HEWLETT PACKARD

SERVICE MANUAL

HP MODELS 240D/E and 250/255 ELECTROSTATIC PLOTTERS

SERIAL NUMBERS

This manual applies directly to the following print engines:
Models 240D/E with serial numbers prefixed 2844J
Models 250/255 with serial numbers prefixed 3101J

This manual applies directly to the following VRCs:
C1600V with serial numbers prefixed 2932A
C1623A with serial numbers prefixed 3051A

With changes described in Chapter 9
this manual also applies to plotters with
serial numbers prefixed below those
described above.

For additional information about serial numbers, see
SERIAL NUMBER INFORMATION in Chapter 1.

16399 W. BERNARDO DRIVE
SAN DIEGO, CALIFORNIA 92127-1899

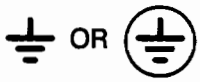
C1600-90050

Printed: December 1993

General Definitions of Safety Symbols

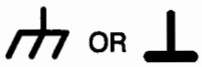
International caution symbol (refer to manual): the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.

Indicates dangerous voltage (terminals fed from the interior by voltage exceeding 1000 volts must also be marked).



Protective conductor terminal. For protection against electrical shock in case of a fault. Used with field wiring terminals to indicate the terminal which must be connected to ground before operating equipment.

Low–noise or noiseless, clean ground (earth) terminal. Used for a signal common, as well as providing protection against electrical shock in case of a fault. A terminal marked with this symbol must be connected to ground in the manner described in the installation (operating) manual, and before operating the equipment.



Frame or chassis terminal. A connection to the frame (chassis) of the equipment which normally includes all exposed metal.

Alternating current

Direct current

Alternating or direct current

The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury.

The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

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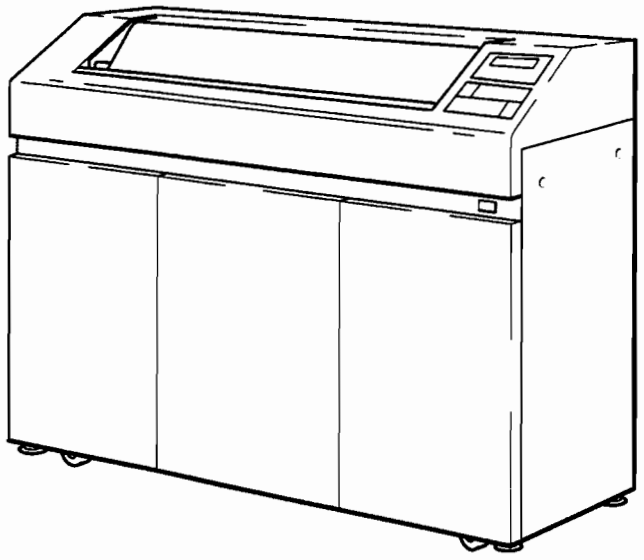
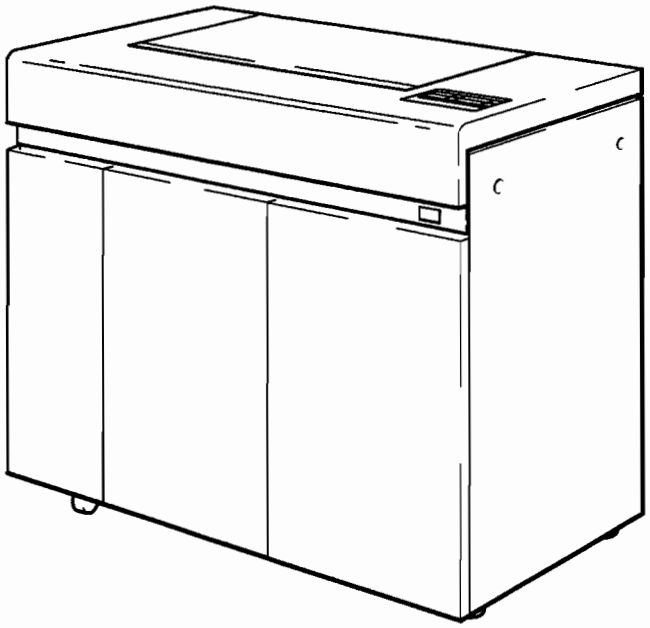


HP Model 250/255 Electrostatic Plotter



HP Model 240D/E Electrostatic Plotter

CHAPTER 1

PRODUCT INFORMATION

1-1. INTRODUCTION

1-2. This manual contains information necessary to test and service the Hewlett-Packard 7600 Series Model 240D/E and Model 250/255 Electrostatic Plotters. The manual is divided into ten chapters as follows:

Chapter	1	Product Information
Chapter	2	Site Planning and Requirements
Chapter	3	Installation and Configuration
Chapter	4	Preventive Maintenance
Chapter	5	Functional Overview
Chapter	6	Removal and Replacement
Chapter	7	Adjustments
Chapter	8	Troubleshooting
Chapter	9	Product History
Chapter	10	Parts and Diagrams

1-3. This Product Information chapter includes a description of the plotter and information on options available, accessories supplied, specifications, serial numbers, test equipment and special tools required to test and repair the plotter.

1-4. DESCRIPTION

1-5. 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.

1-6. 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.

1-7. 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.

1-8. 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.

1-9. 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.

1-10. 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
HPGL–2 Reference Guide	5959–9733

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

1-11. OPTIONS

1-12. 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 docu-

mentation for the HP Model C1621A/C1622A take-up reel can be ordered using part number C1621-90000.

1-13. ACCESSORIES

1-14. The items listed in Table 1-2 are supplied with each plotter. Table 1-3 lists the accessories available for use with the plotters. Touch-up paint for plotter exterior surfaces is listed in Table 1-4.

1-15. PERFORMANCE SPECIFICATIONS

1-16. Table 1-5 lists the specifications for the plotters. These specifications include the performance standards against which the plotters are tested. Table 1-6 lists general characteristics of the plotters. Environmental limits for the plotters and media are listed in Table 1-7.

NOTE

The HP Model 240D/E and Model 250/255 Electrostatic Plotters are very sensitive to the surrounding environment. If the normal office environment is typically dry (less then 30% RH) or typically humid (greater than 80% RH) it is recommended that the plotter be placed in a controlled environment. Optimal output quality is achieved at 73 °F and 40 to 70 % RH. The plotter will operate outside that environmental range, however the image quality degrades significantly.

Table 1-2. Accessories Supplied

DESCRIPTION	QTY	HP PART NUMBER
User's Guide	1	C1600–90002 (240D/E)
	1	C1625–90001 (250/255)
Reference Guide	1	C1620–90001 (240D/E)
	1	C1625–90002 (250/255)
Premium Paper 914 mm x 150m (36 in. x 6000 in.)	1 roll	17276P
Contains 1 ea. 5000 ml (1.3 gal) Black	1	17278A
Pre-moistened Cleaning Wipes	1 pkg	92193N
Writing Head Polish 300 ml (10 oz.)	1 bottle	17290P
Lint-free Wipes 100 count	1 pkg	92193W
Line Cord Set	1	*
Hand-held Media Cutter	1	17291C

* Power cord is supplied based on destination.
Refer to ??Figure 3-20, Power Cord Configurations.

Table 1-2. Accessories Supplied (Continued)

DESCRIPTION	QTY	HP PART NUMBER
Manual Media Cutter Blades (25/255)	Pkg of 5	07596–60008
Blades	box of 5	07596–60008
Guide	2	C1620–20001
Screws M4X.7X14	2	0515–1597
Take-up Reel Spindle (250/255)	1	C1622–60001
Control I/F Cable	1	C1600–60001
VRC Interface Cable	1	C1600–60230
Media Stacker (250/255)	1	C1620–60007

Table 1-3. Accessories Available

DESCRIPTION	HP PART NUMBER
Premium Grade E/A0 914 mm (36 in.)wide x 152.4 m (6000 in.) long	17276P
Translucent (For monochrome Plots) E/A0 914 mm (36 in.)wide x 152.4 m (6000 in.) long	17268T

Table 1-3. Accessories Available (Continued)

DESCRIPTION	HP PART NUMBER
Vellum E/A0 914 mm (36 in.)wide x 152.4 m (6000 in.) long	17270V
Polyester Film Clear (for monochrome plots) E/A0 914 mm (36 in.)wide x 152.4 m (6000 in.) long	17274F
Matte (for monochrome plots) E/A0 914 mm (36 in.)wide x 152.4 m (6000 in.) long	17272F
Dispersant 5 litre (1.3 gal.)	17279D
Gloves 25 pr/box	92193G
Interface Cable	
RS-232-C/CCITT V.24 3 meters	HP 17355M (m to m)
HP-IB 2 or 4 metres	HP 10833 B/C
Centronics Parallel Interface	C2912B

Table 1-4. Touch-Up Paint

COLOR	HP PART NUMBER	USE
Dove Gray 6.5 oz. bottle	6010–1140	Front Top Covers Doors
French Gray 6.5 oz. bottle	6010–1147	Side Covers Rear Covers

Table 1-5. Plotter Specifications

MAXIMUM ACCUMULATED ERROR:
0.1%

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 1-6. 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.)

Table 1-6. 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

Table 1-7. Environmental Limits

OPERATING:	
Temperature:	10 to 30 °C
	50 to 86 °F
Humidity:	30 to 80% Relative *
Altitude:	4572 m (15 000 ft.) @ 40 °C
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

1-17. SERIAL NUMBER INFORMATION

1-18. The plotter serial number is located next to the power receptacle on the rear panel of the plotter. Hewlett-Packard uses a two-part serial number consisting of a four-digit prefix and a five-digit suffix separated by a letter, for example 0000J00000. The prefix is the same for all identical plotters and changes only when a modification is made that affects parts compatibility. The suffix is assigned sequentially and is different for each plotter. This manual applies directly to plotters with the serial prefix shown on the title page.

1-19. If the serial number prefix of your plotter is higher than the one shown, one or more update packages of revised pages are supplied with the manual. Use these new pages to replace the original pages, and discard the old pages. If two or more update packages are supplied, insert them in order by revision letter; that is, Revision A first, then Revision B, etc. The title page will then show the latest serial prefix and the manual will apply directly to plotters with that prefix.

1-20. If the plotter at hand has a lower serial prefix than the one shown on the title page, information in the Product History chapter, Chapter 9, will adapt this manual to that plotter.

1-21. In addition to plotter changes, revised pages may correct errors in the manual or include improved procedures.

1-22. TOOLS AND TEST EQUIPMENT

1-23. The tools required to maintain the HP 7600 Model 240D/E and Model 250/255 are listed in Table 1-8. The Jensen Tool Kit, Part Number JTK–536, is recommended. Test Equipment recommended to maintain the plotter is listed in Table 1-9.

1-24. SUPPORT STRATEGY

1-25. Basic support strategy for the HP 7600 Model 240D/E and Model 250/255 plotters is to diagnose and troubleshoot to the assembly level. The print engine and the VRC are both equipped with built-in diagnostics which should be used to troubleshoot problems with the plotter. Component level repair will not be supported..

1-26. The following monthly maintenance contracts are available for the plotters.

WMMC – Priority On-Site Service
PMMC -- Next Day On-Site Service

Table 1-8. Tools Required

Screwdriver, Phillips	#1, #2, #2 short, & small
Screwdriver, common	large, medium, small, & small insulated
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, 12 mm, 13 mm, 19 mm, & 23 mm
Pliers, Needle-Nose	
Pliers, Snap ring	
Combination Spring Removal Tool	
Fuse Puller	
Absorbent Towels/Wipes	
Gram Gauge (0 through 5 kg)	
Magnifying lens 30x	
Metric Scale 150 mm	

Table 1-9. Recommended Test Equipment

TYPE	RECOMMENDED MODEL
HP Portable PLUS Personal Computer	HP 45711E
Disk Drive	HP 9114B
Language Disks (250/255)	HP C1620–18004 HP C1620–18005
Service Disks (240D/E & 250/255)	C1600–60401
HP-IL/HP-IB Interface	HP 82169A
Centronics Parallel Interface Cable	HP 40242D
Serial Interface Cable	HP 92221P
Interface Cable	HP 17355D
HP-IB Interface Cable	HP 10833B or C
Voltmeter	HP 427A or equivalent
Gram Gauge 0 – 5 kg	HP 8750–0384
RS-232-C Test Connector	HP 07440–60302
Oscilloscope 2 channel	HP 1741A or equivalent

1-27. PRODUCT SAFETY NOTICES

1-28. The following safety notices must be read and understood.

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C [100 °F]). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

WARNING

The media cutter supplied with the plotter has razor sharp blades. Use extreme caution when handling the media cutter. Severe personal injury could result from careless use of the media cutter.

CAUTION

Environmental Hazard

United States of America only

The toner solution is a petroleum distillate (oil based) product. As with most petroleum products, EPA (Environmental Protection Agency) regulations prohibit the disposal of toner using normal waste disposal methods. Contact your local health department, EPA, or regulatory agency for information and/or instructions for disposing of spent toner. Regulations in your state may vary.

Other countries

The toner solution is a petroleum distillate (oil based) product which may require special disposal methods in your country. Since the methods of disposal may vary between countries, consult your local regulatory and/or health agencies for the proper disposal methods in your area.

CAUTION

Toner solution contains isoparaffinic petroleum solvent (flammable liquid). Special disposal methods must be used for spent toner. Consult state or local authorities for the approved waste disposal method.

Dispose of spent toner according to Federal, State, and Local Regulations.

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

CAUTION

Before opening the top frame release the pinch rollers. Do not allow the media to lift from the developer unit.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.

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CHAPTER 2

SITE PLANNING AND REQUIREMENTS

2-1. INTRODUCTION

2-2. This chapter contains information about the physical and electrical requirements for the proper installation of the HP model 240D/E and model 250/255 Electrostatic Plotters.

2-3. ELECTRICAL SPECIFICATIONS

WARNING

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

2-4. POWER REQUIREMENTS

2-5. The power requirements for the plotter is listed in Table 2-1.

2-6. LINE CORD SET

2-7. The configuration of the ac line cord set required for use with the plotter is determined by the destination of the plotter. Refer to Chapter 3 for the available ac line cord connectors.

Table 2-1. Power Requirements

SOURCE:	100 V, 120 V, 220 V, or 240 Vac ±10%
FREQUENCY:	47 to 53 Hz 57 to 63 Hz
CONSUMPTION:	@ 120 V 390 W nominal @ 220 V 440 W nominal

2-8. ENVIRONMENTAL SPECIFICATIONS

2-9. The HP model 240D/E and model 250/255 Electrostatic Plotters are designed to meet FCC class C environmental specifications for a normal office environment. The environmental requirements for operating the plotters are listed in Table 2-2. Storage requirements are in Table 2-3. Storage limits for the media are listed in Table 2-4.

NOTE

The HP model 240D/E and model 250/255 Electrostatic Plotters are very sensitive to the surrounding environment. If the normal office environment is typically dry (less then 30% RH) or typically humid (greater than 80% RH) it is recommended that the plotter be placed in a controlled environment. Optimal output quality is achieved at 23 °C (73 °F), 40 to 70 % RH. The plotters will operate outside that environmental range; however the image quality degrades significantly.

CAUTION

Never operate the HP model 240D/E and model 250/255 plotters in the presence of condensation. Serious damage to the writing head will result.

Table 2-2. Environmental Operating Range

TEMPERATURE:	10 to 30 °C (50 to 86 °F)
HUMIDITY: *	30 to 80 % relative
ATMOSPHERIC PRESSURE:	540 to 810 mm Hg
ALTITUDE:	4572 m (15 000 ft)
VIBRATION:	250 cm/s^2 (0.25 g) (1 to 7 Hz for 5 s)
IMPACT:	1000 cm/s^2 (1 g) 10 ms simewave
FLOATING DUST:	< 200 $\mu g/m^3$
SULFUROUS ACID GAS:	0.2 ppm or less
OXIDIZABLE NITROGEN:	0.1 ppm or less
CARBON MONOXIDE:	10 ppm or less
ALDEHYDES:	0.1 ppm or less

*** non-condensing**

Table 2-3. Environmental Storage Limits

TEMPERATURE:	–10 to 60 °C
HIGH TEMPERATURE:	**Not more than 2 days over 40 °C**
HUMIDITY: *	15 to 85% relative
ALTITUDE:	5487 m (18 000 ft)

*** non-condensing**

Table 2-4. Media Storage Limits

TEMPERATURE:	**-10 to 40 °C (14 to 104 °F)**
HUMIDITY: *	**30 to 80% relative**
ALTITUDE:	**5487 m (18 000 ft)**

*** non-condensing**

2-10. PHYSICAL SPECIFICATIONS

2-11. The HP model 240D/E and model 250/255 must be installed on a smooth level surface capable of supporting 348.5 kg/m^2 (642.4 lb/yd^2).

2-12. The area required for plotter installation is listed in Table 2-5. The physical dimensions and clearance for installation are illustrated in Figure 2-1. If the Media stacker is to be installed, an additional 36 inches of clearance is needed at the rear of the plotter.

Table 2-5. Area Required

Height:	**1500 mm (59.1 in)**
Width:	**2300 mm (90.6 in)**
Depth:	**2100 mm (82.7 in)**
Depth: (with stacker)	**3014 mm (118.7 in)**

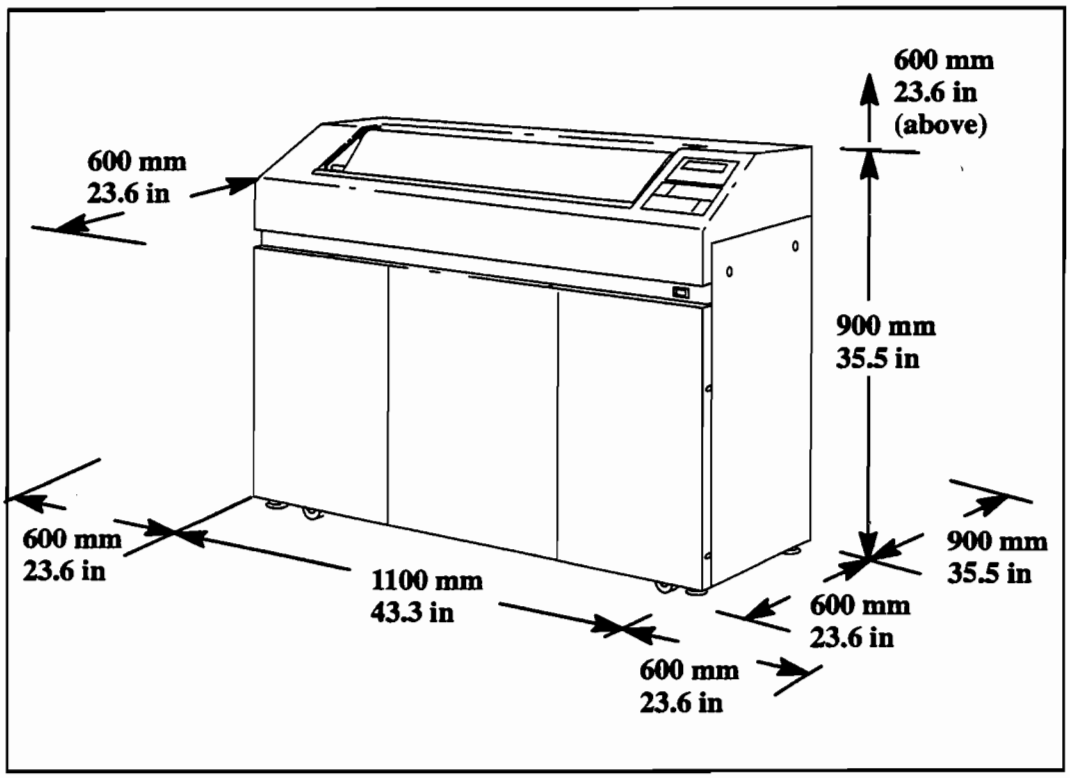

Figure 2-1. HP 240D/E & 250/255 Physical Dimensions and Space Requirements

2-13. CABLE RESTRICTIONS

2-14. Cable restrictions for the plotter are determined by the type of interface being used. Recommendations for each interface are as follows:

2-15. RS-232-C INTERFACE

2-16. The use of short cables (each less than 15 meters or 49.2 feet) is recommended for the RS-232-C Interface. Longer cables are permissible, provided the load capacitance does not exceed 2500 picofarads. For longer distances, use the RS-422-A interface for the plotter.

2-17. HP-IB INTERFACE

2-18. The HP-IB Interface 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 20 metres (65.6 ft) total, no matter how many devices are connected. The devices may be connected in a star or linear bus network.

2-19. CENTRONICS PARALLEL INTERFACE

2-20. The use of short cables (less than 3 m or 10 feet total is recommended. The centronics cable should be properly shielded for error free operation. The recommended cable (for PC use) is HP part number C2912B.

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CHAPTER 3

INSTALLATION AND CONFIGURATION

3-1. INTRODUCTION

3-2. This chapter contains the information required to unpack, inspect, install, and configure the HP Model 240D/E and Model 250/255 Plotters.

WARNING

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

Be sure to connect power to a properly grounded outlet to avoid the possibility of electrical shock.

CAUTION

Do not plug the plotter into a live ac receptacle before instructed to do so. Serious damage to the plotter could result.

Do not connect the vector-to-raster converter (VRC) to a power source outside of the one provided in the print engine unless the power source is a 115 Vac, 60 Hz power source. Doing so will result in damage to the VRC.

3-3. Refer to Table 3-1 for a list of the tools required to unpack, install, and configure the Model 240D/E and Model 250/255 Plotter.

Table 3-1. Tools Required

1. Stubby #2 Phillips screwdriver
2. Five inch, #2 Phillips screwdriver
3. Five inch, #1 Phillips screwdriver
4. Strong shears or knife (to cut banding)
5. Voltmeter

3-4. UNPACKING AND INSPECTION

NOTE

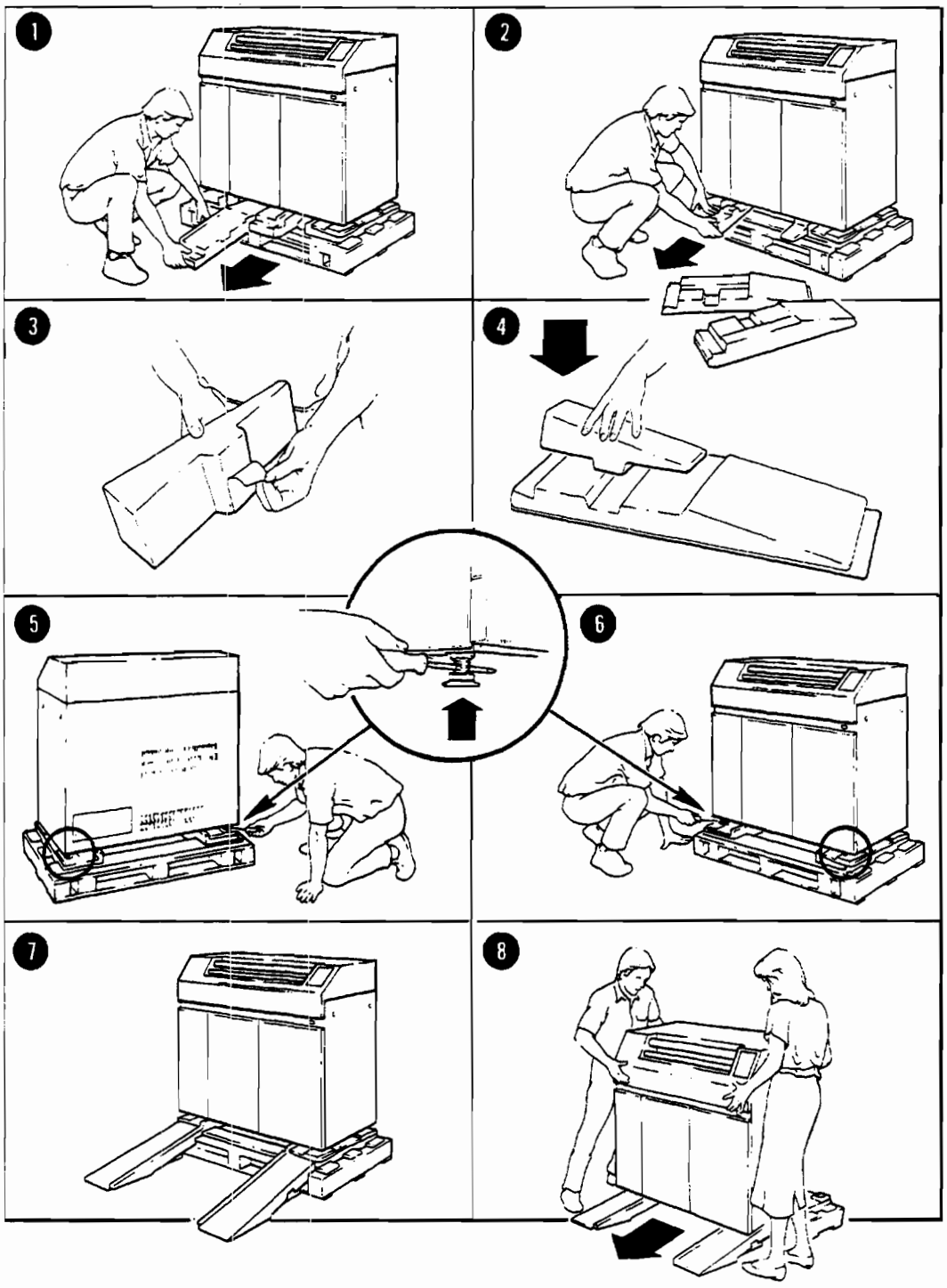
The Model 250/255 print engine is shown in the illustration that follows, but the unpacking procedure for the 240D/E print engine is no different than that shown in the illustration.

3-5. UNPACKING THE PRINT ENGINE

3-6. Incoming inspection procedures are designed to detect any mechanical or electrical defects that may have occurred during transit.

3-7. To unpack the print engine, perform the following steps.

1. Remove the banding from around the print engine carton.
2. With one person on each end, lift the carton off the print engine.
3. Remove the packaging materials from around the print engine.
4. Remove the plastic bag covering the print engine. Leave the tape that secures the top cover and doors in place.
5. Remove the two large ramps from beneath the print engine, and set them off to the side (wooden side down).
6. Remove the two, smaller, wedge-shaped ramp supports from beneath the print engine.
7. Remove the backing from the double-sided tape on the ramp supports.


1
2
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8. Install a ramp support on each ramp; so that the ramp support projection fits into the notch in the ramp. See Figure 3-1.

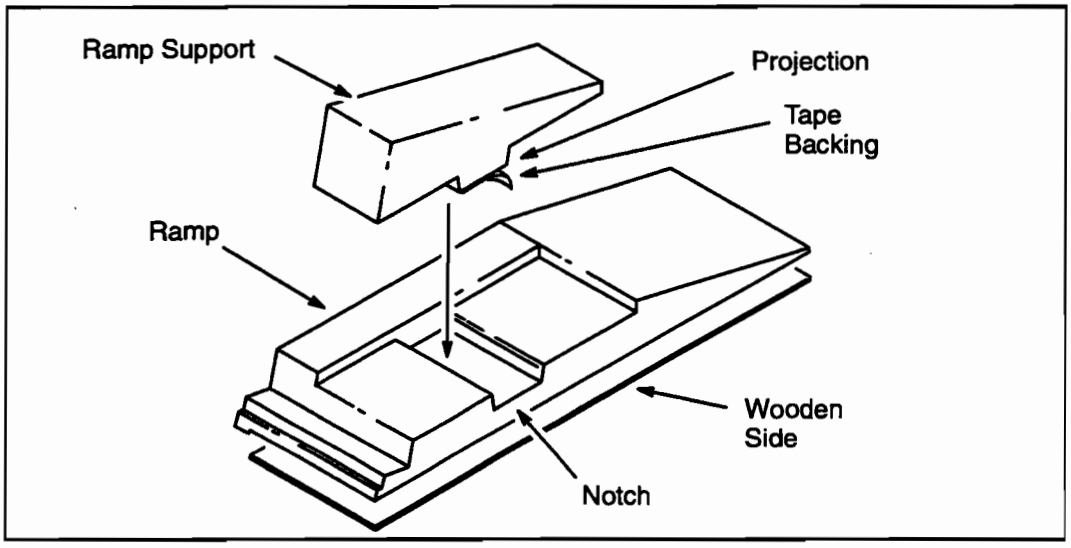


Figure 3-1. Ramp Support Installation

9. 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.

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

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

3-8. UNPACKING THE SUPPLIES

3-9. Open the supplies box and check the supplies in the box against the supplies list in the box.

3-10. In addition to the documentation, the supplies box contains the following:

1. Media
2. Head Cleaner (premoistened wipes)
3. Head Polish
4. Lint-free Wipes
5. Line Cord Set

6. Media Cutter – hand held

7. Manual Cutter – built-in (Model 250/255 only)
   Screws
   Blades

8. Spindle Take-Up (Model 250/255 only)

9. Cables, VRC Interface

10. Toner (black)

3-11. UNPACKING THE VRC

3-12. To unpack the VRC, perform the following steps.

1. Open the VRC box.

2. Remove the bag containing the VRC power cord, front-panel firmware kit, and installation hardware from the box.

NOTE

The VRC-to-print-engine interconnect cables can be found in the accessory kit.

3. Remove the insulation from around the VRC.

CAUTION

Handle the VRC carefully while removing it from the box to prevent possible damage to the hard disk.

4. Remove the VRC from the box.

3-13. MECHANICAL CHECKS

3-14. Visually inspect the print engine and VRC for damage, scratches, dents, or other mechanical defects. Also check the shipping containers for signs of damage that may have affected the print engine or VRC.

3-15. DAMAGE CLAIMS

3-16. If the print engine or VRC is damaged in transit, or, upon receipt, fails to meet the specifications given in Chapter 1 of this manual, notify the carrier and the nearest Hewlett-Packard Sales and Support Office. Retain the shipping containers and insulation material for the carrier's inspection. The field office will arrange for repair, or replacement of the defective unit.

3-17. ELECTRICAL CHECKS

CAUTION

Damage to the plotter will result if the checks are run before completing the installation.

3-18. Electrical performance of the plotter is checked by running the demonstration plot. Do not attempt to run the demonstration plot before completing the installation.

3-19. INSTALLATION INSTRUCTIONS

3-20. PRINT ENGINE INSTALLATION

3-21. To prepare the print engine for installation, perform the following steps:

1. Deliver the print engine to the room where it will be used.
2. Open the top cover by lifting the front edge.

NOTE

Steps three and four apply only to the Model 250/255 plotter.

3. Locate the "Y" Cutter at the right of the assembly.
4. Use a small Phillips screwdriver to remove the locking screw. See Figure 3-2.
5. Locate the S-shaped brackets at either end of the upper frame, which secure the upper frame during shipping. See Figure 3-3.

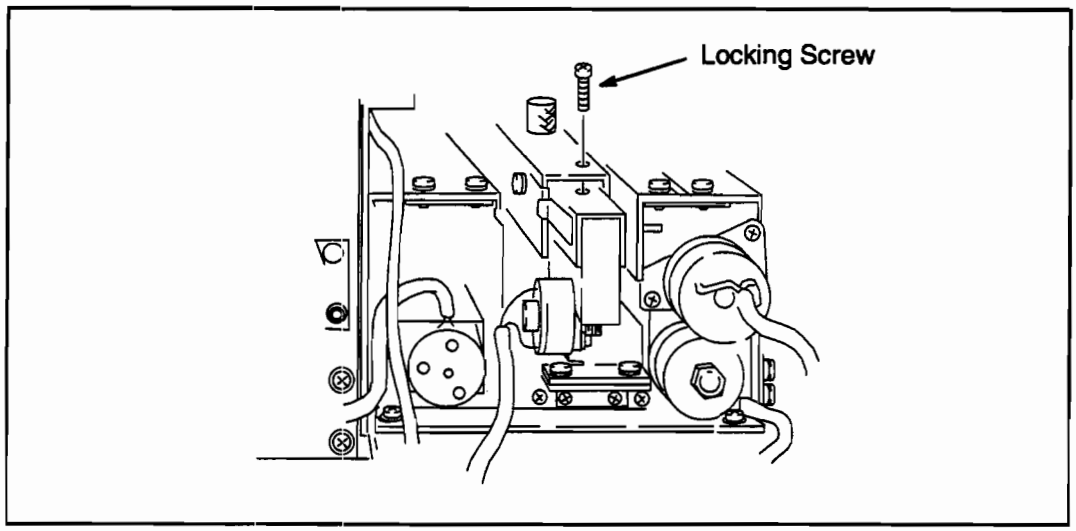


Figure 3-2. "Y" Cutter Lock (Model 250/255 Only)

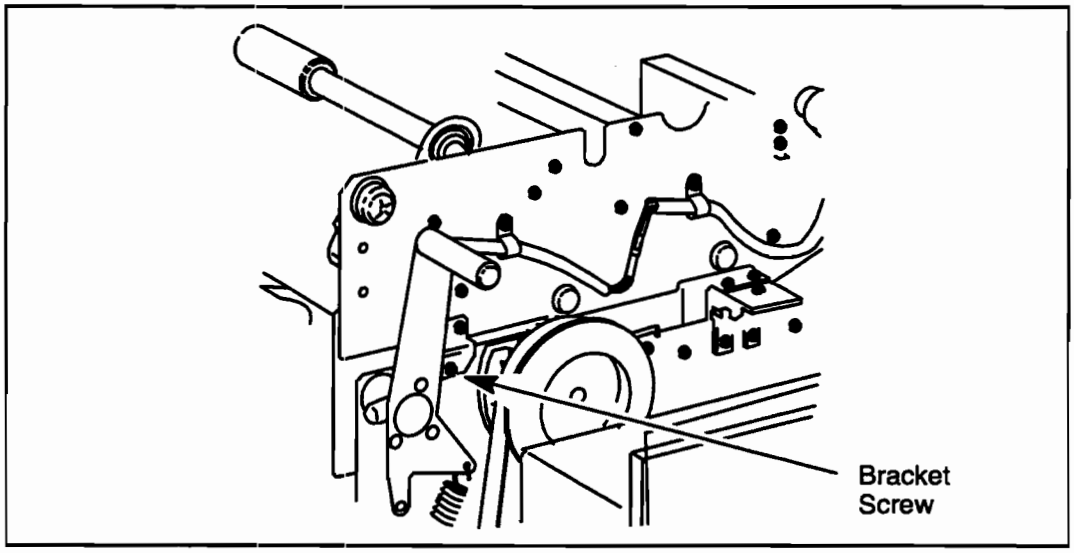


Figure 3-3. S-shaped Bracket (Right Side)

NOTE

The screw to be removed in the following step may be very tight and is easily stripped.

6. 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.

7. Raise the upper frame by pulling back on the clip release handle to the right and in front of the upper frame. See Figure 3-4.

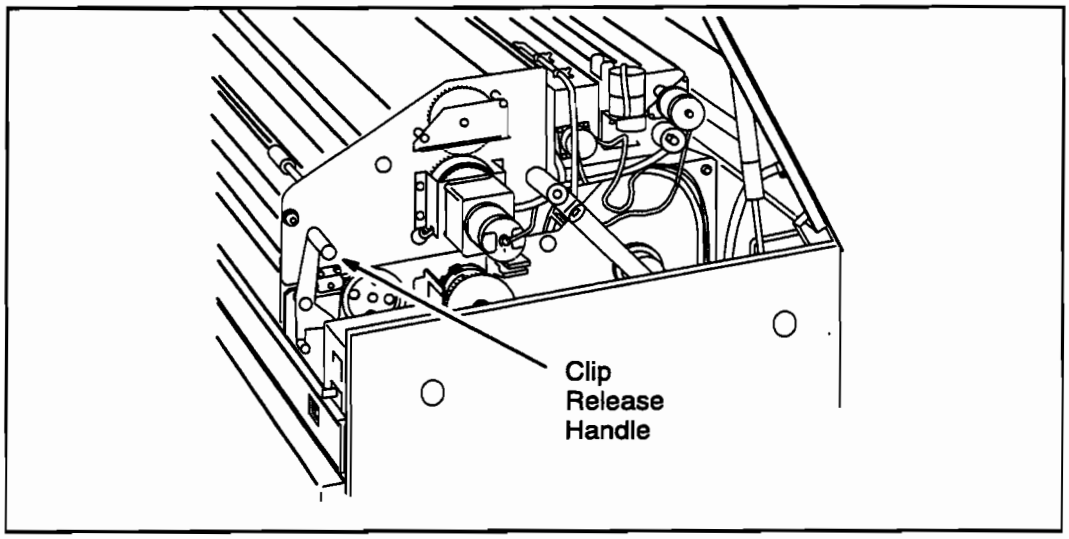


Figure 3-4. Clip Release Handle

8. Remove the support foam and packing material.

9. 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. See Figure 3-5.

10. Remove the pinch roller restraining screws from the other end of the upper frame.

11. Save the retaining screws for future use in storage or shipping of the plotter.

NOTE

Step 12 applies only to the Model 250/255 plotter.

12. If the front panel firmware installation is to be performed, leave the top cover up.

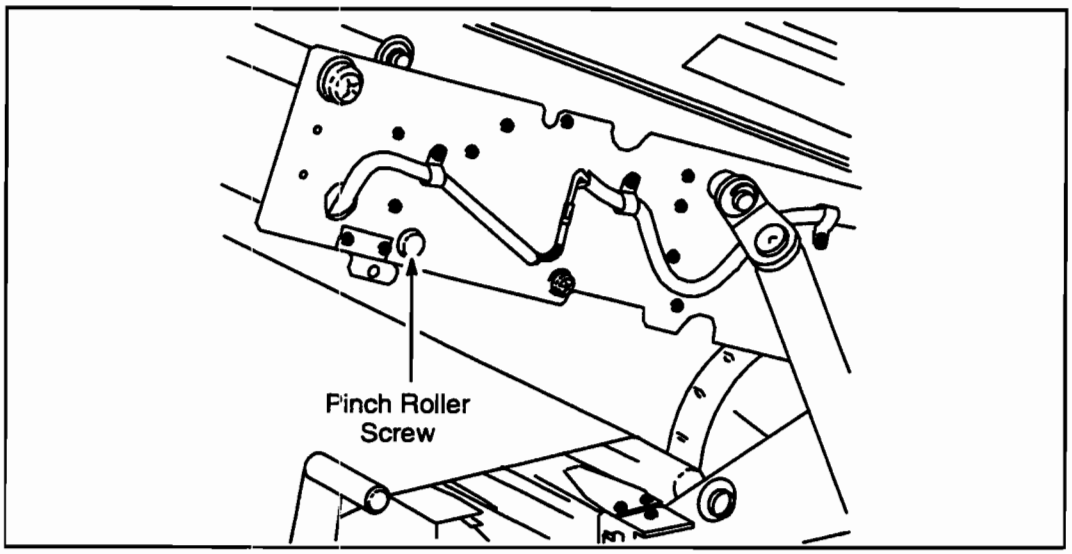


Figure 3-5. Restraining Screw (Right Side)

3-22. FRONT PANEL FIRMWARE INSTALLATION (Model 250/255 Only)

CAUTION

Integrated circuits can be damaged by electrostatic discharge. To prevent damage to the plotter circuits from high voltage electrostatic discharge, perform the following procedure:

1. Do not wear clothing which is subject to static build-up.
2. Do not handle integrated circuits in carpeted areas.
3. Do not remove an Integrated Circuit (IC) from its conductive foam pad until you are ready to install it.
4. Ground your body when working on the plotter. Conductive wristbands (HP P/N 00970–67900) are available for this purpose.
5. Touch all tools to earth ground to remove static charges before using them on the plotter.

3-23. Upon initial installation of the plotter, firmware must be installed in the front panel printed circuit assembly. Refer to the Front Panel Firmware Modification Kit shipped with the VRC. The procedure is as follows:

1. Set the ac line switch to the OFF (O) position.

2. Raise the top cover.

3. Locate the EPROM socket. If an EPROM is installed, remove it. See Figure 3-6.

4. Select and install the new EPROM. Ensure that the ROM leads are properly aligned and that the IC orientation is correct.

5. Testing of the plotter will be done at the completion of the plotter set-up.

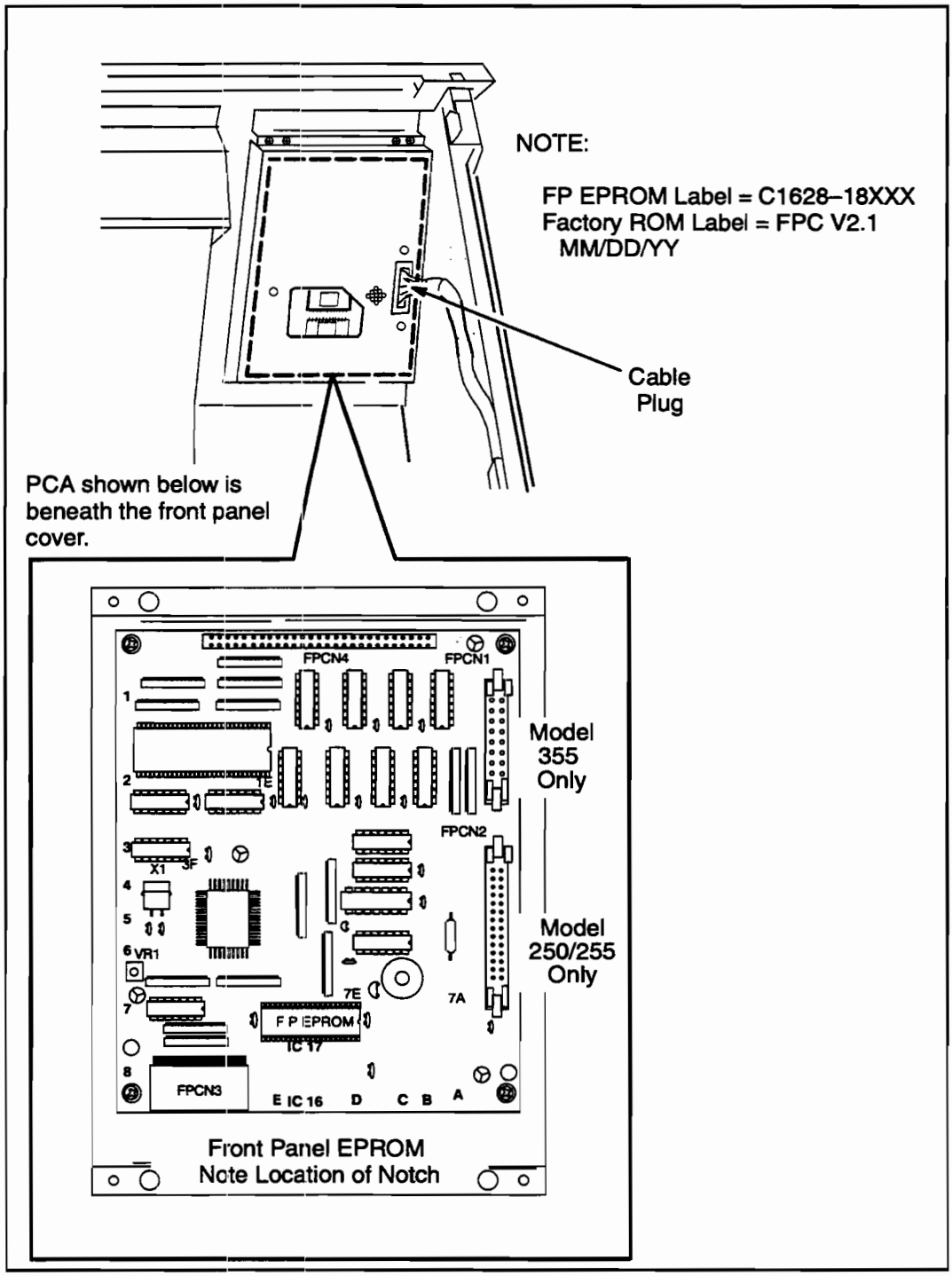


Figure 3-6. Front Panel Removal and EPROM Location

3-24. MODEL 250/255 PRINT ENGINE INSTALLATION

3-25. Perform the steps under paragraph "3-20. " for print engine installation and the following paragraph for cutter set-up.

3-26. 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:

1. Raise the top cover.
2. Locate the "Y" cutter at the right of the assembly.
3. Use a small Pozidriv screwdriver to remove the screw. See Figure 3-7.

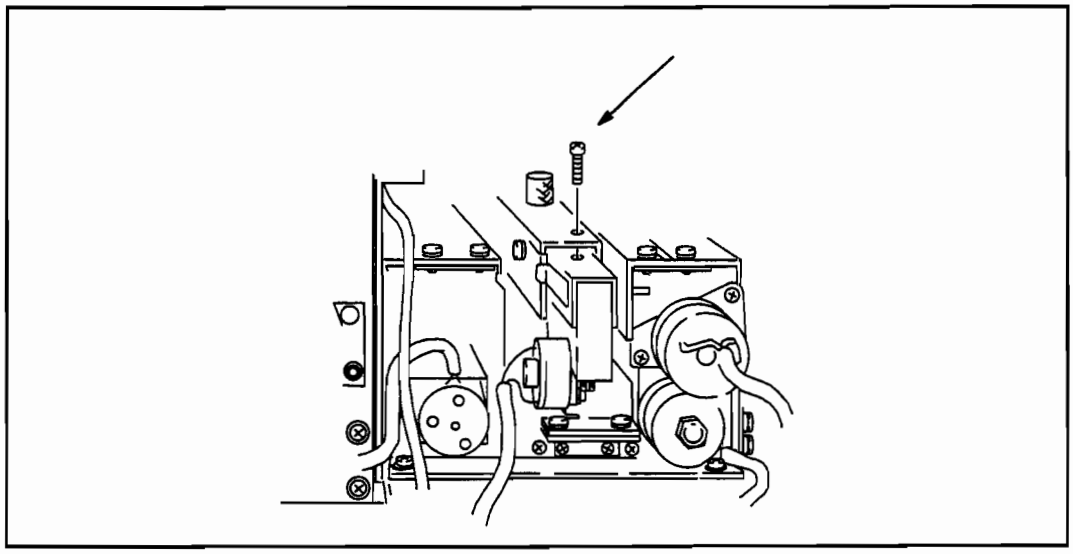


Figure 3-7. "Y" Cutter Lock

3-27. VRC INSTALLATION (Model 240D/E and Model 250/255)

CAUTION

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

1. 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.

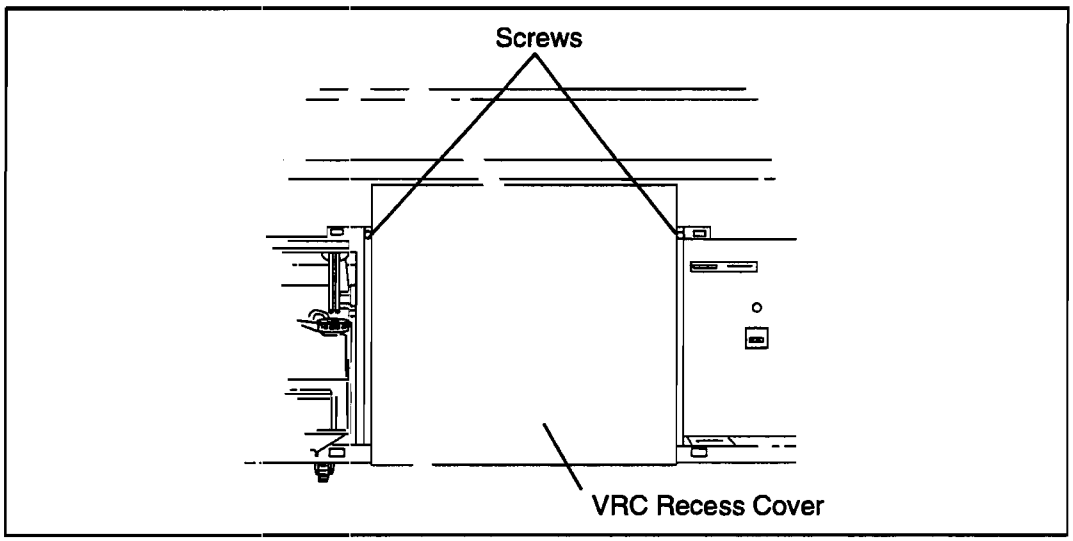


Figure 3-8. Center Cover Removal

2. Unscrew the two screws at the upper sides of the center cover. See Figure 3-8. Pull the top of the cover toward you and lift to remove the cover. Set the center cover off to the side.

3. 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 4.

4. Connect the VRC power cord to the VRC and to the ac receptacle on the User Panel inside the print engine. See Figure 3-9.

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.

5. 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.

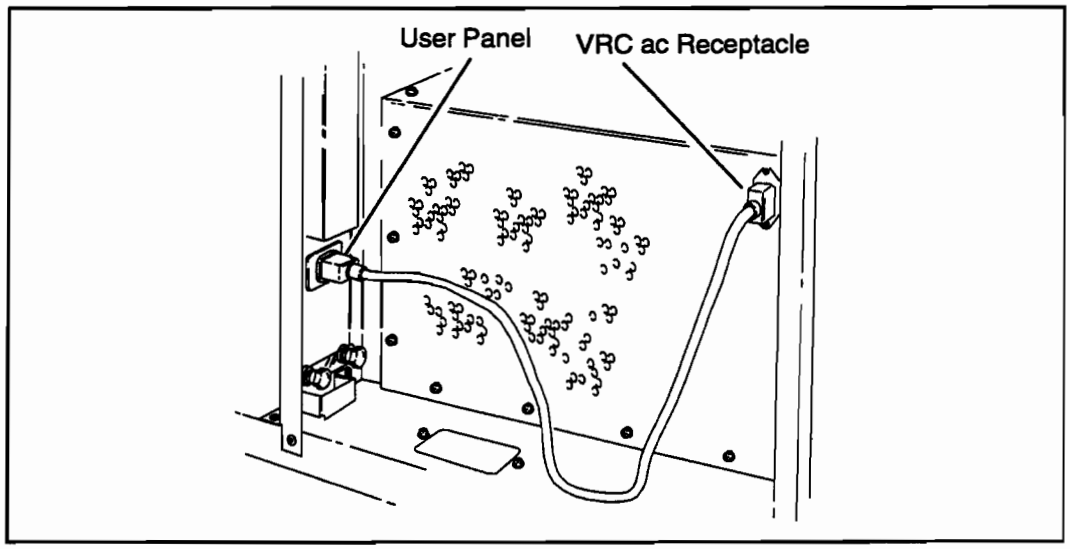


Figure 3-9. VRC Power Cord Connections

6. 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 3-10. 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.

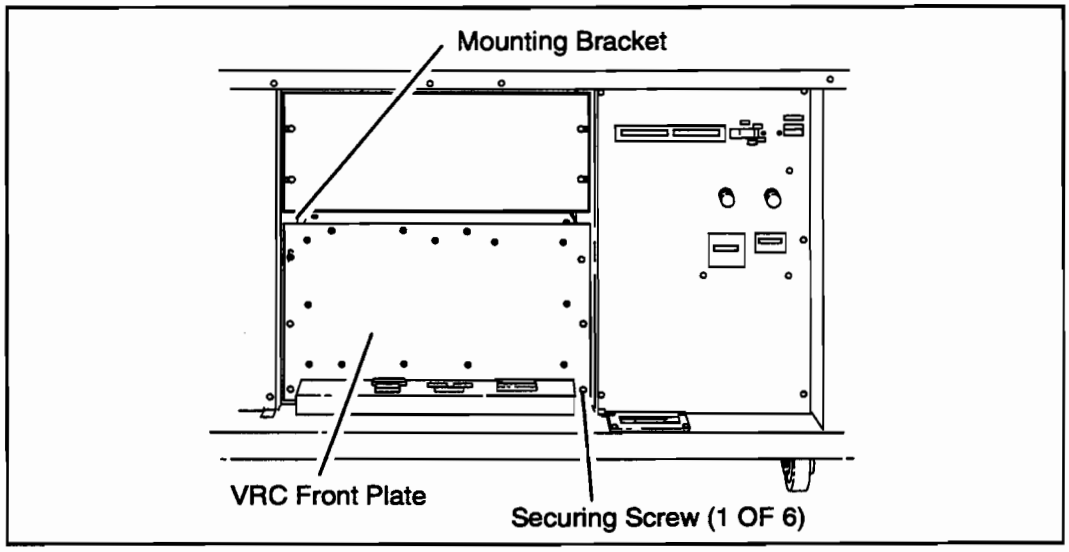


Figure 3-10. Securing the VRC Front Plate

7. 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 3-11. Using a #1 Phillips screwdriver, secure the connector.

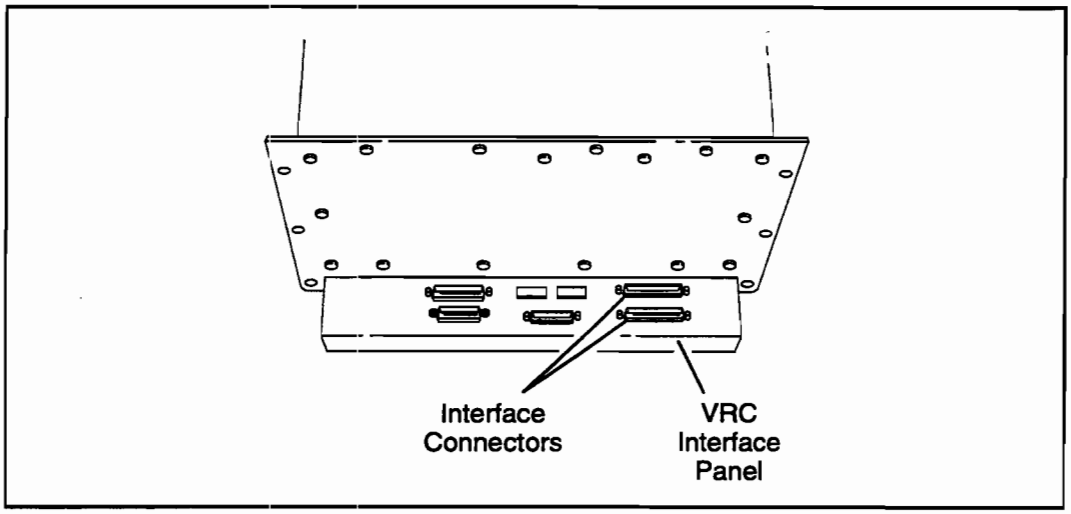


Figure 3-11. VRC Interface Connectors

8. 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.

9. 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.

10. 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 3-12.

11. 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 3-13.

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

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

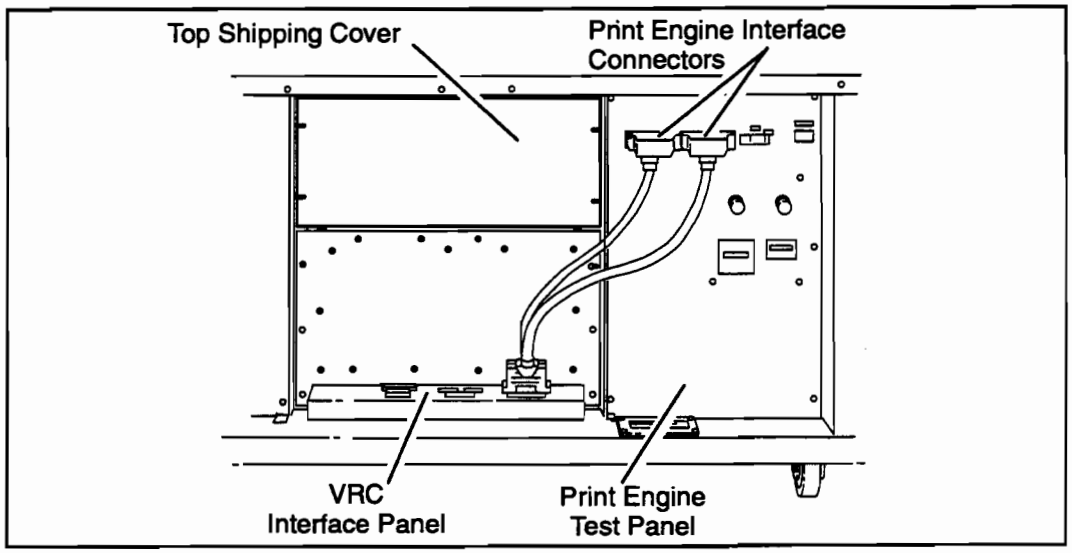


Figure 3-12. VRC to Print Engine Cables

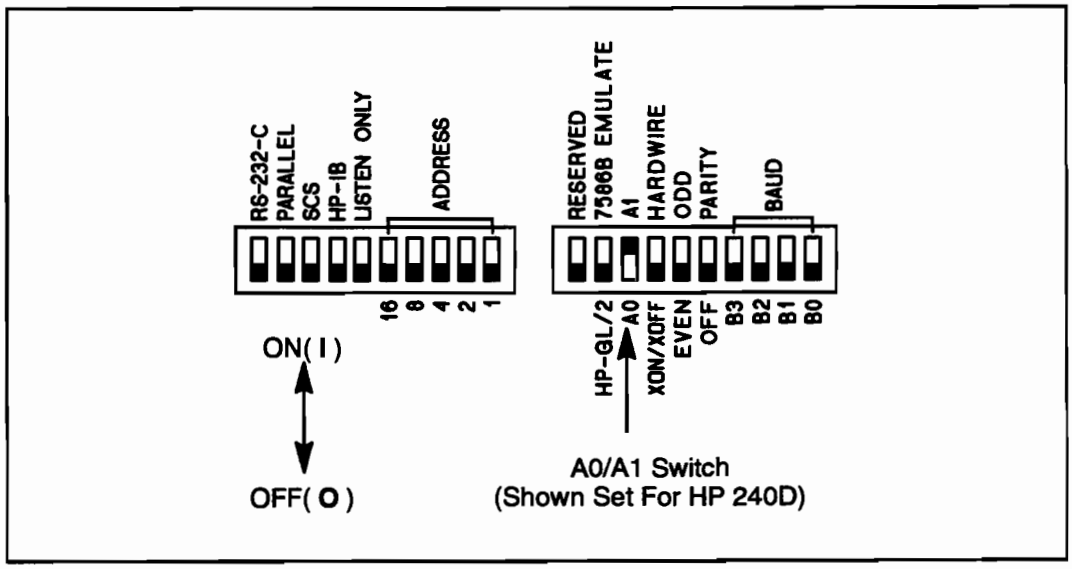


Figure 3-13. Setting the A0/A1 Switch (Model 240D/E Only)

3-28. STACKER INSTALLATION (Model 250/255 Only)

1. Hang the stacker against the rear panel of the plotter by inserting the 3 hooks into the 3 slots at the top of the rear panel. See Figure 3-14.

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

3. If plots to be made are C-, D-, or E-size, hook the media deflector into the vertical position shown in dashed-lines in Figure 3-14.

4. If the plots are smaller than C-size, unhook the media deflector and place it in the horizontal position as shown in solid-lines in Figure 3-14.

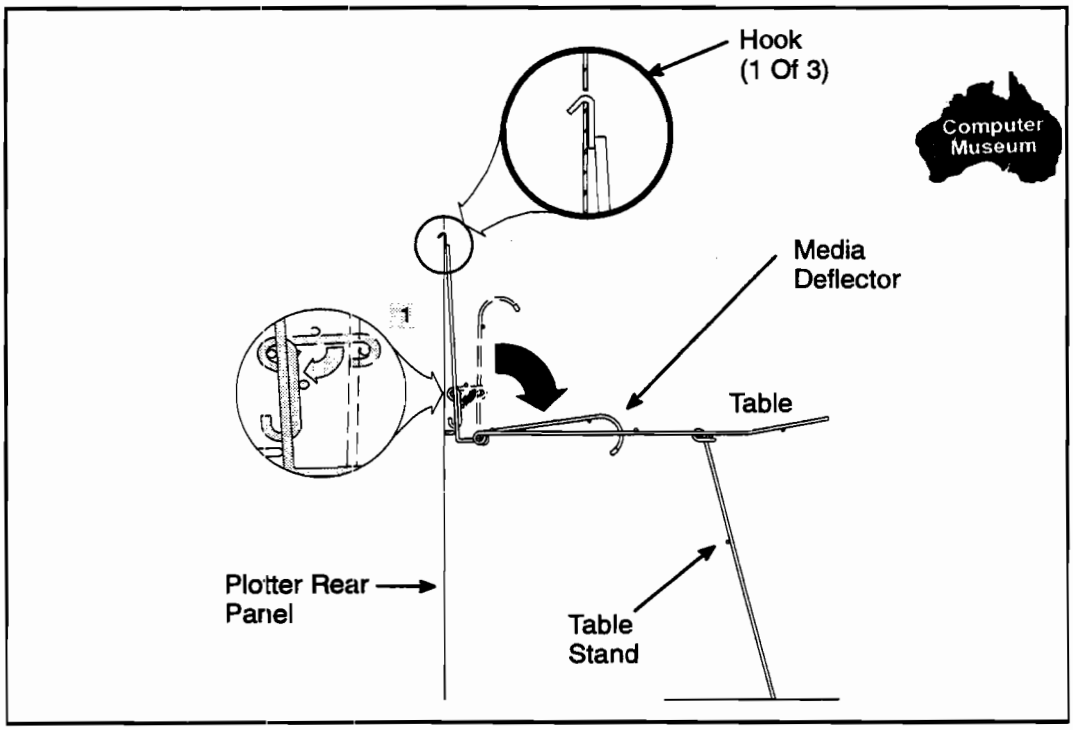


Figure 3-14. Stacker Installation (Model 250/255 Only)

5. Allow 36 inches (914.4 mm) of free space behind the plotter for proper operation of and access to the media stacker.

3-29. MANUAL CUTTER INSTALLATION (Model 250/255 Only)

3-30. To install the manual cutter, proceed as follows:

1. Position the manual cutter guide on the plotter top cover. (See Figure 3-15).

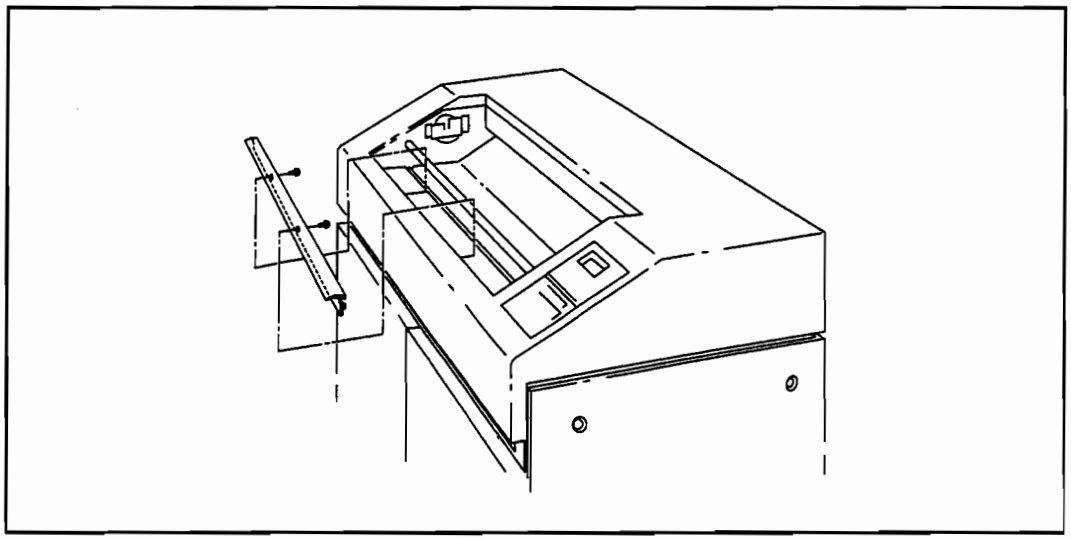


Figure 3-15. Manual Cutter Guide

2. Secure the guide with the 2 Phillips machine screws.

3. Install one of the manual cutter blades by inserting the bottom edge of the blade assembly into the guide and rotating the tabs into the guide notches. (See Figure 3-16).

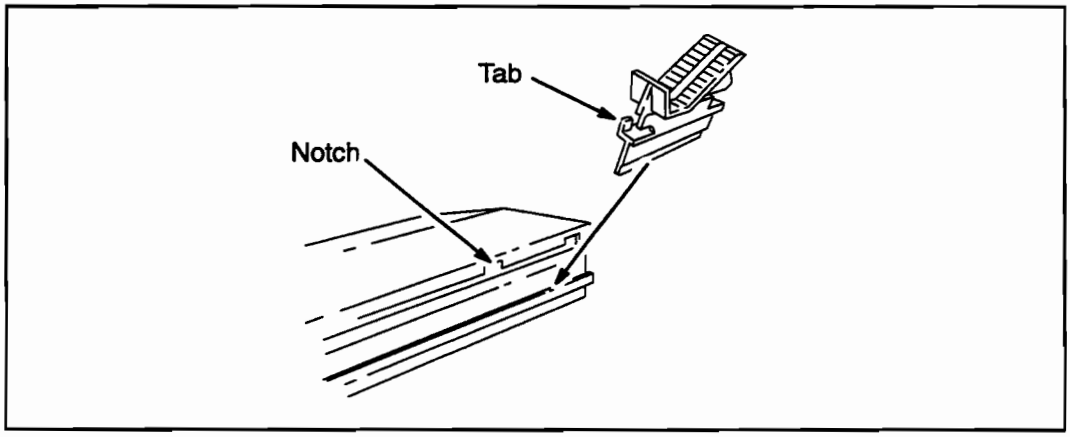


Figure 3-16. Blade Installation

3-31. LINE VOLTAGE AND FUSING

3-32. 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 3-2. 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 3-2. Power Requirements (Cont'd)

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

3-33. CONNECTING THE POWER

3-34. 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.

1. Switch off the main power circuit breaker located above ac receptacle at the rear of the print engine.
2. 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.
3. Measure your power source voltage, and write down its value.
4. Remove the cover from the voltage selection assembly. See Figure 3-17.

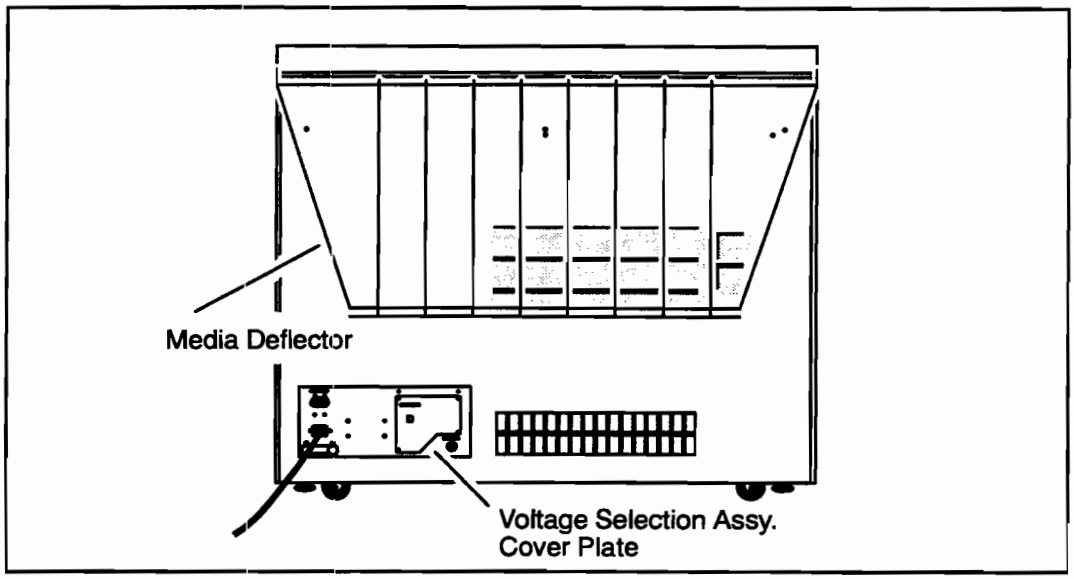


Figure 3-17. Removing the Cover Plate

5. 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 3-18 while adjusting the position of the voltage selector plug.

6. 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

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

8. 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

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

10. 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 3-18.

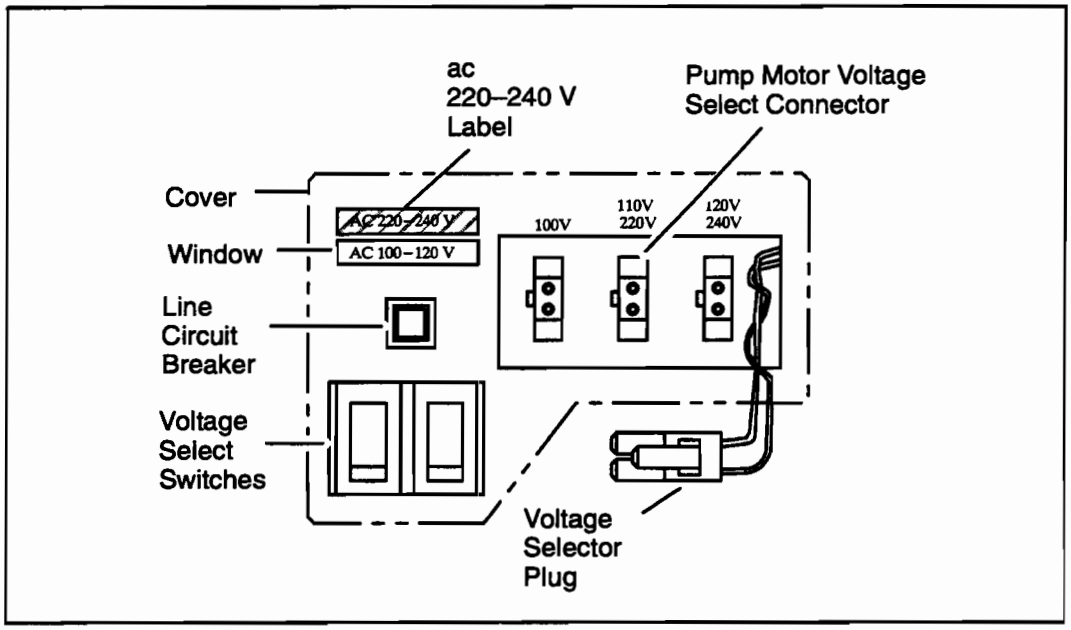


Figure 3-18. Voltage Selection Assembly

11. 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.

12. Verify that the hour meter switch is in the correct position. See Figure 3-19.

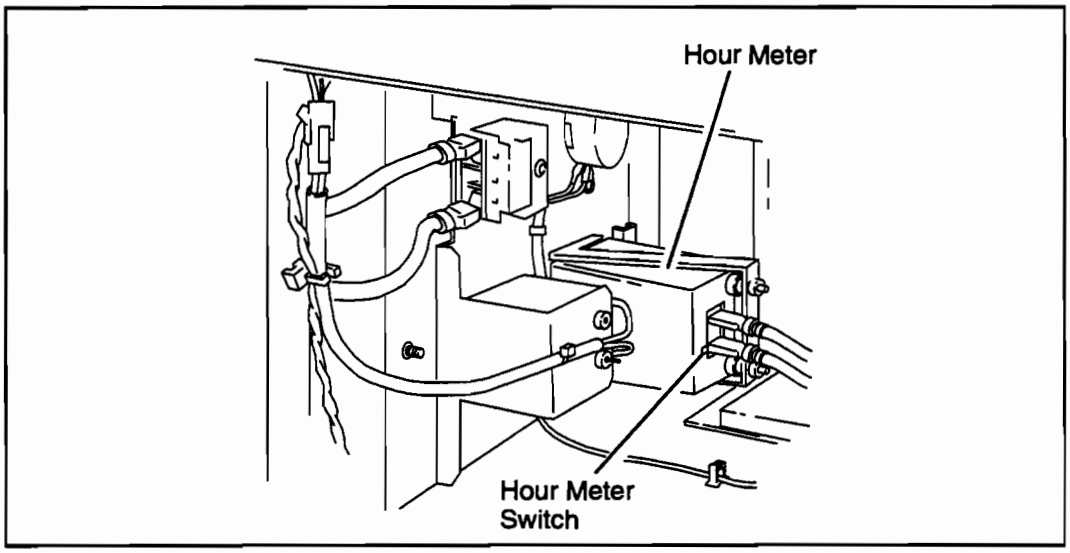


Figure 3-19. Setting the Hour Meter Switch

13. 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.

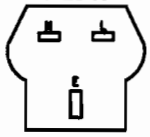
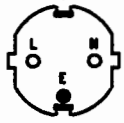
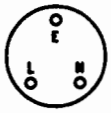
14. Replace the right side panel (viewed from the front) of the plotter.

15. Plug the power cord into the ac outlet whose voltage you measured in step 3.

16. See Figure 3-20 for a description of the available power cord connector configurations for the Model 240D/E Plotter.

Table 3-3. AC Power Features

FEATURE DESIGNATION	DESCRIPTION	VOLTAGE	PLUG CONFIGURATION
AB4	Singapore/Eng	240	900
AB5	Hong Kong/Eng	240	900
ABA	USA	120	903
ABB	Euro/S. America	220	902
ABD	German/German	220	902
ABF	French/French	220	902
ABG	Australian/Eng	240	901
ABL	Canadian/Eng	120	903
ABP	Swiss/German	220	906
ABQ	Swiss/French	220	906
ABU	UK/Eng	240	900
ACD	Swiss/Eng	220	906
ACE	Danish/Eng	240	912
ACF	Japan/Eng	100	903
ACH	Latin Am/Eng	120	903
ACL	Belgium/French	220	902
ACM	Belgium/German	220	902
ACP	Austria/German	220	902
ACQ	So Af/Eng	240	900

		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**
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 3-20. Power Cord Connector Configurations

3-35. LOADING MEDIA

3-36. 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.

1. Remove the roll of media from its box and plastic bag. Discard the plastic end caps.
2. Open the top cover of the print engine by lifting the front edge.
3. Raise the upper frame by pulling back on the clip release handle to the right and in front of the upper frame.
4. Wipe out the media compartment with a damp cloth, or use a hand-held vacuum cleaner if available. Assure that all debris is removed.
5. Remove the right End Cap of the spool by unscrewing it. See Figure 3-21. (The spool was removed from the print engine during the procedure titled PRINT ENGINE INSTALLATION)

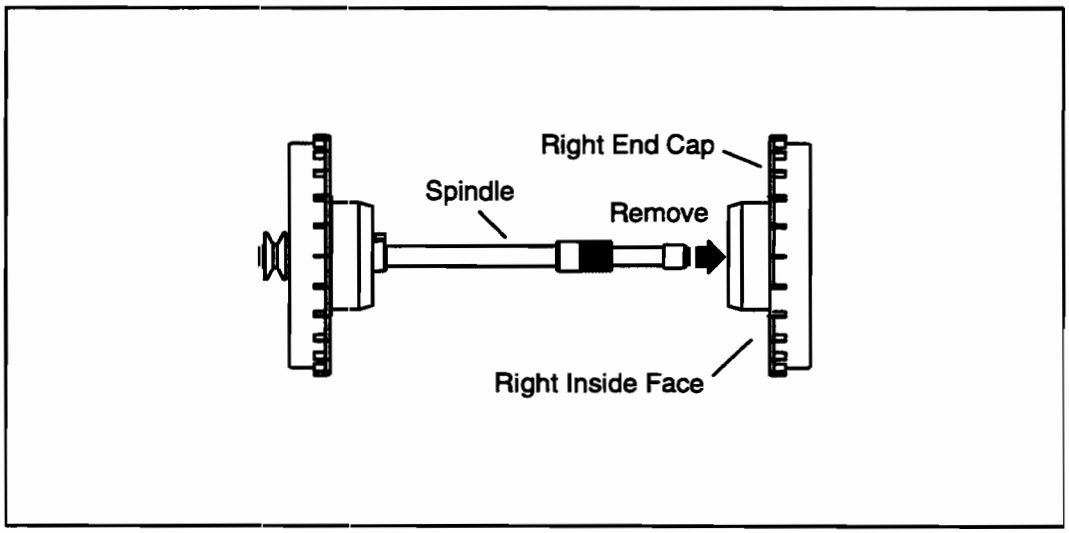


Figure 3-21. Spool End Cap Removal

6. 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.

7. Install the End Cap removed in step 5.

8. Install the spool into the media compartment of the print engine. See Figure 3-22. Ensure that the media is drawn from the bottom of the roll.

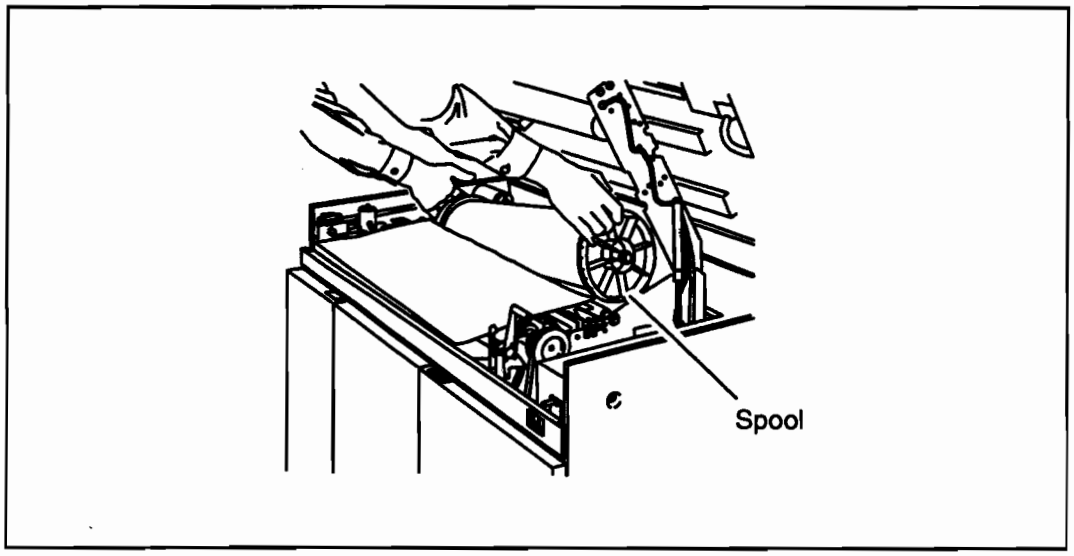


Figure 3-22. Installing the Spool

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

10. Route the media over the writing head and developer bar as shown in Figure 3-23.

11. Close the upper frame. See Figure 3-24. Ensure that both ends are latched.

12. Swing the media feed roller assembly (located at the front of the upper frame) up and forward into the locked-open position. See Figure 3-25.

