2	DXZTL-165	2	2	CATCH
							NOTE ITEMS 15, 16, 19, AND 20 ARE PART OF THE RMC PCA (ITEM 18).



NOTE:

ITEM 34 PART NUMBER IS FOR THE PANEL ONLY. SEE FIGURE 8-17 FOR DETAILED VIEW.

Figure 8-11. Frame Assembly 2
Illustrated Parts Breakdown

Table 8-13. Parts List, Frame Assembly 3

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
1	K3M10254	7	1	K3M10254	7	1	PUMP ASSEMBLY
2	UH30-08	3	1	UH30-08	3	1	TUBE 6 (650 MM)
3	UH30-08	3	2	UH30-08	3	2	TUBE 5 (630 MM)
4	DXZP4X18SMW	8	4	DXZP4X18SMW	8	4	SCREW, P4 X 18 SMW
5	DXZP4X10SMW	2	11	DXZP4X10SMW	2	11	SCREW, P4 X 10 SMW
6	K3310653	4	1	K3310654	4	1	PLATE-MOUNTING, PUMP
7	DXZQ-04	1	4	DXZQ-04	1	4	MOUNT-SOUND
8	DXZP3X6SMW	4	4	DXZP3X6SMW	4	4	SCREW, P3 X 6 SMW
9	K3310979	4	1	K3310980	7	1	LABEL
10	K3M10395	5	1	K3M10395	5	1	COVER, TOP
11	K4311561A	2	1	K4311561B	3	1	BRACKET, GUIDE PLATE LEFT
12	K2310556	6	1	K2310556	6	1	SHEET, CONTROL PANEL
13	K2310528	4	1	K2310528	4	1	PLATE, CONTROL PANEL
14	K4220070	1	1	K4220070	1	1	LIQUID CRYSTAL DISPLAY
15	DXZP2X5SW	8	4	DXZP2X5SW	8	4	SCREW P2X5SW
16	K3M10379	1	1	K3M10379	1	1	PCA, PANEL
17	DXZSQ-12	6	4	DXZSQ-12	6	4	SUPPORT, PCA
18	DXZP3X6SMW	4	6	DXZP3X6SMW	4	6	SCREW P3X6SMW
19	K3M10432	5	1	K3M10432	5	1	PCA FRONT PANEL CIRCUIT (FPC)
20	NA			NA			

Table 8-13. Parts List, Frame Assembly 3 (Continued)

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
21	K2310530	2	1	K2310530	2	1	BOTTOM COVER, CONTROL PANEL
22	K4311737	5	1	K4311737	5	1	PLATE, COVER
23	DXZ0085	0	2	DXZ0085	0	2	FASTENER, SNAP
24	DXZP4X8SMW	7	11	DXZP4X8SMW	7	11	SCREW P4X8SMW
25	RISC-10	1	1	RISC-10	1	1	FERRITE ASSEMBLY, FRONT PANEL
26	DXZP4X8SMW	7	14	DXZP4X8SMW	7	14	SCREW P4X8
27							CABLE STRAP
28	PH3-8-05	0	1	PH3-8-05	0	1	CABLE ASSEMBLY, FRONT PANEL
29	K4311420	4	1	K4311420	4	1	ACTUATOR, INTERLOCK
30	DXZP4X8TTS	6	1	DXZP4X8TTS	6	1	SCREW, P4 X8 TTS
31	K4H10251	1	1	K4H10251	1	1	FG STRAP
32	DXZF3X8	8	4	DXZF3X8	8	4	SCREW F3X8
33	DXZSSP-8	1	2	DXZSSP-8	1	4	PIN SNAP
34	DXZWE8	6	4	DXZWE8	6	4	WASHER
35	DXZP5X14SW	1	10	DXZ5X14SW	1	10	SCREW, P5 X 14 SW
36	K3M10290	3	1	K3M10359	9	2	DAMPER
37	K310251	4	1	K310251	4	1	PLATE-RUBBER
38	K4311190	5	1	K4311190	5	1	BRACKET-RUBBER PLATE
39	DXZP4X8SMW	7	4	DXZP4X8SMW	7	4	SCREW, P4 X 8 SMW
40							DELETED

Table 8-13. Parts List, Frame Assembly 3 (Continued)

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
41	DXZB4X6	9	8	DXZB4X6	9	8	SCREW, B4 X 6
42	TM-147-3	9	1	TM-147-3	9	1	WASHER-PLASTIC
43	KT-B1L20	3	1	KT-B1L20	3	1	KNOB-BOLT
44	DXZTL-11F	5	1	DXZTL-11F	5	1	LATCH-TANK
45	K2310401	9	1	K2310401	9	1	PLATE-SLIDE
46	DXZ330-12	6	2	DXZ330-12	6	2	SLIDE RAIL
47	K2310400	7	1	K2310400	7	1	TANK HOUSING
48	K4945002	4	1	K4945002	4	1	BOTTLE-TONER
49	DXZB3X6TTB	7	3	DXZB3X6TTB	7	3	SCREW, B3 X 6 TTB
50	K4311415	3	1	K4311415	3	1	SPLASH GUARD
51	K4311456	9	1	K4311456	9	1	SEAL-RUBBER
52	K4311712	3	1	K4311712	3	1	PICK-UP TUBE
53	K4311279	3	1	K4311279	3	1	SEAL-TEFLON
54	K4311286	8	1	K4311286	8	1	CAP-SYPHON
55	K3310652	2	1	K3310652	2	1	PLATE-PUMP SHIELDING
56	K4311282	0	1	K4311282	0	1	SPRING-SYPHON ASSEMBLY
57	K4311283	2	1	K4311283	2	1	HOLDER-SPRING
58	K3210168	4	1	K3210168	4	18	ARM-PIPE JOINT
59	TM-96-6	7	1	TM-96-6	7	1	CUSHION-RUBBER
60)			1			1	PLATE-MOUNTING, SSW3 (PART OF ITEM 25)

Table 8-13. Parts List, Frame Assembly 3 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
61	DXZP3X14SW	9	1	DXZP3X14SW	9	1	SCREW, P3 X 14 SW
62	K3M10299	1	1	K3M10299	1	1	SWITCH-SENSOR, TANK (SSW3)
63	DXZPOC8-01	5	3	DXZPOC8-01	5	3	TUBE JOINT 7
64	UH30-08	3	1	UH30-08	3	1	TUBE 4 (530 MM)
65	UH30-08	3	1	UH30-08	3	1	TUBE 7 (1200 MM)
66	DXZ1H75	0	2	DXZ1H75	0	2	HOLDER-ROD
67	K3310784A	0	1	K3310784B	1	1	BRACKET TOP COVER - LEFT
68	DXZWE8	6	6	DXZWE8	6	6	WASHER, HW8
69	DXZSTW-PM8X1	3	1	DXZSTW-PM8X1	3	1	WASHER, PLASTIC
70	K3310784A	0	1	K3310784B	1	1	BRACKET TOP COVER - RIGHT
71	K1310265	7	1	K1310264	5	1	FRAME-MAIN
72	C1625-20001	1	1	C1620-20001	6	1	GUIDE, MANUAL CUTTER
73	07596-60008	3	1	07596-60008	3	1	CUTTER, MANUAL
74	DXZ1520	0	2	DXZ1520	0	2	CATCH, MAGNETIC
75	0515-1597	5	2	0515-1597	5	2	SCREW
76	DXZFSN4	1	5	DXZFSN4	1	5	NUT, FSN4
77	K3M10360	2	1	K3M10360	2	1	CONTROL PANEL ASSEMBLY (INCLUDES ITEMS 12 - 23)
78	DXZWC4B	6	3	DXZWC4B	6	3	WASHER-STAR, M4

THE PARTS LIST FOR FRAME ASSEMBLY 3 IS ON THE FOUR PREVIOUS PAGES OF THIS HANDBOOK.

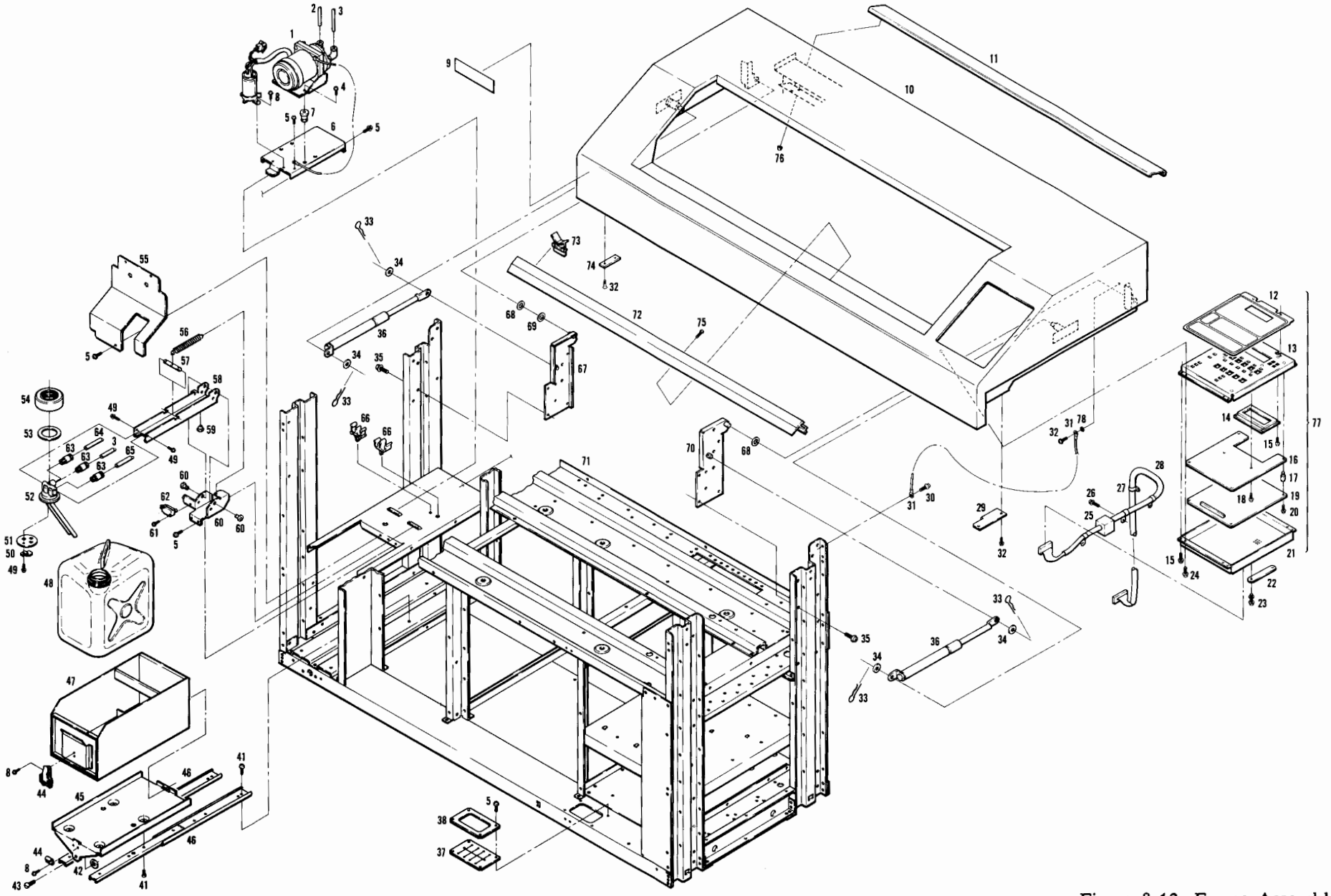


Figure 8-12. Frame Assembly 3
Illustrated Parts Breakdown

Table 8-14. Parts List, Upper Frame Assembly

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
1	DXZP4X10SMW	2	33	DXZP4X10SMW	2	33	SCREW, P4 X 10 SMW
2	DXZSN-4A	8	6	DXZSN-4A	8	6	CLAMP-NYLON
3	DXZJE-6	2	4	DXJE-6Z	2	4	E-RING, JE-6
4	DXZFSCS8X14	6	4	DXZFSCS8X14	6	4	SCREW, FSCS 8 X 14
5	DXZDM5-15R	0	4	DXZDM5-15R	0	4	SCREW (SAM)
6	DXZP5X14SW	1	4	DXZP5X14SW	1	4	SCREW, P5 X 14 SW
7	K3M10139	3	2	K3M10180	0	2	DAMPER
8	DXZN10	0	2	DXZN10	0	2	NUT, N10
9	DXZWA10B	4	2	DXZWA10B	4	2	WASHER-SPRING, S10
10	K4311260	4	2	K4311260	4	2	SPRING-PINCH ROLLER
11	K2210198B	5	1	K2210198B	5	1	PLATE, LEFT-SIDE
12	K4311249	0	2	K4311249	0	2	SHAFT-COUPLING
13	K4311265	4	2	K4311265	4	2	SHAFT-CONNECTOR
14	DXZSP4X36	5	2	DXZP4X36	5	2	PIN-SPRING, SP 4 X 36
15	K4311373	3	1	K4311261	6	1	SPRING-PAD
16	K4210144B	6	2	K4210144B	6	2	ARM-ROLLER (B)
17	K4311214A	6	4	K4311214A	6	4	SCREW-SUPPORT (A)
18	F-FLW688Z1/1K	2	4	F-FLW688Z1/1K	2	4	BEARING (CD 2)
19	K3M10298	9	2	K3M10298	9	2	SWITCH-SENSOR
20	DXZP2X10SMW	0	4	DXZP2X10SMW	0	40	SCREW, P2 X 10 SMW

Table 8-14. Parts List, Upper Frame Assembly (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	K4210143	4	2	K4210143	4	2	ARM-ROLLER SHAFT
22	K4311259	1	2	K4311259	1	2	SPRING-ROLLER ARM
23	K3310636	8	1	K3310619	2	2	SHAFT
24	K43112l4B	7	4	K43112l4B	7	4	SCREW-SUPPORT (B)
25	K3310639	4	1	K3310622	9	1	SHAFT-FEED ROLLER
26	DXZC-12	9	4	DXZC-12	9	4	C-RING, C-12
27	K4311250	3	2	K4311250	3	2	ROLLER-FEED
28	K42101444A	5	2	K42111444A	5	2	ARM-ROLLER (A)
29	K3M10372	7	1	K3M10373	9	1	PINCH ROLLER
30	K3310748	5	1	K3310730	8	1	PLATE-GUIDE
31	DXZP3X6SMW	4	4	DXZP3X6SMW	4	6	SCREW, P3 X 6 SMW
32	K3M10302	0	2	K3M10302	0	3	BRUSH-CONDUCTIVE
33	K3310632	0	1	K3310615	4	1	PLATE-MOUNTING, BRUSH
34	K3310633	2	1	K3310616	6	1	STAY
35	K3310640	7	1	K3310623	1	1	SHAFT-GUIDE
36	K3M10259	7	1	K3M10260	0	1	ROLLER-PAD
37	DXZWC3B	4	4	DXZWC3B	4	6	WASHER-STAR, M3
38	DXZWC4B	6	4	DXZWC4B	6	4	WASHER-STAR, M4
39	DXZSSK4X4	5	2	DXZSSK4X4	5	2	SCREW-SET, SSK 4 X 4
40	K4311371	9	1	K4311371	9	1	GEAR-PINCH ROLLER

Table 8-14. Parts List, Upper Frame Assembly (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
41	K4311262	8	1	K4311262	8	1	ACTUATOR-SWITCH
42	K3310618	0	1	K3310618	0	1	PLATE-MOUNTING, SWITCH
43	K3M10097	3	1	K3M10097	3	1	SWITCH-SENSOR, NO-PAPER (SSW4)
44	DXZP3X14SW	9	1	DXZP3X14SW	9	1	SCREW, P3 X 14 SW
45	K2H10032	3	1	K2H10032	3	1	HARNESS, NO-PAPER SWITCH
46	DXZ4035	8	48	DXZ4035	8	49	CLIP-WIRE
47	K2210198A	4	1	K2210198A	4	1	PLATE-RIGHT SIDE, UPPER FRAME
48	K4H10247	2	1	K4H10247	2	1	FG STRAP 7
49	K4311255	3	2	K4311255	3	2	STOPPER
50	DXZFSCS8X14	0	2	DXZFSCS8X14	0	2	SCREW, FSCS 8 X 14
51	K4311497	5	2	K4311497	5	2	SPACER
52	DXZB5X14TTB	4	4	DXZB5X14TTB	4	4	SCREW-B5X14TTB
53	DXZSN-6A	0	1	DXZSN-6A	0	1	CLAMP-NYLON
54	K3210224	4	1	K3210224	4	1	BRAKE

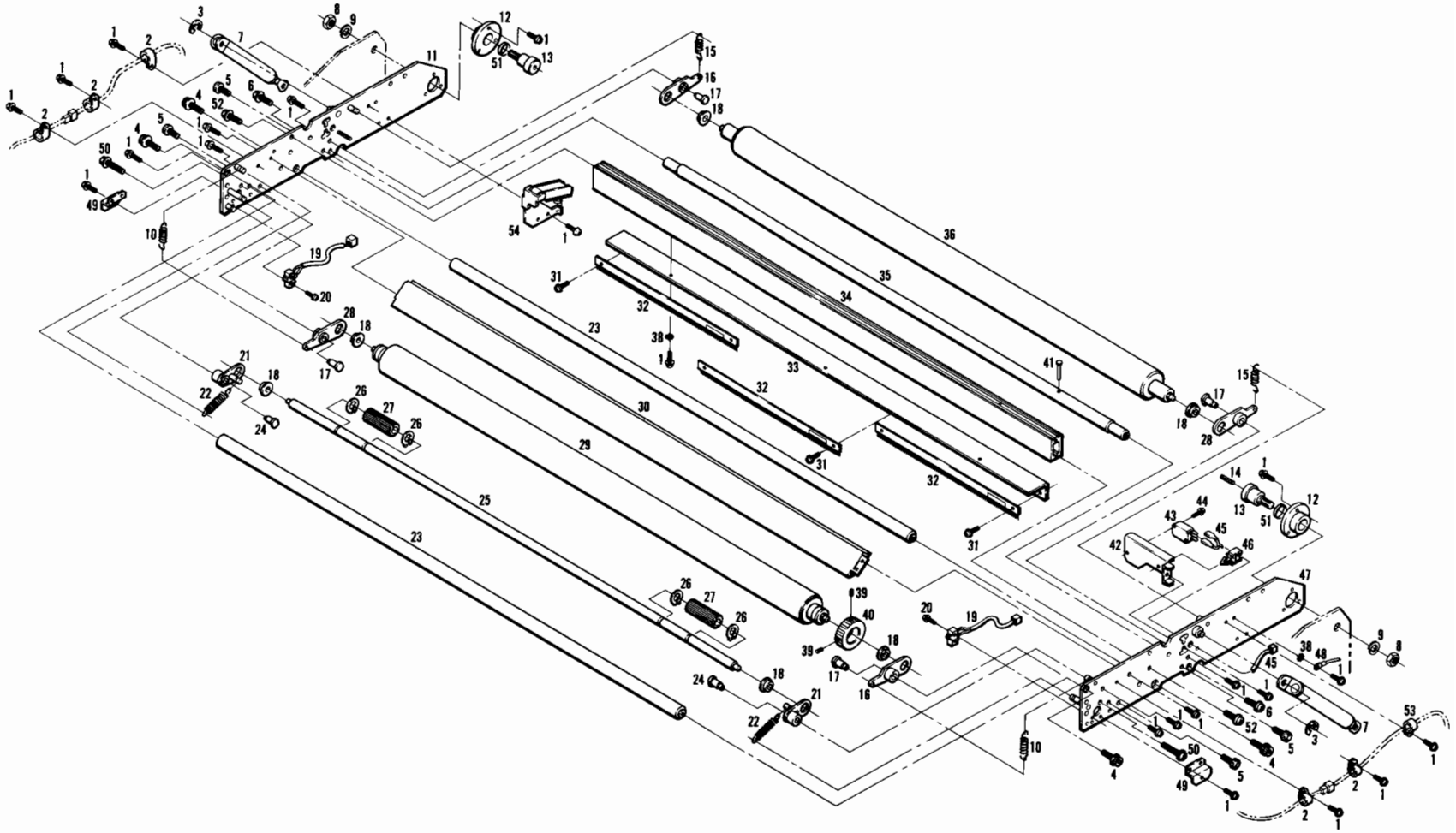


Figure 8-13. Upper Frame Assembly
Illustrated Parts Breakdown

Table 8-15. Parts List, Lower Frame Assembly 1

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	DXZPVU8	2	1	DXZPVU8	2	1	TUBE JOINT 6
2	UH30-08	3	1	UH30-08	3	1	TUBE 3 (45 MM)
3	DXZPMF8-01	9	1	DXZPMF8-01	9	1	TUBE JOINT 5
4	DXZFSCS6X10	8	2	DXZFSCS6X10	8	2	SCREW, FSCS 6 X 10
5	K3310613	0	1	K3310613	0	1	PLATE-MOUNTING, SOLENOID
6	DXZP4X10SMW	2	45	DXZP4X10SMW	2	49	SCREW, P4 X 10 SMW
7	DXZPL8-01	1	1	DXZPL8-01	1	1	TUBE JOINT 2 (SEE NOTES)
8	K3M10258	5	1	K3M10258	5	1	VALVE-SOLENOID (SEE NOTES)
9	DXZPL6-01	7	2	DXZPL6-01	7	2	TUBE JOINT 1 (SEE NOTES)
10	K3M10257	3	1	K3M10257	3	1	SWITCH-VACUUM
11	K3H10108	6	1	K3H10108	6	1	VSW STRAP
12	DXZSN-4A	8	2	DXZSN-4A	8	2	CLAMP-NYLON
13	DXZJE-6	2	4	DXZJE-6	2	4	E-RING, JE-6
14	K4311228	6	2	K4311228	6	2	BRACKET-DEVELOPER BLOCK
15	DXZP5X14SW	1	4	DXZP5X14SW	1	4	SCREW, P5 X 14 SW
16	K4311222	4	2	K4311222	4	2	CASE-BEARING
17	K2210193B	5	1	K2210193B	5	1	PLATE-LEFT SIDE
18	DXZP4X20SMW	3	4	DXZP4X20SMW	3	4	SCREW, P4 X 20 SMW
19	K4311229	8	2	K4311229	8	2	MOUNT-HEAD
20	K4311234	9	2	K4311234	9	2	PLATE-MEDIA SUPPORT

Table 8-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
21	DXZISTW-12	8	3	DXZISTW-12	8	3	RING, ISTW-12
22	K4311691	7	1	K4311691	7	1	WHEEL, MEDIA ALIGNMENT (SEE NOTES AT END OF THIS TABLE)
23	DXZCS4X14	8	3	DXZCS4X14	8	3	SCREW, CS 4 X 14
24	DXZWA4B	4	3	DXZWA4B	4	3	WASHER-SPRING, S4
25	SEE NOTES	5	1	SEE NOTES	5	1	SPOOL-LEFT
26	P-8000-051B	6	2	P-8000-051B	6	2	INSERT-BEARING
27	K3310627	9	1	K3310751	3	1	SHAFT-GUIDE
28	SEE NOTES	1	1	SEE NOTES	9	1	SHAFT-MEDIA
29	K3M10255	9	1	K3M10256	1	1	HEAD-WRITING
30	UH30-06	1	1	UH30-06	1	1	TUBE 1 (105 MM)
31	DXZSP3X15	8	2	DXZSP3X15	8	2	PIN-SPRING, SP 3 X 15
32	K4311416	5	2	K4311416	5	2	PLATE-ISOLATION, DEVELOPER
33	K4311227	4	2	K4311227	4	2	BLOCK-DEVELOPER
34	K2310471	6	1	K2310472	8	1	BAR-DEVELOPER
35	N/A			DXZ1257	0	1	CLIP-CANOE
36	N/A			K4311267	8	1	SUPPORTER-DEVELOPER
37	K3310625	5	1	K3310606	5	1	STAY #2
38	DXZFSCS4X8	3	2	DXZFSCS4X8	3	28	SCREW, FSCS 4 X 8
39	K4311231	3	1	K4311231	3	1	PLATE-CENTER, RECORDING HEAD
40	SEE NOTES	7	1	SEE NOTES	7	1	SPOOL-RIGHT
	NOTES ARE AT THE END OF THIS PARTS LIST						

Table 8-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
41	DXZP4X35SW	4	4	DXZPP4X35SW	4	4	SCREW, P4 X 35 SW
42	K3M10252	3	2	K3M10252	3	242	FAN 3, 4
43	K4210141B	0	1	K4210141B	9	0	LATCH-LIFT (B)
44	K4311239	9	2	K4311239	9	2	SPRING-LATCH
45	K4311214B	7	2	K4311214B	7	2	SCREW-SUPPORT (B)
46	DXZ4035	8	2	DXZ4035	8	2	CLIP-WIRE
47	6001ZZ	9	2	6001ZZ	9	2	BEARING-BALL
48	K3310631	8	1	K3310752	4	1	SHAFT-CAM
49	K3310630	6	1	K3310612	8	1	SHAFT-ROLLER
50	DXZJE-19	7	4	DXZJE-19	7	6	E-RING, JE-19
51	K4311654	9	2	K4311654	9	4	ROLLER
52	UH30-08	3	1	UH30-08	3	1	TUBE 8 (MODEL 250: 440 MM), (MODEL 255: 590 MM) (SEE NOTES)
53	DXZPB8-01	9	1	DXZPB8-01	9	1	TUBE JOINT 4 (SEE NOTES)
54	UH30-08	1	1	UH30-08	1	1	TUBE 9 (MODEL 250: 230 MM), (MODEL 255: 390 MM) (SEE NOTES)
55	DXZPL8-02	2	1	DXZPL8-02	2	1	TUBE JOINT 3 (SEE NOTES)
56	K4H10244	6	1	K4H10244	6	1	FG STRAP 4
57	N/A			K4311223	6	1	SUPPORT-CENTER (1)
58	N/A			K4311224	8	1	SUPPORT-CENTER (2)

Table 8-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
59	N/A			6804ZZ	1	1	BEARING ASSEMBLY
	N/A			K4311667	6	1	RING
	N/A			K4311668	8	1	PLATE
	N/A			DXZP3X6SW	0	1	SCREW, P3X6SW
60	N/A			K4311226	2	2	SHAFT-BEARING
61							NOT ASSIGNED
62	K2310393	0	1	K2310391	6	1	PLATE-FAN
63	SEE NOTES		4	SEE NOTES		4	SCREW-STEPPING MOTOR
64	SEE NOTES		1	SEE NOTES		1	FG STRAP 10
65	SEE NOTES		1	SEE NOTES		1	WASHER-STAR, M5
66	K3M10253	5	1	K3M10253	5	1	MOTOR-STEPPING ASSEMBLY (SEE NOTES)
67	SEE NOTES		2	SEE NOTES		2	MOUNT-MOTOR
68	K4210141A	5	1	K4210141A	5	1	LATCH-LIFT A
69	DXZJE-12	3	1	DXZJE-12	3	1	E-RING, JE-12
70	DXZSSK4X4	5	2	DXZSSK4X4	5	2	SCREW-SET, SSK 4 X 4
71	K4311413	9	1	K4311413	9	1	GEAR-ROLLER SHAFT
72	6001ZZ	9	2	6001ZZ	9	2	BEARING-BALL
73	K4311215	9	1	K4311215	9	1	LEVER-RELEASE
74	K2210193A	4	1	K2210193A	4	1	PLATE-RIGHT SIDE
75	DXZFSCS5X12	8	4	DXZFSCS5X12	8	4	SCREW, FSCS 5 X 12
				NOTES ARE AT THE END OF THIS PARTS LIST			

Table 8-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
76	K2310397	8	1	K2310396	6	1	SPRING-RELEASE LEVER
77	K4311220	0	1	K4311220	0	1	PULLEY-MOTOR
78	K4311219	7	1	K4311219	7	1	PULLEY-ROLLER
79	K3M10293	9	1	K3M10293	9	1	BELT-DRIVE MOTOR
80	K4H10247	2	1	K4H10247	2	1	FG STRAP 7
81	DXZWC4B	4	2	DXZWC4B	4	2	WASHER-STAR, M4
82	K4311270	5	2	K4311270	5	2	PLATE-ADJUSTMENT, RECORDING HEAD
83	SEE NOTES	9	1	SEE NOTES	9	1	WHEEL-MEDIA ALIGNMENT, RIGHT
84	SP4X24	4	1	SP4X24	4	1	PIN-SPRING
85	K4311251	5	2	K4311251	5	2	ROLLER-LATCH
86	DXZSPN-2.6	9	2	DXZSPN-2.6	9	2	NUT-PUSH
87	DXZM-3321	1	1	DXZM-3321	1	1	COVER-VACUUM SWITCH
88				K4311493	7	1	SPACER-DEVELOPER
89				DXZF4X10	4	1	SCREW F4X10
90	DXZB4X8CR	6	4	DXZB4X8CR	6	4	SCREW-B4X8CR
91	DXZP4X30SMW	4	2	DXZP4X30SMW	4	2	SCREW-P4X30SMW
92	DXZSN-6A	0	2	DXZSN-6A	0	2	CLAMP-NYLON
				NOTES ARE AT THE END OF THIS PARTS LIST			

Table 8-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
							NOTES
	K3M10370	3	1	K3M10371	5	1	ITEMS 22, 25, 28, 40, AND 83, ARE PART OF THE SPOOL ASSEMBLY AND CAN BE ORDERED AS AN ASSEMBLY USING THE PART NUMBERS LISTED TO THE LEFT.
							ITEMS 7 AND 9 ARE SUPPLIED AS PART OF THE SOLENOID VALVE ASSEMBLY (ITEM 8).
	K3M10287	6	1	K3M10288	8	1	ITEMS 9, 52, 53, 54, AND 55 MAY BE ORDERED AS A KIT USING THE PART NUMBERS LISTED TO THE LEFT.