13. 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 3-26.

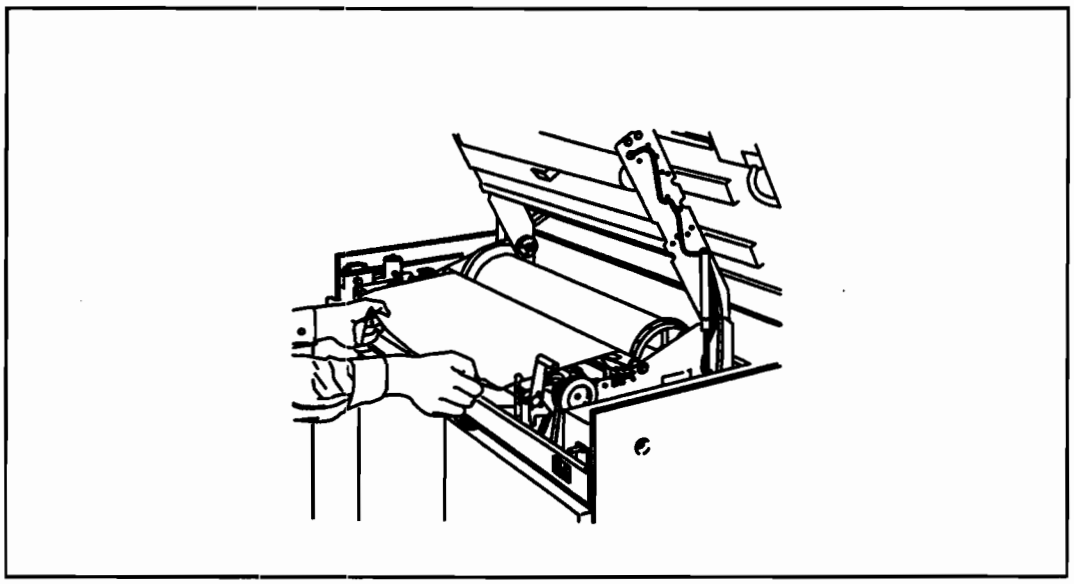


Figure 3-23. Media Routing

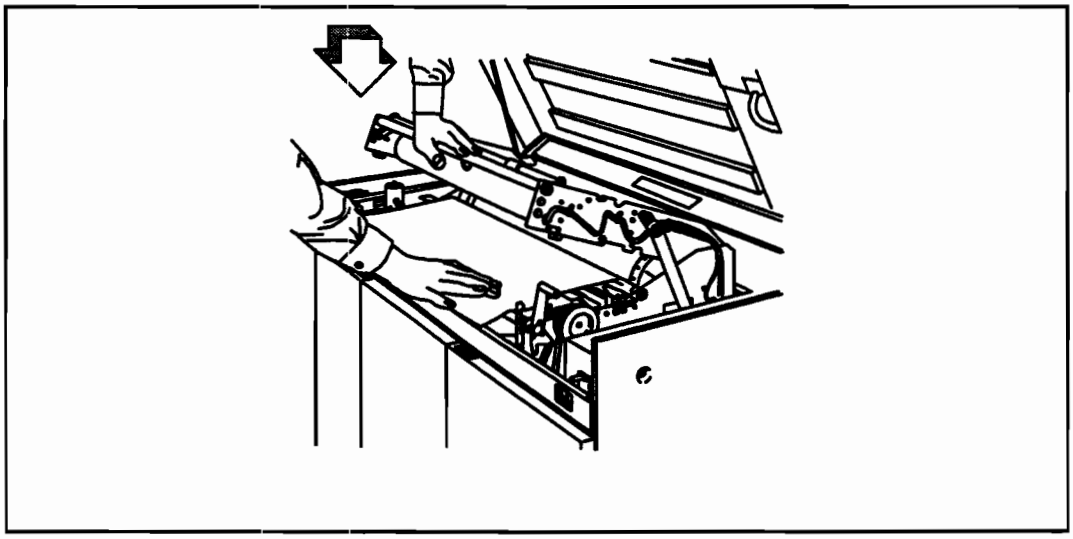


Figure 3-24. Closing the Upper Frame

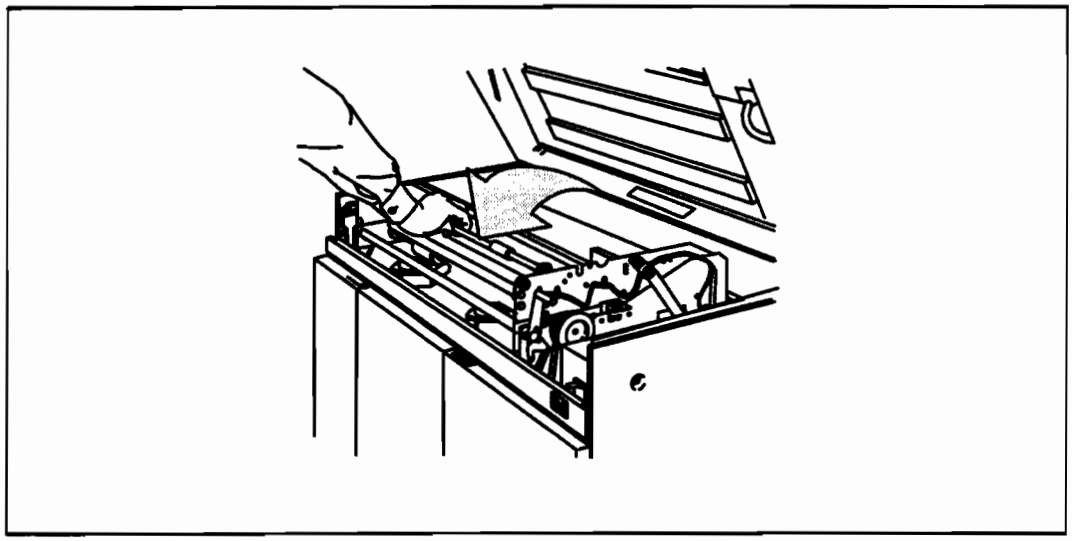


Figure 3-25. Locking the Feed Roller Assembly Forward

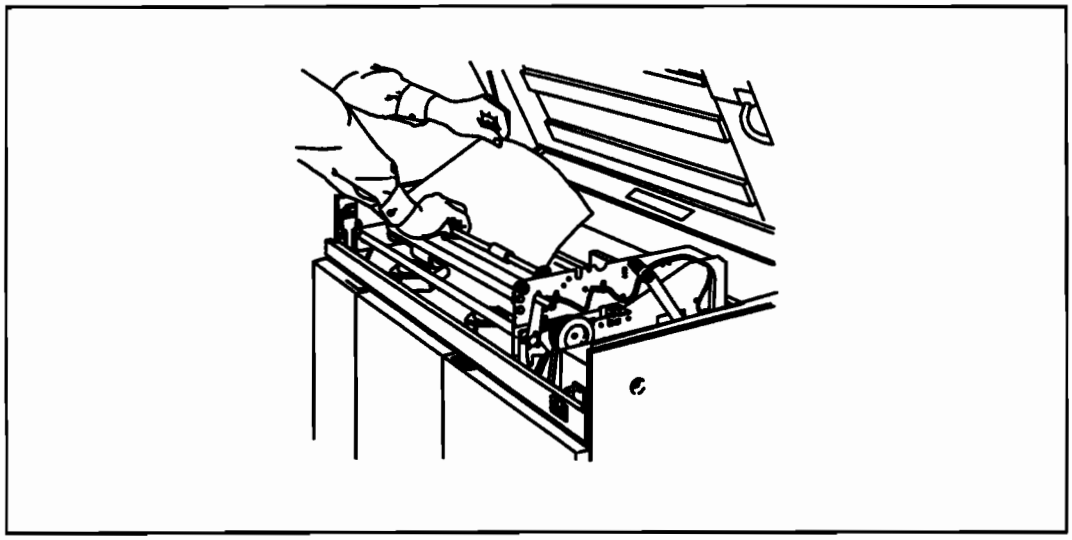


Figure 3-26. Routing the Media

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.

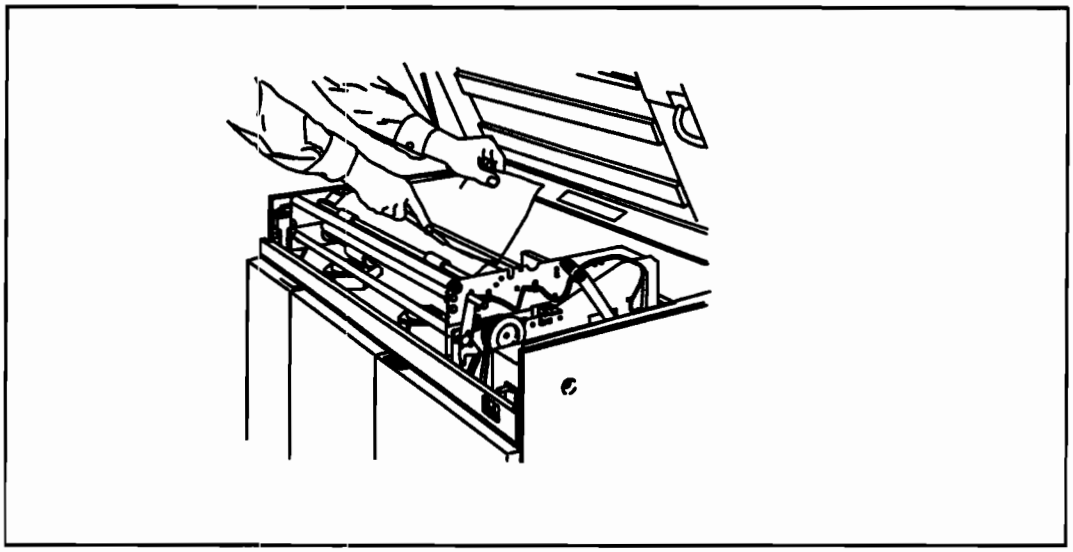


Figure 3-27. Cutting the Media

14. 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 3-27. For the Model 250/255 See Figure 3-28 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 3-39. If the plots are to be cut into sheets, follow the steps under paragraph 3-43.

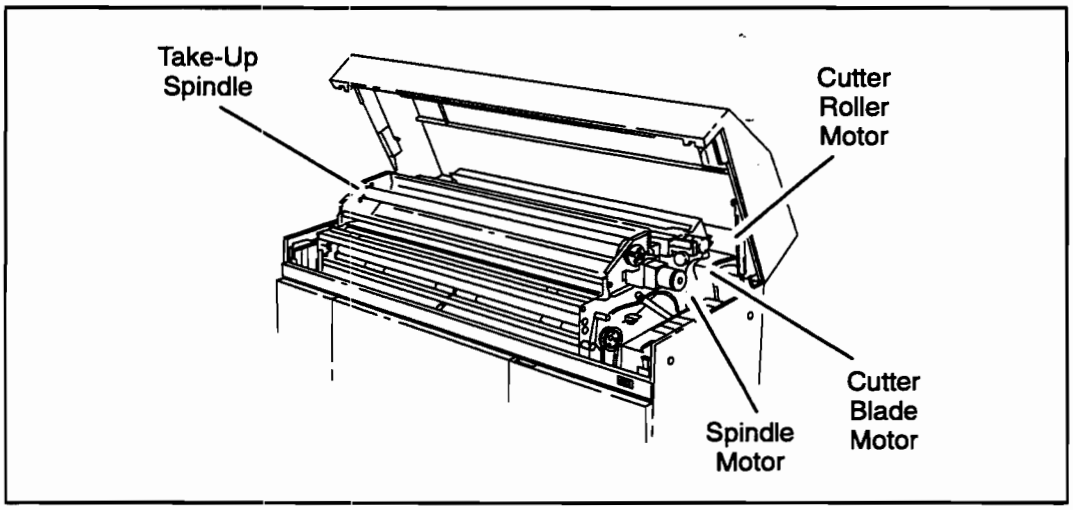


Figure 3-28. Upper Frame Assembly

15. Close the top cover.

3-37. TAKE-UP REEL OPERATION (Model 250/255)

3-38. 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.

3-39. To use the take-up reel, proceed as follows:

1. Load media as indicated in this chapter.
2. Route the media under the bar and over the spindle as indicated in Figure 3-29.
3. Using tape, attach the leading edge of the media to the spindle at the center.
4. Manually advance the spindle to take up the slack in the media and make at least one complete wrap around the spindle. See Figure 3-30.
5. Close the top cover.
6. Apply power to the plotter.
7. Press the **Plotter Setup** button on the front panel.
8. Scroll down to the **MEDIA HDLG** menu.
9. Press the **Value +** or **Value –** button to display **TAKE UP**.
10. Press **Enter** to select the **TAKE-UP** function.
11. The plotter is now configured for take-up reel operation.

NOTE

Media will not advance when the On Line indicator is lit. If the indicator is lit, press the On Line button to take the plotter Off Line.

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

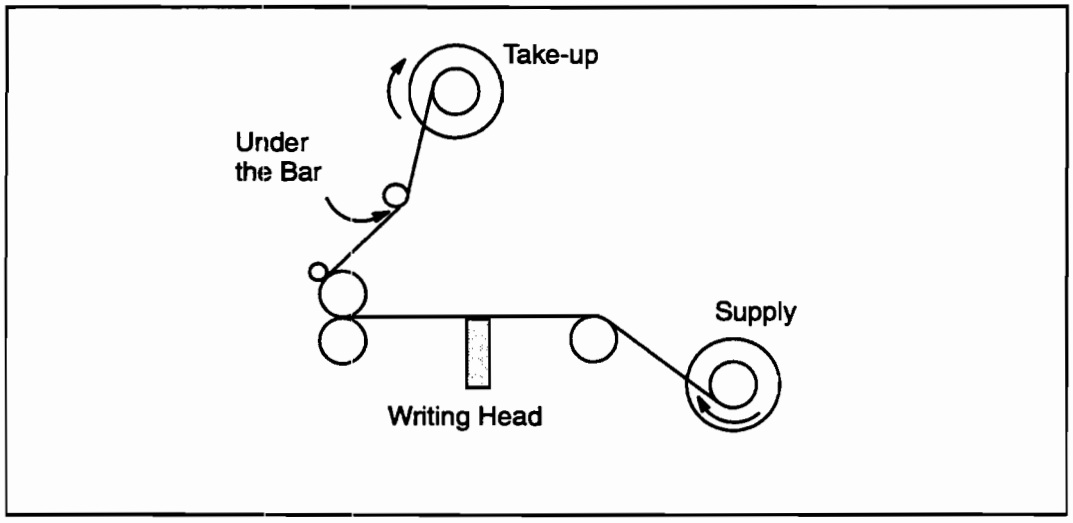


Figure 3-29. Take-Up Reel Loading

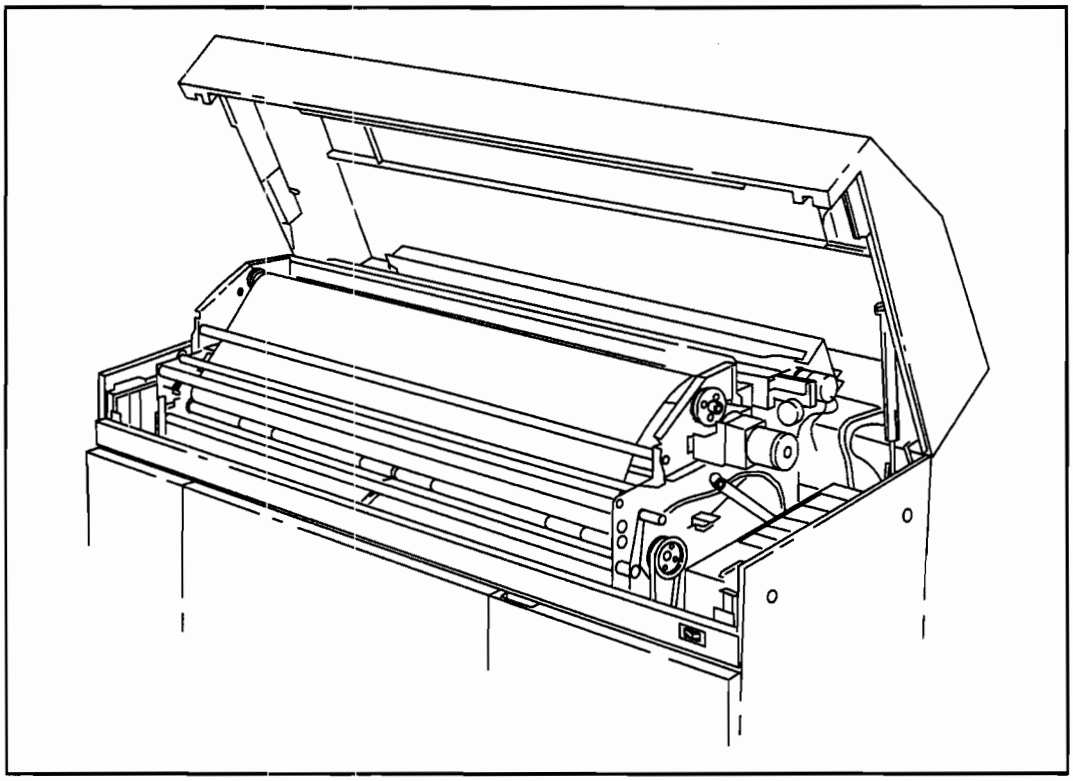


Figure 3-30. Take-Up Reel Operation

3-40. OPTIONAL TAKE-UP REEL C1621A & C1622A FOR MODELS 240D/E

NOTE

For installation and user information on the C1621A & C1622A Take-Up-Reels, please see the Take-Up-Reel Installation and User's Guide, HP P/N C1621–90002. A parts list for the C1621A/C1622A Take-Up Reel is included in chapter 10 of this manual (Table 10-29). An IPB for the C1621A/C1622A Take-Up Reel is included in chapter 10 of this manual (Figure 10-24).

3-41. PLOT CUTTER OPERATION

3-42. 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.

3-43. To use the cutter, proceed as follows:

1. Load media as indicated in this chapter.
2. Ensure that the media has a clean right angle cut across the leading edge.
3. Route the media over the bar and into the slot at the front of the cutter mechanism. See Figure 3-31 and Figure 3-32.
4. Close the top cover.
5. Apply power to the plotter.
6. After a few minutes delay, the following message will appear on the front panel display:

Media not in chosen path. Load media in correct path.
PREV MENU exits.

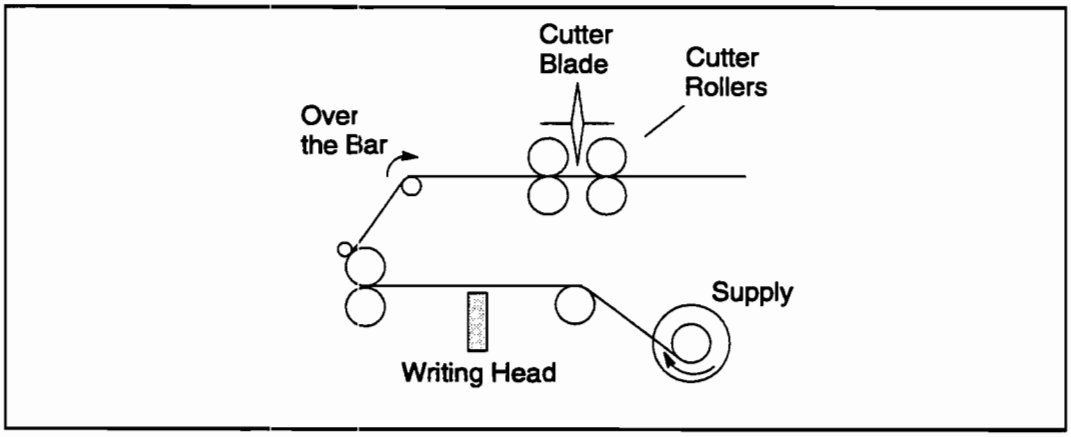


Figure 3-31. Cutter Loading

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

8. Press the **Scroll Down** button once to reach the **MEDIA HDLG** menu.

9. Press the **Value +** or **Value –** button to display either **CUT&VSTK** (Cut and Vertical Stack) or **CUT&HSTK** (Cut and Horizontal Stack).

NOTE

For minimum media waste, select **CUT&HSTK.**

10. Press **Enter** to select the desired function.

11. The plotter is now configured for cutter operation, but the media must be advanced.

NOTE

Media will not advance when the On Line indicator is lit. If the indicator is lit, press the On Line button to take the plotter Off Line.

12. Press and hold down the **Advance** button on the front panel to move the media through the cutter. Release the **Advance** button to stop advancing the media when satisfied that the media has advanced completely through the cutter.

13. Reaching around to the rear of the cutter, tug the media lightly toward the rear of the plotter to take out any slack in the media.

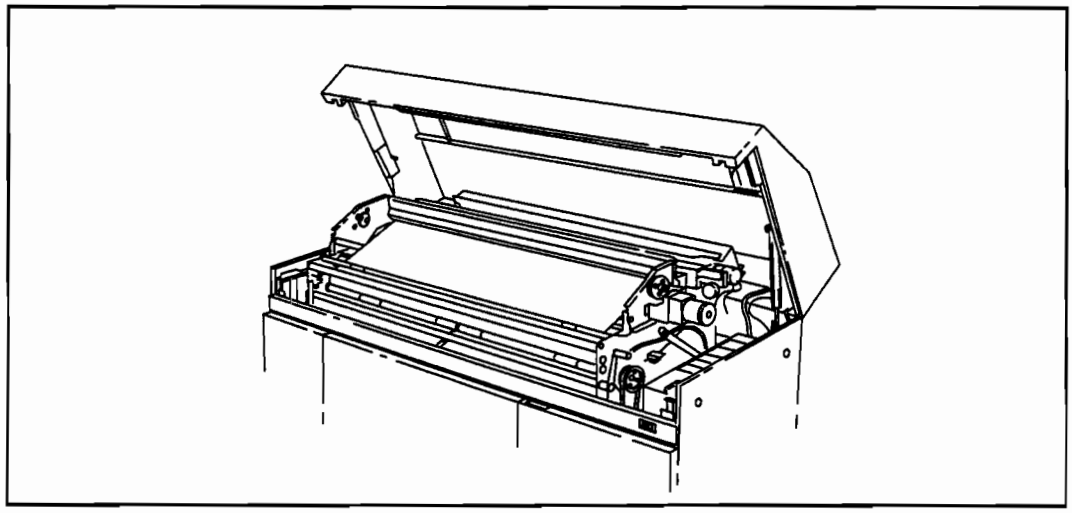


Figure 3-32. Cutter Operation

14. The plotter is ready to plot.

3-44. LOADING TONER

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C 100 °F). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

CAUTION

Environmental Hazard

United States of America only

The toner solution is a petroleum distillate (oil based) product. As with most petroleum products, EPA (Environmental Protection Agency) regulations prohibit the disposal of toner using normal waste disposal methods. Contact your local health department, EPA, or regulatory agency for information and/or instructions for disposing of spent toner. Regulations in your state may vary.

Other countries

The toner solution is a petroleum distillate (oil based) product which may require special disposal methods in your country. Since the methods of disposal may vary between countries, consult your local regulatory and/or health agencies for the proper disposal methods in your area.

CAUTION

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

Toner solution contains isoparaffinic petroleum solvent(flammable liquid). 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. 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.

3-45. To install the toner, perform the following steps:

1. Open the toner compartment door. See Figure 3-33.

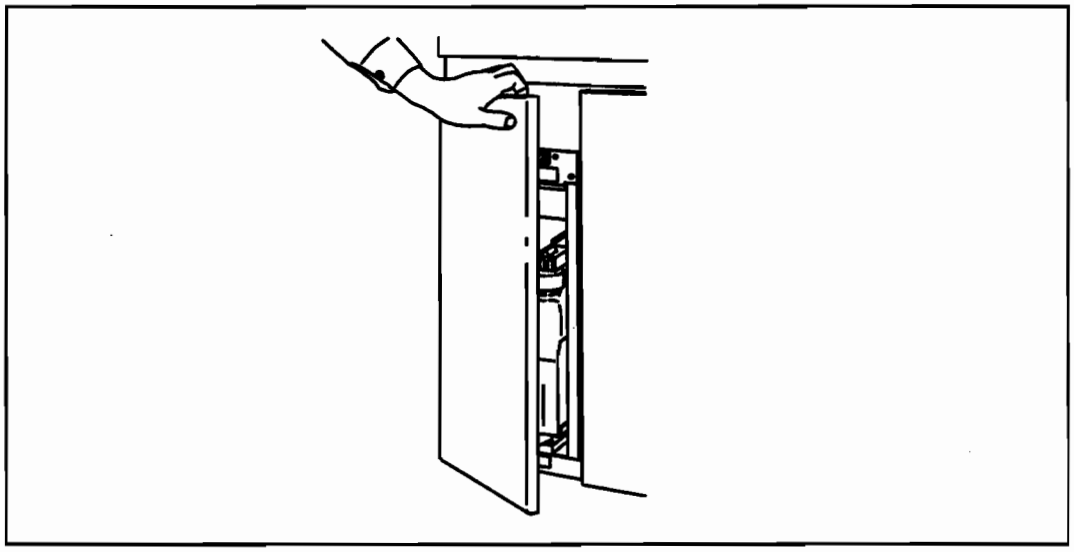


Figure 3-33. Toner Compartment Door

2. 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.

3. Unscrew the toner bottle cap securing the ink tube assembly and raise the assembly. See Figure 3-34.

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

5. Unscrew the toner drawer knob on the toner drawer. See Figure 3-34.

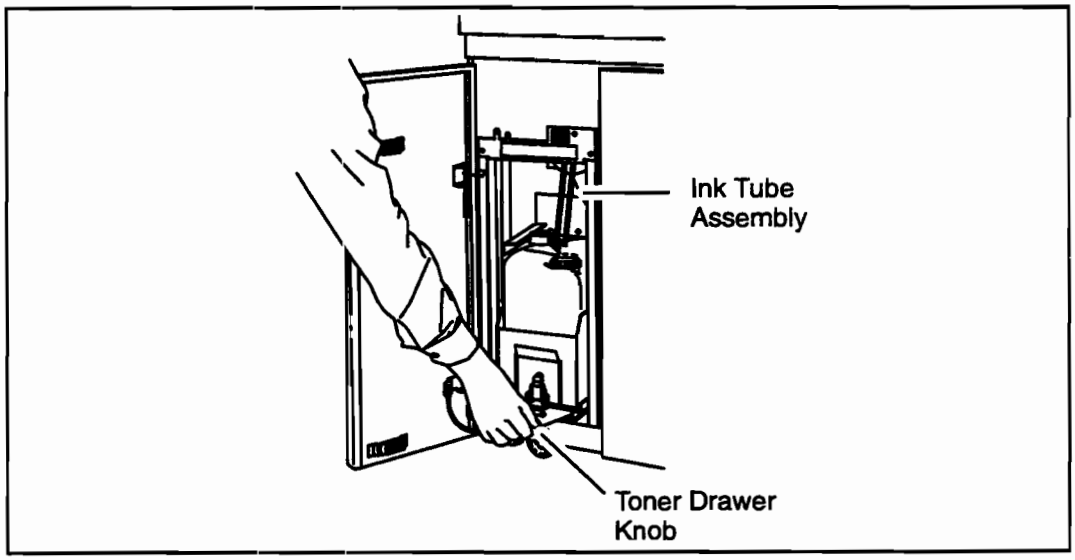


Figure 3-34. Toner Bottle Compartment

6. Pull the toner drawer out. See Figure 3-35.

7. Remove the empty bottle of toner from its box. Save this bottle for use in flushing the developer system. The flushing procedure is described in paragraph "4-23. " of Chapter 4 in this manual.

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

9. 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.

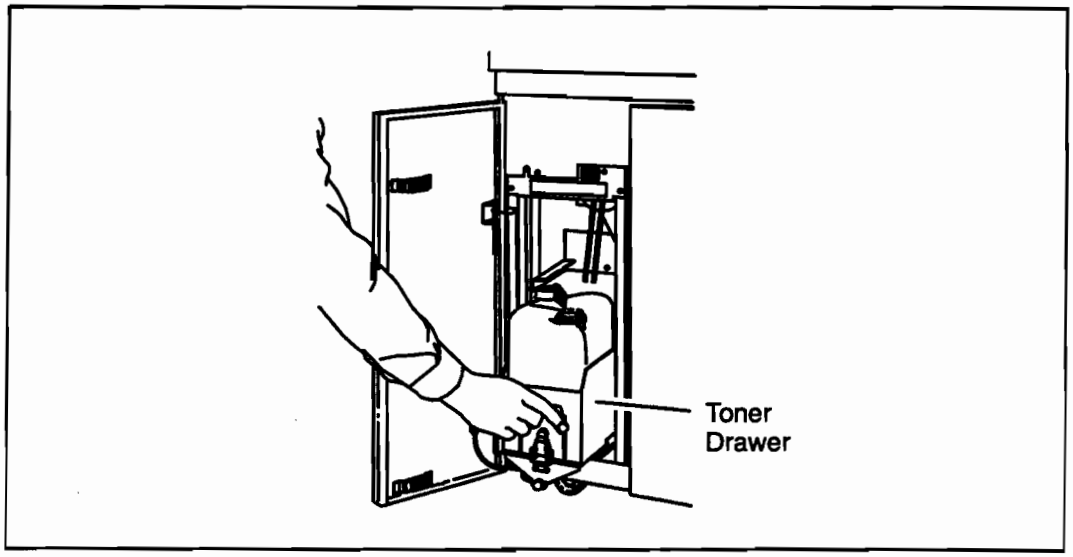


Figure 3-35. Toner Drawer

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

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

3-46. CONNECTING THE COMPUTER (Model 240D/E Only)

3-47. To connect your computer to the plotter, perform the following steps:

1. If you have not performed steps under the procedures headed PRINT ENGINE INSTALLATION, VRC INSTALLATION, LINE VOLTAGE SELECTION, and CONNECTING POWER, perform them now.

2. 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.

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

4. 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 3-36.

5. Connect the interface cable to the appropriate connector on the front of the VRC as shown in Figure 3-36, Figure 3-37, or Figure 3-38.

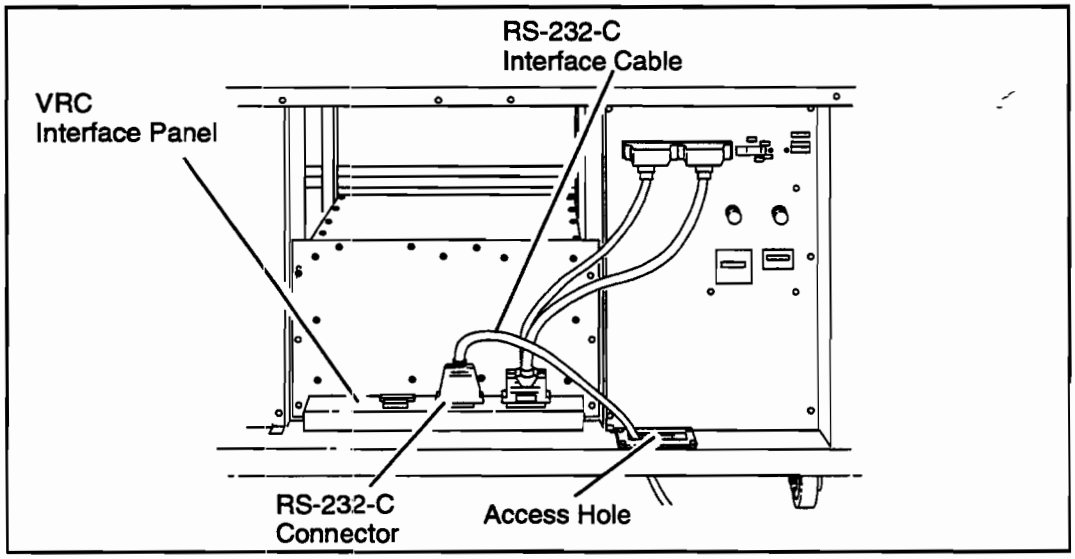


Figure 3-36. RS-232-C Cable Connection

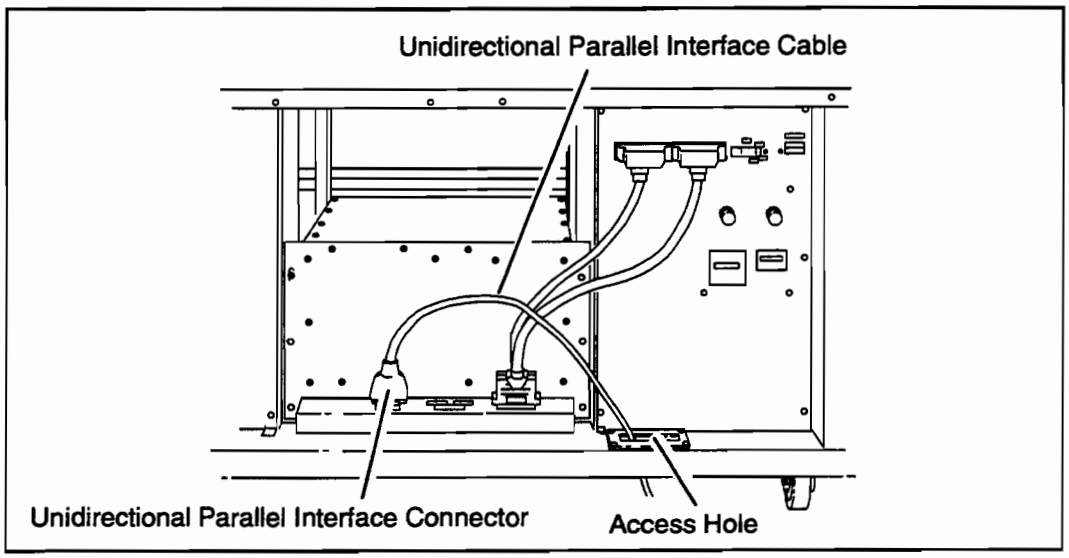


Figure 3-37. Unidirectional Parallel Interface Cable

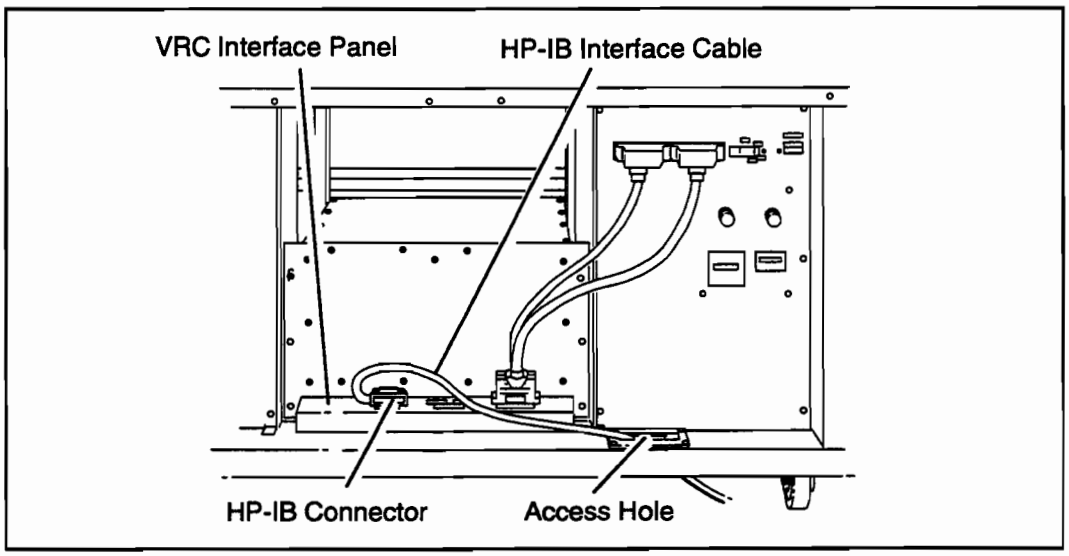


Figure 3-38. HP-IB Cable Connection

6. Set the VRC interface for the appropriate interface options. Refer to paragraph "3-48. " through "3-68. " to set Models 240D/E and paragraph "3-69. " through "3-75. " to set Models 250/255.

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

3-48. 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.

3-49. Remove the front cover of the plotter to see the VRC Main Interconnect PCA switches. For a diagram of the switches, see Figure 3-39. 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.

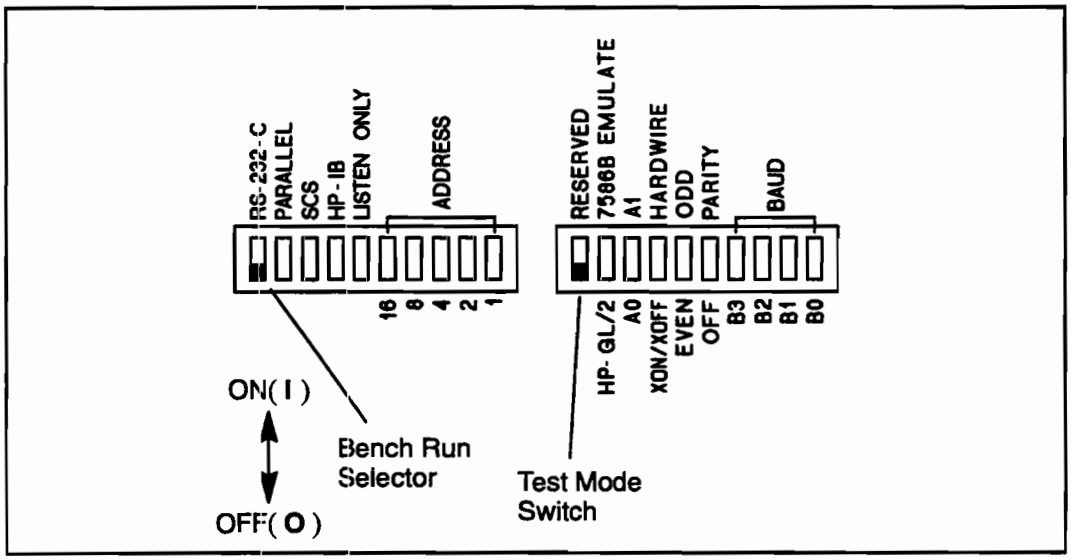


Figure 3-39. VRC Main Interconnect PCA Switches

3-50. The switches, RS-232-C, PARALLEL, SCS, and HP-IB are sensed at power-on. They are checked in right-to-left order. The 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.

3-51. The Secondary Command Support (SCS) protocol allows the plotter to use the HP-IB bus, but without monopolizing the bus in a multiuser environment.

3-52. RS-232-C INTERFACE

3-53. See Figure 3-40 for a diagram of typical switch settings for the RS-232-C interface.

3-54. Figure 3-40 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.

3-55. 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.

3-56. 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.

3-57. 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.

3-58. See Table 3-4 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 sig-

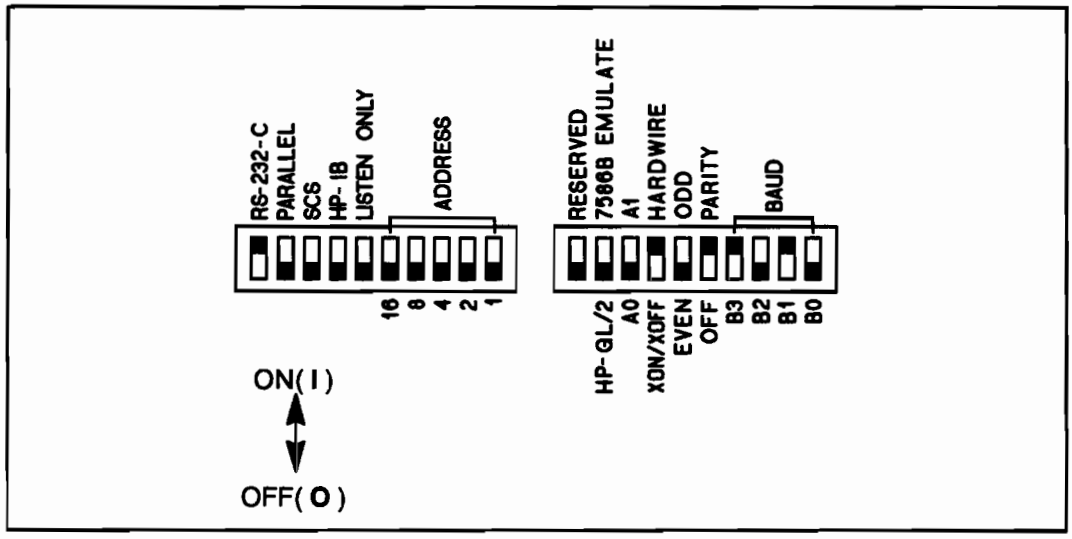


Figure 3-40. RS-232-C Interface Switch Settings

nal 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.

Table 3-4. 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

3-59. 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.

3-60. PARALLEL INTERFACE

3-61. See Figure 3-41 for a diagram of switch settings for this mode of operation.

3-62. 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.

3-63. HP-IB INTERFACE

3-64. See Figure 3-42 for a diagram of typical switch settings for this mode of operation.

3-65. 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

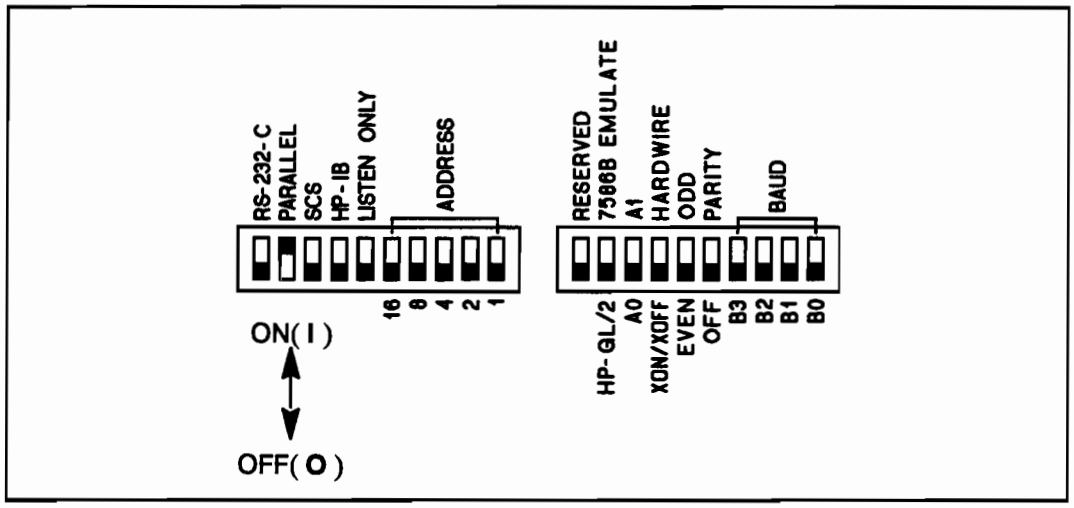


Figure 3-41. Unidirectional PARALLEL Interface Switch Settings

switches (0 through 31). Refer to Table 3-5 for the available address switch settings. Ensure that the controller and plotter are set to the same address.

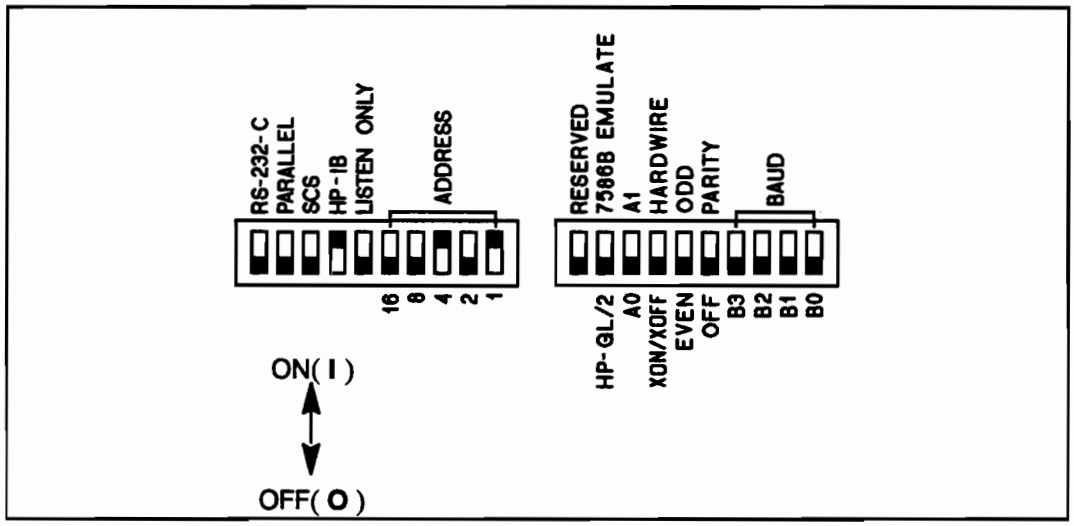


Figure 3-42. HP-IB Interface Without SCS

3-66. HP-IB INTERFACE (WITH SCS PROTOCOL)

3-67. See Figure 3-43 for a diagram of typical switch settings for this mode of operation.

3-68. 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 indi-

cates 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 3-5 for the available address switch settings. Ensure that the controller and plotter are set to the same address.

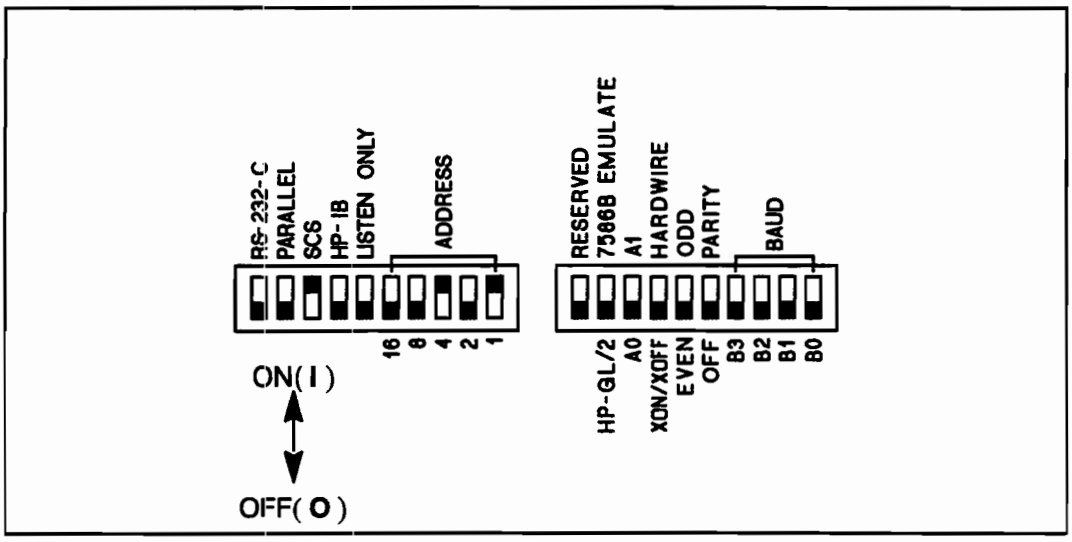


Figure 3-43. HP-IB Interface with SCS

Table 3-5. 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

3-69. CONNECTING THE COMPUTER (Model 250/255 Only)

3-70. To connect your computer to the plotter, perform the following steps:

1. If you have not performed steps under the procedures headed PRINT ENGINE INSTALLATION, VRC INSTALLATION, LINE VOLTAGE SELECTION, and CONNECTING POWER, perform them now.

2. 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.

3. Open the left-front door.

4. Route an HP-IB, RS-232-C, or CENTRONICS PARALLEL interface cable from the controller under the print engine and up through the access hole located just inside the front doors.

5. Connect the interface cable to the appropriate connector on the front of the VRC as shown in Figure 3-44.

6. Secure the interface cable with the clips or screws provided and close the door.

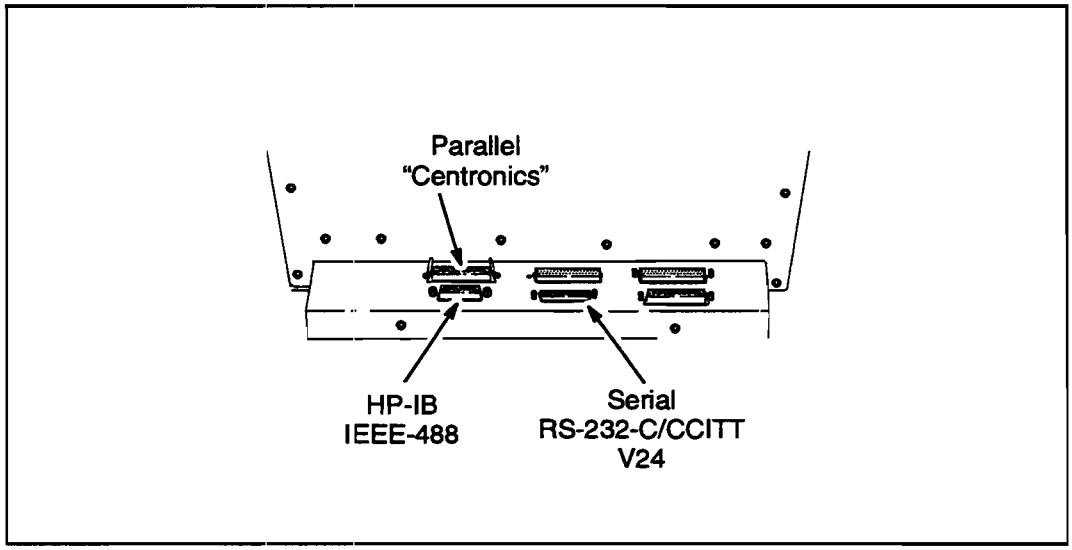


Figure 3-44. Computer Interface Connections

3-71. SETTING UP THE INTERFACE

3-72. Interface functions are established through the plotter front panel. The plotter may be used with Centronics, RS-232-C, or HP-IB interface. Refer to the appropriate paragraph for the type of interface desired.

3-73. CENTRONICS. This uni-directional 8-bit parallel interface is the plotter default. To set up the Centronics interface:

1. Apply power to the plotter. See Figure 3-45.

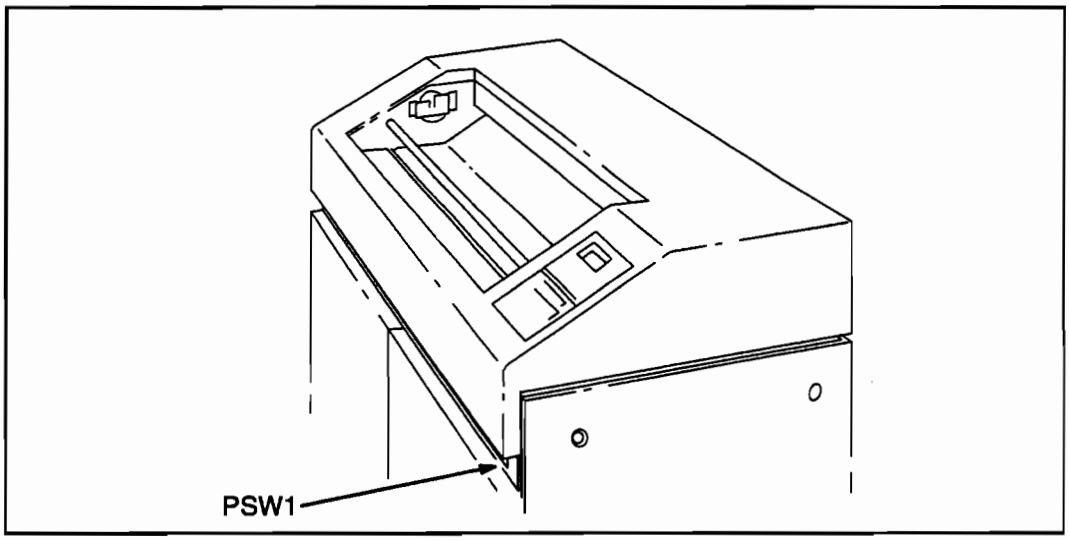


Figure 3-45. Location of Power Switch (Model 250/255)

2. Press the **Plotter Setup** button.

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

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

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

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

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

6. This completes the Centronics interface set-up. Press **Prev Menu** to exit.

3-74. HP-IB. The Hewlett-Packard Interface Bus is an 8-bit parallel, byte-serial bidirectional interface. The interface is set up as follows:

1. Apply power to the plotter. See Figure 3-45.

2. Press the **Plotter Setup** button.

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

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

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

5. 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>
```

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

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

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

9. Press **Scroll Down** once. The display will be as follows:

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

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

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

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

3-75. RS-232-C. This is a bit-serial interface and is selected as follows:

1. Apply power to the plotter. See Figure 3-45.

2. Press the **Plotter Setup** button.

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

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

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

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

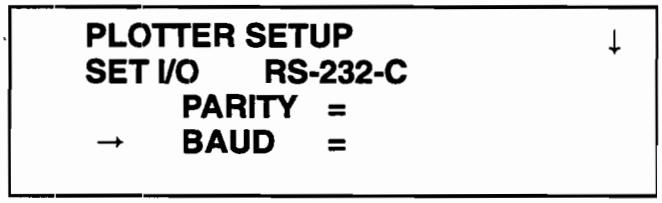
```
PLOTTER SETUP                    ↓
SET I/O   RS-232-C
→      PARITY  =
       BAUD    =
```

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

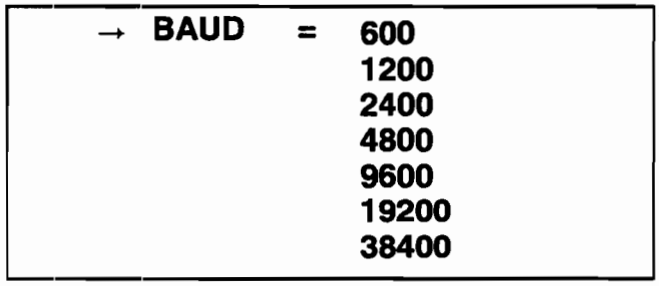
```
PARITY    =  SPACE
             MARK
             OFF
             ODD
             EVEN
```

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

8. Press **Scroll Down** once. The arrow will be at the **BAUD** selection.

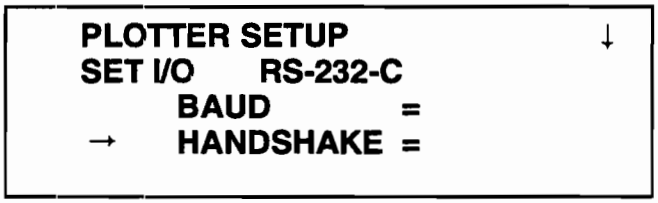


9. Press the **Value +** or **Value –** button to display the desired baud rate. Choices are:



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

11. Press **Scroll Down** once. The arrow will be at the **HANDSHAKE** selection.



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

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

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

3-76. USER INFORMATION AND OPERATION

3-77. SWITCHING ON THE PLOTTER (Model 240D/E Only)

1. Open the test panel door (right side of the plotter viewed from the front)

2. Ensure that the two switches below the label, Motor Pump, on the test panel are in the ON (I) position. The test panel is illustrated in Figure 3-46.

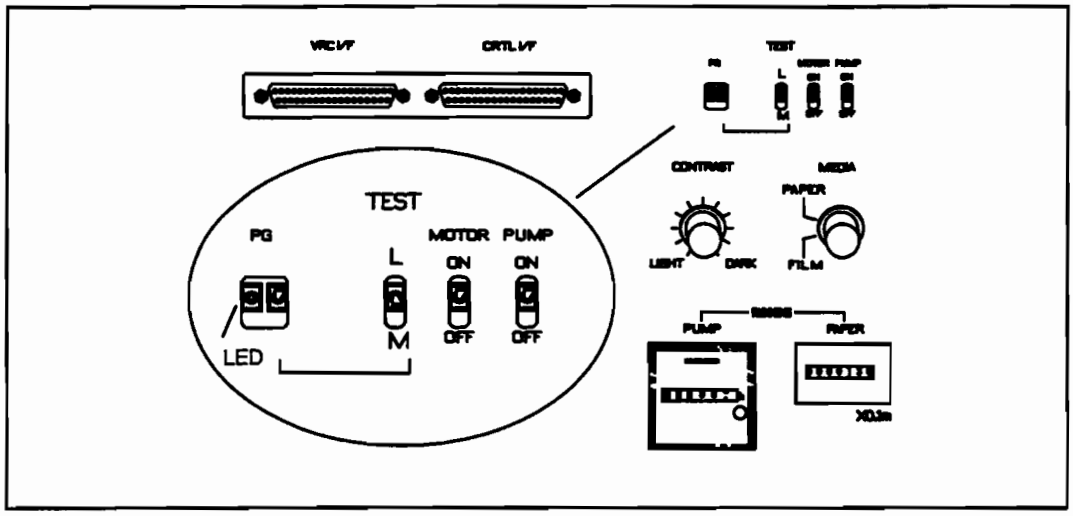


Figure 3-46. Test Panel

3. Close the test panel door.

4. Switch on the main breaker located above the ac receptacle at the rear of the print engine.

5. Switch on the power by pressing the end of the power switch (PSW1) marked I. See Figure 3-47 for the location of the power switch.

6. The power LED on the front panel should light up at this point. See Figure 3-48 for an illustration of the front panel LEDs.

7. The front panel LEDs should give the indication shown in Table 3-6.

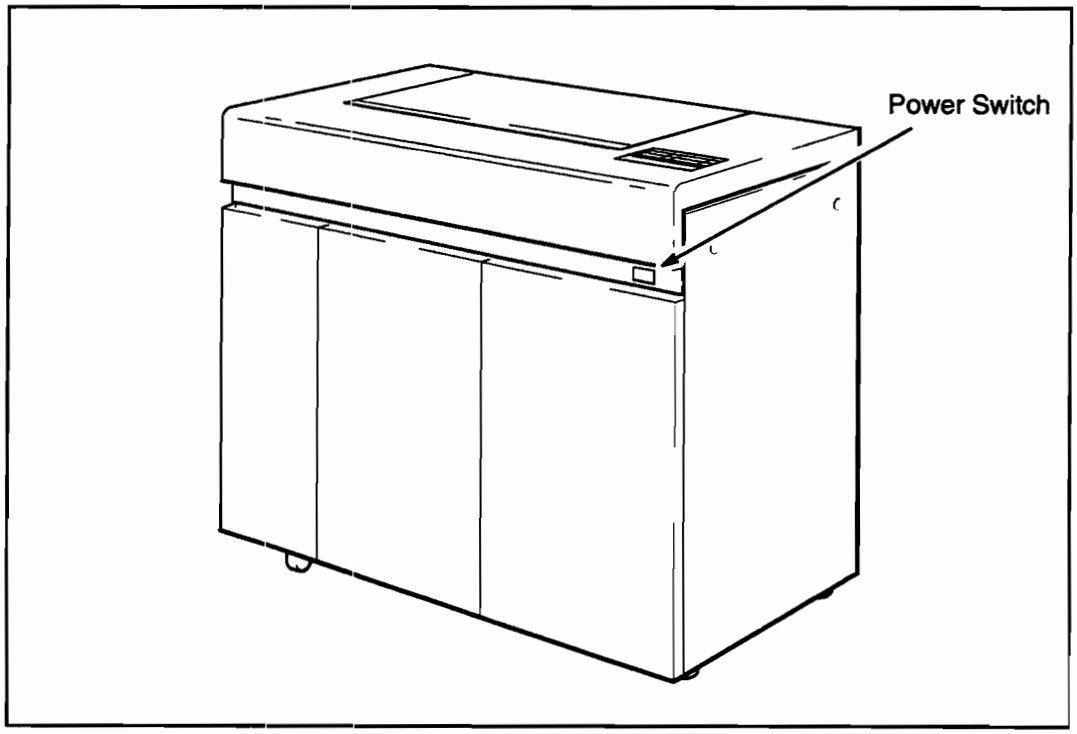


Figure 3-47. Location of Power Switch (Model 240D/E)

3-78. RUNNING THE DEMONSTRATION PLOT

1. Press and hold down the advance button on the front panel to advance the medium until two to three inches of the medium is exposed. (medium advances only as long as the button is pressed.). The Toner Pump will activate when this button is pressed.

2. To start the demonstration plot, press and release the Plot button followed within one second by pressing and releasing the On-Line button. The Busy LED will flash, and, after a two to three minute delay, the demonstration plot will begin.

NOTE

The demonstration plot may not have been loaded onto the VRC disc. If so, the plot will appear as shown in Figure 3-49.

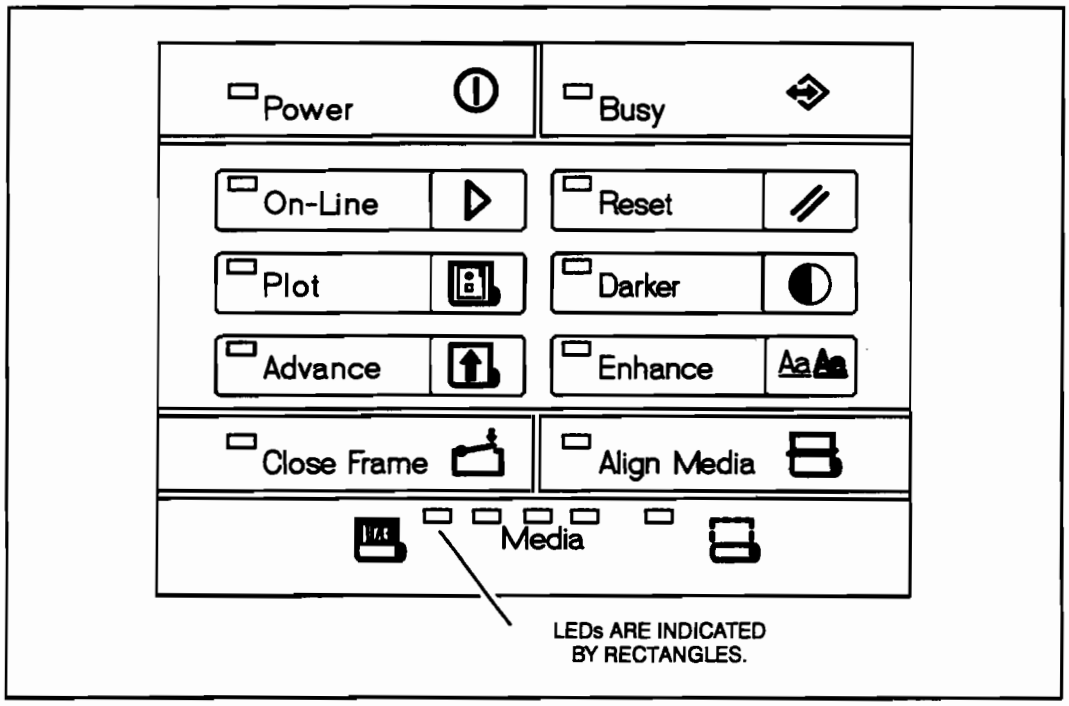


Figure 3-48. Front Panel Buttons

Table 3-6. Front Panel Symbol Functional Descriptions

POWER: ON steady
ON-LINE: OFF
ADVANCE: OFF
RESET: ON momentarily then OFF
CLOSE FRAME: OFF unless error
ALIGN MEDIA: OFF unless error

MEDIA:

a: Four green LEDs (bottom left of the control panel viewed from the front): ON

b. Yellow LED (bottom right side of the control panel viewed from the front): OFF

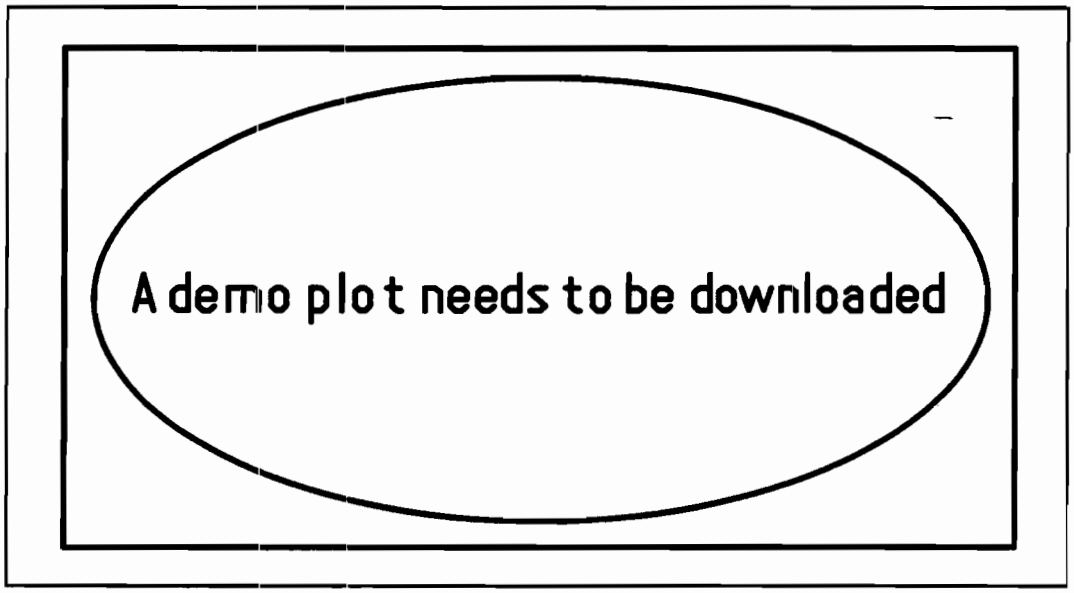


Figure 3-49. Back-up ROM Plot

3. Either the demonstration plot (See Figure 3-50) or the plot shown in Figure 3-49 verifies the operation of the VRC/print engine system except for controller input/output. But, for troubleshooting purposes, the plot shown in Figure 3-50 is more useful. If a feature of the demonstration plot appears defective, refer to Chapter 8, TROUBLESHOOTING, in this manual for the actions to be taken. To load the demonstration plot, refer to the procedures in paragraph.

3-79. LOADING THE DEMONSTRATION PLOT (Models 240D/E Only)

3-80. 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:

1. 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
5. The Portable PLUS is configured as follows:

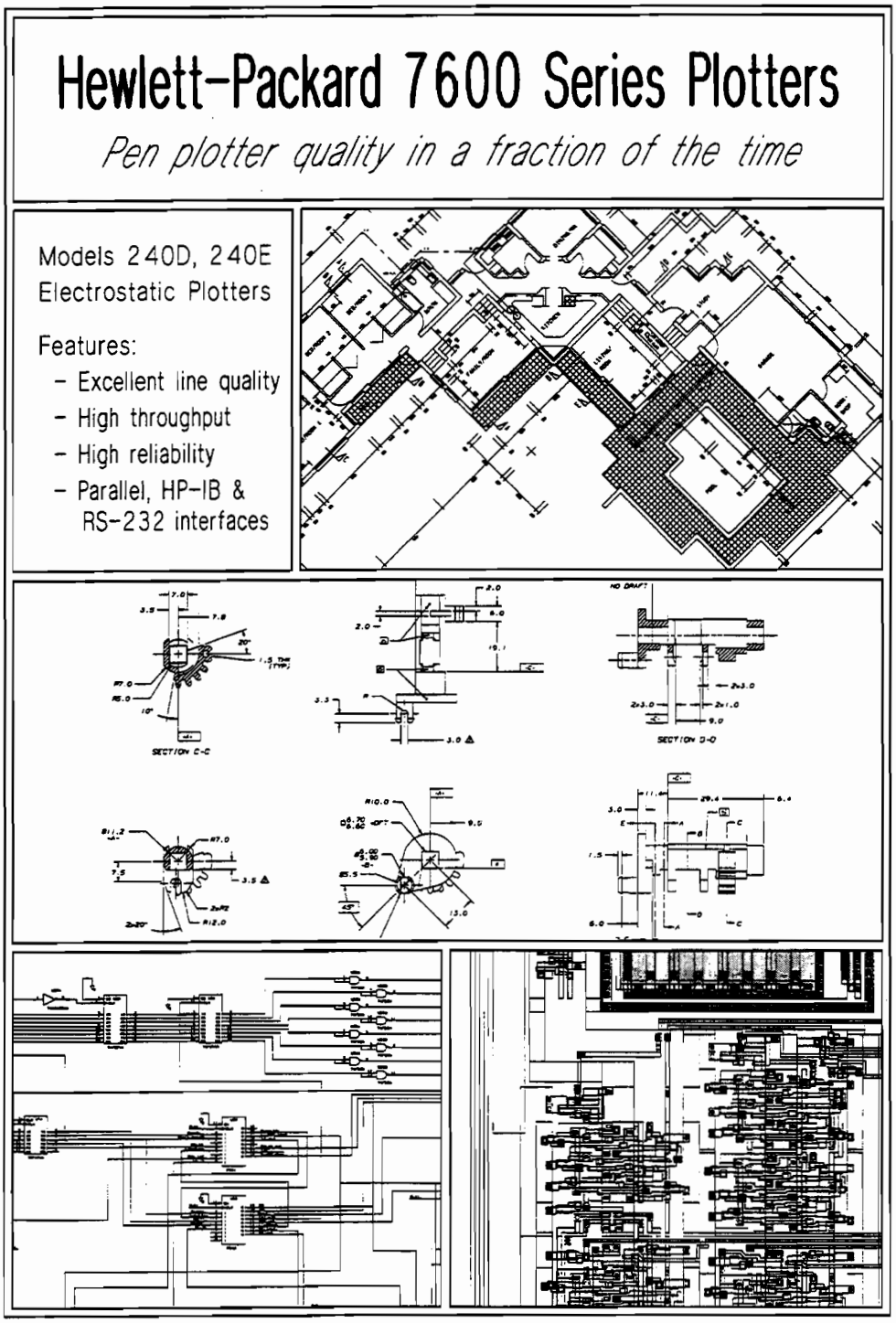


Figure 3-50. Demonstration Plot (Models 240D/E Only)

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

12. 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

6. Connect the Portable PLUS as shown in Figure 3-51.

7. 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 9.

8. Install the service disk in the drive.

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

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

11. Follow the instructions given on the display.

12. Run the program.

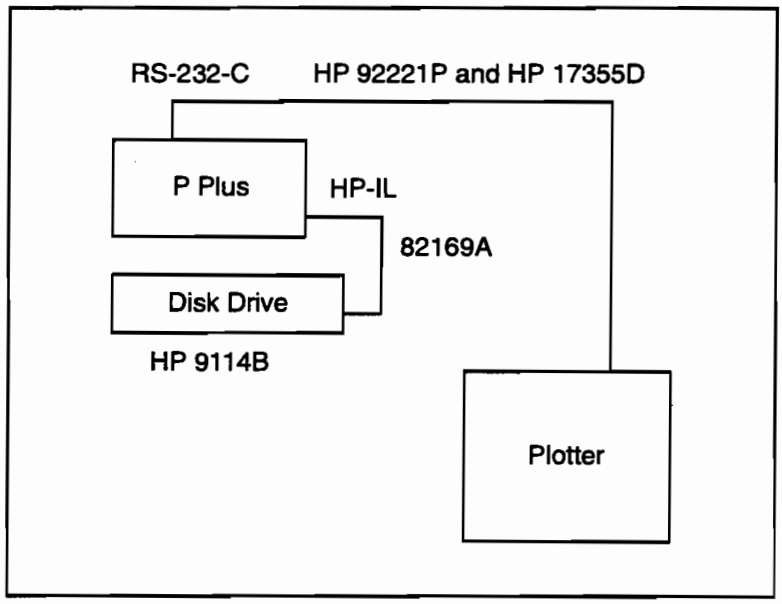


Figure 3-51. Demo Plot Setup

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

14. Turn OFF (**O**) all equipment before disconnecting the cabling.

NOTE

The 7600 Models 240D/E do not require language files to be downloaded on the hard drive for proper operation. If the Demo Plot is not loaded on the 240D/E, the plotter will still function normally for all plotting.

3-81. SWITCHING ON THE PLOTTER (Models 250/255)

1. Open the right front door.

2. Ensure that the MAIN POWER switch and the CONTROLLER circuit breaker are in the ON (**I**) position.

3. Close the panel door.

4. Switch ON (**I**) the power by pressing the end of the power switch (PSW1) marked **I**. See Figure 3-45 for the location of the power switch.

5. The Power LED on the front panel should light up at this point. See Figure 3-54 for an illustration of the front panel.

6. The front panel LCD will display the following message for approximately 30 seconds.

```
INITIALIZING . . . .

   PLEASE WAIT
```

7. The "language" message will remain on the display for another 30 to 45 seconds.

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

8. The Media quantity LEDs will also be ON indicating the media level.

3-82. RUNNING THE DEMONSTRATION PLOT

3-83. To insure that the plotter is functioning properly, the built-in demonstration plot may be run. The procedure is as follows:

1. Switch ON (|) the plotter.

2. Ensure that no plot is being received.

3. Ensure that the Online LED is OFF. If ON, pressing the **Online** button once will toggle the LED.

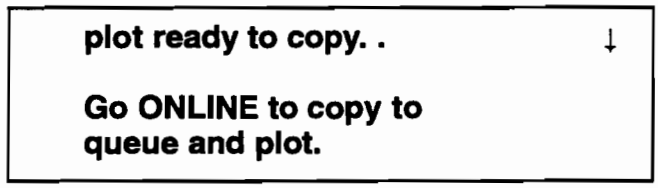
4. Press the **Utilities** button. The Utilities Menu will appear.

```
  UTILITIES                          ↓
→ PLOT DEMO          =FACTRY
  LOAD DEMO          =USER1
  LOAD CONFIG        =USER1
```

5. The "plot factory demo" is the default.

6. Press **Enter** to load the plot.

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



8. Press **Online**.

NOTE

Check the media path if the plotter does not go online at step 8. Media must be properly loaded and front panel settings must be correct before the plotter will go online.

9. If the demonstration plot has not been installed on the VRC hard disk, an alternate plot will be displayed. See Figure 3-52.

10. The Online LED will go on and the factory demonstration plot will begin to plot.

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.

11. When the demonstration plot is complete, set the plotter Off-Line, press and hold down the **Advance** button until the plot is completely visible.

12. If you desire to run the demonstration plot again, simply press the **Plot** button.

3-84. LOADING THE DISK FILES

3-85. If the plotter does not produce the factory DEMO plot and exhibits various blank displays when attempting to perform a front panel function, the language/demo files are not present on the disk. For instructions on downloading the language files to the disk, refer to page , paragraph 8-43.

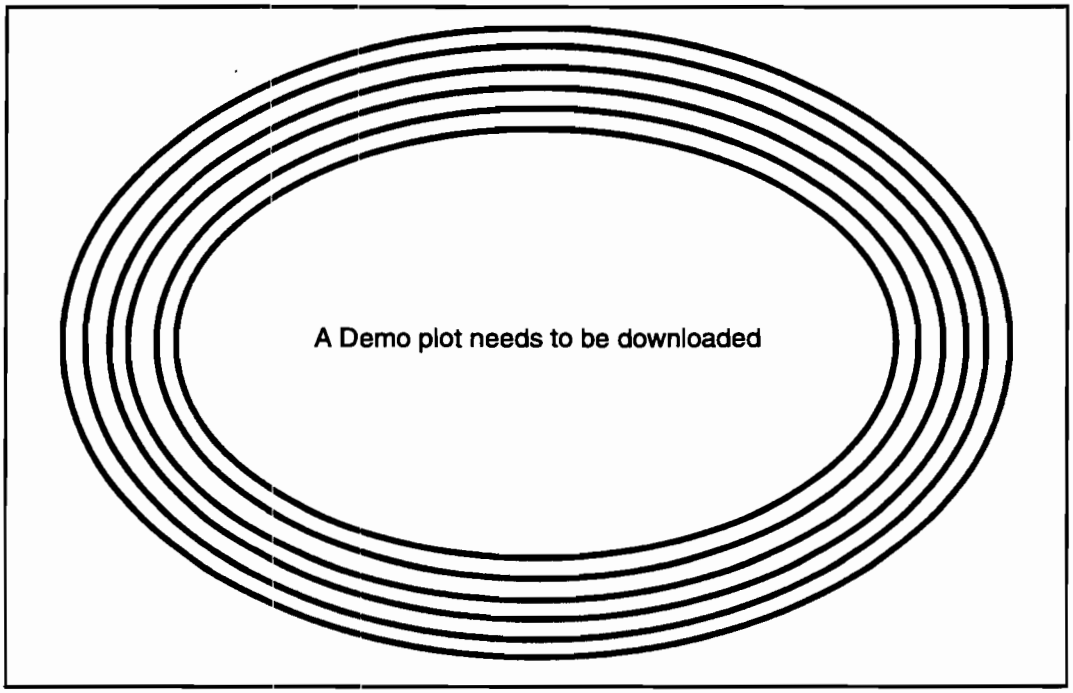


Figure 3-52. Back-Up Plot

3-86. FIRMWARE COMPATIBILITY (Models 250/255 Only)

3-87. For proper operation of the plotter, the front panel and VRC firmware revisions must be compatible with the language files on the hard disk.. The current revision of the VRC and front panel firmware can be checked from the front panel diagnostic menu. Table 3-7 shows the language files that are compatible for use with each pair of front panel and VRC code revisions. Note that two (2) language disks are required for downloading the necessary files onto the hard drive.

3-88. To check the current revision of the VRC, perform the following steps:

1. Enter the diagnostic menu by pressing the Diagnostic button on the front panel.
2. Scroll down to "Show Plotter Stats" and press the enter button.
3. The following display will appear:

NOTE

Future VRC and front panel (FP) code revisions that are pending will result in higher numbers being shown on the above display.

```
DIAGNOSTICS
PLOTTER STATISTICS
   VRC Code REV  :317
   FP Code REV   :320
```

3-89. Table 3-7 below shows the language files that are compatible for use with each pair of front panel and VRC code revisions.

Table 3-7. Language Disk and Code Revision Compatibility

	First Revision	Second & Third Revision	Fourth Revision	Current Revision
Language Disks (Use HPPNs)	C1620–60011 C1620–60012	C1620–60011 C1620–60012	C1620–18004 C1620–18005	C1620–18004 C1620–18005
VRC Code Rev.	207	215	315	317
Front Panel Code Rev.	N/A	261	320	320

NOTE

The second and third revision were the same and only a processor PCA change was made. Refer to Service Note C1620-01 for more information.

3-90. FRONT PANEL BUTTON FUNCTIONS ON THE MODEL 240D/E

3-91. See Figure 3-53 for a drawing of the front panel buttons.

3-92. Refer to Table 3-8 for functional descriptions of the front panel symbols.

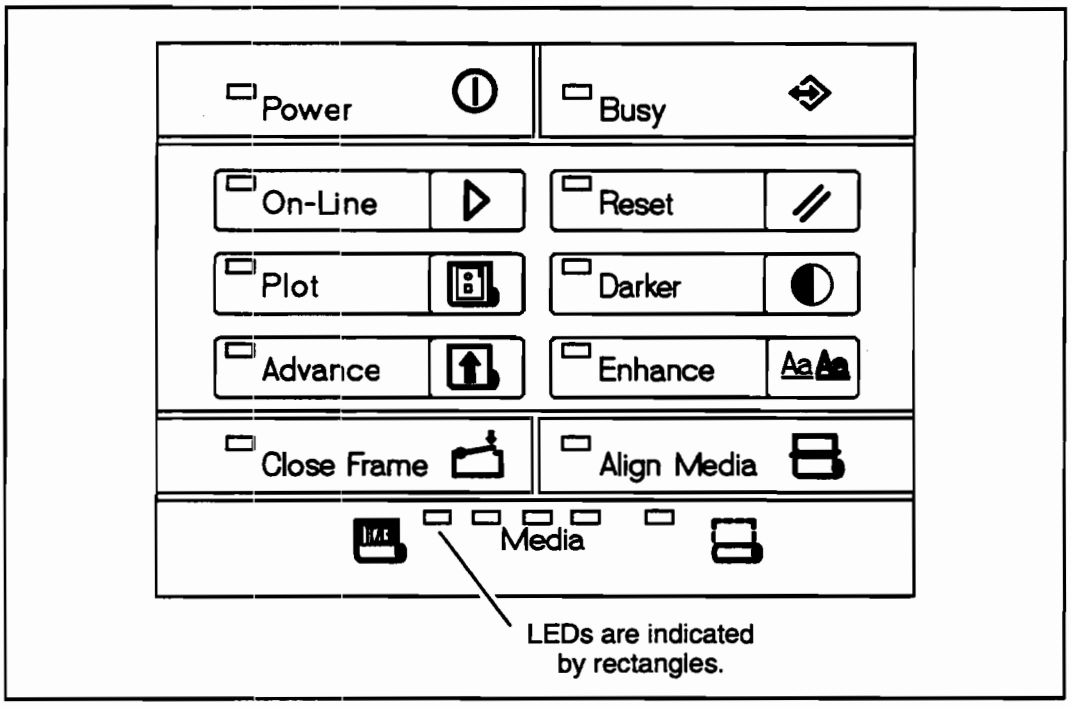


Figure 3-53. Front Panel Buttons

Table 3-8. 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. Widens lines.
	**Enhance**	

Table 3-8. 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.)

NOTE: 240D/E ADDED FRONT PANEL FUNCTIONS:

Paper Saver Mode: Invoked by holding down the RESET button for several seconds on power-up. Will cause the plotter to use only enough media for the imaged area.

Display Function Mode: Invoked by holding down the PLOT button on power-up until the BUSY LED stops flashing. Puts the plotter ON-LINE enabling the plotter to receive a plot file. Once the plot file has been received, press the PLOT button to plot out the plot file commands received.

3-93. FRONT PANEL BUTTONS (Models 250/255)

3-94. See Figure 3-54 for an illustration of the front panel.

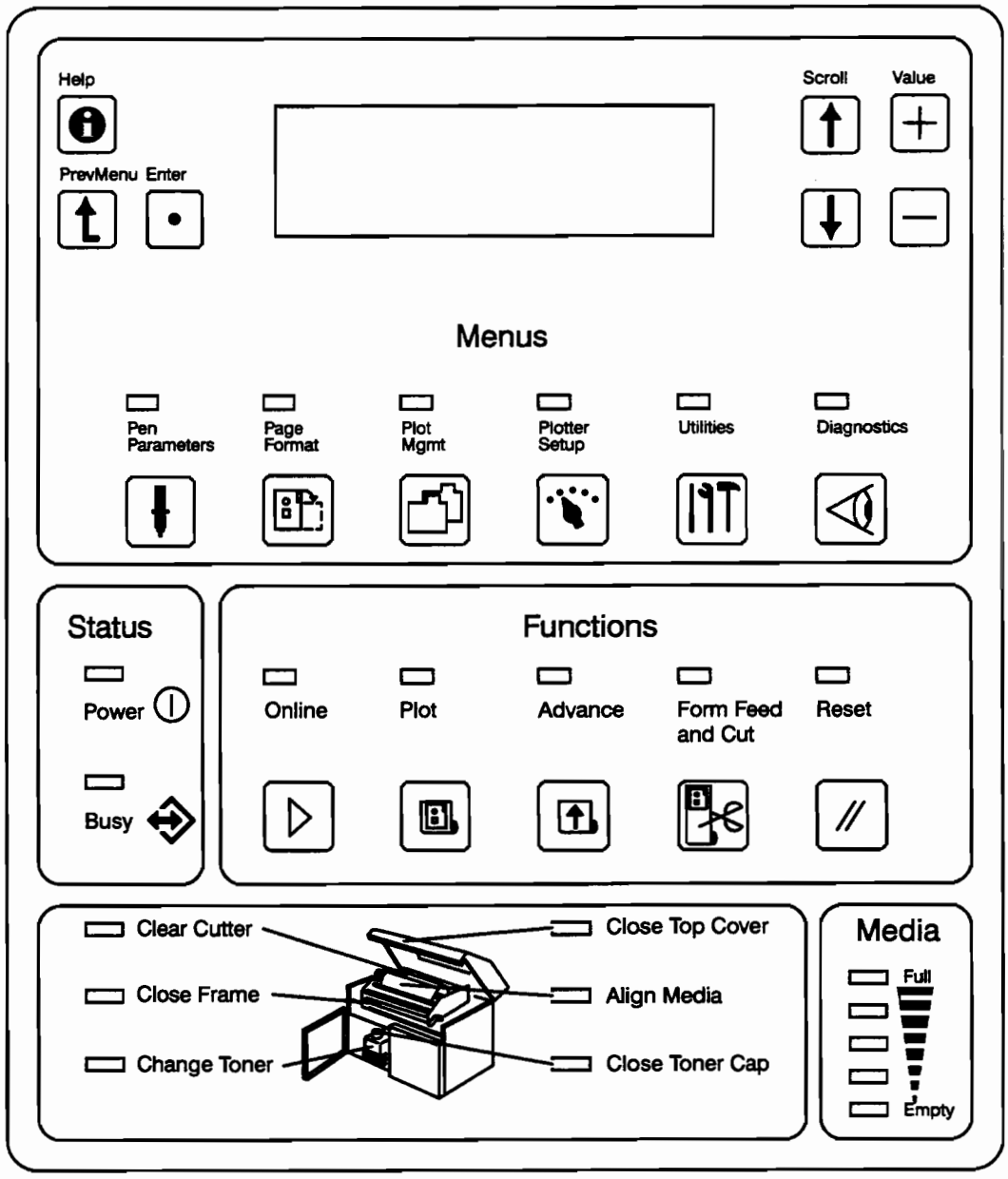
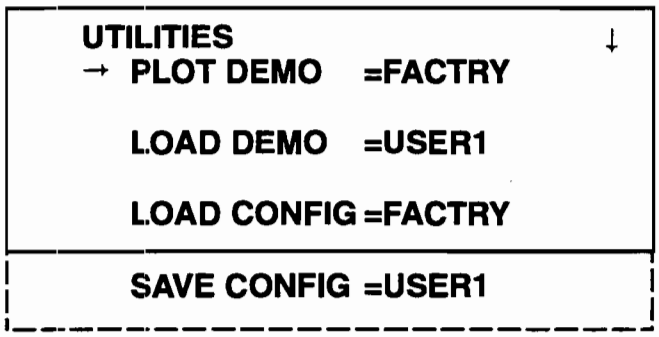


Figure 3-54. Front Panel

3-95. USING THE FRONT PANEL MENUS

3-96. To understand and explain the use of the front panel menus, it is very useful to run a Menus plot from the utility menu. The menu plot will show the hierarchy of the front panel and help in learning how to move from one menu to another. To run a menus plot, perform the following steps:

1. Switch ON (I) the plotter.
2. Ensure that no plot is being received.
3. Ensure that the Online LED is OFF.
4. Press the **Utilities** button. The Utilities menu will appear as follows:

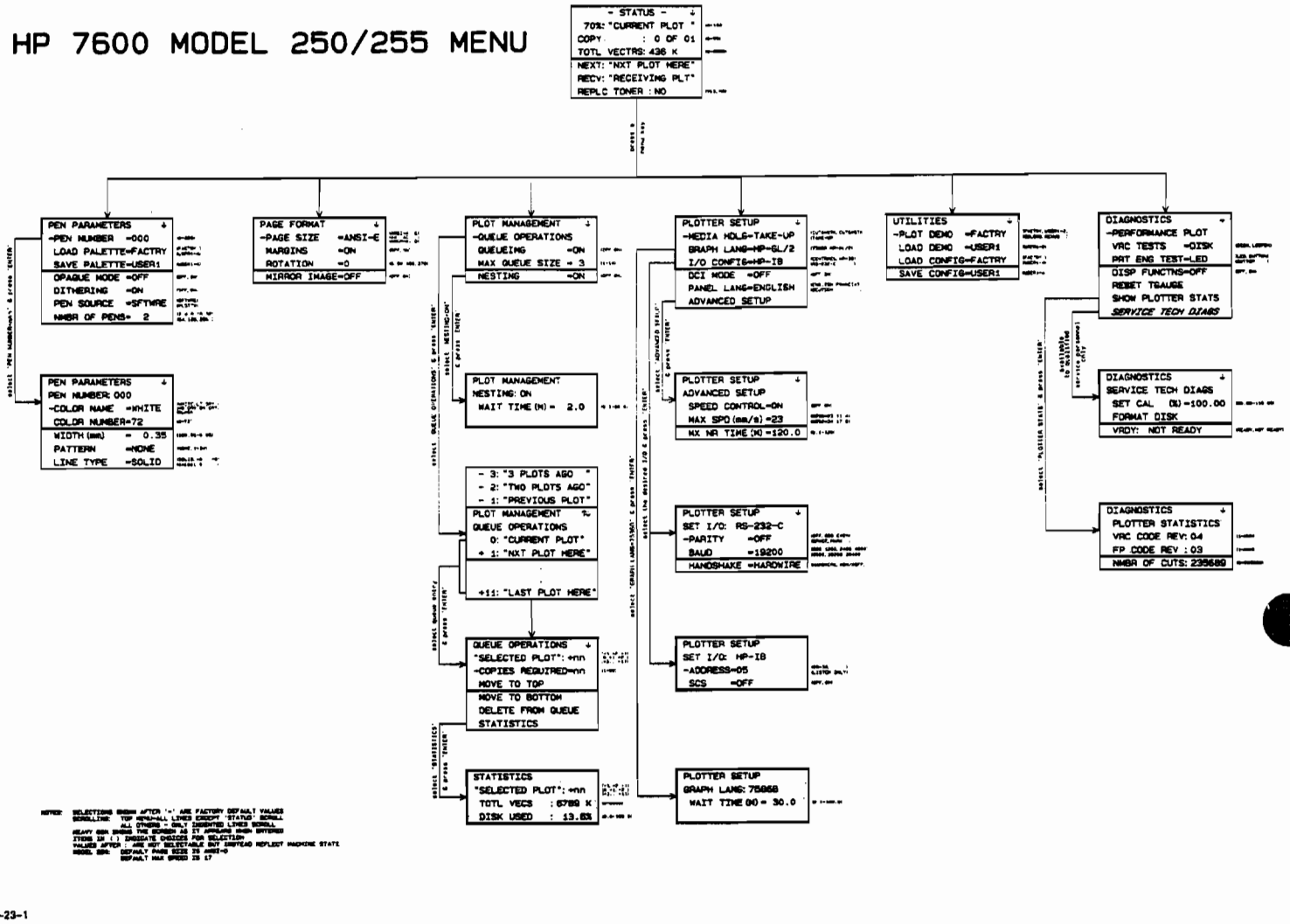


NOTE

The "SAVE CONFIG=USER1" line does not appear unless the you press the Scroll # button.

5. Press the **Value** – button one time to change the PLOT DEMO to "MENUS".
6. Press the **Enter** button to load the plot.
7. The LCD display will prompt the user to go on-line.
8. Press the **Online** button. The plotter will produce the plot shown in Figure 3-55.

3-97. The front panel of your plotter is divided into two parts. You use the top half, called the menus, to configure your plotter and to select special options. You use the bottom half for day-to-day operations like setting the plotter online, advancing the media, and so on. This chapter describes the top half of the front panel, the menus.



7600-D-23-1

Figure 3-55. HP Model 255 Menu

3-98. The following illustration shows the top half of the front panel:

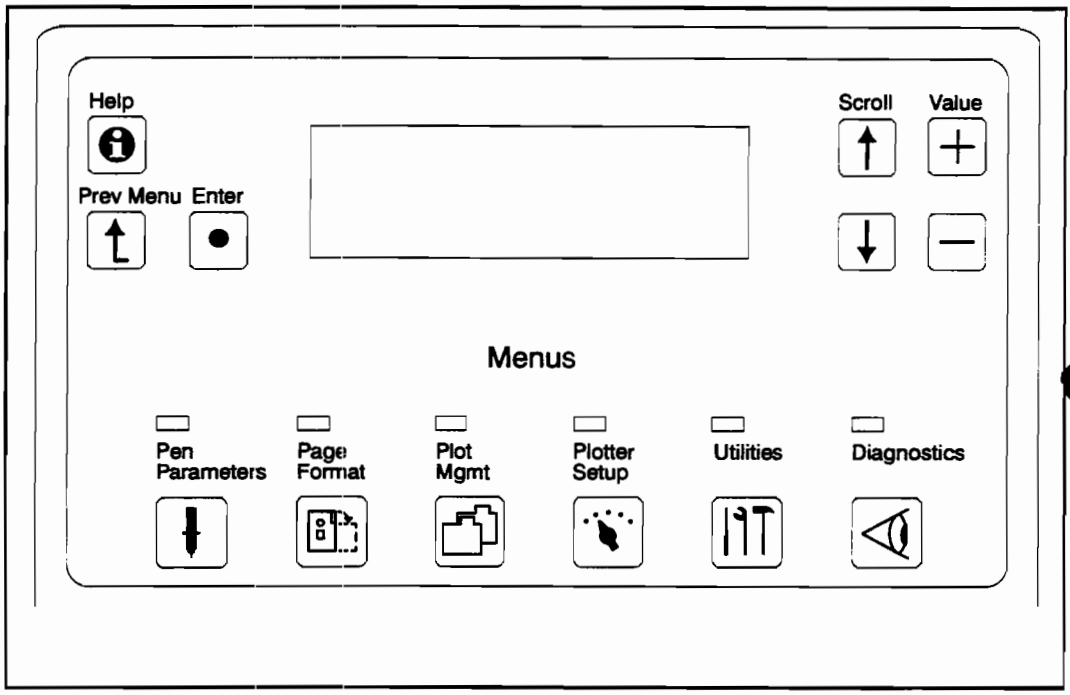


Figure 3-56. Front Panel, Top Half

3-99. GETTING ACQUAINTED WITH THE MENU CONTROLS

3-100. When you press one of the six menu buttons (the buttons below the word "Menus" on the display), the top level of the menu is shown on the display. You can then use the seven menu control buttons to move around in the menu, to change values, and to get help. The control buttons are shown in Table 3-9. An example of using the menu control buttons follows in the next section, "Working with the Menus: An Example."

Table 3-9. Menu Control Buttons

Symbol	Name	Purpose
	**Help**	Used to access context-specific help about any menu choice.
	**Prev Menu**	Used to return to the next higher-level menu. Also used from message displays to tell the plotter "no" when it is requesting a confirmation before proceeding.
	**Enter**	Used to activate a value in a menu line, and to call a submenu or perform an action associated with that menu line. Also used from message displays to tell the plotter "go ahead" when it is requesting a confirmation before proceeding.
	**Scroll Up/Down**	Used to move up and down within a menu. Arrows in the upper right corner of the display indicate whether there are more menu lines available in either direction. When you scroll, the arrow to the left of the menu lines moves to point to the current menu line.
	**Value +/–**	Used to increment or decrement the values on a menu line. When you change a value, the value flashes to indicate that it is not active. When you press **Enter**, the value becomes active and stops flashing.

3-101. WORKING WITH THE MENUS: AN EXAMPLE

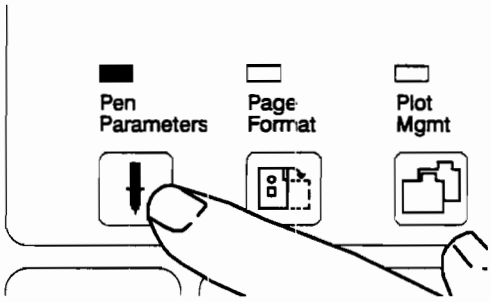
3-102. Interaction with the plotter menus is similar to many other menu-driven computer programs. The following example illustrates how to scroll, call submenus, change values and get help using the plotter menus.

3-103. The "pens" in your plotter are held in an electronic "palette."

3-104. Assume that pen 2 of your current palette is now set to plot as black, but you want it to plot as red.

3-105. Follow these steps to change pen 2 from black to light gray.

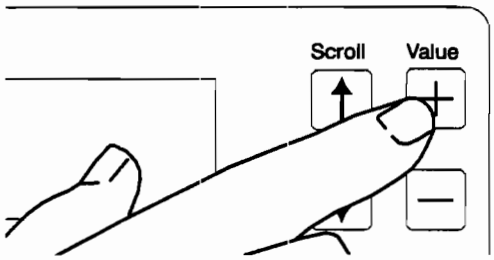
1. Make sure that no plot is currently plotting or being received.




```
PEN PARAMETERS          ↓
>PEN NUMBER =000
 LOAD PALETTE=FACTRY
 SAVE PALETTE=USER1
```

Note that the top line of the menu is a "header line" that tells you which menu you selected. The down arrow (↓) in the upper right corner indicates that there are further menu choices below those currently visible on the display. You could press the **Scroll Down** key to view these other choices. However, you want to change the parameters of a pen number, and the left arrow is already pointing at the PEN NUMBER line, so you do not need to scroll down at this time.

2. You want to change pen number 2. Press the **Value +** button twice to increment the pen number to 2.



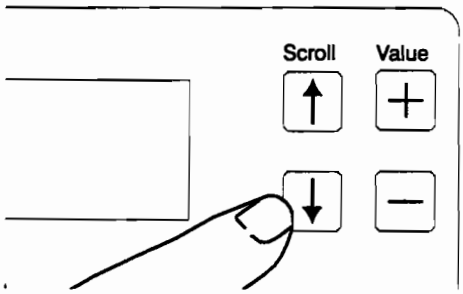

```
PEN PARAMETERS          ↓
>PEN NUMBER =002
 LOAD PALETTE=FACTRY
 SAVE PALETTE=USER1
```

3. You can press the **Help** button at any time for more information on a display or message. Press the **Help** button now. The help menu will appear as shown below.

HELP: ↓
PEN NUMBER
Select from 0–255.
Press [Enter] to set

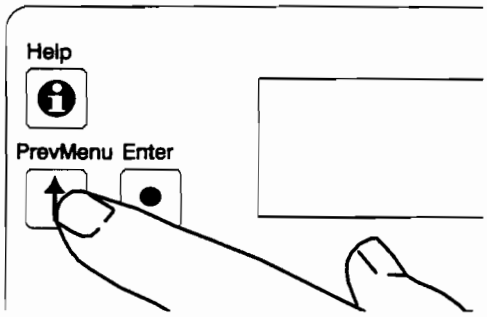
NOTE

The down arrow (↓) in the upper right corner indicates that there are more lines below those currently visible on the display. Press the **Scroll Down** button to read the rest of the help text. The help menu will appear as shown below.



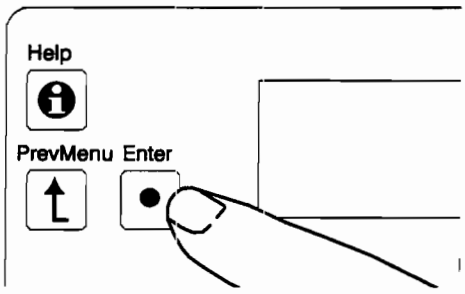
HELP: ↓
Select from 0–255.
Press [Enter] to set
pen's attributes.

When you are done reading the help text, press the **Prev Menu** button to return to the Pen Parameters menu.



PEN PARAMETERS ↓
>PEN NUMBER =002
LOAD PALETTE=FACTRY
SAVE PALETTE=USER1

4. Press the **Enter** button to tell the plotter that you want to work on pen number 2. The Pen Number submenu appears.




```
PEN PARAMETERS          ↓
PEN NUMBER: 002
>COLOR NAME =BLACK
 COLOR NUMBER=      1
```

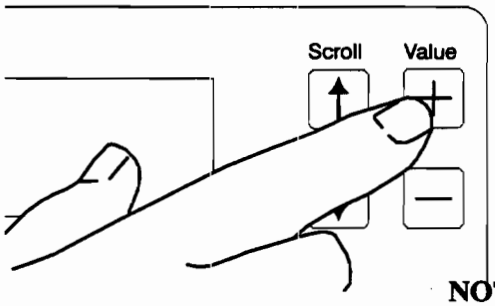
NOTE

Note that there is now a second header line that tells you which submenu you selected, and which pen number you are working on. The first header line tells you the name of the previous menu (Pen Parameters). You can recognize these as header lines because they are not indented.

5. You can set a pen's gray value by either number or name. You can set a pen to any color by number, but only eight colors are available by name. Since the color you want, light gray, is available by name, it is easiest to set it by name.

NOTE

The left arrow currently points to the Color Name line. Press the **Value** + button until LT GRAY appears to the right of the equal sign (=).

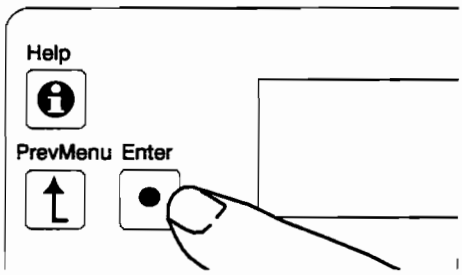



```
PEN PARAMETERS          ↓
PEN NUMBER: 002
>COLOR NAME =LT GRAY
 COLOR NUMBER=  2
```

NOTE

The word "LT GRAY" flashes to indicate that it is not the active, or permanently stored, value. If you were to move to another line or exit the menu at this time, the pen color would not be changed; it would revert to Black.

6. Press **Enter** to make the new value active.




```
PEN PARAMETERS          ↓
PEN NUMBER: 002
>COLOR NAME  =LT GRAY
 COLOR NUMBER=  2
```

NOTE

The word "LT GRAY" stops flashing. Pen number 2's color is now light gray. For plots received from now on, pen number 2 will plot as light gray. (This assumes that Pen Source in the Pen Parameters main menu is set to Plotter. Otherwise, your software may override the Pen Parameters settings you make from the plotter's front panel.

7. Press the **Online** button to set the plotter back online.

NOTE

The "Online" light goes ON.

3-106. RESPONDING TO MESSAGES

3-107. There are several circumstances under which a message may appear on the display. Some messages are strictly informative and only appear for a few seconds. Other messages require you to respond in some way.

3-108. There are two basic kinds of messages that require a response:

- If you request an operation from a menu that will cause data to be lost in some way, the plotter asks you to confirm your request. For example:

```
Save overwrites
previous config.
ENTER saves,
PREV MENU exits.
```

NOTE

When the plotter asks for confirmation, pressing **Enter** confirms the choice. Pressing **Prev Menu** exits without confirming the choice.

- Some messages indicate a problem or the status of a completed operation. For example:

Demo load completed

Press PREV MENU
to exit.

NOTE

For this kind of information-only message, you must press **Prev Menu** to exit from the message. Pressing the **Enter** button has no effect.

3-109. GETTING ACQUAINTED WITH THE MENUS

3-110. The following table gives a brief overview of the six menus. Detailed descriptions of the individual menus follow this section.

Table 3-10. Front Panel Menu Descriptions

Symbol	Name	Purpose
	**Pen Parameters**	Used to change the attributes of the plotter's 256 "pens" and to load, change and save palettes. Attributes for pens are color, width, pattern and line type. Also used for other pen-related options, namely Opaque Mode, Dithering, Pen Source, and maximum Number of Pens.
	**Page Format**	Used to tell the plotter how plots should appear on a page. Settings are Page Size, Margins, Rotation, and Mirror Image.
	**Plot Mgmt**	Used to operate on plots in the queue, to turn queueing and nesting on and off, and to set the size of the queue. Queue operations are Copies required, Move to Top, Move to Bottom, Delete from Queue, and Statistics.
	**Plotter Setup**	Used to specify plotter setup options including the cutter or take-up reel, media type, graphics language, and I/O configuration.

	**Utilities**	Used to make and plot demonstration plots and to load and save plotter configurations.
	**Diagnostics**	Used to reset the toner gauge, to flush the toner system, and to activate various plotter tests and calibrations.

3-111. UNDERSTANDING THE STATUS DISPLAY

3-112. The display at the top of the front panel gives information about the status of the plotter whenever you are not using the menus. This section describes how to scroll through the status lines and explains what each line means.

3-113. The first time you switch on your plotter, the display looks like this:

```
     -STATUS-          ↓
  0%
COPY        : 0 OF 01
TOTL VECTRS:
```

3-114. This is the Status display. The table on the next page describes the meaning of the individual lines of the Status display.

3-115. Notice the down arrow (↓) in the upper right corner of the display. This indicates that there are more lines below the ones you currently see.

3-116. Press the **Scroll Down** button (↓) several times to view these additional lines.

3-117. When you scroll down, an up arrow (↑) also appears in the upper right corner of the display, indicating that there are additional lines above the ones you currently see.

3-118. Press the **Scroll Up** button (↑) to view these lines.

3-119. While you use the plotter, the Status display is updated continuously with pertinent information about the current plot, the next plot in the queue, the plot currently being received, and other plotter status information. The following is a sample Status display:

3-120. Note that you cannot change any of the values on the Status display.

3-121. Table 3-11 describes each line of the Status display in detail.

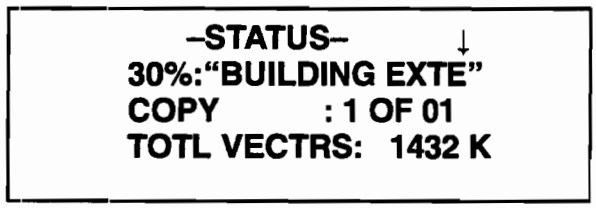


Table 3-11. Status Display Descriptions

Display Line	Meaning
- STATUS -	**Heading line:** Identifies this as the Status display.
nnn%:" (Plot Name) "	**Current plot:** Shows the percent complete and the name of the plot currently plotting.
COPY :nn OF nn	**Copy number:** For the current plot, shows which copy is currently plotting. The default number of copies is 1.
TOTL VECTRS:nnnn K	**Total vectors:** For the current plot, shows the approximate total number of vectors in the plot, in thousands (K). Multiply the number shown by 1000 to arrive at the approximate actual plot size.
NEXT:" (Plot Name) "	**Next plot:** Shows the name of the next plot in the queue (the +1 position of the queue). This plot will start plotting when the current plot finishes. Refer to "Using Queueing" in chapter 4 for more information on queueing.
RECV:" (Plot Name) "	**Receiving plot:** Shows the name of the plot currently being received. This plot goes to the bottom of the queue when transmission of the plot is complete. See "Plot" later in this chapter for information on when a plot is considered complete.
REPLC TONER:cc cc cc	**Replace toner:** Indicates that toner is depleted. NO means that existing toner is sufficient. See "Replacing Toner" in chapter 6 for instructions on how to replace toner.

3-122. PLOT NAMES

3-123. While a plot is being received, the plot name at first appears in the RECV line of the Status display as UNNAMED. If your graphics software sends a plot name (as part of the the HP-GL/2 Begin Plot (BP) command), this becomes the plot's name. The name appears on the display, truncated to 13 characters. If your graphics software does not send a plot name,

after the transmission is complete, the number of vectors in the plot is shown in place of a name. The number of vectors is counted in thousands (K).

3-124. GETTING ACQUAINTED WITH THE CONTROLS

3-125. This section contains several tables that provide *summary* information on the status lights, plotting function buttons, and error lights found on the bottom half of your plotter's front panel.

3-126. Following this section, each of these buttons and lights is described in detail.

3-127. STATUS LIGHT SUMMARY

3-128. The status lights tell you about the basic status of your plotter.

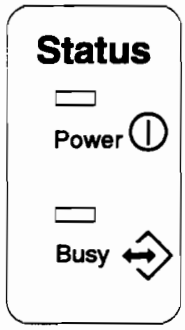


Table 3-12. Status Light Descriptions

Symbol	Name	Meaning when Lit
⏻	**Power**	When ON, indicates that the plotter is receiving power.
⇔	**Busy**	When flashing, indicates that the plotter is receiving data from the computer and parsing (interpreting) it, or that the plotter is rasterizing vector data and plotting it, or both.

3-129. PLOTTING FUNCTION BUTTON SUMMARY

3-130. You use the plotting function buttons to control basic plotter operations.

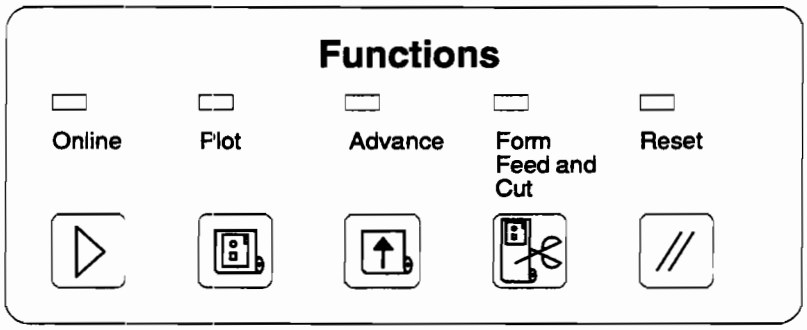


Table 3-13. Function Button Descriptions

Symbol	Name	Function
	Online	Press this button to set the plotter online and offline. The plotter is online when the light is ON. The plotter must be online to continue receiving instructions from the computer, and to plot.
	Plot	Press this button to tell the plotter to plot an incomplete nest, to terminate an incoming plot that lacks a terminating instruction, to increase the number of copies of the highest plot in the queue, or to replot the last plot.
	Advance	Press this button to advance media. Media advances as long as you press the button. You must take the plotter offline to use this button.
	Form Feed and Cut	When using the automatic cutter, press this button after a plot is finished to tell the plotter to advance the media and cut it off following the plot. If you press the **Advance** button before pressing **Form Feed and Cut**, the media is cut immediately, without advancing any further. You must take the plotter offline to use this button.
	Reset	Press this button to clear the plotter's data input buffer, and reset the plotter's palette and configuration settings, thus preparing it for a new transmission.

3-131. ERROR AND MEDIA USAGE LIGHT SUMMARY

3-132. The error lights identify problems with the plotter. The media usage lights tell you approximately how much media is left in the plotter.

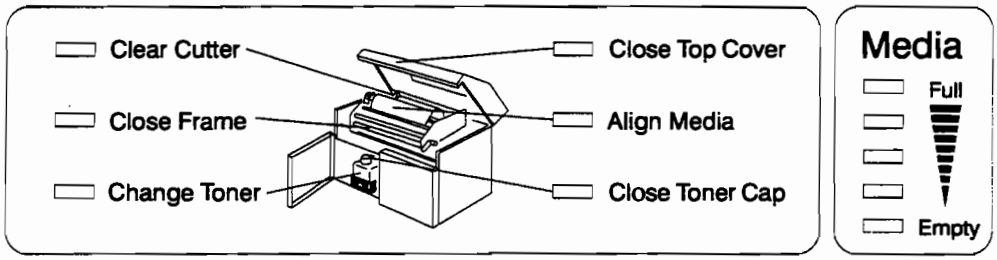


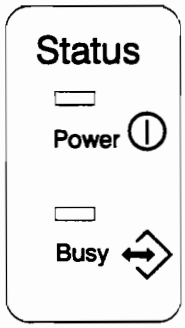
Table 3-14. Error and Media Usage Light Descriptions

Name	Meaning when Lit
Clear Cutter	Indicates that the automatic cutter blade could not complete a cut. You must clear the cutter path and manually move the cutter to one side before continuing.
Close Frame	Indicates that the frame inside the plotter is not completely closed. You must close the frame before continuing.

Change Toner	Indicates that one or more of the toners is depleted. Refer to the Status display to determine which toner is depleted. Replace the depleted toner to maintain optimum plot quality.
Close Top Cover	Indicates that the top cover is not completely closed. You must close the top cover before continuing.
Align Media	Indicates that the media inside the plotter is not feeding smoothly. You must clear the media path of any wrinkled or jammed media before continuing.
Close Toner Cap	Indicates that the toner bottle cap is not closed tightly. You must close the toner bottle cap before continuing.
Media Full – Empty	Indicates the amount of media remaining on the supply reel. Four green lights indicate a full roll of media. As media is used, fewer lights are ON. When the roll is empty, the red **Empty** light goes ON. When the red **Empty** light is ON, you must replace the roll of media before continuing.

3-133. UNDERSTANDING THE STATUS LIGHTS

3-134. Two status lights indicate the basic condition of the plotter. These are the Power and Busy lights.



3-135. POWER ⏻

USE: When ON, indicates that the plotter is receiving power.

EXPLANATION: The following conditions must be met for this light to be ON:

- The plotter must be plugged into a power outlet.

- The plotter's Power Breaker (located above the plotter's power socket) must be in the ON position.
- The plotter's ON/OFF switch must be in the ON (**I**) position.

3-136. BUSY 

USE: When flashing, indicates that the plotter is receiving data from the computer and parsing (interpreting) it, or that the plotter is rasterizing vector data and plotting it, or both.

EXPLANATION: This light shows that the plotter is active with some operation, even though it may not actually be plotting. The **Busy** light is ON during either of the following operations:

- Receiving and parsing (interpreting) data — means that the plotter is receiving data from the computer, preparing it for disk storage, and storing it on the plotter's hard disk.
- Rasterization and plotting — means that the plotter is completing the vector-to-raster conversion of a plot stored on the plotter's hard disk and plotting the plot as a raster image.

3-137. USING THE PEN PARAMETERS MENU

3-138. Use the Pen Parameters menu to change the attributes of the plotter's 256 "pens" and to load, change and save palettes.

3-139. The following table summarizes the menu choices available from the Pen Parameters menu.

Table 3-15. Pen Parameter Menu Choices

Menu Line	Possible Values	Action/Notes
PEN NUMBER	0-255	Calls the Pen Number submenu for the pen you specify.
COLOR NAME	WHITE, LT GRY, MD GRY, DK GRY, BLACK, NONE	Sets the color of the pen by name, which automatically sets the corresponding Color Number (below). If you set the color via Color Number, "None" may appear to indicate that the color number you selected does not correspond to any of the eight basic colors listed here. (You cannot explicitly set the Color Name to None.)
COLOR NUMBER	8-72	Sets the grayscale colors of the pen by number. Select the specific grayscale number from the color palette. Use the Utilities/Plot Demo=Colors command to plot a sample palette of all the grayscale colors with their numbers. This plot also shows which grayscale colors are assigned to which pens in the factory-defined palette, Factory.
WIDTH(mm)	0.06 - 100.00	Sets the width of the pen in millimeters. Widths are rounded to the nearest .06 mm, the width of one pixel on the plotter.
PATTERN	NONE, 1-24	Sets the pattern for the pen. Patterns apply to both lines and solid area fills. Patterns always plot as one of the eight basic colors. Use the Utilities/Plot Demo=Colors command to plot a sample of the different patterns.
LINE TYPE	SOLID, -8 to -1, +1 to +8	Sets the line type for the pen. Use the Utilities/Plot Demo=Colors command to plot a sample of the different types of lines.

Menu Line	Possible Values	Action/Notes
LOAD PALETTE	FACTRY, USER1-USER 4	Loads the specified palette. Requires confirmation that the current Pen Parameters settings should be redefined. Default: last palette loaded or saved.
SAVE PALETTE	USER1-USER 4	Saves the specified palette. Requires confirmation that the palette previously saved with that name should be overwritten. Default: last palette loaded or saved.
MERGE MODE	ALL, NONE, WHITE, COLORS	When set to All, all vectors blend together. When set to None, vectors received later are opaque; they overlay vectors received earlier. When set to White, pure white vectors are transparent, that is, they do not overlay vectors received earlier. (However, vectors other than white *do* overlay vectors received earlier.) When set to Colors, pure white vectors erase vectors received earlier. (Other colors blend together.) Plotter throughput is fastest when Merge Mode is set to All. Also, Off corresponds to the HP-GL/2 default values. Setting in default palette: White.
DITHERING	ON, OFF	When On, all dithered colors plot. When Off, colors revert to one of the eight main colors (see Color Name at the top of this menu), giving greatest saturation. Setting in default palette: On.

Menu Line	Possible Values	Action/Notes
PEN SOURCE	SFTWRE, PLOTTR	When set to Software, commands from your graphics software override related Pen Parameters menu settings. When set to Plotter, Pen Parameters menu settings override any related graphics software settings. Setting in default palette: Software.
NMBR OF PENS	2, 4, 8, 16, 32, 64, 128, 256	Sets the maximum number of pens available for plotting. If your graphics software requests a pen number greater than Number of Pens, the pen number is reduced using the modulo function. Setting in default palette: 8.

3-140. SPECIAL NOTES

3-141. **Pens and Palettes.** Your plotter allows you to define up to 256 "pens." You can specify certain attributes for each pen. The attributes are Color Number and Name, Width, Pattern, and Line Type. You do not have to define attributes for all 256 pens; the pens you do not define simply retain their earlier values.

3-142. A set of 256 pens makes up a *palette*. You can define and store up to four palettes in addition to the built-in factory palette. The settings of Merge Mode, Dithering, Pen Source, and Number of Pens are also saved with each palette.

3-143. Although it is not required, it is recommended that you create custom palettes for your specific applications and save them using the Save Palette command. The easiest way to create a palette is to modify an existing one. You can start from the factory default palette, or from another palette you already created.

3-144. **When Are Pen Parameters Active?** Note the following important points when setting pen parameters:

- When Pen Source is set to Software, as it is in the factory default palette Factory, commands received from your graphics software can override the settings you make in the Pen Parameters menu. The Pen Parameter settings are only used as long as no related software commands are received to redefine pen colors, line types, and so on. If you want to always use the Pen Parameters settings regardless of what commands are received from your software, set Pen Source to Plotter.

- When you change any of the Pen Parameters settings, the changes apply only to plots received after the changes. They do not apply to plots currently in the plotter's queue.

3-145. **Number of Pens.** Through software, you can define up to 1024 pens. For further information, refer to the NP command in *The HP-GL/2 Reference Guide.*

3-146. USING THE PAGE FORMAT MENU

3-147. You use the Page Format menu to tell the plotter how plots should appear on a page. Note that commands received from your graphics software can override any of the Page Format settings.

3-148. Table 3-16 summarizes the menu choices available from the Page Format menu.

Table 3-16. Page Format Menu Choices

Menu Line	Possible Values	Action/Notes
PAGE SIZE	ANSI A-, ANSI E, A4-A0, ARCH A-, ARCH D*, MAX	When changed to a fixed size, future incoming plots will be clipped to fit on the specified page size. When Page Size is set to Maximum, the default page size is set to the largest size available on your plotter. Setting in default configuration: MAX.
MARGINS	ON, OFF	When switched to ON, the plotter ensures that there are at least 8 mm of white space on all sides of each plot. Margins are added to nested as well as unnested plots. When switched to OFF, plots plot with no margins. The Margins setting applies to plots already in the queue as well as to future incoming plots. Setting in default configuration: ON.
ROTATION	0, 90, 180, 270	When changed, future incoming plots will be rotated the specified number of degrees before plotting. Settings of 0 and 180 generate plots with landscape (horizontal) image orientation. Settings of 90 and 270 generate plots with portrait (vertical) image orientation. Setting in default configuration: 0.
MIRROR IMAGE	ON, OFF	When switched to ON (I), future incoming plots will plot as a mirror image, reversed from side to side. When switched to OFF, future incoming plots will plot as normal images, not reversed. Setting in default configuration: OFF.

* ANSI = American National Standards Institute.
ISO = International Organization for Standardization.
ARCH = English Architectural standard.

3-149. SPECIAL NOTES

3-150. **Standard Plot Sizes.** The following table lists the fixed plot sizes supported by the Page Size option.

Standard	Size (mm)	Size (inches)
ANSI A	216 x 279	8.5 x 11
ANSI B	279 x 432	11 x 17
ANSI C	432 x 559	17 x 22
ANSI D	559 x 864	22 x 34
ANSI E	864 x 1118	34 x 44
ISO A4	210 x 297	8.27 x 11.69
ISO A3	297 x 420	11.69 x 16.54
ISO A2	420 x 594	16.54 x 23.39
ISO A1	594 x 841	23.39 x 33.11
ISO A0	841 x 1189	33.11 x 46.81
ARCH A	229 x 305	9 x 12
ARCH B	305 x 457	12 x 18
ARCH C	457 x 610	18 x 24
ARCH D	610 x 914	24 x 36
MAX	896 x 1219 (Mono mode)	35.3 x 48 (Mono mode)

NOTE

When Page Size is set to Maximum, the default page size is set to the largest size available on your plotter. This size comes as close as possible to accommodating the largest Architectural size.

3-151. USING THE PLOT MANAGEMENT MENU

3-152. You use the Plot Management menu to operate on plots in the queue, to turn queueing and nesting on and off, and to set the size of the queue.

3-153. Table 3-17 summarizes the menu choices available from the Plot Management menu.

Table 3-17. Plot Management Menu Choices

Menu Line	Possible Values	Action/Notes
QUEUE OPERATIONS		Calls the Queue Operations submenu.
Plot Selection List: . . - 1:" (Plot Name) " 0:" (Plot Name) " + 1:" (Plot Name) " . .	Names of plots in the queue.	Each line is a plot in the queue, and shows its queue position and plot name. If no name is shown, that queue position is empty. Scroll through the list to select a name on which to perform one of the following operations. Calls the "Selected Plot" submenu. Default: previous plot (–1 position in the queue).
COPIES REQUIRED	1-99	Changes the total number of copies for the selected plot. Default: 1.
MOVE TO TOP		Moves the selected plot to the first position in the queue (the +1 position). The plot will begin plotting as soon as the current plot finishes.
MOVE TO BOTTOM		Moves the selected plot to the last position in the queue. This defers the plot until all other plots in the queue have finished plotting.
DELETE FROM QUEUE		Deletes the selected plot from the queue entirely.
STATISTICS		For the selected plot, shows total vectors (in thousands) and percentage of total disk space used. Press the **Prev Menu** button to return to the "Selected Plot" submenu.

QUEUEING	ON, OFF	When switched to ON, the plotter receives and plots at the same time. Incoming plots are accumulated in a queue. Old plots are automatically deleted from the queue to make room for new incoming plots. When switched to OFF, the plotter finishes plotting one plot before allowing the next plot to transmit. For additional information, see "Using Queueing" in chapter 4. Setting in default configuration: ON.
MAX QUEUE SIZE	1-14	Determines the maximum number of plots in the queue. **CAUTION**: Changing Maximum Queue Size repartitions the disk; thus deleting all plots currently in the queue. Setting in default configuration: 3.
NESTING	ON, OFF	When switched to ON, future incoming plots will be positioned on the media in such a way that as little media is used as possible. Plots are rotated to be the shortest length, and moved to one side or the other to allow other plots to fit. Excess white space is eliminated. Calls the Wait Time submenu. When switched to OFF, future incoming plots will be centered on the media. Nesting works best when Maximum Queue Size is set to 6 or more. Setting in default configuration: ON.
WAIT TIME(M)	0.1 - 60.0 minutes	Determines how long the plotter should wait before assuming that no further plots are being transmitted. When the time is up, the plotter plots the current nest, even though the page is not full. Only applies when Nesting is not None. Setting in default configuration: 2.0.

3-154. SPECIAL NOTES

3-155. **Queue Operations and Plot Names.** The Queue Operations submenu is a list of plots in the queue. By scrolling up and down in this menu, you can select one of the plots. When you press **Enter**, the plotter shows you a list of things you can do to that plot: move it around in the queue, delete it from the queue, or view statistics about the plot.

3-156. Only "unlocked" (non-demo) plots are shown in this list. Exception: when you use the Utilities/Plot Demo command to request that a locked demo plot be plotted, the plot appears in the queue until it finishes plotting.

3-157. Plot names shown in the Queue Operations submenu are truncated to 13 characters. If your graphics software did not send a name (as part of the HP-GL/2 Begin Plot (BP) command), the number of vectors in the plot is shown instead.

3-158. **Queue Size.** In general, set Maximum Queue Size to a large number if you want maximum flexibility and especially when working with relatively small plots. Large plots will be automatically "chained" across several queue partitions if necessary.

3-159. Set Maximum Queue Size to a small number for maximum efficiency when plotting large, complex plots.

3-160. Nesting works best when Maximum Queue Size is set to 6 or more.

3-161. See "Queueing and Disk Space" in chapter 4 for more detailed information on the relationship between Maximum Queue Size, plot size, and plotting efficiency.

3-162. Note that because of its potentially destructive effects, Maximum Queue Size is not loaded or stored with other configuration values when you use the Utilities/Load Configuration or Save Configuration commands. Maximum Queue Size always retains the last value you assigned to it.

3-163. **Nesting.** When Nesting is ON, the plotter waits after receiving a plot to see if the next plot would fit on the media with the first. This continues until a plot nest is complete, or until no new plot starts transmitting within the length of time specified by Nesting/Wait Time. Then plotting begins. You can make the plotter plot an page not yet full of nested plots by pressing the **Plot** button.

3-164. USING THE PLOTTER SETUP MENU

3-165. You use the Plotter Setup menu to specify plotter options.

3-166. Table 3-18 summarizes the menu choices available from the Plotter Setup menu.

CAUTION

Taking the plotter offline while a plot is plotting destroys that current plot. Changing a pen color while a plot is being received corrupts the plot being received.

NOTE

The sixth line of the Status display should show no plot name next to "RECV:". (You must press the **Scroll Down** Button to see this line.)

8. Press the **Online** Button to take the plotter offline. The **Online** light goes out. See Figure 3-57.

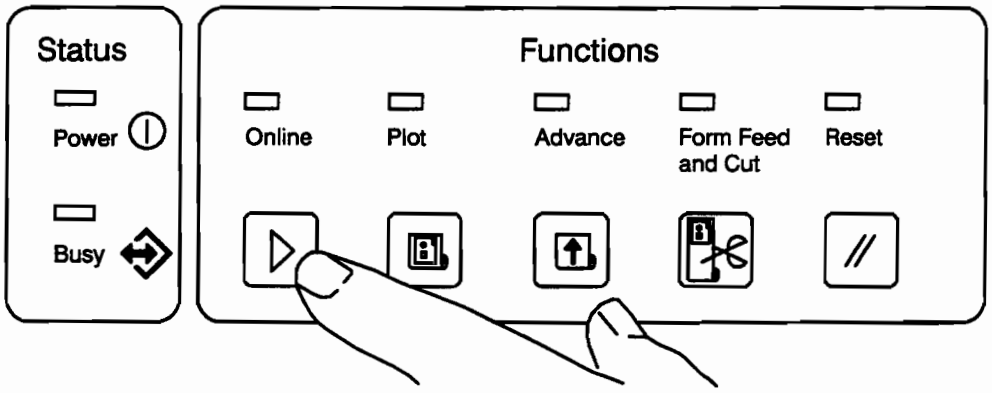


Figure 3-57. Front Panel Center Section

NOTE

You can look through the menus while the plotter is online, but you cannot perform any operations except for queue operations.

9. Press the **Pen Parameters** button. The **Pen Parameters** light goes ON and the Pen Parameters menu appears.

Table 3-18. Plotter Setup Menu Choices

MEDIA HDLG	CUT&VSTK, CUT&HSTK TAKE-UP	When set to Cut and Stack Vertical or Cut and Stack Horizontal, the automatic cutter is switched on and makes a cut at the end of each plot, unless the cutter is overridden by your graphics software. the plot's leader is cut off separately. With Cut and Stack Vertical, the leader is fixed-length to allow the media stacker to neatly stack plots in the vertical position. Extra space is added to small plots to assure proper stacking. With Cut and Stack Horizontal, the leader is kept as small as possible, and no extra space is added. With this selection, the media stacker must be in its horizontal position. When set to Take-Up, the take-up reel is switched on and the automatic cutter is switched off. Setting in default configuration: Take-Up.
MEDIA TYPE	FILM, NON-FILM	When set to Film, plotter electronics are adjusted to give the best-quality output on film media. When set to Non-Film, the electronics are adjusted to give best-quality output on non-film media. Setting in default configuration: Non-Film.

GRAPH LANG	7586B, HP-GL/2, CCITT/4	When switched to 7586B, future incoming plotting commands will be interpreted as if the plotter were an HP 7586 pen plotter (HP-GL). This mode brings up the Wait Time submenu. When switched to HP-GL/2, future incoming plotting commands will be interpreted in the plotter's native mode (HP-GL/2). When switched to CCITT/4, future incoming plotting commands will be interpreted according to the CALS CCITT Group 4 Type I Raster standard (MIL-R-28002). This mode brings up the Resolution submenu. Setting in default configuration: HP-GL/2.
WAIT TIME(M)	0.1 – 120.0 minutes	In 7586B emulation mode only, determines how long the plotter should wait for a terminating instruction from your graphics software before assuming that the plot transmission is complete. When the time has passed, the plotter terminates the plot and sends it to the queue for plotting. Setting in default configuration: 30.0.
RESOLUTION	SFTWRE, PLOTTR	In CCITT/4 mode only, when set to Software, the plotter scales the plot to the exact resolution specified in the CALS header information. When set to Plotter, the plotter rounds up the resolution in the CALS header to 406, 203, or 102 dpi for faster throughput. Setting in default configuration: Software.
I/O CONFIG	CENTRNCS, RS-232-C, HP-IB	Identifies which data port is used for receiving data, and, for RS-232-C and HP-IB, calls a submenu to set up the associated parameters. There is no submenu for Centronics. Setting in default configuration: HP-IB.
PARITY	OFF, ODD, EVEN, SPACE, MARK	For RS-232-C: Identifies which kind of parity checking to use for data received through the RS-232-C connection. Setting in default configuration: OFF.

BAUD	600, 1200, 2400, 4800, 9600,19200, 38400	For RS-232-C: Identifies which baud rate to use for data received through the RS-232-C connection. Setting in default configuration: 19200.
HANDSHAKE	HARDWIRE, XON/XOFF	For RS-232-C: Identifies which kind of handshaking to use for data received through the RS-232-C connection. Setting in default configuration: Hardwire.
ADDRESS	0–30 LISTEN ONLY	For HP-IB: Identifies the HP-IB device address for the plotter. Setting in default configuration: 5.
SCS	ON, OFF	For HP-IB: Identifies whether to use HP-IB Secondary Command Support or not. Setting in default configuration: OFF.
DCI MODE	ON, OFF	When switched to ON, Escape sequences in future input are interpreted as immediate-execute device-control commands (used for initialization and for configuring RS-232-C handshakes). When switched to OFF, Escape sequences in future input are interpreted as raster commands or raster data. Setting in default configuration: OFF.
PANEL LANG	ENGLISH, FRANCAIS, DEUTSCH,	Identifies which language the front panel displays appear in: English, French, or German. Setting in default configuration: English.
ADVANCED SETUP		Calls the Advanced Setup submenu.
SPEED CONTROL	ON, OFF	When switched to ON, media movement speed is automatically adjusted downward from the Maximum Speed (see below) for more complex plots. When switched to OFF, plotting is constantly at Maximum Speed. Setting in default configuration: ON.

MAX SPD(mm/S)	4, 8, 12, 16, 20, 24, 30	Sets the maximum media movement speed in mm/second. Setting in default configuration: 30.
MAX NR TIME(M)	0.1 – 120.0 minutes	Sets the Maximum Not Ready Time, which limits how long your graphics software can take the plotter offline. Setting in default configuration: 120.0.

3-167. SPECIAL NOTES

3-168. **Media Handling.** When you set Media Handling to Cut, the cutter automatically cuts these leaders off. The plotter makes two cuts after each plot, one before and one after the leader.

3-169. The automatic cutter cuts off all but the last plot plotted. Use the **Form Feed and Cut** button to advance the last plot out of the plotter and cut it off. If your graphics software has disabled cutting, the media is ejected, but no cut occurs.

3-170. **Graphics Language CCITT/4.** When you set Resolution to Software, the plotter scales the plot to the exact resolution specified in the CALS header information. The dimensions of the original image in the CALS file are maintained.

3-171. When you set Resolution to Plotter, the plotter rounds up the resolution in the CALS header to 406, 203, or 102 dpi, the plotter's native resolutions. (If the CALS header resolution is greater than 406 dpi, it is set to 406 dpi.) Plotting at these native resolutions significantly enhances plotter throughput. When the selected native resolution is different from the resolution in the CALS header, the resulting plot size will be different from the original image in the CALS file.

3-172. The following considerations govern plotting in CCITT/4 mode:

- The Page Format menu option Rotation has no effect on the raster image.
- Page Format/Mirror Image works as expected.
- Page size is always determined from the CALS header and overrides the front panel setting.
- When you set Graphics Language to CCITT/4, Plotter Setup/DCI Mode is automatically set to OFF. This is required so that Escape characters can be interpreted as raster data. If you set DCI Mode back to ON, the plotter will interpret Escape characters as the beginning of device-control instructions, which may corrupt the raster image.

3-173. **Plotter Input/Output.** The I/O Config value (Centronics, RS-232-C, or HP-IB) must correspond to the physical I/O port you are using. These ports are located inside the left door of the plotter, and are marked Parallel, RS-232-C, and HP-IB. (The "Parallel" port corresponds to "Centronics" in this menu.) See the Computer Information manual that came with your plotter for complete information on connecting the plotter to your computer.

3-174. **DCI Mode.** The plotter automatically sets DCI to the setting that is best for most situations.

3-175. When you set Graphics Language to HP-GL/2 or CCITT/4, DCI is automatically switched to OFF. You must manually reset DCI to ON if you want Escape sequences to be interpreted as device-control commands.

3-176. When you set Graphics Language to 7586B, DCI is automatically switched to ON. The 7586B emulation mode uses the HP-GL graphics language, which does not support raster commands, so you should not set DCI to OFF when Graphics Language is 7586B.

3-177. **Controlling Plotter Speed.** When Speed Control is ON, the plotter's predictor algorithm reduces media speed for complex plots. If the algorithm determines that a plot is too complex to plot even at the lowest plotting speed, and your plotter has a 40 Mbyte disk, the plotter will attempt to plot anyway. You may see white lines across your plot where the media was moving faster than the plotter could plot.

3-178. Setting Speed Control to OFF turns off the plotter's algorithms for automatically reducing plotter speed based on plot complexity. Since these algorithms are conservative, you may be able to increase overall plotter speed by setting Speed Control to OFF and manually adjusting the media speed using Maximum Speed (which becomes the constant speed). But if you set Speed Control to OFF and set Maximum Speed to a relatively high value, you may see the white lines described above. To correct this problem, use a lower Maximum Speed, or set Speed Control back to ON.

3-179. USING THE UTILITIES MENU

3-180. You use the Utilities menu to load and plot demonstration plots, and to load and save plotter configurations.

3-181. Table 3-19 summarizes the menu choices available from the Utilities menu.

Table 3-19. Utilities Menu Choices

Menu Line	Possible Values	Action/Notes
PLOT DEMO	FACTRY, USER1, USER2, COLORS, MENUS	After confirmation, copies the specified demonstration plot to the queue. The plot plots when it reaches the top of the queue. **CAUTION:** Plotting a demonstration plot corrupts any plot that was being received. Make sure no plot is being received before plotting a demonstration plot. Demonstration plots are: **Factory:** main factory demo. Note that this plot always plots the same. Regardless of menu settings, its size does not change, and it is not rotated, mirrored, or nested. **User1–2:** plots loaded by user **Colors:** samples of all grayscale colors (colors plotted as shades of gray), screen patterns, and line types. Numbers correspond to the settings available in the Pen Parameters/Pen Number submenu. . **Menus:** all front panel menus. Note that, for proper results when plotting, one of the factory-installed demonstration plots (Factory, Colors, or Menus), Pen Parameters/Pen Source should be set to Software. Default: last demo plotted.
LOAD CONFIG	FACTRY, USER1–USER4	Loads the specified configuration. Requires confirmation that the current configuration parameters should be reset. Default: last configuration loaded or saved.
SAVE CONFIG	USER1–USER4	Saves the specified configuration. Requires confirmation that the configuration previously saved with that name should be overwritten. Default: last configuration loaded or saved.

3-182. SPECIAL NOTES

3-183. **Demonstration Area.** The demonstration area is a special part of the hard disk you can use for long term plot storage. If there is a plot you need frequently, rather than transmitting it to the plotter each time you want to plot it, you can keep it in the demonstration area. Then, when you need that plot, use the Plot Demo command to copy it to the queue. It will plot when all other plots in the queue have completed plotting.

3-184. You can store two plots in the demonstration area, USER1 and USER2. Each plot file can contain 150 kilobytes of data.

3-185. **Configurations.** A *configuration* is a record of all the menu settings except those in the Pen Parameters menu and Plot Management/Maximum Queue Size. (Pen Parameters are stored separately in palettes. Maximum Queue Size always retains the last value you assigned to it.) You can define and store up to four user-defined configurations in addition to the built-in factory configuration.

3-186. You may want to create different configurations for different plotting needs and environments. For instance, you could create one configuration for draft-quality plotting and another for final output. Or you could create a configuration for connecting your plotter to a PC and another for connecting it to a minicomputer or mainframe.

3-187. USING THE DIAGNOSTICS MENUS AND THE SERVICE TECH DIAGNOSTICS MENUS

3-188. The regular diagnostics menu is used to perform a variety of tests and service related operations on the plotter. The service technician diagnostics menus are designed to give the field engineer additional troubleshooting tools.

3-189. Table 3-20 summarizes the choices available in the regular Diagnostics menus. Table 3-21 summarizes the choices available in the service technician diagnostics menus.

3-190. Pressing the **Diagnostics** button gives user access to the regular diagnostic menu choices. You can access the service technician menu choices while in the diagnostics menu by pressing the **Scroll Down** button and the **Diagnostics** button simultaneously.

Table 3-20. Regular Diagnostics Menu Choices

Menu Line	Possible Values	Action/Notes
PERFORMANCE PLOT		Copies the performance plot to the queue. For use by service personnel.
VRC TESTS	DISK, LOOPBACK	After confirmation, performs the specified vector-to-raster converter test. For use by service personnel. Default: Disk.
PRT ENG TEST	LED CUTTER BUTTON	Performs the specified print engine test. For use by service personnel. Default: `LED`.
DISP FUNCTNS	OFF ON	When switched to On, for future incoming plots, the incoming HP-GL or HP-GL/2 commands themselves are plotted instead of being executed. This allows you to see exactly which commands your graphics software is sending to the plotter. When switched to Off, for future incoming plots, incoming commands are executed normally, that is, true plotting is enabled. Setting in default configuration: Off.
RESET TGUAGE	BLACK	After confirmation, resets the toner gauge so that the Change Toner light goes out. Reset the toner gauge when you change toners.
PLOTTER STATS		Calls the Plotter Statistics submenu, which shows firmware code revision numbers for the VRC and front panel, as well as the number of cuts performed by the plotter. You cannot change any values in this sub-menu.

Table 3-21. Service Technician Diagnostic Menu Choices

Menu Line	Possible Values	Action/Notes
SET CAL % =	90.00 – 110.00	
FORMAT DISK		Formats the plotter disk. The disk files must be downloaded after the disk is formatted in order for the plotter to function. For loading instructions, see page 3-60, paragraph 3-84.
VRDY	READY NOT READY	Sets the VRC to the Ready mode or to the Not Ready mode.

3-191. PROCESSOR UPGRADE (C1643A) (HP 7600 MODELS 240D/E) CONFIGURATION AND USER INFORMATION

NOTE

A Complete parts list of the C1643A Upgrade Kit can be found in Chapter 10, page 10-101, Table 10-28.

3-192. INTRODUCTION

3-193. In the first half of 1990, HP introduced a series of new HP-GL/2 plotters. The HP 7600 Series Models 250/255/355 electrostatic plotters included new optional extension blocks of related commands. These new commands are now added as an upgrade to the Models 240D and 240E electrostatic plotters. The new HP-GL/2 commands are described later in this manual.

3-194. A number of CAD and other graphical software packages have developed generic HP-GL/2 drivers (or HP-GL/2 hyperdrivers in order to provide across-the-board support for these new HP plotters. These drivers will not always work with your standard Model 240 electrostatic plotter, because the drivers use commands in new extension blocks not implemented in the standard Model 240.