Table 8-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
							NOTES (CONTINUED)
	K3M10253	5	1	K3M10253	5	1	ITEMS 63, 64, 65, 66, AND 67 ARE SUPPLIED AS AN ASSEMBLY USING THE PART NUMBERS K3M10253.
	K3M10287	6	1	K3M10288	8	1	ITEMS 9, 18, 32, 33, 34, 52, 53, 54, & 55 ARE PART OF THE DEVELPER BAR ASSEMBLY (ITEM 34).

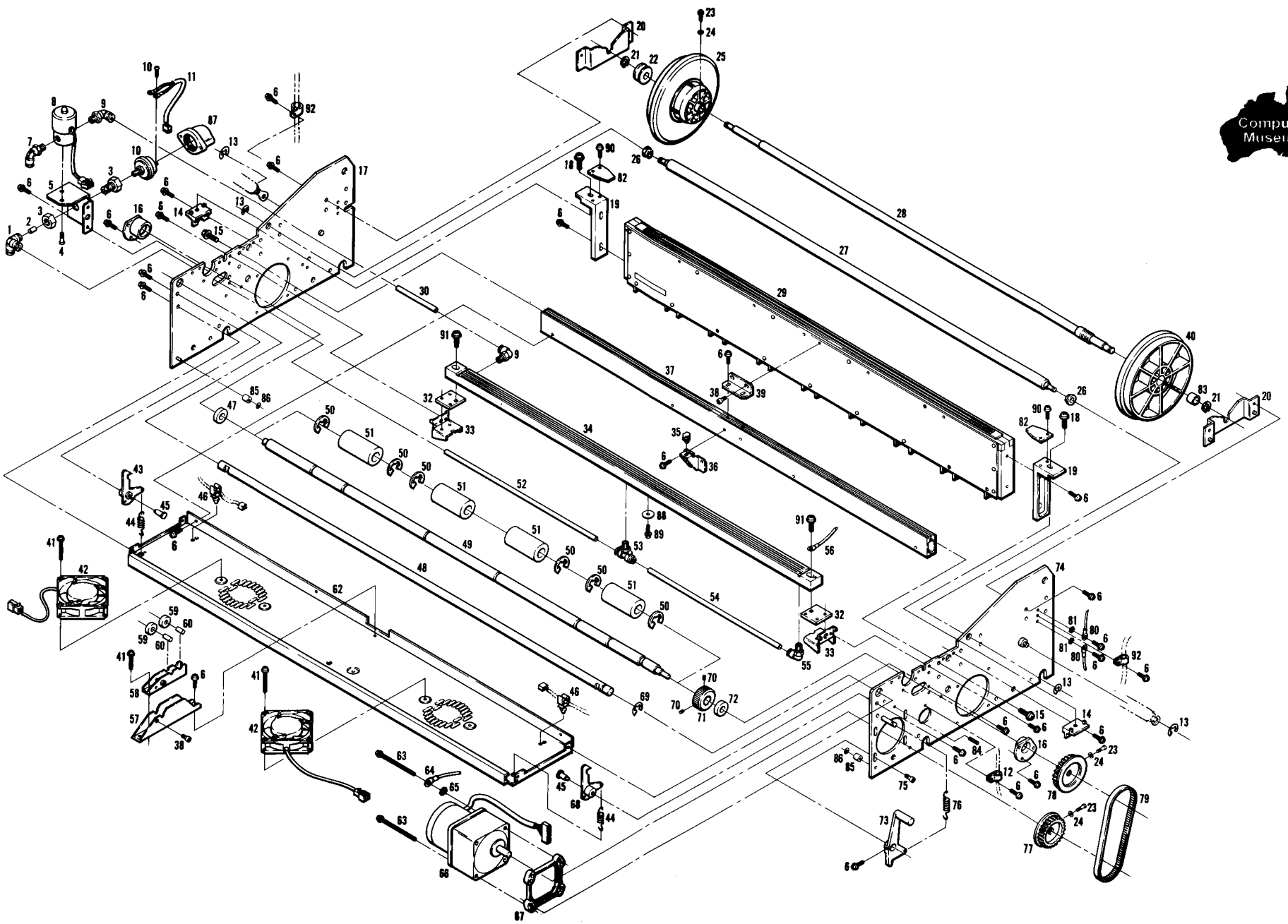


Figure 8-14. Lower Frame Assembly 1
Illustrated Parts Breakdown

Table 8-16. Parts List, Lower Frame Assembly 2

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X35SW	4	4	DXZP4X35SW	4	4	SCREW, P4 X 35 SW
2	DXZPG-36	7	2	DXZPG-36	7	2	GUARD-FAN
3	K3M10252	3	2	K3M10252	3	2	FAN 1, 2
4	DXZN08	5	4	DXZN08	5	4	NUT
5	DXZWA8B	2	4	DXZWA8B	2	4	WASHER-SPRING
6	DXZWG8	6	4	DXZWG8	6	4	WASHER-FLAT
7	DXZP5X14SW	1	20	DXZP5X14SW	1	20	SCREW, P5 X 14 SW
8	K4311211	1	4	K4311211	1	4	BRACKET-ANGLE
9	EA2003	3	2	EA2003	3	2	SPACER
10	K4311235	1	1	K4311235	1	1	PLATE-MOUNTING, SENSOR
11	K4311241	4	1	K4311241	4	1	SPRING-ACTUATOR
12	K4311448	2	1	K4311448	2	12	SPACER-SENSOR
13	K3M10300	6	1	K3M10300	6	1	SWITCH-SENSOR, NEAR END OF PAPER (SSW5)
14	DXZP3X6SW	0	4	DXZP3X6SW	0	4	SCREW, P3 X 6 SW
15	K2210193B	5	1	K2210193B	5	1	PLATE-LEFT SIDE
16	K4311244	0	1	K4311244	0	1	BRAKE-RUBBER
17	OPL0.3-12	8	1	OPL0.3-12	8	1	LIMITER-TORQUE
18	K4311245	2	1	K4311245	2	1	LIMITER-SPRING
19	DXZP4X10SMW	2	15	DXZP4X10SMW	2	15	SCREW, P4 X 10 SMW
20	K4311232	5	1	K4311232	5	1	ACTUATOR-MEDIA

Table 8-16. Parts List, Lower Frame Assembly 2 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	DXZJE-6	2	2	DXZJE-6	2	2	E-RING, JE-6
22	P-8000-051B	6	2	P-8000-051B	6	2	INSERT-BEARING
23	K4311216	1	1	K4311216	1	1	PLATE-MOUNTING, SENSOR
24	K4311236	3	1	K4311236	3	14	PLATE-SENSING, MEDIA
25	K4311237	5	1	K4311237	5	1	SHAFT-ACTUATOR
26	K2310403	3	1	K2310402	1	1	SHIELD-REAR, PCA
27	K3310624	3	2	K3310605	3	2	STAY #1
28	K2310394	2	1	K2310392	8	1	BOX-MEDIA
29	K2310451	4	1	K2310450	2	1	PLATE-COVER
30	K3310799	2	1	K3310799	2	1	LABEL-CAUTION
31	K3M10244	6	2	K3M10245	8	2	PCA-CONTROL ELECTRODE DRIVER (CED)
32	K3M10243	4	1	K3M10243	4	2	PCA-PIN ELECTRODE DRIVER (PED)
33	K2310397	8	1	K2310396	6	1	PLATE-BASE
34	DXZFSCS6X10	8	5	DXZFSCS6X10	8	5	SCREW, FSCS6 X 10
35	N/A			N/A			FRAME-MAIN
36	K2210193A	4	1	K2210193A	4	1	PLATE-RIGHT SIDE
37				DXZWG10	0	2	WASHER
38	DXZB5X14TTB	4	4	DXZB5X14TTB	4	4	SCREW
39	K3M10301	8	1	K3M10301	8	1	SWITCH-SENSOR, NEAR END OF PAPER (SSW6)

THE PARTS LIST FOR LOWER FRAME ASSEMBLY 2 IS ON THE TWO PREVIOUS PAGES OF THIS HANDBOOK.

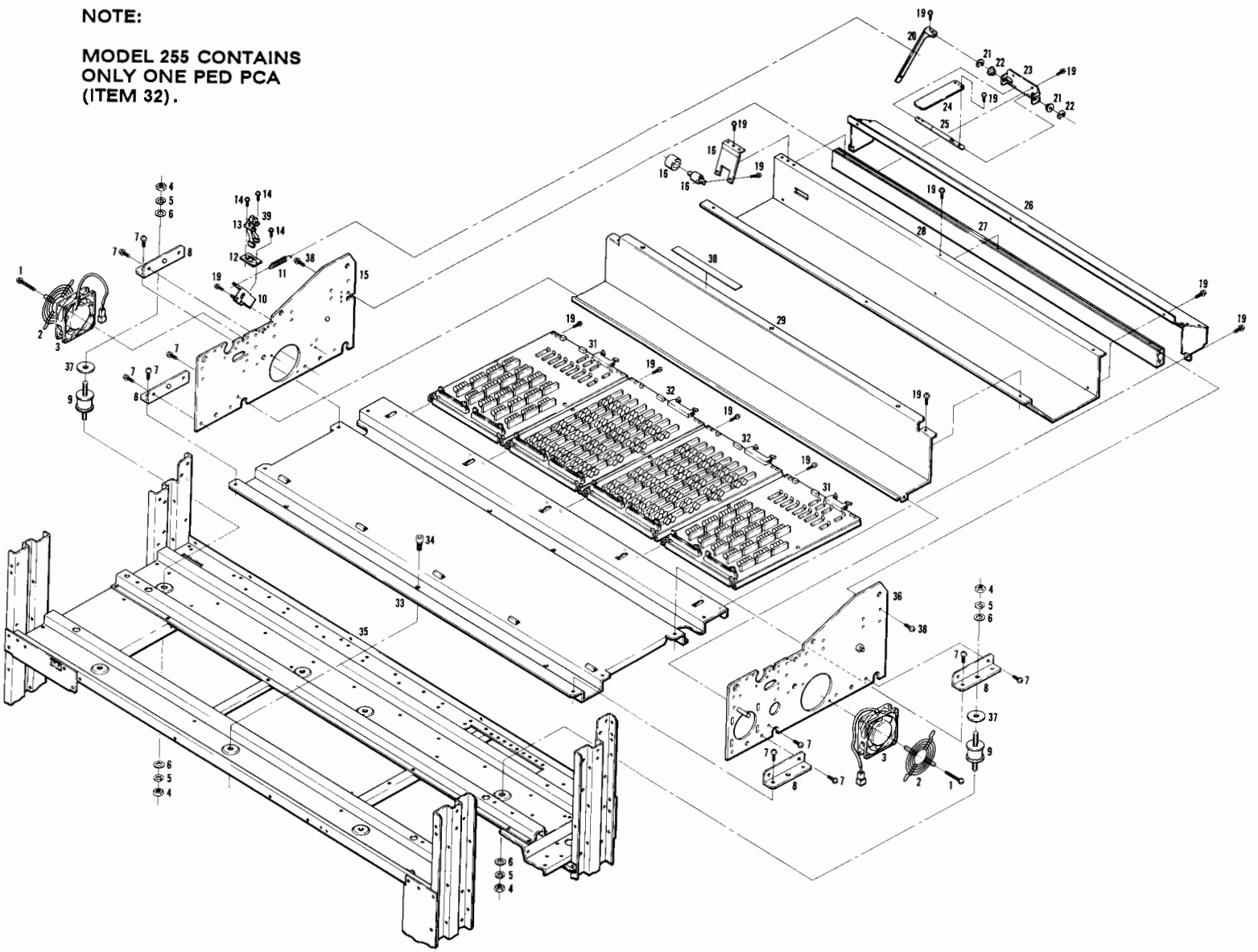
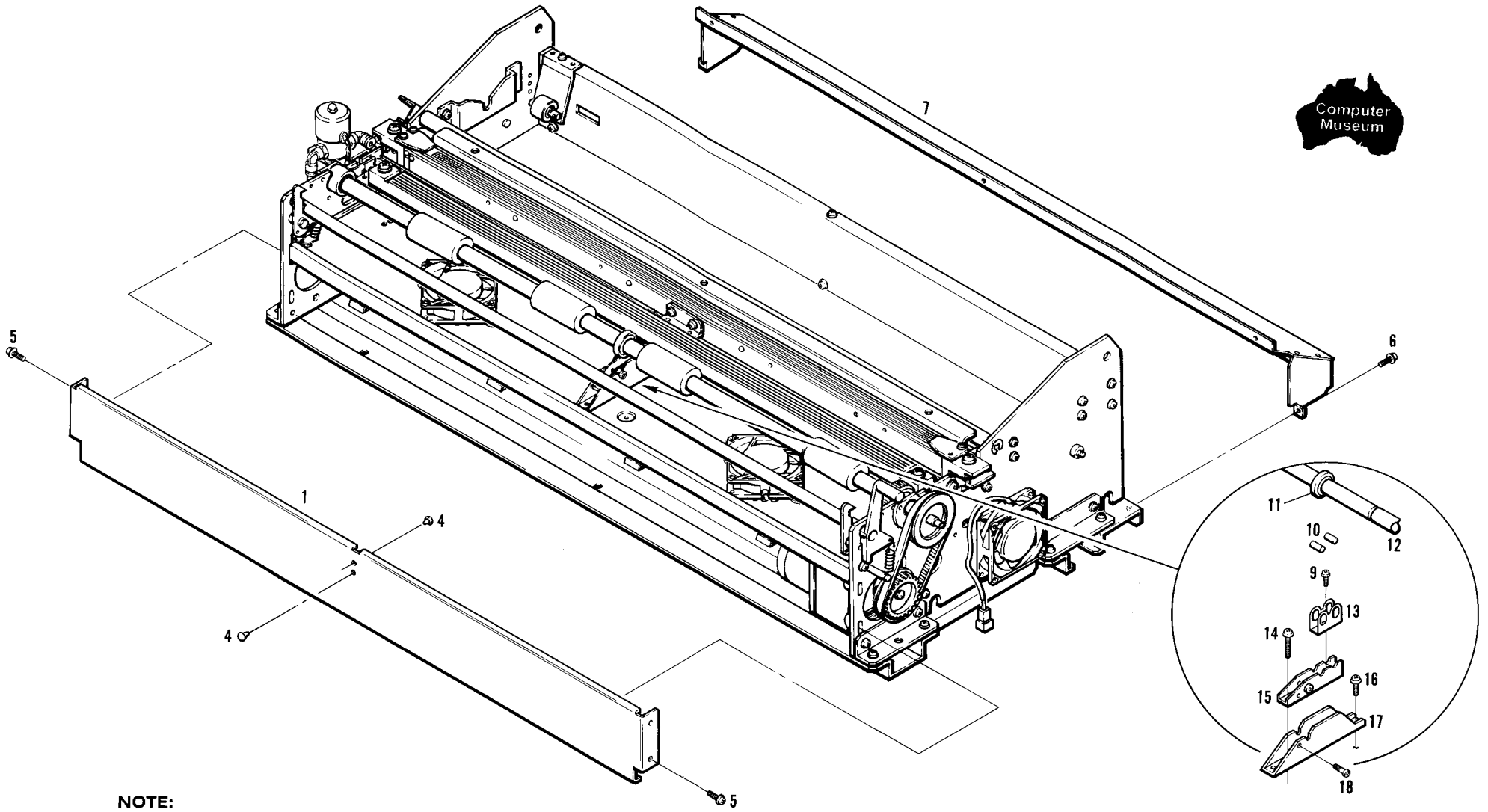


Figure 8-15. Lower Frame Assembly 2
Illustrated Parts Breakdown

Table 8-17. Parts List, Lower Frame Assembly (Model 250/255 Differences)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K3210266A	1	1	K3210266B	2	1	PLATE, FRONT SHIELD (EUROPE ONLY)
2							DELETED
3							DELETED
4				TM-96-2	3	2	CUSHION, RUBBER
5	DXZFSCS5X12	8	2	DXZFSCS5X12	8	2	SCREW FSCS5X12
6	DXZP4X8SMW	7	4	DXZP4X8SMW	7	4	SCREW P4X8SMW
7							SHIELD REAR PCA
	K2310403	3	1	K2310402	1	1	U.S.A.
	K3210230A	6	1	K3210230B	7	1	EUROPE
8							DELETED
9				DXZP3X6SW	0	1	SCREW P3X6SW
10				K4311226	2	2	PIN
11				FLW688ZZ	5	1	BEARING
12	K3310630	6	1	K3310612	8	1	SHAFT, ROLLER
13				K4311668	8	1	RETAINER
14				K4311668	8	1	SCREW
15				K4311224	8	1	SUPPORT
16				DXZP4X10SMW	2	2	SCREW P4X10SMW
17				K4311223	6	1	BASE, SUPPORT
18				DXZFSCS 4X8	3	1	SCREW FSCS 4X8



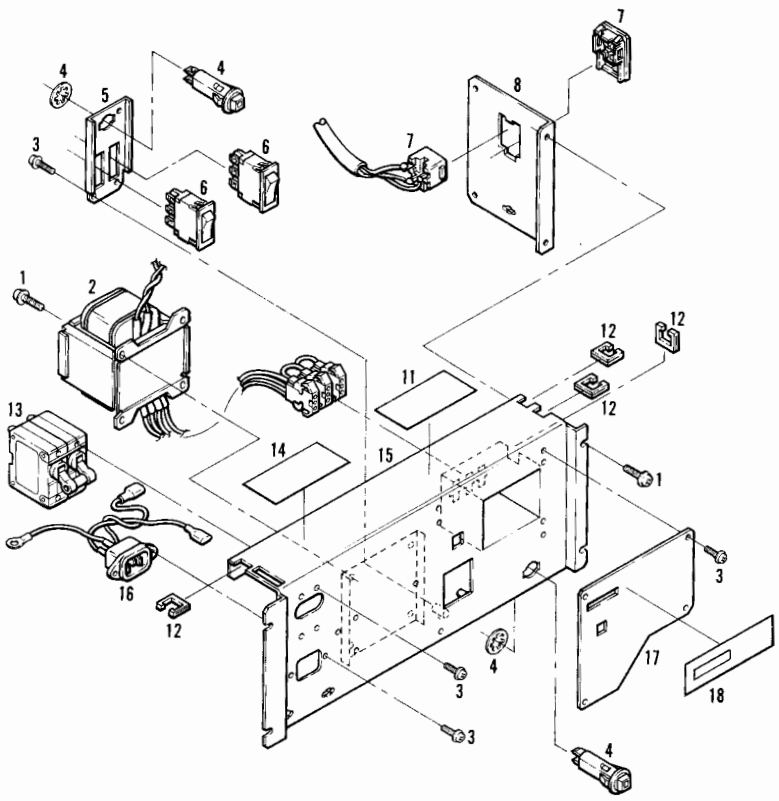
NOTE:

SEE ALSO FIGURE 8-15.

Figure 8-16. Lower Frame Assembly
(Model 250/255 Differences)
Illustrated Parts Breakdown

Table 8-18. Parts List, Power Panel Assembly

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X8SMW	7	8	DXZP4X8SMW	7	8	SCREW, P4 X 8 SMW
2	DXZ70888	5	1	DXZ70888	5	1	TRANSFORMER-PUMP, T2
3	DXZP3X6SW	0	14	DXZP3X6SW	0	14	SCREW, P3 X 6 SW
4	NRF110-8A	9	2	NRF110-8A	9	2	CIRCUIT BREAKER
5	K4311299	5	1	K4311299	5	1	SWITCH PLATE-AC PANEL
6	AJ921100R3	8	2	AJ921100R3	8	2	SWITCH-VOLTAGE SETTING
7	WCF1051B	9	1	WCF1051B	9	1	HARNESS-AC
8	K2310586-L1	2	1	K2310586-L1	2	1	AC OUTLET, PANEL
9	T-6500-16-BK	1	3	T-6500-16-BK	1	3	TERMINAL
10	DXZWA5B	6	6	DXZWA5B	6	6	WASHER-SPRING, S5
11	K3310800	7	1	K3310800	7	1	LABEL-POWER UNIT CONNECTION
12	DXZEDS-1	1	4	DXZEDS-1	1	4	EDGE SADDLE
13	NRLR2100-15-AA	1	1	NRLR2100-15-AA	1	1	CIRCUIT BREAKER, CB1
14	K4311447	0	1	K4311447	0	1	LABEL-WARNING
15	K2310586-L1	2	1	K2310586-L1	2	1	PANEL-POWER (INCLUDES LABEL)
16	K4210196	5	1	K4210196	5	1	INLET-AC
17	K3311057-L1	4	1	K3311057-L1	4	1	COVER-VOLTAGE SWITCH (INCLUDES LABEL)
18	K4311482	4	1	K4311482	4	1	LABEL-VOLTAGE



NOTE:

VIEW ROTATED 90 DEGREES FROM FIGURE 8-11.