3-195. BENEFITS OF THE UPGRADE KIT

3-196. **HP-GL/2 Compatibility With Current Generation Plotters.** If you are now using your Model 240 plotter in HP-GL emulation mode, the ability to use the new HP-GL/2 drivers will represent the following significant improvements in your total plotting solution:

- Performance improvement: HP-GL/2 plot files are typically 20%–30% of the size of HP-GL files. This allows much faster transmission times and total plot times when using HP-GL/2 drivers, especially if you are using a slow I?O like the RS–232.

- Image definition improvements: Most HP-GL/2 drivers include the ability to programmatically define pen widths, gray scale lines and long axis plots. Some HP-GL/2 drivers also include high-level HP-GL/2 capabilities like screened lines, area fill patterns, and control over whether drawing layer intersections appear to merge or overlay.

3-197. **New Capabilities.** Besides compatibility with HP-GL/2 hyperdrivers, the upgrade kit provides the Model 240 with some new capabilities that were added to the current generation of plotters:

- HP Raster Transfer Language (HP-RTL) and CALS CCITT group 4 Type I.

- Queueing and Nesting: "Nesting" mode can be selected in an upgraded Model 240. Nesting allows up to six plots to be stored on the plotter's 40-megabyte hard disk. Up to three plots can be plotted side-by-side and/or auto-rotated in order to further save media.

- Faster vector-to-raster conversion: The new processor board in the upgrade kit allows vector-to-raster conversion twice as fast as the standard HP Model 240. If you notice that your plotter is often being held up by the vector-to-raster conversion process (and slowing down during printing), the upgrade kit will significantly increase performance.

- Mirror-image plotting: Mirror-image plotting causes plots to be "mirrored" or reversed horizontally, so that what used to be on the left side of a plot appears on the right, and vice versa.

3-198. LIMITATIONS OF THE UPGRADE KIT

3-199. Note that the HP-GL/2 Upgrade for the Model 240 will not turn this plotter into a Model 250/255.

3-200. While an upgraded Model 240 is identical to the Model 250/255 in terms of language commands, an upgraded Model 240 will *not* have the advanced front-panel features or automatic cutter capabilities of the Model 250/255 plotters.

3-201. USING YOUR UPGRADED PLOTTER

3-202. Most of the new capabilities in the upgrade kit can only be accessed programmatically, usually through your application software drivers. however, queueing and nesting features can be selected through the Model 240 front-panel buttons.

3-203. **Queueing and Nesting.** Queueing and nesting are enabled by holding down the "Reset" button at power-up. This is the same procedure as enabling "paper-saver" in the standard HP Model 240 plotter.

3-204. All plots in the queue are deleted when power is cycled or when "Reset" is pressed. Once queueing and nesting are turned on, they can only be turned off by cycling power.

3-205. **Queueing.** Queueing is a special feature that allows your plotter to accumulate incoming plots in a lest, or *queue*. When queueing in On, you can send several plots to the plotter without waiting for each plot to finish being drawn before sending the next one. (The plotter receives and plots at the same time.) The plots wait in the queue until they can be plotted. Up to 6 plots can be in the queue at a time.

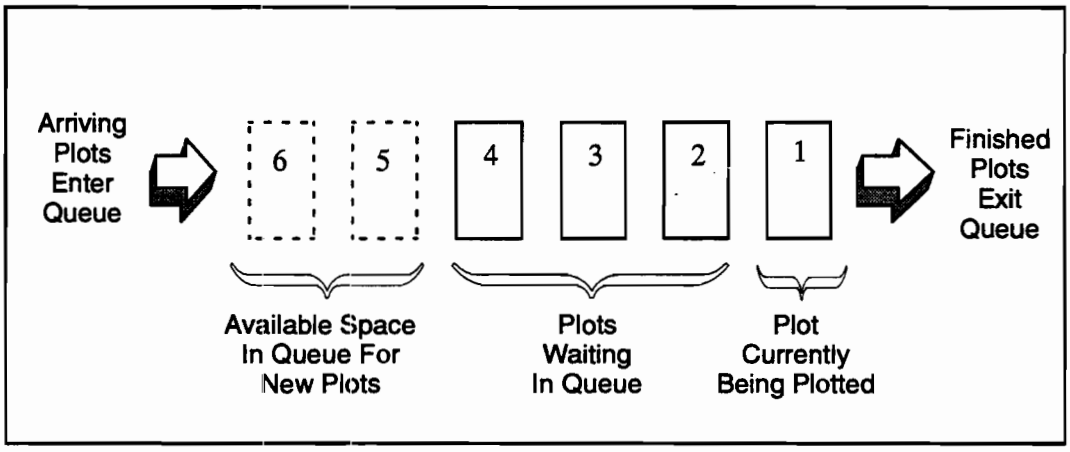


Figure 3-58. Queueing Illustration

3-206. When queueing is Off, plots do not queue, and the plotter does not receive and plot at the same time; exactly as the standard HP Model 240. When a plot finishes plotting, it remains on the disk until transmission of another plot begins.

3-207. **Nesting.** When nesting is On, the plotter waits after receiving a plot to see if the next plot would fit on the media with the first. This continues until the media is filled with up to three plots, or until no new plot starts arriving within 2 minutes. Nesting saves media in three ways:

1. Extra white space around the plot is eliminated (same as paper-saver mode in the standard Model 240).

2. Plots are rotated so that the plot's longer side is along the horizontal axis of the plotter. (The plot is not rotated if the plot's longer side is longer than the media width.)

3. Up to three plots can fit side by side on the media.

3-208. If the plotter goes off line while plotting a nest, all plots in the nest will be replotted when the plotter goes back on line.

3-209. The amount of media saved by nesting depends on the size of the plots being received, and the order in which they are downloaded. Figure 3-59 shows an example of output with and without nesting:

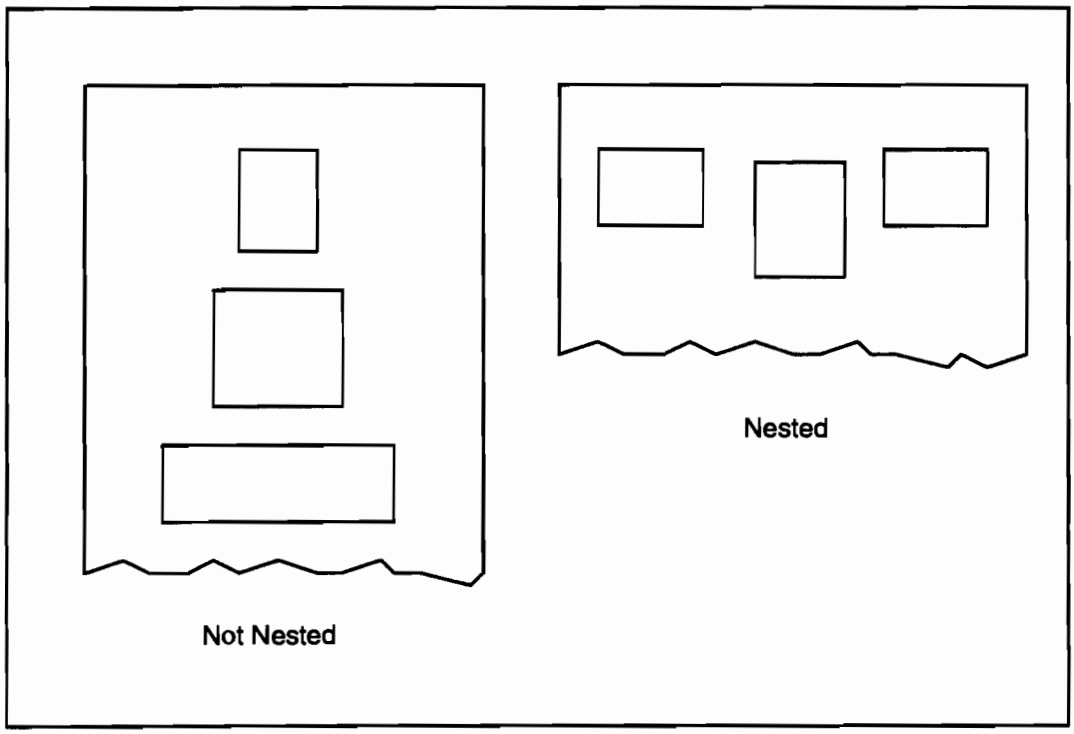


Figure 3-59. Nesting Example

3-210. Note that nesting will not change the order of plots. Plots are still plotted "first in, first out." Auto-rotation and side-by-side placement are applied to the plots in the order they are downloaded.

3-211. **Wait Time (7585B Emulation Mode Only).** The plotter waits 30 minutes for a terminating instruction (PG or similar instruction) from your graphics software before assuming that the plot transmission is complete. When the time is up, the plotter terminates the plot and sends it to the queue for plotting.

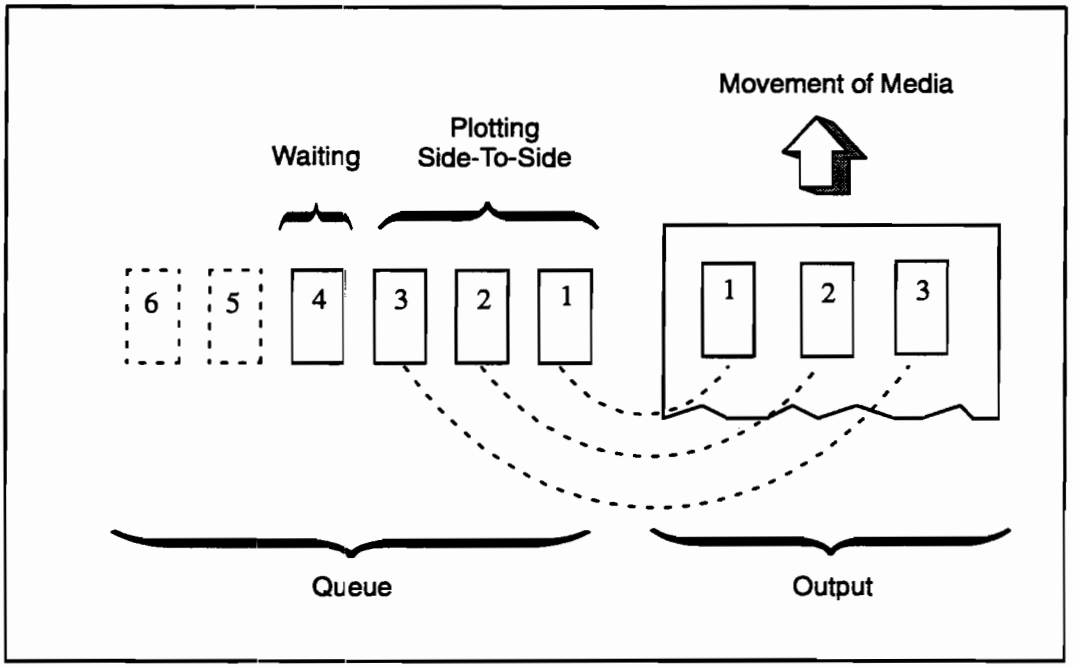


Figure 3-60. Side-by-Side Plotting

3-212. **Raster and Device Control Instruction (DCI).** Regardless of whether you are plotting HP-RTL or CALS CCITT Group 4 Type I raster data, you must first take the plotter out of "DCI" (Device Control Instruction) mode.

3-213. In order to take the plotter out of DCI mode, set the "listen-only" dip switch to the UP position. DCIs are enabled when the listen-only dip switch is in the down position. Press the "Reset button after changing the listen-only dip switch.

3-214. Keep in mind the following points when plotting raster:

- Some HP-GL drivers use DCIs to configure the RS-232 I/O.
- HP-GL/2 Hyperdrivers do not use DCIs. Disabling DCIs allow HP-GL/2 files and raster files in the same environment.
- The upgrade kit will change the functionality of the "Listen-Only" switch. If you want to connect to the plotter over the HP-IB I/O in listen-only mode, set the HP-IB address to 31.

3-215. **Raster Input.** An upgraded HP Model 240 can process and print HP-RTL data (described in "Using Vector and Raster Data" section of this chapter), as well as CALS CCITT Group 4 Type I Raster commands, (described in the Department of Defense military specification MIL-R-28002).

3-216. In order to print raster images, the Model 240 plotter must be programmatically switched into "HP-RTL mode" before it can print HP-RTL files, and must be switched into "CALS CCITT Group 4 Type I mode" before it can print the MIL-R-28002 files. HP-RTL drivers will automatically switch the plotter to the correct language mode.

3-217. *The HP 7600 Series Plotter Models 250, 255, and 355 Reference Guide Addendum describe raster functionality in detail. References in the addendum to the Model 250 also apply to the upgraded Model 240D. References to the Model 255 also apply to the upgraded Model 240E. references in the addendum to the front-panel settings do not apply to your upgraded Model 240.*

3-218. **Plotting a CALS Plot from HP-GL/2 Mode.** Use the following procedure to plot CALS CCITT Group 4 Type I files while in HP-GL/2 mode:

1. Send ESC%0A
   To enter HP-RTL mode.

2. Send ESC%–12345@PJL ENTER LANGUAGE = CALRASTER <LF>
   To enter CALS mode.
   <LF> is a Line Feed character. (A Carriage Return character can precede the Line Feed character.)

3. Send your CALS plot or plots.
   When all you CALS plots have been sent, follow steps 4 and 5.

4. Send ESC%–12345X@PJL ENTER LANGUAGE = PCL <LF>
   To enter HP-RTL mode.

5. Send ESC%0B
   To enter HP-GL/2 mode.

3-219. **Plotting a CALS Plot from Emulation Mode.** Use the following procedure to plot CALS CCITT Group 4 Type I files while in Emulation mode:

1. Send BP
   To enter HP-GL/2 mode. Parameters may or may not be included.

2. Send ESC%0A
   To enter HP-RTL mode.

3. Send ESC%–12345X@PJL ENTER LANGUAGE = CALRASTER <LF>
   To enter CALS mode.
   <LF> is a Line Feed character. (A Carriage Return character can precede the Line Feed character.)

4. Send your CALS plot or plots.

5. Send ESC%12345X@PJL ENTER LANGUAGE = PCL <LF>
   To enter HP-RTL mode.

6. Send ESC%0B
   To enter HP-GL/2 mode.
   Once in HP-GL/2 mode, you will automatically return to Emulate mode.

3-220. **Other Differences.** Other differences between the standard and the upgraded Model 240 include:

- The upgraded Model 240 does not have an internal demo plot. On the standard Model 240, you could print the demo plot by pushing the "plot" button quickly followed by the "on-line" button.
- The red out-of-media light now glows a solid red both when the plotter is almost out of media, and when it is completely out of media. The standard Model 240 flashed when completely out of media.
- Pressing the "Reset" button re-initializes the plotter to respond to any changed dip switches. This is a change from the standard Model 240 which required a power-up to re-initialize.
- Alternate Palette – Allows you to choose what pens and line thickness you desire.

3-221. **Using Alternate Palette.** If your software allows you to select what pens you use, you can choose what line thickness you desire from this palette by selecting the pen number. This palette is available in both HP-GL/2 and 7586B Emulation modes. The pen numbers and associated pen widths for the alternate palette are listed in Table 3-22.

3-222. To select the alternate palette without mirror imaging, perform the following steps:

1. Set the desired I/O dip switch to the DOWN position (RS-232-C, parallel, SCS, or HP-IB).
2. Set the other three I/O switches to the UP position.
3. Press the "Reset" button.

3-223. To exit the Alternate Palette, reverse the four dip switches, then press the "Reset" button.

3-224. To select the Alternate Palette and mirror imaging, refer to the "Mirror-Image Plotting" section.

Table 3-22. Alternate Palette Pen Numbers and Widths

PEN	PIXELS	PEN	PIXELS
0	1 (0.0625 mm)	8	8 (0.5 mm)
1	1 (0.0625 mm)	9	9 (0.5625 mm)
2	2 (9,125 mm)	10	10 (0.625 mm)
3	3 (0.1876 mm)	11	11 (0.6875 mm
4	4 (0.250 mm)	12	12 (0.75 mm)
5	5 (0.3125 mm)	13	13 (0.8125 mm)
6	6 (0.376 mm)	14	14 (0.875 mm)
7	7 (0.4375 mm)	15	15 (0.9376 mm)

3-225. **Mirror-Image Plotting.** Mirror-image plotting is a new feature that causes a plot to be reversed horizontally. See Figure 3-61. This feature is enabled by setting the SCS dip switch after the four I/O switches have been set.

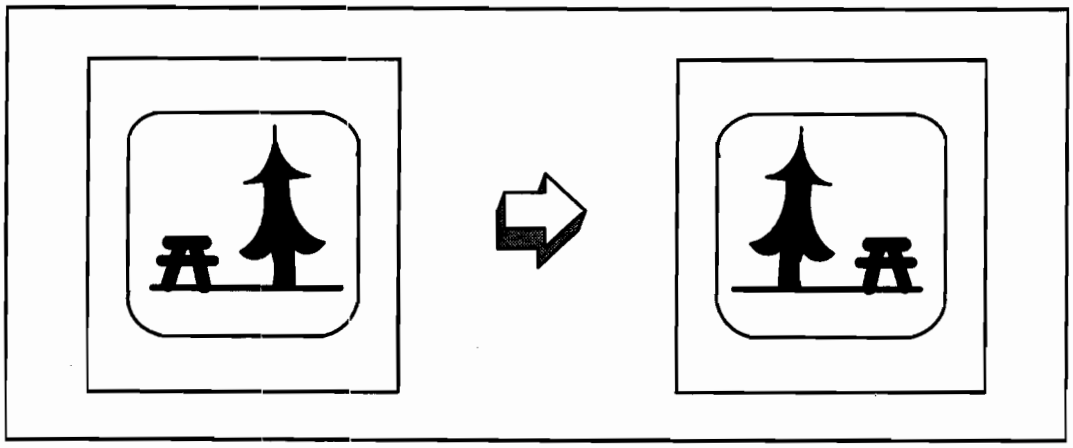


Figure 3-61. Example of Mirror-Image Plotting

3-226. To mirror image a plot, perform the following steps:

1. Set one of the I/O switches (RS-232-C, parallel, SCS, or HP-IB) to the UP position and the other three DOWN. See Figure 3-62.

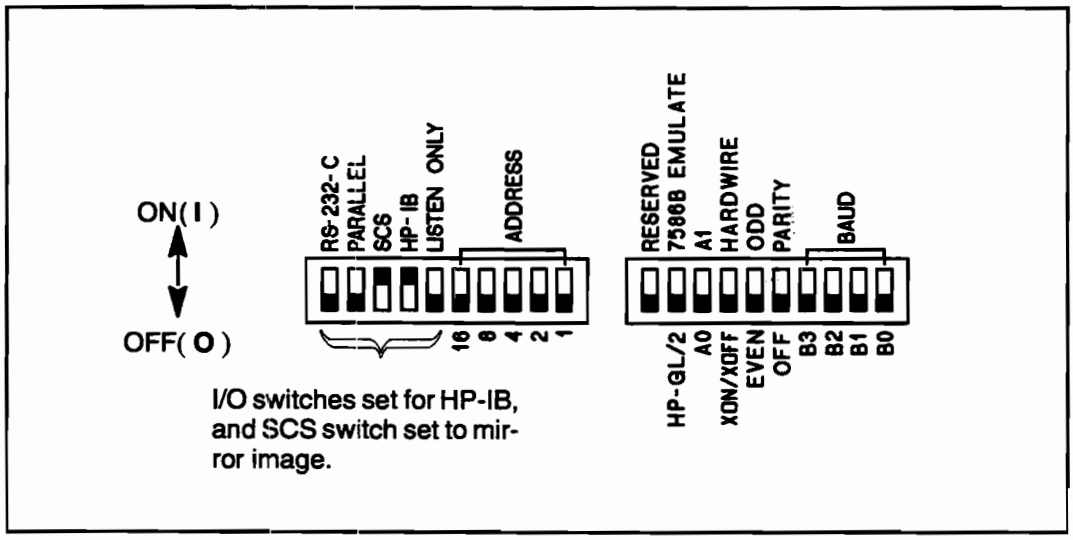


Figure 3-62. Mirror Image Setting

2. Reverse these 4 switches if the alternate palette is desired.

3. Reverse the SCS I/O switch to the opposite position.

4. Press the "Reset" button.

3-227. **Setting the Listen-Only Mode.** The "listen-only" dip switch now controls whether or not DCIs are enabled. Set the HP-IB address to 31 to get listen only; then press the "Reset" button.

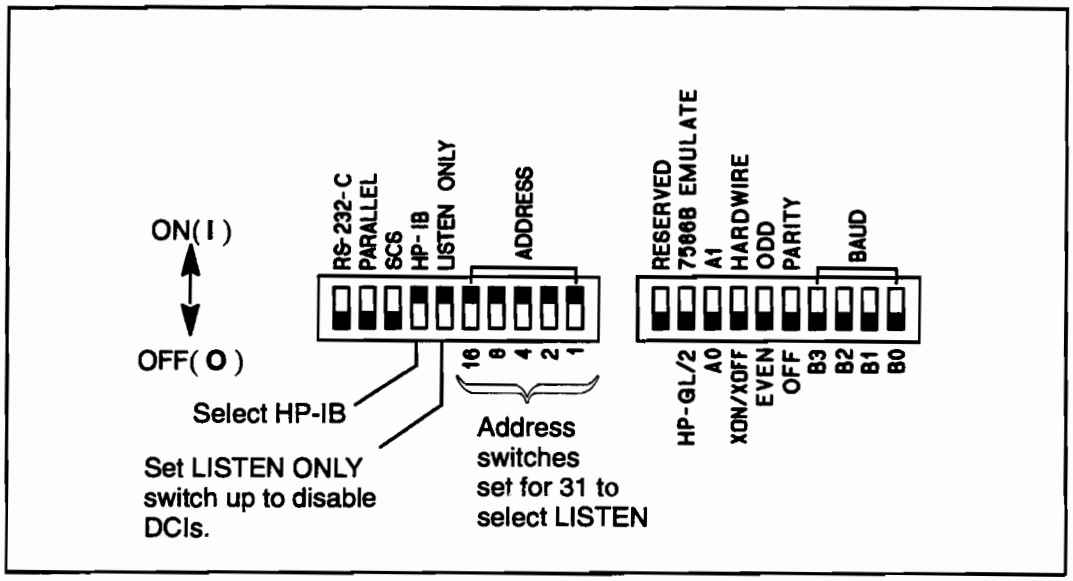


Figure 3-63. Listen-Only Switch Setting

3-228. USING VECTOR AND RASTER DATA

3-229. Your plotter can plot two basic kinds of data: *vector* data and *raster* data. Vector data describes the kind of lines to draw between or around selected points on the plot. Raster data describes individual dots or *pixels* of a plot. See Figure 3-64.

3-230. Vector and raster data can be represented in many ways. Your plotter processes vector data as represented using the HP-GL/2 language, or, when the plotter is in HP 7586B emulation mode, using the original HP-GL language. Your plotter processes raster data as represented by the HP-RTL standard or by the CALS CCITT Group 4 Type I Raster standard.

3-231. **HP Raster Transfer Language (HP-RTL).** HP-RTL supports gray-image plotting, combined vector and raster plotting, and several compression modes. Note that the fonts and character controls that are part of HP-RTL in HP printers are not included in HP-RTL. HP-RTL can only be used to describe raster data.

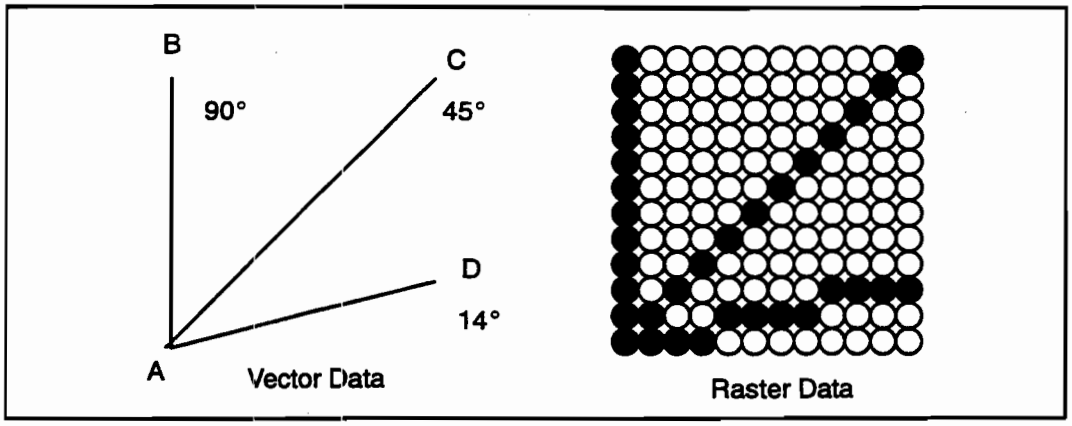


Figure 3-64. Images Formed with Vector and Raster Data

3-232. **Merged Vector and Raster Data.** With HP-RTL, it is possible to mix HP-GL/2 vector graphics with HP raster graphics.

3-233. Vectors and raster are rendered in the order they are received. This means that if some raster data is received, and then some vector data, the vectors will appear to be on top of the raster image. If more raster data is received, that raster image will appear on top of the vectors.

3-234. **Vectors, Raster, and Merge Mode.** When vectors are rendered on top of raster, the way the image appears depends on the current parameter values of the HP-GL/2 instructions, Merge Control (MC), and Transparency Mode (TR).

3-235. When raster is rendered on top of vectors, or on top of raster, it always overwrites what was previously rendered. The MC and TR instructions have no effect when raster is rendered after earlier vector or raster data.

3-236. **CALS CCITT Group 4 Type I Raster.** CALS CCITT Group 4 Type I Raster is the U.S. Department of Defense Computer Aided Logistic Support (CALS) standard for raster graphics, as specified in MIL-R-28002. Plots generated according to this specification include header information that describes the plot as well as raster data compressed using the CCITT Group 4 Type I method.

3-237. All CALS CCITT Group 4 Type I Raster plots can be replotted without retransmitting the plot. Smaller plots can also be nested.

3-238. HP 7600 Series plotters do not support the optional CALS CCITT Group 4 Type I Raster functionality of tiling or rotation.

3-239. NEW HP-GL/2 COMMANDS

3-240. In order to guarantee that an HP-GL/2 hyperdriver will work with the standard Model 240 as well as the new electrostatic plotters, the upgrade kit added the palette extension block and new commands in the technical extension block. The new commands include features such as gray-level equivalents for color and screened lines. The new commands are:

1. **Begin Plot (BP).** Separates and controls plot files. BP as the first command of an HP-GL/2 file will put the plotter into HP-GL/2 mode only for that plot. The plotter will return to the mode set at the dip switch when the HP-GL/2 plot ends at the PG command.

2. **Merge Control (MC).** Defines intersecting vectors as either overlapping or merging.

3. **Media Type (MT).** Allows programmatic selection of media type. (not used by the upgraded Model 240)

4. **Quality Level Selection (QL).** Programmatic selection of draft vs. final quality mode. (Ignored by Model 240)

5. **Set Color Range (CR).** Allows flexible definition of pen colors (which are changed to gray-level equivalents in the upgraded Model 240).

6. **Number of Pens (NP).** This and PC are probably the most critical new commands. Hyperdrivers will use NP and PC to set up a palette of pens, and then select a certain pen using SP.

7. **Pen Color Assignment (PC).** Allows assignment of colors to pen numbers. (The upgraded Model 240 will translate the pen colors to gray patterns.)

8. **Screened Vectors (SV).** Allows you to apply shaded fills or user-defined raster fill patterns to any line.

9. **Transparency Mode (TR).** Lets you define the white pen (default pen 0) to be either opaque or transparent. This essentially provides an erase mode.

10. **Enter HP-GL/2 Mode (Esc%#B).** Where # is the numerical value set. This command will allow you to programmatically switch between HP-GL mode and HP-GL/2 mode if the dip switches are set to HP-GL mode.

3-241. For further information on all HP-GL/2 commands refer to the HP-GL/2 Comparison Guide.

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CHAPTER 4

PREVENTIVE MAINTENANCE

4-1. INTRODUCTION

4-2. This chapter contains information on keeping the HP Model 355 Electrostatic Plotter in the best operating condition. Included are preventive maintenance (PM) procedures and checks to be performed by the user.

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C [100 °F]). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

The media cutter supplied with the plotter has razor sharp blades. Use extreme caution when handling the media cutter. Severe personal injury could result from careless use of the media cutter.

WARNING

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

Environmental Hazard

United States of America only

The toner solution is a petroleum distillate (oil based) product. As with most petroleum products, EPA (Environmental Protection Agency) regulations prohibit the disposal of toner using normal waste disposal methods. Contact your local health department, EPA, or regulatory agency for information and/or instructions for disposing of spent toner. Regulations in your state may vary.

Other countries

The toner solution is a petroleum distillate (oil based) product which may require special disposal methods in your country. Since the methods of disposal may vary between countries, consult your local regulatory and/or health agencies for the proper disposal methods in your area.

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

CAUTION

Before opening the top frame release the pinch rollers. Do not allow the media to lift from the developer unit.

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.

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.

4-3. EFFECT ON PRODUCT RELIABILITY

4-4. 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.

4-5. The supplies for preventive maintenance are listed in Table 4-1. The schedule and procedures are listed in Table 4-2. Maintenance intervals specific to the toner systems are listed in Table 4-3.

Table 4-1. Maintenance Supplies

DESCRIPTION	PART NUMBER
Pre-moistened Cleaning Wipes	HP 92193N
Lint-Free Wipes	HP 92193W
Head Polish	HP 17290P
Clear Dispersant	HP 17279D
Protective Gloves	HP 92193G

Table 4-2. Maintenance Schedule

FREQUENCY	PROCEDURE
Initial Set-Up	Clean paper compartment. Clean head. Clean developer surface. Clean and inspect rollers. Clean exterior surfaces.
Daily	Check output image quality. Clean writing head if necessary. Wipe down developer bar and clear developer bar holes if necessary.
Weekly or when changing media	Check output image quality. Clean grooves in developer bar.
Monthly	Clean paper compartment. Polish and clean head. Clean and inspect rollers. Clean media guide bar. Clean exterior surfaces. Clean VRC filters.

Table 4-3. Toner Pump Flushing Intervals

PUMP ON HOURS PER MONTH	FLUSHING INTERVAL
50 hour or less	6 months
50 to 125 hours	3 months
125 hours or more	1.5 months

NOTE

It is recommended that the toner system be flushed at the same time the toner is being replaced (after the old toner bottle is removed and before the fresh toner bottle is installed.) Under heavy usage, the toner system should be

flushed more frequently than indicated in Table 4-3 to prevent sludge build-up.

4-6. IMAGE QUALITY

4-7. Image quality is one of the best tools to determine the operating condition of the plotter. Image quality is best checked by running a test pattern or demo plot. If there is a problem with the quality, consult troubleshooting Table 8-8.

4-8. 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.

4-9. 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.

4-10. GENERAL CLEANING

4-11. 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.

4-12. 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.

4-13. 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.

4-14. WRITING HEAD CLEANING AND POLISHING

4-15. The writing head should be wiped with a lint free wipe (P/N 92193W), or similar lint free cloth.

4-16. If dust, toner, or other foreign matter is stuck to the writing head, it must be cleaned with IPA (isopropyl alcohol) wipes. 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.

4-17. The writing head is polished as follows:

1. Apply the approved head polish (P/N 17290P) to a lint free wipe, or similar cloth.
2. Using the wipe, apply the polish to the entire length of the writing head. See Figure 4-1.
3. Rub the entire length of the writing head, as if sanding it.
4. Wipe the polish from the head with a clean wipe.

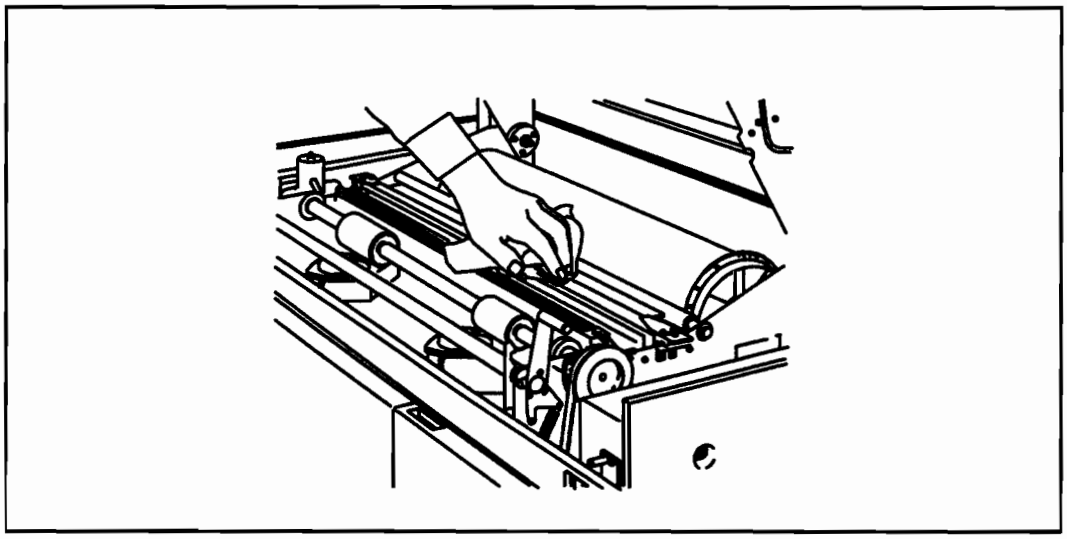

Figure 4-1. Head Cleaning

5. Use pre-moistened cleaning wipes (P/N 92193N) to remove all polish residue from the head. Wipe in the paper path direction for final cleaning.

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

4-18. DEVELOPER BAR CLEANING

4-19. Plotting with a Hewlett-Packard electrostatic plotter provides the highest quality when normal cleaning procedures are followed. One such procedure which drastically impacts the quality of the plots received is regular developer bar cleaning. When plotting, toner flows through the channels of the developer bar allowing the toner to be exposed to the latent image formed on the dielectric of the electrographic media by the print head. During normal usage, residual toner will build up in the channels, preventing adequate toner flow. This build-up results in higher background, extraneous marks, and other undesirable attributes.

4-20. Here are suggestions for cleaning the toner developer bars:

1. Using a non-metal, thin stick such as a coffee stirrer or popsicle stick, split the end as shown in the illustration with a sharp cutter.

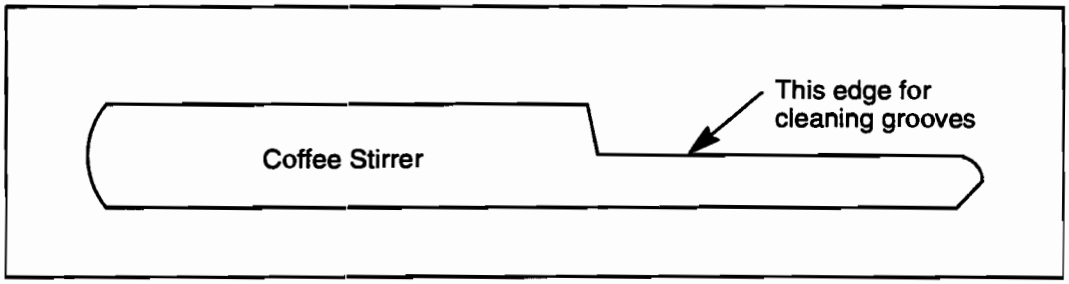

Figure 4-2. Developer Bar Cleaning Tool

CAUTION

The top surface of the developer bar MUST NOT be scratched! Use the edge of the cleaning tool to remove the accumulated sludge in the GROOVES of the developer bar. Scrape from the ends to the center to prevent particles from entering the holes in the developer bar. Continue scraping until the stainless steel at the bottom of the grooves is visible.

2. Perform final cleaning of the channels using the premoistened cleaning wipe (P/N 92193N) and the stick as a means of applying pressure inside the channel. In other words, the wipe should be in contact with the metal of the channel and the stick used to apply pressure inside each groove. After cleaning, the channels will retain some color from the toner. This is not a cause for alarm.

3. Wipe the front edge of the bar (the edge closest to the front of the plotter) using the premoistened cleaning wipe to remove any build-up.

CAUTION

Make sure not to allow ANY sharp edge of the paper clip to touch the top of the developer bar while performing step 4. ANY scuff or scratch on the developer bar surface will result in poor plot quality.

4. Using the end of a paper clip, ensure that all holes on both the supply and discharge sides of the bar are free of blockage.

5. It is recommended that the above procedure be performed with every roll change of media or weekly.

4-21. ROLLER CLEANING

4-22. The surface of the roller must be inspected for damage. It can also be cleaned with premoistened cleaning wipes or a lint free wipe.

4-23. TONER SYSTEM FLUSHING

4-24. Flushing the toner system removes toner particles from the system so that they do not clog the plotter.

4-25. Plotter usage is measured in "pump hours." Pump hours counts the number of hours the plotter spends actually plotting. Flush the toner system every 1000 pump hours, or every 12 months, whichever comes first. Depending on how much you use your plotter, you may need to flush the toner system as often as every 3 months. In addition, flush the toner system when the plotter will not be used for several months. See "Storing the Plotter" later in this chapter.

4-26. Refer to the pump hour meter on the test panel inside the right door of the plotter to check the pump hours.

4-27. **Using Dispersant.** You will need a bottle of dispersant to flush the toner system.

4-28. You can use dispersant up to three times. Follow these guidelines when storing dispersant:

- Store dispersant in a cool, dry, well-ventilated area. Keep dispersant away from direct sunlight and from areas that exceed 50 °C (122 °F) for more than 72 hours.
- Use dispersant in the order it was purchased.

- Clean up dispersant immediately if spilled.

NOTE

Refer to the material safety data sheet (MSDS) that is shipped with the dispersant for further information regarding the handling and use of dispersant.

4-29. **The Toner Flushing Procedure.** Follow these steps to flush your plotter's toner system:

1. Ensure that no plot is currently plotting or being received. Press the **Online** button to take the plotter offline.

2. Replace the toner with a bottle of dispersant. Refer to "Replacing Toner" in chapter 6 of the User's Guide for instructions on how to replace a toner bottle.

3. Open the plotter's right door. Inside, you will see an array of test switches. See Figure 4-3.

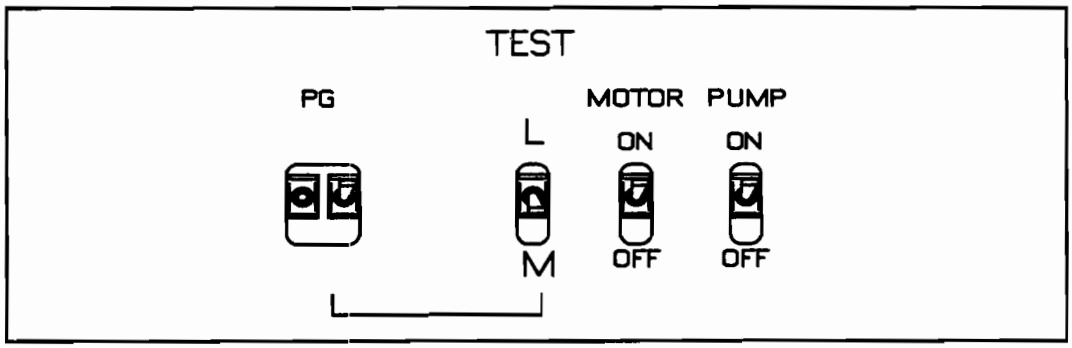

Figure 4-3. Array of Test Switches

4. Switch off the **Motor** switch to keep the media from advancing during toner flushing.

5. Push down the **PG** switch and release it. This plotter starts pumping dispersant through the toner system to flush it.

6. Let the plotter run approximately five minutes. After five minutes, push down and release the **PG** switch to stop the flushing.

7. Remove the dispersant bottle. Place the toner bottle that you removed in step "2." or a new bottle back into the plotter.

8. After you have used the dispersant three times, or, if you do not want to store used dispersant, dispose of the dispersant bottle properly. Contact your local health de-

partment, EPA, or regulatory agency for information and/or instructions for disposing of spent toner.

4-30. VRC FAN FILTERS

4-31. When service is required on a plotter or the VRC is removed, it is recommended that the VRC fan filters be vacuumed or brushed out.

CAUTION

Failure to perform the periodic checks recommended below may result in premature disk drive failure, power supply failure, or both due to overheating of the VRC.

4-32. The VRC fan filters should be checked for cleanliness and cleaned if necessary at least once a year. If the plotter is operated in a dusty environment, more frequent checks are recommended.

4-33. To check and clean the VRC fan filters perform the following steps:

1. Switch OFF (O) the plotters.
2. Open the front doors of the print engine.
3. Remove the lower panel immediately behind the left cover.

CAUTION

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

4. Disconnect the Color VRC I/F (VRC to Print Engine) interface cable at the VRC.
5. If the plotter is connected to an external controller, disconnect the external controller cable at the VRC.
6. 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.
7. If the VRC fan filters are dirty, vacuum or brush out the dust. The filters are located on the left side of the VRC (viewed from the front). See Figure 6-107.

NOTE

The filters are screens that cover the fans. Do not remove the screws from a filter in an attempt to remove a filter for cleaning. The screws hold the fan to the side of the VRC, and there is a nut on the upper left screw of each filter that will fall into the inside of the VRC if the screw is removed.

8. If the filters are especially dirty, it is recommended that the top cover of the VRC be removed and that the inside of the VRC be vacuumed out.

9. Install the VRC. If necessary refer to the procedure VRC INSTALLATION in chapter 3 of this manual.

4-34. 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.

4-35. 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.

4-36. MEDIA

4-37. The following procedures should be followed to assure the highest quality plots on the media:

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

2. The storage temperature for the media should not exceed 38 °C (100 °F) for more than 48 hours.

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

4. Store media on end (vertical).

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

6. Use the media in an operating environment of 5 to 38 °C (41 to 100 °F) and relative humidity of 30 to 80% .

4-38. TONER SOLUTION

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C [100 °F]). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

4-39. The following procedure should be used for toner solution handling and storage.

1. Store in a cool, dry, well ventilated area.
2. Keep the toner solution away from exposure to direct sunlight.
3. The temperature of the toner should not be allowed to exceed 38 °C (100 °F) for more than 72 hours.
4. The storage temperature should be kept between 5 and 38 °C (41 to 100 °F).

NOTE

The following step is very important.

5. Shake the toner solution well before installing it in the plotter.
6. All toner spills should be cleaned up immediately.
7. Avoid inhalation of vapors.
8. Avoid toner contact with the skin. Protective gloves are recommended.

CHAPTER 5 CONTENTS

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CHAPTER 5

FUNCTIONAL OVERVIEW

5-1. INTRODUCTION

5-2. This chapter provides functional level descriptions of the circuits used in the HP Series 7600 Models 240D/E and 250/255 Electrostatic Plotters.

5-3. SIMPLIFIED DESCRIPTION OF THE SYSTEM

5-4. The HP 240D/E and 250/255 plotters accept vector input from a controller, convert the vectors to a raster image, and produce a plot of the raster image on paper, vellum, or film.

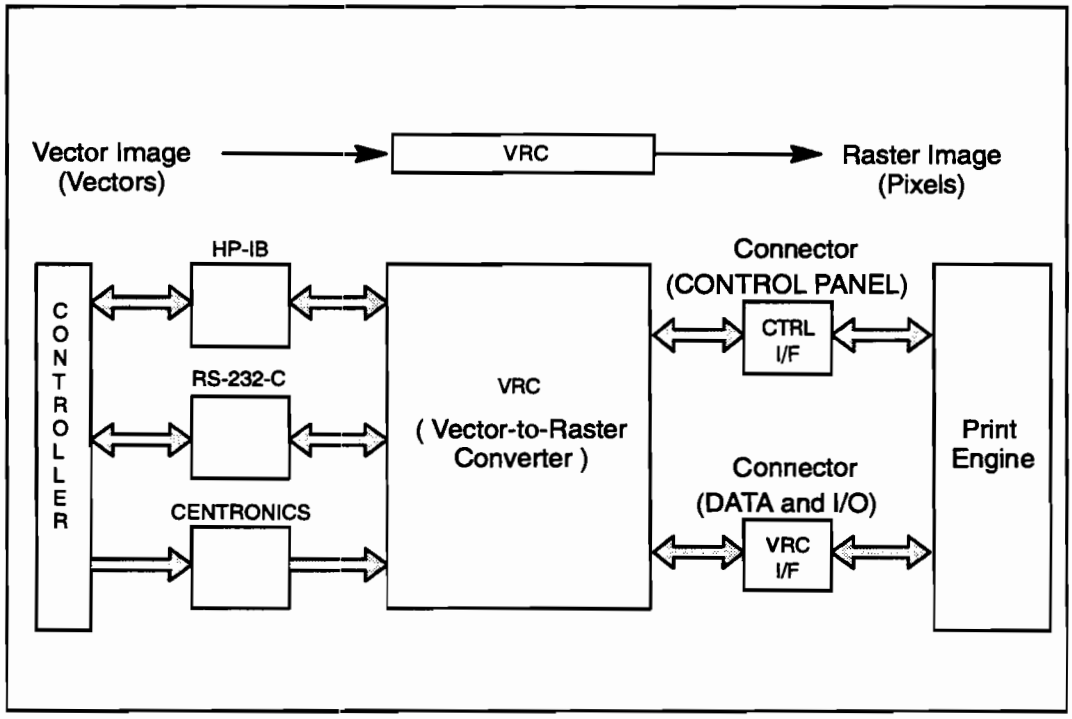

Figure 5-1. Simplified Block Diagram

5-5. The plotter consists of a vector-to-raster converter (VRC) and a print engine (see Figure 5-1). The VRC communicates with the controller through one of three interfaces. The interfaces provided are an HP-IB interface, an RS-232-C interface, and a Centronics interface. The interface circuits are located on the direct memory access input output (DMA I/O) printed circuit assembly (PCA) of the VRC.

5-6. The VRC converts vectors to a data format suitable for raster conversion, and stores this data format on an internal disk. When plotting, the data format is dynamically converted to raster lines that are temporarily stored, 256 lines at a time, in random access memory (RAM). The VRC then sends the stored, 256-line portions of the plot image to the print engine through the VRC interface (VRC I/F). The image is sent as lines of pixels (dots), one line at a time. As the lines are received by the print engine, they are electrostatically transferred onto the plot media.

5-7. The control interface (CTRL I/F) allows the status of the control panel to be passed to the VRC. It allows the VRC to control certain print engine states and light-emitting diodes (LEDs) on the control panel. The CTRL I/F also allows the VRC to receive the state of the control panel buttons.

5-8. FUNCTIONAL DESCRIPTION OF SYSTEMS

5-9. TONER SYSTEM

5-10. See Figure 5-2 while reading the following description of the toner system. As the plot medium passes over the writing head, high voltages are applied to the medium through pin and control electrodes in the writing head. This application of high voltages creates electrostatically charged dot patterns on the medium. As the medium passes the developer, toner diffused in the developing solution adheres to the charged dot patterns and a visible image is produced.

5-11. To start the operation of the toner system, a Pump On signal from the recording and mechanical control (RMC) PCA causes a relay in the high voltage power supply (HPS1) to close. An ac voltage passes through the relay contacts to power the pump motor. An SV ON signal from the mechanical component driver (MCD) PCA opens a solenoid valve in the toner system. The pump circulates the developing solution onto the developer bar and back to the toner bottle. The developing solution consists of a liquid dispersant in which toner particles are suspended.

5-12. TAKE-UP-REEL CUTTER (Models 250/255)

5-13. Phased pulses from the mechanical component driver (MCD) drive the pulse motor (PM1), which rotates the drive roller shaft. When the take-reel is in use, the path of the medium is between the pinch roller and drive roller shaft and over the take-up reel rather than

under it as shown in Figure 5-2. Signals from the MCD cause the take–up reel motor to drive the take-up reel which takes up any slack in the medium. Signals FAN3 and FAN4 cause the paper drying fans to operate. The fans dry the medium after it passes over the developer.

5-14. When the cutter is in use, the path of the medium is through the pinch roller and drive roller shaft and under the take-up reel as shown in Figure 5-2. A signal from the MCD drives the cutter roller motor (M3), which moves the medium through the cutter. The cutter roller brake (BK1) stops the cutter rollers and the Y-cutter motor (M4) moves the blade of the cutter to cut the medium. Cutter operation can be controlled from the front panel or via software.

5-15. PLOT LAYOUT SYSTEM

5-16. See Figure 5-3, titled Plot Layout Diagram, while reading this paragraph. To convert a vector plot to a raster image, the VRC divides the plot into swaths of 256 lines per swath. It also clips the vectors and sorts them. For example, vector 1 would be clipped at the point where it crosses the line between swath 1 and swath 2, and instructions representing the upper portion of the vector would be placed into the part of disk memory set aside for swath 1 data. Instructions representing the lower portion of the vector would be placed in the part of disk memory set aside for swath 2 data.

5-17. The vectors representing the plot are stored by the VRC on its 40 Mbyte mass storage disk. Each vector includes data as to its type, beginning point, ending point, slope, etc. Once all of the data for a plot are stored on disk, the VRC can begin the conversion of lines into pixels for transmission to the print engine.

5-18. Horizontal and vertical plot resolution is 16 pixels/mm (406 pixels/inch). Each pixel (dot) has a diameter of 0.0625 mm (0.0025 inches). there are 14 336 pixels/line on the HP 240E and 255 plotters. There are 9600 pixels/line on the HP 240D and 250 plotters. Thus, the HP 240E and 255 plotters produce a plot that is 896 mm (35.27 inches) wide, and the HP 240D and 250 plotters produce a plot that is 600 mm (23.62 inches) wide. The HP 240E and 255 plotters can produce a complete plot in approximately 51 seconds at the paper-feeding speed of 22 mm/s (0.86 in./s).

5-19. SIMPLIFIED FUNCTIONAL DESCRIPTION OF THE VRC

5-20. The VRC is a 68020 microprocessor-based (16 MHz) computer which communicates with the host computer (i.e. PC, mainframe, etc.) via one of the three standard interfaces (RS-232, Centronics, or HP-IB). The VRC processes the incoming HP-GL/2 commands which describe the vectors that make up a plot. This data, which is in vector format, is clipped, sorted, and then stored on the VRC hard drive in 1 Kbyte blocks. Once the entire plot file has been received, the VRC rasterizes the vector data, converting it into raster data (1's and 0's). The raster data is then transferred in 500 Kbyte blocks to the print engine's RMC PCA via the Swath Ram and I/O DMA PCAs. This raster data is then plotted in "swath" format which is in 16 mm widths on the physical page of the print engine.

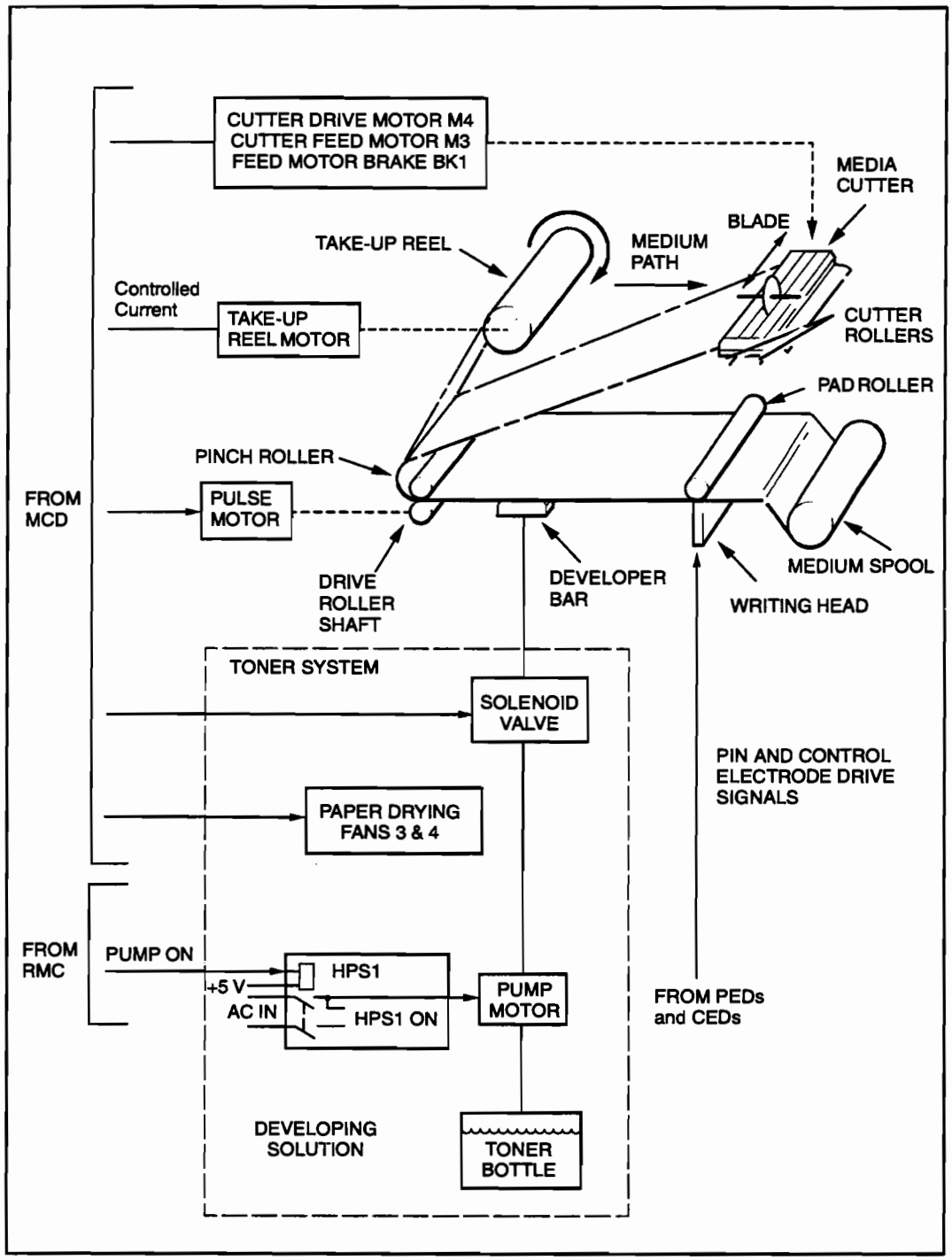

Figure 5-2. Toner System Diagram (Cutter and Take-Up-Reel Models 250/255 Only)

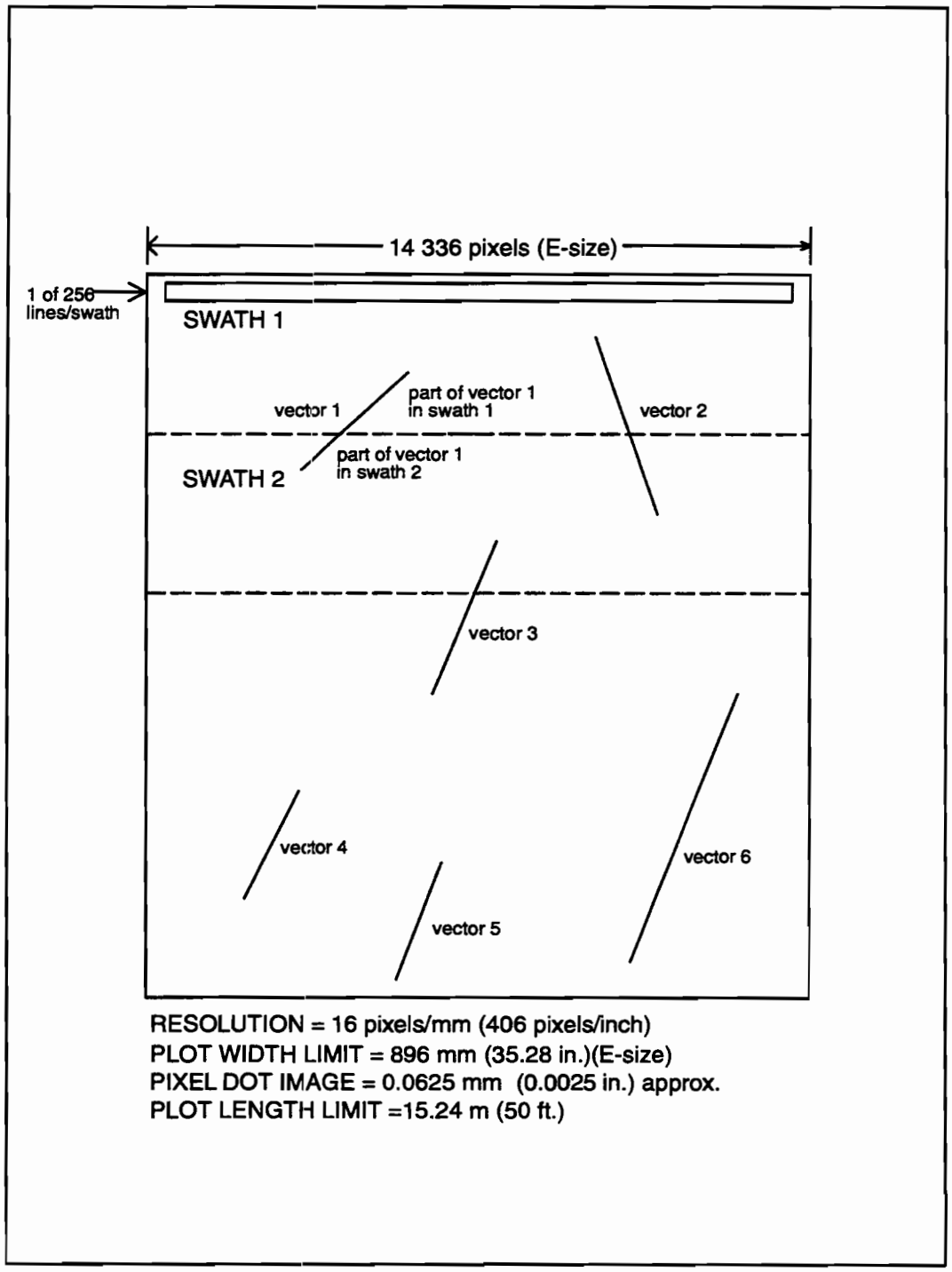

Figure 5-3. Plot Layout Diagram

5-21. All front panel configurations (dipswitch settings on the 240D/E) are implemented on the incoming HP-GL/2 data before the vector data is stored on the disk. This is why a plot must be present from the host computer after changing configurations to reflect changes in the plot (i.e. the replot function will NOT reflect configuration changes made since the current plot was received). The 240D/E and 250/255 Model electrostatic plotters also have a 7586B Emulation mode which enables the plotters to accept standard HP-GL commands.

5-22. The disk drive on the 250/255 models may be partitioned via the front panel queue setting from 1 to 14. The queue number represents the maximum number of plots which can be stored on the hard disk at one time. However, if the queue is set to the maximum setting (14) and a very large plot file is sent, the VRC disk controller will continue to allocate memory in 1 Kbyte blocks until the entire plot file is received or the hard drive runs out of memory space. If the disk runs out of memory space, the remaining portion of the plot file will be lost! The 40 Mbyte hard drive has about 2.25 Mbytes of unusable space which is used for operating system and demo/user plot area. this leaves 37.75 Mbytes for plot file storage.

5-23. The Model 240D/E has a queue of one (1) unless a C1643A upgrade kit has been installed. Installation of the C1643A upgrade kit expands the 240D/E queue to six (6).

5-24. The VRC is capable of processing about 16 000 vectors per second. The VRC is conservatively rated for being able to accept about 3.3 million vectors maximum. This is calculated by short vectors (<9 pixels in length) requiring approximately 9 bytes of memory and a vector longer than 9 pixels requiring 13 bytes of memory. The number of vectors generated by a given plot file size varies greatly. Depending on the efficiency of the software/driver, the ratio of plot file size, to the number of vectors may vary as much as 10 to 1. That is, a plot file size of 100 Kbytes may only contain 10 K vectors after being clipped and sorted.

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CHAPTER 6

REMOVAL AND REPLACEMENT

6-1. INTRODUCTION

6-2. This chapter contains procedures for the removal and replacement of the HP Models 240D/E and 250/255 plotter assemblies and mechanisms.

6-3. SAFETY CONSIDERATIONS

6-4. The Safety Symbols used with Hewlett-Packard instruments are illustrated in the front matter of this manual. WARNING and CAUTION symbols and instructions must be reviewed before service work is performed. These warnings and cautions must be followed for your protection and to avoid damage to the plotter.

WARNING

Disconnect the ac line cord and the interface cable before performing any disassembly or maintenance. Failure to do so can expose the service person to high voltage circuits and possible personal injury.

CAUTION

DO NOT touch the writing head with your bare hand, tools, or other objects that could leave deposits or scratches on the writing head assembly.

If you touch the writing head assembly with some foreign matter or substance, such as toner, quickly clean the writing head assembly with isopropyl alcohol wipes (HP P/N 92193N) supplied with the plotter. Then wipe the writing head assembly dry with HP Lint-Free Wipes (HP P/N 92193W).

Never rotate the paper supply roll to take up excess or slack paper. If the paper has contacted the toner trough, it can short out the writing head assembly if it is rolled back over the head assembly.

It is recommended that you always keep a section of paper over the writing head assembly when working on the plotter.

6-5. ESD CONSIDERATIONS

6-6. Integrated circuits can be damaged by electrostatic discharge. To prevent damage to the plotter circuits from high voltage electrostatic discharge, perform the following procedure:

1. Do not wear clothing which is subject to static build-up.
2. Do not handle integrated circuits in carpeted areas.
3. Do not remove an IC from its conductive foam pad until you are ready to install it.
4. Ground your body while disassembling and working on the plotter. Conductive wrist-bands (HP P/N 00970–67900) are available for this purpose.
5. Attach a clip lead between the PCA common and earth ground, and touch all tools to earth ground to remove static charges before using them on the plotter.

6-7. REQUIRED TOOLS AND EQUIPMENT

6-8. The tools and equipment required to disassemble the HP Models 240D/E and 250/255 are listed in Table 6-1.

6-9. DISASSEMBLY AND REASSEMBLY PROCEDURES

6-10. Use the following procedures to remove or replace the plotter assemblies.

6-11. RAISING THE TOP COVER

6-12. Raise the top cover by placing your hands under the front edge of the cover and lifting straight up. Raise the top cover to its fully opened position. See Figure 6-1.

6-13. REAR COVER

6-14. To remove the rear cover, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Using a #2 Phillips screwdriver, remove the three rear cover mounting screws. Slowly pull the top of the cover outward and allow the cover to swing out until it stops. See Figure 6-2, Detail A.

Table 6-1. Required Tools and Equipment

TOOLS/EQUIPMENT	DESCRIPTION
Screwdrivers	Phillips (#1, #2, #2 Stubby) #2 offset and #2 long
Screwdrivers	Pozidriv (1 pt.)
Screwdrivers	Common; large and small
Allen Wrench	1.5 mm, 2 mm, 3 mm, 4 mm, and 5 mm
Nut Drivers	12 mm, 14 mm, 3/16 in., and 9/32 in.
Open–end Wrenches	7 mm, 19 mm, and 23 mm
Combination Spring Removal Tool	
Needle–nose Pliers	
Fuse Puller	
Absorbant Towels/Wipes	
Snap–Ring Tool	

CAUTION

Disconnecting the ground strap from the rear cover will allow the cover to fall from the plotter, resulting in possible damage to the cover.

3. Using a #2 Phillips screwdriver, remove the screw that connects the ground wire to the rear cover. See Figure 6-2, Detail B.

4. Lift the rear cover straight up to release the tabs located at the bottom inside edge of the cover from the slots in the plotter chassis.

5. To replace the rear cover, reverse this procedure.

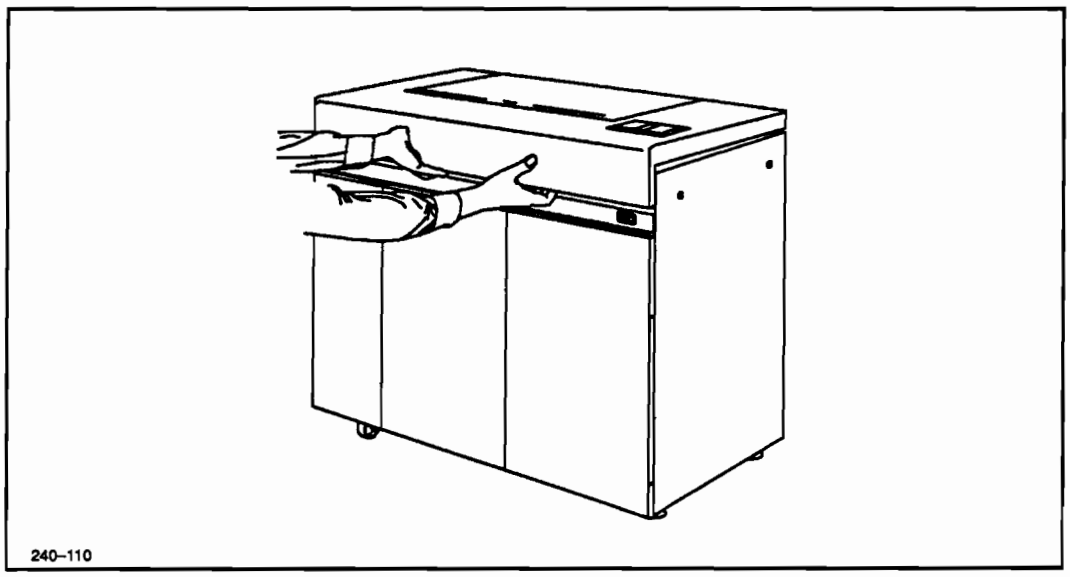

Figure 6-1. Raising the Top Cover

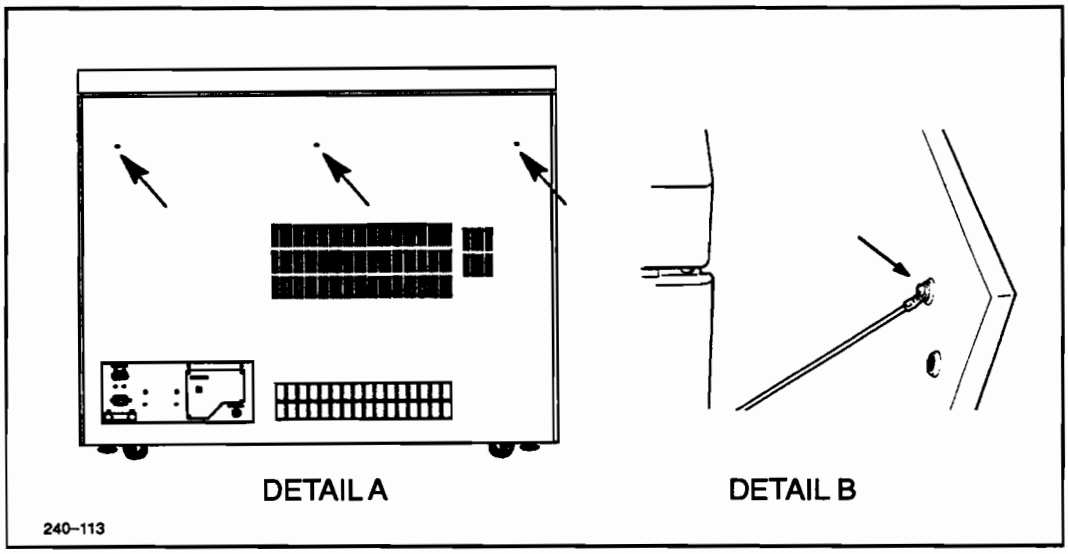

Figure 6-2. Rear Cover Removal

6-15. LEFT- OR RIGHT-SIDE COVER

6-16. To remove the left or right side cover, perform the following procedure:

NOTE

This procedure is identical for the removal of either the left or right side cover. The left-side cover will be discussed and illustrated.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Using a #2 Phillips screwdriver, remove the two side cover mounting screws. See Figure 6-3.

NOTE

Figure 6-3 shows Model 250/255, but the Model 240D/E does not differ significantly.

3. Slowly pull the top of the cover outward and allow the cover to swing out until it stops.

CAUTION

Disconnecting the ground strap from the side cover will allow the cover to fall, resulting in possible damage to the cover.

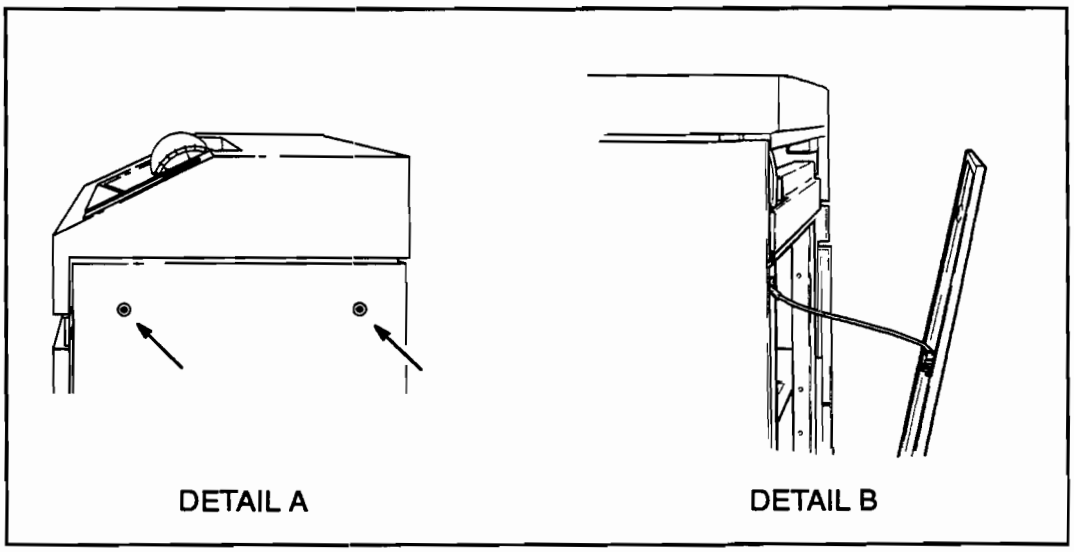

Figure 6-3. Left Side Cover Removal (Model 250/255 shown.)

4. While holding the side cover upright, use a #2 Phillips screwdriver to remove the screw that fastens the ground wire to the side cover.

5. Lift the side cover straight up to release the tabs located at the bottom inside edge of the cover from the slots in the plotter chassis.

6. Remove the side cover.

7. To replace the side cover, reverse this procedure.

6-17. LEFT- OR RIGHT-FRONT DOOR

6-18. To remove the left- or right-front door, perform the following procedure:

NOTE

This procedure may be used to remove either front door. The right-front door will be removed in this procedure.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Open the right-front door.

3. Disconnect the ground wire from the door at the lower-inside corner of the door. See Figure 6-4.

4. Using needle-nose pliers, remove the retaining pins from both hinge bolts.

5. While supporting the door, push both hinge bolts up through the door hinge and remove the door.

6. To replace the right-front door, reverse this procedure.

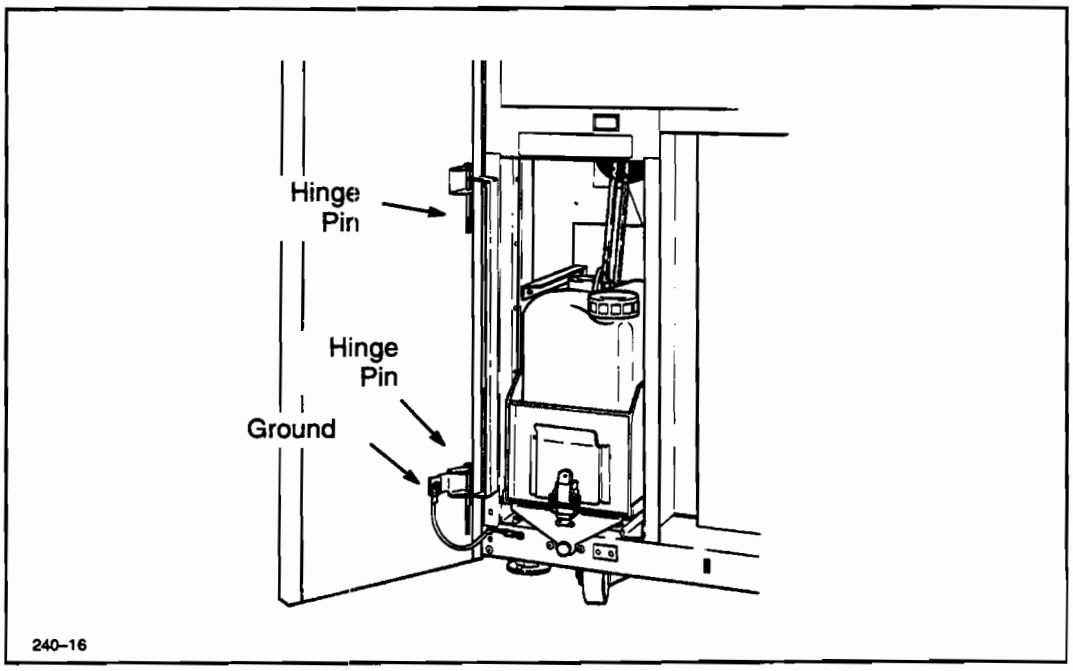

Figure 6-4. Toner Door Removal

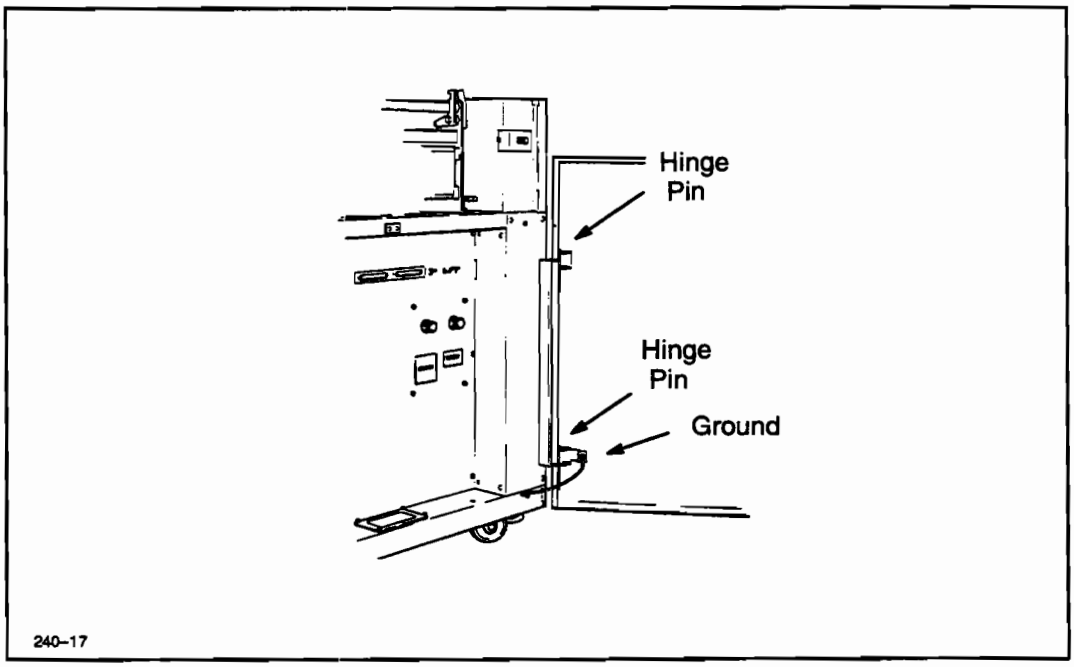

Figure 6-5. Test Panel Door Removal

6-19. CENTER COVER REMOVAL

6-20. To remove the center cover, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Open the toner door and the test panel door.

NOTE

The screws called out in step 3. may have been removed at plotter installation. If the screws are not present, skip to step 4. for cover removal.

3. Using a #2 Phillips screwdriver, remove the two center cover mounting screws. See Figure 6-6..

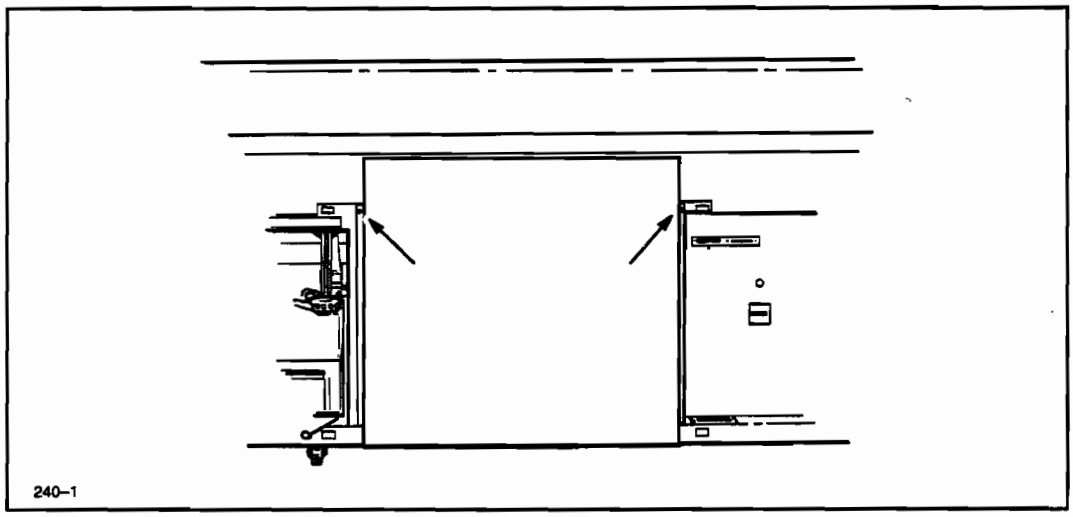

Figure 6-6. Center Cover Removal

4. Pull out at the top edge to disengage the cover latches.
5. Lift up and out to disengage the lower hooked tabs from the slots on the chassis.
6. To replace the center cover, reverse this procedure.

6-21. TOP COVER

6-22. To remove the top cover, perform the following procedure:

WARNING

The top cover is very heavy and must be removed carefully. Use two people if possible to avoid excessive muscular strain or other personal injury. Do not drop the top cover as personal injury or damage to the plotter may result.

WARNING

Releasing the pneumatic tube from the top cover will allow the top cover to close over the plotter without restraint. The cover is heavy and could injure you if your hands are in the plotter.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Remove the rear cover. Refer to the Rear Cover removal procedure in paragraph 6-13.
3. Raise the top cover to its fully opened position.
4. Remove the front panel cable connector (release two tabs) and cable clamp mounting screws from the top cover. See Figure 6-7.
5. Disconnect the ground wire.
6. Remove the left- and right-side covers. Refer to the Left- or Right-Side Cover procedure in paragraph 6-15.
7. Using a #2 Phillips screwdriver, loosen but do not remove the four screws that mount the right-side bracket and the left side bracket. See Figure 6-8.
8. Using needle-nose pliers, remove the retaining clip and washer that holds the top end of the pneumatic tubes to the top cover. See Figure 6-7.
9. Holding the cover open, carefully slide each pneumatic tube from its pivot point on the top cover.
10. Grasp the top edge of the cover and carefully lift the top cover off the left side bracket, then the right side bracket (use two persons if possible).
11. To replace the top cover, reverse this procedure.

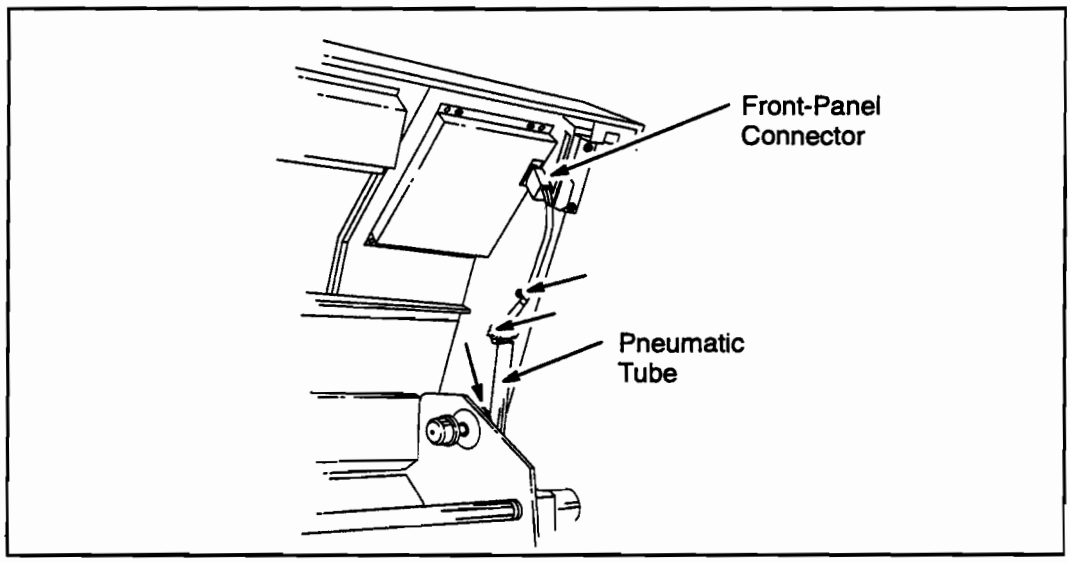

Figure 6-7. Top Cover Removal

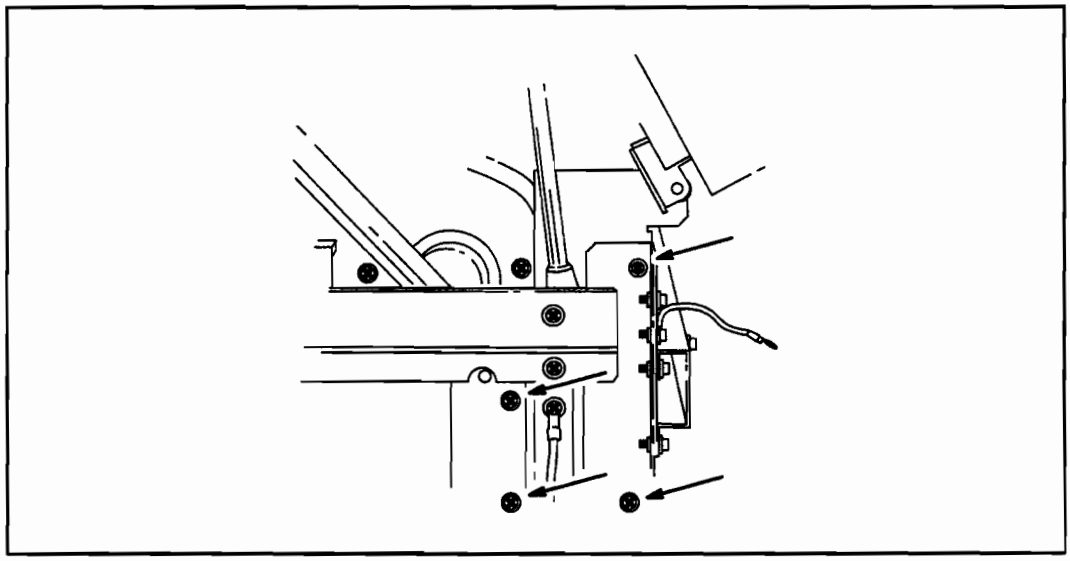

Figure 6-8. Top Cover Bracket Removal

6-23. FRONT PCA SHIELD

6-24. To remove the front PCA shield, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.

3. Open both front doors.

4. Using a #2 Phillips screwdriver, loosen the four bottom PCA-shield mounting screws. See Figure 6-9.

5. Using a #2 Phillips screwdriver, remove the top screw at each end of the shield. See Figure 6-9.

6. Lift the shield off the bottom screws.

7. To replace the PCA shield, reverse this procedure.

6-25. REAR PCA SHIELD

6-26. To remove the rear PCA shield, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the rear cover. If necessary, refer to the Rear Cover procedure in paragraph 6-13.

3. Using a #2 Phillips screwdriver, remove the five PCA shield mounting screws.See Figure 6-10.

4. Pull the shield straight out from the plotter.

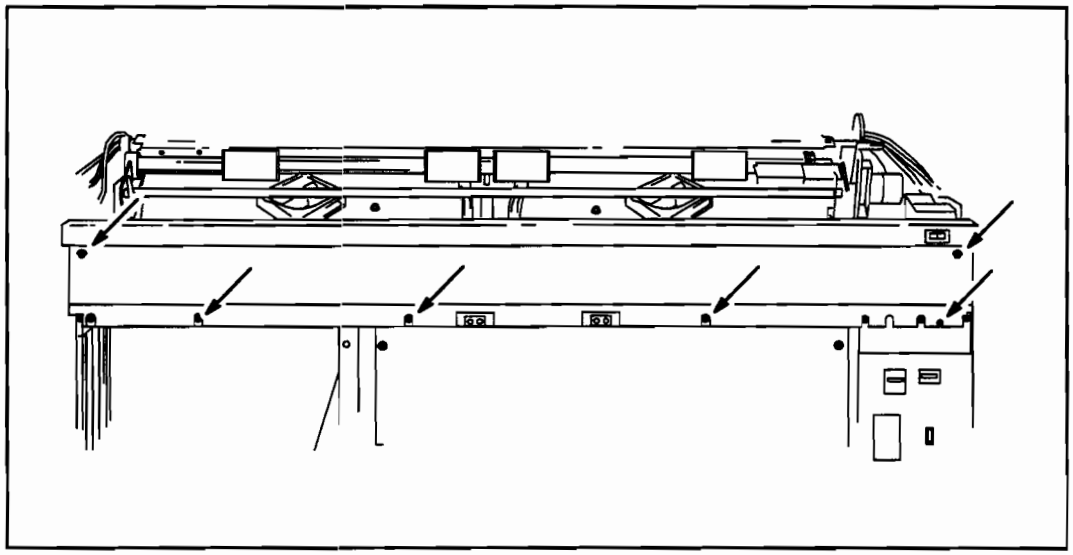

Figure 6-9. Front PCA Shield Removal

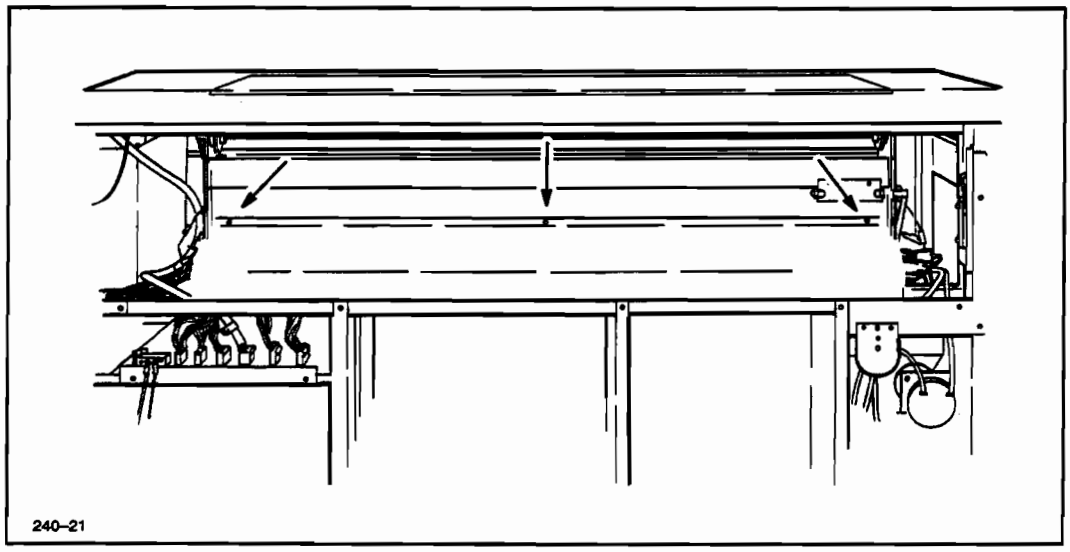

Figure 6-10. Rear PCA Shield Removal

5. To replace the Rear PCA shield, reverse this procedure

6-27. FRONT PANEL

6-28. To remove the front panel, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Unplug the front-panel cable. See Figure 6-11.
4. Using a #2 Phillips screwdriver, remove the mounting screws and remove the front panel as shown in Figure 6-10.

5. To replace the front panel, reverse this procedure.

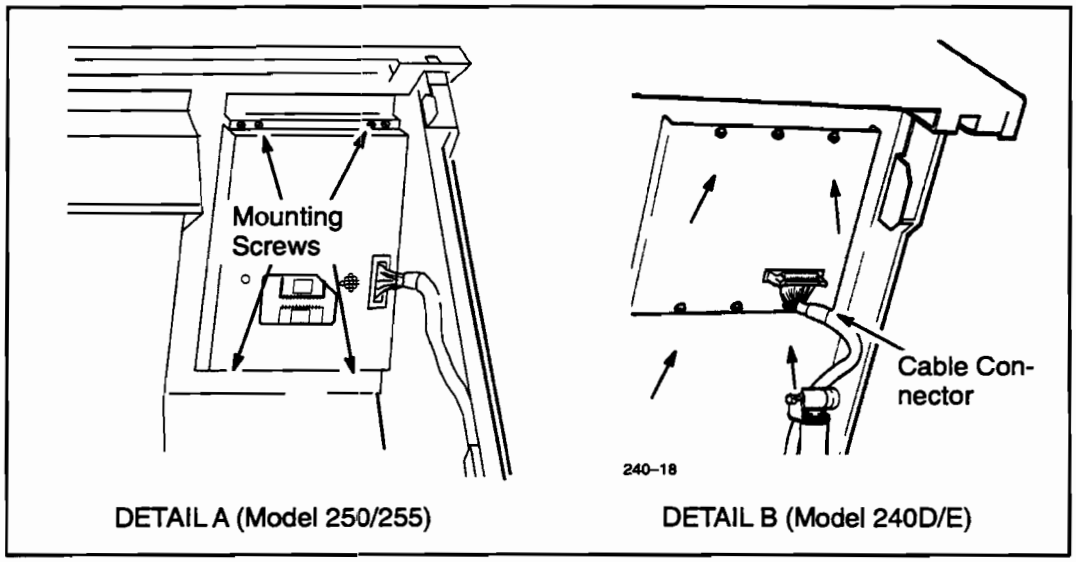

Figure 6-11. Front Panel Removal

6-29. TOP COVER INTERLOCK SWITCH (PSW2)

6-30. To remove the top cover interlock switch (PSW2), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Using a #2 Phillips screwdriver, remove the two interlock switch mounting screws. See Figure 6-12.
4. Using a #2 Phillips screwdriver, remove the three side-bar mounting screws.
5. Using a #2 Phillips screwdriver, remove the four switch cover mounting screws.
6. Slide the interlock switch out from the side of the cover and disconnect the wires. See Figure 6-13.
7. To replace the interlock switch, reverse this procedure.

6-31. POWER ON/OFF SWITCH (PSW1)

6-32. To remove the power on/off switch (PSW1), perform the following procedure:

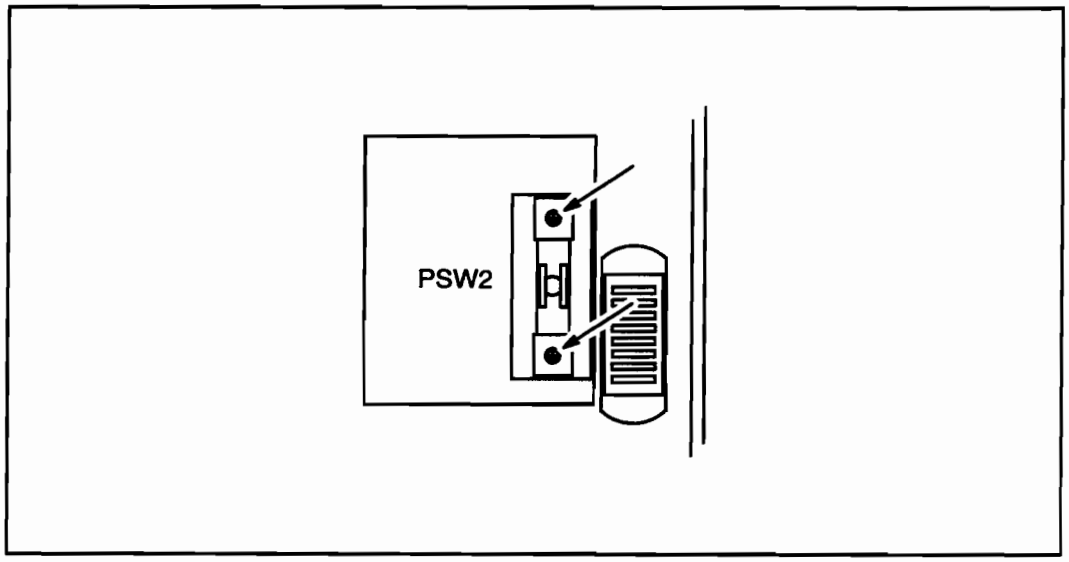

Figure 6-12. Interlock Switch Mounting Screws

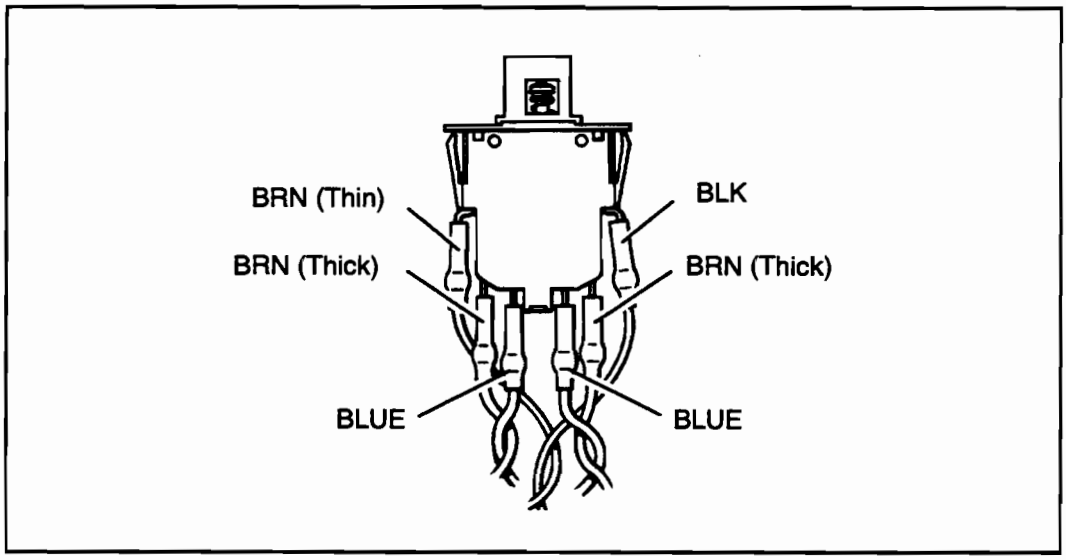

Figure 6-13. Interlock Switch Wiring

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Open the right-front door.
3. Remove the front PCA shield. If necessary, refer to the Front PCA Shield removal procedure starting on paragraph 6-23.

4. Using a #2 stubby Phillips screwdriver, remove the two switch mounting screws. See Figure 6-14.

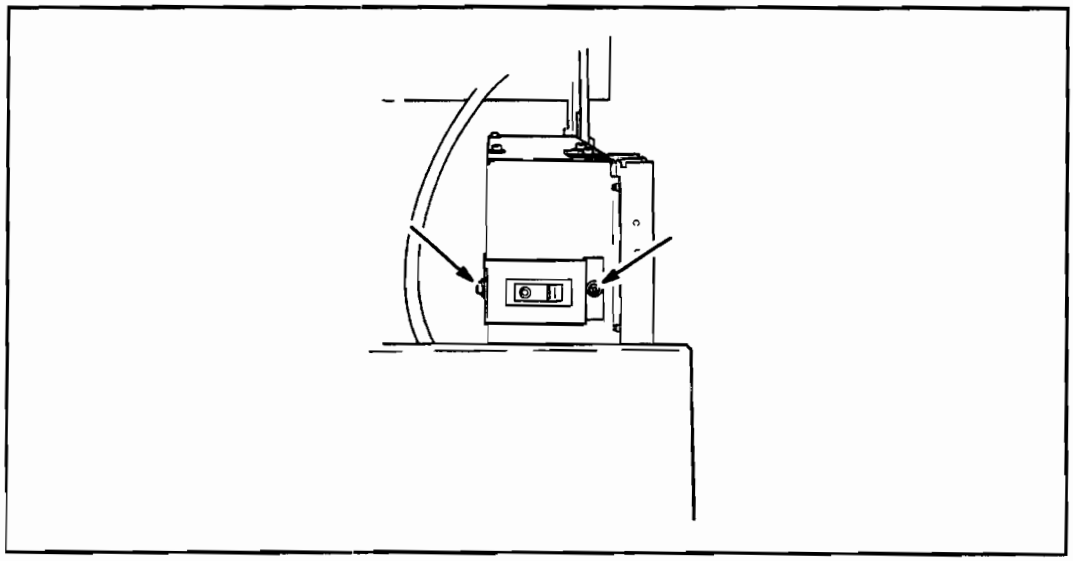

Figure 6-14. Power Switch Removal

5. Carefully pull the switch out of the switch cover and disconnect the wires. See Figure 6-15 for wire connections when replacing the switch.

6. To replace the switch, reverse this procedure.

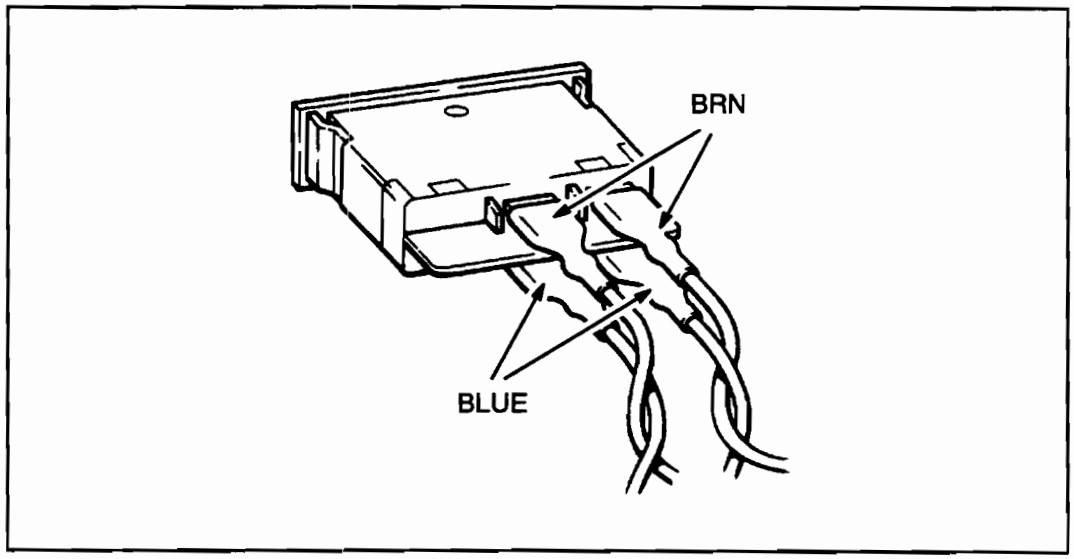

Figure 6-15. Power Switch Wiring

6-33. LINE/LOAD RELAY (RL1) (Models 240D/E Only)

6-34. To remove the Line/Load Relay (RL1), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Remove the right side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
3. Note the orientation of the line and load wire connections to the relay. Disconnect the wires from the relay. See Figure 6-16.

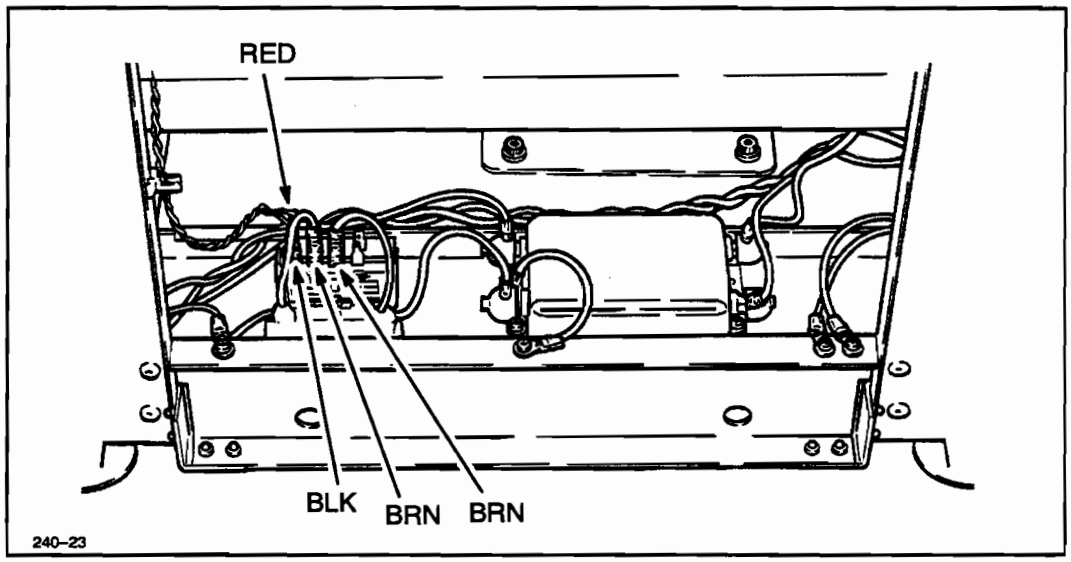

Figure 6-16. Line/Load Relay (RL1) Removal (Models 240D/E)

4. Separate the holding tabs from the relay and lift out the relay.
5. To replace the relay, reverse this procedure.

6-35. IN-RUSH RESISTOR (R1) REPLACEMENT (Models 240D/E)

6-36. The following procedure outlines the replacement of the In-Rush resistor. If replacement is necessary, consult the troubleshooting section in chapter 8 for causes of R1 failure.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Remove the right side cover. If necessary refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

3. Referring to Figure 6-17 make note of the wire connections on the In-Rush resistor and then disconnect the wires from the noise filter (NF1) and the relay (RL1 which connect the In-Rush resistor R1.

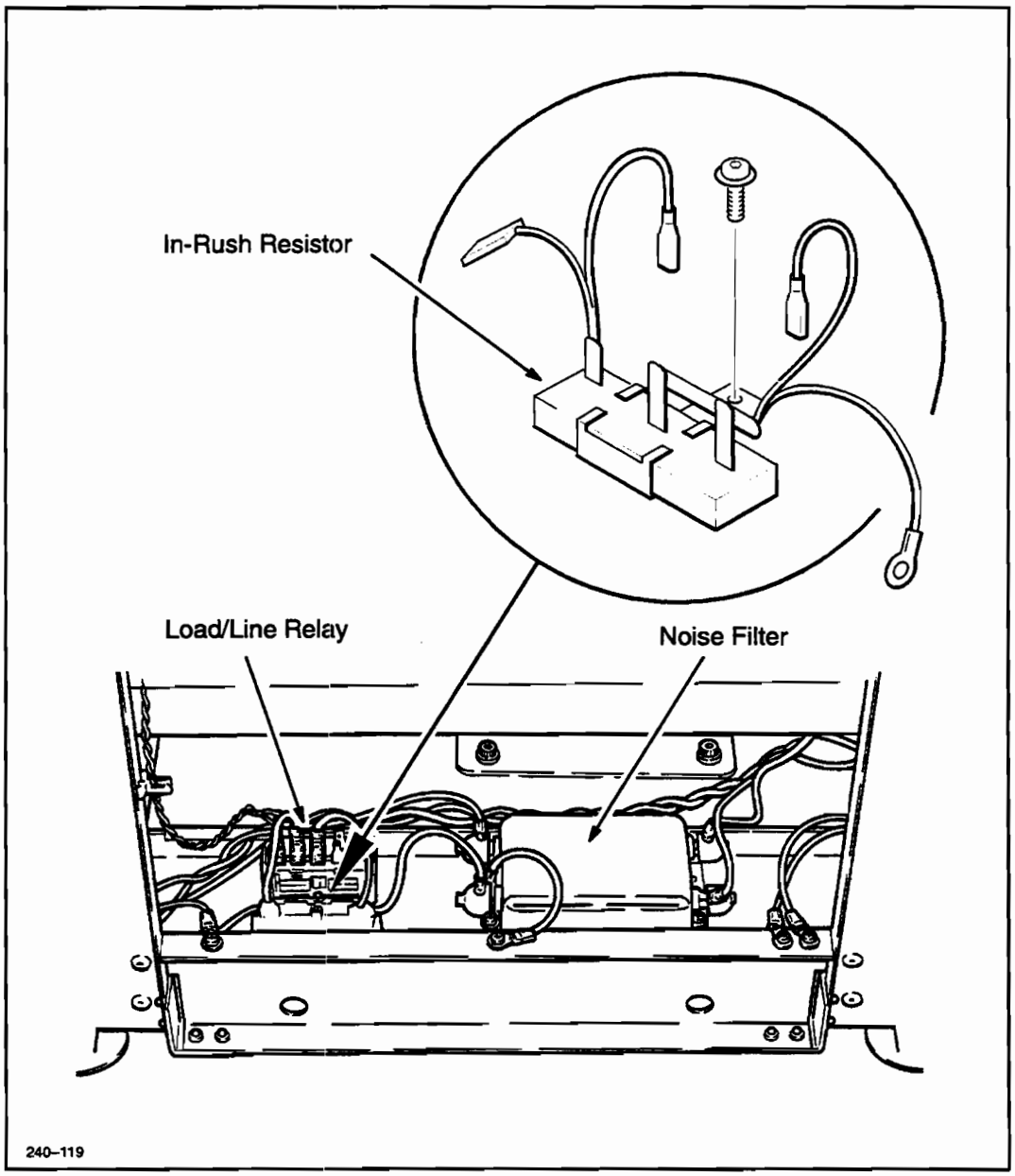

Figure 6-17. In-Rush Resistor Removal (Models 240D/E and 250/255)

4. Using a #1 Phillips screwdriver, remove the In-Rush bracket screw and remove the In-Rush resistor.

5. To replace the In-Rush resistor, reverse this procedure.

6-37. LINE/LOAD RELAY (RL1) (Models 250/255 Only)

6-38. To remove the Line/Load Relay (RL1), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the right- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

3. Note the orientation of the line and load wire connections to the relay. Disconnect the wires from the relay. See Figure 6-18.

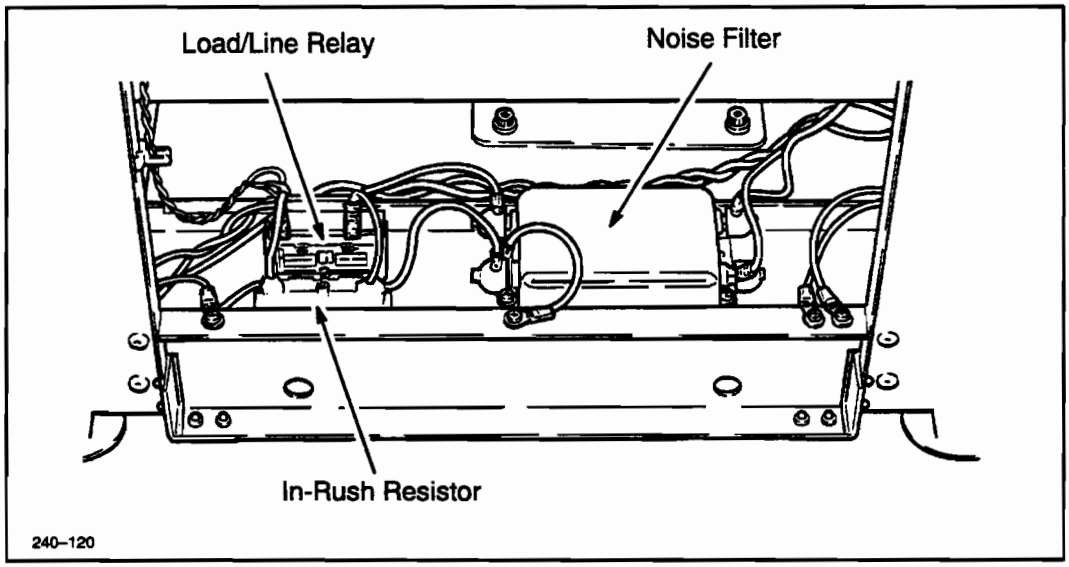

Figure 6-18. Line/Load Relay (RL1) Removal (Models 250/255)

4. Separate the holding tabs from the relay and lift out the relay.

5. To replace the relay, reverse this procedure.

6-39. IN-RUSH RESISTOR (R1) REPLACEMENT (Models 250/255 Only)

6-40. The following procedure outlines the replacement of the In-Rush resistor. If replacement is necessary, consult the troubleshooting section in chapter 8 for causes of R1 failure.

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Remove the right side cover. If necessary refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
3. Referring to Figure 6-17 make note of the wire connections on the In-Rush resistor and then disconnect the wires from the noise filter (NF1) and the relay (R11 which connect the In-Rush resistor.
4. Using a #1 Phillips screwdriver, remove the In-Rush bracket screw and remove the In-Rush resistor.
5. To replace the In-Rush resistor, reverse this procedure.

6-41. NOISE FILTER (NF1) (Models 240D/E and 250/255)

6-42. To remove the noise filter (NF1), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Remove the right- side cover. If necessary, refer to the Left- or Right-Side Cover procedure starting on paragraph 6-15.
3. Pull the four rubber boots off the filter connections.
4. Note the orientation of the wires for reconnection. See Figure 6-19.

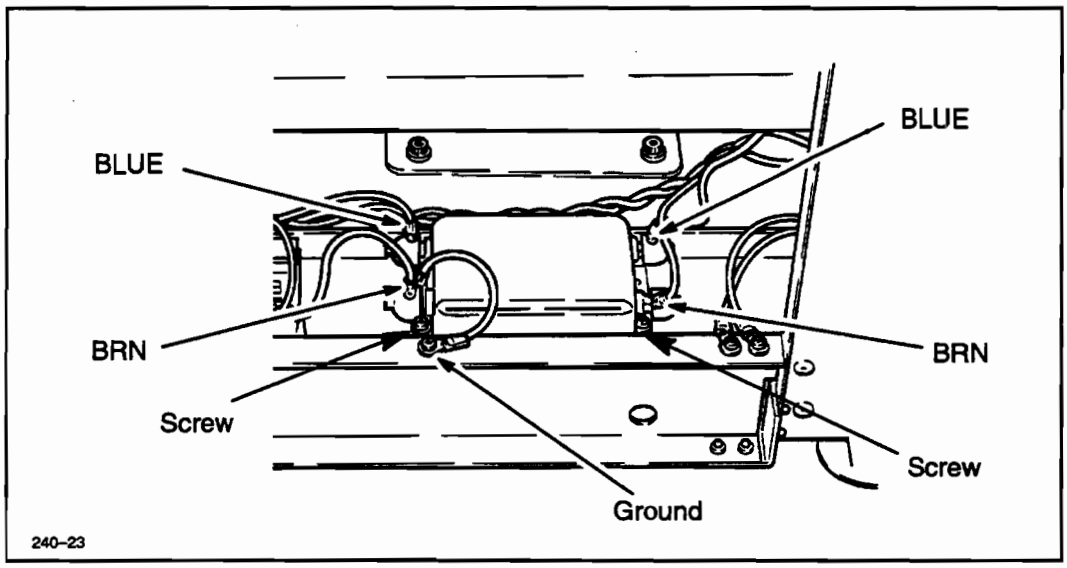

Figure 6-19. Noise Filter (NF1) Removal (Models 240D/E and 250/255)

5. Using a 7 mm open-end wrench, remove the outside nut from each terminal.
6. Pull the wires off the filter terminals.
7. Remove the four noise filter mounting screws at the base. See Figure 6-19.
8. Remove the noise filter.
9. To replace the noise filter, reverse this procedure.

6-43. +5 VOLT POWER SUPPLY (LPS1) REMOVAL (Models 240D/E and 250/255)

6-44. To remove the +5 volt power supply (LPS1), perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.
3. Remove the terminal protective shield on the +5 V supply terminal strip.

NOTE

Note the orientation of the wire connections for reassembly. The wires are connected in order from top to bottom; red, black, green/yellow, brown, and blue.

4. Using a common screwdriver, disconnect the wires from the terminal strip.
5. Using a #2 Phillips screwdriver, remove the +5 V power supply mounting screw. See Figure 6-20.

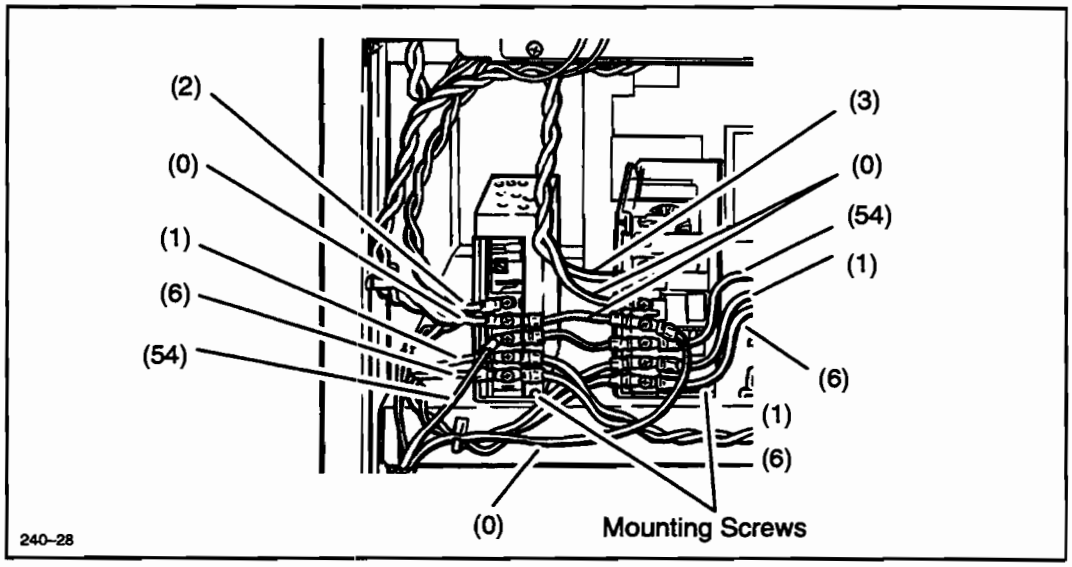

Figure 6-20. LPS1 and LPS2 Removal

NOTE

The front of the power supply is held by a tab. When replacing LPS1, be sure to slide the base underneath the tab.

6. Slide the power supply out from the back of the plotter.

7. To replace the +5 V power supply, reverse this procedure.

6-45. +24 VOLT POWER SUPPLY (LPS2) REMOVAL (Models 240D/E and 250/255)

6-46. To remove the +24 volt power supply (LPS2), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

3. Remove the terminal protective shield on the +24 V supply terminal strip.

NOTE

Note the orientation of the wire connections for reassembly. The wires are connected in order from top to bottom; orange, black, black (2), green/yellow, brown, and blue..

4. Disconnect the wires from the terminal strip. See Figure 6-20.

5. Slide the power supply out from the back of the plotter.

6. To replace the +24 V power supply, reverse this procedure.

6-47. HIGH VOLTAGE POWER SUPPLY (HPS1) REMOVAL (Models 240D/E and 250/255)

6-48. To remove the high voltage power supply (HPS1), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

3. Disconnect PCN1 through PCN6. See Figure 6-21.

4. Remove the terminal protection cover on the terminal strip. Note the orientation of wiring for reassembly (green/yellow on top, brown in the center, and blue on the bottom).

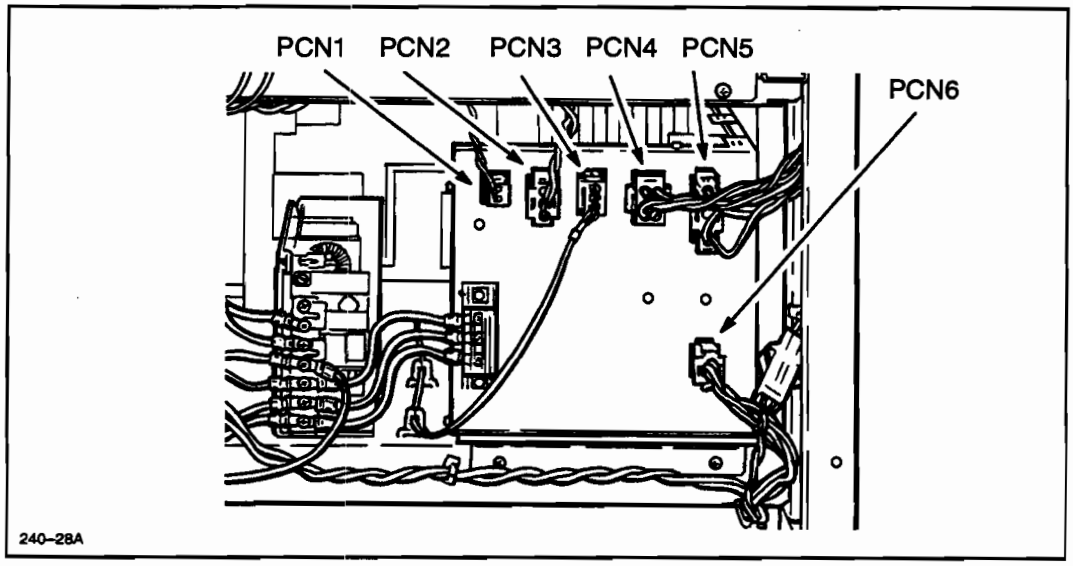

Figure 6-21. HPS1 Removal

5. Using a common screwdriver, remove the three terminal strip wires. See Figure 6-21.

6. Using a #2 Phillips screwdriver, remove the two mounting screws.

NOTE

The front of the power supply is held by two tabs. When replacing HPS1, be sure to slide the base underneath the tabs.

7. Slide the high voltage power supply out from the back of the plotter.

8. To replace the high voltage power supply, reverse this procedure.

6-49. LINE POWER RECEPTACLE ASSEMBLY REMOVAL (Models 240D/E and 250/255)

6-50. To remove the line power receptacle assembly, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

3. Remove the right- side cover. If necessary refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

4. Using a #2 Phillips screwdriver, remove the screw that attaches the line receptacle ground wire to the chassis. See Figure 6-22.

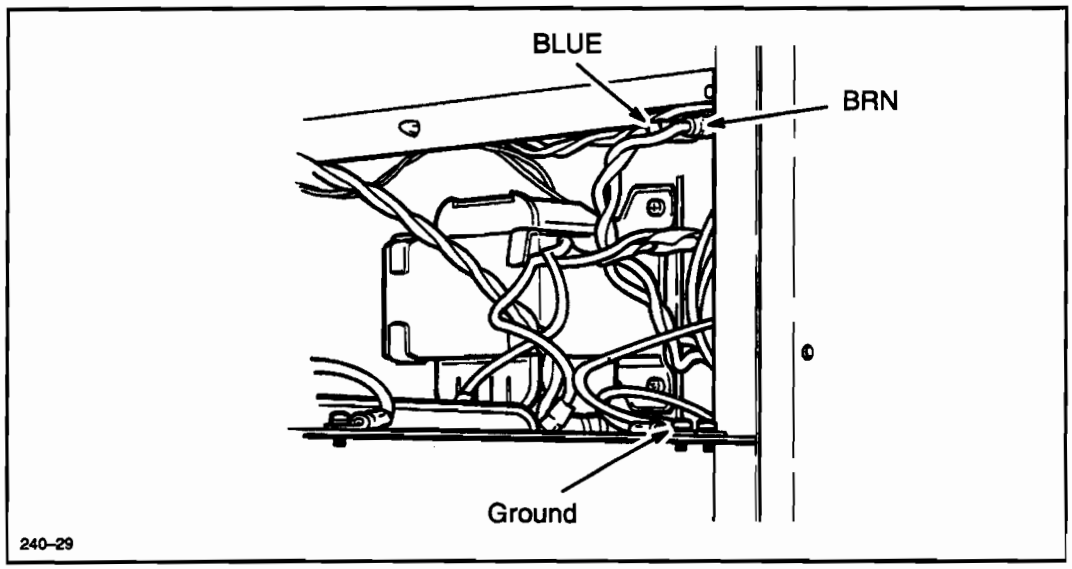

Figure 6-22. Line Receptacle Assembly Removal

5. Reach in and disconnect the two top wires that connect the line receptacle to the main power breaker (left wire is blue, right wire is brown).

6. Using a #1 Phillips screwdriver, remove the two line receptacle mounting screws. See Figure 6-23.

7. To replace the line receptacle, reverse this procedure.

6-51. OPENING THE MAIN POWER PANEL (Models 240D/E and 250/255)

6-52. To open the main power panel, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the center cover. If necessary, refer to the Center Cover Removal procedure in this chapter starting at paragraph 6-19.

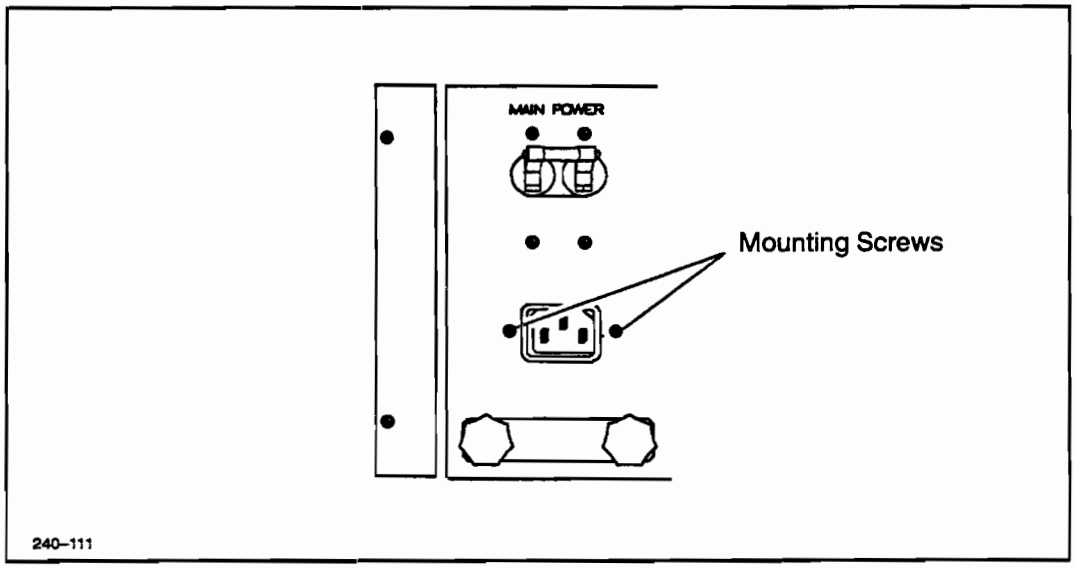

Figure 6-23. Line Receptacle Mounting Screws

3. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

NOTE

Access to some screws will require that the VRC be moved forward 6 to 8 inches. Refer to the VRC Removal procedure to accomplish this task.

4. Slide the VRC toward the front of the plotter.

5. Using a short #2 Phillips screwdriver, remove the outlet ground wire mounting screw. See Figure 6-24.

6. Disconnect the pump transformer (T2) connector. See Figure 6-25.

7. Disconnect PCN6 from the high voltage power supply (HPS1).

8. Using a #1 Phillips screwdriver, remove the four circuit breaker mounting screws and allow the circuit breaker to hang loosely inside the power panel.

9. Using a #1 Phillips screwdriver, remove the two line power receptacle mounting screws and allow the receptacle to hang loosely inside the power panel.

10. Using a #1 Phillips screwdriver, remove the four ac outlet mounting screws. See Figure 6-24.

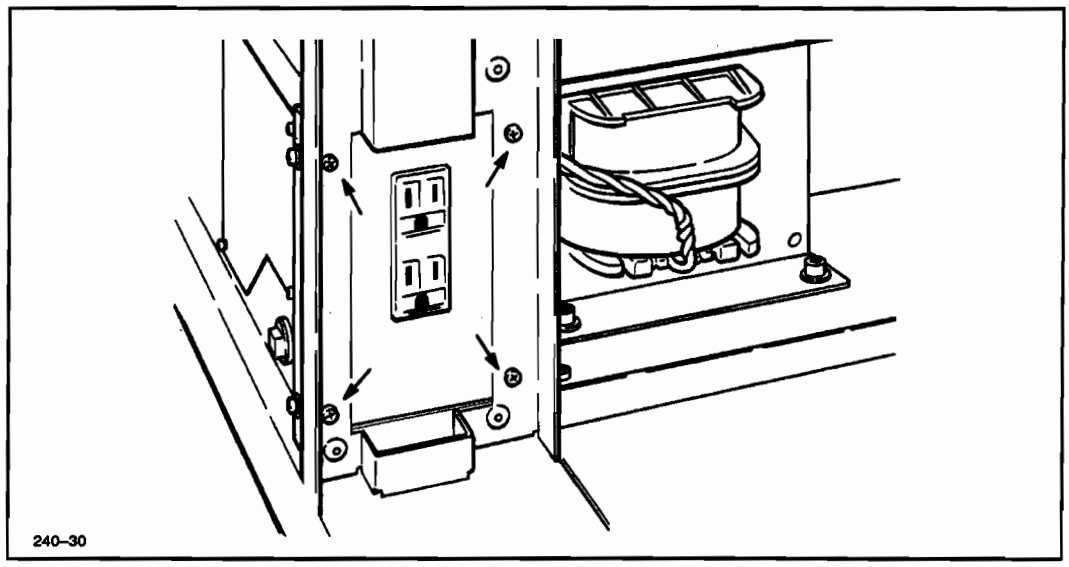

Figure 6-24. Outlet Ground Wire

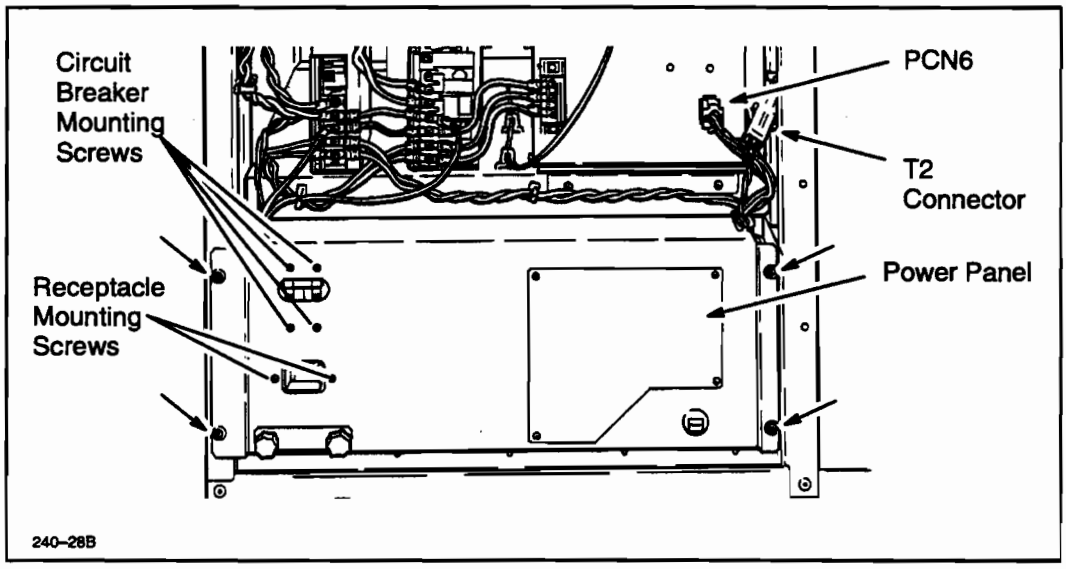

Figure 6-25. Pump Transformer (T2) Connector

11. Using a #2 Phillips screwdriver, remove the two left-side power panel mounting screws. See Figure 6-25.

12. Carefully pull the left side of the power panel out until the left end clears the left corner of the plotter.

13. Slide the power panel to the left until the right end clears the support brace.

14. Carefully lay the power panel face down. See Figure 6-26.

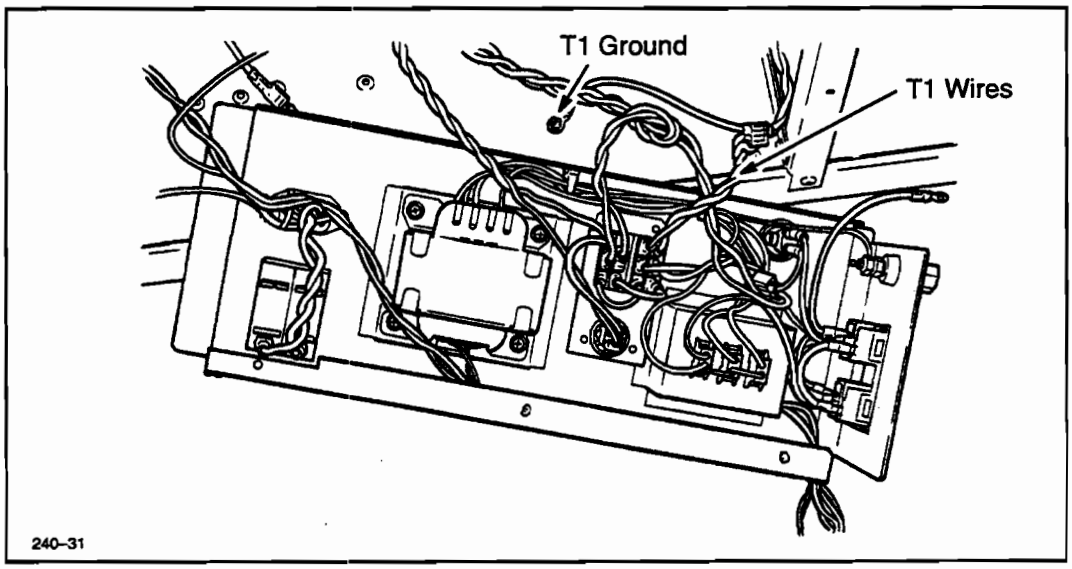

Figure 6-26. Opening the Main Power Panel

15. To install the power panel, reverse this procedure.

6-53. MAIN TRANSFORMER (T1) REMOVAL (Models 240D/E and 250/255)

6-54. To remove the main transformer (T1), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the center cover. If necessary, refer to the Center Cover Removal Procedure in this chapter starting at paragraph 6-19.

3. Remove the left- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

4. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

5. Remove the VRC. If necessary, refer to the VRC Removal procedure in this chapter starting at paragraph 6-156.

6. Open the power panel.

7. Using a #2 Phillips screwdriver, remove the mounting screw that attaches the main transformer ground wire to the chassis. See Figure 6-26.

8. Using a 4 mm Allen wrench, remove the four transformer mounting screws. See Figure 6-27.

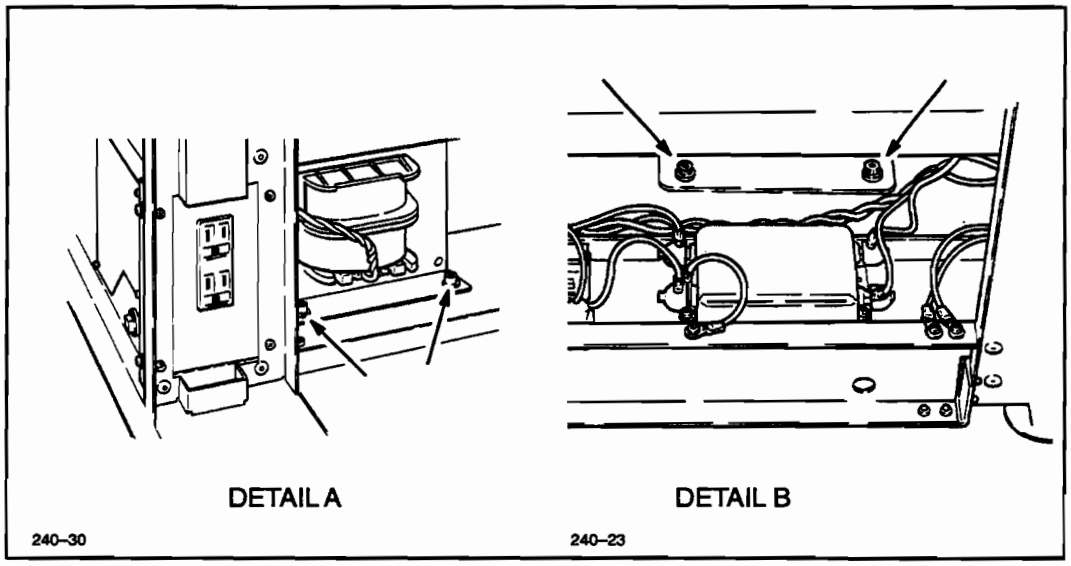

Figure 6-27. Main Transformer (T1) Mounting Screws

WARNING

The transformer is very heavy and could cause back strain or other personal injury. Use proper lifting techniques when removing.

9. Slide the transformer out from the rear of the plotter and place it next to the power panel. See Figure 6-28.

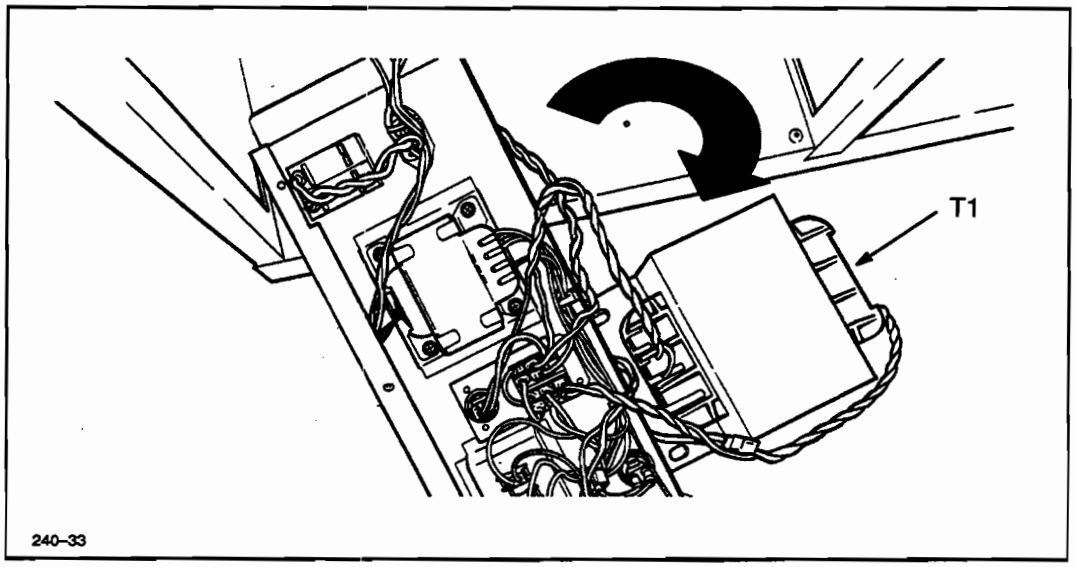

Figure 6-28. Main Transformer (T1) Removal

NOTE

When replacing the transformer, remove and replace the wiring on a one-for-one basis.

10. Disconnect the transformer wires from the power panel. See Figure 6-26.

11. To replace the main transformer, reverse this procedure.

6-55. PUMP TRANSFORMER (T2) REMOVAL (Models 240D/E and 250/255)

6-56. To remove the pump transformer (T2), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Open the power panel. If necessary refer to the procedures in this chapter.

NOTE

When replacing the transformer, remove and replace the wiring on a one-for-one basis.

3. Disconnect the transformer wiring. See Figure 6-29.

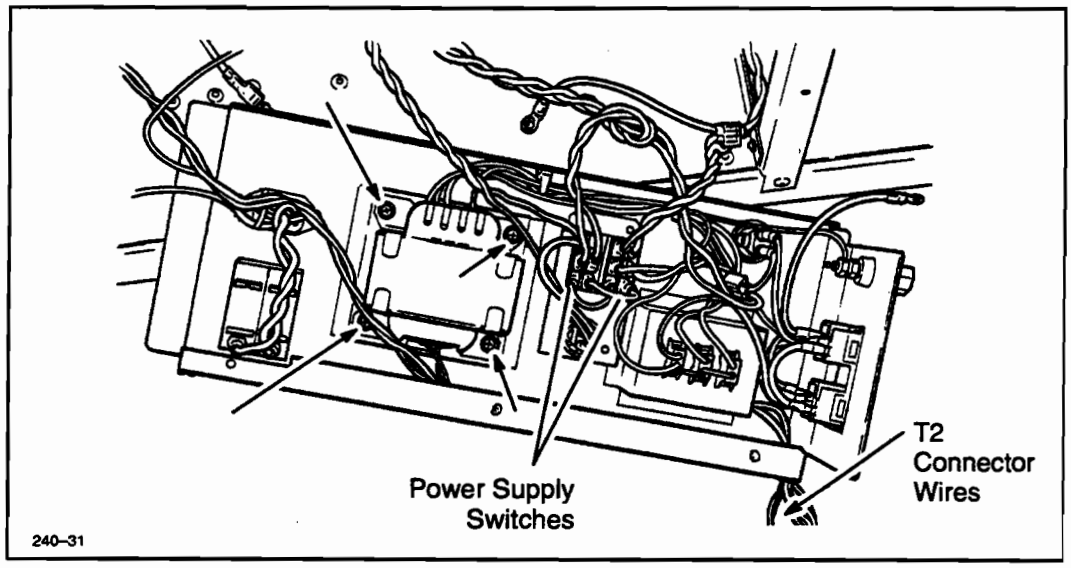

Figure 6-29. Pump Transformer and Power Supply Switches

4. Using a #2 Phillips screwdriver, remove the four pump transformer mounting screws.

5. Remove the transformer.

6. To replace the transformer, reverse this procedure.

6-57. POWER SUPPLY SWITCHES (PSW3, PSW4) REMOVAL (Models 240D/E and 250/255)

6-58. To remove Power Supply Switches (PSW3, PSW4), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Open the power panel. If necessary refer to the procedures in this chapter.

3. Disconnect the wiring from the selected power supply switch. See Figure 6-29.

4. Using a #1 Phillips screwdriver, remove the four controller panel mounting screws. See Figure 6-30.

5. Press the side tabs in and push the switch through the mounting plate.

6. To replace the switches, reverse this procedure.

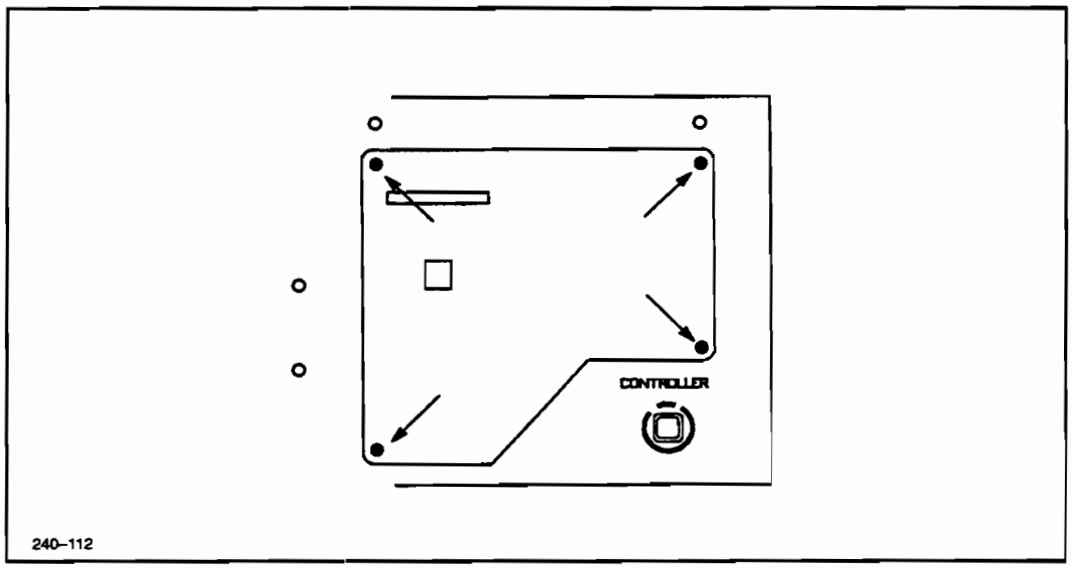

Figure 6-30. Controller Panel Mounting Screws

6-59. CIRCUIT BREAKERS (CB2, CB3) REMOVAL (Models 240D/E and 250/255)

6-60. To remove one or both of the circuit breakers, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

NOTE

If replacing CB3, remove the four controller panel mounting screws. See Figure 6-30.

2. Open the main power panel. If necessary refer to the procedure for opening the main power panel in this chapter starting at paragraph 6-51.

NOTE

If replacing CB3, remove the four mounting plate screws. See Figure 6-31.

3. Disconnect the wiring from the selected circuit breaker. See Figure 6-31.
4. Using needle-nose pliers, remove the circuit breaker securing ring.
5. Push the circuit breaker through the front of the main power panel (mount plate if CB3) and remove.

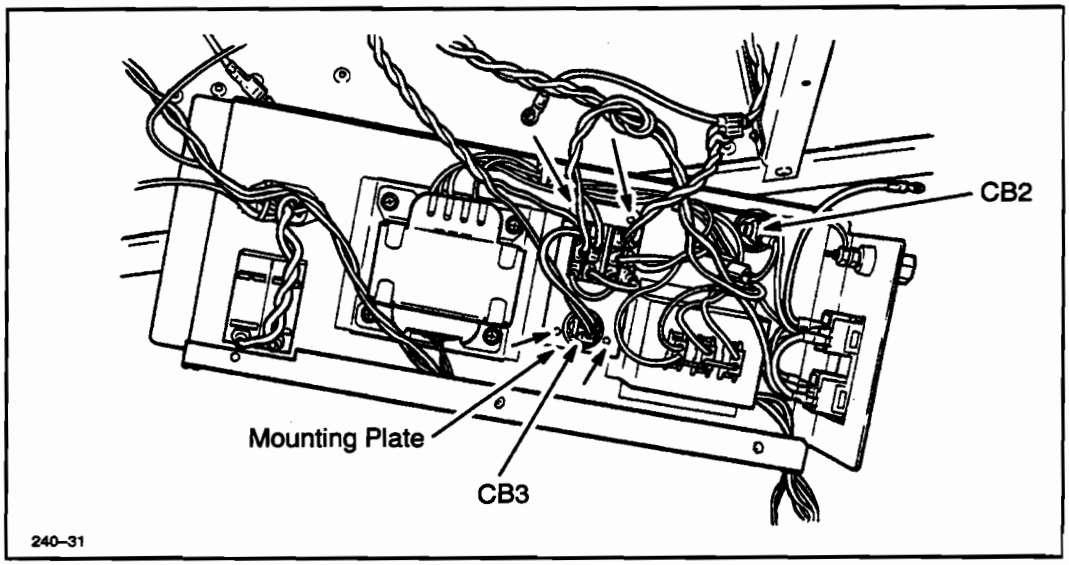

Figure 6-31. CB2 and CB3 Removal

6. To replace the circuit breakers, reverse this procedure.

6-61. AC OUTLET REMOVAL (Models 240D/E and 250/255)

6-62. To remove the ac outlet, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Open the main power panel. If necessary refer to the procedure for opening the main power panel in this chapter starting at paragraph 6-51.
3. Disconnect the ac outlet ground wire. See Figure 6-24.
4. Disconnect the outlet wiring from CB2 and PSW4. See Figure 6-32.
5. Press the side tab in and push the ac outlet through the mounting plate and remove.
6. To replace the ac outlet, reverse this procedure.

6-63. FAN 5 REMOVAL (Models 240D/E and 250/255)

6-64. To remove Fan 5, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

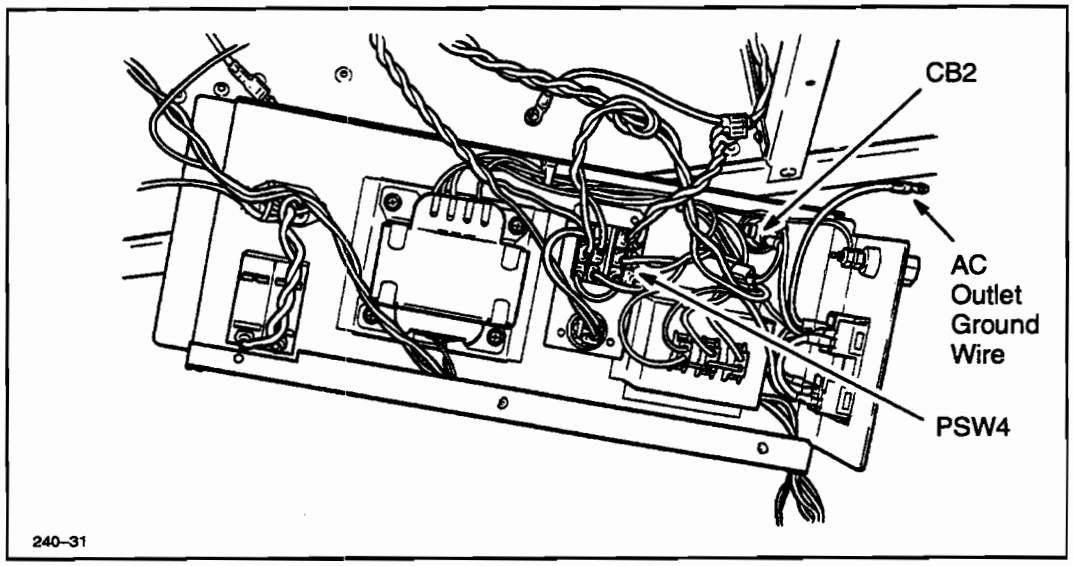

Figure 6-32. AC Outlet Removal

2. Remove the right- side cover. If necessary refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

3. Disconnect the fan wires at Connector 7. See.Figure 6-33.

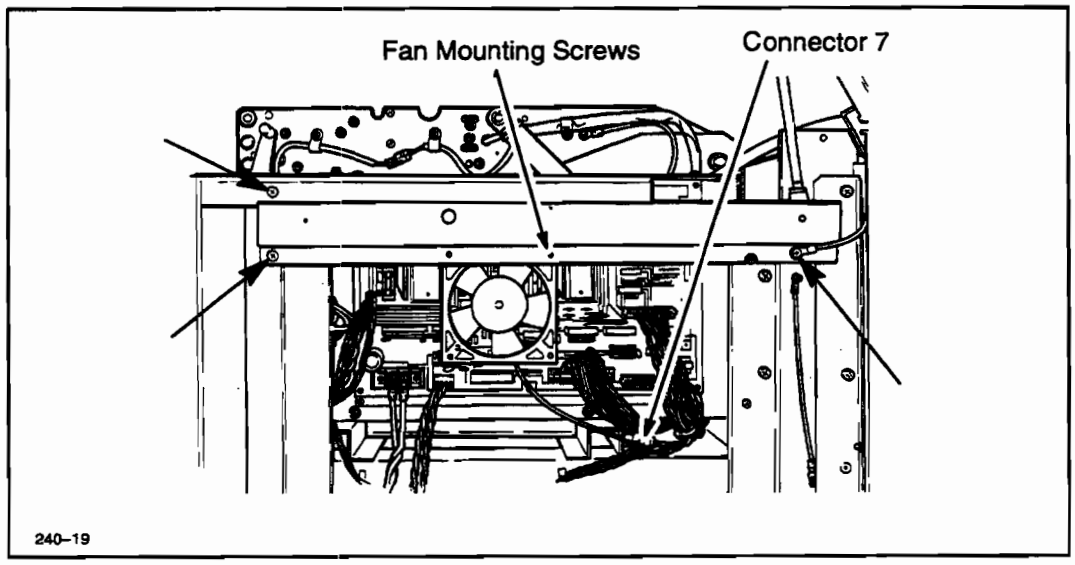

Figure 6-33. Fan 5 Removal

4. Using a #2 Phillips screwdriver, remove the three right-side support bar mounting screws and remove the bar.

5. Remove the two fan mounting screws from the support bar.

6. To replace Fan 5, reverse this procedure.

6-65. MECHANICAL COMPONENT DRIVER (MCD) PCA REMOVAL (Models 240D/E and 250/255)

6-66. To remove the Mechanical Component Driver (MCD) PCA, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Raise the top cover to its fully opened position.

3. Remove the right- side cover. If necessary refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

4. Disconnect Fan 5 wires at Connector 7. See Figure 6-33.

5. Using a #2 Phillips screwdriver, remove the three right-side support bar mounting screws and remove the bar.

6. Remove MCD PCA connectors MCCN1, MCCN2, MCCN3, MCCN8, and MCCN9. See Figure 6-34. On Models 250/255 connectors MCCN5 and MCCN7 must also be removed.

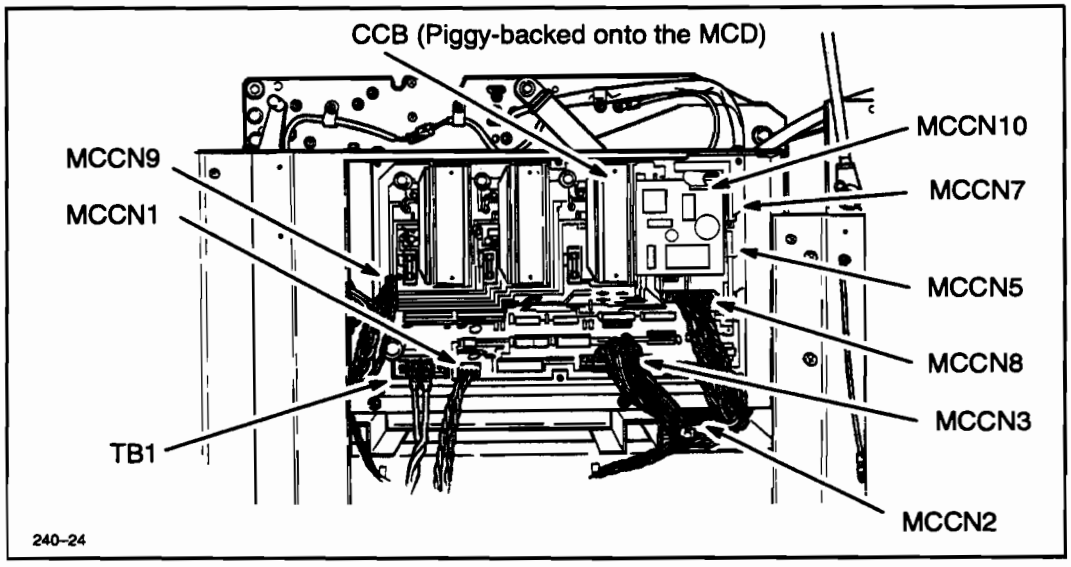

Figure 6-34. MCD PCA Removal

7. To replace the MCD PCA, reverse this procedure.

6-67. MCD PCA FUSE REMOVAL (Models 240D/E and 250/255)

6-68. To remove the MCD fuses, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Remove the right- side cover. If necessary refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
4. Disconnect Fan 5 wires at Connector 7. See Figure 6-33.
5. Using a fuse puller, remove the selected fuse.
6. To replace, reverse this procedure.

6-69. CUTTER CONTROL PCA (CCB) REMOVAL (Models 250/255 Only)

6-70. To remove the Cutter Control (CCB) PCA, perform the following procedure:

1. Follow the procedure for removing the MCD PCA as outlined in paragraph 6-65. .
2. Once the MCD PCA is removed, disconnect connector MCCN10.
3. Using a pair of needle nose pliers, pinch the ends of the plastic standoffs securing the PCA and remove it from the MCD PCA.
4. To replace the CCB PCA, align the standoffs with the PCA and press the PCA down until the standoffs snap into place.
5. Reconnect connector MCCN10.

6-71. PIN ELECTRODE (PED) PCA AND CONTROL ELECTRODE (CED) PCA REMOVAL

6-72. To remove the pin electrode PCAs and control electrode PCAs, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.

3. Remove the center cover. If necessary, refer to the Center Cover Removal Procedure in this chapter starting at paragraph 6-19.

4. Remove the front PCA shield. If necessary refer to the Front PCA Shield Removal Procedure in this chapter starting at paragraph 6-23.

5. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

6. Remove the rear PCA shield. If necessary refer to the Rear PCA Shield Removal Procedure in this chapter starting at paragraph 6-25.

NOTE

The HP Models 240E and 255 have two identical Pin Electrode PCAs located in PCA positions 2 and 3 as viewed from left to right. There are two identical Control Electrode PCAs in PCA positions 1 and 4 in all the 240D/E and 250/255 models. The HP Models 240 and 250 have only one (1) Pin Electrode PCA. The removal procedure for either the CED or PED PCA is identical. The only difference is the reference designation of the connectors (CDCN vs. PDCN).

7. Reach through the front opening and disconnect PDCN4 and PDCN5 at the front edge of the selected PCA. See Figure 6-35.

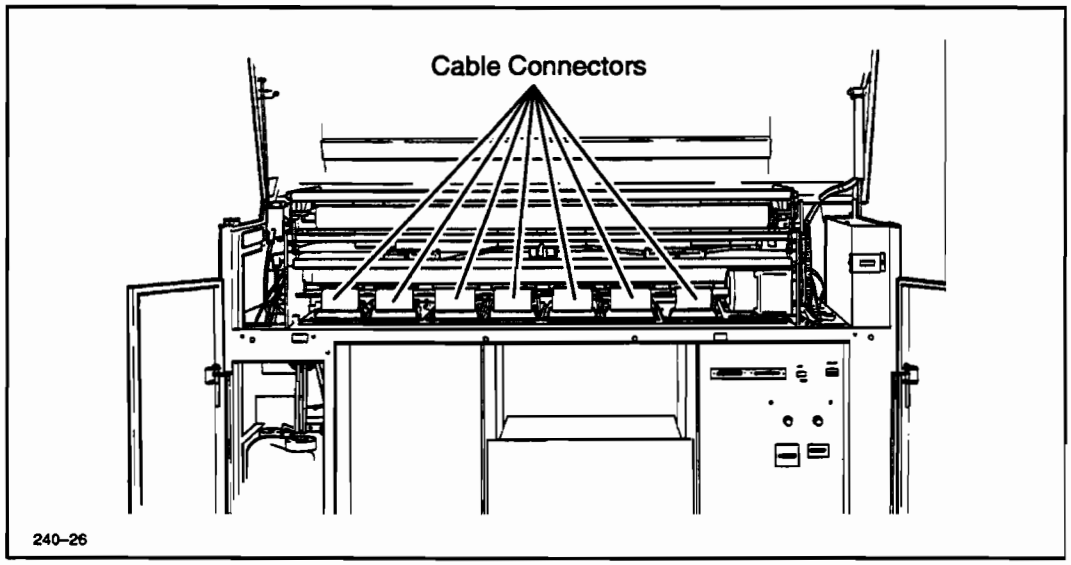

Figure 6-35. PED and CED PCA Front Connectors

8. Reach through the rear PCA shield opening and disconnect PDCN1, PDCN2, and PDCN3 of the selected PCA. See Figure 6-36.

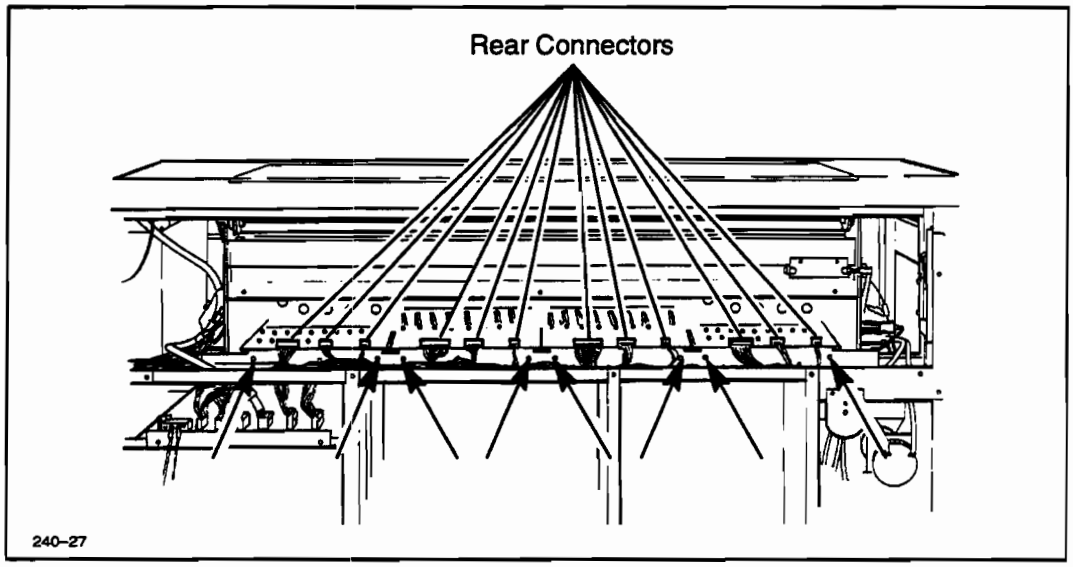

Figure 6-36. PED and CED PCA Rear Connectors

9. Using a #2 Phillips screwdriver, remove the two PCA mounting screws. See Figure 6-36.

10. Carefully lift up on the bracket and pull the bracket with PCA straight out of the back of the plotter.

11. Repeat steps 7. through 10. for each PCA to be removed.

12. To replace the PCAs, reverse this procedure.

6-73. RECORDING AND MECHANICAL CONTROL (RMC) PCA REMOVAL

6-74. To remove the Recording and Mechanical Control (RMC) PCA, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

3. Remove the wires connected to TB1 (red from +5 V, black from SG). See Figure 6-37.

4. Remove all cable connectors.

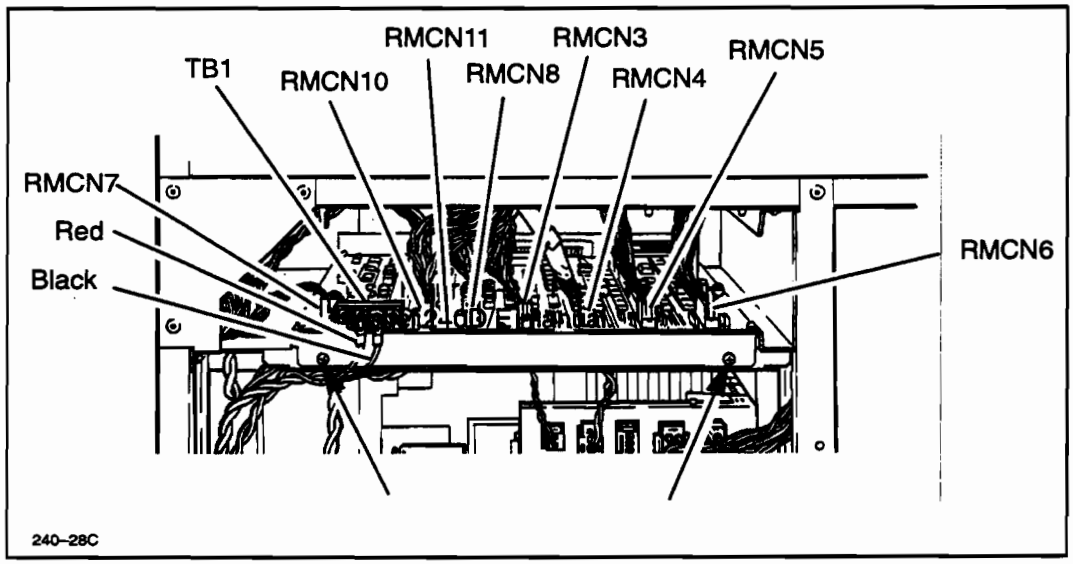

Figure 6-37. RMC PCA Removal

5. Using a #2 Phillips screwdriver, remove the two PCA mounting screws. See Figure 6-37.

6. Slide the PCA out of the back of the plotter.

7. Before installing the PCA, ensure that the two switch units on the PCA are properly set. See Figure 6-38 for Models 240D/E only).

8. To replace the RMC PCA, reverse this procedure.

6-75. RMC PCA REPLACEMENT (Models 250/255 Only)

1. Before installing the PCA ensure that DSW1 segment 5 is ON (down) for either plotter.

2. For the E/A0 plotter Model 255, all other switch segments are in the OFF (up) position. See Figure 6-39.

3. For the D/A1 plotter Model 250, also set DSW1 segment 8 to the ON (down) position. See Figure 6-39.

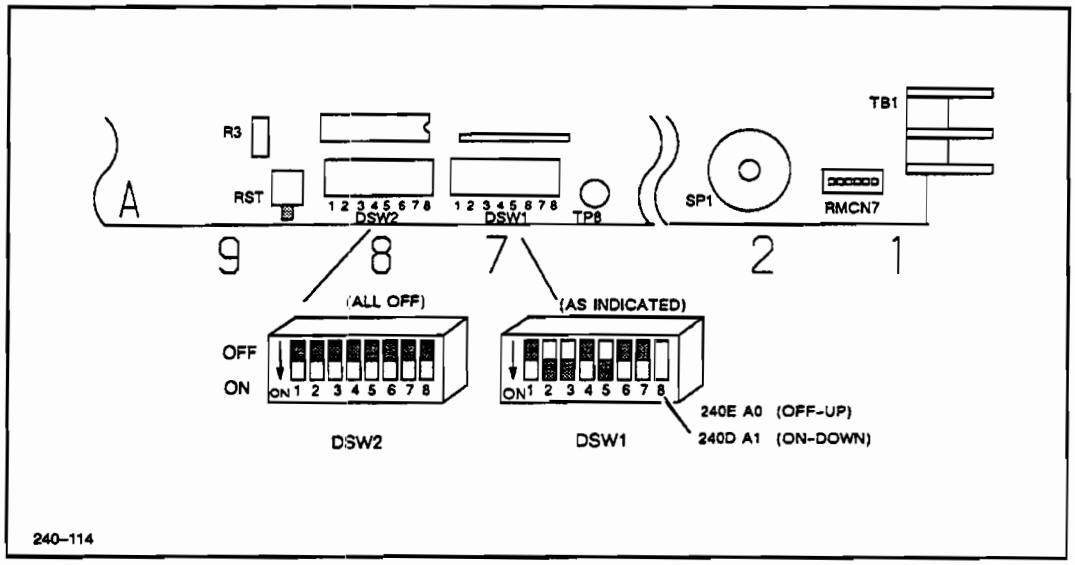

Figure 6-38. RMC PCA Switches (Models 240D/E Only)

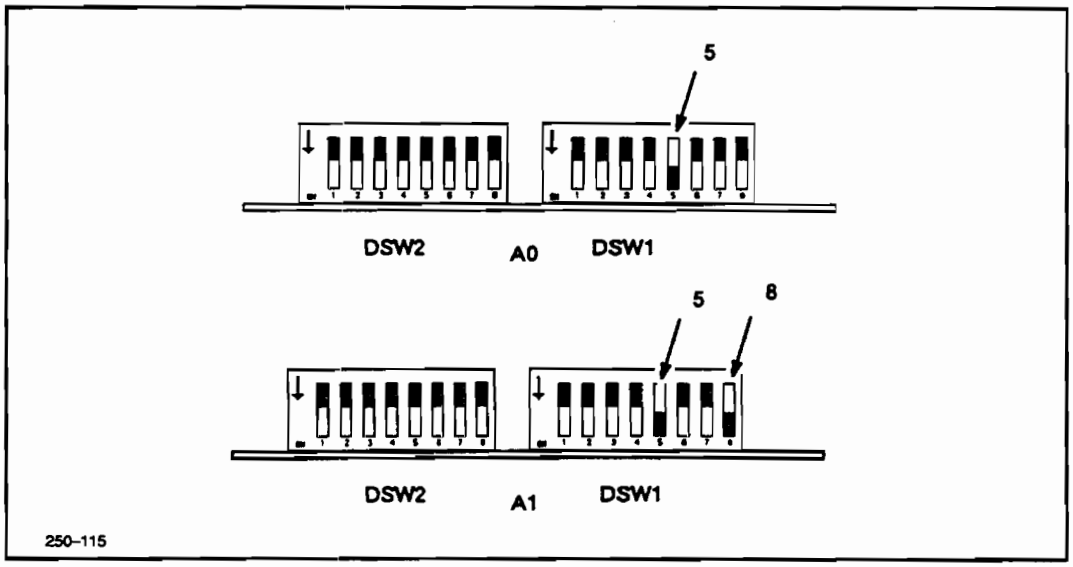

Figure 6-39. RMC PCA Switch Positions

6-76. WRITING HEAD ASSEMBLY

6-77. To remove the writing head assembly, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.
4. Pull the upper carriage release lever and allow the upper carriage to raise to the full upright position.
5. Cut the media along the start of the roll and remove the excess. Exercise care not to drag the media from the developer area back across the writing head.
6. Remove the front PCA Shield. If necessary, refer to the Front PCA Shield removal procedure starting on paragraph 6-23.
7. Reach through the shield opening to access the writing head cable connectors and remove the connectors from the PED PCAs and CED PCAs. See Figure 6-40.
8. Using a 3 mm hex wrench, remove the two screws that mount the center head bracket to the writing head. See Figure 6-41.

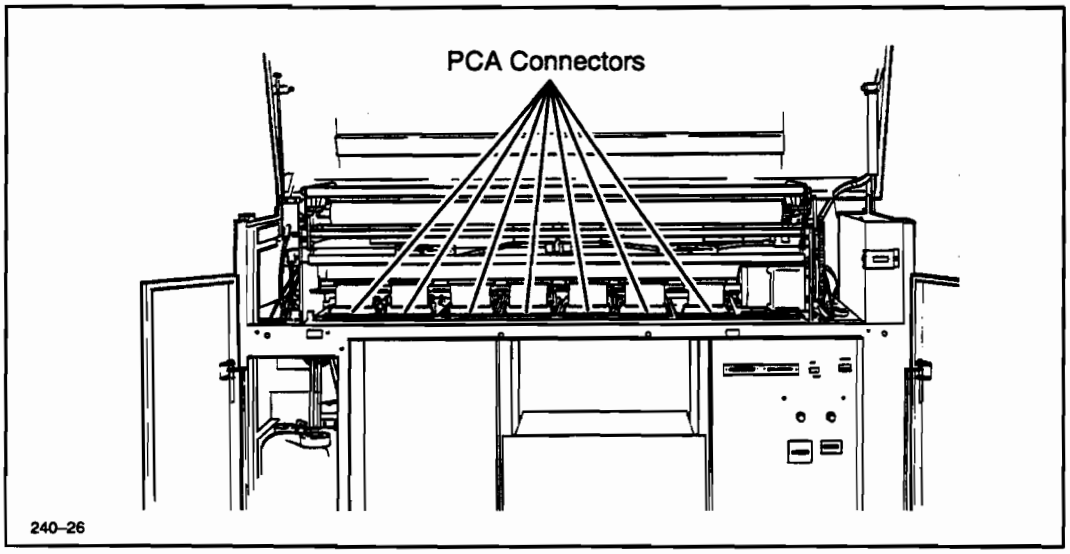

Figure 6-40. Writing Head Connectors

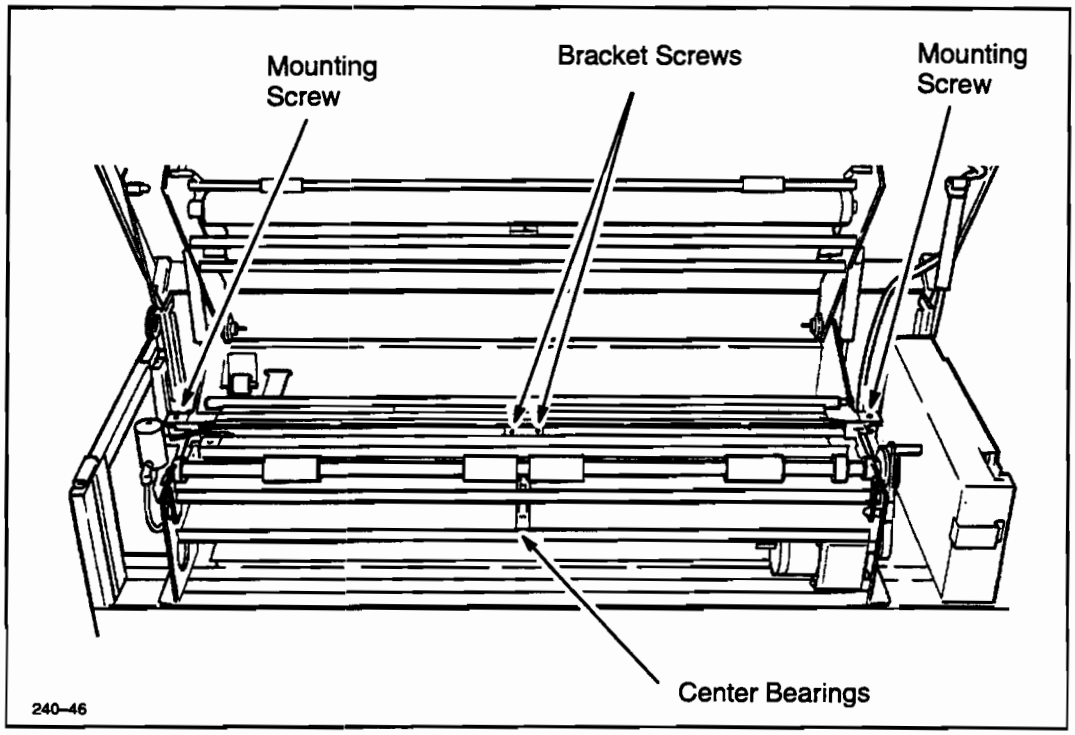

Figure 6-41. Writing Head Removal

9. Using a #2 Phillips screwdriver, remove the writing head mounting screw located at each end of the writing head.

10. Grasp the ends of the writing head and carefully lift the head assembly up and out of the plotter.

11. Remove the cables from the writing head assembly.

NOTE

When replacing the writing head, perform the writing head adjustment procedure given in Chapter 7.

12. To replace the writing head assembly, reverse this procedure.

6-78. MEDIA SWITCH REMOVAL (Models 240D/E and 250/255)

6-79. To remove the media switch, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Open the test panel door.
3. Remove the right- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
4. Disconnect the two media control wires. See Figure 6-42.

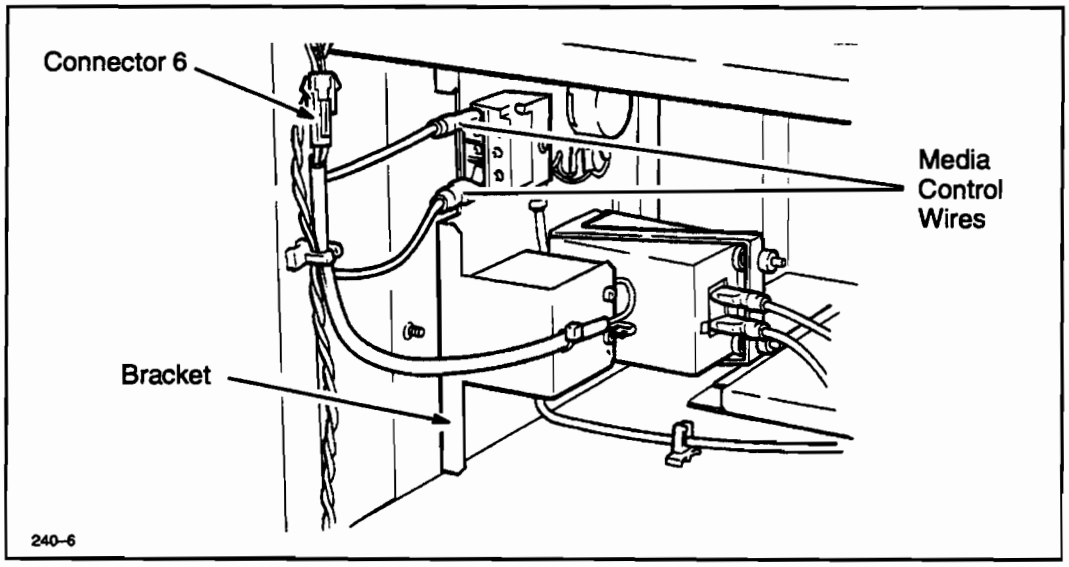

Figure 6-42. Media Switch Removal

5. Using a #1 Phillips screwdriver, remove the four meter bracket mounting screws. See Figure 6-43.
6. Remove the bracket and controls from the test panel.
7. Using a small common screwdriver, loosen the media control knob set screw and slide the knob off the control.
8. Using a 14 mm open-end wrench, remove the control locking nut and washer. See Figure 6-43.
9. Remove the media switch from the bracket.
10. To replace the media switch, reverse this procedure.

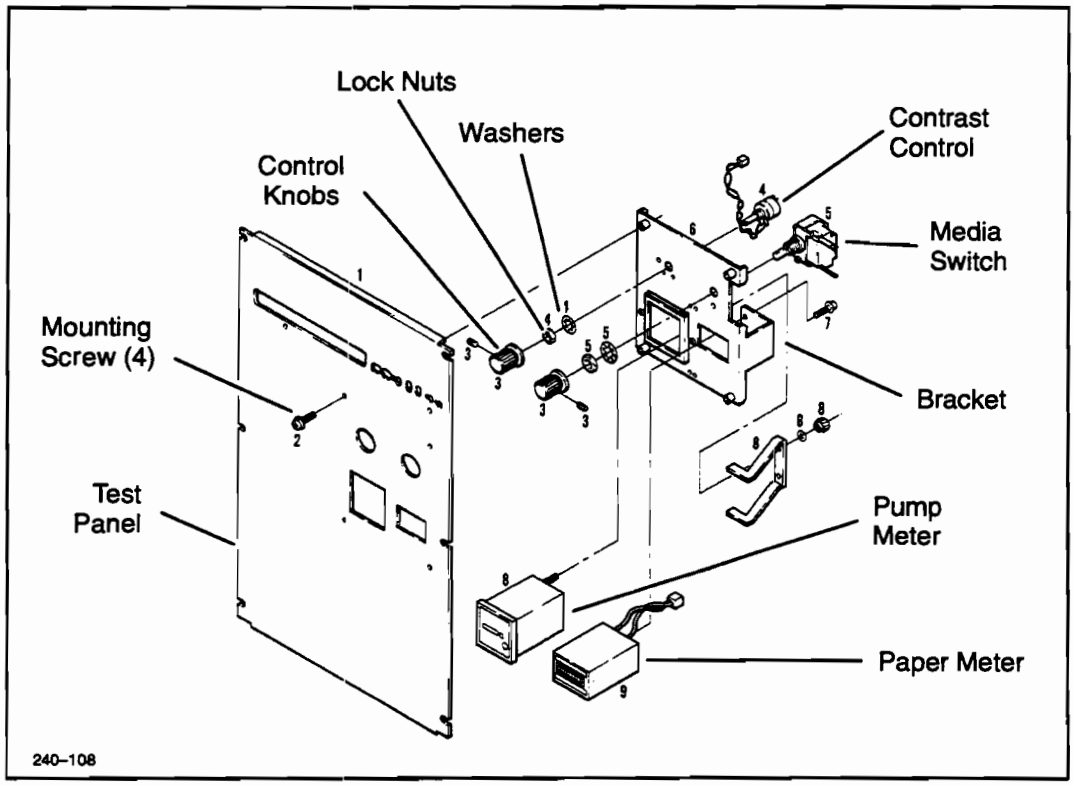

Figure 6-43. Test Panel Assembly

6-80. MEDIA CONTROL ASSEMBLY REMOVAL (Models 240D/E and 250/255)

6-81. To remove the media control assembly, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Open the test panel door.
3. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.
4. Remove the right-side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
5. Disconnect the wires from the paper meter at Connector 6 and from the pump meter and media switch. See Figure 6-42.

6. Disconnect the contrast control wires at PCN3 on the high voltage power supply. See Figure 6-44.

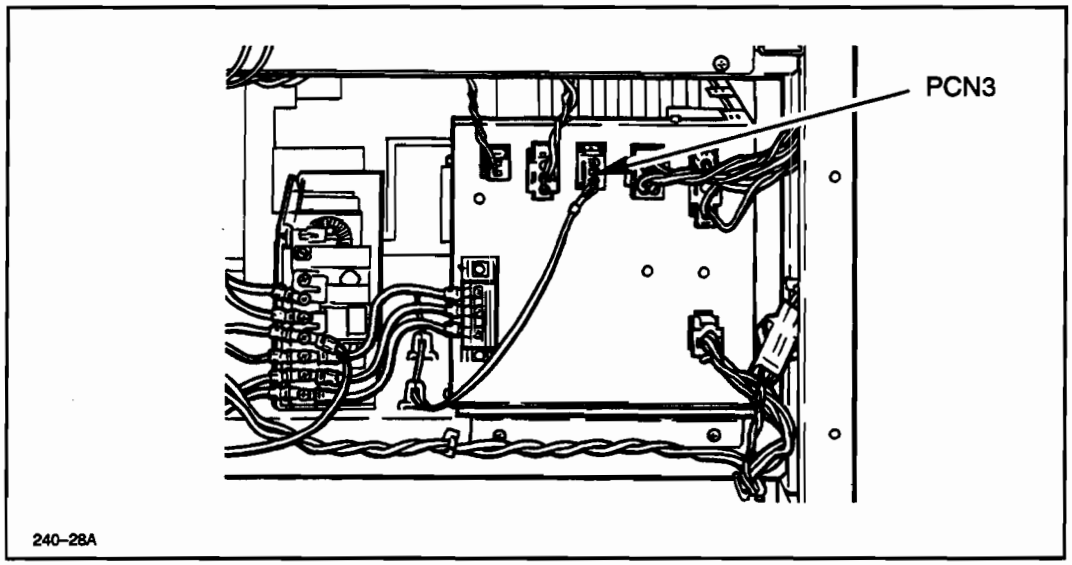

Figure 6-44. PCN3 Location

7. Using a #1 Phillips screwdriver, remove the four meter bracket mounting screws. See Figure 6-43.

NOTE

Once the media control assembly is removed, the contrast control, pump meter, paper meter, and media control can be removed individually.

8. To replace the media control assembly, reverse this procedure.

6-82. CONTRAST CONTROL REMOVAL (Models 240D/E and 250/255)

6-83. To remove the contrast control, perform the media control assembly removal procedure given in paragraph 6-80.

6-84. PAPER METER REMOVAL (Models 240D/E and 250/255)

6-85. To remove the paper meter, perform the media control assembly removal procedure given in paragraph 6-80.

6-86. PUMP METER REMOVAL (Models 240D/E and 250/255)

6-87. To remove the pump meter, perform the media control assembly removal procedure given in paragraph 6-80.

6-88. LEFT SIDE FAN (FAN 1) REMOVAL (Models 240D/E and 250/255)

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Remove the left- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
3. Disconnect the fan wires at the connector (J7). See Figure 6-45.

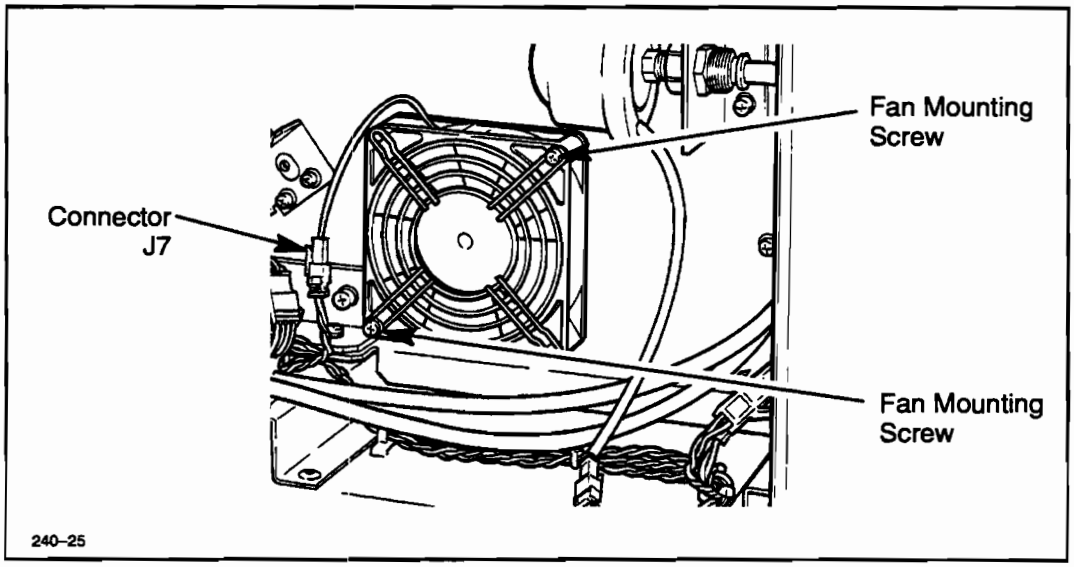

Figure 6-45. Fan 1 Removal

4. Using a #2 Phillips screwdriver, remove the two fan mounting screws and remove the fan.
5. To replace Fan 1, reverse this procedure.

6-89. RIGHT SIDE FAN (FAN 2) REMOVAL (Models 240D/E and 250/255)

6-90. To remove the right side fan (Fan 2), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Disconnect the fan wires at the connector. See Figure 6-46.

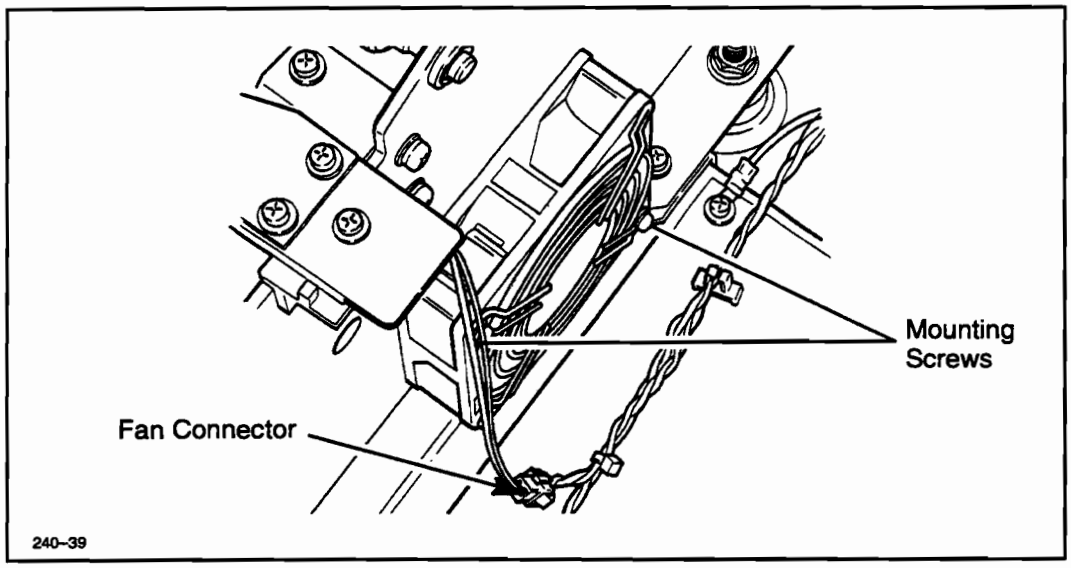

Figure 6-46. Fan 2 Removal

4. Using an offset Phillips screwdriver, remove the two fan mounting screws.
5. Remove the fan.
6. To replace Fan 2, reverse this procedure.

6-91. MEDIA DRYING FANS (FANS 3 AND 4) REMOVAL

6-92. To remove either media drying fan (fan 3 or 4), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.

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

4. Disconnect the appropriate fan wires from the harness connector.

5. Using a #2 Phillips screwdriver, remove the 2 fan mounting screws and lift out the fan.

6. To replace the fan, reverse this procedure.

6-93. PUMP ASSEMBLY REMOVAL (Models 240D/E and 250/255)

6-94. To remove the pump assembly, perform the following procedure:

NOTE

During pump assembly removal, be careful to use paper towels or a cloth to prevent toner from spilling when disconnecting the toner tubes.

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.

2. Remove the left- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

3. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

4. Disconnect the pump transformer (T2) connector. See Figure 6-47.

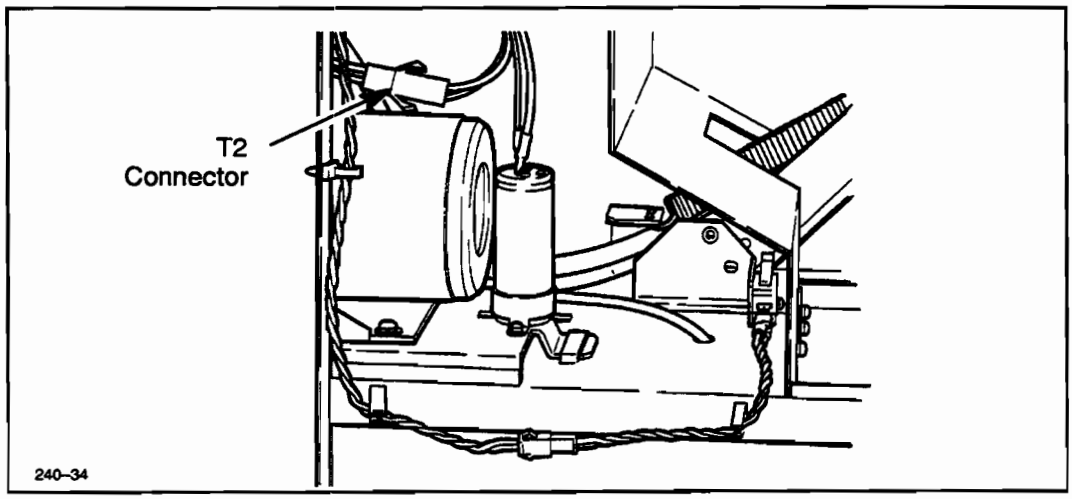