Figure 8-17. Power Panel Assembly Illustrated Parts Breakdown

7600-A-107-3R

Table 8-19. Parts List, Test Panel Assembly

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K2310489	3	1	K2310489	3	1	TEST PANEL
2	DXZP3X8SMW	6	4	DXZP3X8SMW	6	4	SCREW, P3 X 8 SMW
3	K-11-20KNURL	0	2	K-11-20KNURL	0	2	KNOB-CONTROL
4	K4210199	1	1	K4210199	1	1	CONTROL-VOLUME, RV1
5	ARA25	9	1	ARA25	9	1	SWITCH-ROTARY, RSW1
6	K3310755	0	1	K3310755	0	1	PLATE-MOUNTING, VOLUME
7	DXZP3X6SW	0	2	DXZP3X6SW	0	2	SCREW, P3 X 6 SW
8	TH-147U	9	1	TH-147U	9	1	METER-HOUR, HM1
9	K4210249	8	1	K4210249	8	1	COUNTER-MAGNETIC, MC1
10	DXZSSK4X4	5	2	DXZSSK4X4	5	2	SCREW-SET SSK4X4

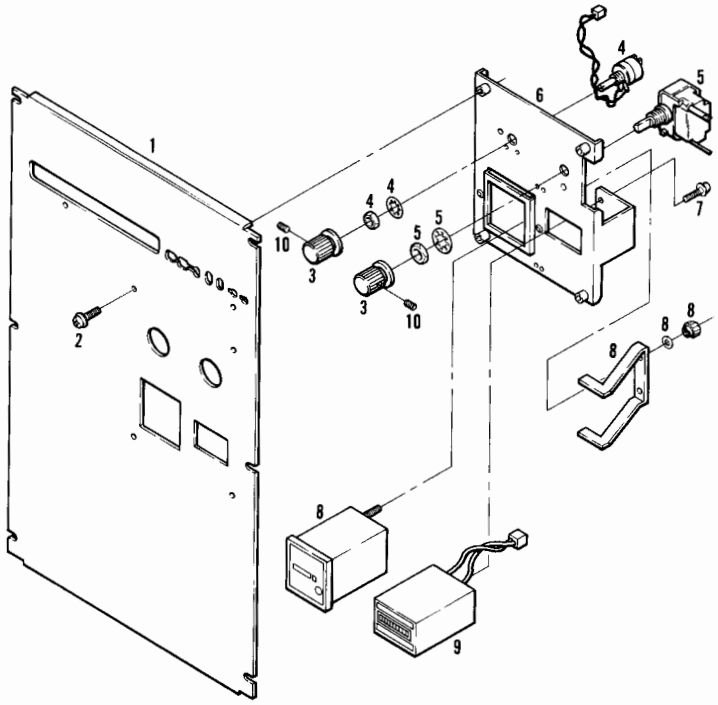


Figure 8-18. Test Panel Assembly
Illustrated Parts Breakdown

7600-A-108-2

Table 8-20. Parts List, Power Unit

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1					6	1	POWER SUPPLY, HIGH VOLTAGE (HPS 1)
	K3M10249	6	1	K3M10249			U.S.A
	K3M10361	4	1	K3M10361	4	1	EUROPE
2							POWER SUPPLY, LOW VOLTAGE (+24V) (LPS 2)
	K3M10251	1	1	K3M10251	1	1	U.S.A.
	K3M10363	8	1	K3M10363	8	1	EUROPE
3							POWER SUPPLY, LOW VOLTAGE (+5V) (LPS 1)
	K3M10250	9	1	K3M10250	9	1	U.S.A.
	K3M10362	6	1	K3M10362	6	1	EUROPE
4	MAS-1215-33	1	1	MAS-1215-33	1	1	FILTER (NF2)
5	K3310968	1	2	K3310968	1	2	PLATE, MOUNTING (EUROPE ONLY)
6	DXZP4X8SMW	7	10	DXZP4X8SMW	7	10	SCREW P4X8SMW
7	DXZP3X8SMW	6	1	DXZP3X8SMW	6	1	SCREW P3X8SMW
8	K2310563	1	1	K2310563	1	1	SHIELD, REAR (EUROPE ONLY)
9	DXZP4X8SMW	7	4	DXZP4X8SMW	7	4	SCREW P4X8SMW (EUROPE ONLY)

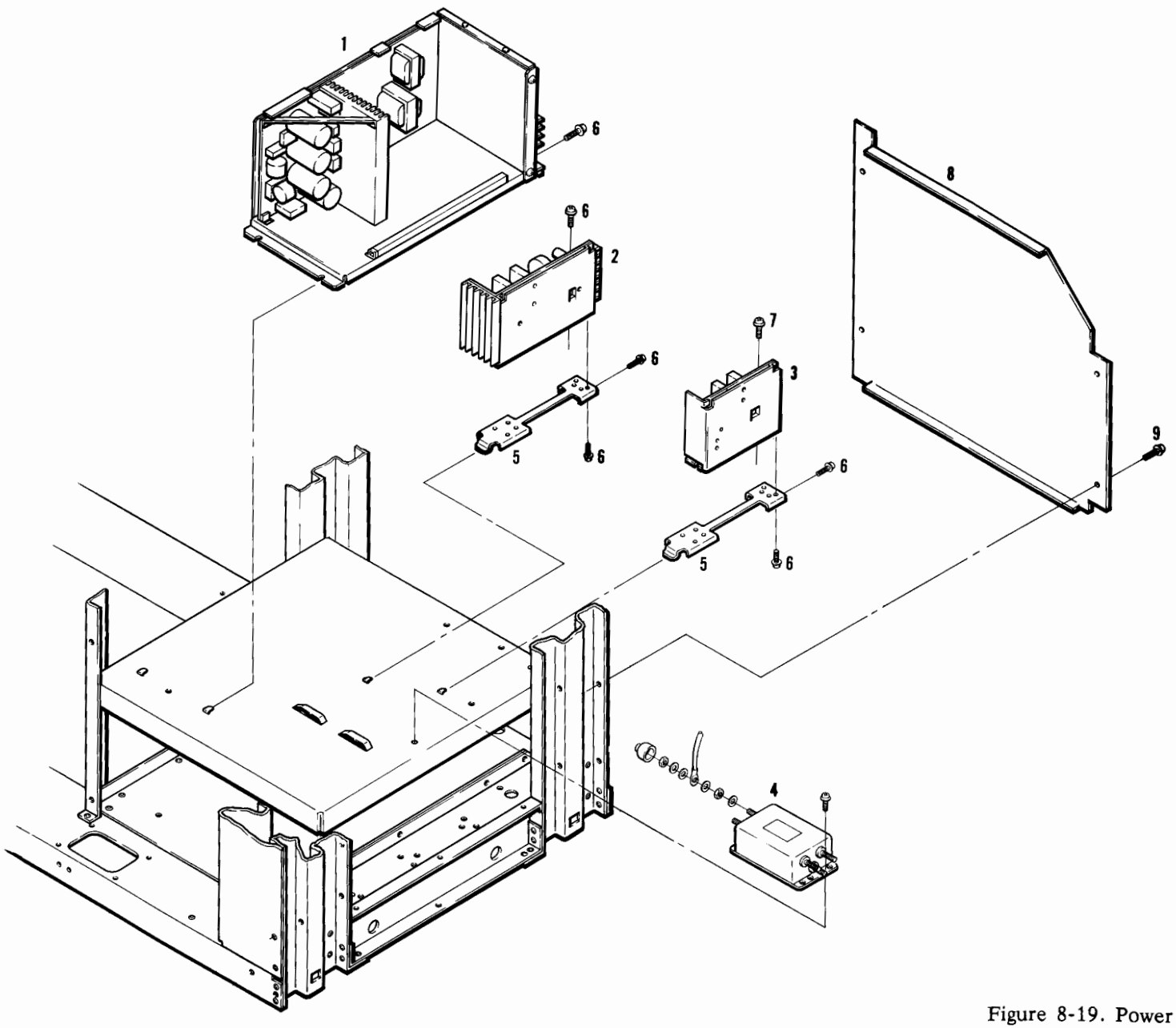


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Figure 8-19. Power Units
Illustrated Parts Breakdown

Table 8-21. Parts List, Take-Up Reel

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K2310555B	4	1	K2310555B	4	1	PLATE, SIDE-LEFT
2	K3310940	3	2	K3310940	3	2	PLATE, ANGLE
3	DXZP4X8SMW	7	28	DXZP4X8SMW	7	28	SCREW P4X8SMW
4							DELETED
5	DXZFSCS8X14	6	2	DXZFSCS8X14	6	2	SCREW FSCS 8X14
6	DXZSTW10	1	1	DXZSTW10	1	1	RING, RETAINER
7	K4311684	2	1	K4311684	2	1	SLEEVE-LEFT
8	K4311687	8	1	K4311687	8	1	PLATE, SLEEVE
9	DXZF3X8	8	3	DXZF3X8	8	3	SCREW F3X8
10	K4311686	6	1	K4311686	6	1	SPRING
11	K4311685	4	1	K4311685	4	1	SHAFT, IDLER
12	K4311683	0	1	K4311683	0	1	HUB- LEFT
13	R2280ZZ	6	4	R2280ZZ	6	4	BEARING
14	DXZSTW8	6	1	DXZSTW8	6	1	RING, RETAINER
15	K3M10398	1	1	K3M10398	1	1	HUB ASSEMBLY-LEFT (INCLUDES ITEMS 6 THROUGH 14)
16	C1621-60005	5	1	C1622-60001	2	1	SPINDLE
17	C1621-00017	3	1	C1621-00017	3	1	LABEL
18	K3311058A-L1	7	1	K3311058B-L1	8	1	STAY (2) (INCLUDES LABEL)
19	K4210248	6	1	K4210248	6	1	HUB ASSEMBLY-RIGHT
20	K4311682	8	1	K4311682	8	1	SLEEVE-RIGHT

Table 8-21. Parts List, Take-Up Reel (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	R2280ZZ	6	2	R2280ZZ	6	2	BEARINGS
22	K3M10399	3	1	K3M10399	3	12	SLEEVE ASSEMBLY-RIGHT (INCLUDES 20 AND 21)
23	K2310555A	3	1	K2310555A	3	1	PLATE, SIDE-RIGHT
24	DXZP3X8SMW	6	3	DXZP3X8SMW	6	3	SCREW P3X8SMW
25	K3310941A	4	1	K3310941B	5	1	STAY (1)
26	K3311059A	4	1	K3311059B	5	1	COVER
27	K3310982A	0	1	K3310982B	1	1	SHAFT, MEDIA
28	DXZP5X12SMW	7	2	DXZP5X12SMW	7	2	SCREW P5X12SMW
29	90XL037UK	7	1	90XL037UK	7	1	BELT, DRIVE
30	DXZCS4X25	1	2	DXZCS4X25	1	2	SCREW CS 4X25
31	DXZWA4B	4	2	DXZWA4B	4	2	WASHER, SPRING S4
32	DXZWE4	8	1	DXZWE4	8	1	WASHER, FLAT HW4
33	K4311688	0	1	K4311688	0	1	PULLEY, DRIVE
34	K3310969	3	1	K3310969	3	1	MOUNT, MOTOR
35	K3M10377	7	1	K3M10377	7	1	MOTOR, TAKE-UP REEL
36	K4311689	2	1	K4311689	2	1	PULLEY, MOTOR
37	DXZSSK4X4	5	1	DXZSSK4X4	5	1	SCREW, SET
38	K3M10397	9	1	K3M10409	6	1	MOTOR ASSEMBLY TAKE-UP REEL (INCLUDES ITEMS 34, 35, 36, 37, & 40)
39	DXZN04	7	1	DXZN04	7	1	NUT, N4
40	DXZP5X8SMW	8	2	DXZP5X8SMW	8	2	SCREW P5XZ8SMW

THE PARTS LIST FOR THE TAKE-UP REEL ASSEMBLY IS ON THE TWO PREVIOUS PAGES OF THIS HANDBOOK.

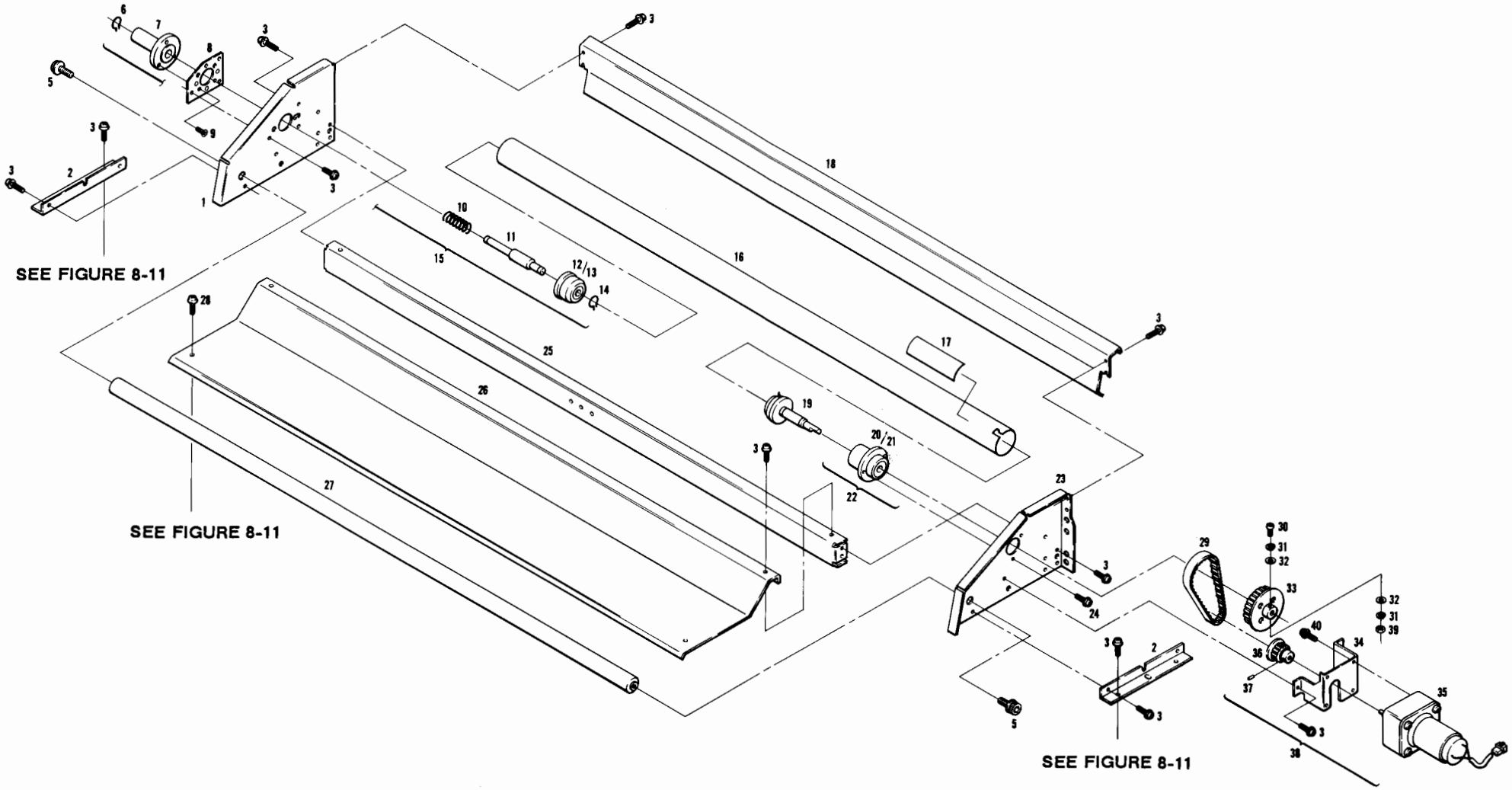


Figure 8-20. Take-Up Reel Assembly
Illustrated Parts Breakdown

Table 8-22. Parts List, Cutter

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X8SMW	7	6	DXZP4X8SMW	7	6	SCREW P4 X 8SMW
2	K3310939B	0	1	K3310939B	0	1	PLATE,ANGLE-RIGHT
3	DXZP5X14SW	1	2	DXZP5X14SW	1	2	SCREW P5X14SW
4	DXZ SSK3X3	3	11	DXZ SSK3X3	3	11	SCREW SSK3X3
5	K4311384	6	1	K4311384	6	1	STOPPER
6	K4311694	3	2	K4311694	3	2	FLANGE
7	144MXL6.4UK	0	1	144MXL6.4UK	0	1	BELT, SYNCHRO
8	K4311322	6	2	K4311322	6	2	PULLEY
9	1382309-80160	6	1	1382309-80160	6	1	COLLAR (A)
10	LF1680ZZ	7	3	LF1680ZZ	7	3	BEARING
11	1382309-80250	5	1	1382309-80250	5	1	COLLAR (B)
12	K4311593B	9	1	K4311593B	9	1	BRACKET "Y" CUTTER (B)
13	DXZP4X8SMW	3	8	DXZP4X8SMW	3	8	SCREW P4X8SW
14	K2310531B	4	1	K2310531B	4	1	PLATE, CUTTER-LEFT
15	K2310534	0	1	K2310535	2	1	PLATE, GUIDE (2)
16	K2310532	6	1	K2310533	8	1	PLATE, GUIDE (1)
17	K3310935	2	1	K2310559	2	1	ROLLER, MEDIA FEED
18	DXZJE-3	9	2	DXZJE-3	9	2	"E" RING
19	K4311699	3	1	K4311699	3	1	SHAFT
20	K3310975	6	1	K3310975	6	1	HINGE, TENSION

Table 8-22. Parts List, Cutter (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	K4311696	7	1	K4311696	7	1	SPRING, TENSION
22	K4311697	9	1	K4311697	9	1	PAD, TENSION
23							NOT USED
24	K4311698	1	1	K4311698	1	1	LEVER, TENSION
25	K3310958	0	1	K3310959	2	1	COVER-BOTTOM
26	K3310931	4	1	K3310932	6	1	STAY (1)
27	K4311594	1	2	K4311594	1	2	SUPPORT, CENTER
28	K4311591A	4	2	K4311591A	4	2	SPACER (A)
29	DXZP3X18SMW	7	2	DXZP3X18SM	7	2	SCREW P3X18SMW
30	DXZP3X10SMW	1	2	DXZP3X10SMW	1	2	SCREW P3X10SMW
31	1480201-48020	8	4	1480201-48020	8	4	GRIP RING
32	K4311634	7	2	K4311634	7	2	SHAFT, ACTUATOR
33	K4311632	3	2	K4311632	3	2	ACTUATOR, SENSOR
34	DXZ P3X8SW	2	11	DXZ P3X8SW	2	11	SCREW P3X8SW
35	K4311633	5	2	K4311633	5	2	BRACKET, SENSOR MOUNTING
36	K3M10378	9	3	K3M10378	9	3	PCA, PHOTO SENSOR (HPS-1)
37	K3M10402	2	2	K3M10402	2	2	PHOTO SENSOR ASSEMBLY (INCLUDES 31, 32, 33, 34, 35, 36)
38	PH3-8-87	2	1	PH-8-87	2	18	CABLE ASSEMBLY, PHOTO SENSOR (SSW21)
39	PH3-8-86	0	1	PH3-8-86	0	1	CABLE ASSEMBLY, PHOTO SENSOR (SSW20)
40	PH3-8-85	8	1	PH3-8-85	8	1	CABLE ASSEMBLY, ROTARY SENSOR (SSW19)

Table 8-22. Parts List, Cutter (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
41	K4311583A	7	2	K4311583A	7	2	PINCH ROLLER (A)
42	80F-0608	6	2	80F-0608	6	2	BEARING
43A	K4311847A	7	6	K4311847A	7	8	SPRING, PINCH ROLLER REAR
43B	K4311847B	8	6	K4311847B	8	8	SPRING, PINCH ROLLER FRONT
44	K4311582	6	6	K4311582	6	8	BRACKET, ROLLER (2)
45	K4311586	4	6	K4311586	4	8	SHAFT, PINCH ROLLER
46	K4311585	2	1	K4311585	2	1	PLATE, SENSOR
47	K4311636	1	1	K4311636	1	1	PLATE, SENSOR MOUNTING
48	K3M10375	3	1	K3M10376	5	1	Y-CUTTER ASSEMBLY (SEE FIGURE 12-5 FOR DETAILS)
49	K3310937	6	1	K2310560	5	1	ROLLER, MEDIA EJECT
50	K3310933	8	1	K3310934	0	1	STAY (2)
51	K2310538	8	1	K2310539	0	1	PLATE, GUIDE (4)
52	K2310536	4	1	K2310537	6	1	PLATE, GUIDE (3)
53							NOT USED
54	1480201-48060	6	10	1480201-48060	6	14	GRIP RING
55	STW-FM6X1	9	10	STW-FM6X1	9	14	SLIDER
56	K4311583B	8	10	K4311583B	8	14	PINCH ROLLER (B)
57							DELETED
58	K2310531A	3	1	K2310531A	3	1	PLATE, CUTTER-RIGHT
59	LF1360ZZ	9	1	LF1360ZZ	9	1	BEARING
60	K4311410	3	1	K4311410	3	1	HOLDER, BEARING (2)

Table 8-22. Parts List, Cutter (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
61	K4311593A	8	1	K4311593A	8	1	BRACKET, "Y" CUTTER (A)
62	DXZF3X6	6	2	DXZF3X6	6	2	SCREW F3X6
63							SCREW
64							SCREW
65							SCREW
66	80MXL6.4UK	4	1	80MXL6.4UK	4	1	BELT, SYNCHRO
67	K4311591B	5	3	K4311591B	5	3	SPACER (B)
68	DXZP3X35SMW	3	3	DXZP3X35SMW	3	3	SCREW P3X35SMW
69	K3M10374	1	1	K3M10374	1	1	MOTOR, FEED (2)
70	K4311590	3	1	K4311590	3	1	BRACKET, MOTOR MOUNTING
71							SCREW
72	K4311603	2	1	K4311603	2	1	PULLEY, MOTOR
73	K3M10400	8	1	K3M10400	8	1	MOTOR ASSEMBLY, MEDIA FEED (INCLUDES 69, 70, 71, 72 & SET SCREW (4))
74	K4311601	8	1	K4311601	8	1	NUT, CLUTCH
75A	K4311599A	0	1	K4311599A	0	1	PLATE, CLUTCH (A)
75B	K4311599B	1	1	K4311599B	1	1	PLATE, CLUTCH (B)
76	K4311602	0	1	K4311602	0	1	SPRING, CLUTCH
77	K4311597	7	2	K4311597	7	2	LINING, CLUTCH
78	K4311600	6	2	K4311600	6	2	PLATE, CLUTCH (2)
79	K4311604	4	1	K4311604	4	1	PULLEY, CLUTCH
80	K4311598	9	1	K4311598	9	1	STOPPER, CLUTCH

Table 8-22. Parts List, Cutter (Continued)

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
81	DXZP3X12SW	50	4	DXZP3X12SW	50	4	SCREW P3X12SW
82	K3M10401	00	1	K3M10401	00	1	BRAKE ASSEMBLY, FEED ROLLER (INCLUDES BRAKE & SET SCREW[41])
83	K4311383	40	1	K4311383	40	1	SPACER (2)
84	DXZ4035	80	1	DXZ4035	80	1	CLIP, WIRE
85	K3310949	10	1	K3310949	10	1	BRACKET, CONNECTER
86	DXZ2U46	50	1	DXZ2U46	50	1	CLIP, WIRE
87	DXZP3X8SMW	60	2	DXZP3X8SMW	60	2	SCREW P3X8SMW
88	K3310939A	90	1	K3310939A	90	1	PLATE, ANGLE-LEFT
89	DXZWA5	60	2	DXZWA5	60	2	WASHER, SPRING S5
90	DXZN05	90	2	DXZN05	90	2	NUT M5
91	DXZ4035	80	5	DXZ4035	80	5	CLIP, WIRE
92	K4311726	20	2	K4311726	20	2	PLATE, RUBBER
93							CLIP, WIRE

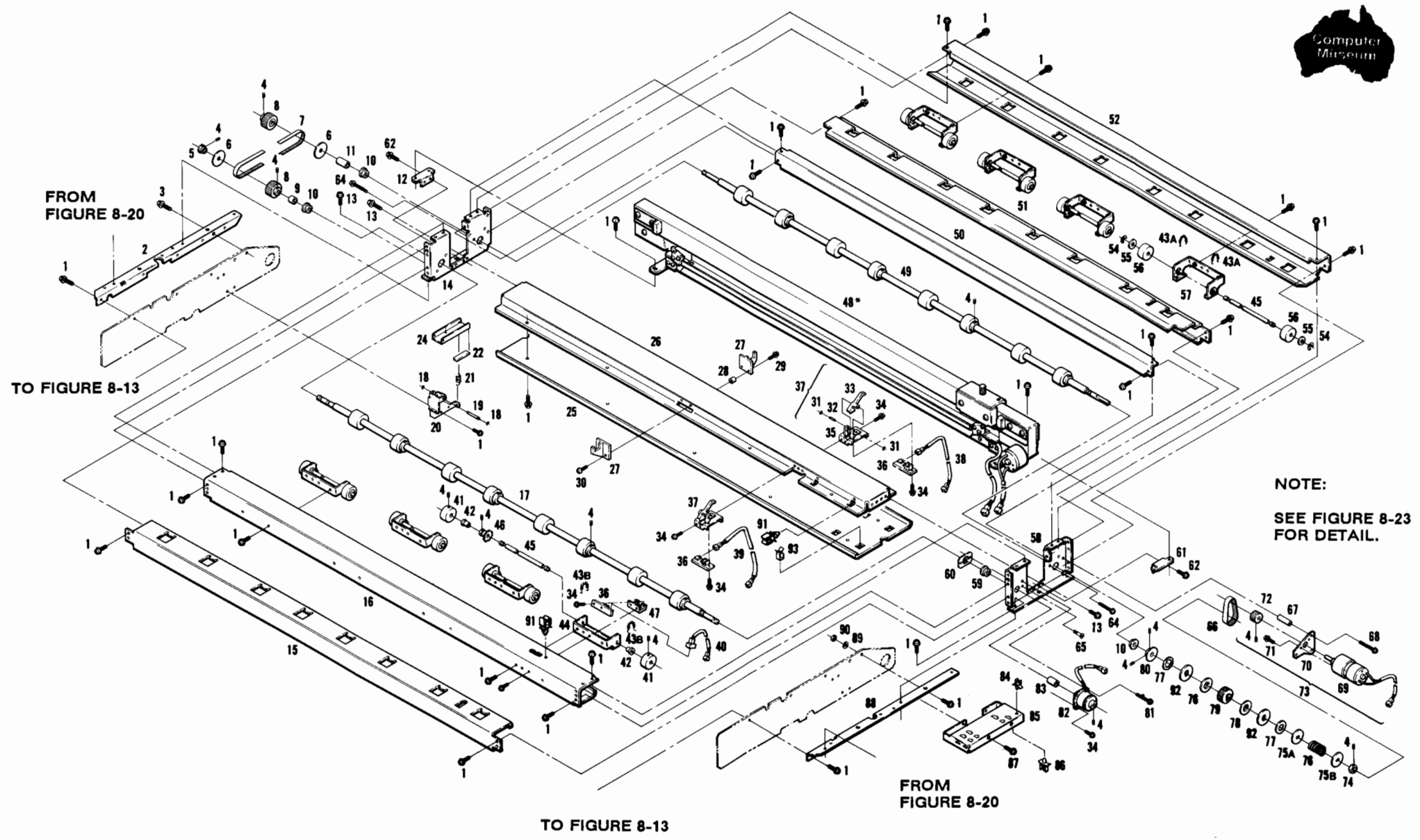


Figure 8-21. Cutter Assembly Illustrated Parts Breakdown

Table 8-23. Parts List, Y-Axis Cutter

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1							SCREW
2							SCREW
3							STOP, MEDIA CUTER
4							BUSHING
5							PULLEY
6							SCREW
7							GUIDE
8	K3M10403	4	1	K3M10403	4	1	BLADE ASSEMBLY, CUTTER
9							SPRING
10	K3M10407	2	1	K3M10408	4	1	CABLE, CUTTER DRIVE
11							SCREW
12	K3M10406	0	1	K3M10406	0	1	MOTOR ASSEMBLY, CUTTER DRIVE
13	K3M10404	6	1	K3M10405	8	1	L AND R SENSOR ASSEMBLY (SSW17/SSW18)
14							SCREW

NOTES:

ITEM 3 MAY NOT BE PRESENT IN ALL UNITS.