Figure 6-47. Pump Transformer Connector

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C [100 °F]). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

CAUTION

Environmental Hazard

United States of America only

The toner solution is a petroleum distillate (oil based) product. As with most petroleum products, EPA (Environmental Protection Agency) regulations prohibit the disposal of toner using normal waste disposal methods. Contact your local health department, EPA, or regulatory agency for information and/or instructions for disposing of spent toner. Regulations in your state may vary.

Other countries

The toner solution is a petroleum distillate (oil based) product which may require special disposal methods in your country. Since the methods of disposal may vary between countries, consult your local regulatory and/or health agencies for the proper disposal methods in your area.

CAUTION

Before opening the top frame release the pinch rollers. Do not allow the media to lift from the developer unit.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.

5. Remove the pump toner tubes by simultaneously pressing down the red locking tabs while pulling on the tubes. See Figure 6-48.

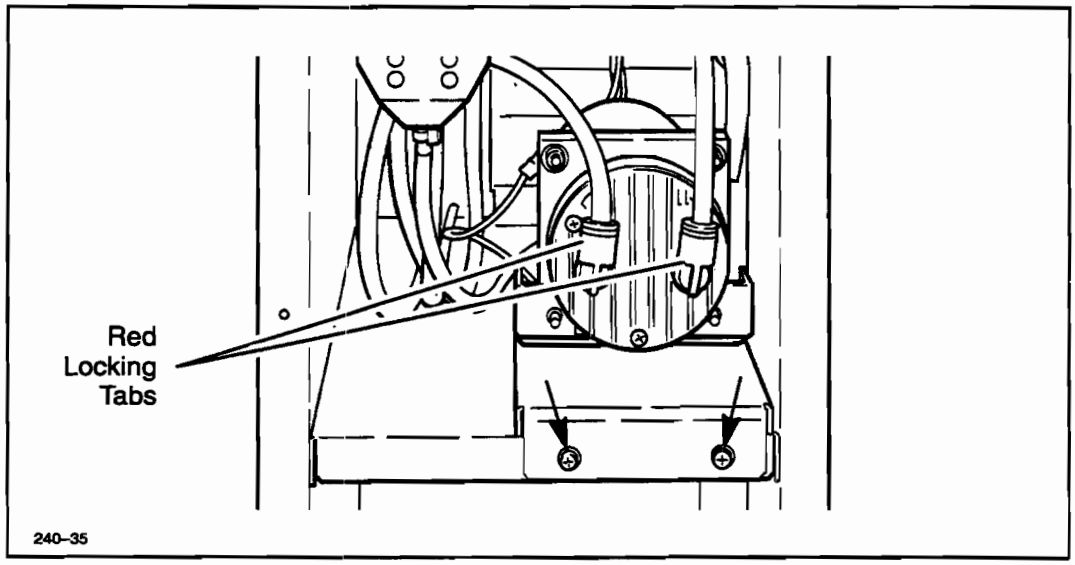

Figure 6-48. Toner Tube Removal

6. Using a #2 Phillips screwdriver, remove the two pump assembly mounting screws shown in Figure 6-48.

7. Slide the pump assembly out from the back of the plotter.

8. To replace the pump assembly, reverse this procedure.

6-95. VENT REMOVAL (Models 240D/E and 250/255)

6-96. To remove the vent, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the rear cover. If necessary, refer to the Rear Cover Removal procedure in this chapter starting at paragraph 6-13.

3. Using a #2 phillips screwdriver, remove the vent mounting screw. See Figure 6-49.

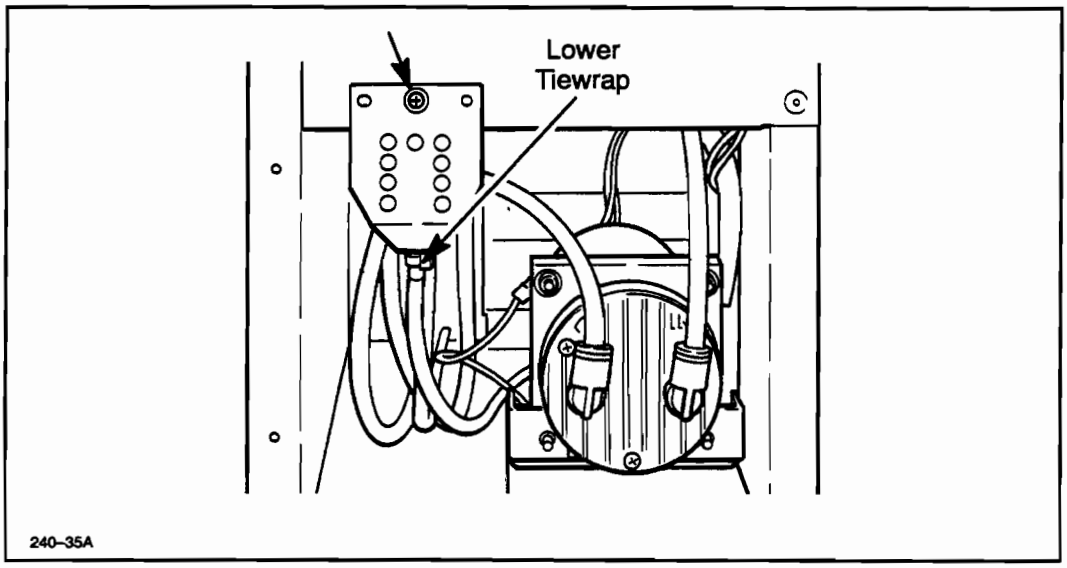

Figure 6-49. Vent Removal

4. Remove the tie wrap from the lower vent tube and disconnect the tube.

5. To replace the vent, reverse this procedure.

6-97. OUT-OF-TONER SWITCH (SSW3) REMOVAL (Models 240D/E and 250/255)

6-98. To remove the out-of-toner switch (SSW3), perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the left- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

3. Open the toner door.

4. Using a #2 Phillips screwdriver, remove the pump motor guard plate mounting screws. See Figure 6-50.

5. Using a #1 Phillips screwdriver, remove the switch mounting screw and remove the switch.

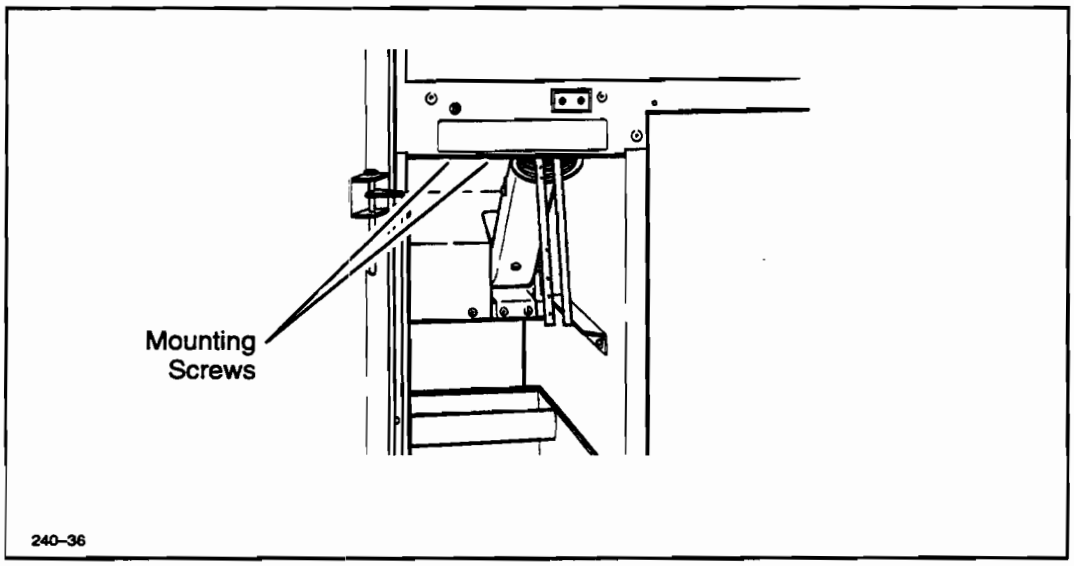

Figure 6-50. Guard Plate Mounting Screws

6. To replace the switch, reverse this procedure.

6-99. SYPHON ASSEMBLY REMOVAL (Models 240D/E and 250/255)

6-100. To remove the syphon assembly, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Remove the left- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
3. Open the toner door.

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C [100 °F]). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

CAUTION

Environmental Hazard

United States of America only

The toner solution is a petroleum distillate (oil based) product. As with most petroleum products, EPA (Environmental Protection Agency) regulations prohibit the disposal of toner using normal waste disposal methods. Contact your local health department, EPA, or regulatory agency for information and/or instructions for disposing of spent toner. Regulations in your state may vary.

Other countries

The toner solution is a petroleum distillate (oil based) product which may require special disposal methods in your country. Since the methods of disposal may vary between countries, consult your local regulatory and/or health agencies for the proper disposal methods in your area.

CAUTION

Toner solution contains isoparaffinic petroleum solvent (flammable liquid). Special disposal methods must be used for spent toner. Consult state or local authorities for the approved waste disposal method.

Dispose of spent toner according to Federal, State, and Local Regulations..

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

CAUTION

Before opening the top frame release the pinch rollers. Do not allow the media to lift from the developer unit.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.

4. Unscrew the syphon assembly cap and allow the assembly to rise to the full upright position. Gently tap the toner tubes to drain any residual toner. See Figure 6-51.

5. Unscrew the slide bracket screw and carefully slide the toner drawer out. See Figure 6-52.

6. Cap the toner bottle and remove the bottle from the drawer. Place an absorbent towel in the drawer to soak up any residual toner.

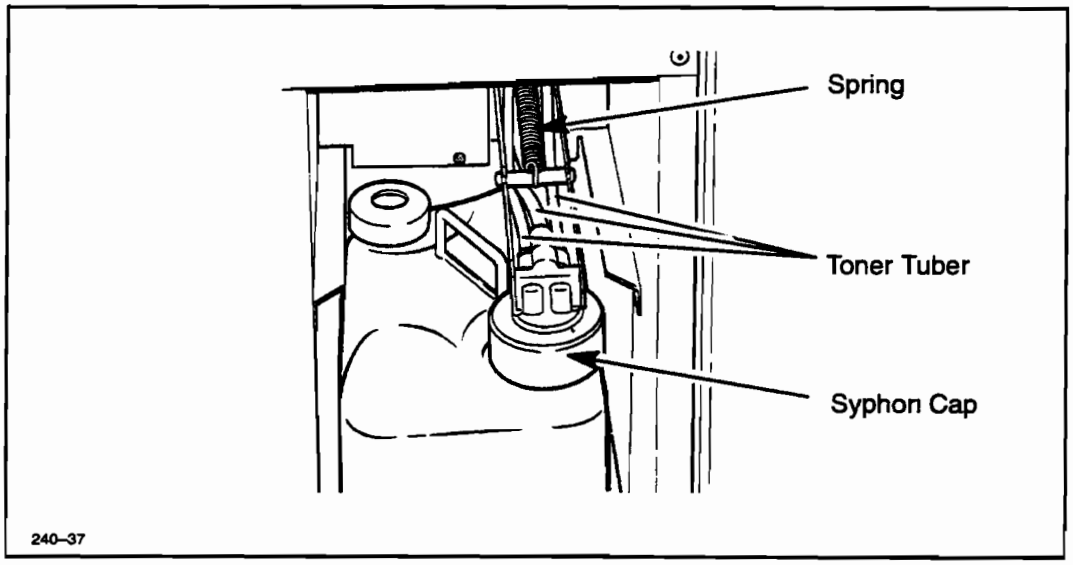

Figure 6-51. Syphon Assembly

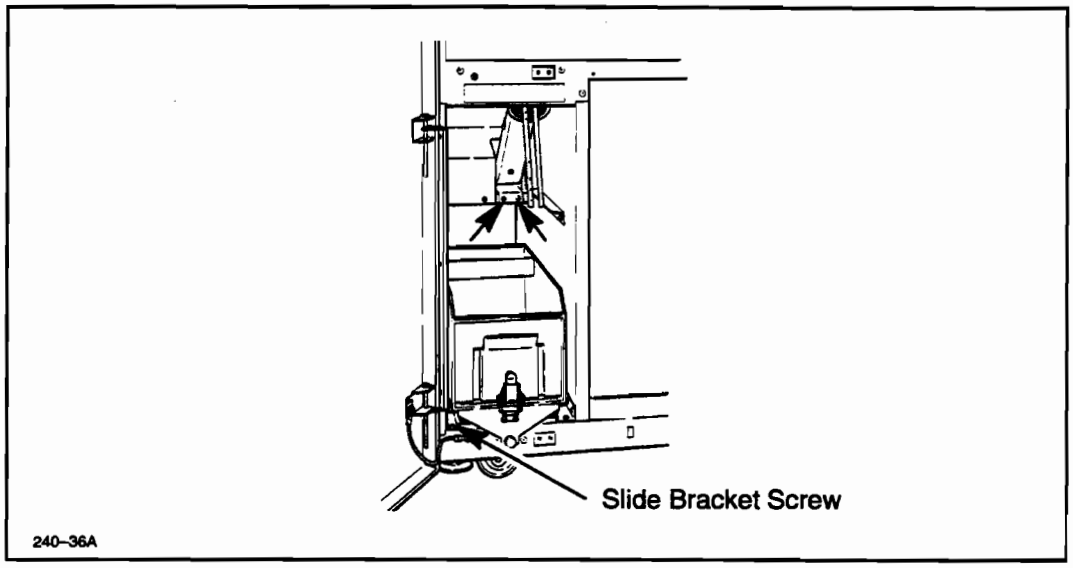

Figure 6-52. Syphon Assembly Mounting Screws

7. Using a #2 Phillips screwdriver, remove the pump motor guard plate mounting screws. See Figure 6-50.

8. Disconnect SSW3 at Connector 14, and release the wires from the cable clamp. See Figure 6-53.

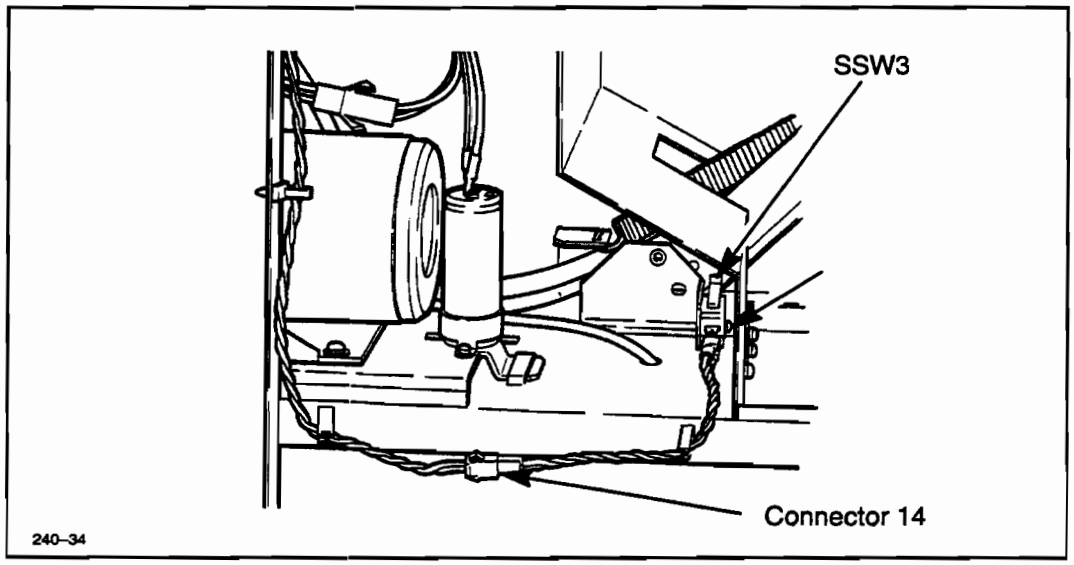

Figure 6-53. SSW3 Removal

9. With the syphon assembly in its upright position, use needle-nose pliers to release the spring from the rear of the syphon bracket. See Figure 6-51.

10. Using a #2 Phillips screwdriver, remove the two mounting screws. See Figure 6-52.

11. Slide the syphon assembly out the left side of the plotter.

12. Using a #2 Phillips screwdriver, remove the two screws that mount the syphon assembly to its bracket. See Figure 6-51.

13. Release the toner tubes from their fittings (mark the tubes for reassembly).

14. To replace the syphon assembly, reverse this procedure.

6-101. TONER DRAWER AND SLIDE BRACKET REMOVAL (Models 240D/E and 250/255)

6-102. To remove the Toner Drawer and Slide Bracket, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C [100 °F]). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

CAUTION

Environmental Hazard

United States of America only

The toner solution is a petroleum distillate (oil based) product. As with most petroleum products, EPA (Environmental Protection Agency) regulations prohibit the disposal of toner using normal waste disposal methods. Contact your local health department, EPA, or regulatory agency for information and/or instructions for disposing of spent toner. Regulations in your state may vary.

Other countries

The toner solution is a petroleum distillate (oil based) product which may require special disposal methods in your country. Since the methods of disposal may vary between countries, consult your local regulatory and/or health agencies for the proper disposal methods in your area.

CAUTION

Toner solution contains isoparaffinic petroleum solvent (flammable liquid). Special disposal methods must be used for spent toner. Consult state or local authorities for the approved waste disposal method.

Dispose of spent toner according to Federal, State, and Local Regulations..

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

CAUTION

Before opening the top frame release the pinch rollers. Do not allow the media to lift from the developer unit.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. Open the toner door.

3. Unscrew the syphon assembly cap and allow the assembly to rise to the full upright position. Gently tap the toner tubes to drain any residual toner. See Figure 6-54.

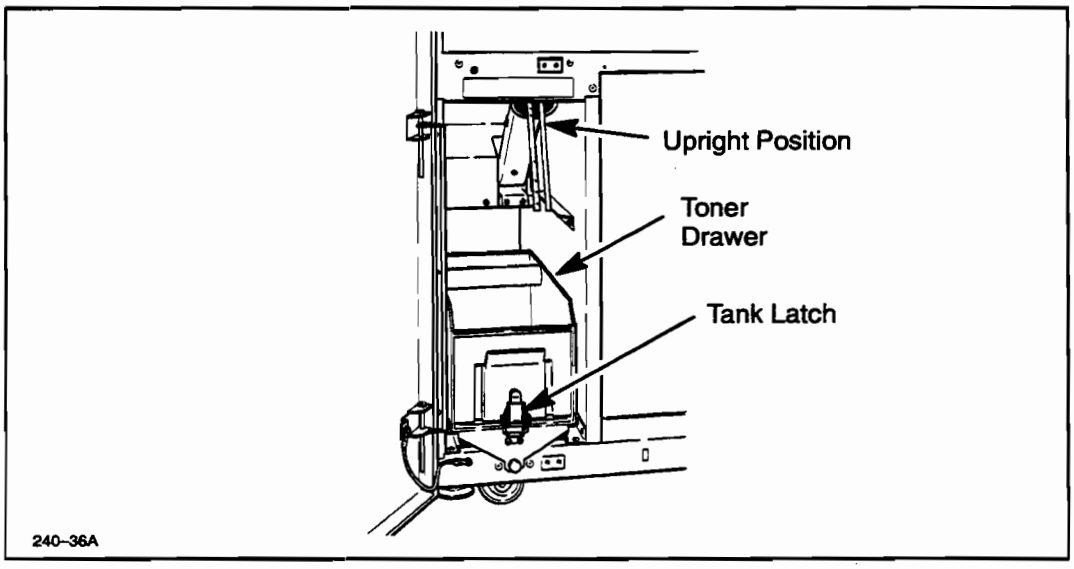

Figure 6-54. Toner Drawer Removal

4. Unscrew the slide bracket and slowly slide the drawer out so that the toner does not spill. See Figure 6-52.

5. Cap the toner bottle and remove the bottle from the drawer.

6. Unlatch the toner drawer and remove the drawer from the slide bracket. See Figure 6-54.

7. Remove the four slide bracket mounting screws and remove the slide bracket. See Figure 6-55.

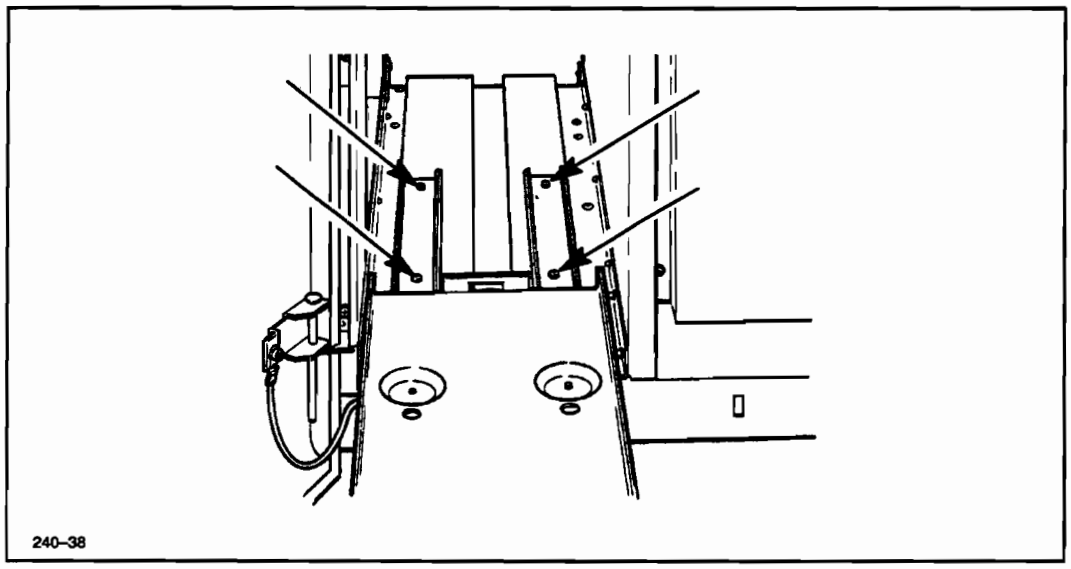

Figure 6-55. Slide Bracket Removal

8. To replace the toner drawer and slide bracket, reverse this procedure.

6-103. DEVELOPER BAR REMOVAL (Models 240D/E and 250/255)

6-104. To remove the Developer Bar, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Raise the top cover to its fully opened position.

3. Raise the feed roller shaft and carefully pull the medium free from the upper carriage.

4. Pull the upper carriage release lever and allow the upper carriage to rise to the full upright position.

5. Cut the medium along the start of the roll and remove the excess. Exercise care not to drag the medium from the developer area back across the writing head.

6. Using a #2 Phillips screwdriver, remove the screw that holds the ground wire to the right end of the developer. See Figure 6-56.

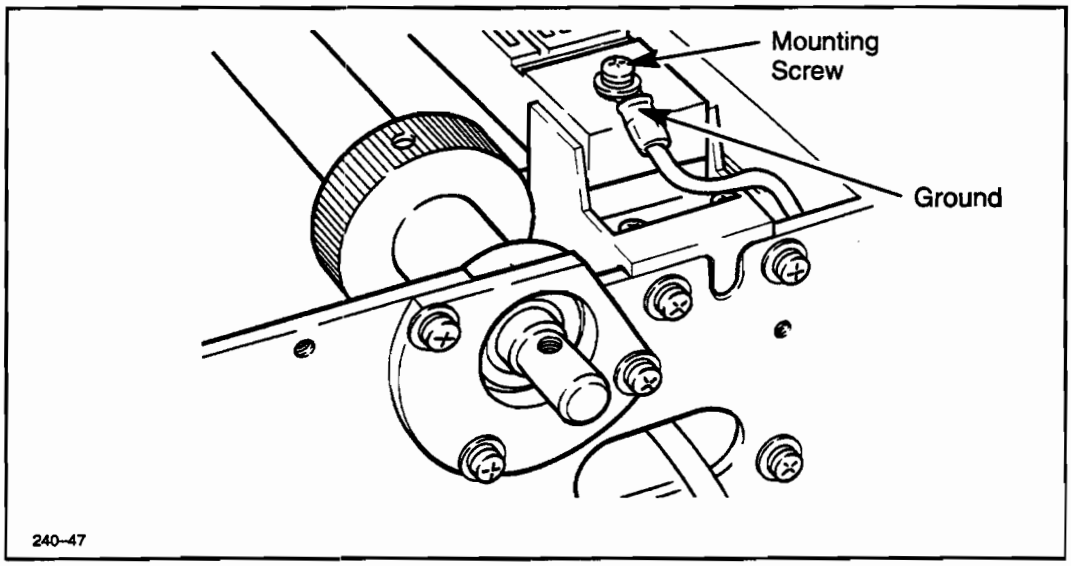

Figure 6-56. Developer Bar Removal

WARNING

The toner products (pre-mixed and clear dispersant) and vapors are combustible (flash point = 38 °C [100 °F]). 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 glasses of water. DO NOT INDUCE VOMITING. Seek medical assistance immediately.**

CAUTION

Environmental Hazard

United States of America only

The toner solution is a petroleum distillate (oil based) product. As with most petroleum products, EPA (Environmental Protection Agency) regulations prohibit the disposal of toner using normal waste disposal methods. Contact your local health department, EPA, or regulatory agency for information and/or instructions for disposing of spent toner. Regulations in your state may vary.

Other countries

The toner solution is a petroleum distillate (oil based) product which may require special disposal methods in your country. Since the methods of disposal may vary between countries, consult your local regulatory and/or health agencies for the proper disposal methods in your area.

CAUTION

Toner solution contains isoparaffinic petroleum solvent (flammable liquid). Special disposal methods must be used for spent toner. Consult state or local authorities for the approved waste disposal method.

Dispose of spent toner according to Federal, State, and Local Regulations..

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

CAUTION

Before opening the top frame release the pinch rollers. Do not allow the media to lift from the developer unit.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.

7. Remove the toner fill tube at the back of the left end of the developer bar. See Figure 6-57.

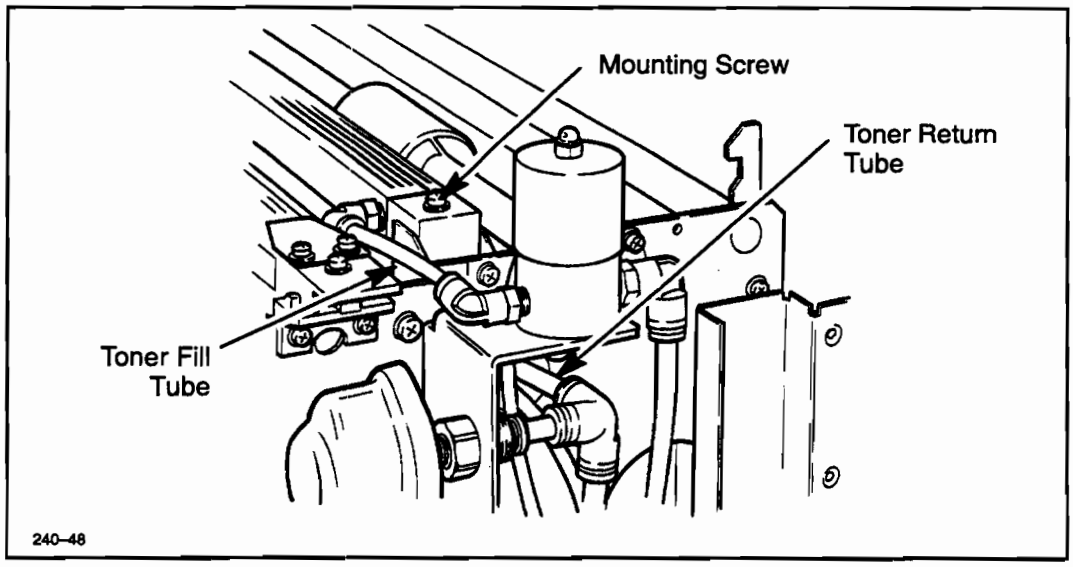

Figure 6-57. Tube Fittings and Screws

8. Remove the toner return tube that connects the developer bar to the three-way tube fitting.

9. Using a #2 Phillips screwdriver, remove the two developer bar mounting screws located at each end of the developer bar.

10. Lift the developer bar up and out of the plotter. Note the isolator pad that is placed between the developer bar and the developer support bar. Do not remove the isolator pad unless it is damaged and being replaced.

11. To replace the developer bar, reverse this procedure.

6-105. SOLENOID VALVE (SV1) REMOVAL (Models 240D/E and 250/255)

6-106. To remove the Solenoid Valve (SV1) perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Remove the left- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.
4. Using a #2 Phillips screwdriver, remove the three left-side support bar mounting screws. See Figure 6-58.

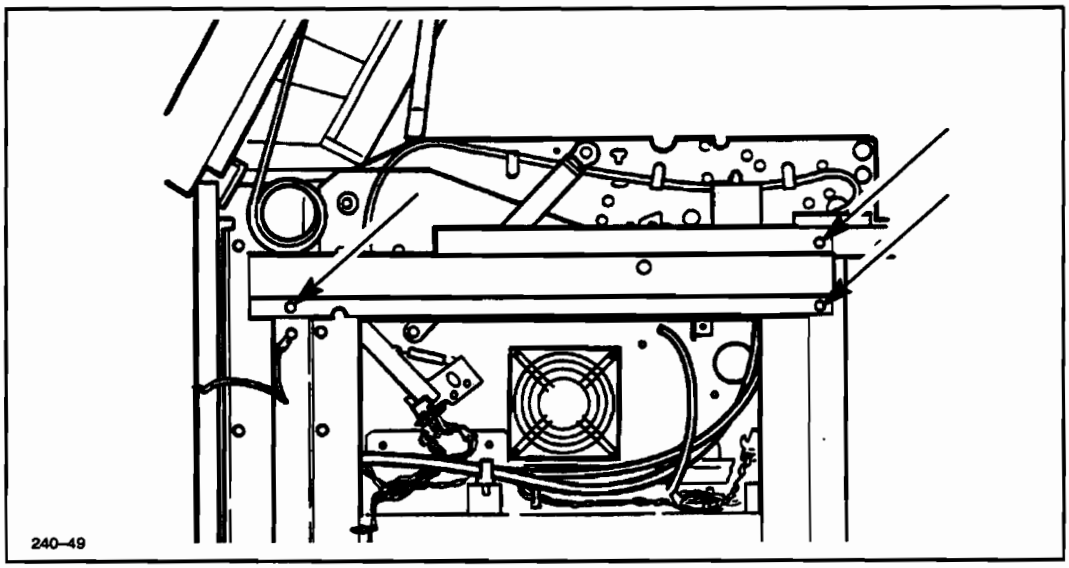

Figure 6-58. Support Bar Mounting Screws

5. Disconnect the solenoid valve cable at Connector 8 located below the switch. See Figure 6-59, Detail A.

NOTE

Residual traces of toner fluid may be present in the tubes. Use a paper towel or absorbent cloth to wipe up any droplets of fluid spilled while disconnecting the fittings. a mild soap and water solution may be used to clean the plotter or your hands if you come in contact with the toner fluid.

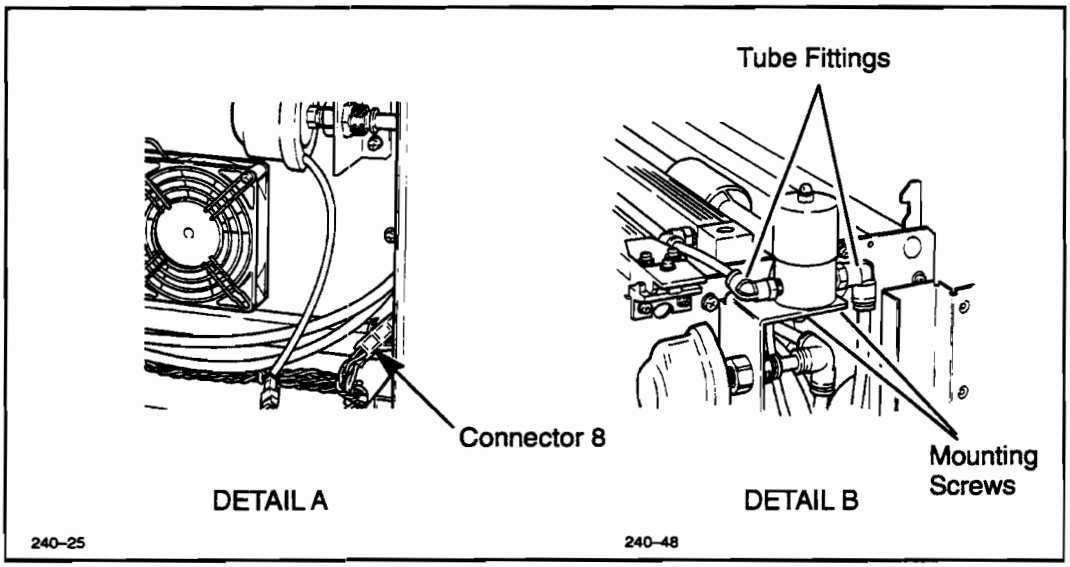

Figure 6-59. Solenoid Valve Removal

6. Remove the toner tubes from the tube fittings at the front and rear of the solenoid valve. See Figure 6-59, Detail B.

7. Using a 5 mm Allen wrench, remove the two mounting screws from the bottom of the valve.

8. To replace the solenoid valve, reverse this procedure.

6-107. VACUUM SWITCH (VSW1) REMOVAL (Models 240D/E and 250/255)

6-108. To remove the Vacuum Switch (VSW1) perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Raise the top cover to its fully opened position.

3. Remove the left- side cover. If necessary, refer to the Left- or Right- Side Cover Removal procedure starting on paragraph 6-15.

4. Remove the three left-side support mounting screws. See Figure 6-58.

5. Disconnect the vacuum switch at Connector 16. See Figure 6-60.

6. Remove the toner tube from the vacuum switch tube fitting. See Figure 6-60.

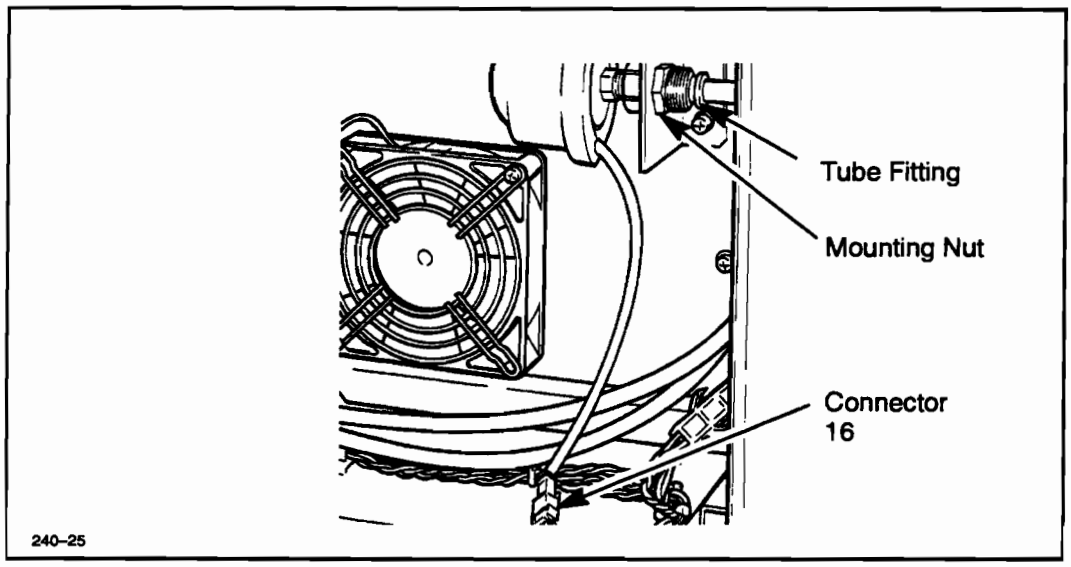

Figure 6-60. Vacuum Switch (VSW1) Removal

7. Using a 19 mm open-end wrench, remove the vacuum switch mounting nut.

8. To replace VSW1, reverse this procedure.

6-109. DRIVE MOTOR BELT (Models 240D/E and 250/255)

6-110. To remove the drive motor belt, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Raise the top cover to its fully opened position.

3. Using a 4 mm Allen wrench, loosen the drive motor mounting screws. See Figure 6-61.

4. Remove the drive belt.

5. When replacing the drive belt, reverse the above procedure and, for belt tensioning, refer to the adjustment procedure in Chapter 7 starting at paragraph 7-10. .

6-111. MEDIA DRIVE MOTOR (Models 240D/E and 250/255)

6-112. To remove the media drive motor, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

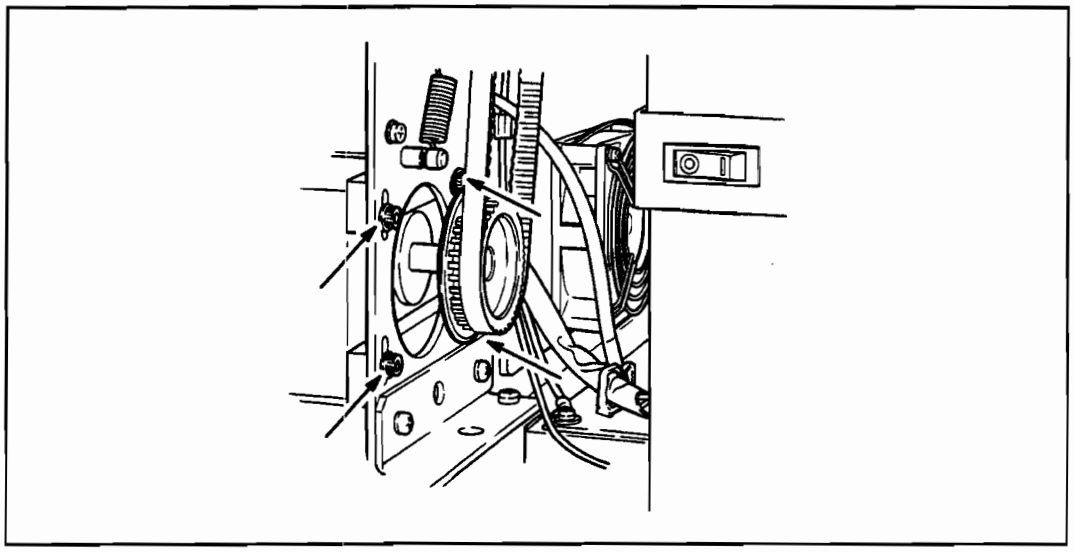

Figure 6-61. Drive Motor Belt Removal

2. Raise the top cover to its fully opened position.

3. Open the right-front door.

4. Remove the front PCA shield. If necessary, refer to the Front PCA Shield removal procedure starting on paragraph 6-23.

5. Remove the drive motor belt. If necessary, refer to the Drive Motor Belt removal procedure starting on paragraph 6-109.

6. Disconnect the drive motor cable and ground wire located behind the drive motor gear.

7. Remove the four drive motor mounting screws and remove the drive motor.

8. To replace the media drive motor, reverse this procedure and, for belt tensioning, refer to the adjustment procedure given in Chapter 7 starting at paragraph 7-10. .

6-113. NEAR END OF PAPER SENSORS (SSW5 AND SSW6) (Models 240D/E and 250/255)

6-114. To remove SSW5 and SSW6, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Remove the left-side cover. If necessary, refer to the Left- or Right-Side Cover removal procedure starting at paragraph 6-15.

3. Disconnect the harness connector at the base of the PCA. See Figure 6-62.

4. Using a #1 Phillips screwdriver, remove the two sensor assembly mounting screw and remove the sensors.

5. To replace the sensors, reverse this procedure.

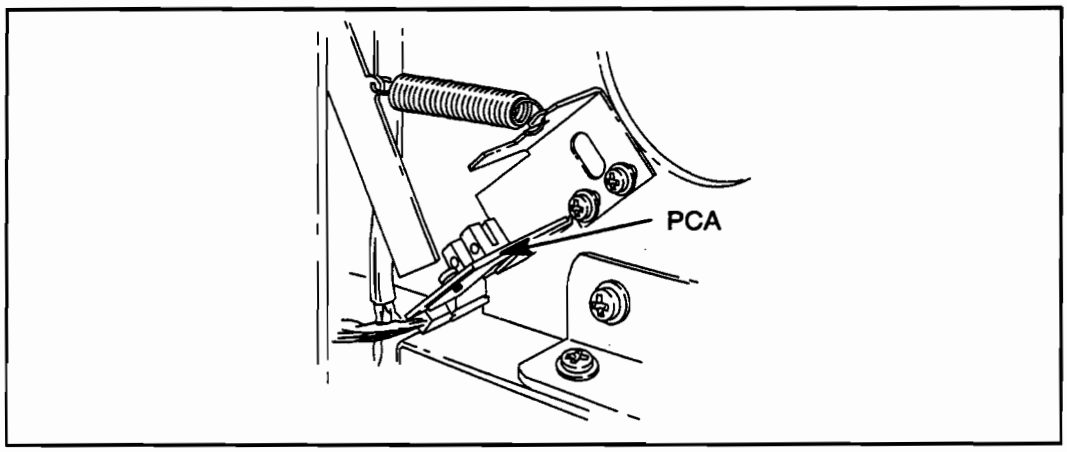

Figure 6-62. SSW5 and SSW6 Removal

6. Adjust the sensors per the procedure in chapter 7 starting at paragraph 7-18.

6-115. UPPER CARRIAGE RIGHT-SIDE INTERLOCK SWITCH (SSW2) (Models 240D/E and 250/255)

6-116. To remove SSW2, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Raise the top cover to its fully opened position.

3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.

4. Pull the upper carriage release lever and allow the upper carriage to raise to the full upright position.

5. Disconnect SSW2 wiring at Connector 12. See Figure 6-63.

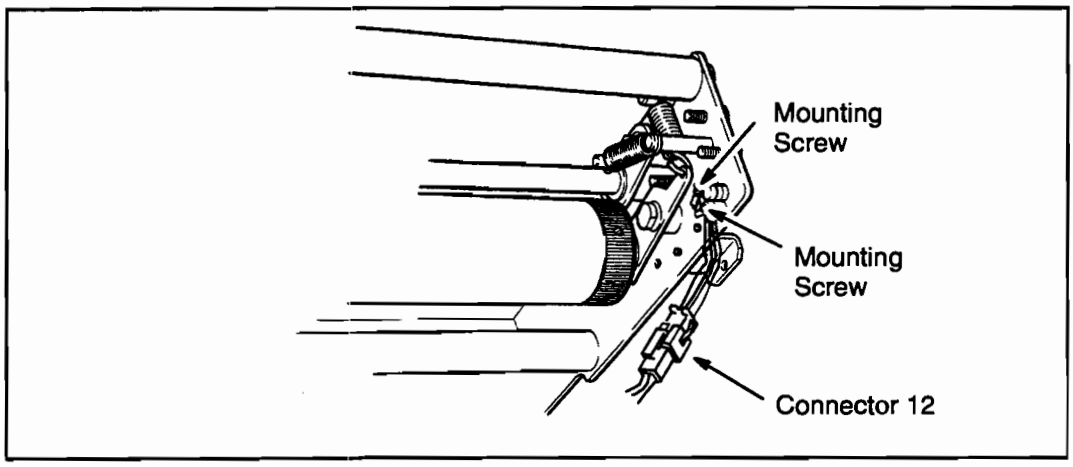

Figure 6-63. SSW2 Connector

6. Using a #1 Phillips screwdriver, remove the two switch mounting screws and remove the switch. See Figure 6-63.

7. To replace SSW2, reverse this procedure.

6-117. UPPER CARRIAGE LEFT-SIDE INTERLOCK SWITCH (SSW1) (Models 240D/E and 250/255)

6-118. To remove SSW1, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.

2. Raise the top cover to its fully opened position.

3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.

4. Pull the upper carriage release lever and raise the upper carriage to the full upright position.

5. Disconnect SSW1 wiring at Connector 12. See Figure 6-64.

6. Using a #1 Phillips screwdriver, remove the two switch mounting screws and remove the switch. See Figure 6-64.

7. To replace SSW1, reverse this procedure.

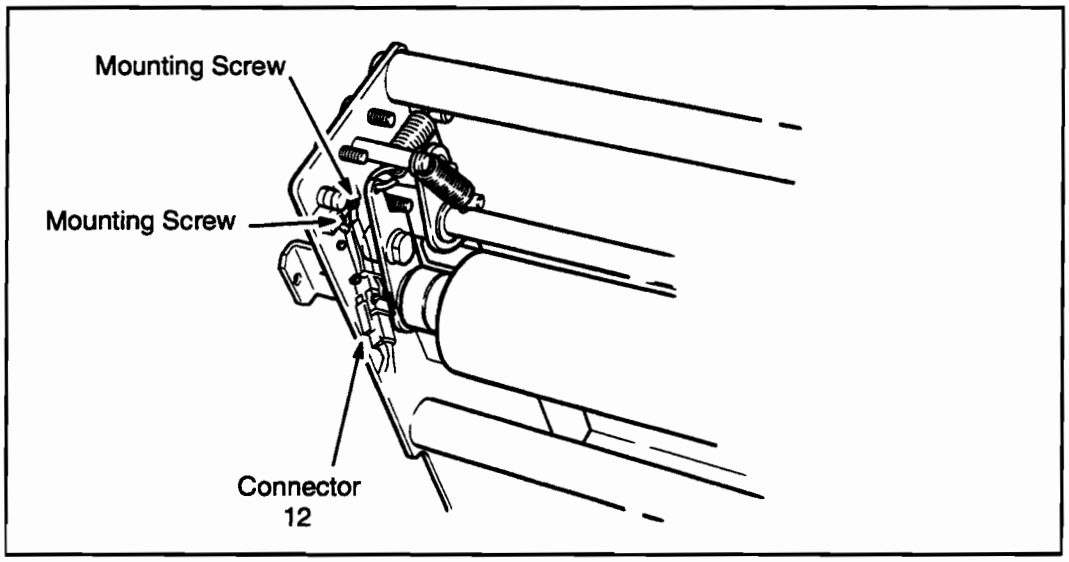

Figure 6-64. SSW1 Connector

6-119. OUT-OF-PAPER SENSOR SWITCH (SSW4) (Models 240D/E and 250/255)

6-120. To remove SSW4, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Disconnect the switch wires (black to top connector, blue to middle connector). See Figure 6-65.
4. Using a #1 Phillips screwdriver, remove the screw that mounts the switch to the bracket and remove the switch.
5. To replace the switch, reverse this procedure.

6-121. PINCH ROLLER AND GEAR (Models 240D/E and 250/255)

6-122. To remove the pinch roller and gear, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.

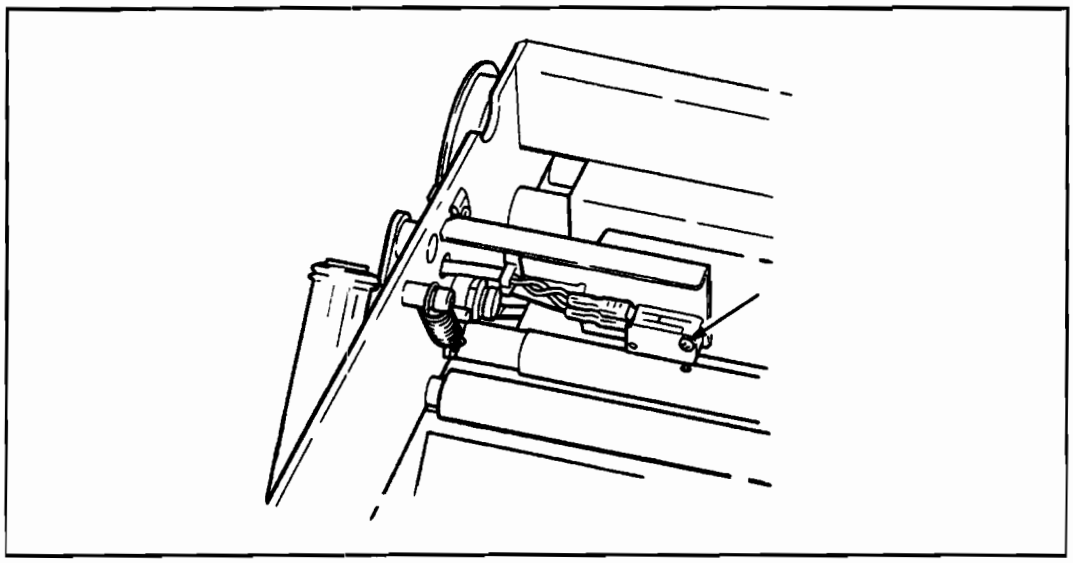

Figure 6-65. SSW4 Removal

3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.

4. Loosen the left and right pivot arm restricting screws until their threads are clear of the pivot arm. See Figure 6-66 and Figure 6-67.

5. Pull the upper carriage release lever forward and allow the upper carriage to raise to its full upright position.

6. Using a combination spring tool or needle-nose pliers, carefully disconnect the left and right pinch roller tension springs located at the ends of the shaft pivot arms. See Figure 6-66 and Figure 6-67.

CAUTION

Removal of the pinch roller shaft pivot arm mounting screws will allow the shaft and spacers to fall into the plotter. Exercise care not to drop the shaft and spacers into the plotter or damage to the plotter may occur.

7. Using a #2 Phillips screwdriver, remove the screw holding the right pinch roller shaft pivot arm to the side of the chassis. Note that the spacer has a small diameter extension that fits into the hole in the arm. Carefully slide the spacer out of the arm and lower the right end of the pinch roller away from the upper frame.

8. Carefully pull the left end of the shaft out of the left shaft pivot arm.

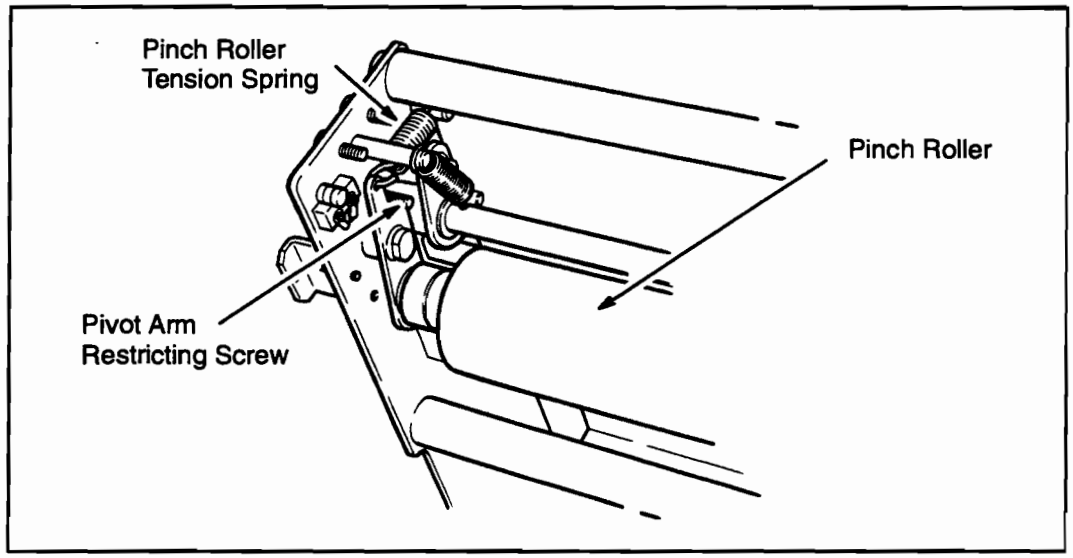

Figure 6-66. Left Tension Spring

9. Using a 2 mm Allen wrench, loosen the two set screws that secure the pinch roller gear and remove the gear. See Figure 6-67.

10. To replace the pinch roller and gear, reverse this procedure.

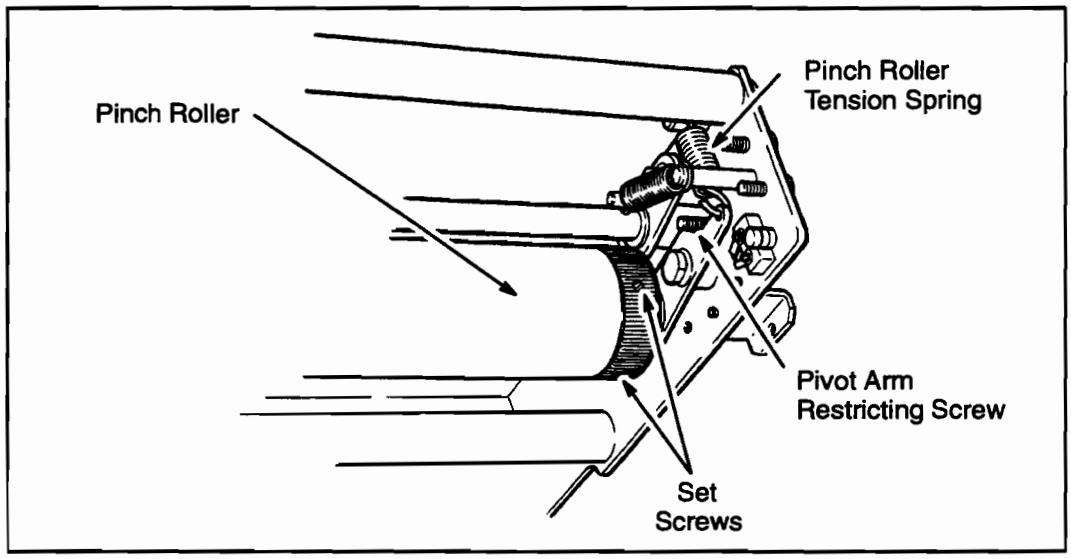

Figure 6-67. Right Tension Spring

6-123. FEED ROLLER ASSEMBLY (Models 240D/E and 250/255)

6-124. To remove the feed roller assembly, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.
4. Using a combination spring tool, remove the tension spring at each end of the feed roller shaft. See Figure 6-66 and Figure 6-67.
5. Using a #2 Phillips screwdriver, remove the left- and right-side shaft pivot arm screws. See Figure 6-71 and Figure 6-72.
6. Lift the feed roller shaft out and remove the pivot arms from each end (pivot arm, spacer, and washer).
7. Remove the "c"-rings from the shaft and slide the rollers off.
8. To replace the feed roller assembly, reverse this procedure.

6-125. BRUSH (Models 240D/E and 250/255)

6-126. To remove the brush, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.
3. Raise the top cover to its fully opened position.
4. Using a #2 Phillips screwdriver, remove the three brush-plate mounting screws. See Figure 6-68.

6-127. PAD ROLLER (Models 240D/E and 250/255)

6-128. To remove the pad roller, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.

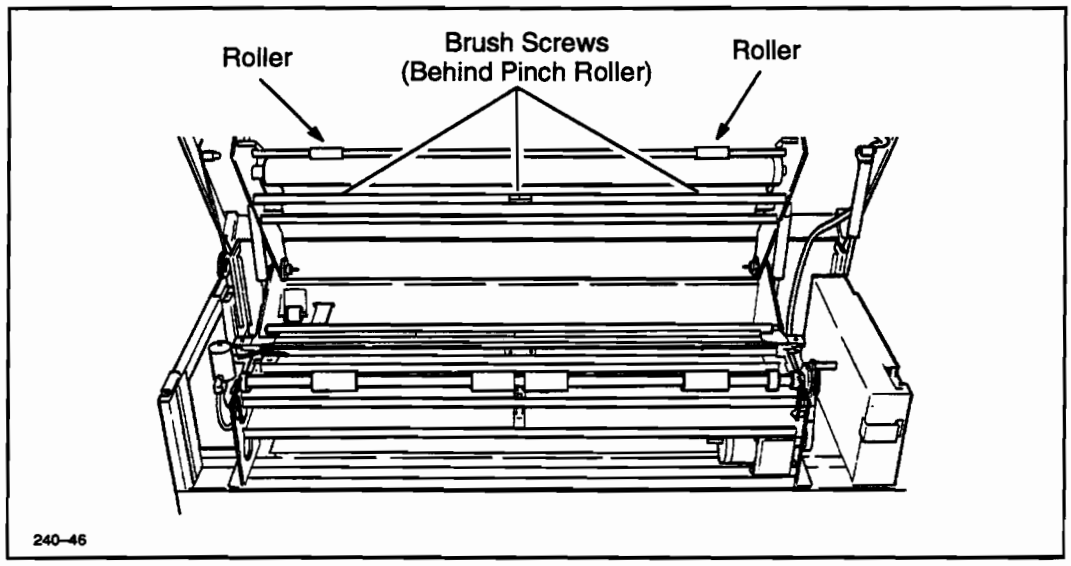

Figure 6-68. Brush Removal

3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.

4. Pull the upper carriage release lever forward and allow the upper carriage to raise to its full upright position.

5. Release the two pad-roller arm springs. See Figure 6-69.

6. Using a #2 Phillips screwdriver, remove the left pad-roller arm mounting screw. See Figure 6-70.

NOTE

When lifting the pad roller from the upper carriage, hold the bushing to prevent it from falling into the plotter.

7. Carefully lift the left end of the pad roller from the upper carriage taking care that the shaft bushing does not fall into the plotter.

8. Slide the pad-roller arm and bushing off the pad roller shaft.

9. Slide the pad roller to the left to disengage the shaft from the right pad-roller arm.

10. To replace the pad roller, reverse this procedure.

11. Pull the upper carriage release lever forward and allow the upper carriage to raise to its full upright position.

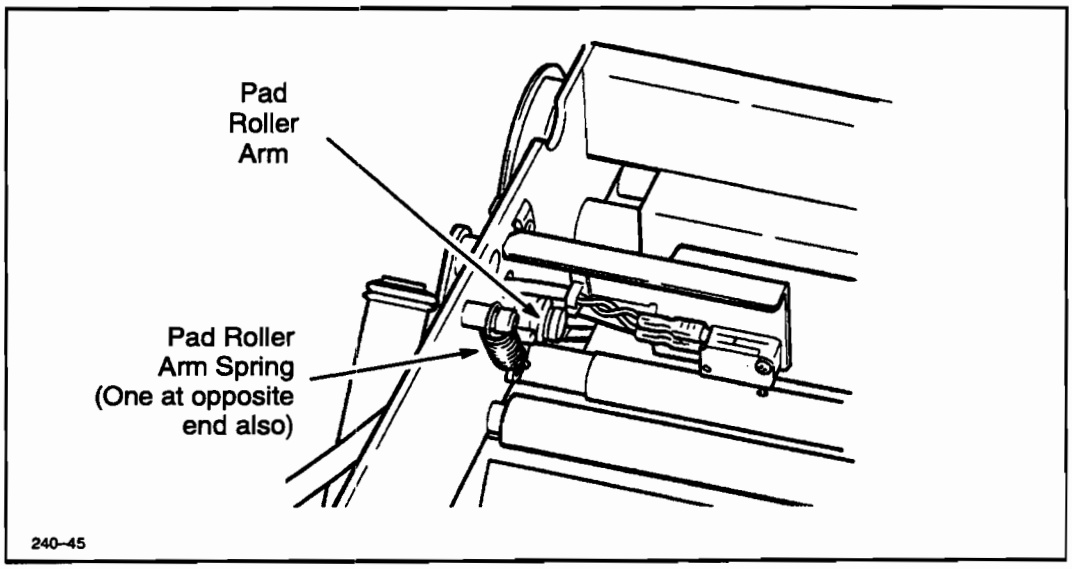

Figure 6-69. Pad Roller Removal

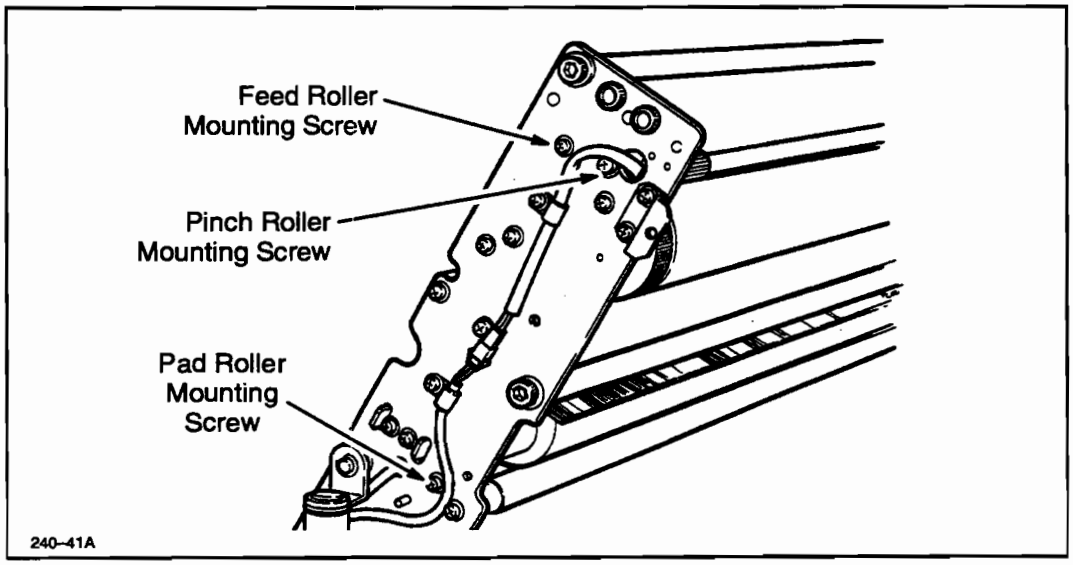

Figure 6-70. Left Pad-Roller Arm Mounting Screw

12. Slide the damper off the upper and lower pivot points.

13. To replace the damper, reverse this procedure.

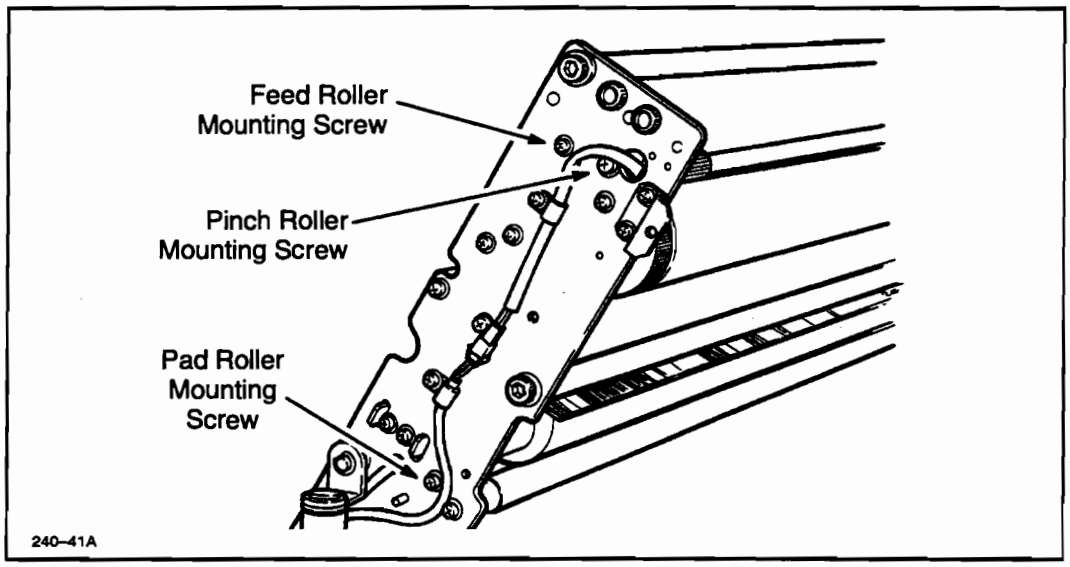

Figure 6-71. Feed Roller Tension Spring

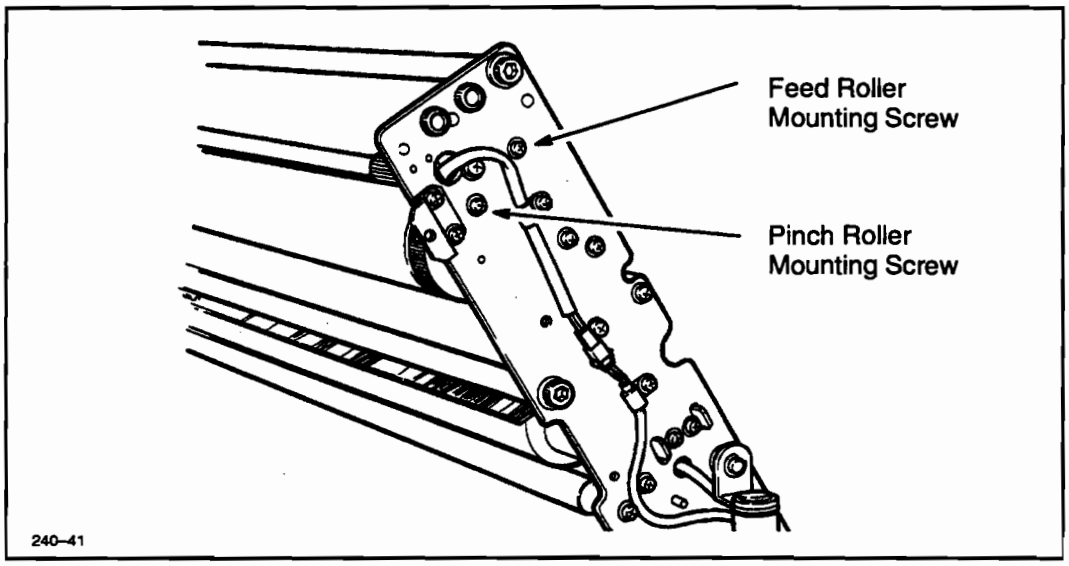

Figure 6-72. Feed Roller Assembly Removal

6-129. UPPER-CARRIAGE DAMPER (Models 240D/E and 250/255)

6-130. To remove the upper-carriage damper, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

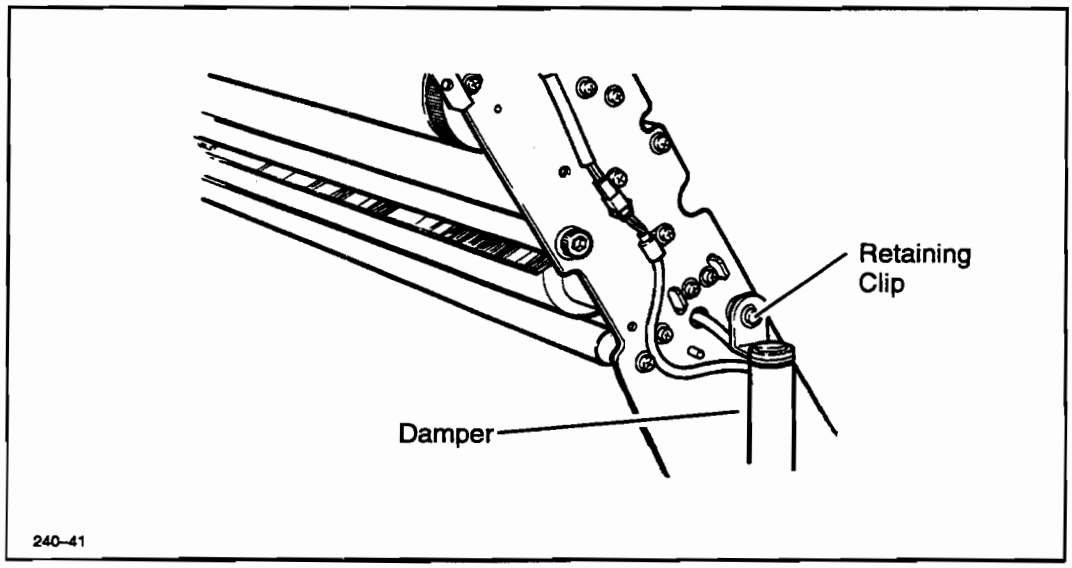

Figure 6-73. Upper-Carriage Damper Removal

2. Raise the top cover to its fully opened position.

3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so it drapes over the front of the plotter.

4. Pull the upper carriage release lever forward and allow the upper carriage to raise to its full upright position.

WARNING

Removal of the damper retaining clips will allow the damper to come free of its pivot point and the upper carriage to fall. To prevent personal injury or damage to the plotter, remove and replace only one damper at a time. Support the upper carriage while disconnecting the damper.

NOTE

The remaining steps are identical for both the left and right dampers.

5. Using needle-nose pliers, remove the retaining clip from the damper pivot point on the upper carriage assembly. See Figure 6-73.

6. Remove the retaining clip from the damper lower pivot point on the lower carriage assembly.

NOTE

The brush plate contains three sections on the 240E and 255 models. The 240D and 250 models each have two brush sections. Each section is removed individually and the procedure is the same for all sections.

7. Using a #2 Phillips screwdriver, remove the two screws holding the section of brush to the brush plate.

8. To replace the brush, reverse this procedure.

6-131. DRIVE ROLLER SHAFT AND GEAR (Models 240D/E and 250/255)

6-132. To remove the drive roller shaft, gear, and center bearing, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.

2. Raise the top cover to its fully opened position.

3. Raise the feed roller shaft and carefully pull the media down from the upper carriage so that it drapes over the front of the plotter.

4. Pull the upper carriage release lever forward and allow the upper carriage to rise to its full upright position.

5. Cut the media along the start of the roll and remove the excess. Exercise care not to drag the media from the developer area back across the writing head.

6. Remove the drive motor belt. If necessary, refer to the Drive Motor Belt removal procedure starting on paragraph 6-109.

7. Using a 7 mm nut driver remove the lock nut from the drive roller shaft pulley screw.

8. Using a 3 mm hex wrench, remove the drive roller shaft pulley screw. Remove the gear. See Figure 6-74.

9. Using a #2 stubby screwdriver, remove the three shaft bearing-assembly mounting screws located on the right end of the shaft. See Figure 6-75.

10. Remove the bearing assembly from the lower carriage frame. Make sure the bearing and bearing cradle are removed.

11. Grasp the drive roller shaft near both ends and slowly slide the shaft to the right until the left end of the shaft is free from the left bearing assembly.

12. Using a 2 mm hex wrench, loosen the two set screws holding the right gear to the shaft. See Figure 6-75.

13. Slide the gear off the shaft.

14. To replace the drive roller shaft, gears, and center bearings, reverse this procedure.

NOTE

On the Model 240E, the Center Bearing Assembly may be removed after lifting the lower drive roller out of the lower frame. To remove the Center Bearing from the lower Drive Roller Shaft of the Model 255, the "C" rings and lower rollers must be removed from one side of the shaft allowing the Center bearing to slip off the end. to replace the Center Bearing on the 255, reverse the procedure.

CAUTION

When lubricating the friction surfaces of the gears in the next step, take care not to apply any excess grease. If any grease gets onto the rubber surface of the pinch roller that is driven by the drive-roller gears, the rubber will deteriorate rapidly.

15. When replacing the gears, apply a thin coat of lithium-based grease (HP P/N 6040–0584) to the friction surfaces of the gears at both ends of the shaft.

16. Run a demonstration plot. Then check that the grease is evenly distributed over the friction surfaces of the drive roller gears and the pinch roller gears. If any excess grease appears at the sides of the gears, wipe it off with a lint free cloth. If any grease is on the rubber surface of the pinch roller, clean the surface thoroughly with alcohol wipes.

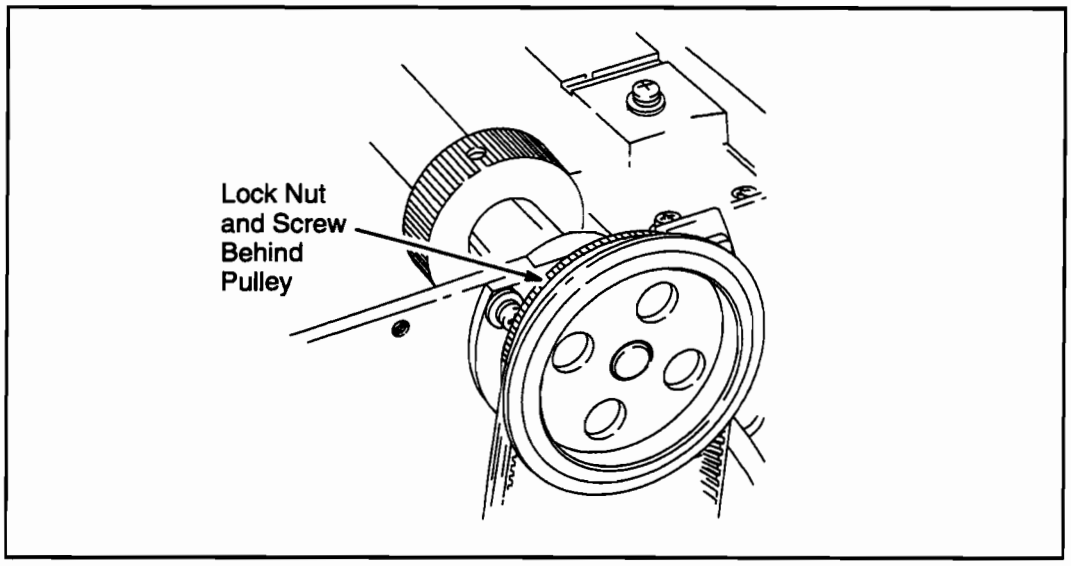

Figure 6-74. Roller-Shaft Pulley Removal

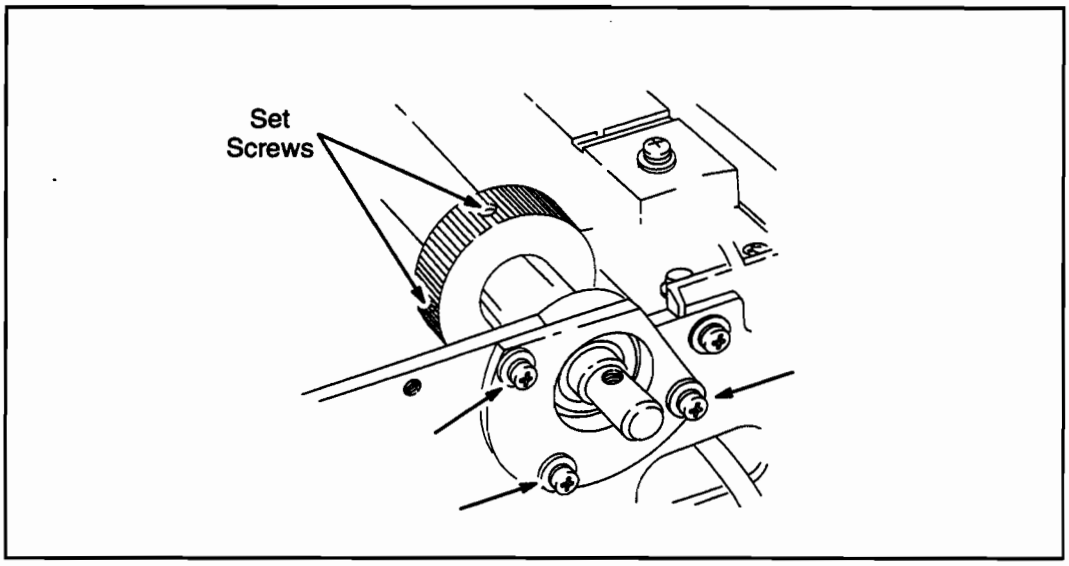

Figure 6-75. Roller Shaft Removal

6-133. TAKE-UP REEL MOTOR AND DRIVE GEAR (Models 250/255 Only)

6-134. To remove the take-up reel motor and drive gear, proceed as follows:

NOTE

Removal and replacement of the take-up reel motor will require adjustment of the belt tension.

1. Switch the plotter OFF (**O**)
2. Disconnect the ac power cord and the interface cable from the plotter.
3. Raise the top cover.
4. Unplug the reel motor (P59) at the interconnect bracket.
5. Remove the three (3) screws securing the motor assembly to the plotter. See Figure 6-76.

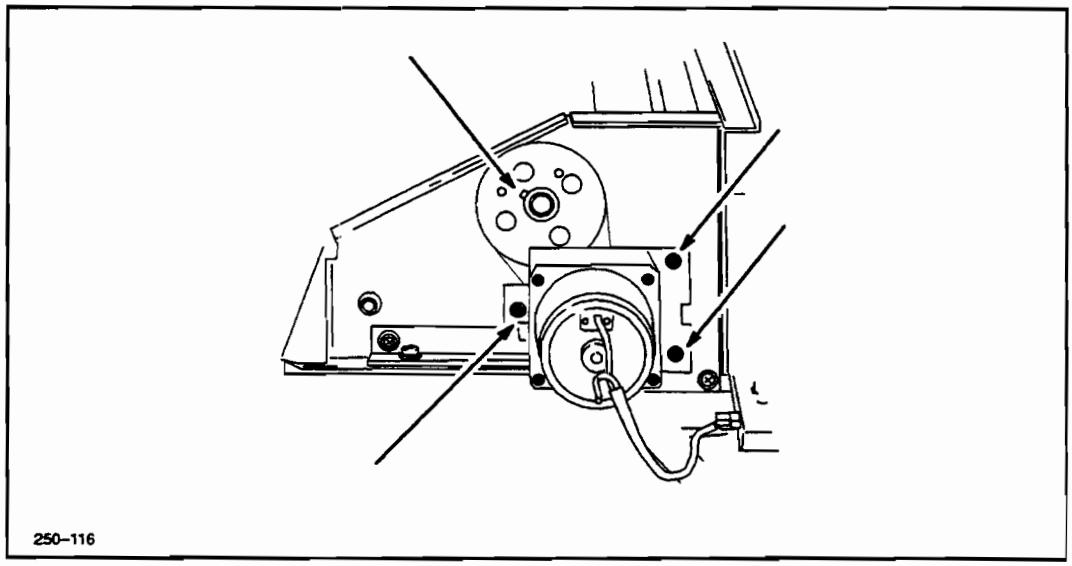

Figure 6-76. Take-Up Reel Drive

6. Carefully disengage the drive belt from the gear.
7. The drive gear can be removed by using a hex-head wrench to loosen the screw. See Figure 6-76.
8. Replacement is accomplished by reversing the procedure.

9. Refer to Chapter 7 of this document for the take—up reel belt tension adjustment procedure.

6-135. RIGHT-HAND HUB ASSEMBLY (Models 250/255 Only)

6-136. To remove the right-hand hub assembly, proceed as follows:

NOTE

Removal and replacement of the right-hand hub or bushing will require adjustment of the belt tension.

1. Switch the plotter OFF (**O**)
2. Disconnect the ac power cord and the interface cable from the plotter.
3. Raise the top cover.
4. Remove the media spindle from the plotter.
5. Remove the take-up reel drive gear from the shaft. Refer to paragraph 6-134.
6. This allows removal of the right-hand hub.
7. To remove the bushing, remove the three (3) screws as shown in Figure 6-77.

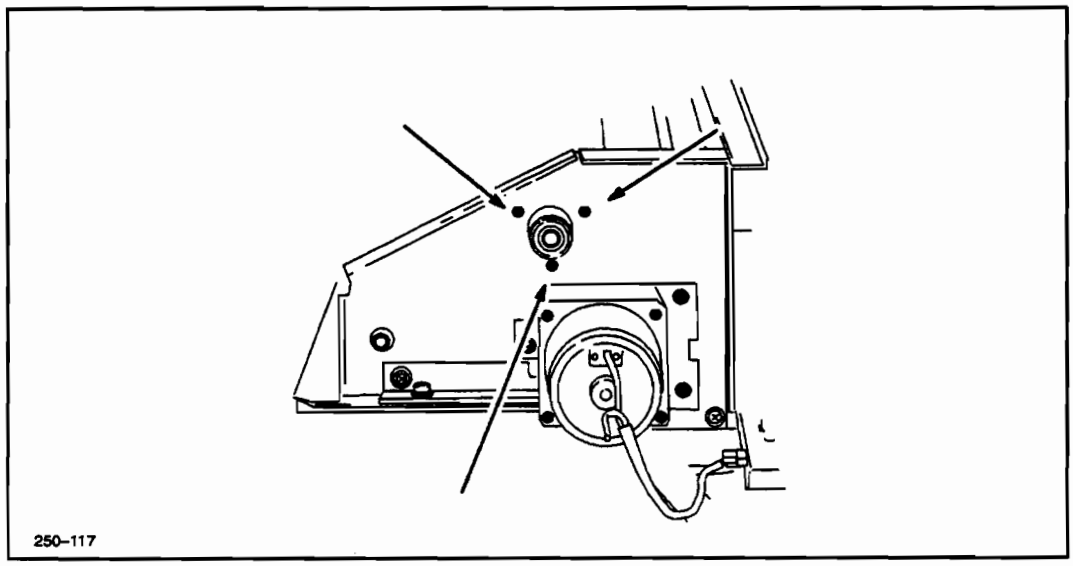

Figure 6-77. Right-Hand Bushing

8. To replace the bushing and hub, reverse this procedure.

9. Refer to the take-up reel belt tension adjustment procedures in Chapter 7 of this document.

6-137. LEFT-HAND HUB ASSEMBLY (Models 250/255 Only)

1. Switch the plotter OFF (**O**)
2. Disconnect the ac power cord and the interface cable from the plotter.
3. Raise the top cover.
4. Remove the media spindle from the plotter.
5. Remove the "C" ring as shown in Figure 6-78.
6. Pull the left-hand hub and bearing off the spindle shaft.

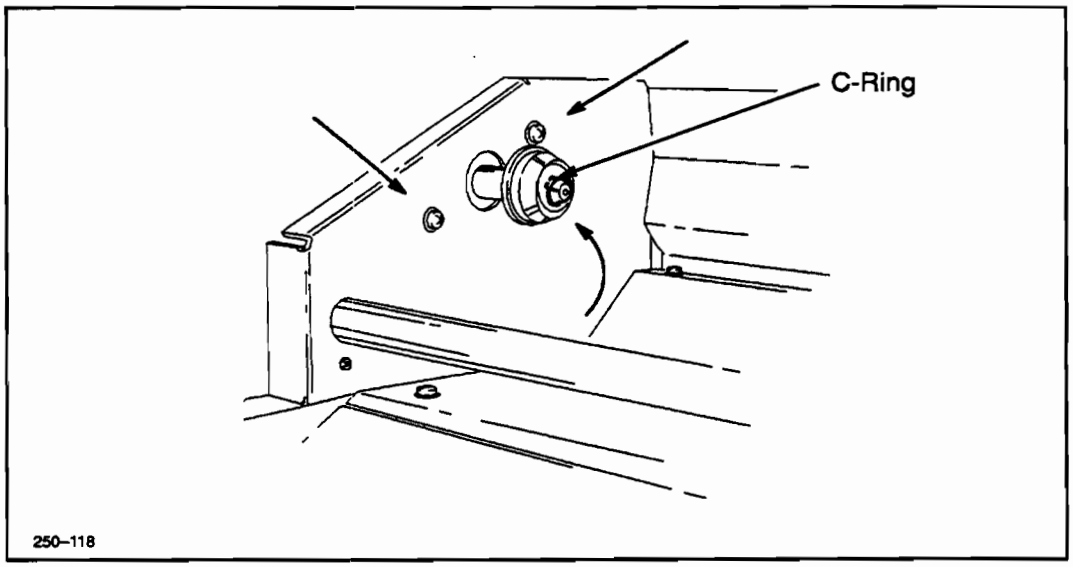

Figure 6-78. Take-Up Reel Hub (Left)

7. Remove the three (3) screws securing the hub to the plotter. See Figure 6-78.

6-138. GENERAL INFORMATION ON MEDIA CUTTER SYSTEM MECHANICS

6-139. Before proceeding with the removal of cutter system parts, see Figure 6-79 to get an idea of the overall organization of the media cutter system mechanics.

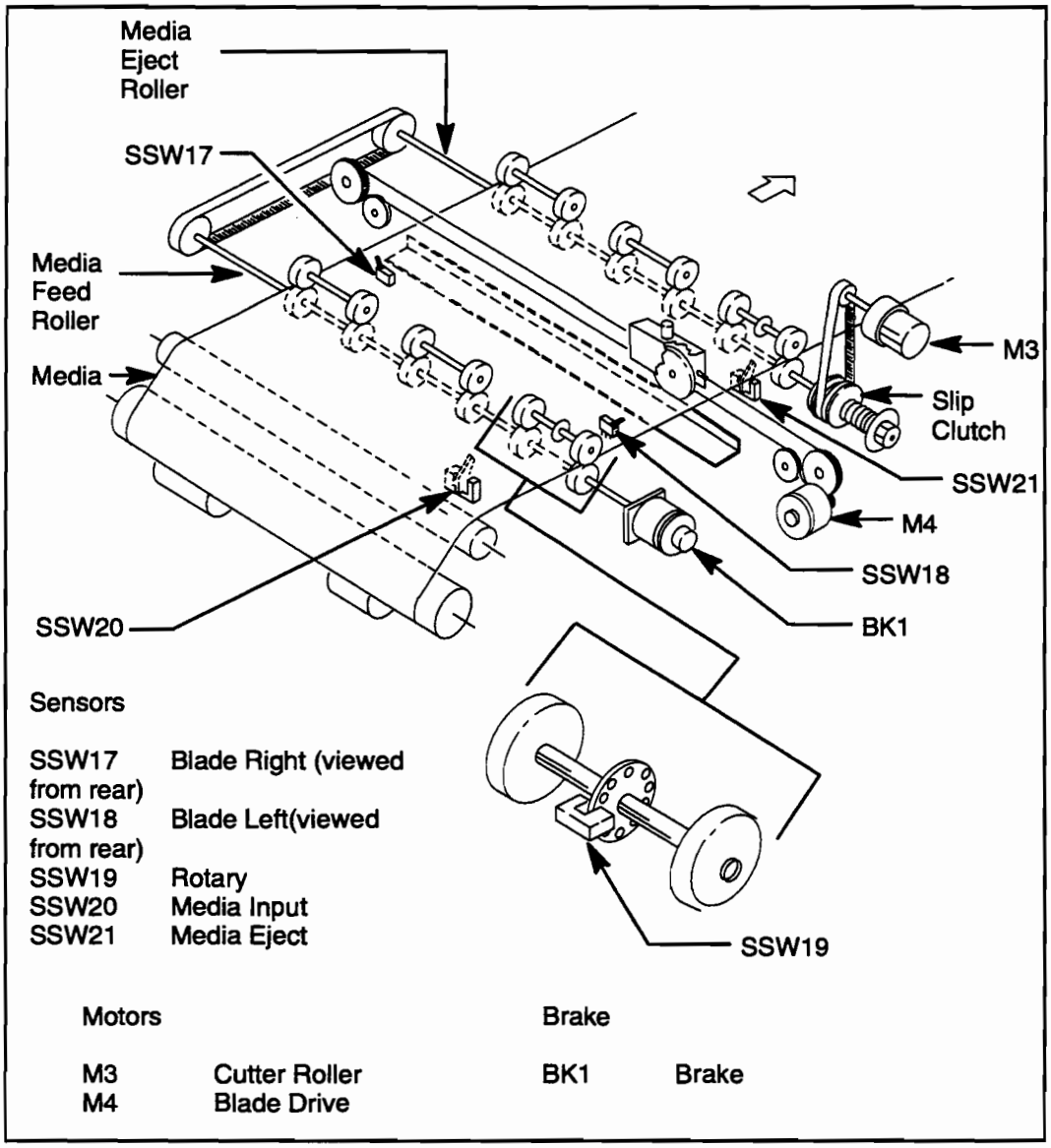

Figure 6-79. Media Cutter System Mechanics

6-140. CUTTER ROLLER MOTOR AND BELT (Model 250/255 Only)

6-141. To remove the cutter roller motor, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. If media is loaded, remove the take-up roll.
4. Unplug the cutter motor.
5. Remove the 3 screws securing the motor assembly to the plotter. See Figure 6-80.
6. Disengage the drive belt from the gear on the motor assembly. See Figure 6-81.
7. Remove the motor assembly and the standoffs.
8. To replace the cutter roller motor, re-install the motor, standoffs, and screws. Before tightening the three screws, ensure that the motor belt is tight by rotating the motor clockwise. While holding the motor in this position, tighten the three screws.

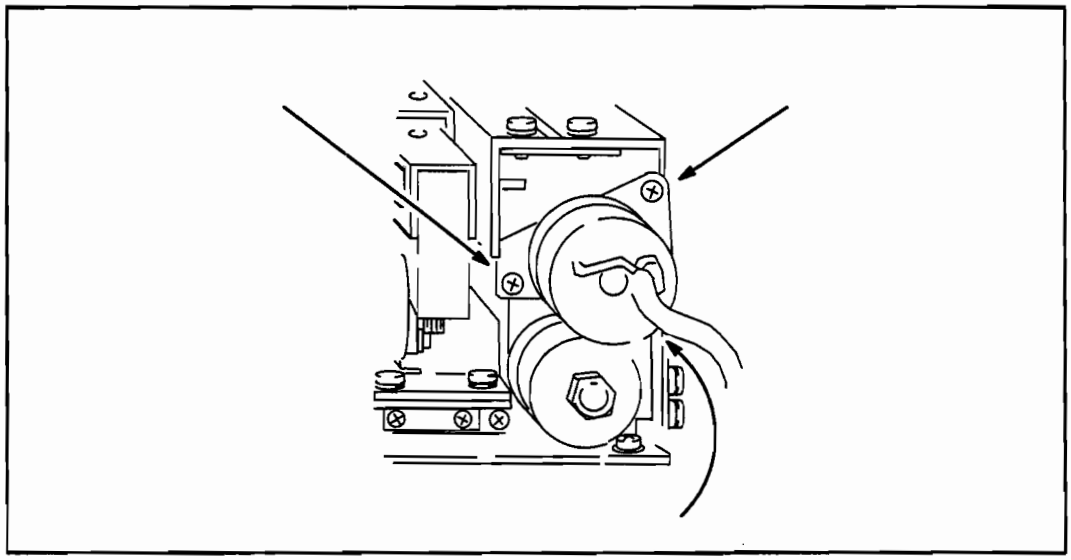

Figure 6-80. Cutter Roller Motor

9. To replace the cutter roller motor and belt, reverse this procedure.

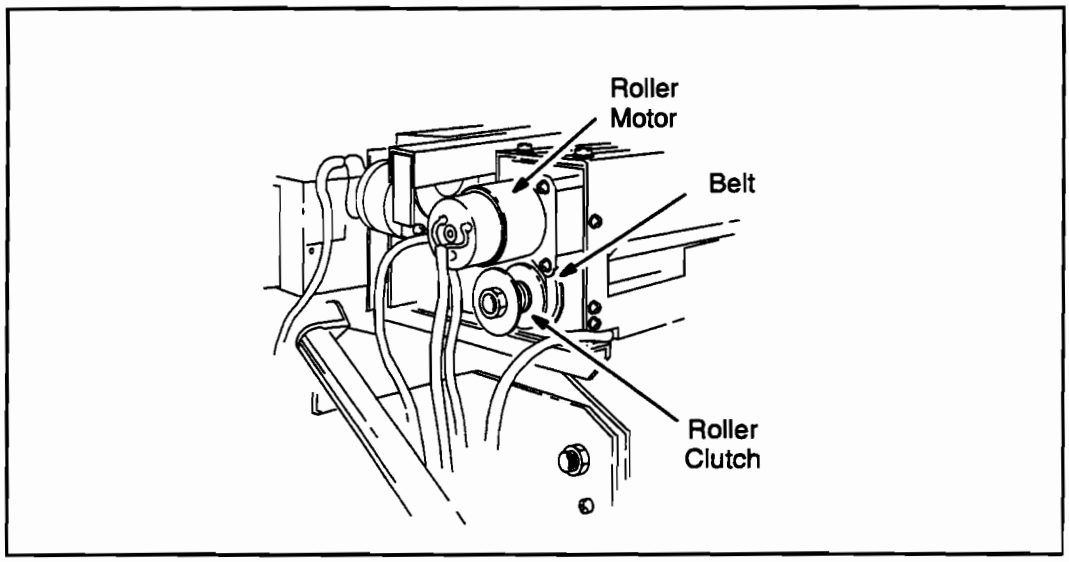

Figure 6-81. Roller Motor and Clutch

6-142. CUTTER BRAKE (Model 250/255 Only)

6-143. To remove the cutter brake, proceed as follows:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to its fully opened position.
3. Unplug the cutter brake at (P58). See Figure 6-82.
4. Use a 1.5 mm hex wrench to loosen the 2 set screws securing the brake to the roller shaft.
5. Remove the 2 screws securing the brake to the frame. See Figure 6-82.

NOTE

When removing the brake, be careful not to lose the small, thin, spacer washer on the inside of the brake plate. (This washer is at the end of the brake shaft and is used as a spacer between the brake plate and the main brake module.)

6. To replace the cutter brake, reverse this procedure. Be sure to place the brake plate directly over the spacer washer and to hold it firmly against the spacer washer while tightening the set screws.

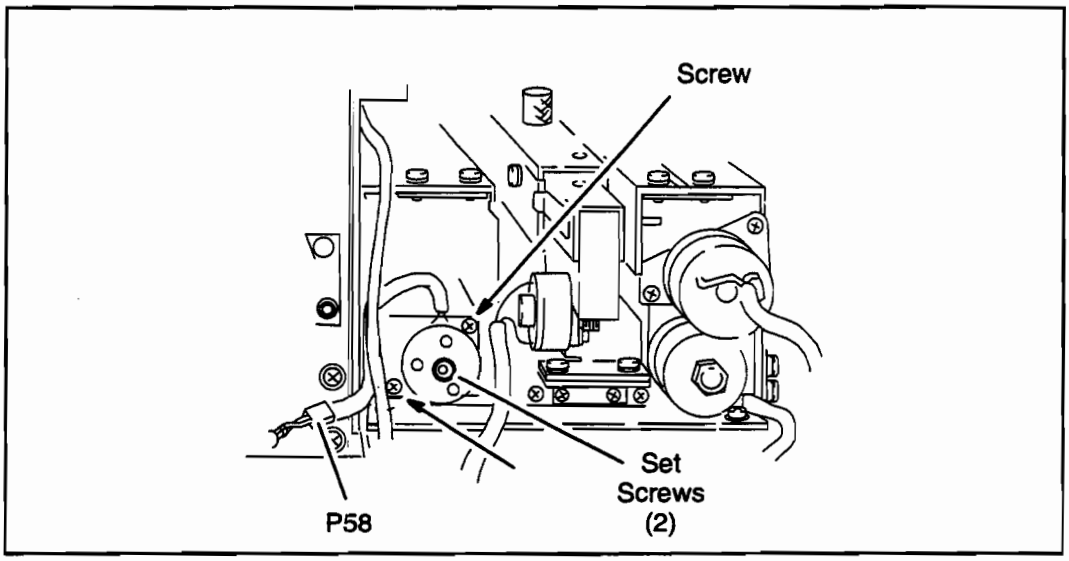

Figure 6-82. Feed-Roller Brake

6-144. SHAFT ROTATION SENSOR (SSW19) (Model 250/255 Only)

6-145. To remove the shaft rotation sensor, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Lift the top cover to the fully opened position.
3. Disconnect the sensor at P52.
4. Remove the 4 screws securing the upper front roller assembly to the cutter and lift the assembly from the plotter. See Figure 6-83.
5. The sensor bracket and PCA can be removed from the roller assembly by removing 2 screws. See Figure 6-84.
6. To replace the sensor, reverse this procedure.

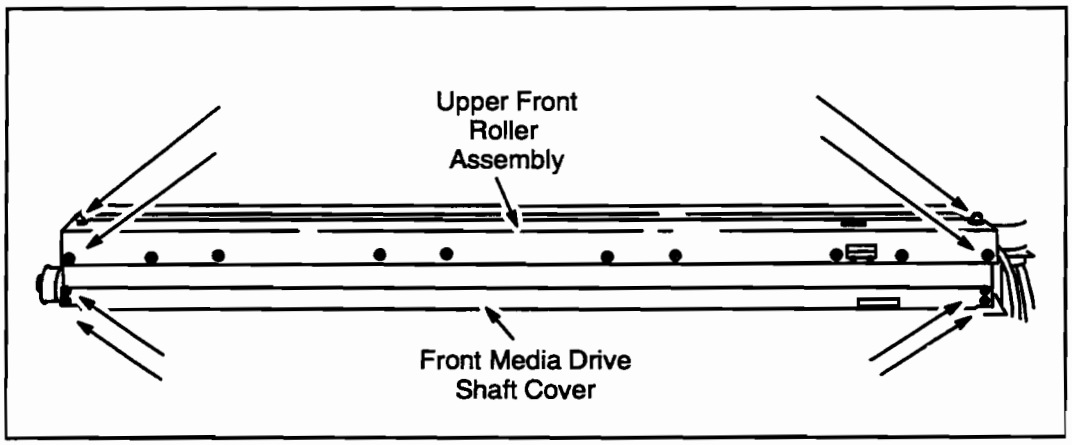

Figure 6-83. Front Roller Assembly

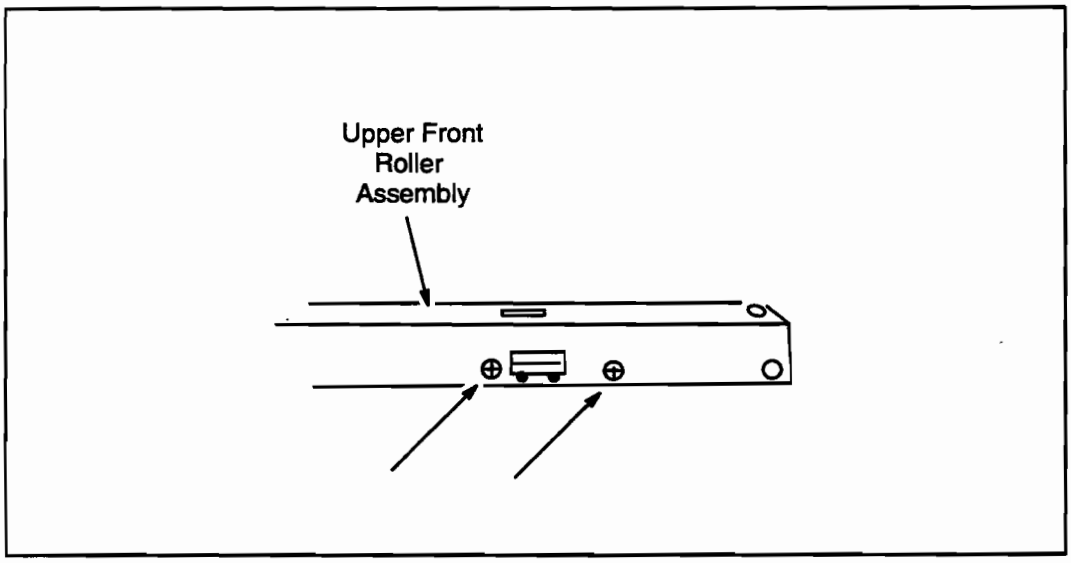

Figure 6-84. Sensor Removal

6-146. MEDIA INPUT SENSOR (SSW20) (Models 250/255)

6-147. To remove the media input sensor, perform the following procedure:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to the fully open position.

3. Unplug all cables (P51, P52, P53, P54, P56, P57, & P58) to the cutter assembly.

4. Using a #2 Phillips screwdriver, remove the four (two at each end) cutter assembly mounting screws.

WARNING

The cutter assembly is heavy. Use proper lifting techniques when removing the assembly from the plotter. Get assistance if necessary. Serious personal injury can result if proper procedures are not followed.

5. Lift the entire cutter assembly from the plotter and place the unit on a sturdy work surface.

CAUTION

Use care when removing the roller assembly and roller cover. The sensor arm can be easily damaged.

6. Remove the 4 screws securing the upper front roller assembly to the cutter. See Figure 6-83.

7. Remove the roller assembly.

8. Remove the 4 screws holding the front media drive roller cover in place. See Figure 6-83.

9. Carefully lift the cover from the cutter assembly to avoid damaging the sensor arm.

10. Disconnect the sensor cable from the PCA. Release the cable from its clips and move aside for access to the sensor mounting screw.

11. Remove the sensor mounting screw and sensor. See Figure 6-85.

12. Reverse this procedure for reassembly.

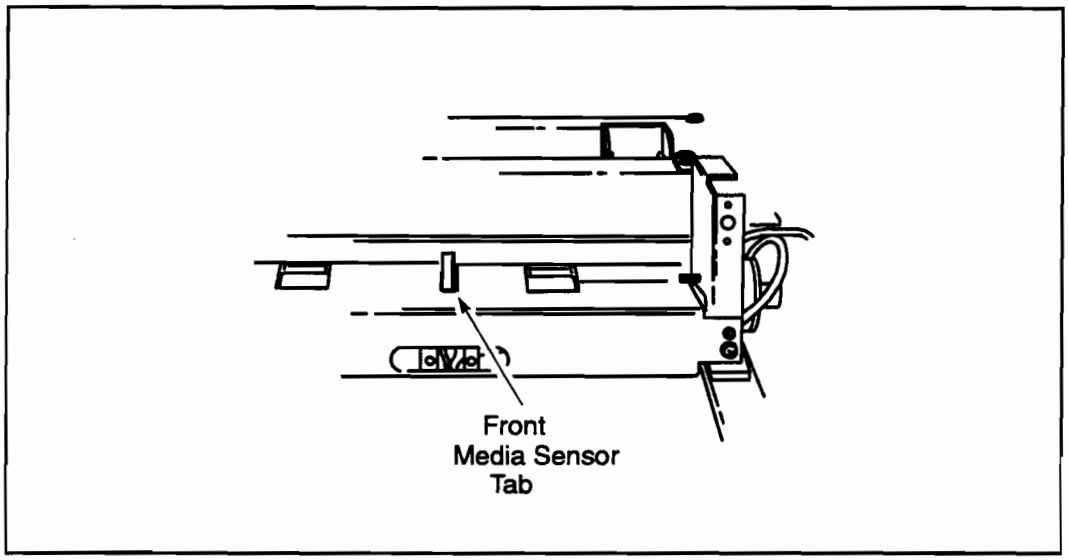

Figure 6-85. Media Input Sensor

6-148. MEDIA EJECT SENSOR (Models 250/255)

6-149. To remove the media eject sensor, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to the fully open position.
3. Unplug all cables (P51, P52, P53, P54, P56, P57, & P58) to the cutter assembly.
4. Using a #2 Phillips screwdriver, remove the four (two at each end) cutter assembly mounting screws.

WARNING

The cutter assembly is heavy. Use proper lifting techniques when removing the assembly from the plotter. Get assistance if necessary. Serious physical injury can result if proper procedures are not followed.

5. Lift the cutter assembly from the plotter and place the assembly on a sturdy work surface.

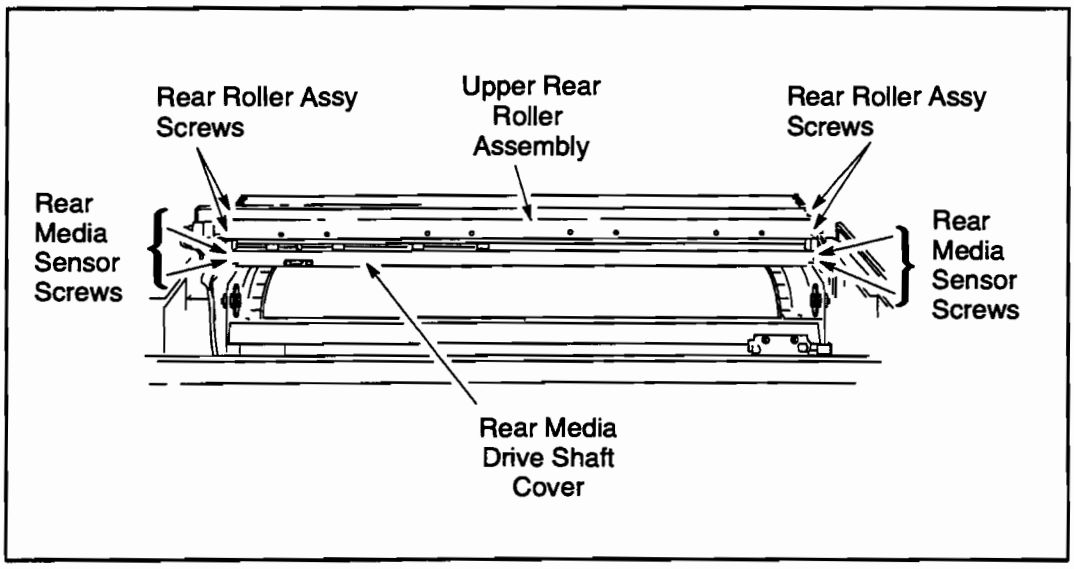

Figure 6-86. Rear Roller Assembly (Viewed from the Rear)

6. Remove the four screws in the upper rear roller assembly. See Figure 6-86.

7. Remove the roller assembly.

8. Remove the four screws holding the rear media drive shaft cover.

9. Carefully remove the cover.

10. Remove the screw securing the sensor assembly to the plotter. See Figure 6-87.

CAUTION

Use extreme care while performing the next step. The sensor arm can be easily damaged.

11. Carefully pull the lower front edge of the sensor bracket out and up, working the assembly out from under the media drive shaft.

12. Unplug the sensor (P54) at the interconnect bracket and slip the cable from the cable clamps.

13. The media eject sensor can be installed by reversing this procedure.

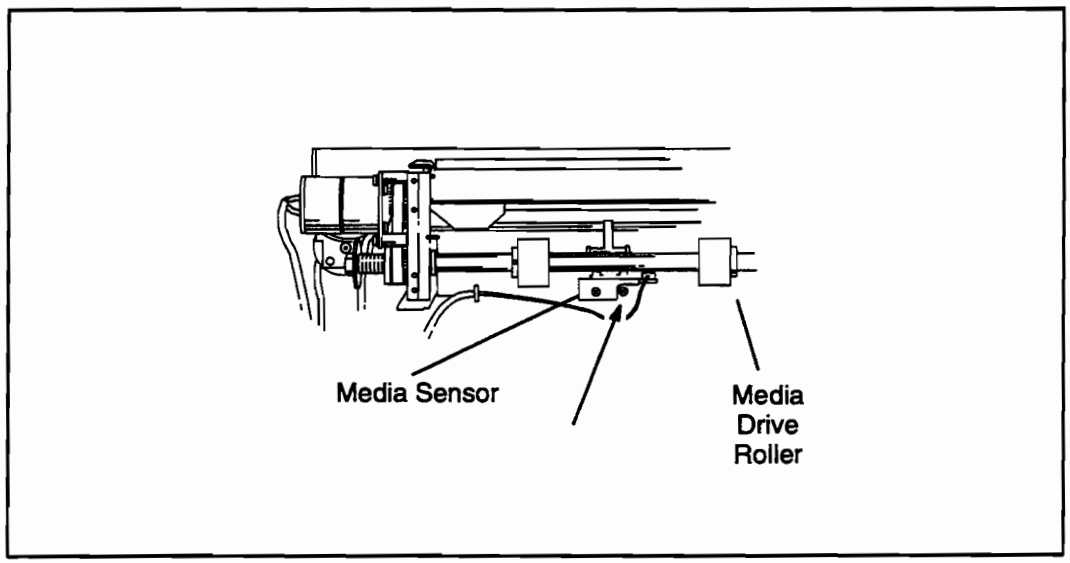

Figure 6-87. Media Eject Sensor

6-150. Y-AXIS CUTTER MOTOR (Models 250/255)

6-151. To remove and replace the Y-axis cutter motor, proceed as follows:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Disconnect the wiring connector (J57) attached to the cutter motor. Refer to Figure 6-88.
3. Using a #1 Phillips screwdriver, remove the 2 screws shown in Figure 6-88 and remove the motor.

NOTE

When replacing the motor make sure the motor/cutter gears mesh together. If the gears are too tight, the gears will bind causing cutter failures. If the gears are too loose, slippage and premature wear will occur.

4. Replace the motor by reversing this procedure.

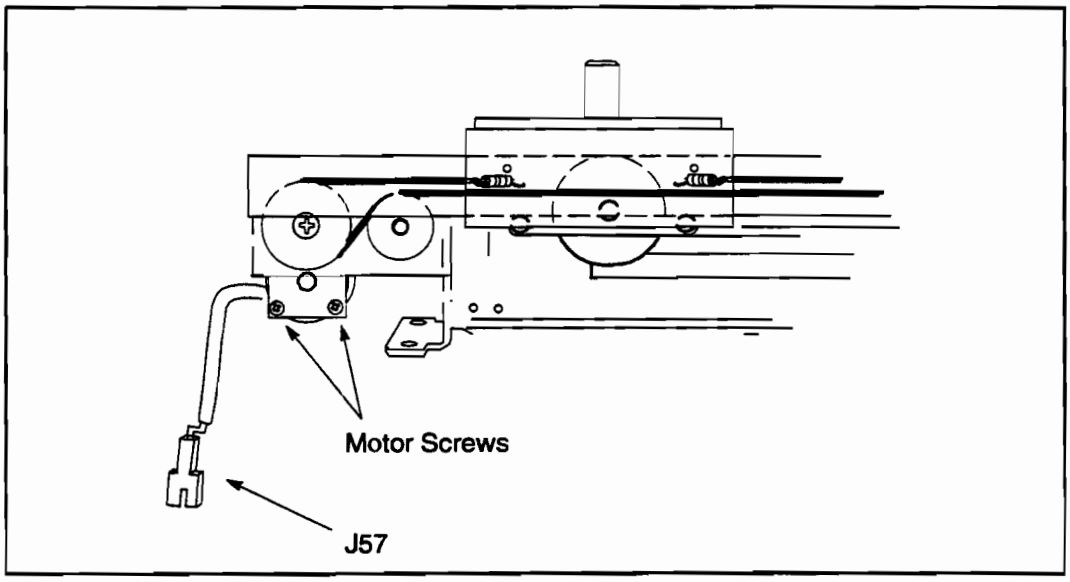

Figure 6-88. Y-axis Cutter Motor

6-152. Y-AXIS CUTTER ASSEMBLY (Models 250/255)

WARNING

The circular blade in the cutter mechanism is extremely sharp. Use care when working around the cutter. Serious injury can result for improper handling of the cutter.

CAUTION

Do not attempt to remove the cutting blade from the assembly. Factory alignment of components is required.

NOTE

It is recommended that, if repeated cutter jams/failures occur, the Y-axis cutter be replaced as an assembly. Refer to Figure 6-91 for correct cutter blade positioning. If the cutter blade or the cutting edge which the blade cuts against is nicked or damaged in any way, the assembly must be replaced. Also refer to the troubleshooting section in chapter 8 for more information.

6-153. To remove the Y-axis cutter assembly, proceed as follows:

1. Switch the plotter OFF (O) and disconnect the ac power cord and interface cable.
2. Raise the top cover to the fully opened position.
3. Remove the four screws in the upper rear roller assembly. See Figure 6-86. Carefully lift the assembly up and out of the plotter being careful not to damage the rear media sensor arm.
4. Unplug the cutter motor (P58) and the left and right sensor switches (P51).
5. Remove the four screws holding the Y-axis cutter assembly to the rest of the media cutter system. See Figure 6-89 and Figure 6-90.
6. Lift the Y-axis cutter assembly from the plotter.

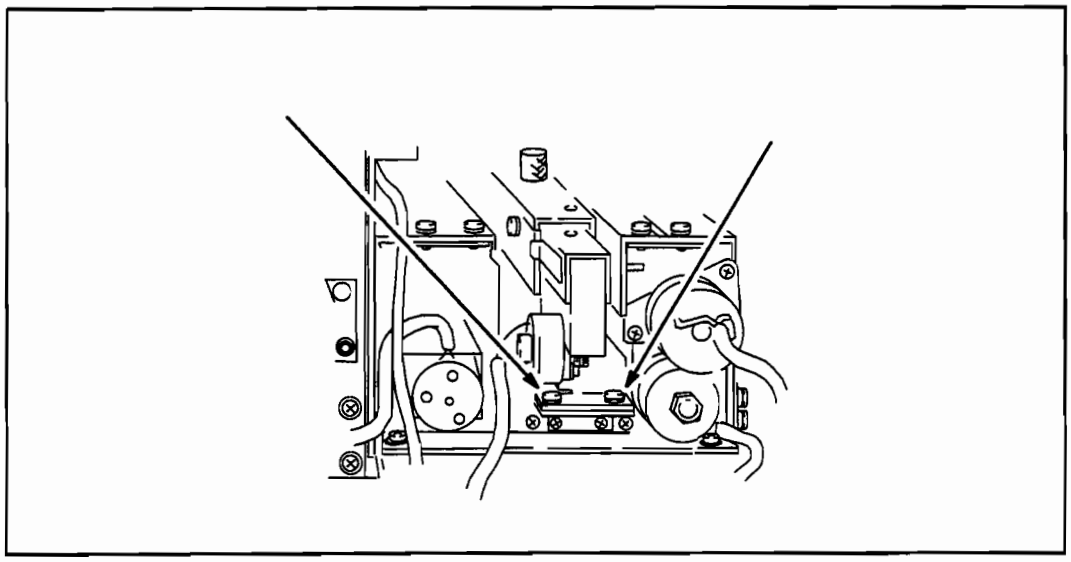

Figure 6-89. Y-axis Cutter Assembly (Right End)

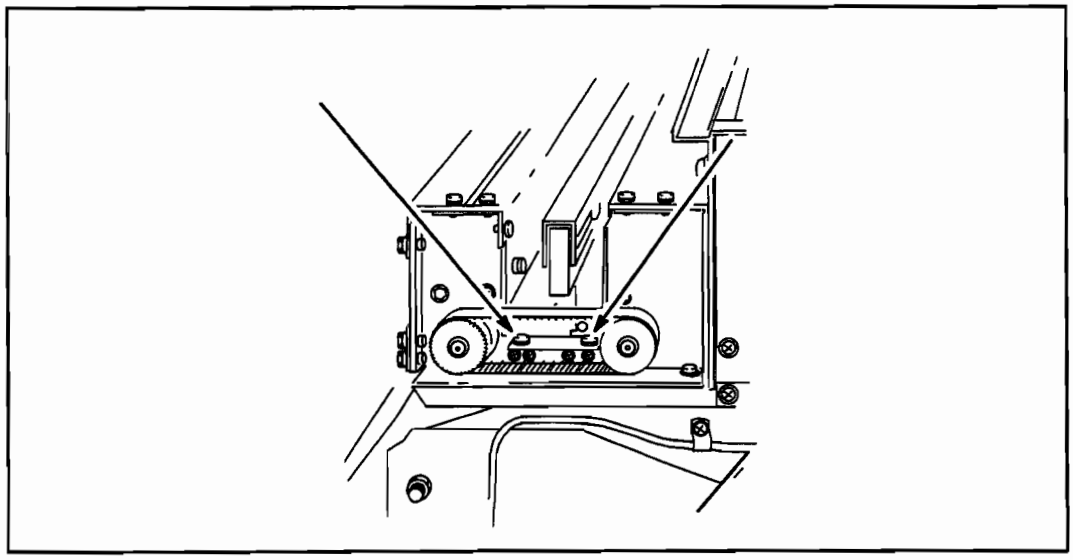

Figure 6-90. Y-axis Cutter Assembly (Left End)

NOTE

Before installing the new cutter, ensure that the cutter blade is positioned correctly. See Figure 6-92.

7. To replace the Y-axis cutter assembly, reverse this procedure.

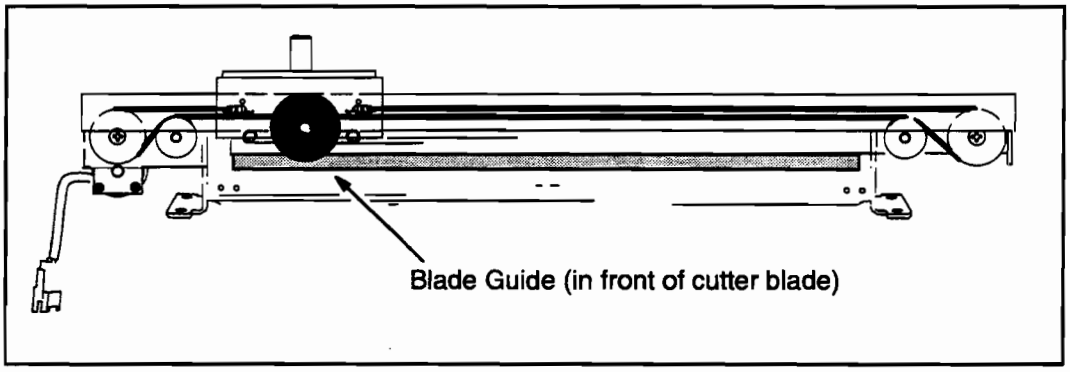

Figure 6-91. Y-axis Cutter Assembly

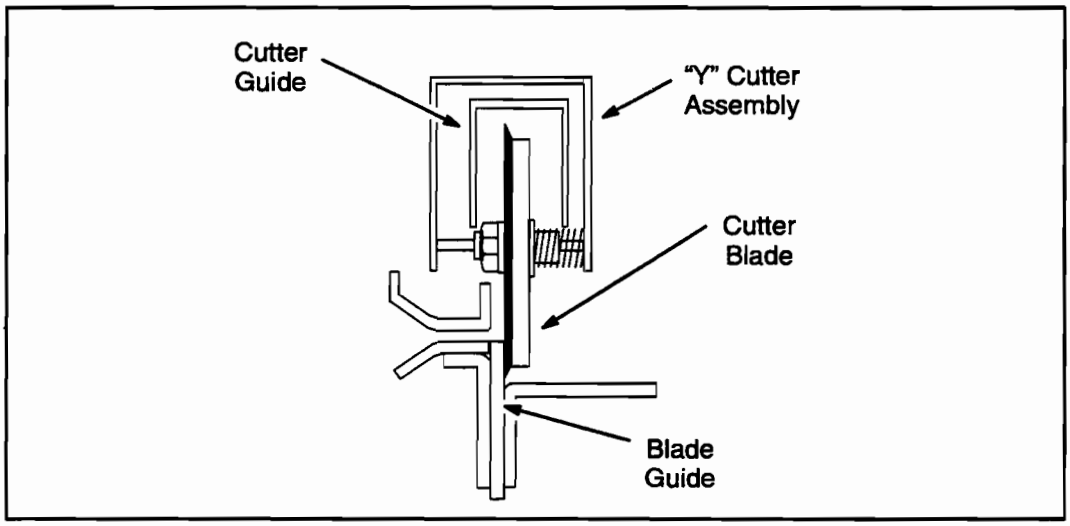

Figure 6-92. Cutter Blade Positioning

6-154. LEFT- AND RIGHT-CUTTER SWITCHES (SSW17 AND SSW18) (Models 250/255)

6-155. To remove the left- and right-cutter sensor switch assembly, proceed as follows:

1. Switch the plotter OFF (**O**) and disconnect the ac power cord and interface cable.
2. Raise the top cover to the fully opened position.
3. Remove the Y-axis cutter assembly. Refer to the Y-axis Cutter procedure starting at paragraph 6-152.
4. Remove the cable ties holding the switch cables to the cutter.
5. Remove the bracket mounting screw securing each switch to the cutter. Figure 6-93 illustrates the right end. The left end is identical.