ITEM 8 MAY VARY IN APPEARANCE BETWEEN UNITS.

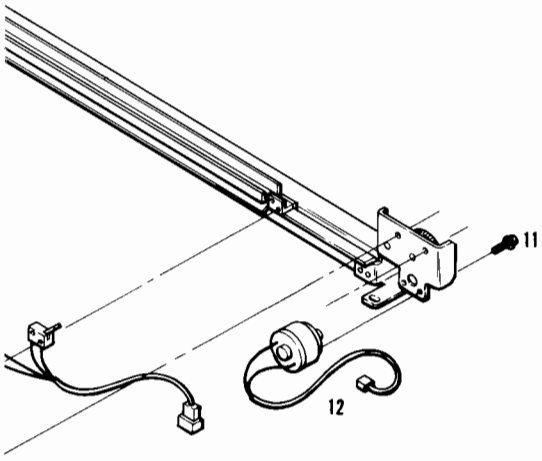
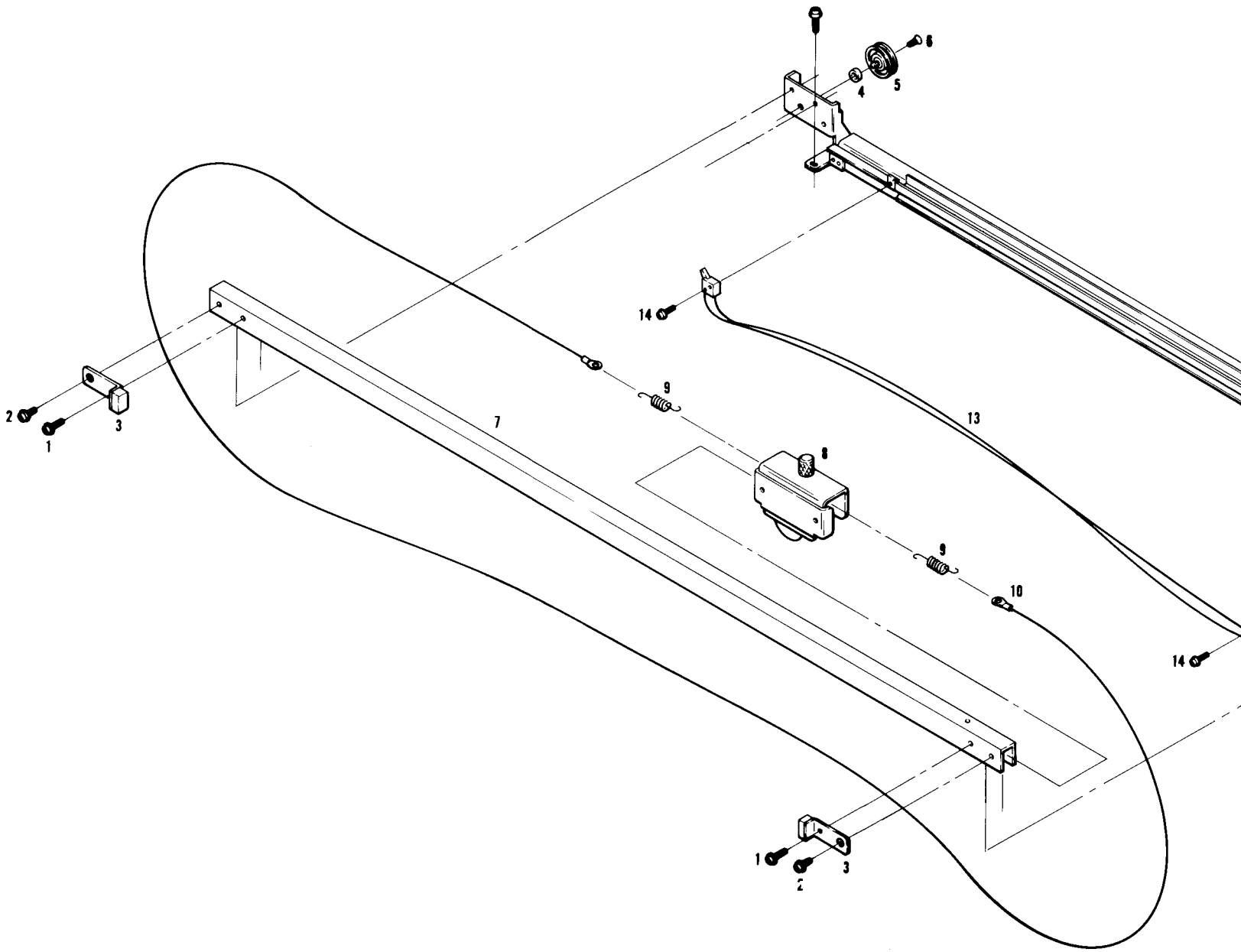


Figure 8-22. Y-Axis Cutter
Illustrated Parts Breakdown


6
5
4
14
9
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13
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14
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2
3

Table 8-24. Parts List, Vector-to-Raster Converter

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	C1600-00070	3	1	C1600-00070	3	1	RETAINER-PCA
2	4324-0135	4	2	4324-0135	3	2	PAD-FOAM
3	0515-0780	6	86	0515-0780	6	86	SCREW-METRIC
4	3050-1179	6	2	3050-1179	6	2	WASHER-FLAT
5	C1600-00080	5	1	C1600-00080	5	1	GUIDE SUPPORT-LH
6	C1600-00010	1	1	C1600-00010	1	1	PLATE-FRONT
7	C1600-00035	0	1	C1600-00035	0	1	PANEL-INTERFACE
8	0380-0644	4	2	0380-0644	4	2	STANDOFF-METRIC
9	0515-0055	8	2	0515-0055	8	2	SCREW, M3X 0.5 X 6
10	1251-7828	8	2	1251-7828	8	2	STANDOFF-RS232
11	C1600-00016	7	1	C1600-00016	7	1	GUIDE-PCB, LH
12	0403-0639	7	8	0403-0639	7	8	GUIDE-PCB
13	C1623-68100	9	1	C1623-68100	9	1	PCA-MAIN
14	C1600-20001	2	4	C1600-20001	2	4	STANDOFF-I/F CONNECTOR
15	0380-1941	3	2	0380-1941	3	2	STANDOFF
16	C1600-00015	6	1	C1600-00015	6	1	GUIDE-PCB, RH
17	0515-0413	2	4	0515-0413	2	4	SCREW-PCB
18	C1600-60230	3	1	C1600-60230	3	1	CABLE-DISC, 34
19	C1600-60225	6	1	C1600-60225	6	1	CABLE-DISC, 20
20	C1600-60205	2	1	C1600-60205	2	1	CABLE-DISC, POWER

Table 8-24. Parts List, Vector-to-Raster Converter (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	C1600-60200	7	1	C1600-60200	7	1	CABLE-POWER SUPPLY
22	C1623-68107	6	1	C1623-68107	6	1	PCA-DMA I/O
	C1623-69107	8	1	C1623-69107	8	1	PCA-DMA I/O (EXCHANGE)
23	C1623-68106	5	1	C1623-68106	5	1	PCA-PROCESSOR
	C1623-69106	7	1	C1623-69106	7	1	PCA-PROCESSOR (EXCHANGE)
24	C1623-68103	2	1	C1623-68103	2	1	PCA-SWATH/RAM
	C1623-69103	4	1	C1623-69103	4	1	PCA-SWATH/RAM (EXCHANGE)
25	C1623-68109	8	1	C1623-68109	8	1	PCA-DISC CONTROL
	C1623-69109	0	1	C1623-69109	0	1	PCA-DISC CONTROL (EXCHANGE)
26	C1600-60215	4	1	C1600-60215	4	1	CABLE-FAN
27	0535-0006	1	3	0535-0006	1	3	NUT-HEX, M4 X 0.7
28	3160-0539	3	2	3160-0539	3	2	FAN-ALUMINUM FRAME
29	C1600-00050	9	2	C1600-00050	9	2	NUT PLATE
30	C1600-00030	5	1	C1600-00030	5	1	SHELF-POWER SUPPLY
31	0400-0318	3	2	0400-0318	3	2	GROMMET-SPLIT
32	0950-1958	4	1	0950-1958	4	1	POWER SUPPLY
33	C1600-00020	3	1	C1600-00020	3	1	COVER
34	C1600-00500	4	1	C1600-00500	4	1	LABEL-SERIAL
35	0515-1597	5	8	0515-1597	5	8	SCREW-METRIC, M4X 0.7 X 14
36	3150-0544	9	2	3150-0544	9	2	FILTER SCREEN
37	1400-1405	2	1	1400-1405	2	1	CLAMP-CABLE, .750D
38	2360-0117	6	4	2360-0117	6	4	SCREW, 6-32 X .37

Table 8-24. Parts List, Vector-to-Raster Converter (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
39	C1600-00060	1	2	C1600-00060	1	2	MOUNT-DISC
40	0950-1892	5	1	0950-1892	5	1	DISC DRIVE
	0957-0031	6	1	0957-0031	6	1	DISC DRIVE (EXCHANGE)
41	C1600-00005	3	1	C1600-00005	3	1	BASE
42	C1600-00007	6	1	C1600-00007	6	1	BAFFLE-VRC
43	0515-0406	3	2	0515-0406	3	2	SCREW, M3X O.5 X 8
44	8120-1575	0	1	8120-1575	0	1	AC LINE CORD (VRC TO ENGINE)
45	C1600-60001	6	1	C1600-60001	6	1	CABLE ASSEMBLY, CTRL IF
46	C1600-60230	3	1	C1600-60230	3	1	CABLE ASSEMBLY, VRC IF

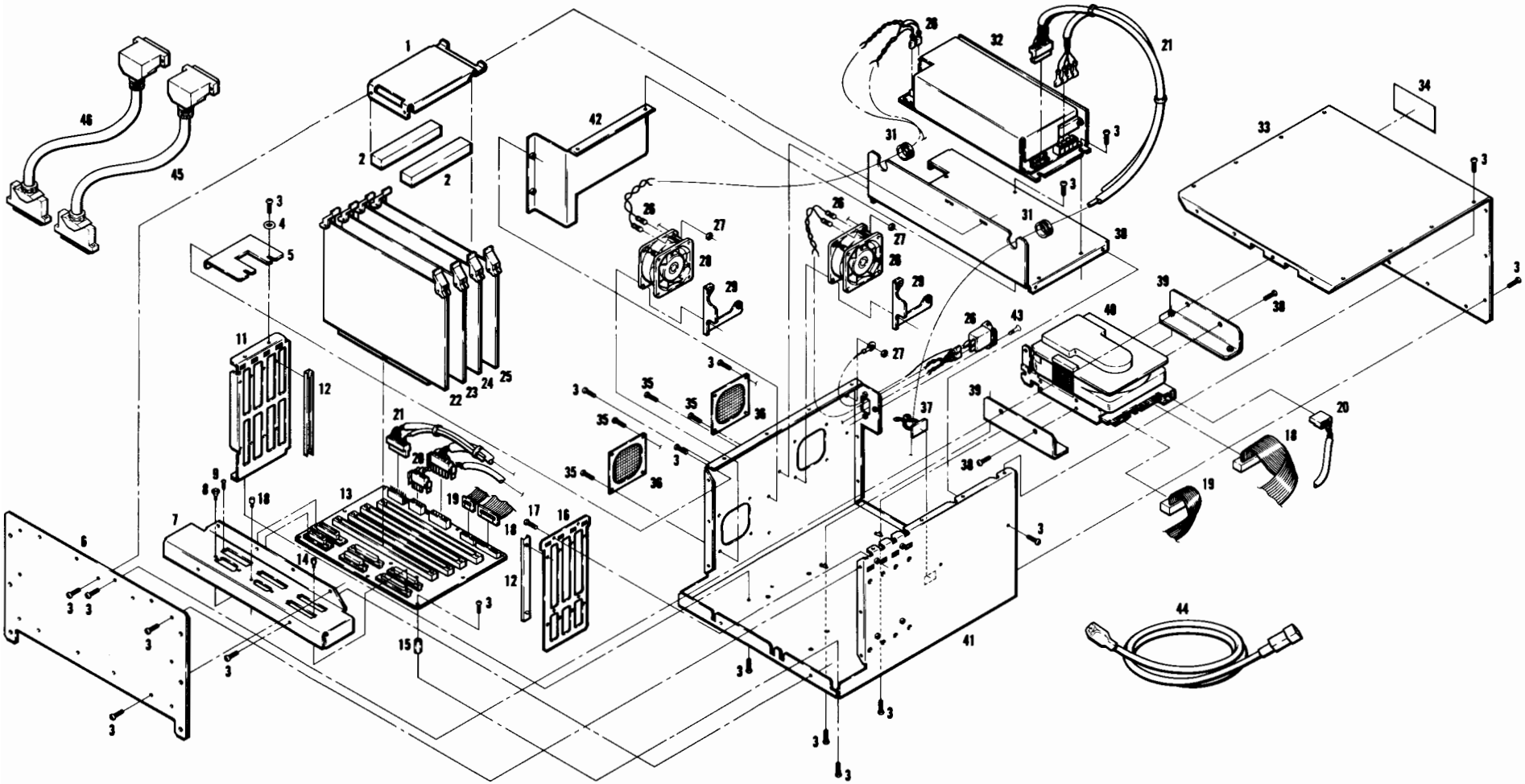


Figure 8-23. Vector-to-Raster Converter Assembly Illustrated Parts Breakdown

Table 8-25. Parts List, Print Engine PCAs

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
1	K3M10364	0	1	K3M10365	2	1	PCA, RMC
2	K3M10366	4	1	K3M10366	4	1	PCA, MCD
3	K3M10367	6	1	K3M10367	6	1	PCA, CCB
4	KGLS-12S	3	4	KGLS-12S	3	4	PCA, SUPPORT CCB
5	K3M10244	6	2	K3M10245	8	2	PCA, CONTROL ELECTRODE DRIVER (CED)
6	K3M10243	4	1	K3M10243	4	2	PCA, PIN ELECTRODE DRIVER (PED)
7	K3M10432	5	1	K3M10432	5	1	PCA, FRONT PANEL CIRCUIT (FPC)
8	K3M10378	9	3	K3M10378	9	3	PCA, PHOTO SENSOR (HPS-1)

Table 8-26. Parts List, Cable Assemblies

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K3M10404	6	1	K3M10405	8	1	L AND R SENSOR ASSEMBLY (SSW17&SSW18)
2	PH3-8-85	8	1	PH3-8-85	8	1	ROTARY SENSOR CABLE ASSEMBLY (SSW19)
3	PH3-8-86	0	1	PH3-8-86	0	1	SUPPLY SENSOR CABLE ASSEMBLY (SSW20)
4	PH3-8-87	2	1	PH3-8-87	2	1	EJECT SENSOR CABLE ASSEMBLY (SSW21)
5	PH3-8-83	4	1	PH3-8-83	4	1	CUTTER SENSORS HARNESS
6	PH3-8-84	6	1	PH3-8-84	6	1	CUTTER MOTORS HARNESS
7	PH3-8-64	4	1	PH3-8-64	4	1	PULSE MOTOR (PM1) HARNESS
8	PH3-8-63A1	5	1	PH3-8-63A0	3	1	MECHANICAL CONTROL HARNESS
9							RMCN7 HARNESS
	PH3-8-61	8	1	PH3-8-61	8	1	U.S.A.
	PH3-8-61E	1	1	PH3-8-61E	1	1	EUROPE
10	PH3-8-71	9	1	PH3-8-71	9	1	TOP COVER INTERLOCK (PSW2) HARNESS
11	PH3-8-72	1	2	PH3-8-72	1	2	UPPER FR. INTERLOCK(SSW1/SSW2) HARNESS
12	PH3-8-73	3	1	PH3-8-73	3	1	TANK INTERLOCK(SSW3) HARNESS
13	PH3-8-75	7	1	PH3-8-75	7	1	NO MEDIA INTERLOCK(SSW4) HARNESS
14	PH3-8-76	9	1	PH3-8-76	9	1	VACUUM INTERLOCK (VSW1)HARNESS
15	PH3-8-77	1	1	PH3-8-77	1	1	NEAR END 1 SENSOR(SSW5) HARNESS
16	PH3-8-78	3	1	PH3-8-78	3	1	NEAR END 2 SENSOR (SSW6) HARNESS

Table 8-26. Parts List, Cable Assemblies (Continued)

REF DES	250 PART NUMBER.	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
17							LPS1 CABLE ASSY
	PH3-8-51	7	1	PH3-8-51	7	1	U.S.A.
	PH3-8-51E	0	1	PH3-8-51E	0	1	EUROPE ONLY
18							LPS2 CABLE ASSY
	PH3-8-52	9	1	PH3-8-52	9	1	U.S.A.
	PH3-8-52E	2	1	PH3-8-52E	2	1	EUROPE ONLY
19	PH3-8-58A1	4	1	PH3-8-58A0	2	1	PCN4 HARNESS ASSEMBLY (HPS1-CED)
20	PH3-8-59A1	6	1	PH3-8-59A0	4	1	PCN5 HARNESS ASSEMBLY (HPS1-PED)
21							PCN2 HARNESS ASSEMBLY (HPS1- SG)
	PH3-8-53	1	1	PH3-8-53	1	1	U.S.A.
	PH3-8-53E	1	1	PH3-8-53E	1	1	EUROPE
22	PH3-8-60	6	1	PH3-8-60	6	1	PCN3 HARNESS ASSEMBLY (HPS1 - RV1)
23	PH3-8-05	0	1	PH3-8-05	0	1	CONTROL PANEL CABLE ASSEMBLY
24	PH3-8-57	9	1	PH3-8-57	9	1	RMC TO MCD CABLE ASSY (RMCN11)
25	PH3-8-04	8	1	PH3-8-04	8	1	RMC TO MCD CABLE ASSY - FLAT(RMCN3)
26	PH3-8-91	1	1	PH3-8-91	1	1	MCD TO CCB CABLE ASSY (MCCN1)
27	PH3-8-06A1	5	1	PH3-8-06A0	3	1	RMC TO CED CABLE ASSY (RMCN5)
28	PH3-8-54A1	6	1	PH3-8-54A0	4	1	RMC TO CED CABLE ASSY (RMCN10)
29	PH3-8-07A1	7	1	PH3-8-07A0	5	1	RMC TO PED CABLE ASSY (RMCN6)
30	PH3-8-55	5	1	PH3-8-55	5	1	RMC TO PED CABLE ASSY (RMCN8)
31				PH3-8-56A0	8		RMC TO PED CABLE ASSY (RMCN9) (A0 ONLY)

Table 8-26. Parts List, Cable Assemblies (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
32	PH3-8-03A1	9	4	PH3-8-02A0	5	4	CED TO WRITING HEAD (CDCN4 & CDCN5)
33	PH3-8-01	2	2	PH3-8-01	2	4	PED TO WRITING HEAD (PDCN4 & PDCN5)

Table 8-27. Parts List, Exchange Assemblies (Model 250/255)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
	C1600-69301	7	1	C1600-69301	7	1	PCA-PIN ELECTRODE DRIVER (PED)
	C1600-69302	8	1	C1600-69303	9	1	PCA-CONTROL ELECTRODE DRIVER (CED)
	C1600-69304	0	1	C1600-69305	1	1	PCA-RECORDING MECHANICAL CONTROL (RMC)
	C1600-69306	2	1	C1600-69306	2	1	PCA-MECHANICAL CONTROL DRIVER (MCD)
	C1600-69307	3	1	C1600-69308	4	1	WRITING HEAD
	C1623-69106	7	1	C1623-69106	7	1	PCA-PROCESSOR, VRC
	C1623-69107	8	1	C1623-69107	8	1	PCA-I/O DMA, VRC
	C1623-69109	0	1	C1623-69109	0	1	PCA-DISC CONTROL, VRC
	C1623-69103	4	1	C1623-69103	4	1	PCA-SWATH RAM, VRC
	0957-0031	6	1	0957-0031	6	1	DISC DRIVE, VRC

CONTENTS

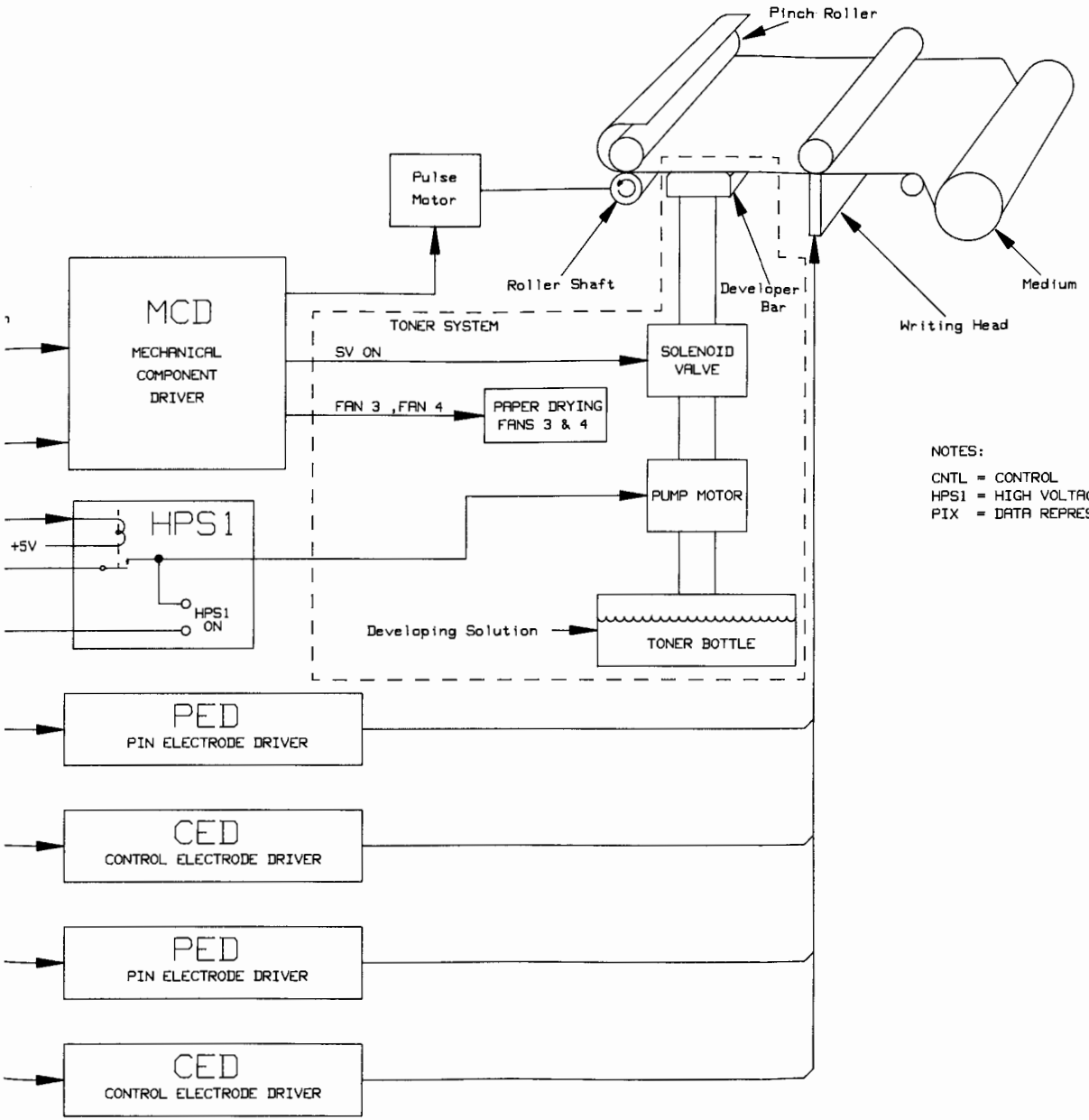
ILLUSTRATIONS

SECTION IX

DIAGRAMS

9-1. BLOCK DIAGRAMS

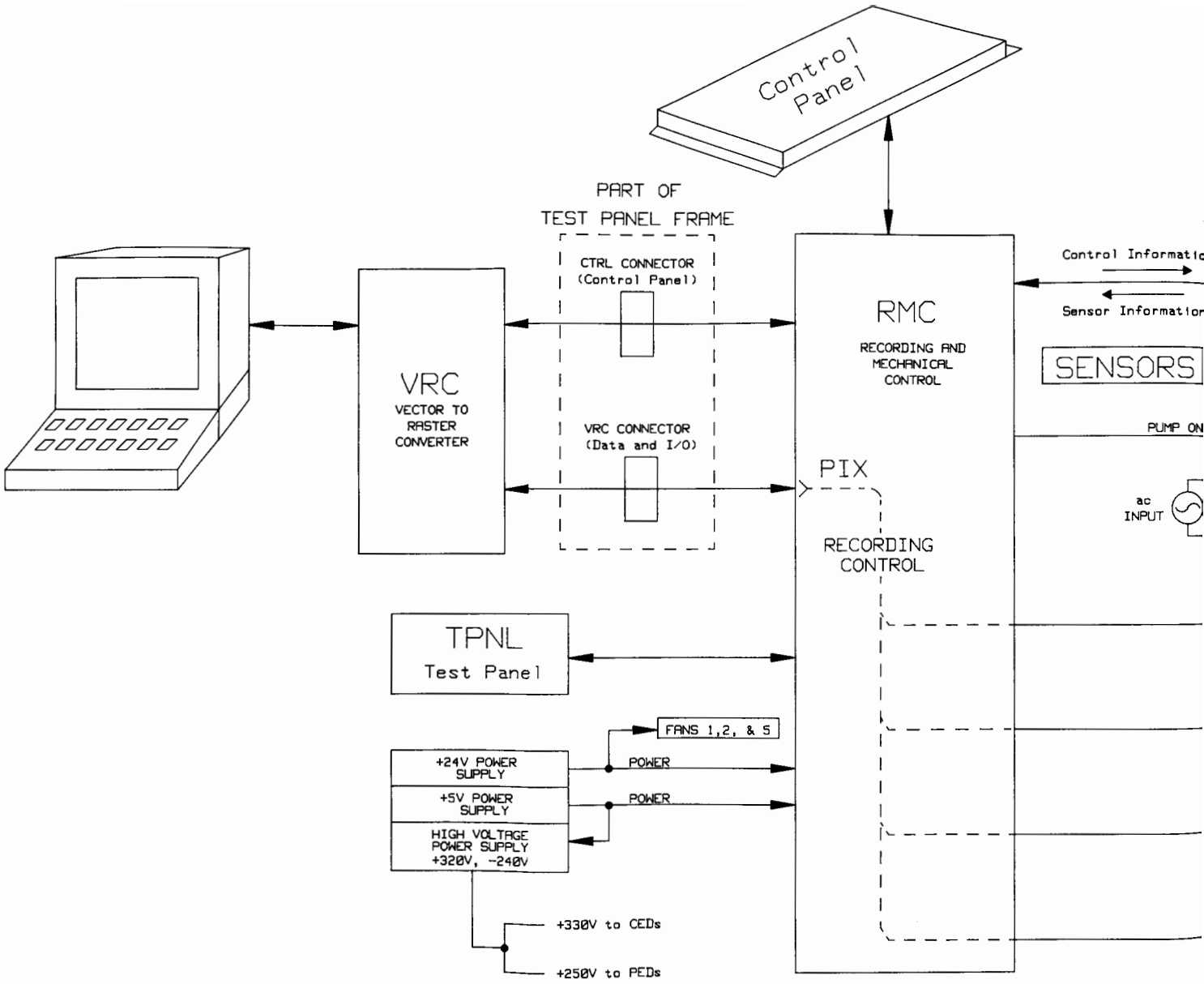
9-2. The functional block diagrams, power distribution diagrams, and cable interconnection diagrams of the HP 7600 Models 240D/E and 250/255 are included in this section.



NOTES:

CNTL = CONTROL
HPS1 = HIGH VOLTAGE POWER SUPPLY (1 OF 1)
PIX = DATA REPRESENTING GRAPHICS DOTS (PIXELS)

Figure 9-1. Model 240D/E Functional Block Diagram


Control Panel
PART OF
TEST PANEL FRAME
CTRL CONNECTOR
(Control Panel)
VRC CONNECTOR
(Data and I/O)
VRC
VECTOR TO
RASTER
CONVERTER
RMC
RECORDING AND
MECHANICAL
CONTROL
Control Informatio
Sensor Information
SENSORS
PUMP ON
PIX
ac
INPUT
RECORDING
CONTROL
TPNL
Test Panel
FANS 1,2, & 5
+24V POWER
SUPPLY
+5V POWER
SUPPLY
HIGH VOLTAGE
POWER SUPPLY
+320V, -240V
POWER
POWER
+330V to CEDs
+250V to PEDs

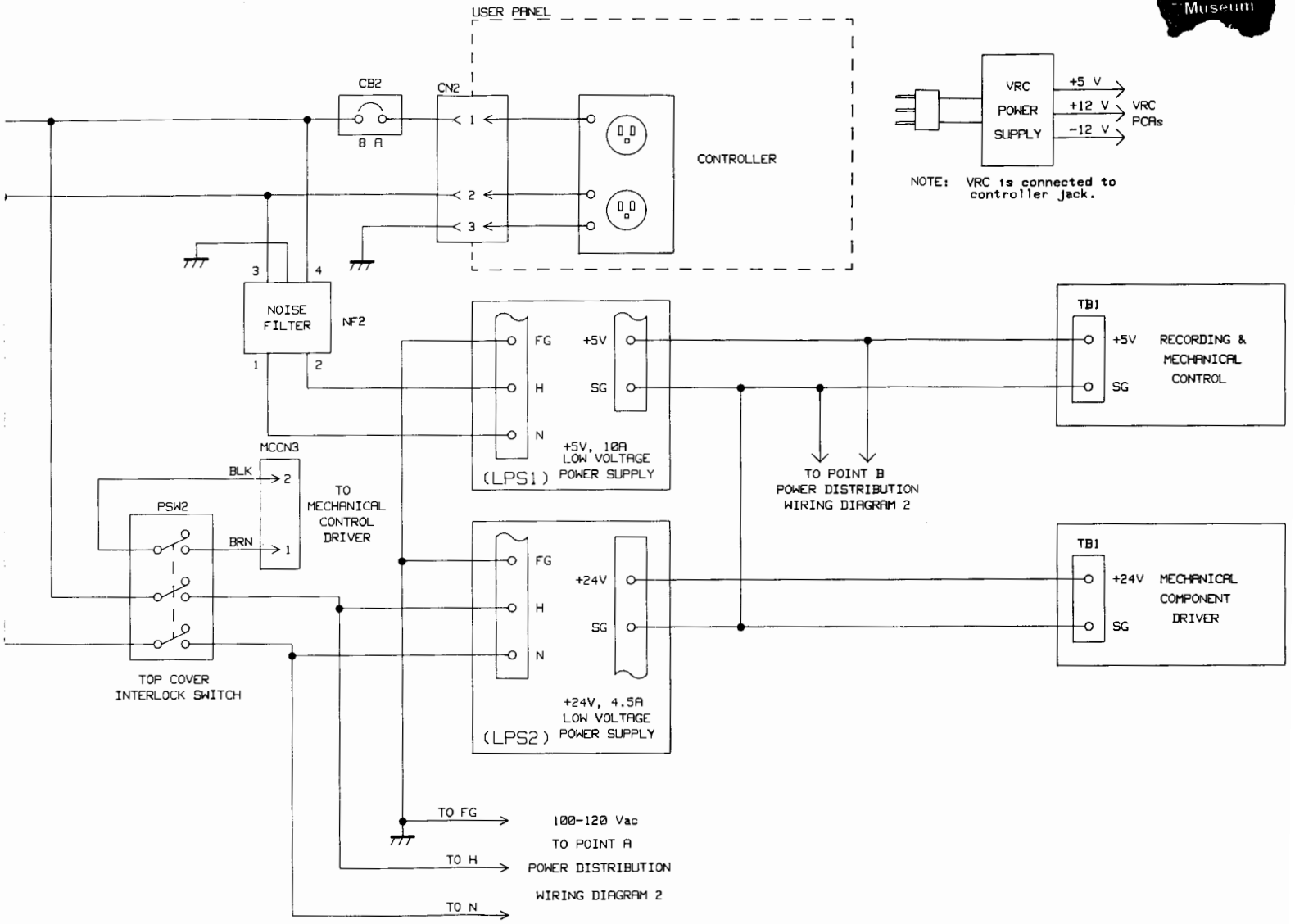
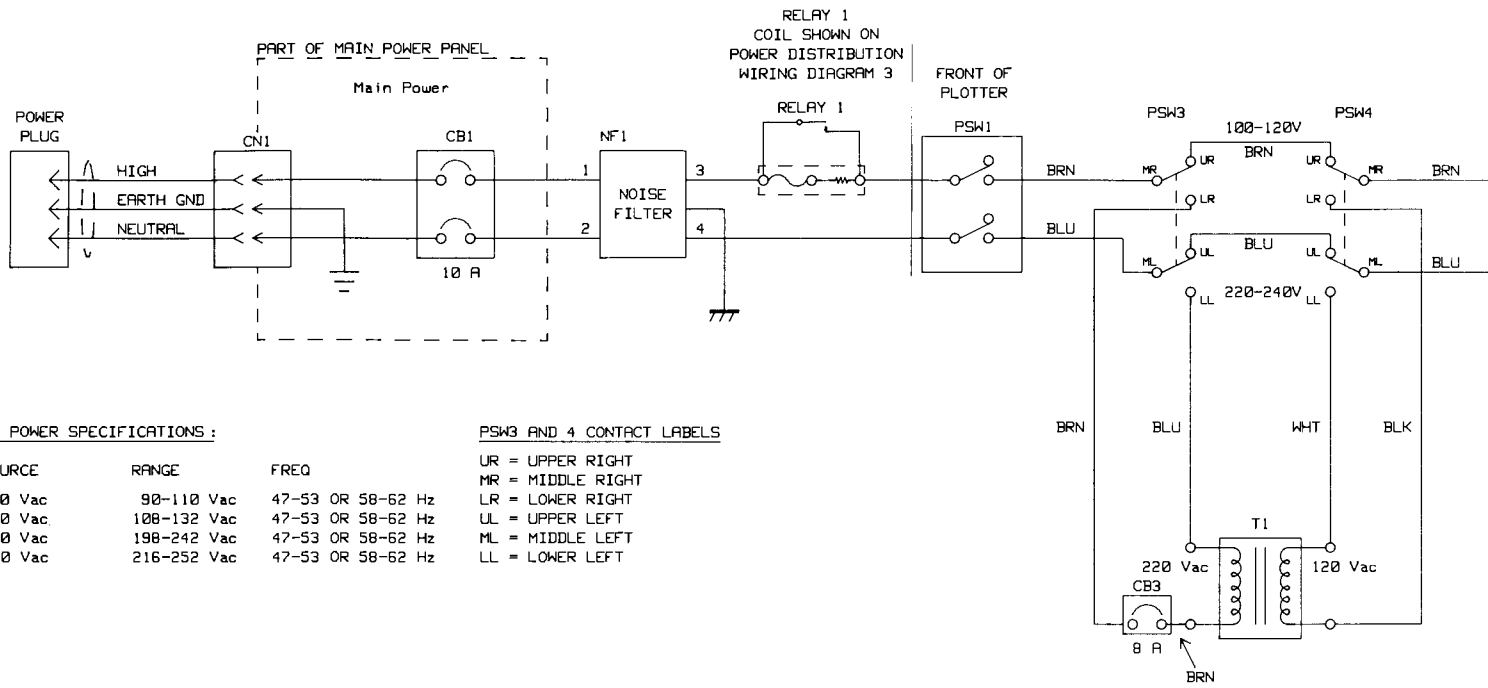


Figure 9-2. Power Distribution Diagram
(Sheet 1 of 4)



INPUT POWER SPECIFICATIONS :

SOURCE	RANGE	FREQ
100 Vac	90-110 Vac	47-53 OR 58-62 Hz
120 Vac	108-132 Vac	47-53 OR 58-62 Hz
220 Vac	198-242 Vac	47-53 OR 58-62 Hz
240 Vac	216-252 Vac	47-53 OR 58-62 Hz

PSW3 AND 4 CONTACT LABELS

UR = UPPER RIGHT
MR = MIDDLE RIGHT
LR = LOWER RIGHT
UL = UPPER LEFT
ML = MIDDLE LEFT
LL = LOWER LEFT

SYMBOL DEFINITIONS :

CB = Circuit Breater
(Manually Operated, Automatically Tripped)
CN = Connector
FG = Frame Ground
SG = Signal Ground
PSW = Power Switch
VRC = Vector to Raster Converter

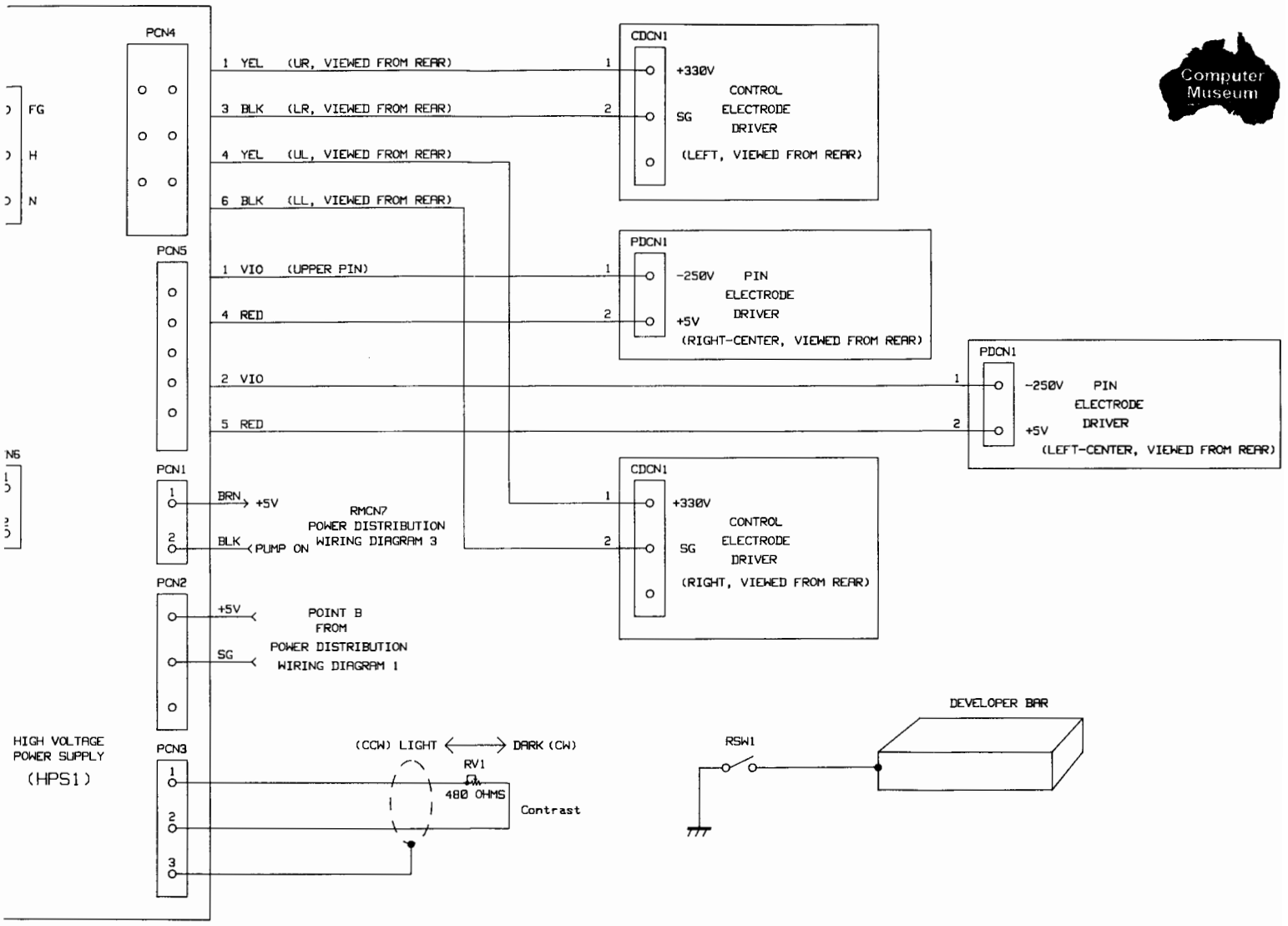
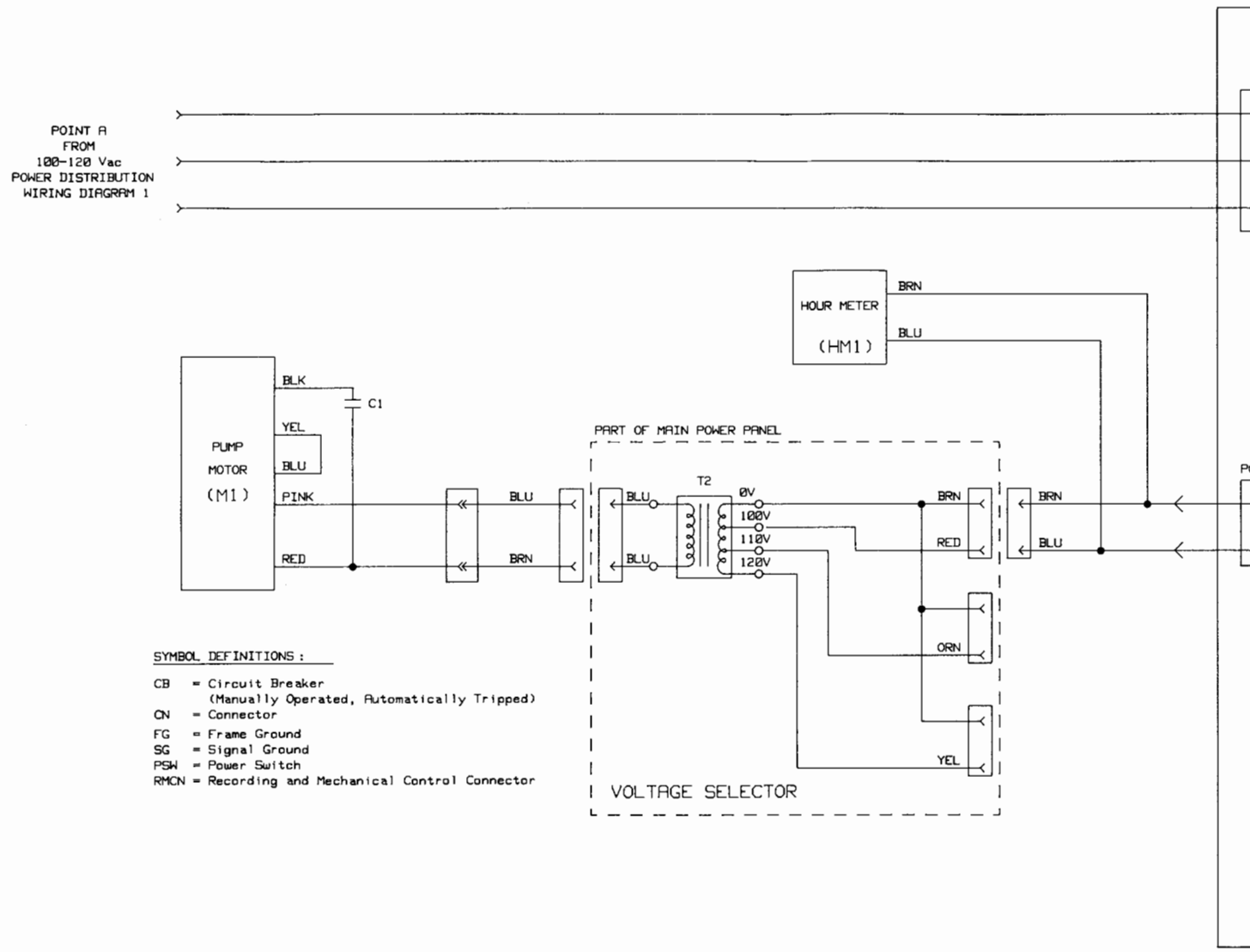


Figure 9-3. Power Distribution Diagram
(Sheet 2 of 4)


POINT A
FROM
100-120 Vac
POWER DISTRIBUTION
WIRING DIAGRAM 1
HOUR METER
(HM1)
BRN
BLU
PUMP
MOTOR
(M1)
BLK
YEL
BLU
PINK
RED
C1
BLU
BRN
PART OF MAIN POWER PANEL
T2
BLU
BLU
0V
100V
110V
120V
BRN
RED
BRN
BLU
ORN
YEL
VOLTAGE SELECTOR
SYMBOL DEFINITIONS :
CB = Circuit Breaker
(Manually Operated, Automatically Tripped)
CN = Connector
FG = Frame Ground
SG = Signal Ground
PSW = Power Switch
RMCN = Recording and Mechanical Control Connector

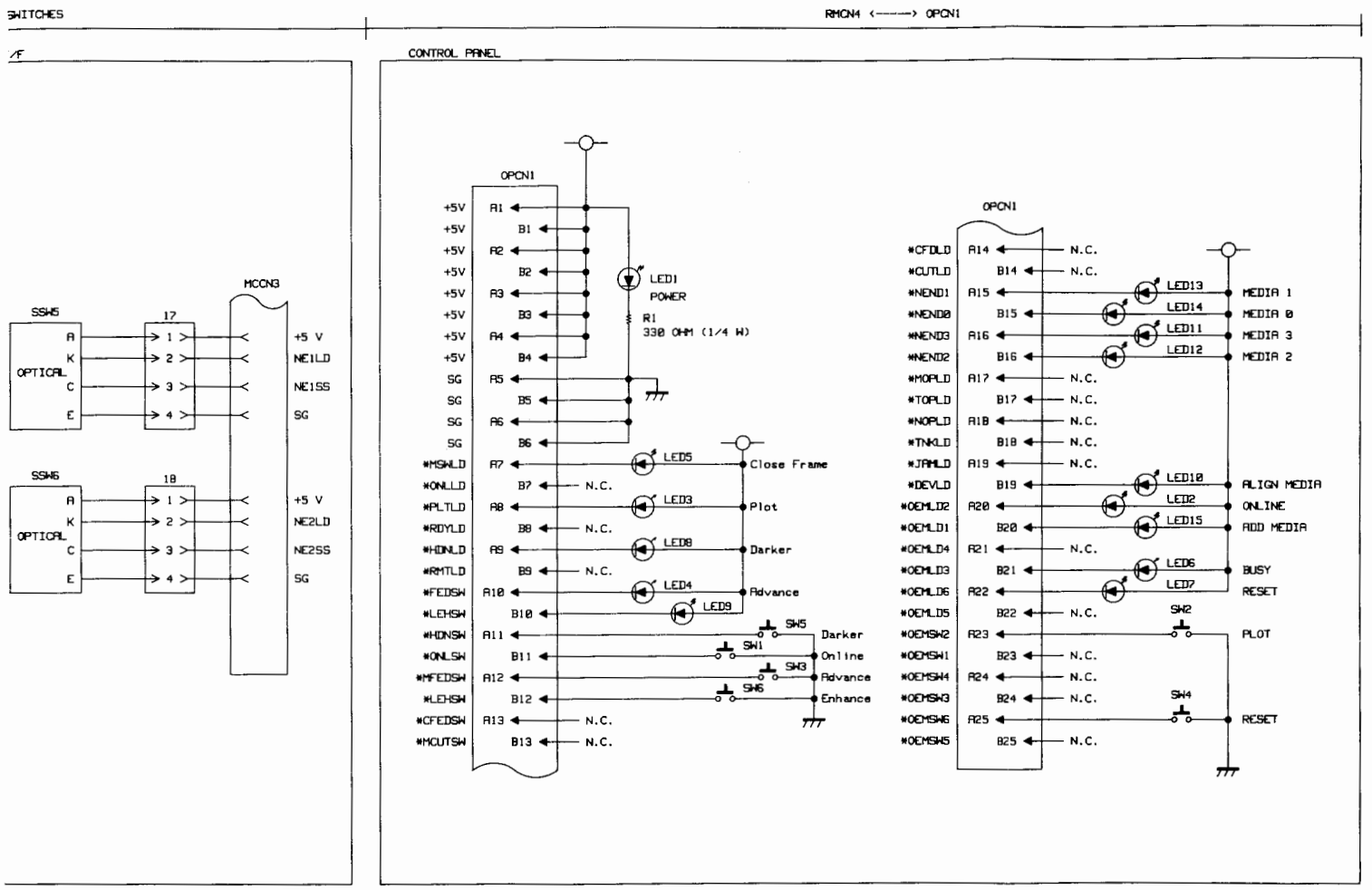
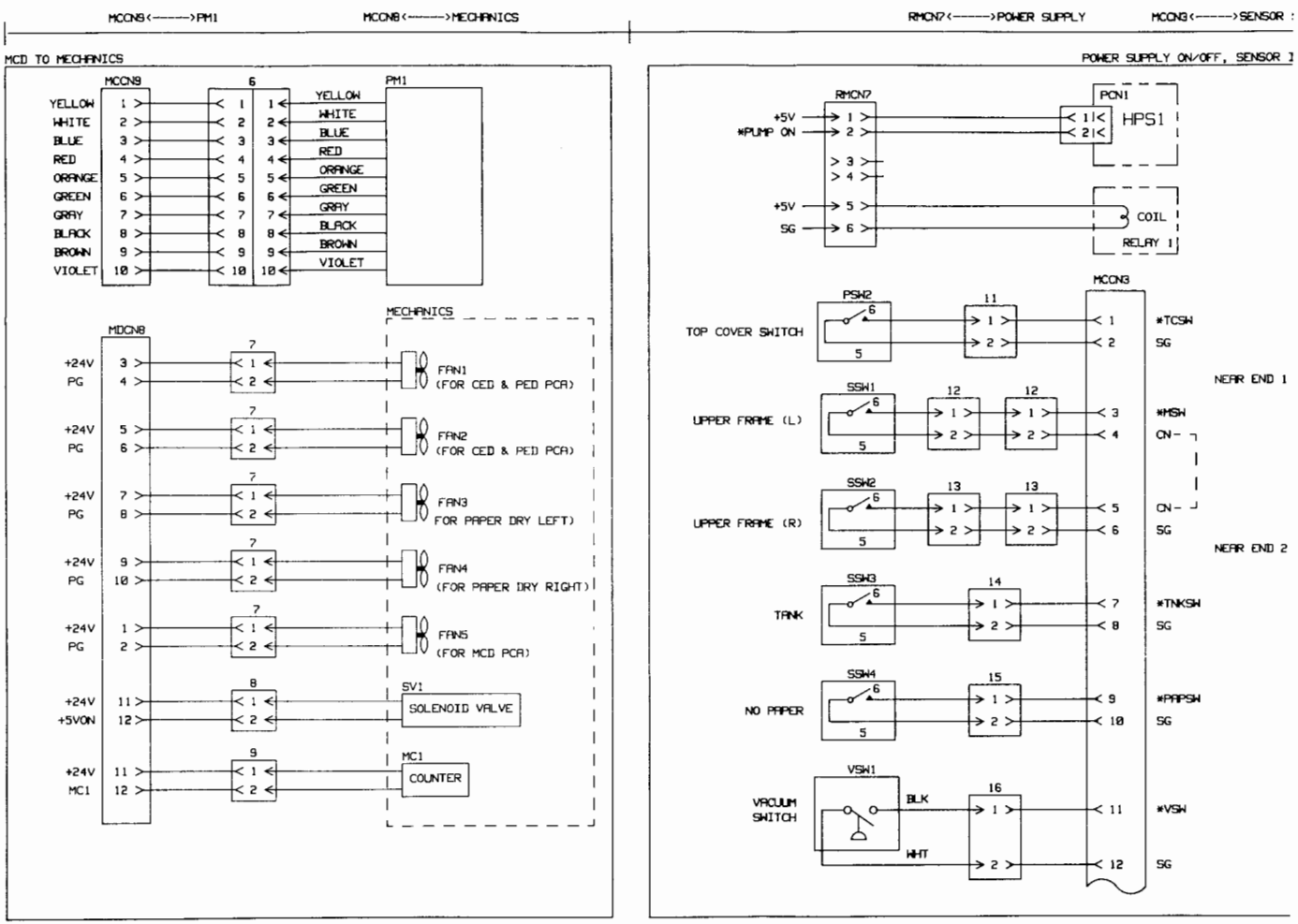


Figure 9-4. Power Distribution Diagram
(Sheet 3 of 4)


MCON9<------>PM1
MCON8<------>MECHANICS
RMCN7<------>POWER SUPPLY
MCON3<------>SENSOR
MCD TO MECHANICS
POWER SUPPLY ON/OFF, SENSOR
MCON9
PM1
YELLOW
WHITE
BLUE
RED
ORANGE
GREEN
GRAY
BLACK
BROWN
VIOLET
MECHANICS
MDCN8
+24V
PG
FAN1 (FOR CED & PED PCA)
FAN2 (FOR CED & PED PCA)
FAN3 FOR PAPER DRY LEFT)
FAN4 (FOR PAPER DRY RIGHT)
FAN5 (FOR MCD PCA)
SV1
SOLENOID VALVE
+5VON
MC1
COUNTER
RMCN7
PCN1
HPS1
*PUMP ON
+5V
SG
COIL
RELAY 1
MCON3
PSW2
TOP COVER SWITCH
*TCSW
SSW1
UPPER FRAME (L)
*MSW
NEAR END 1
SSW2
UPPER FRAME (R)
NEAR END 2
SSW3
TANK
*TNKSW
SSW4
NO PAPER
*PAPSW
VSW1
VACUUM SWITCH
BLK
WHT
*VSW

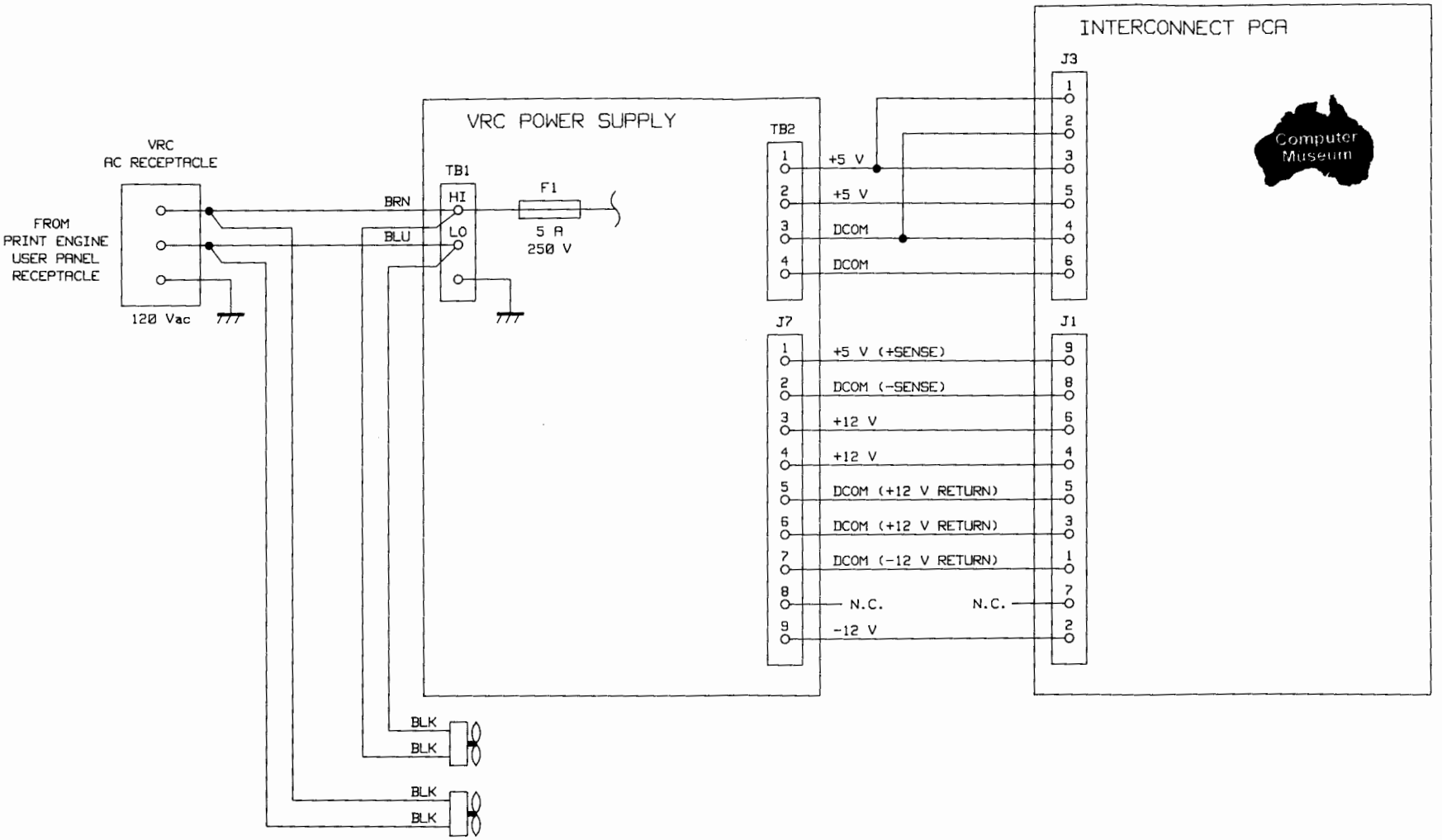
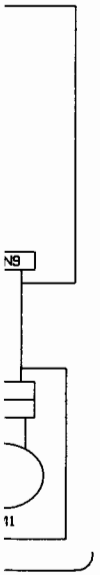


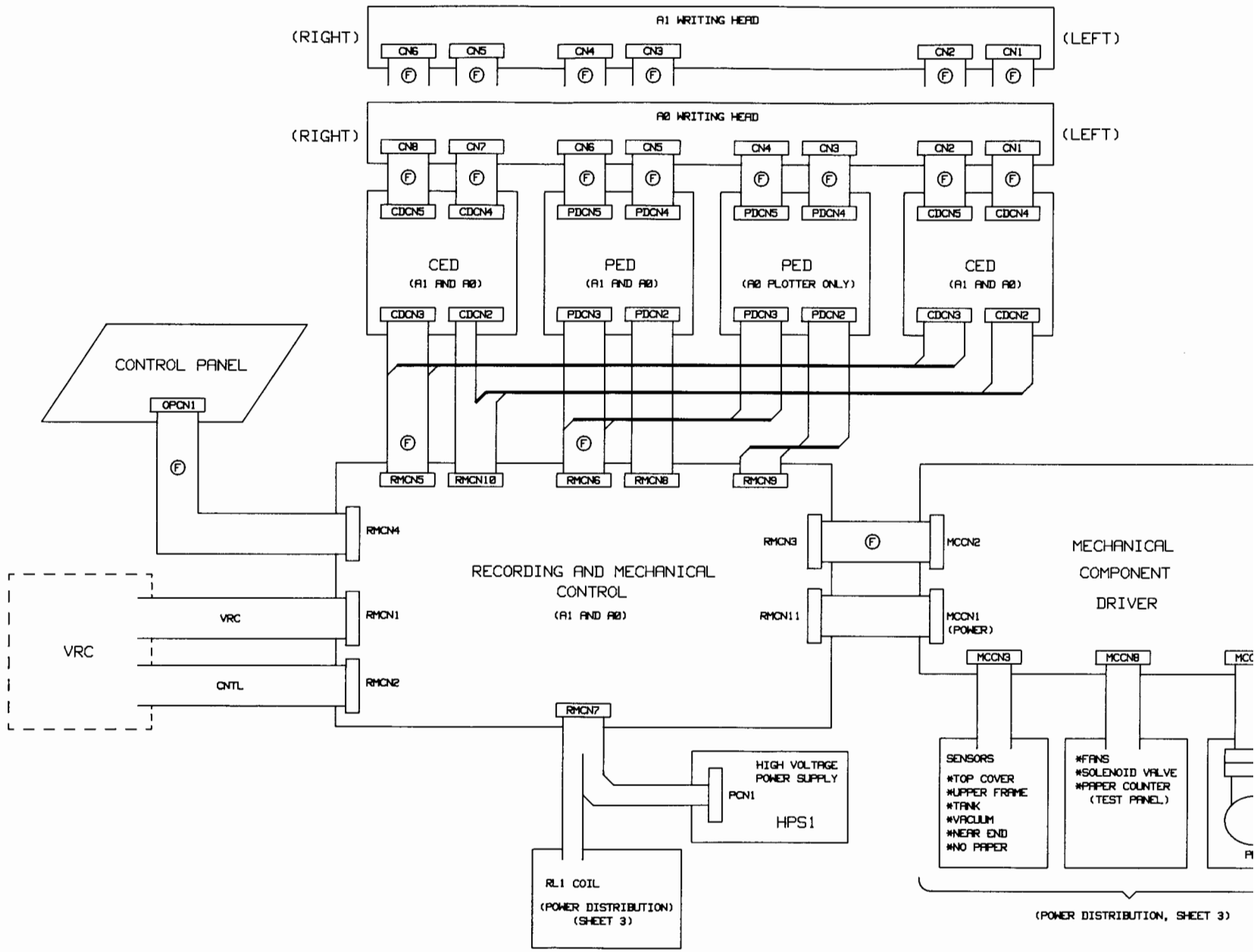
Figure 9-5. Power Distribution Diagram
(Sheet 4 of 4)

7600-B-116-1



NOTES:
1. CED = CONTROL ELECTRODE DRIVER.
2. PED = PIN ELECTRODE DRIVER.
3. (F) MARKED ON THE CABLE MEANS "FLAT CABLE".
4. VRC = VECTOR TO RASTER CONVERTER.

Figure 9-6. Interconnecting Cabling Diagram


A1 WRITING HEAD
(RIGHT)
(LEFT)
CN6
CN5
CN4
CN3
CN2
CN1
A0 WRITING HEAD
(RIGHT)
(LEFT)
CN8
CN7
CDCN5
CDCN4
PDCN5
PDCN4
CED
(A1 AND A0)
PED
(A1 AND A0)
PED
(A0 PLOTTER ONLY)
CED
(A1 AND A0)
CDCN3
CDCN2
PDCN3
PDCN2
CONTROL PANEL
OPCN1
RMCN5
RMCN10
RMCN6
RMCN8
RMCN9
RMCN4
RMCN1
RMCN2
VRC
CNTL
RECORDING AND MECHANICAL
CONTROL
(A1 AND A0)
RMCN3
RMCN11
MCCN2
MCCN1
(POWER)
MECHANICAL
COMPONENT
DRIVER
MCCN3
MCCN8
RMCN7
HIGH VOLTAGE
POWER SUPPLY
PCN1
HPS1
SENSORS
*TOP COVER
*UPPER FRAME
*TANK
*VACUUM
*NEAR END
*NO PAPER
*FANS
*SOLENOID VALVE
*PAPER COUNTER
(TEST PANEL)
RL1 COIL
(POWER DISTRIBUTION)
(SHEET 3)
(POWER DISTRIBUTION, SHEET 3)

7600-D-117-1

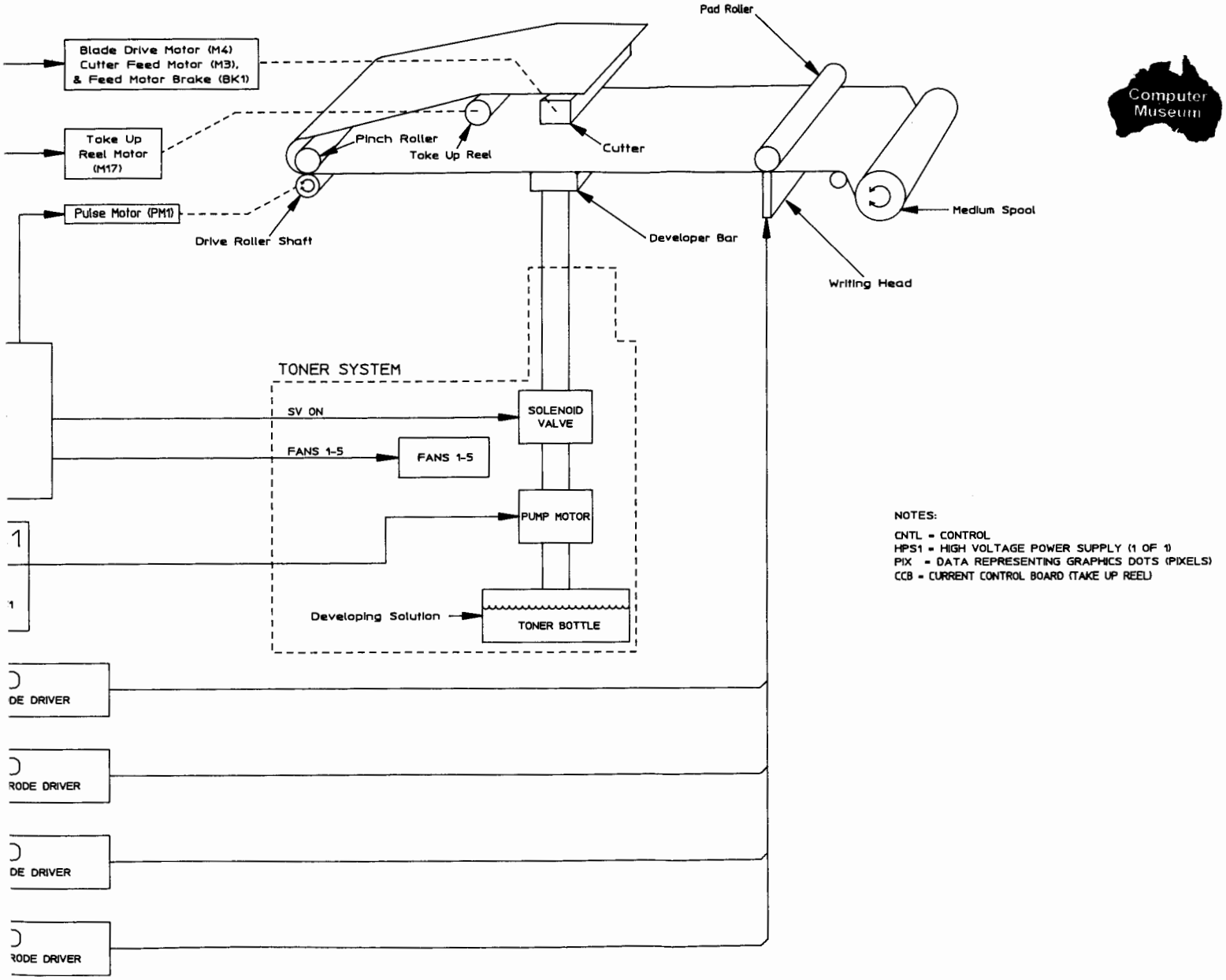
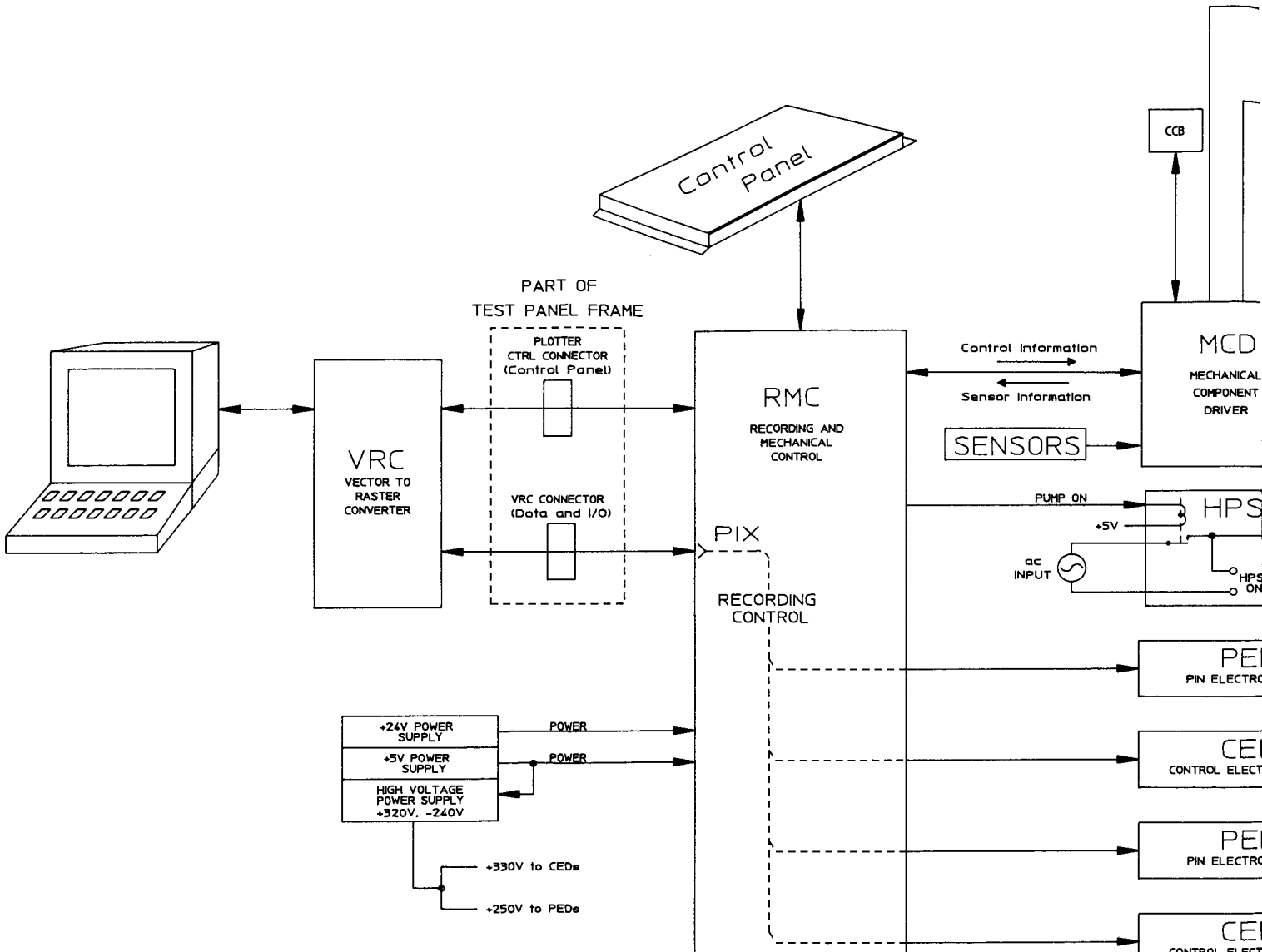


Figure 9-7. HP Model 250/255 Functional Block Diagram


Control Panel
CCB
PART OF
TEST PANEL FRAME
PLOTTER
CTRL CONNECTOR
(Control Panel)
VRC
VECTOR TO
RASTER
CONVERTER
VRC CONNECTOR
(Data and I/O)
RMC
RECORDING AND
MECHANICAL
CONTROL
PIX
RECORDING
CONTROL
Control Information
Sensor Information
SENSORS
MCD
MECHANICAL
COMPONENT
DRIVER
PUMP ON
+5V
ac
INPUT
HPS
+24V POWER
SUPPLY
+5V POWER
SUPPLY
HIGH VOLTAGE
POWER SUPPLY
+320V, -240V
POWER
POWER
+330V to CEDs
+250V to PEDs

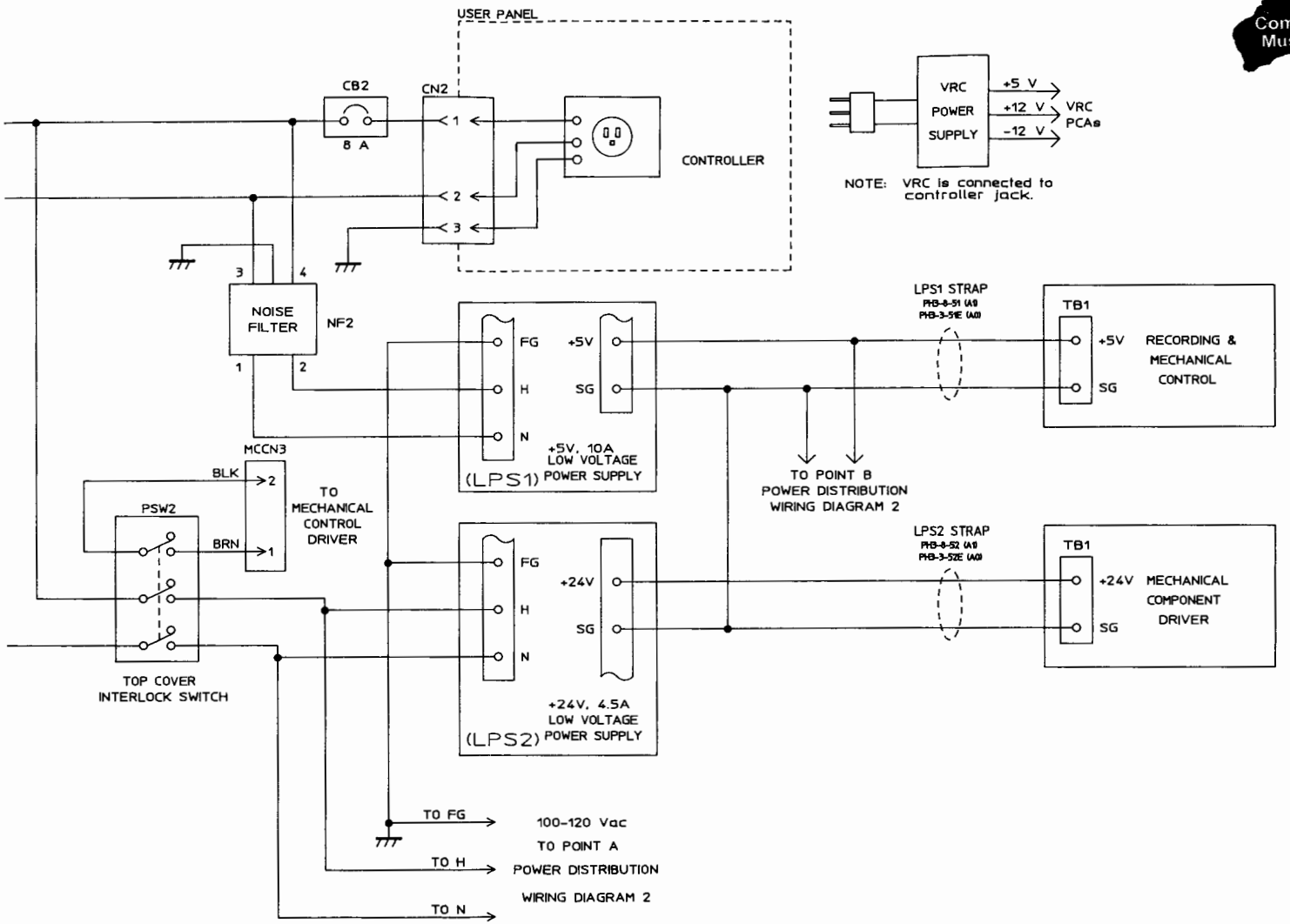
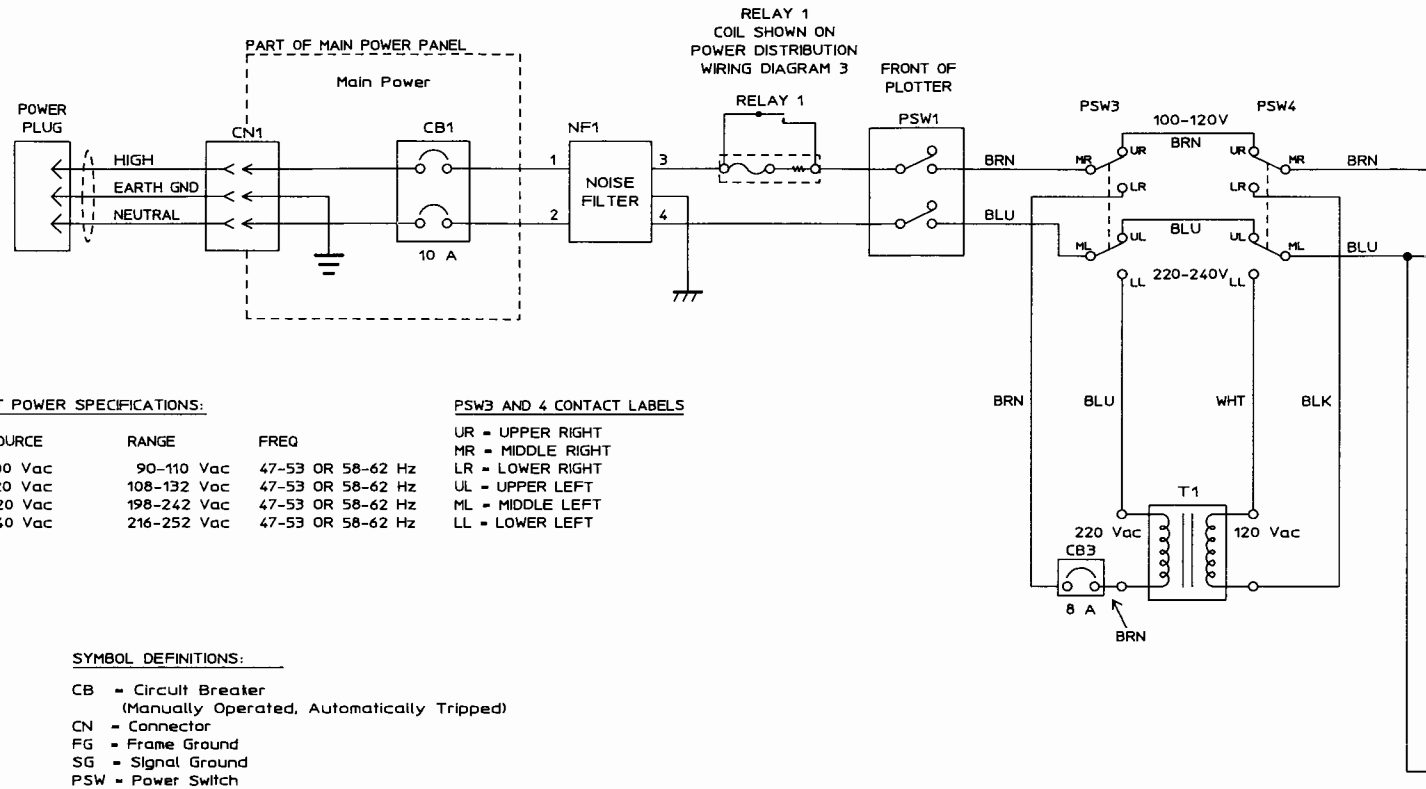


Figure 9-8. Power Distribution Diagram
(Sheet 1 of 5)



INPUT POWER SPECIFICATIONS:

SOURCE	RANGE	FREQ
100 Vac	90-110 Vac	47-53 OR 58-62 Hz
120 Vac	108-132 Vac	47-53 OR 58-62 Hz
220 Vac	198-242 Vac	47-53 OR 58-62 Hz
240 Vac	216-252 Vac	47-53 OR 58-62 Hz

PSW3 AND 4 CONTACT LABELS

UR = UPPER RIGHT
MR = MIDDLE RIGHT
LR = LOWER RIGHT
UL = UPPER LEFT
ML = MIDDLE LEFT
LL = LOWER LEFT

SYMBOL DEFINITIONS:

CB = Circuit Breaker
(Manually Operated, Automatically Tripped)
CN = Connector
FG = Frame Ground
SG = Signal Ground
PSW = Power Switch
VRC = Vector to Raster Converter

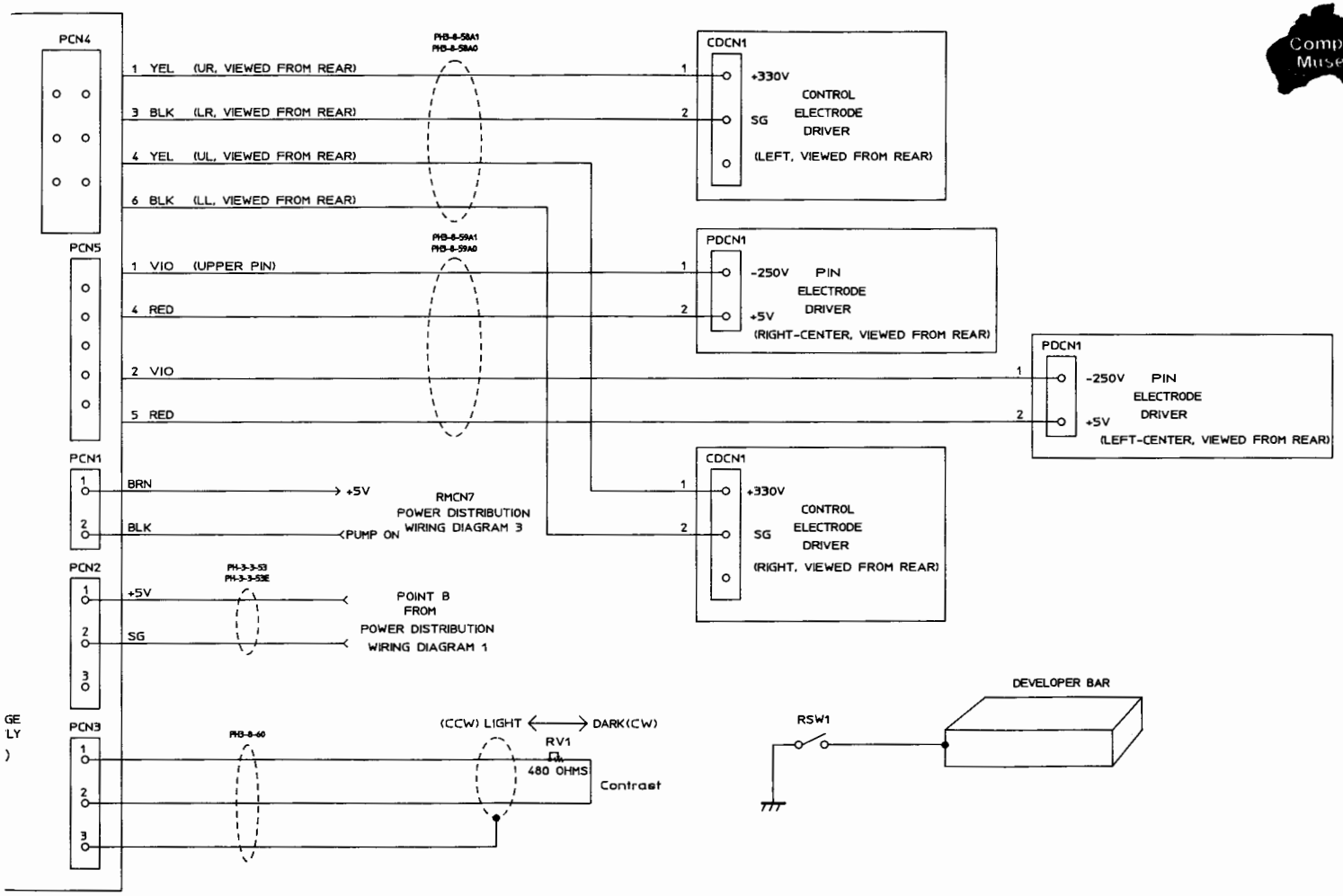
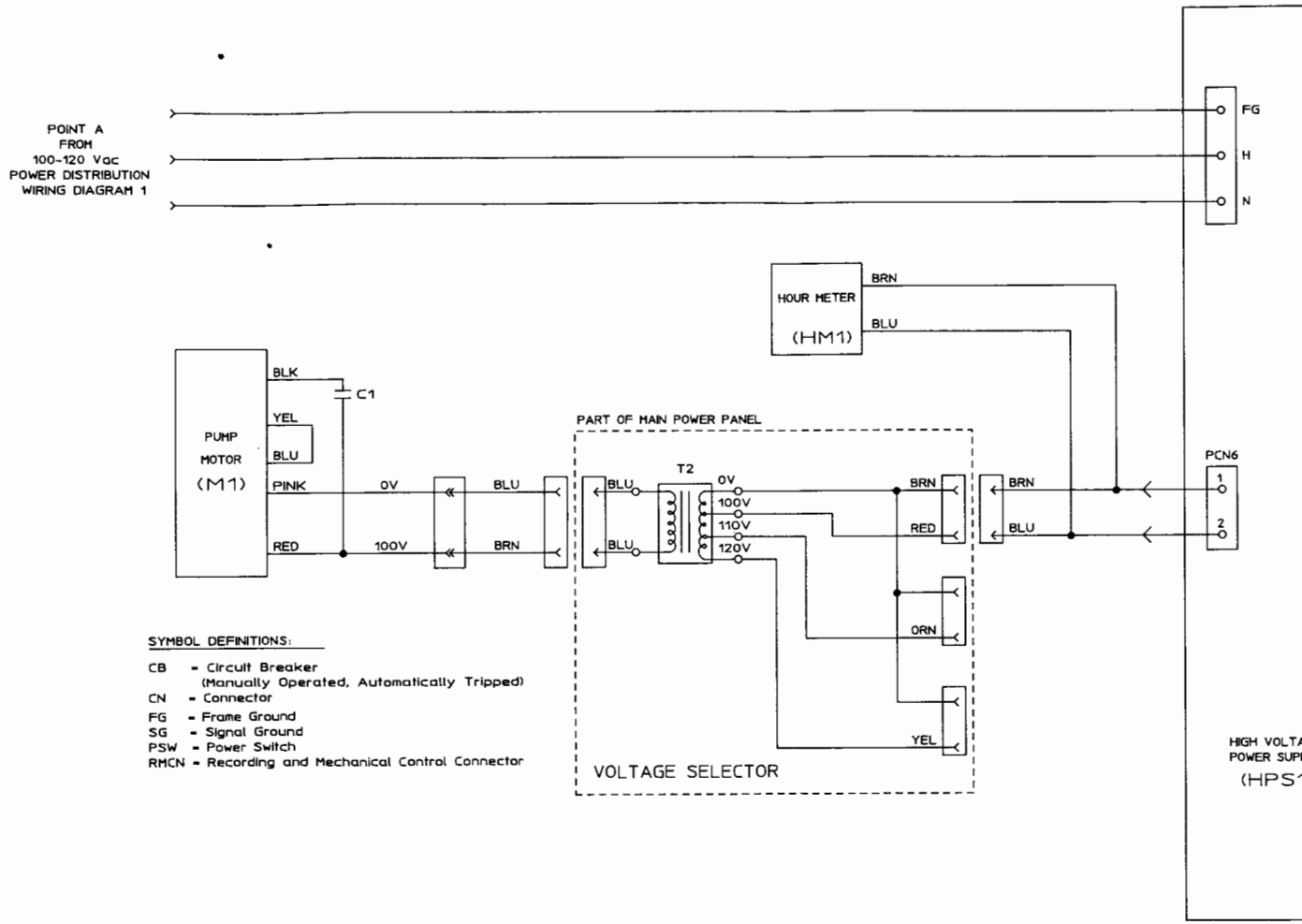


Figure 9-9. Power Distribution Diagram
(Sheet 2 of 5)


POINT A
FROM
100-120 Vac
POWER DISTRIBUTION
WIRING DIAGRAM 1
FG
H
N
HOUR METER
(HM1)
BRN
BLU
PUMP
MOTOR
(M1)
BLK
C1
YEL
BLU
PINK
RED
0V
100V
BLU
BRN
PART OF MAIN POWER PANEL
T2
0V
100V
110V
120V
BRN
RED
ORN
YEL
PCN6
1
2
SYMBOL DEFINITIONS:
CB = Circuit Breaker
(Manually Operated, Automatically Tripped)
CN = Connector
FG = Frame Ground
SG = Signal Ground
PSW = Power Switch
RMCN = Recording and Mechanical Control Connector
VOLTAGE SELECTOR

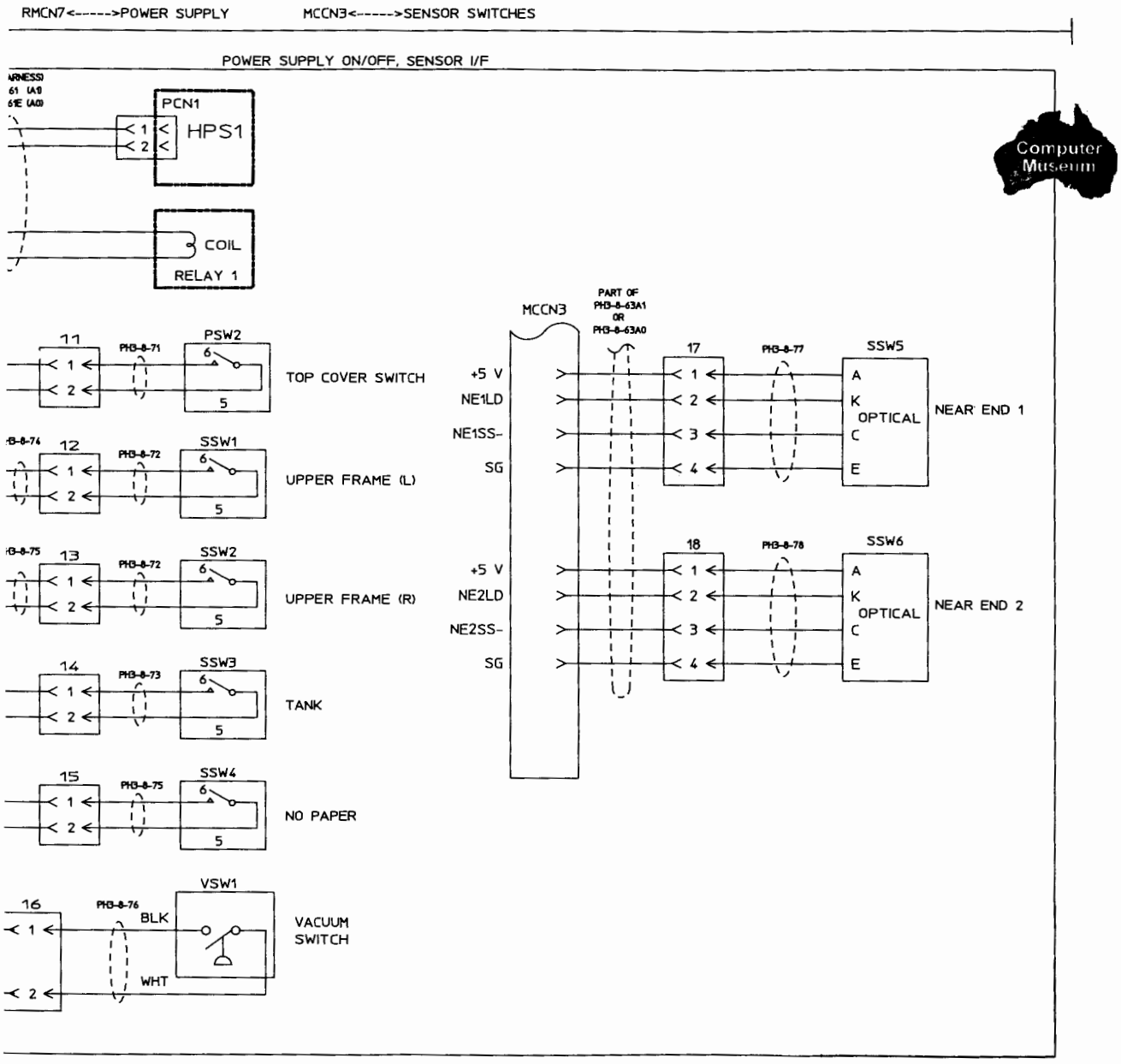
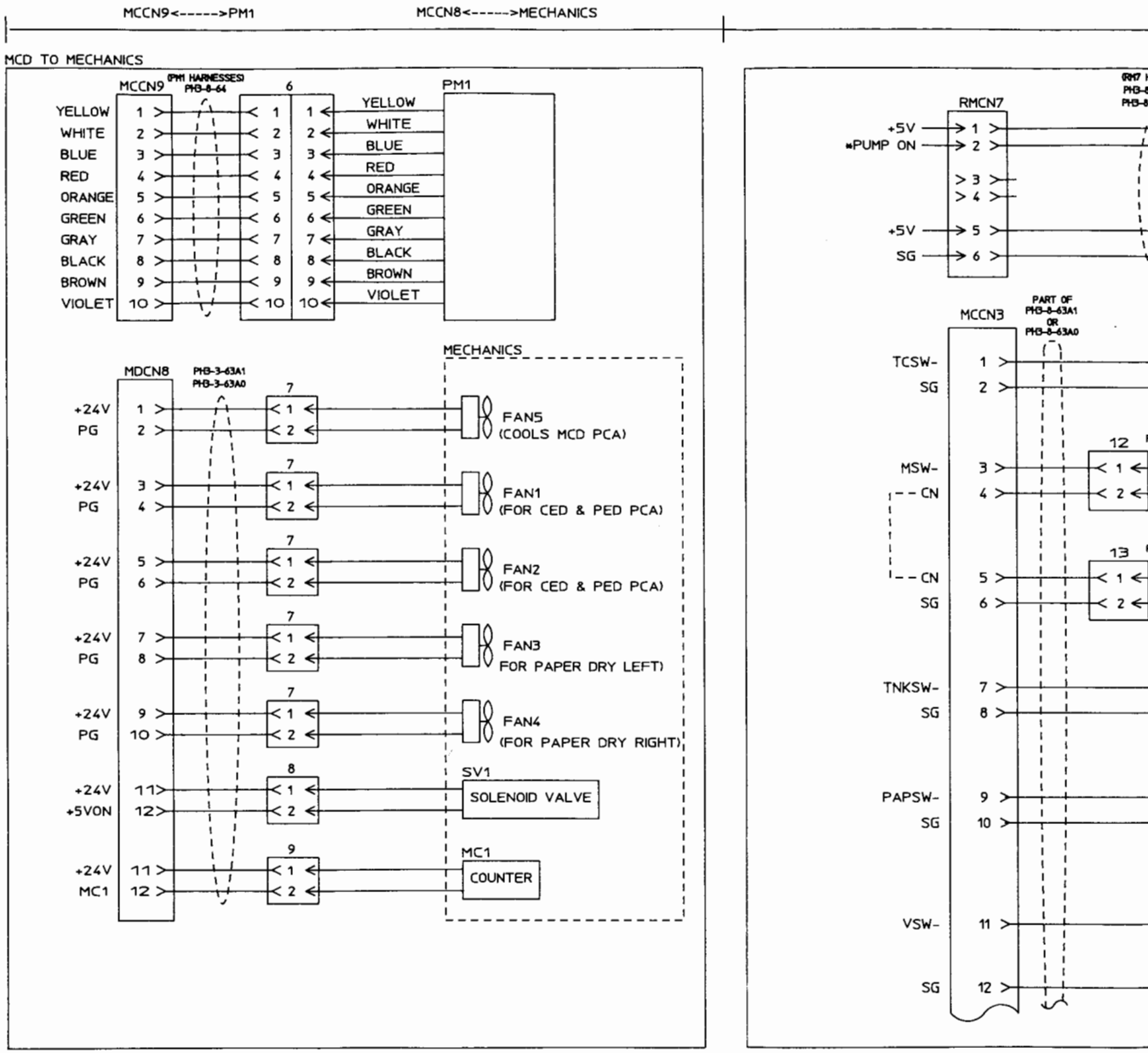


Figure 9-10. Power Distribution Diagram
(Sheet 3 of 5)


MCCN9<------>PM1
MCCN8<------>MECHANICS
MCD TO MECHANICS
MCCN9
(PM1 HARNESSES)
PHB-8-64
6
PM1
YELLOW 1
WHITE 2
BLUE 3
RED 4
ORANGE 5
GREEN 6
GRAY 7
BLACK 8
BROWN 9
VIOLET 10
MECHANICS
MDCN8
PHB-3-63A1
PHB-3-63A0
+24V 1
PG 2
FAN5
(COOLS MCD PCA)
+24V 3
PG 4
FAN1
(FOR CED & PED PCA)
+24V 5
PG 6
FAN2
(FOR CED & PED PCA)
+24V 7
PG 8
FAN3
FOR PAPER DRY LEFT)
+24V 9
PG 10
FAN4
(FOR PAPER DRY RIGHT)
SV1
+24V 11
+5VON 12
SOLENOID VALVE
MC1
+24V 11
MC1 12
COUNTER
RMCN7
+5V 1
*PUMP ON 2
+5V 5
SG 6
MCCN3
PART OF
PHB-8-63A1
OR
PHB-8-63A0
TCSW- 1
SG 2
MSW- 3
CN 4
CN 5
SG 6
TNKSW- 7
SG 8
PAPSW- 9
SG 10
VSW- 11
SG 12

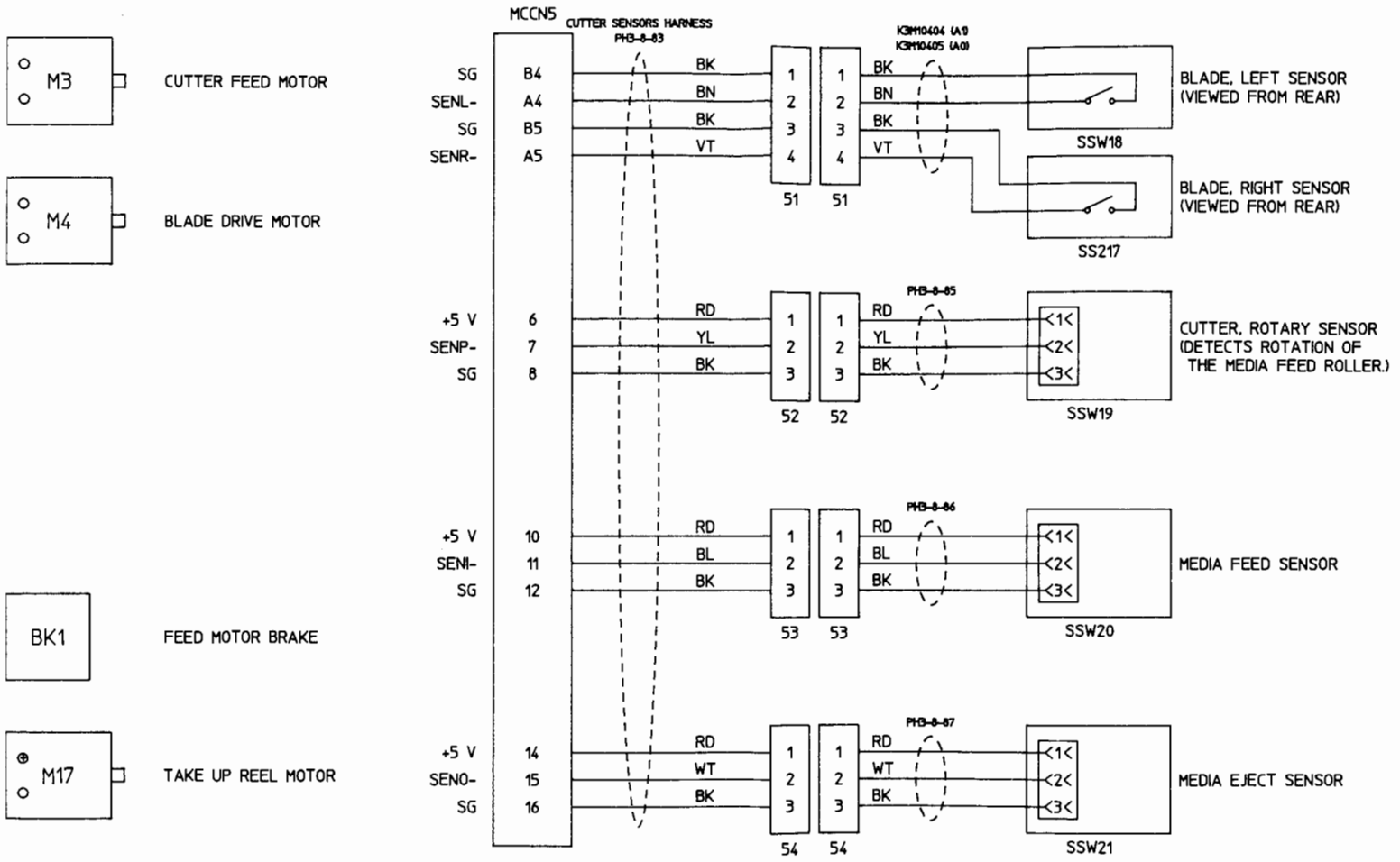
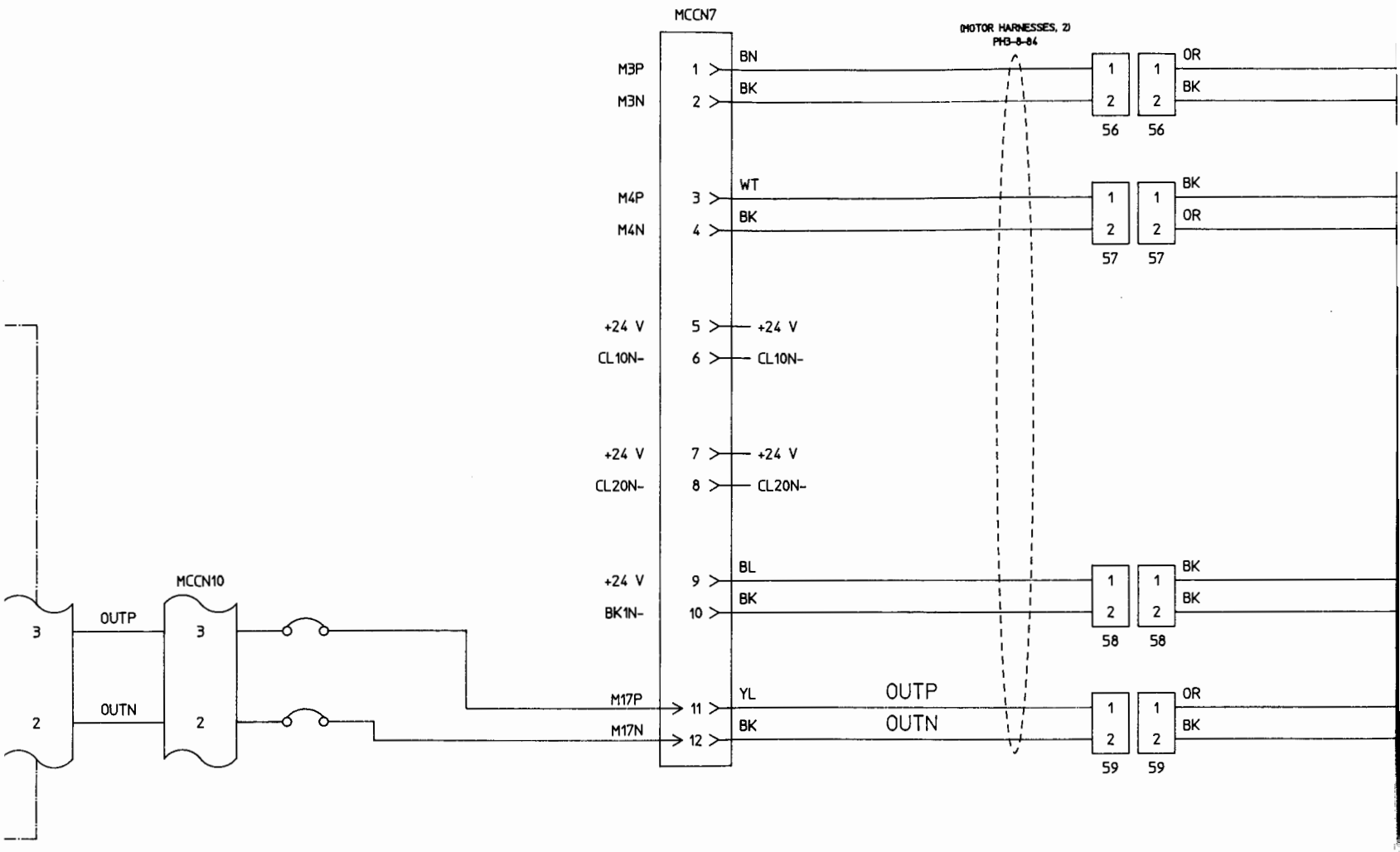
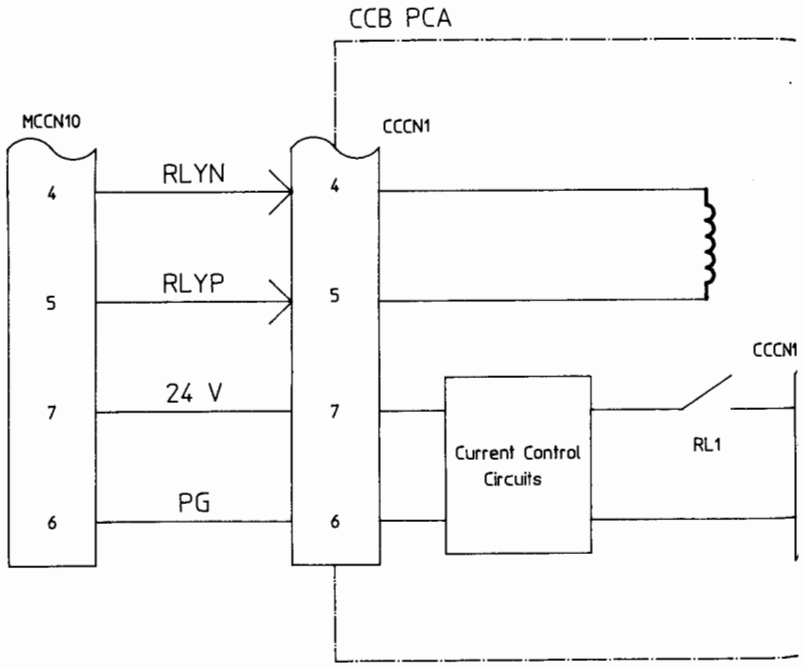


Figure 9-11. Power Distribution Diagram
(Sheet 4 of 5)


MCCN7
(MOTOR HARNESSES, 2)
PHB-8-84
M3P
M3N
M4P
M4N
+24 V
CL10N-
+24 V
CL20N-
+24 V
BK1N-
M17P
M17N
1
2
3
4
5
6
7
8
9
10
11
12
BN
BK
WT
BK
+24 V
CL10N-
+24 V
CL20N-
BL
BK
YL
BK
OUTP
OUTN
OR
BK
BK
OR
BK
BK
OR
BK
56
56
57
57
58
58
59
59
MCCN10
3
2
OUTP
OUTN
3
2


CCB PCA
MCCN10
CCCN1
RLYN
RLYP
24 V
PG
4
5
7
6
4
5
7
6
Current Control Circuits
CCCN1
RL1

C1625-D-14-1

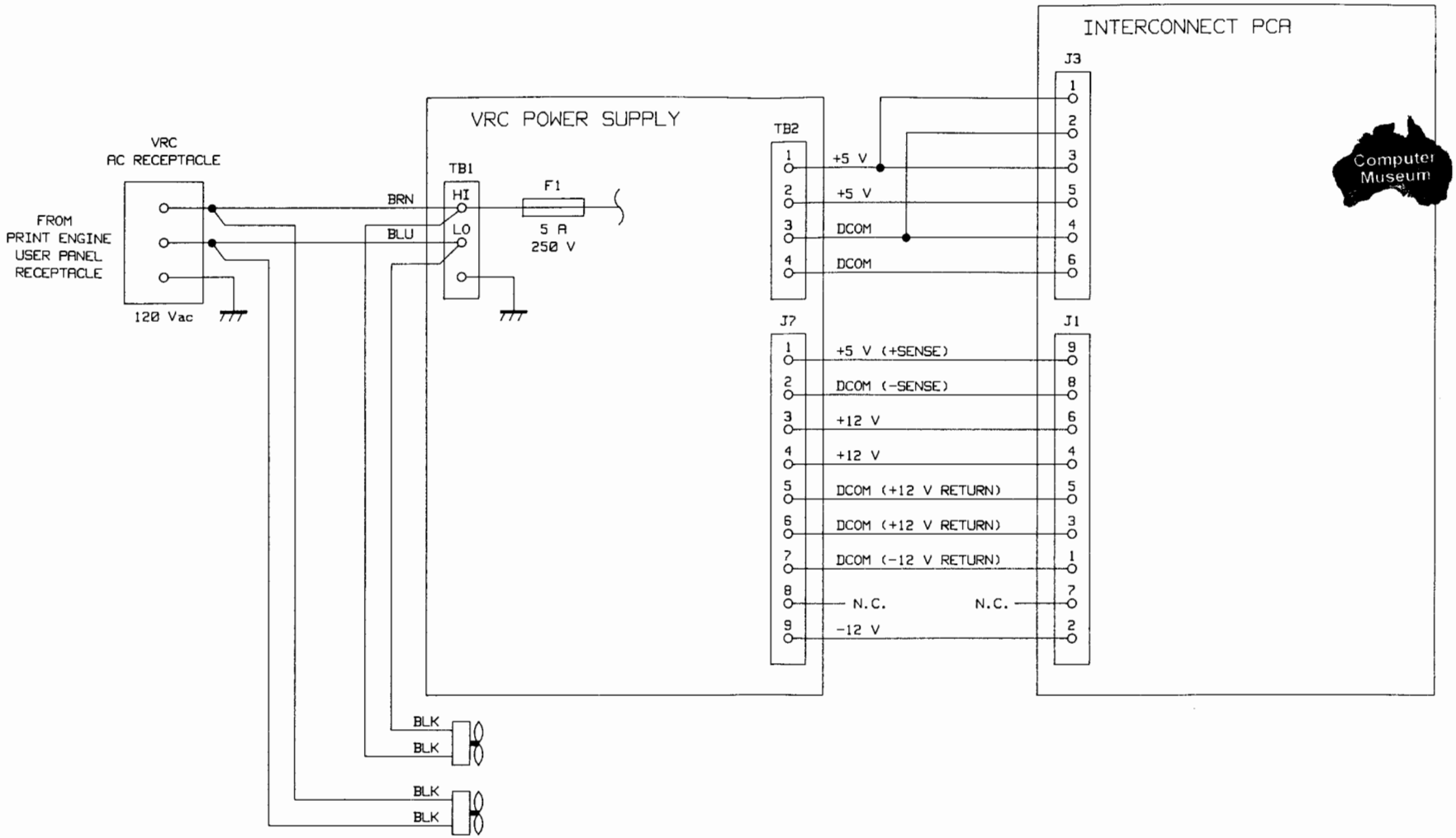


Figure 9-12. Power Distribution Diagram
(Sheet 5 of 5)

7600-B-116-1

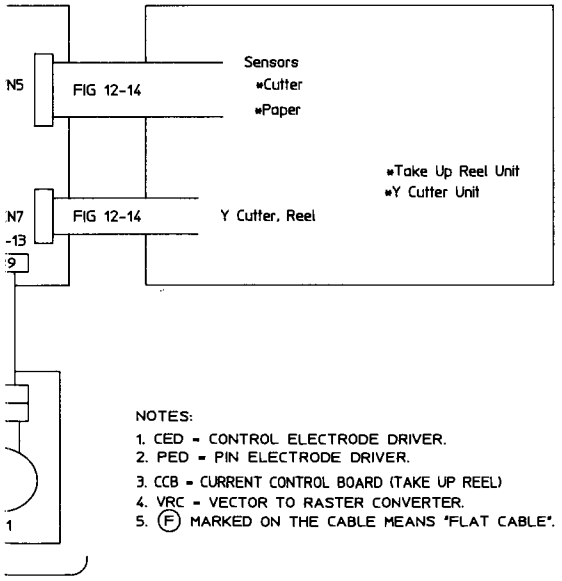
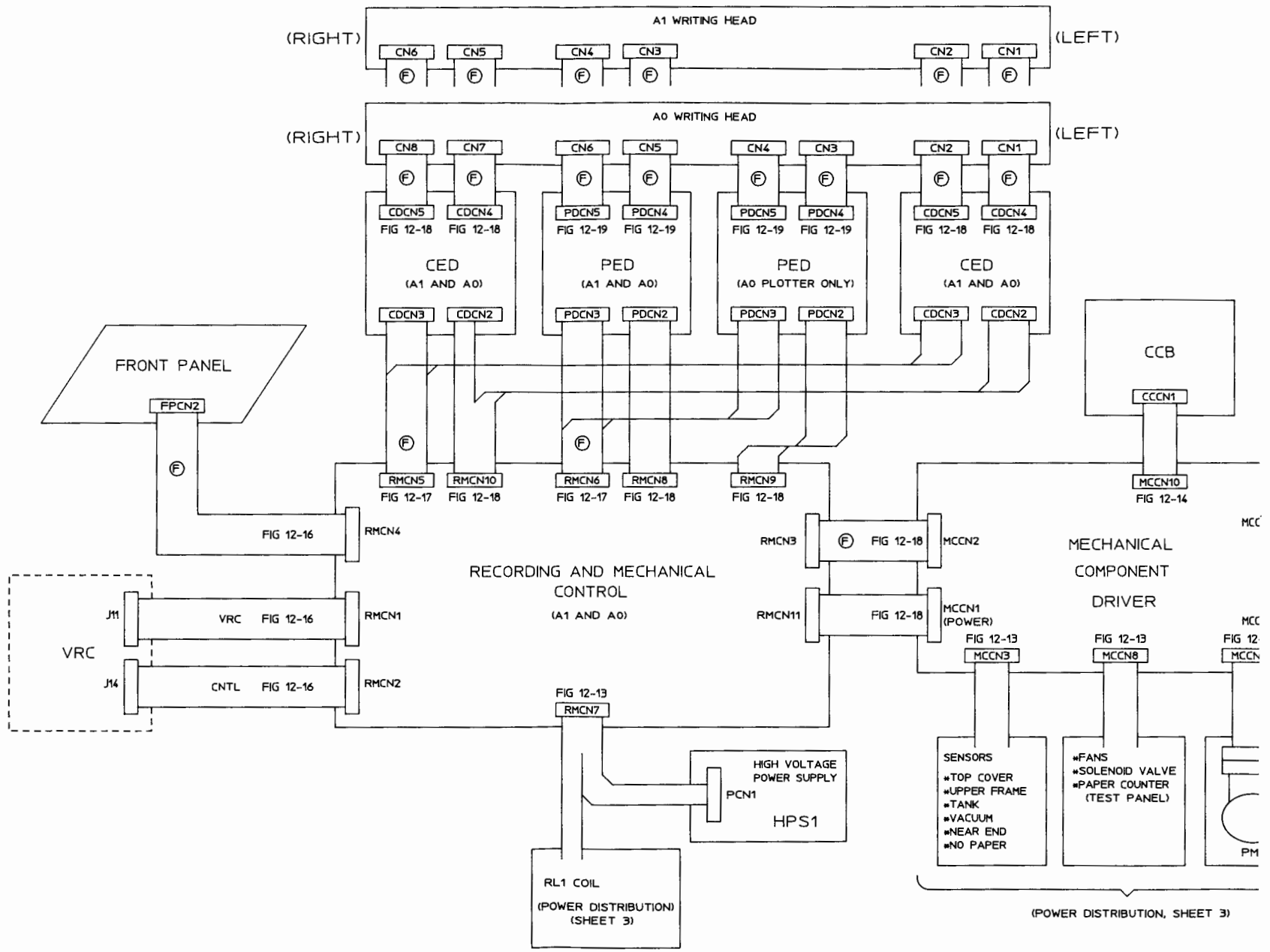


Figure 9-13. Interconnecting Cabling Diagram


A1 WRITING HEAD
(RIGHT)
(LEFT)
CN6
CN5
CN4
CN3
CN2
CN1
A0 WRITING HEAD
(RIGHT)
(LEFT)
CN8
CN7
CN6
CN5
CN4
CN3
CN2
CN1
CDCN5
CDCN4
PDCN5
PDCN4
PDCN5
PDCN4
CDCN5
CDCN4
FIG 12-18
FIG 12-19
CED
(A1 AND A0)
PED
(A1 AND A0)
PED
(A0 PLOTTER ONLY)
CED
(A1 AND A0)
CDCN3
CDCN2
PDCN3
PDCN2
PDCN3
PDCN2
CDCN3
CDCN2
FRONT PANEL
FPCN2
CCB
CCCN1
RMCN5
RMCN10
RMCN6
RMCN8
RMCN9
FIG 12-17
FIG 12-18
MCCN10
FIG 12-14
FIG 12-16
RMCN4
RMCN3
FIG 12-18
MCCN2
MECHANICAL
COMPONENT
DRIVER
RECORDING AND MECHANICAL
CONTROL
(A1 AND A0)
J11
VRC
FIG 12-16
RMCN1
RMCN11
MCCN1
(POWER)
VRC
J14
CNTL
FIG 12-16
RMCN2
FIG 12-13
MCCN3
MCCN8
FIG 12-13
RMCN7
HIGH VOLTAGE
POWER SUPPLY
PCN1
HPS1
SENSORS
*TOP COVER
*UPPER FRAME
*TANK
*VACUUM
*NEAR END
*NO PAPER
*FANS
*SOLENOID VALVE
*PAPER COUNTER
(TEST PANEL)
RL1 COIL
(POWER DISTRIBUTION)
(SHEET 3)
(POWER DISTRIBUTION, SHEET 3)

CONTENTS

TABLES

SECTION X
REFERENCE

10-1. INTRODUCTION

10-2. This chapter contains miscellaneous reference material including reference publications, schematic diagram symbols, Hewlett-Packard Graphics Language instructions, mnemonics and a glossary.

10-3. OTHER MANUALS AND REFERENCES

10-4. In addition to this manual, other publications which apply to the HP 7600 Models 240D/E and 240/255 are listed in Table 10-1.

10-5. OTHER TECHNICAL DATA

10-6. Table 10-2 contains a list of abbreviations of organizations that contribute to the electronics publications standards used in this manual.

10-7. CODE LISTINGS

10-8. The HP 7600 Models 240D/E and 250/255 use the Hewlett-Packard Graphics Language/2 (HP-GL/2) instructions listed in Table 10-3. The instructions are programmed into the plotter through an external controller.

10-9. Self-test error codes for HP 7600 Models 240D/E and front panel error codes for HP 7600 Models 250/255 are listed in Section V of this handbook.

10-10. MNEMONICS

10-11. Mnemonics used through out this handbook are listed alphabetically in Table 10-4.

10-12. GLOSSARY

10-13. A glossary of the terms used in this handbook is listed alphabetically in Table 10-5.

Table 10-1. Other HP 7600 Model 240D/E and Model 250/255 Publications

PUBLICATION	HP PART NUMBER
Programmers Guide	C1600-90001
Users Guide	C1600-90002
Quick Reference	C1600-90009
Set-Up Guide	C1620-90002

Table 10-2. Organizational Abbreviations

ABBREVIATION	FULL NAME
ANSI	American National Standards Institute
CCITT	International Telephone and Telegraph Consultive Committee
EIA	Electronics Industries Association
IEEE	Institute of Electrical and Electronic Engineers
ISO	International Organization for Standardization

Table 10-3. HP-GL/2 Instructions

COMMAND	MNEM-ONIC	PARAMETERS	HP-GL/2	7586B
LINE AND FILL ATTRIBUTES GROUP				
Line Type	LT	(line_type (,pattern_length (,mode)));	✓	
Line Type	LT	(line_type (,pattern_length));		✓
Line Attributes	LA	(kind,value... (,kind,value));	✓	
User Defined Line Type	UL	(index (,gap_1...gap_n));	✓	
User-Defined Fill Type	UF	gap_1(,gap_2,...gap_3);		✓
Fill Type	FT	(fill_type (,option_1 (,option_2)));	✓	✓
Symbol Mode	SM	(char);	✓	✓
Raster Fill Definition	RF	(index(,width, height,pen_number ...pen_number));	✓	
Select Pen Group	SG	n;		✓
Pen Width	PW	(width(,pen));	✓	✓
Pen Width Unit Selection	WU	(type);	✓	

Table 10-3. HP-GL/2 Instructions (Continued)

COMMAND	MNEM-ONIC	PARAMETERS	HP-GL/2	7586B
Select Pen	SP	(pen);	✓	✓
Tick Length	TL	Tp(,Tn);		✓
X-Tick	XT			✓
Y-Tick	YT			✓
Anchor Corner	AC	(x_coord,y_coord);		
CONFIGURATION AND STATUS GROUP				
Scale	SC	(x1,x2,y1,y2 (,type(,left, bottom)); or (x1, xfactor,y1, yfactor,2);	✓	✓
Input Window	IW	(xLL,yLL,xUR, yUR);	✓	✓
Input P1 and P2	IP	(p1x,p1y(,p2x, p2y));	✓	✓
Input Relative P1 and P2	IR	(p1x,p1y(,p2x, p2y));	✓	
Default Values	DF		✓	✓
Initialize	IN	(n);	✓	✓
Input Mask	IM	E_value(,S_value (,P_value));		✓
Frame Advance	FR		✓	✓

Parameters in parentheses are optional.

Table 10-3. HP-GL/2 Instructions (Continued)

COMMAND	MNEM-ONIC	PARAMETERS	HP-GL/2	7586B
CONFIGURATION AND STATUS GROUP (continued)				
Advance Half Page	AH			✓
Enable Cutter	EC		✓	
Message	MG		✓	
Advance Full Page	AF		✓	
Replot	RP	(n);	✓	✓
Not Ready	NR	(timeout)	✓	✓
Page Size	PS	(length (,width))	✓	✓
Rotate Coordinate System	RO	(angle);	✓	✓
Begin Plot	BP	(kind, value ... (kind, value));	✓	
OUTPUT STATUS GROUP				
Output Actual Position	OA			✓
Output Commanded Position	OC			✓
Parameters in parentheses are optional.				

Table 10-3. HP-GL/2 Instructions (Continued)

COMMAND	MNEM-ONIC	PARAMETERS	HP-GL/2	7586B
OUTPUT STATUS GROUP (Continued)				
Output Digitized Point	OD			✓[2]
Output Error	OE		✓	✓
Output Factors	OF			✓
Output Hard-clip Limits	OH		✓	✓
Output Identification	OI		✓	✓
Output Label Length	OL			✓
Output Options	OO			✓
Output P1 and P2	OP		✓	✓
Output Status	OS		✓	✓
Output Carousel Type	OT			✓[2]
Output Window	OW			✓

Parameters in parentheses are optional.

2 - Dummy response returned: (OD 0,0,0)(OT -1,255)

Table 10-3. HP-GL/2 Instructions (Continued)

COMMAND	MNEM-ONIC	PARAMETERS	HP-GL/2	7586B
PALETTE EXTENSIONS				
Set Color Range for Relative Color Data	CR	(b_ref_red, w_ref_red,b_ref_grn, w_ref_grn, b_ref_blue, w_ref_blue);	✓	
Number of Pens	NP	(number);	✓	
Pen Color Assignment	PC	(pen(,red,grn, blue));	✓	
Screened Vectors	SV	(screen_type(,opt1 (,opt2)));	✓	
Transparency Mode	TR	(mode);	✓	
Merge Control	MC	(mode);	✓	
Parameters in parentheses are optional.				

Table 10-4. Mnemonics

MNEMONIC	DEFINITION
ADCK	Address Clock
ADDR	Address
ALARM	Vacuum Error
AST	Address Strobe
ATN	Attention
BERR	Buffer Error
BYTEENS	Swath RAM Byte Enable signal
CACK	Centronics Acknowledge
CB	Centronics Buffer
CB	Circuit Breaker
CBUSY	Centronics Interface Busy
CED	Control Electrode Driver
CENTRD	Centronics Read
CENTRNC	Centronics Control
CHARROM	Character ROM
CINIT	Centronics Interface Initialize
CN	Connector (MCCN - Mechanical Component Connector)
CNTL	Control
CS	Chip Select
CSTROBE	Centronics Strobe
CTRL	Control
DA	Data Address
DATALCH	Data Latch
DAV	Data Valid
DBEN	Data Buffer Enable
DBENI	Data Buffer Enable after Interface

Table 10-4. Mnemonics (Continued)

MNEMONIC	DEFINITION
DEV	Device (Align Media LED)
DMA	Direct Memory Access
DS	Data Strobe
DSW	Dip Switch
DVRST	Vacuum Alarm Reset
EIA	Electrostatically
ESC	Escape
FAN	Fan Enable Signal (Fans 3 & 4 only)
FED	Feed (media advance signal to panel)
FG	Frame Ground
GL	Graphics Language
HDEN	High Density
Hg	Mercury
HM1	Hour Meter (1)
HPCS	HP-IB Chip Select
HP-GL/2	Hewlett-Packard Graphics Language (1988 revision)
HPRD	HP-IB Read
HPS1	High Voltage Power Supply
IAC	Interrupt Acknowledge
IFCN	Interface Connector
INT	Interrupt
I/O	Input/Output
IPL	Interrupt Priority Level
IRQ	Interrupt Request
LB	Loop Back
LED	Light Emmitting Diode
LPS1	Low Voltage Power Supply
M1	Motor (1) (pump motor)

Table 10-4. Mnemonics (Continued)

MNEMONIC	DEFINITION
MB	Megabyte
MC1	Mechanical Counter (1)
MCON	Mechanical Counter On
MCD	Mechanical Component Driver
MFED	Media Feed (from panel)
MPU	Main Processing Unit
MSW	Mechanical Switch
MUX	Multiplexer
NDAC	Not Data Acknowledge
NEND	Near End (approx. 5 m)
NF1	Noise Filter
NOPAP	No Paper
OE	Output Enable
OFFBRD	Off Board
ONL	On Line
ONLINE	Ready for Commands
PAPSW	Paper Switch
PCA	Printed Circuit Assembly
PCB	Printed Circuit Board
PED	Pin Electrode Driver
PG	Page
PIX	Picture Data Bits H=Black
PLT	Plot
PM	Preventive Mainenance
PNL	Panel
POWUP	Power Up
PPM	Pulses per Minute
ppm	Parts per Million
PPW	Pin Pulse Width
PSW	Power Switch
PUMPON	Pump ON signal

Table 10-4. Mnemonics (Continued)

MNEMONIC	DEFINITION
RCK	Recording Clock Signal
RDY	Ready
RECK	Record Enable Clock
REMOTE	Plotter Start
RENA	Record Enable
RESETB	Reset after Buffering
RESETI	Reset Interrupt
RL1	Relay (1)
RMC	Recording and Mechanical Controller
RST	Reset
RV1	Variable Resistor (1) (contrast control)
SG	Signal Ground
SIZ	Size
STEP	Media Advance to motor
STPA	Step Pulse return
STROBEL	Strobe Latch
SV1	Solenoid Valve
SVON	Solenoid Valve ON (open)
SYSRAM	Processor Random Access Memory
SYSROM	Processor ROM
TCSW	Top Cover Switch
TNKSW	Tank Switch
TPNL	Test Panel
TSW	Test Switch
µp	Microprocessor
VRC	Vector-to-Raster Converter
VSW	Vacuum Switch
VSWON	Vacuum Switch ON (closed)

Table 10-4. Mnemonics (Continued)

MNEMONIC	DEFINITION
WPL	Words per Line
XBar	Crossbar
XCEIVER	Transceiver
XCVR	Transceiver

Table 10-5. Glossary

Clear Dispersant	A highly purified isoparafinic hydrocarbon that is used for the base in the toner solution. The clear dispersant is also used for flushing and cleaning the toner system as a part of periodic maintenance.
Control Electrode	The 4 mm wide electrical contact which establishes the bias voltage for generating the electrostatic image on the media. +300 V potential
Cutter	In the HP Model 250/255, this term usually refers to the motor driven automatic cutter built into the plotter. The cutter is controlled either from the front panel or through the program.
Developer	The liquid (also called TONER) which is passed over the media and deposited on the electrostatic image to create the visible image.
Developer Bar	The mechanical device used to deposit toner on the media. As the media passes over the bar, toner is pumped through open channels and adheres to the electrostatic pattern.
Drop Out	A missing dot image on the media. This can be caused by a shorted pin electrode or by a defective pin driver.
Flare	A condition where the diameter of the dot image on the media exceeds the diameter of the pin electrode producing the image.

Table 10-5. Glossary (Continued)

Front Panel	The user interface for the plotter. Includes the liquid crystal display, light emitting diodes and push buttons. Allows control of a majority of the plotter functions.
HP-GL/2	The 1988 update/revision of the Hewlett-Packard Graphics Language.
HSTK	Horizontal Stack – Plotter Set-Up menu Media Handling selection with the cutter. The media is cut immediately after the plot. (See VSTK)
LCD	Liquid Crystal Display – The plotter front panel display for user interface.
Medium/Media	The substance upon which the image is created. In the case of the electrostatic plotters, this is paper, vellum, or plastic film which has been treated to hold an electrostatic charge to attract the toner particles.
Pin Electrode	The 60 μm diameter electrode that electrostatically impresses the image upon the media. -240 V potential
Pixel	Picture element. HP Model 255 has 14 336 pixels/line.
Print Engine	The part of the plotter that prints the raster image on the media. See Vector-to-Raster Converter.

Table 10-5. Glossary (Continued)

Raster Image	A bit-mapped representation of a graphics image.
Queueing	The ordering of plots to be printed (also called spooling). May be user controlled from the front panel.
Raster	A matrix of dots, or pixels. Each pixel is defined by a bit. A bit that is "off" will leave the area blank.
Swath	A 256 line division of the raster graphics image.
Take-Up Reel	(TUR) The motor driven spindle built into the plotter that rolls up the plots as they are completed.
TGauge	Front panel menu display term for the Toner Gauge. A firmware routine counts raster dots to determine toner use. When a predetermined number is reached, the Status menu indicates Replace Toner. The Toner Gauge must be reset at this time.
Toner	A combination of liquid isoparaffinic hydrocarbons, carbon particles, and fixing agent formulated to render the latent electrostatic image on the media visible.
TUR	Take-Up Reel

Table 10-5. Glossary (Continued)

Vector-to-Raster Converter	An electronic device which converts lines represented by vectors of a given magnitude and direction into raster images which are represented by a series of dots on the media.
VSTK	Vertical Stack – Plotter Set-Up menu Media Handling selection with the cutter. The minimum length of media is 630 mm (25 in.). (See HSTK)
Writing Head	The electromechanical device containing the control and pin electrodes which deposit the electrostatic pattern on the plotting media.

CONTENTS

SECTION XI

SERVICE NOTES/IOSMs

11-1. INTRODUCTION

11-2. This section is reserved for the insertion of any Service Notes and/or Inter-Office Memos (IOSMs) that may be generated for the HP 7600 Models 240D/E and 250/255.