6. To replace the sensor switch assembly, reverse this procedure.

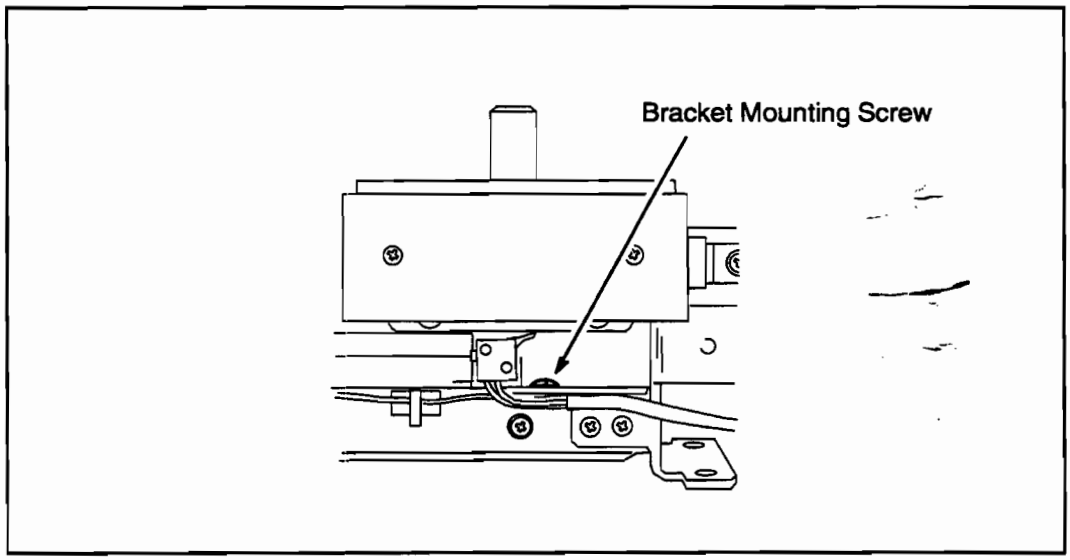

Figure 6-93. Right-Hand Sensor Switch

6-156. VECTOR-TO-RASTER CONVERTER (VRC) (Models 240D/E and 250/255)

CAUTION

Rough handling of the VRC could cause damage to the 40 Mbyte hard disk drive.

NOTE

Whenever the VRC is removed for servicing, the VRC fan filters must be cleaned if they are dirty. Cleaning should also be done on a regular basis as recommended in the cleaning procedure, VRC FAN FILTERS, in chapter 4 of this manual.

6-157. To accomplish the removal and replacement of the VRC refer to chapter 3 paragraph 3-27. Perform steps 1 and 2. Then disconnect the VRC interface and external controller connectors at the front of the old VRC. Working from the rear of the plotter, disconnect the VRC power cord from the old VRC, and remove it. Starting at step 4, perform the remaining steps of the procedure to install the new VRC.

6-158. VRC TOP COVER

6-159. To remove the VRC top cover, perform the following procedure:

CAUTION

Rough handling of the VRC could cause damage to the 40 Mbyte hard disk drive contained inside the VRC.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord.
2. Remove the VRC. If necessary, refer to the Vector-to-Raster Converter (VRC) procedure starting on paragraph 6-156.
3. Using a 2 pt. Pozidriv screwdriver, remove the 22 VRC top cover mounting screws. See Figure 6-94.
4. Remove the VRC top cover.
5. To replace the VRC top cover, reverse this procedure.

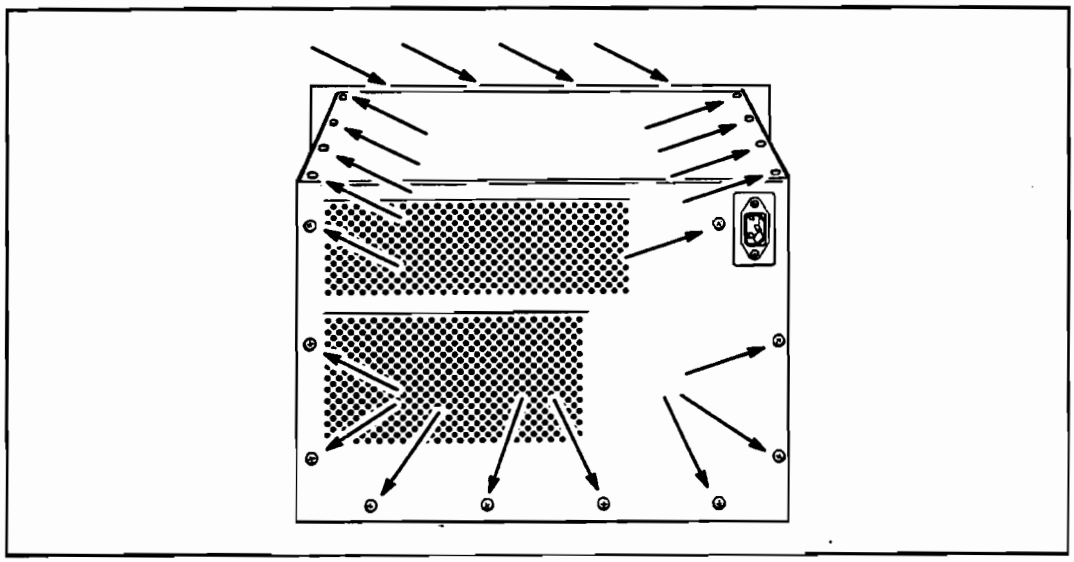

Figure 6-94. VRC Top Cover Screws

6-160. VRC PCAs

6-161. To remove the VRC PCAs, perform the following procedure:

NOTE

This procedure applies to the Processor PCA, DMA I/O PCA, Disk Control PCA, and SWATH RAM PCA.

CAUTION

Rough handling of the VRC could cause damage to the 40 Mbyte hard disk drive contained inside the VRC.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord.
2. Remove the VRC. If necessary, refer to the Vector-to-Raster Converter (VRC) procedure starting on paragraph 6-156.
3. Remove the VRC top cover. If necessary, refer to the VRC Top Cover procedure starting on paragraph 6-158.
4. Using a 2 pt. Pozidriv screwdriver, remove the two PCA retaining bracket mounting screws and the retaining bracket.

5. Remove the desired PCA. See Figure 6-95.

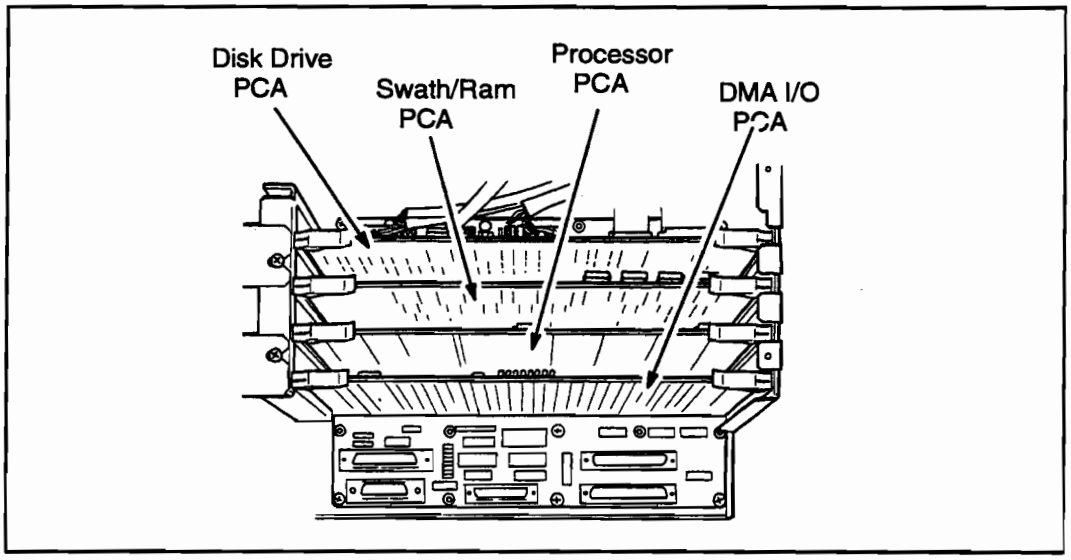

Figure 6-95. VRC PCA Removal

6-162. VRC MAIN INTERCONNECT PCA

6-163. To remove the VRC main interconnect PCA, perform the following procedure:

CAUTION

Rough handling of the VRC could cause damage to the 40Mbyte hard disk drive contained inside the VRC.

1. Switch the plotter OFF (O) and disconnect the ac power cord.
2. Remove the VRC from the Plotter. If necessary, refer to the Vector-to-Raster (VRC) removal procedure starting on paragraph 6-156.
3. Remove the VRC top cover. If necessary, refer to the VRC Top Cover procedure starting on paragraph 6-158.
4. Remove the VRC PCAs. If necessary, refer to the VRC PCAs procedure starting on paragraph 6-160.
5. Using a 2 pt. Pozidriv screwdriver, remove the front cover mounting screws and remove the front cover. See Figure 6-96.

6. Using a 3/16 in. nut driver, remove the six screws that secure the VRC I/F, CTRL I/F, and RS-232-C connectors. See Figure 6-96.

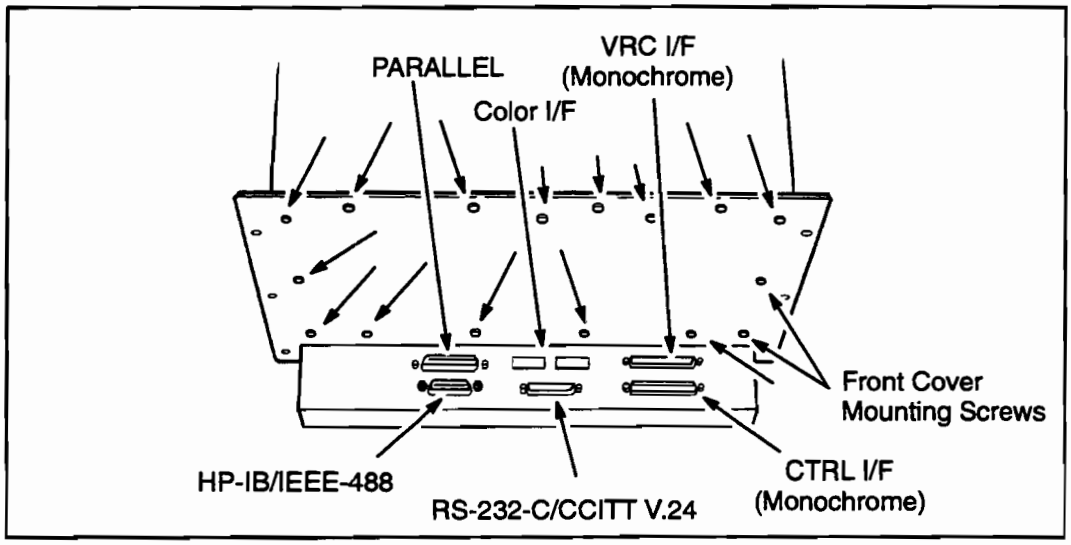

Figure 6-96. VRC Front Cover Removal

7. Using a 9/32 in. nut driver, remove the two screws that secure the HP-IB/IEEE-488 connector.

8. Using a 1 pt. Pozidriv screwdriver, remove the two screws that secure the PARALLEL connector.

9. Carefully remove the interface panel.

10. Remove all cable connectors from the VRC Main Interconnect PCA. See Figure 6-97.

11. Using a 2 pt. Pozidriv screwdriver, remove the screws that mount the VRC Main Interconnect PCA to the bottom of the VRC.

12. Lift the PCA up slightly and slide it out through the front of the VRC.

13. To replace the VRC Main Interconnect PCA, reverse this procedure.

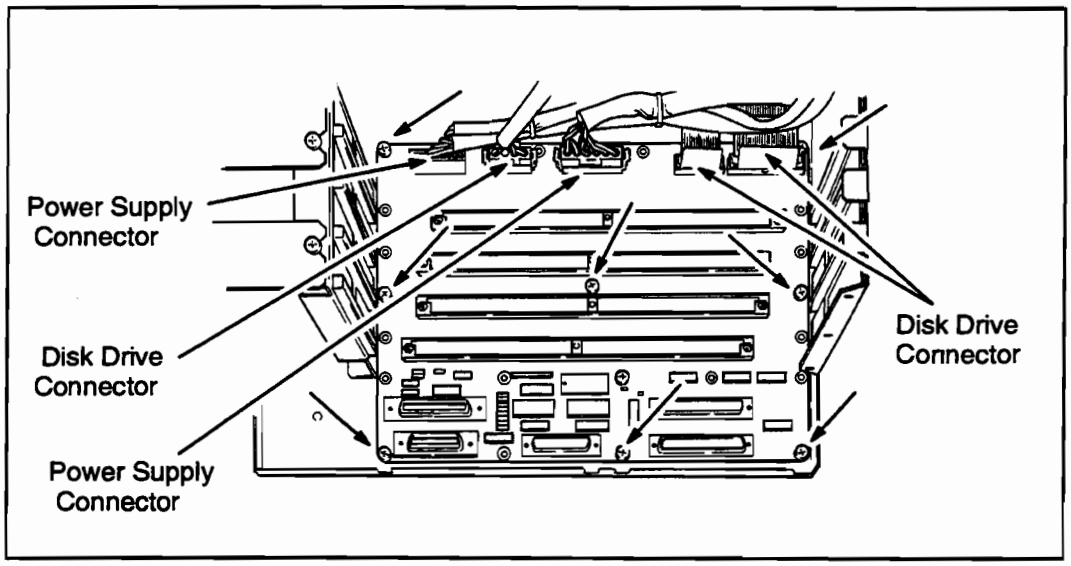

Figure 6-97. Main Interconnect PCA Removal

6-164. VRC POWER SUPPLY

6-165. To remove the VRC power supply, perform the following procedure:

CAUTION

Rough handling of the VRC could damage the 40 Mbyte hard disk drive contained inside the VRC.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord.
2. Remove the VRC. If necessary, refer to the Vector-to-Raster Converter (VRC) procedure starting on paragraph 6-156. .
3. Remove the VRC top cover. If necessary, refer to the VRC Top Cover procedure starting on paragraph 6-158. .

4. Reach into the back of the VRC and disconnect J1 and J3 connectors from the main interconnect PCA and release the cable from the tie located on the right side. See Figure 6-98.

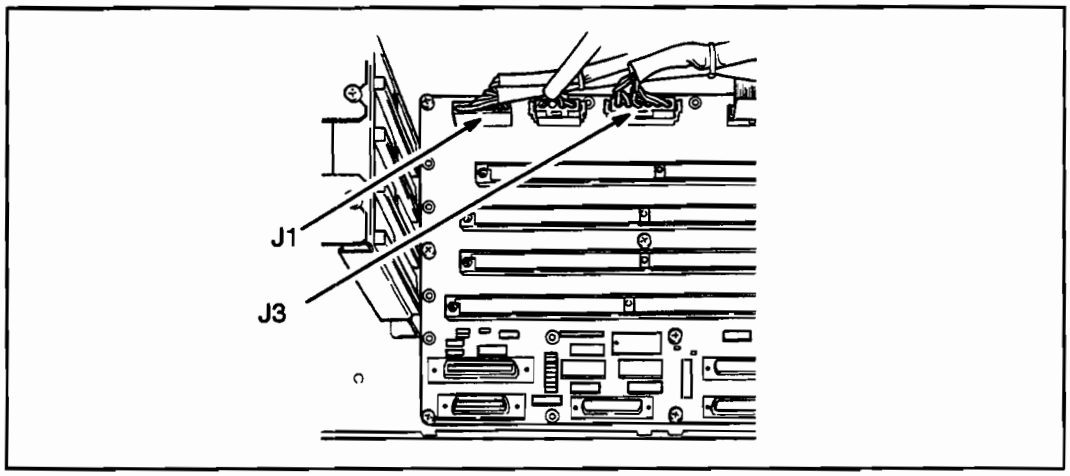

Figure 6-98. J1 and J3 Connectors

5. Disconnect the power receptacle wires at TB1 of the power supply by pulling up on the connectors. See Figure 6-99.

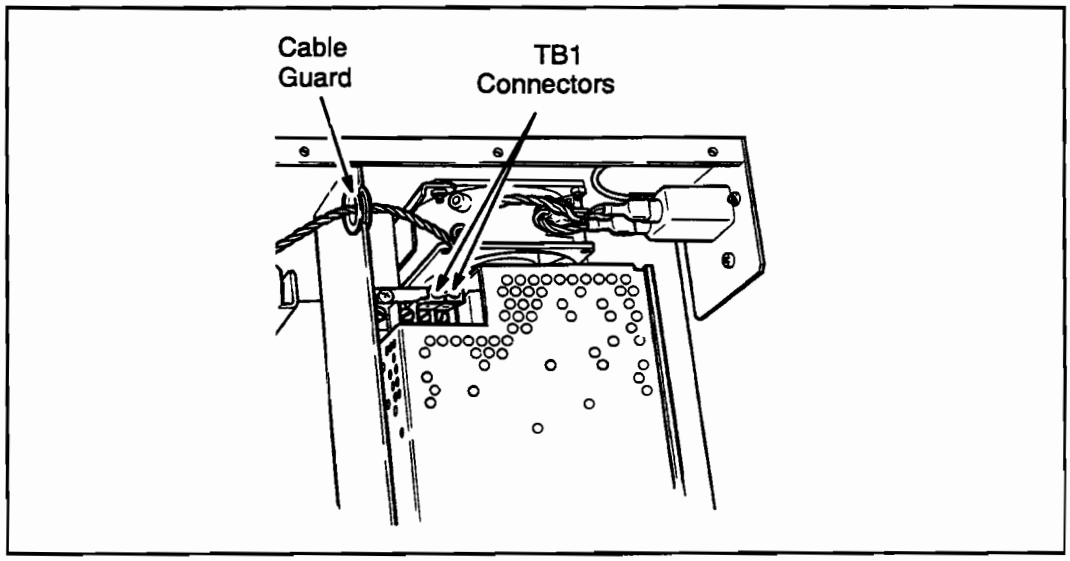

Figure 6-99. Power Receptacle Wiring

6. Remove the connector cable guard from the right side of the mounting bracket.

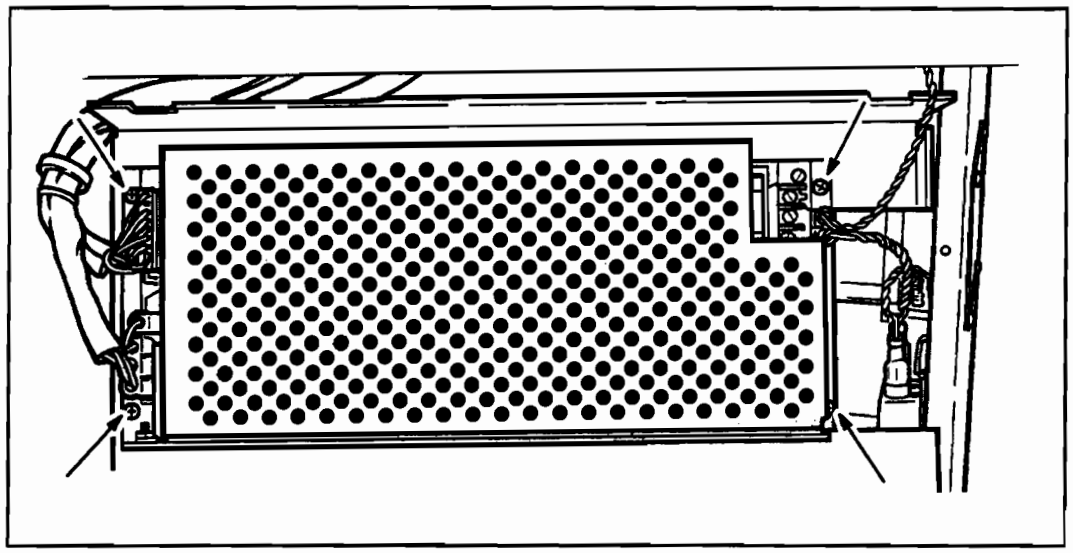

Figure 6-100. Power Supply Mounting Screws

7. Using a 2 pt. Pozidriv screwdriver, remove the four power supply screws. See Figure 6-100.

8. Carefully lift the power supply from the VRC.

9. Remove the power supply cable from the power supply.

10. To replace the VRC power supply, reverse this procedure.

6-166. DISK DRIVE ASSEMBLY

6-167. To remove the disk drive assembly, perform the following procedure:

CAUTION

Rough handling of the VRC could cause damage to the 40 Mbyte hard disk drive contained inside the VRC.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord.

2. Remove the VRC. If necessary refer to the Vector-to-Raster Converter (VRC) procedure starting on paragraph 6-156.

3. Remove the VRC top cover. If necessary refer to the VRC Top Cover procedure starting on paragraph 6-158.

4. Disconnect the disk drive connectors. See Figure 6-101.

5. Set the VRC on its right side (as viewed from the front).

CAUTION

Removing the disk drive mounting screws will allow the disk drive to fall inside the VRC.

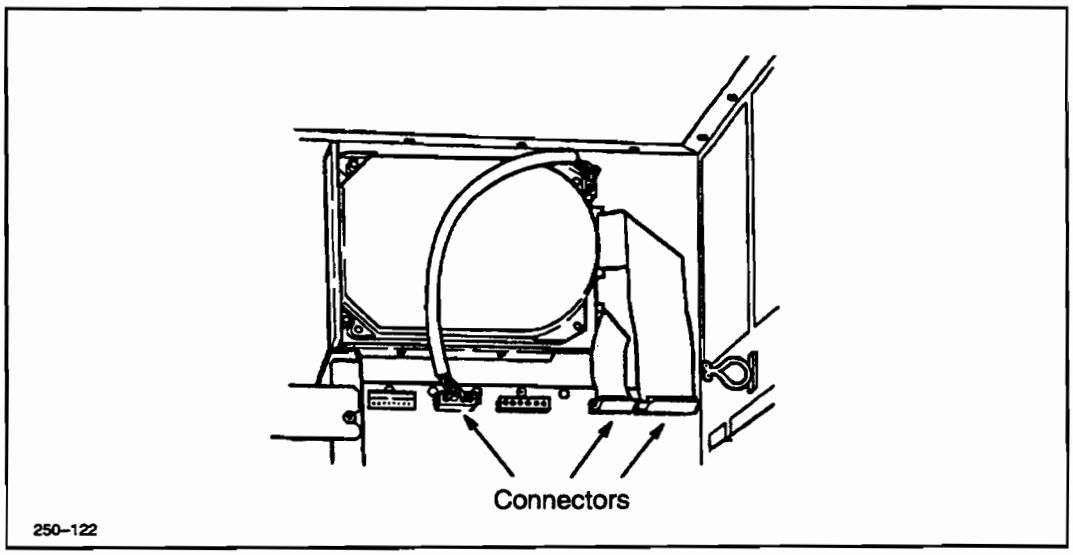

Figure 6-101. Disk Drive Connectors

6. While supporting the disk drive inside the VRC, use a 2 pt. Pozidriv screwdriver, remove the four mounting screws on the bottom of the VRC that secure the disk drive assembly to the VRC frame. See Figure 6-102.

7. Carefully remove the disk drive assembly from the VRC frame.

8. Remove the disk drive cables from the disk drive.

NOTE

Before replacing the old disk drive assembly with the new one, ensure that the jumpers on the new assembly are connected exactly as the jumpers were connected on the old assembly.

9. To replace the disk drive assembly, reverse this procedure.

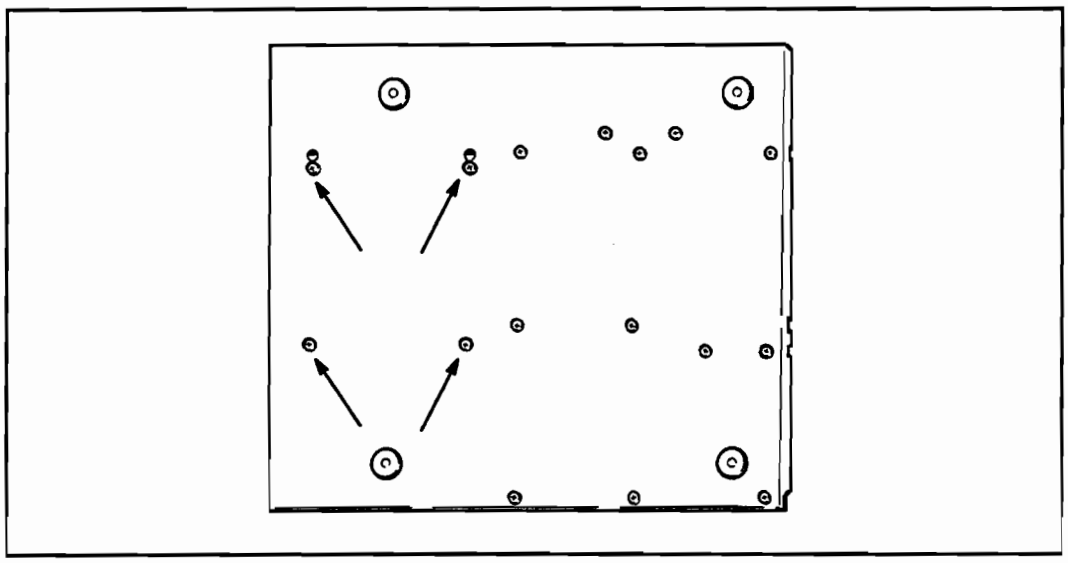

Figure 6-102. Disk Drive Removal

NOTE

Before replacing the old disk drive assembly with a new one, ensure that the jumpers on the new assembly are configured properly. See Figure 6-103. Also, ensure that the VRC fan filters are clean and the fans are fully functional. Clogged filters or faulty fans will cause an increase in VRC temperature and may cause premature hard disk failure.

6-168. VRC POWER CORD RECEPTACLE

6-169. To remove the VRC power cord receptacle, perform the following procedure:

CAUTION

Rough handling of the VRC could cause damage to the 40 Mbyte hard disk drive contained inside the VRC.

1. Switch the plotter OFF (**O**) and disconnect the ac power cord.

2. Remove the VRC. If necessary refer to the Vector-to-Raster Converter (VRC) procedure starting on paragraph 6-156.

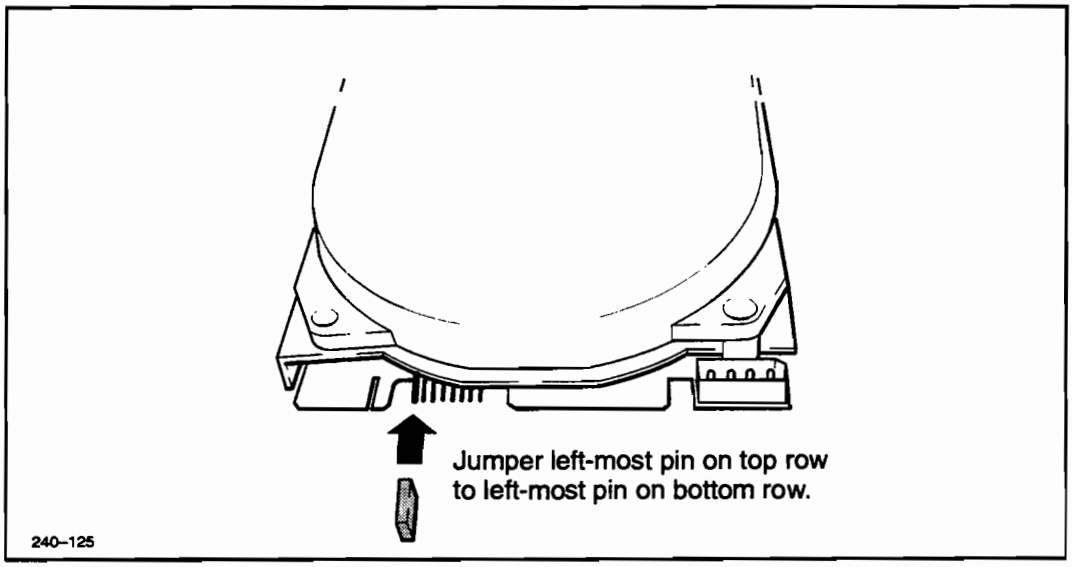

Figure 6-103. Disk Drive Jumper Configuration

3. Remove the VRC top cover. If necessary refer to the VRC Top Cover procedure starting on paragraph 6-158.

4. Using a 9/32 in. nut driver, remove the receptacle ground wire mounting nut and disconnect the ground wire from the side of the chassis. See Figure 6-104.

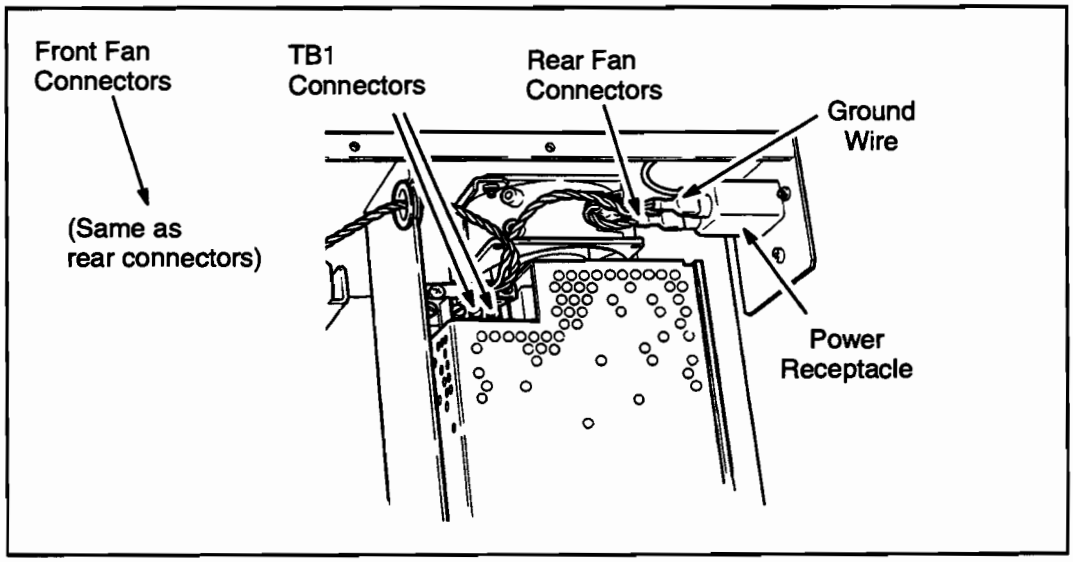

Figure 6-104. Power Receptacle Wiring

5. Disconnect the receptacle wire connectors from the front and rear fans. See Figure 6-104.

6. Disconnect the receptacle wire connections at TB1 on the power supply. See Figure 6-104.

7. Using a 1 pt. Pozidriv screwdriver, remove the two receptacle mounting screws. See Figure 6-105.

8. Remove the receptacle.

9. To replace the power cord receptacle, reverse this procedure.

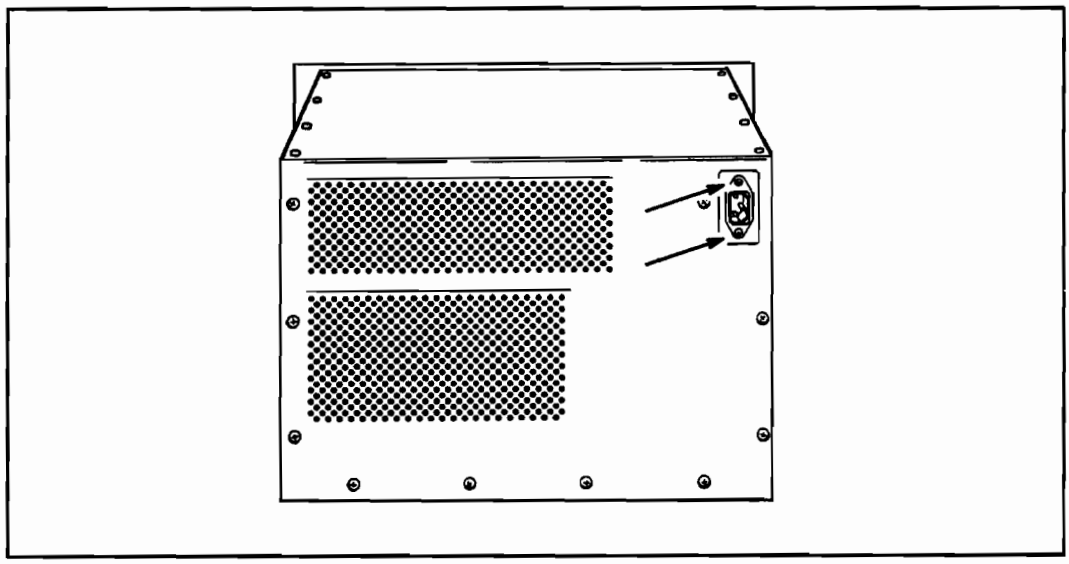

Figure 6-105. Receptacle Removal

6-170. VRC FANS

6-171. To remove either of the VRC fans, perform the following procedure:

1. Switch the plotter OFF (O) and disconnect the ac power cord.

2. Remove the VRC. If necessary refer to the Vector-to-Raster Converter (VRC) procedure starting on paragraph 6-156.

3. Remove the VRC top cover. If necessary refer to the VRC Top Cover procedure starting on paragraph 6-158.

4. Note the orientation of the fan(s) and the associated wiring. Remove the electrical connection from the fan(s). See Figure 6-106.

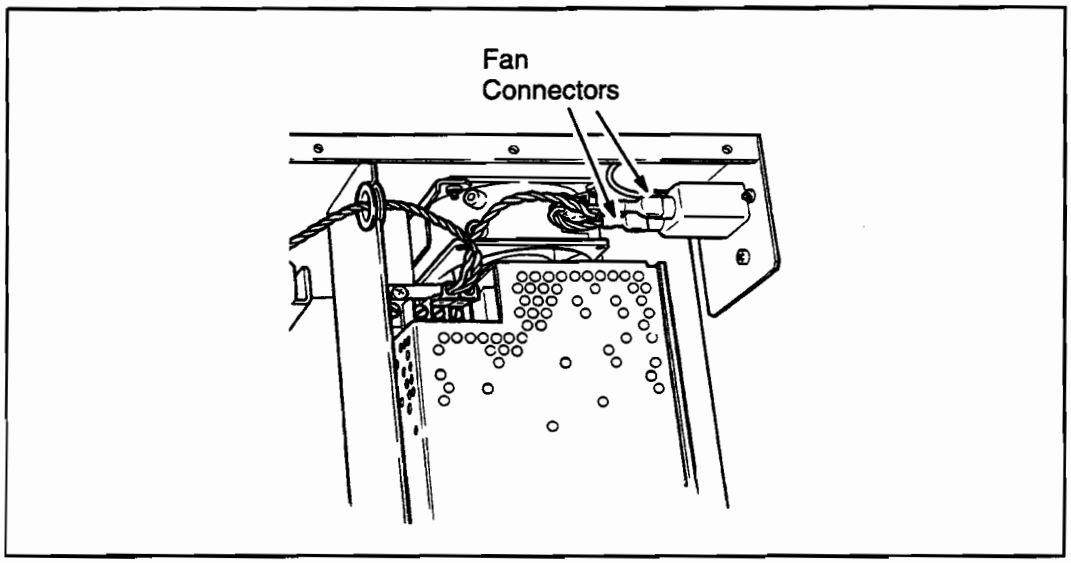

Figure 6-106. VRC Fan Wiring

NOTE

Removing the fan mounting screws without holding on to the fan from the inside of the VRC will allow the fan, nut plate, and hex nut and to fall inside the VRC.

5. Using a 2 pt. Pozidriv screwdriver, remove the four screws that mount the fan, fan screen, and bracket to the VRC chassis. See Figure 6-107.

6. To replace either of the VRC fans, reverse this procedure.

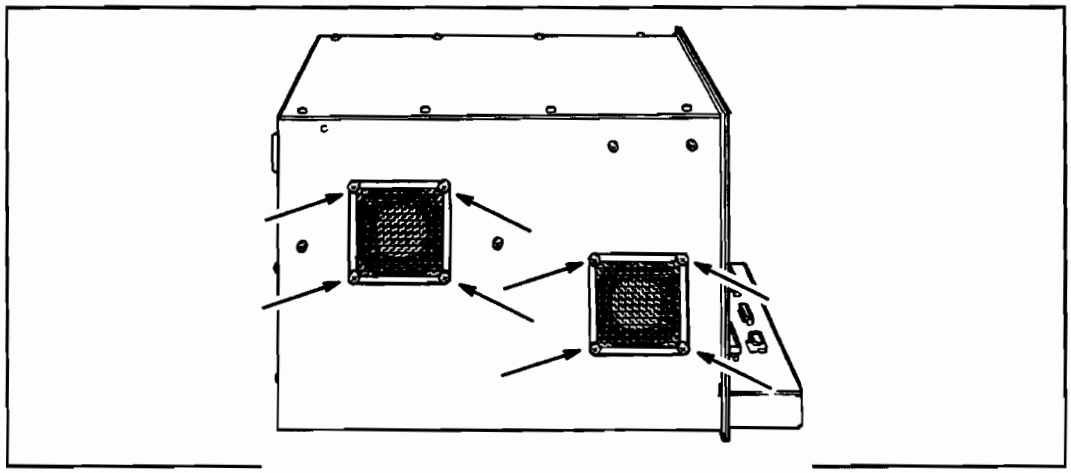

Figure 6-107. VRC Fan Removal

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CHAPTER 7
ADJUSTMENTS

7-1. INTRODUCTION

7-2. This chapter describes the adjustments used to maintain the HP Models 240D/E and 250/255 plotters, or to return the plotters to a proper operating condition after repairs have been made.

7-3. SAFETY CONSIDERATIONS

7-4. The HP Models 240D/E and 250/255 have been designed in accordance with accepted safety standards. Safety symbols used with Hewlett-Packard instruments are contained in the front matter of this manual. These symbols must be reviewed before service work is performed. Also, refer to Chapter 6 for ESD considerations.

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.

7-5. REQUIRED TOOLS AND EQUIPMENT

7-6. The tools and equipment required for the following adjustment procedures are listed in Table 7-1.

7-7. ORDER OF ADJUSTMENTS

7-8. The following adjustments are not interactive, and can be performed singly or in any sequence.

Table 7-1. Required Tools and Equipment

TOOLS/EQUIPMENT	DESCRIPTION
Screwdrivers	Pozidriv #2 Phillips #2 Phillips #2 offset Common large Common small, insulated
Allen Wrench	2 mm, 3 mm, & 4 mm
Scale, machinist	152 mm (6 in.)
Metric Scale	150 mm
Gram Scale (0 to 5 kg)	HP 8750-0384
Voltmeter	HP 427A or equivilant.

7-9. MECHANICAL ADJUSTMENTS

7-10. DRIVE MOTOR BELT TENSION (Models 240D/E and 250/255)

7-11. To adjust the motor belt, perform the following procedure:

1. Turn the plotter line switch to OFF (O) and disconnect the ac power cord.
2. Remove the front PCA shield. If necessary, refer to the Front PCA Shield procedure starting on paragraph 6-23.
3. Using a 4 mm Allen wrench, loosen the four screws on the motor mounting plate. See Figure 7-1.
4. Adjust the belt tension by moving the motor position until the belt can be flexed 2 mm $\pm$ 0.5 mm at 170 grams.
5. Tighten the motor mounting screws.

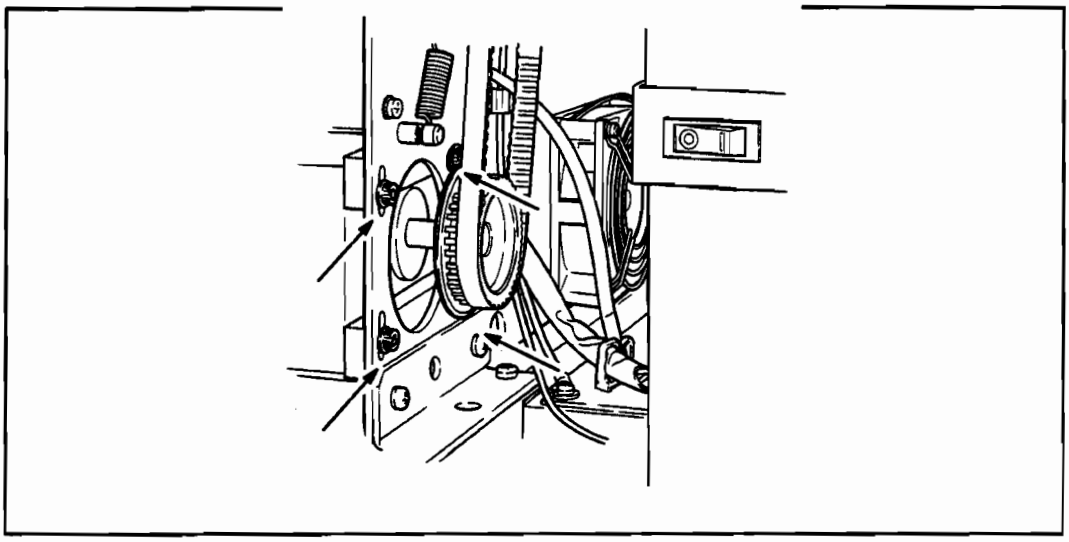

Figure 7-1. Motor Belt Adjustment

7-12. WRITING HEAD ADJUSTMENT (HORIZONTAL) (Models 240D/E and 250/255)

7-13. Horizontal adjustment of the writing head, may be performed as follows:

1. Load media into the plotter.

2. Switch the plotter ON (I) and perform the factory demonstration plot. If necessary, refer to the Running the Demonstration Plot procedure starting on paragraph 3-78. for Models 240D/E and paragraph 3-82. for the Models 250/255.

3. Using a metric scale, measure the distance between the left edge of the media 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).

4. Turn the plotter line switch to OFF (O) and disconnect the ac power cord.

5. Raise the top cover to the fully opened position.

6. Raise the upper frame by pulling the release lever, located in the near right corner of the upper frame, towards you. See Figure 7-2.

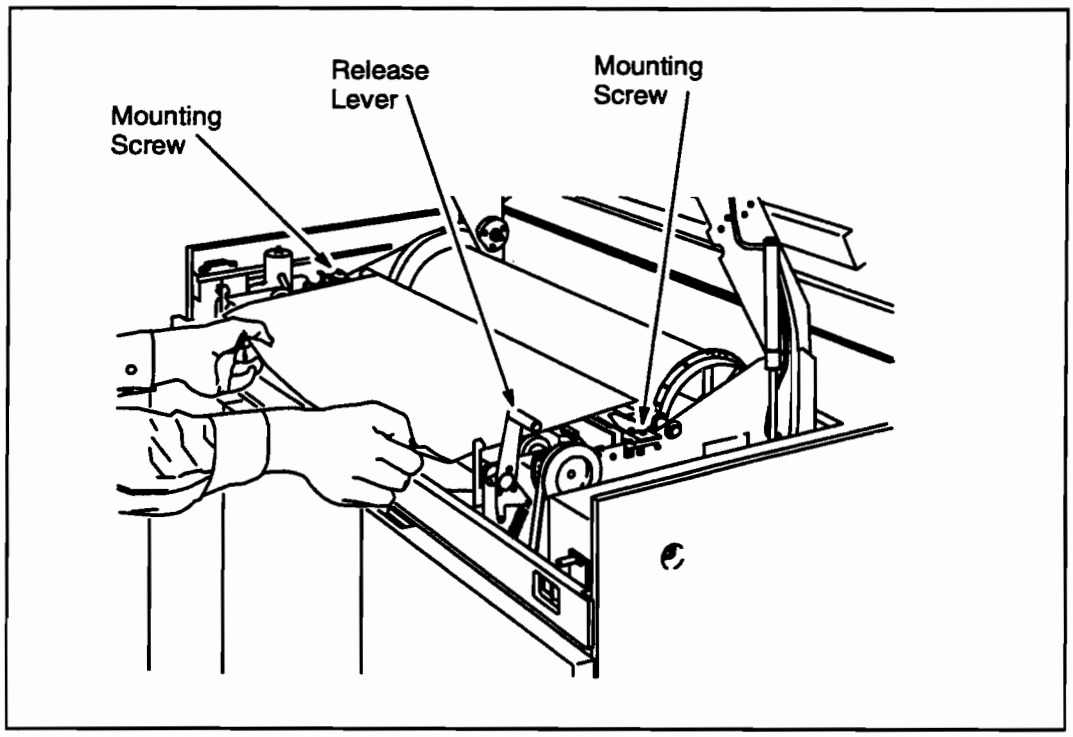

Figure 7-2. Writing Head Adjustment

7. Using a #2 Phillips screwdriver, loosen the mounting screw located at each end of the writing head. Refer to Table 10-5, item 18 and see Figure 10-5 for Models 240D/E. Refer to Table 10-15, item 18 and see Figure 10-15 for Models 250/255..

8. Using a 3 mm Allen wrench, loosen the two center bracket mounting screws. Refer to Table 10-5, item 38 and see Figure 10-5 for Models 240D/E. Refer to Table 10-15, item 38 and Table 10-15 for Models 250/255.

9. Adjust the writing head to the amount equal to the difference between the actual distance from the edge of the media to the image area, and 9 mm.

10. Tighten the mounting screw at each end of the writing head and the two Allen screws on the center bracket.

11. Load media into the plotter.

12. Switch the plotter ON (I) and perform the Factory Demonstration Plot again.

13. If necessary, repeat this procedure until the adjustment is correct.

7-14. CENTER BEARING ADJUSTMENT (Models 240E and 255 Only)

7-15. Media skew problems may be caused by a misadjusted center bearing. The adjustment procedure is as follows:

NOTE

When performing this adjustment, it must be understood that there are several causes for media skew failures. If you have adjusted the center bearing per this procedure, but media skew failures are still present, follow the troubleshooting procedures in chapter 8.

1. Turn the plotter OFF (**O**) and disconnect the ac line cord.

NOTE

While working on the plotter, always leave a section of media over the writing head to prevent any possible damage to the head.

2. Raise the top cover and raise the upper frame.

3. Remove the media or wind excess media onto the supply reel.

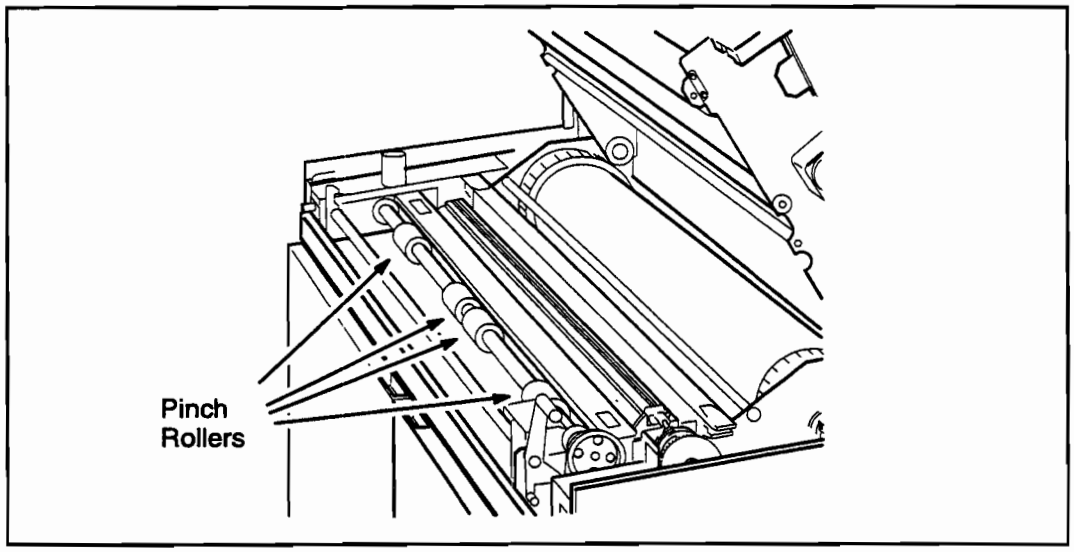

Figure 7-3. Media Rollers

4. Loosen the 3 mm Allen head lock screw (Figure 7-4, item 1) and the three (3) adjusting screws (Figure 7-4, items 2, 3, and 4) on the center bearing support two (2) turns each.

5. Close and latch the upper frame, making sure that the drive gears are properly meshed.

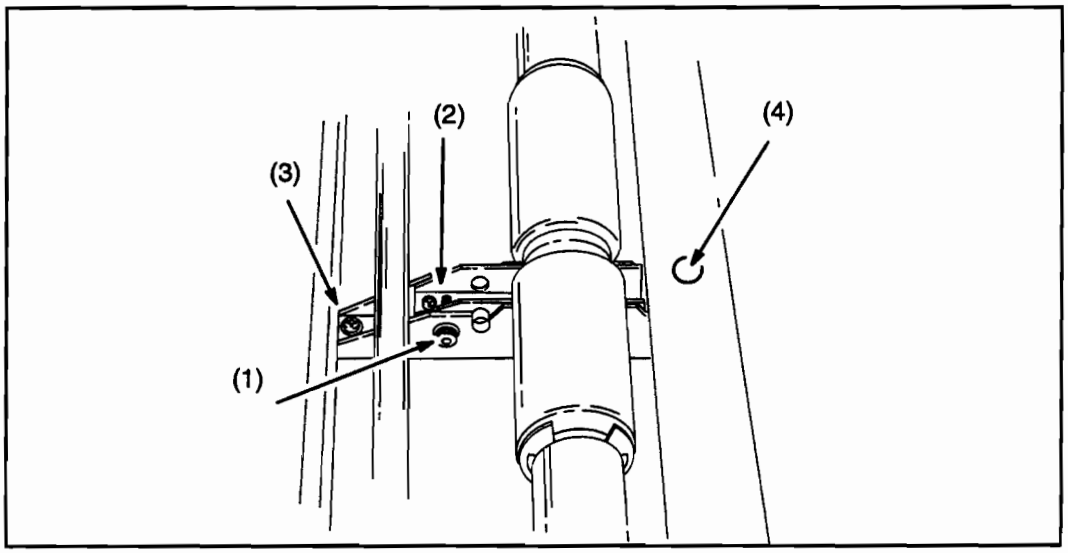

Figure 7-4. Center Bearing Adjustment

6. By turning the vertical adjustment screw (Figure 7-4, item 2) clockwise, slowly raise the center bearing support while manually moving the entire support assembly from front to back. Keep the support assembly centered; so it will not rub against the two center rollers. As the bearing support is raised, all front-to-back movement (play) will be removed.

NOTE

To assure a correct adjustment, raise the center bearing adjustment screw until both center rollers touch the pinch roller with enough pressure to stop turning while performing step 7. Many of the rollers are not concentric and may slip a limited amount as you manually continue to turn them against the pinch roller.

7. While manually turning one of the two center rollers, continue to raise the center bearing support by turning the adjustment screw (Figure 7-4, item 2) clockwise until the CENTER roller which you are turning touches the pinch roller (mounted on the upper frame assembly) with enough pressure to stop turning.

8. Open the upper frame and tighten the vertical adjustment screw (Figure 7-4, item 2) another 1/2 turn.

9. Tighten the horizontal adjustment screws (Figure 7-4, items 3 and 4) and the lock screw (Figure 7-4, item 1) to secure the adjustment.

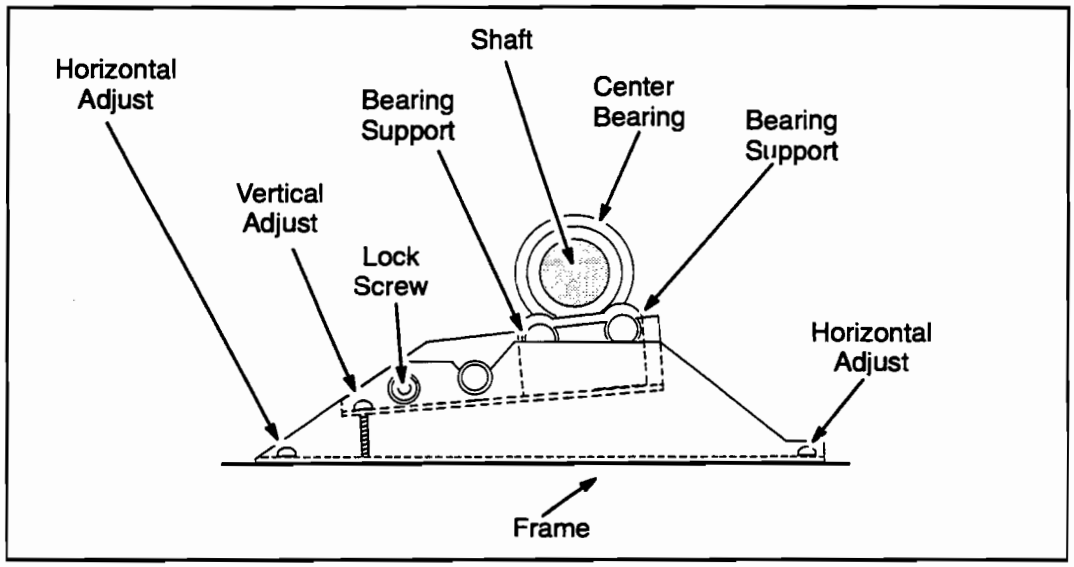

Figure 7-5. Center Bearing Support

NOTE

If the center bearing adjustment is raised too far, the drive gears will bind and/or slip, causing mechanical and possible registration problems.

10. Verify proper adjustment by installing media and performing a demonstration plot or print engine test plot via the test panel.

7-16. MEDIA CUTTER SLIP CLUTCH ADJUSTMENT (250/255 Only)

7-17. 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. To adjust the cutter slip clutch, perform the following steps:

CAUTION

Tension on the cutter clutch must be set so that the clutch will slip when the media is not being advanced. Over-tightening of the clutch will cause the motor to stall and possibly burn out.

1. Turn the plotter line switch ON (**I**).
2. Select the cutter from the front panel menu.
3. Using the front panel keys, advance approximately two (2) meters (6 feet) of media through the cutter without cutting it off.
4. Turn OFF (**O**) the plotter.
5. Cut the media at the scissor mark where the media comes out of the lower frame. See Figure 7-6.

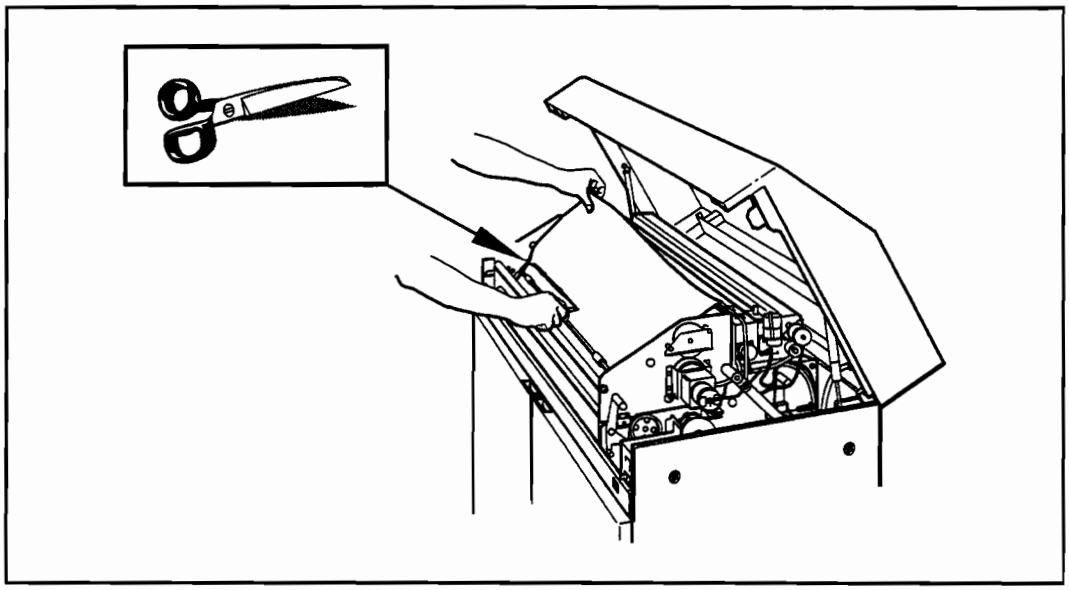

Figure 7-6. Cutting the Media at the Scissor Mark

6. Pull approximately 1/2 meter of media back through the cutter toward the front of the plotter and fold the media into a "V". See Figure 7-7. Fold the end of the media over several times and tape the folded end.

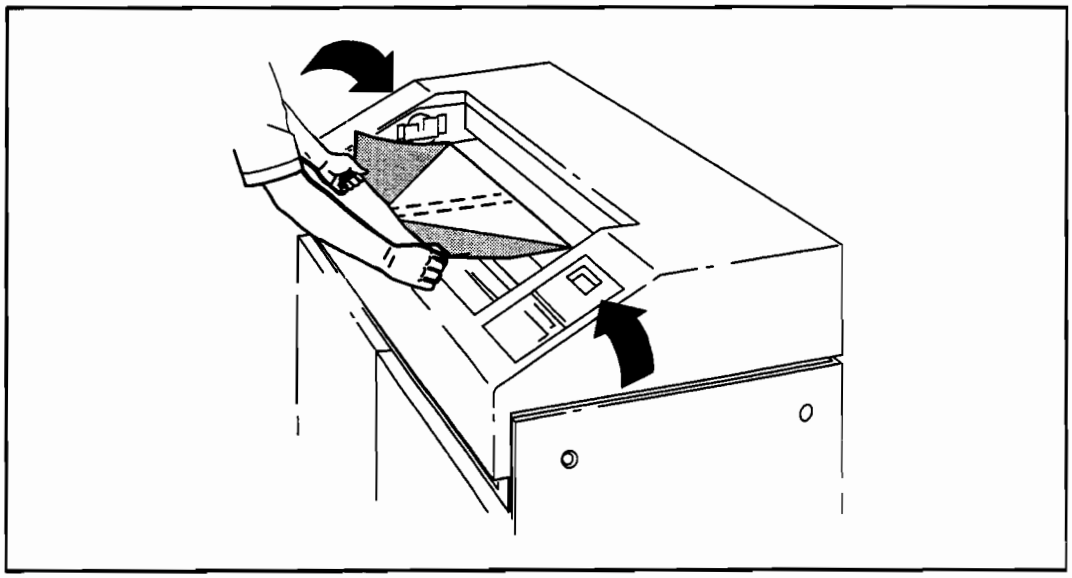

Figure 7-7. Folding the Media into a "V" for Cutter Slip Clutch Adjustment

7. Put a small hole through the media in the center and on the inside of the fold.

8. Using a zero (0) to five (5) kilogram gauge accurate to within $\pm$0.1 kg, attach the gauge to the media and pull the media (with the gauge) using just enough force to slowly pull the media out of the cutter at a constant speed. See Figure 7-8. When the media is being pulled through the cutter, the kilogram gauge should read 1.4 kg $\pm$0.3 kg. If pulling the media through the cutter requires more tension, use a 1.5 mm Allen wrench to loosen the set screw on the adjusting nut and loosen the cutter clutch nut in small increments until the 1.4 kg tension is reached. See Figure 7-9. If the tension required is less than 1.4 kg, tighten the cutter clutch nut until the 1.4 kg setting is reached. Once the adjustment is complete, tighten the cutter clutch nut set screw exactly where it is. DO NOT move the set screw to the flat side of the shaft!

NOTE

If a kilogram gauge is not available, the cutter clutch may be adjusted so that the clutch slips when a force of 2.0 kg/cm is applied to the cutter shaft. The motor must be held and prevented from turning while a torque wrench is used to turn the shaft by way of the adjustment nut. To achieve the 2.0 kg/cm tension it may be necessary to loosen the set screw on the adjustment nut and tighten or loosen the adjustment.

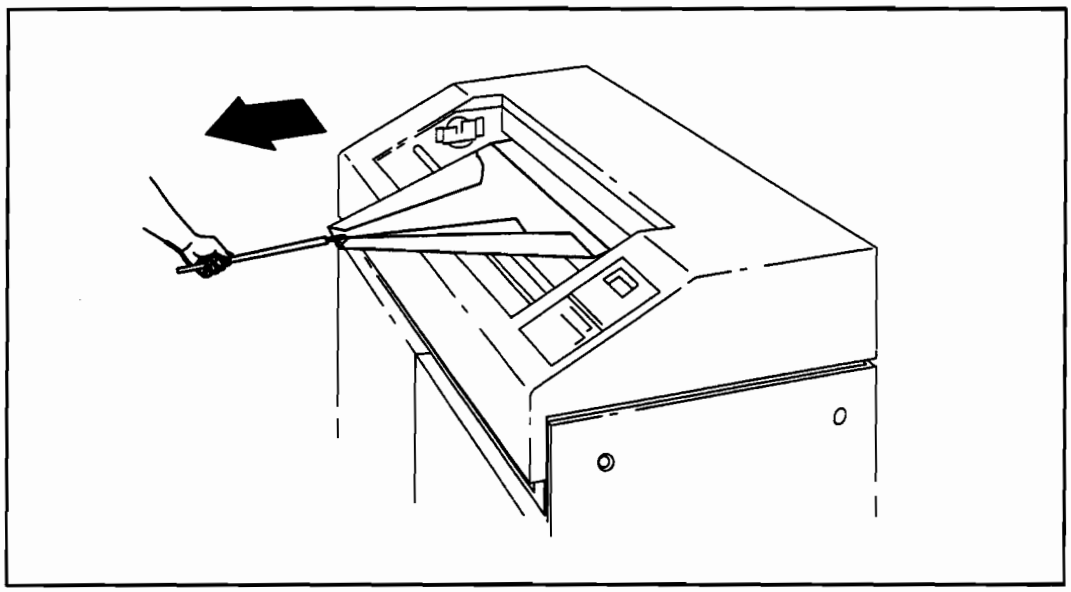

Figure 7-8. Measuring Cutter Slip Clutch Tension

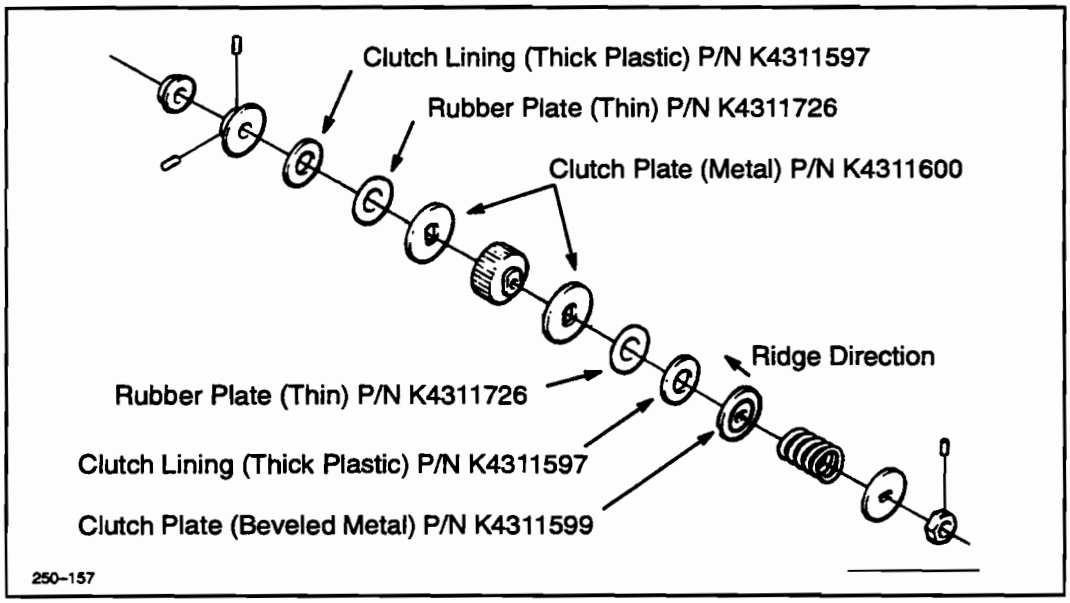

Figure 7-9. Cutter Clutch

NOTE

If the cutter clutch washers are in good condition, or have been replaced, and the media is still slipping or buckling through the cutter assembly, remove the rear paper eject roller assembly and test the plotter without it. If the plotter performs normally without it, repair or replace the assembly (sticky, worn, or dirty rollers).

7-18. MEDIA QUANTITY INDICATOR ADJUSTMENT (Models 240D/E and 250/255)

7-19. To adjust the media quantity indicator, perform the following steps:

1. Turn the plotter line switch to OFF (O) and disconnect the ac power cord.
2. Remove the left-side cover. Refer to the procedure in Chapter 6.
3. Raise the top cover to the fully opened position.
4. Raise the upper frame.
5. Remove the media spool from the plotter.
6. Observe the position of the lever arm shown in Figure 7-10. It will rest against the stop on the PCA bracket. The left edge of the lever arm should just clear the lower left media quantity sensor.
7. Reach into the media spool compartment and press and release the arm in the compartment.
8. Observe that the lever arm in Figure 7-10 moves freely through the center notches of the media quantity sensors.
9. If the lever arm touched the sensors at step 8., loosen the lever arm locking screw and slide the lever arm on the shaft to center the lever arm in the sensor notches. Tighten the locking screw and repeat steps 7. and 8. Repeat this procedure until the lever arm moves freely through the center notches of the sensors.
10. If the left edge of the lever arm did not just clear the lower left media quantity sensor at step 6., continue this procedure at step 11. Otherwise, move to step 13.
11. Loosen the two screws on the PCA bracket.
12. Move the PCA bracket until the left edge of the lever arm just clears the lower left media quantity sensor. Tighten the PCA bracket screws.

13. Install a full roll of media in the plotter.

14. Ensure that the lever arm in Figure 7-10 is clear of both media quantity sensors.

15. Close the upper frame and top cover, install the power cord, and switch the plotter line switch to ON (I). After the plotter has initialized, ensure that all of the media LEDs except the empty LED are lit.

16. Install the left-side cover.

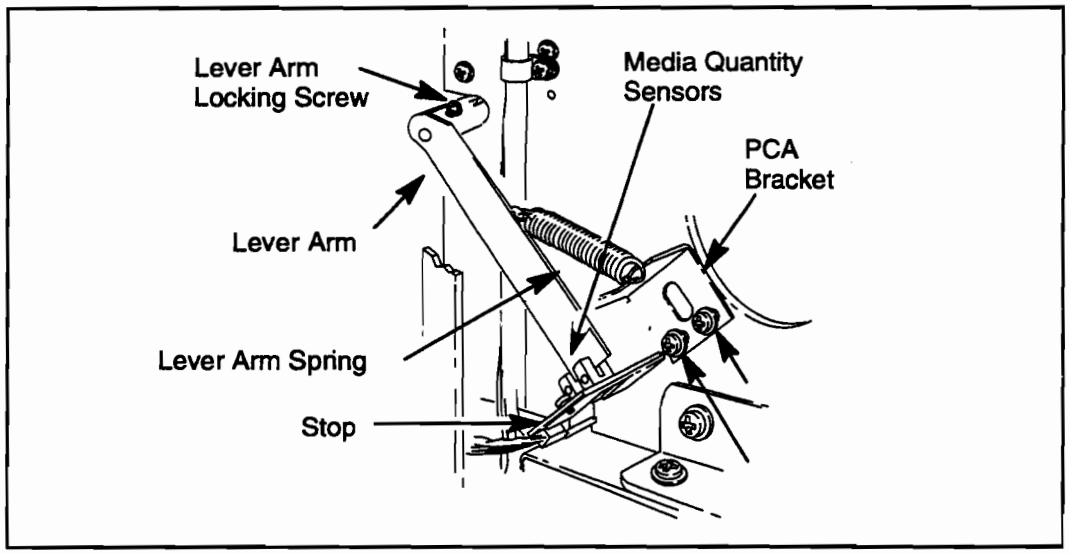

Figure 7-10. Media Quantity Indicator Adjustment

7-20. OUT-OF-MEDIA SWITCH (SSW4)ADJUSTMENT (Models 240D/E and 250/255)

7-21. The out-of-media switch requires adjustment if a false indication is given, or if the switch actuator is causing marks or tears on the media.To adjust the out-of-media switch, perform the following steps:

1. Switch the plotter line switch to OFF (O).

2. Raise the top cover to the fully opened position.

3. Raise the upper frame.

4. Locate the Out-of-Media actuator at the right of the upper frame. See Figure 7-11, Detail A.

5. Listening carefully, push up on the switch actuator. The switch should "click" before the actuator has been pushed fully up into the shaft (See Figure 7-11, Detail B).

6. There must be sufficient play in the switch so that the actuator may be pushed up flush with the shaft. See Figure 7-11, Detail C.

7. If both these conditions are not met, the switch must be adjusted.

8. Remove the back cover. Refer to the procedure in Chapter 6.

9. Locate the switch mounting bracket to the left, looking from the back of the plotter. See Figure 7-12.

10. Using a #2 Phillips screw driver, loosen the switch bracket mounting screws.

11. Adjust the switch mounting bracket and recheck steps 5. and 6.

12. Tighten the mounting screws.

13. Load media into the plotter.

14. Close the upper frame.

15. Close the top cover.

16. Power up the plotter.

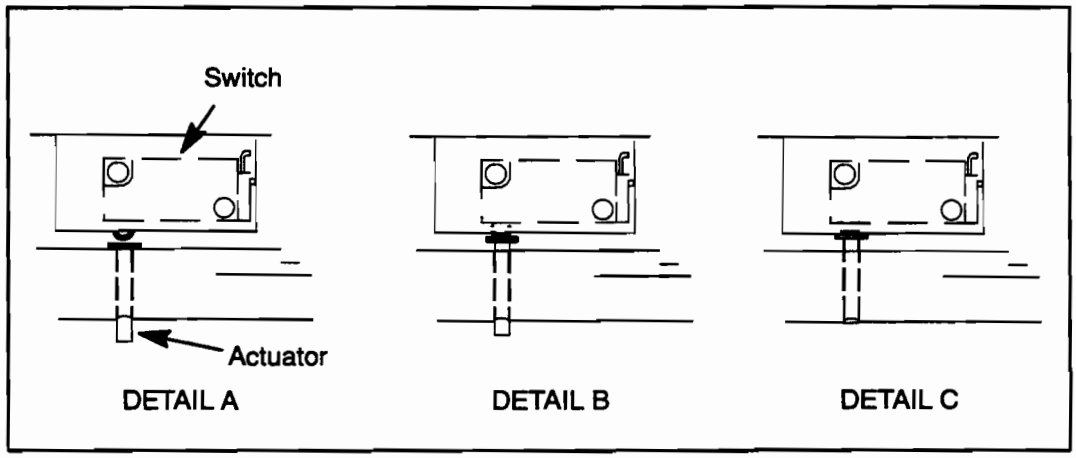

Figure 7-11. Out-of-Media Switch

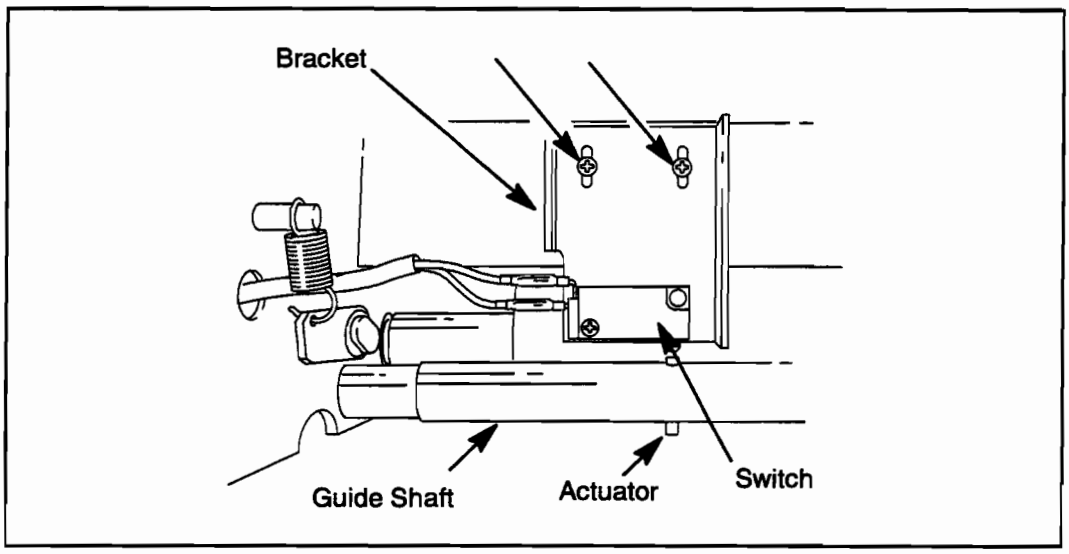

Figure 7-12. Out-of-Media Sensor Adjustment

17. After initialization, check for normal operation.

7-22. CUTTER TIMING ADJUSTMENT (Models 250/255 Only)

7-23. 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 7-13.

7-24. When replacing the RMC PCA, set the rotary switches on the new PCA to the same position as those on the PCA being removed.

7-25. Adjustment of the timing is made as follows:

1. Turn the plotter OFF (**O**).
2. Disconnect the ac line cord and the interface cable.
3. Remove the right-hand end cover.
4. Set DSW2 segment 8 ON.
5. Apply power and turn the plotter ON (**I**).
6. Press the spring loaded cutter test switch on the test panel once. The red LED will light.
7. The plotter will generate a cutter test pattern (see Figure 7-14), advance and cut the media at 90 mm (3.54 in.).

8. Replace the right-hand end cover.

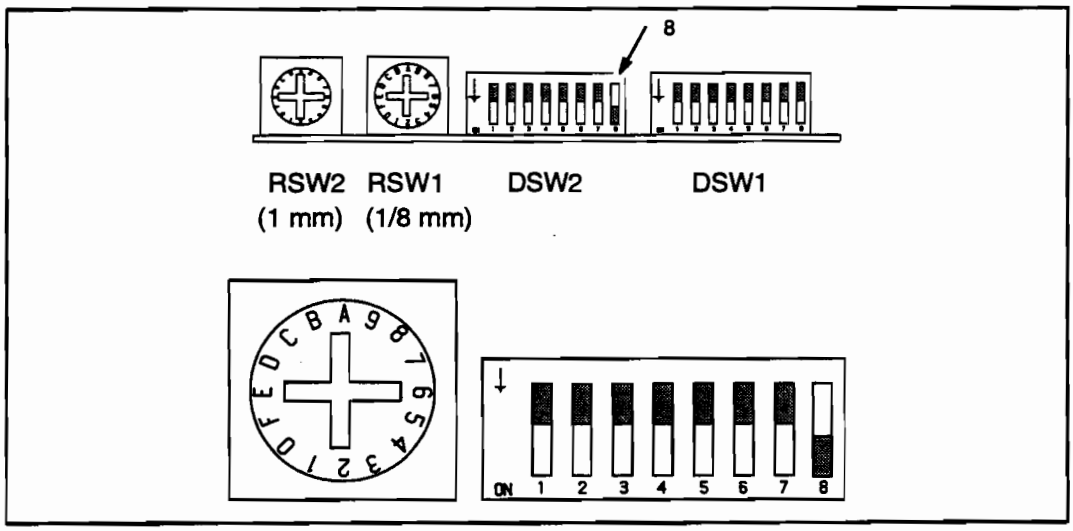

Figure 7-13. Cutter Position Adjustment

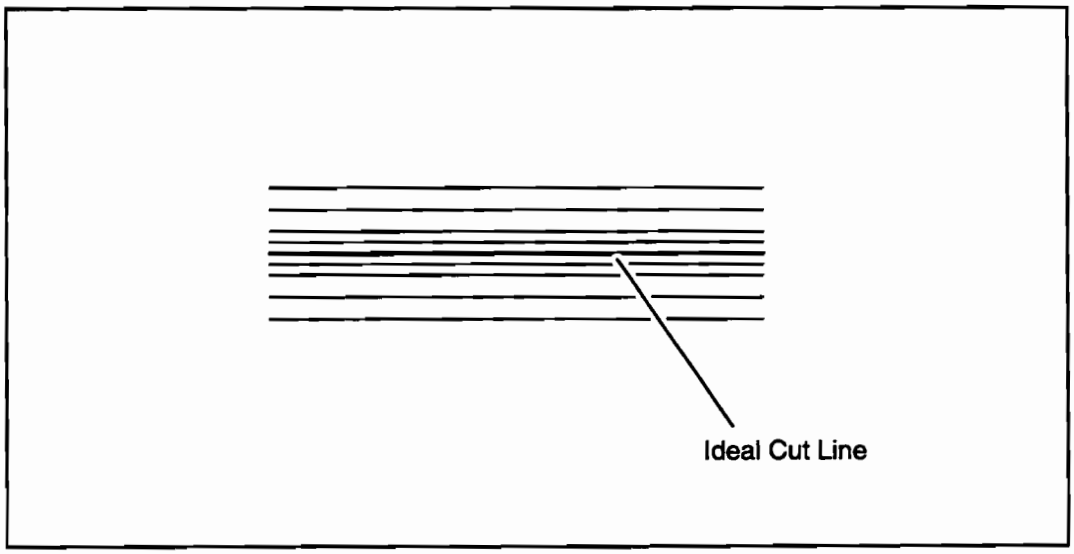

Figure 7-14. Cutter Test Pattern

7-26. ELECTRICAL ADJUSTMENTS

7-27. HPS1 ADJUSTMENT (Models 240D/E and 250/255)

7-28. 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).

1. Switch the plotter line switch to OFF (O).
2. Remove the rear cover. Refer to the procedure in Chapter 6.
3. Disconnect the cable at PCN4.
4. Set the voltmeter to a range above the +330 volts used by the power supply.
5. Insert the probes (+ to Pin 1 and – to Pin 3) into the female side of the plug. See Figure 7-15.
6. Turn the potter line switch to ON (I).
7. Set the MOTOR switch on the test panel to OFF.
8. Press the PG switch on the test panel to initiate a plotting mode.
9. At the front panel, set the contrast control to DARKEST.
10. With a small common screwdriver, adjust the control marked +330 V ADJ until the voltmeter measures +330 ± 10 V.

WARNING

Voltage is still present for approximately 40 seconds after power is turned off.

11. Turn the plotter line switch to OFF (O) and remove the voltmeter probes.

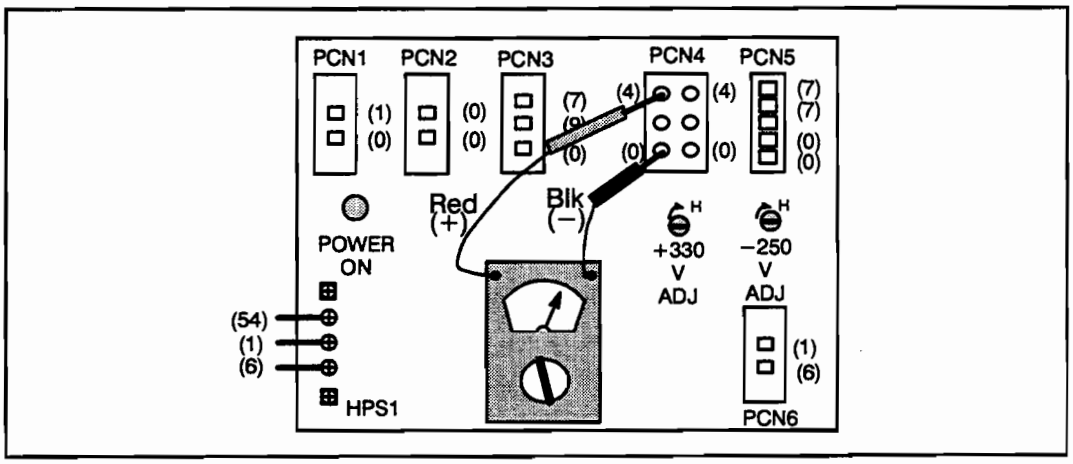

Figure 7-15. +330 V Power Supply Adjustment

12. Reconnect the cable at PCN4.

13. Disconnect the cable at PCN5.

14. Set the voltmeter to a range above the –250 volts used by the power supply.

15. Insert the voltmeter probes (+ to Pin 1 and – to Pin 4) into the female side of the plug. See Figure 7-16.

16. Turn the plotter line switch to ON (**I**).

17. Press the PG switch on the test panel to initiate a plotting mode.

18. Using a small common screwdriver, adjust the control marked –250 V ADJ until the voltmeter measures –250 ±10 V.

19. Turn the plotter line switch to OFF (**O**) and remove the voltmeter probes.

20. Reconnect the cable at PCN5.

21. Reset the MOTOR switch on the front panel to ON (**I**)

22. Install the rear cover. Refer to the procedure in Chapter 6.

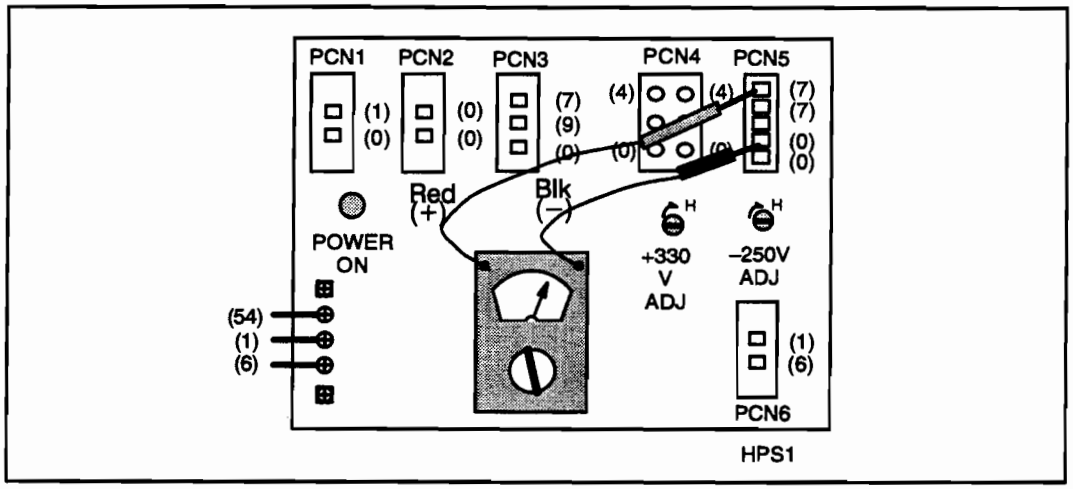

Figure 7-16. –250 V Power Supply Adjustment

7-29. LPS1 ADJUSTMENT (Models 240D/E and 250/255)

7-30. LPS1 is located above the power panel next to HPS1. To adjust the +5 V power supply, perform the following procedure:

1. Turn the plotter line switch to OFF (O).
2. Remove the rear cover and the power supply cover. Refer to the procedures in Chapter 6.
3. Set the voltmeter to a range above the +5 volts of the power supply.
4. Connect the voltmeter probes to the two screw terminals as shown in Figure 7-17.
5. Turn the plotter line switch to ON (I).
6. Using a small common screwdriver, turn the adjustment until the voltmeter measures +5 ± 0.25V.
7. Switch the plotter OFF (O) and remove the voltmeter probes.
8. If the procedures are complete install the covers. Refer to the procedure in Chapter 6.

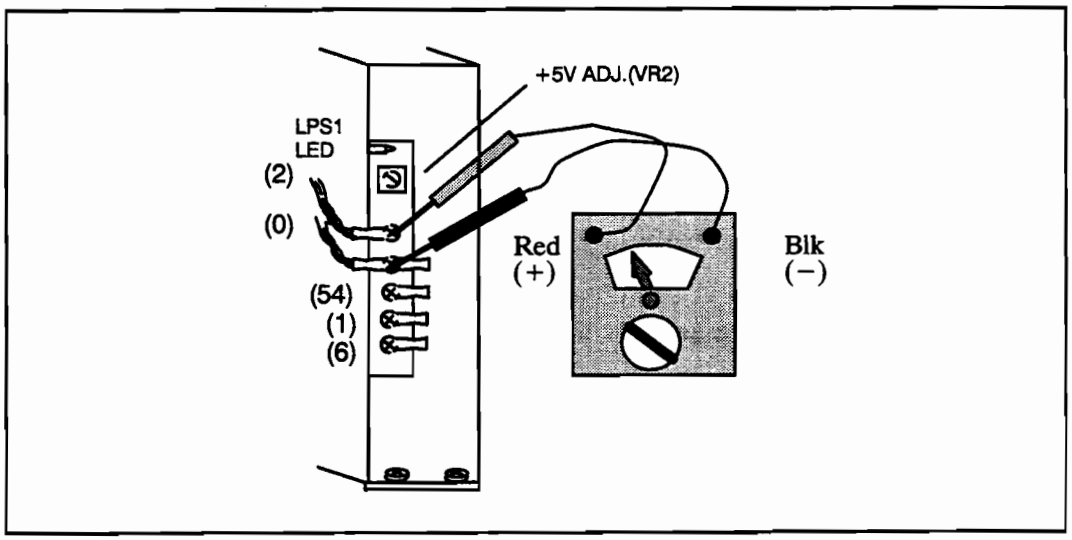

Figure 7-17. +5 V Power Supply Adjustment

7-31. LPS2 (+24 V) ADJUSTMENT (Models 240D/E and 250/255)

7-32. LPS2 (the +24 V supply) is located above the power panel next to LPS1. To adjust the +24 V power supply, perform the following procedure:

1. Turn the plotter line switch to OFF (O).
2. Remove the rear cover. If necessary, refer to the removal procedures given in Chapter 6.
3. Set the voltmeter to a range above the +24 volts used by the power supply.
4. Turn the plotter line switch to ON (I).
5. Connect the voltmeter probes to the two screw terminals as shown in Figure 7-18.
6. Using a small common screwdriver, turn the +24 V adjustment pot until the voltmeter measures +24 ± 1.2 V.
7. Remove the voltmeter probes and switch the plotter OFF (O).
8. If the adjustment procedures are complete install the covers. If necessary, refer to the replacement procedures given in Chapter 6.

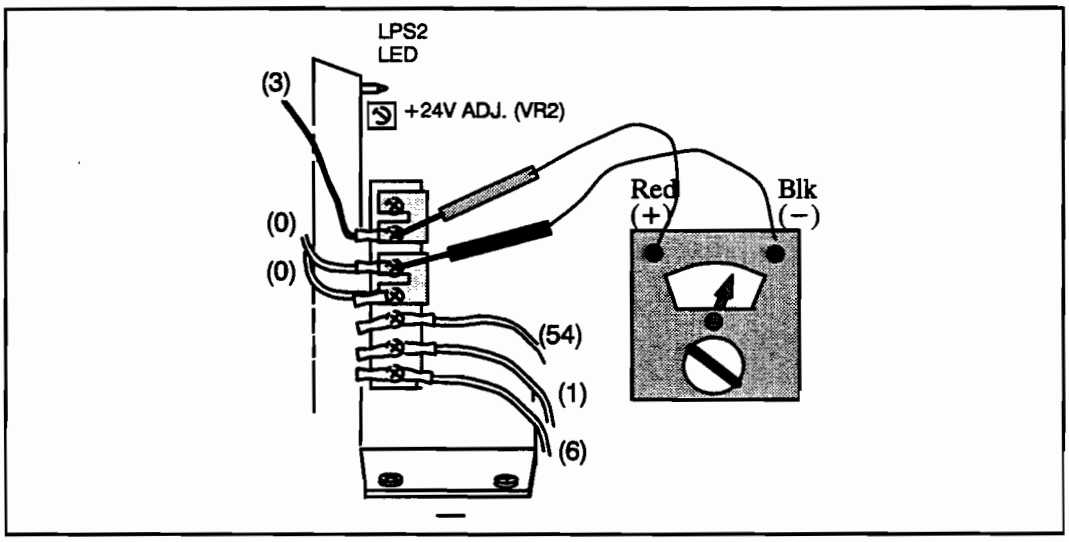

Figure 7-18. +24 V Power Supply Adjustment

7-33. FRONT PANEL LCD ADJUSTMENT (Models 250/255 Only)

7-34. The contrast of the front panel liquid crystal display can be adjusted as follows:

1. Raise the plotter top cover.

2. Locate the adjustment opening in the front panel assembly cover. See Figure 7-19.

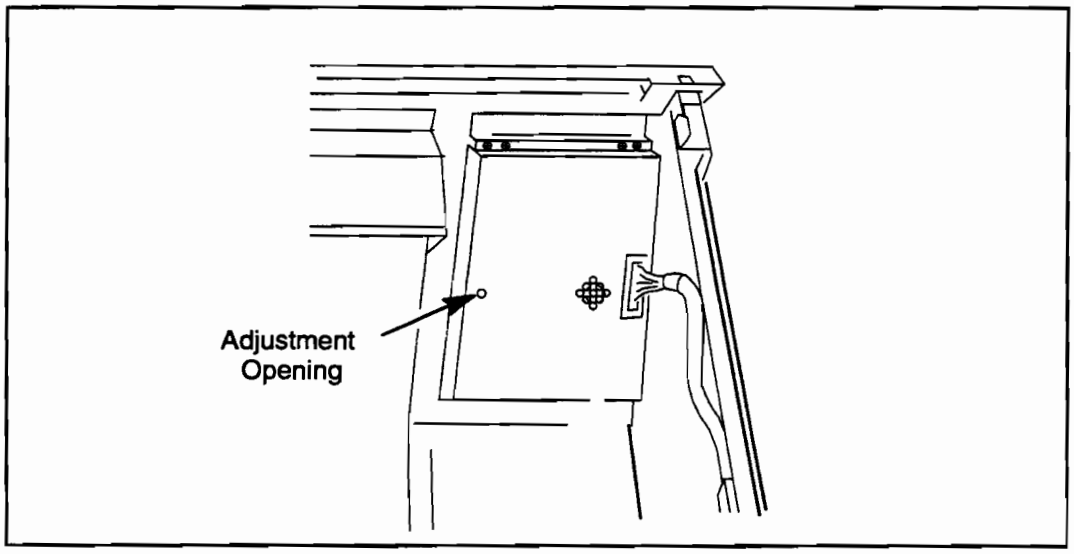

Figure 7-19. LCD Contrast Adjustment

CAUTION

It is possible to short-out components on the front panel PCA.Use only a plastic or insulated tool to perform the adjustment.

3. Insert a plastic adjustment tool or a small insulated screw driver through the opening into the control (VR1). VR1 is illustrated in Figure 7-19.

4. Clockwise rotation will increase the contrast; counter-clockwise rotation will decrease it.

7-35. RMC PCA REPLACEMENT (Models 250/255 Only)

7-36. 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 Figure 7-20 for switch segment designations. The settings are as follows:

Table 7-2. 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 †	

1. Prior to installing the PCA be certain that DSW1 segment 5 is down for either plotter.
2. For the E/A0 plotter Model 255, all other switch segments are in the up position.
3. For the D/A1 plotter Model 250, also set DSW1 segment 8 to the ON (down) position. See Figure 7-20.

7-37. SET CALIBRATION (Models 250/255 Only)

7-38. To adjust the calibration of the plotter output in the axis of media movement (X-axis), perform the following steps:

NOTE

To assure plotter accuracy, plot the line in step "1." on polyester film media. Paper medias shrink and wrinkle making them inaccurate.

1. Plot a line in the x axis.

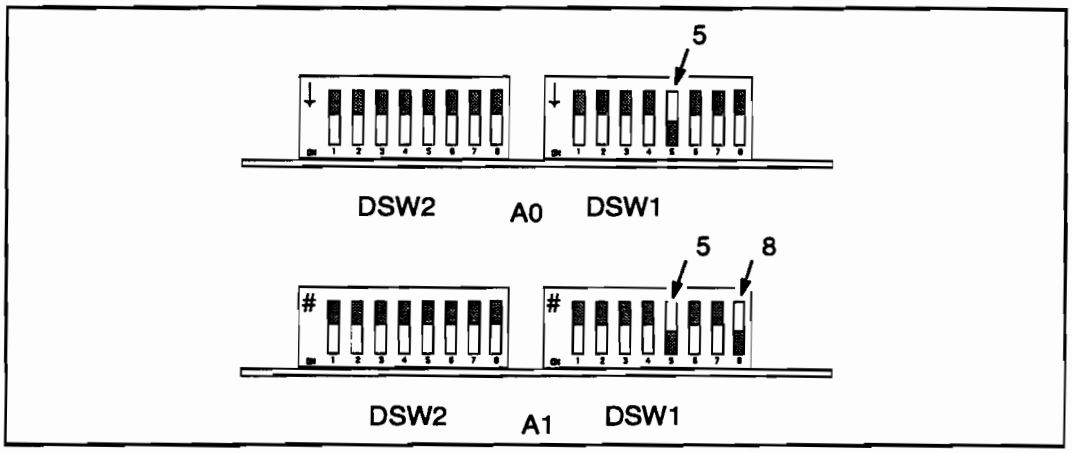

Figure 7-20. RMC PCA Switch Positions

2. Measure that line and perform the following computation:

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

† measured

3. Enter the service tech diagnostic menu.

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

5. Press the **Value +** or **Value –** button to select the value computed in step 2.

6. The calibration range is 90.00 to 110.00 in increments of hundredths.

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

PROCESSING COMMAND

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

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

7-39. HP C1621A/C1622A TAKE-UP-REEL ADJUSTMENTS

7-40. INTRODUCTION

7-41. This section describes the adjustments used to maintain the HP C1621A/C1622A, or to return it to a proper operating condition after repairs have been made.

7-42. SAFETY CONSIDERATIONS

7-43. The HP C1621A/C1622A has been designed in accordance with accepted safety standards. Safety symbols used with Hewlett-Packard instrument are contained in the front matter of the Hardware Support Manual. These symbols must be reviewed before service work is performed. Also, refer to Chapter 6 in this manual for ESD considerations.

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 section.

7-44. ORDER OF ADJUSTMENTS

7-45. The following adjustments are not interactive, and can be performed singly or in any sequence.

7-46. SPINDLE ALIGNMENT

7-47. The spindle alignment procedure may be indicated if any of the following conditions occur.

- A media crash – Align media error.
- An Out-of-Media error occurs when media is in the plotter.
- The media margin width varies.

7-48. The spindle alignment procedure may be performed by the user. See Figure 7-21 and perform the procedure as follows:

1. Turn OFF (**O**) the plotter and the take-up reel.
2. Remove the media from the take-up spindle.
3. Advance 4 or 5 meters (12 - 15 ft.) of media from the plotter. This will stabilize tracking of the media from the plotter.
4. Allow the media to hang over the back of the plotter.
5. Using the media cutter, carefully cut off the media approximately half way down the back of the plotter.
6. Loosen the 3 set screws in the left-hand sleeve using the Allen wrench provided. See Detail A.
7. Lay the media over the spindle as shown in Detail B.
8. Carefully align the sides of the media at the front of the plotter. Hold the edges securely in place by pressing the thumbs down against the cutting guide. See Detail C.
9. Adjust the spindle position for uniform contact across the width of the media. See Detail D.
10. Check the alignment of the media and the spindle, and tighten the set screw. See Detail E.
11. Advance approximately 0.5 meters (1.5 ft.) of media to test the alignment of the spindle again. This will check for any media stretching which may have occurred.
12. Attach the media to the spindle (refer to Chapter 3) and run the print engine test to check for proper tracking.

7-49. DRIVE BELT TENSION ADJUSTMENT

7-50. Drive belt tension adjustment may be required if:

- The take-up reel does not maintain tension on the media with power applied.

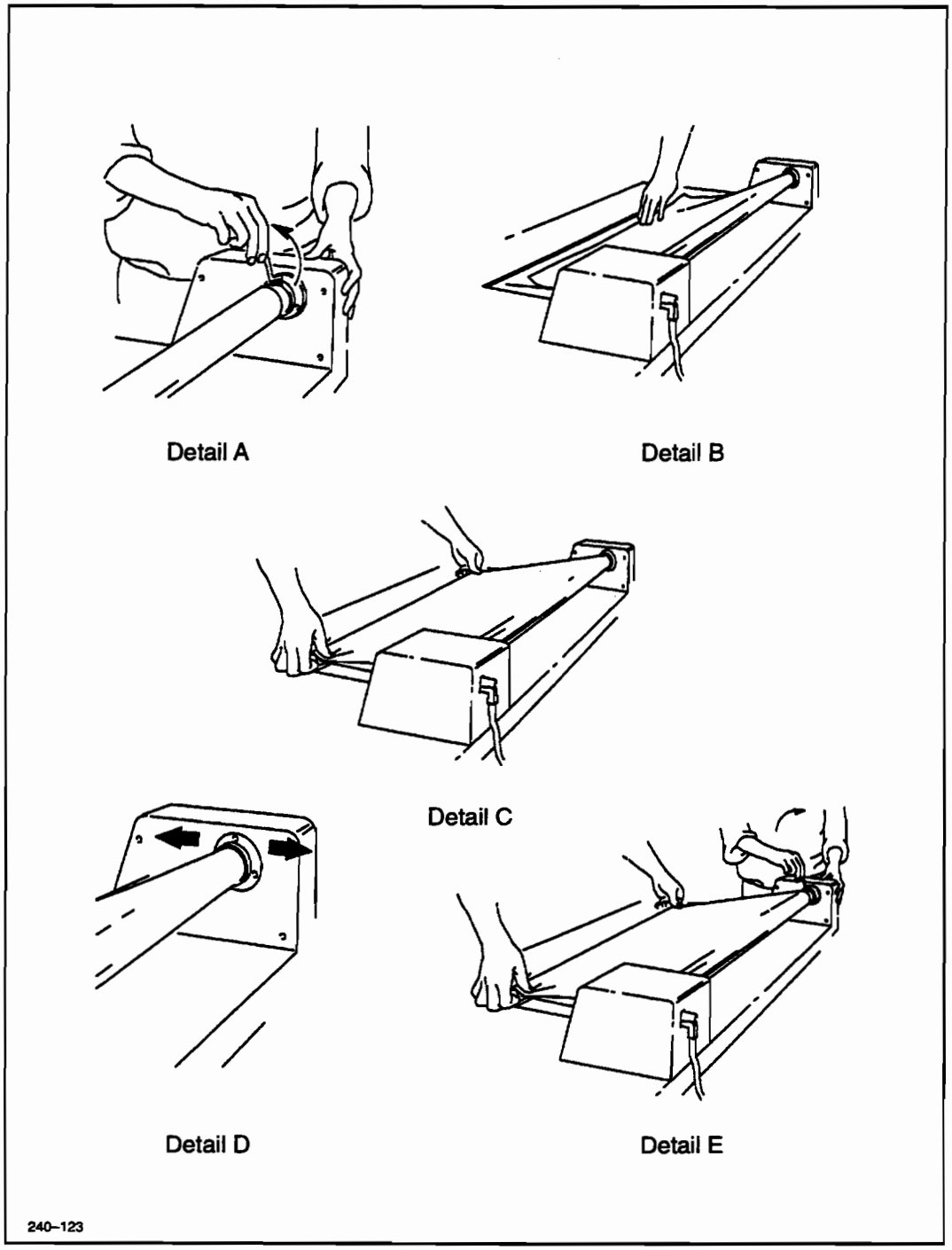

Figure 7-21. Spindle Adjustment

- The belt has been replaced or other service procedures have been performed which made belt removal necessary.

7-51. See Figure 7-22 while adjusting the drive belt tension. The drive belt tension is adjusted as follows:

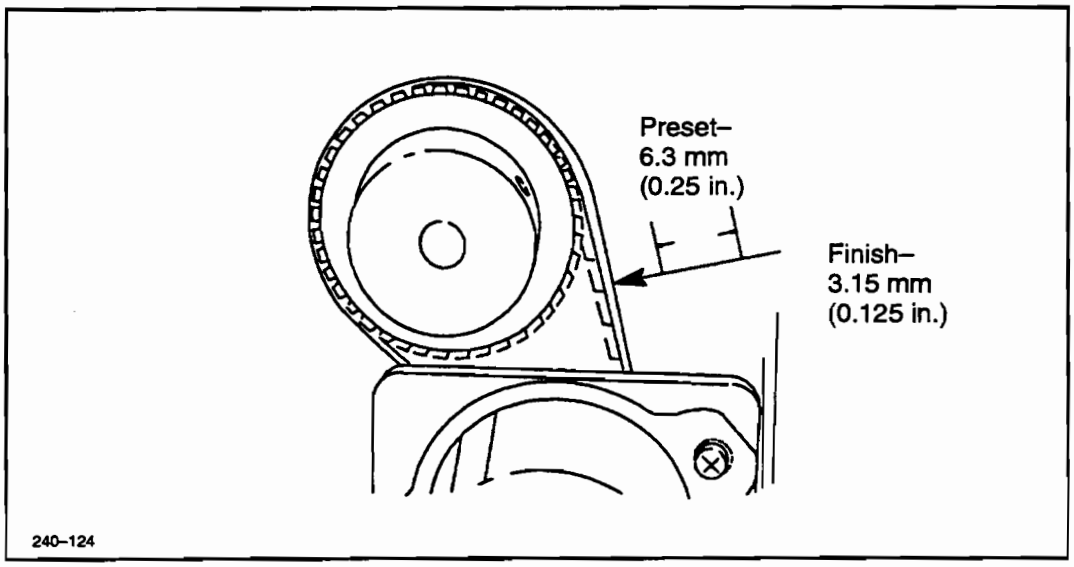

Figure 7-22. Drive Belt Adjustment

1. Turn OFF (**O**) the plotter and the take-up reel. Remove the power cord from the back of the right-hand module.

2. Remove the top cover from the right-hand module.

3. Loosen the 2 screws on the motor mount until the motor pivots freely.

4. Center the drive belt on both pulleys.

5. Pivot the motor on its mount until the belt is tight. Hold the motor in this position.

6. Using the thumb and first finger of the free hand, pinch the belt together until each side deflects 6.3 mm (0.25 in.). Hold the belt at this point.

7. Release the motor.

8. With the Pozidriv #2 screwdriver, tighten the motor mount screws.

9. As the motor mount screws are tightened, tension will increase on the belt. When the mount is completely tight, the belt deflection should be 3.15 mm (0.125 in.) on each side.

10. Replace the module cover and connect power to the module.

11. Turn the plotter and the take-up reel ON (I).

12. Check for tension on the media. Advance media from the plotter and see that the media is wound onto the spindle.

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CHAPTER 8

TROUBLESHOOTING

8-1. INTRODUCTION

8-2. This chapter contains the information necessary to efficiently isolate a defect in the HP Models 240D/E and 250/255 Electrostatic Plotters. Several levels of troubleshooting information are presented to help isolate a problem either to an assembly or to a failed component.

8-3. SAFETY CONSIDERATIONS

8-4. HP Models 240D/E and 250/255 are Safety Class I instruments (provided with a terminal for protective earthing) and have been manufactured and tested according to international safety standards.

8-5. Safety symbols used with Hewlett–Packard instruments are illustrated in the front matter. The safety considerations, symbols, and instructions should be reviewed before service work is performed.

WARNING

The procedures in this chapter are intended for service-trained personnel who are aware of the possible hazards involved.

Turn off the plotter and remove the ac line cord before beginning any troubleshooting. Potentials of up to 600 Vdc are available inside the plotter. Serious injury or death can occur if proper procedures are not followed.

Wait for a minimum of 60 seconds after the power is removed before continuing with any other procedures. This provides time for the power supply to bleed down.

Disconnect the power cord from the ac wall outlet before opening up the plotter.

To avoid personal injury, use extreme caution while performing any of the diagnostic or troubleshooting procedures. Moving mechanical parts and electrical circuitry may be exposed during testing.

The procedures in this chapter are intended for service-trained personnel only. Failure to properly follow these procedures may lead to personal injury or permanent damage to the plotter.

CAUTION

Applying a line voltage of 220V or 240V to the plotter while the plotter selector switches are set to 110V or 120V can damage the plotter.

8-6. RECOMMENDED TOOLS AND TEST EQUIPMENT

8-7. Table 8-1 lists the tools that are required to service the plotter. Test equipment required is listed in Table 8-2.

8-8. TROUBLESHOOTING STRATEGY

8-9. Several levels of diagnostics have been built into the plotter. It is possible to quickly isolate a problem to a major assembly which may be replaced, or to use more extensive testing to isolate the problem to an individual assembly. On power-up the plotter will automatically run diagnostics to give the operator an immediate go/no–go indication. Testing beyond this level must be reserved for qualified service personnel. Four types of diagnostic tests have been built in. They include the VRC Power-On Self Test, the Demonstration Plot, Print Engine Test, and the Service Tests. Examination of the actual plot may also help to define and isolate a problem.

Table 8-1. Tools Required

Screwdriver, Phillips	#1, #2, #2 short, & jewelers
Screwdriver, common	large,small, & jewelers
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	7mm, 12 mm, 13 mm, 19 mm & 23 mm
Pliers, Needle-Nose	
Pliers, Snap ring	
Combination Spring Tool	
Magnifying lens x30	
Metric Scale 150 mm	

Table 8-2. Recommended Test Equipment

TYPE	RECOMMENDED MODEL
HP Portable PLUS Personal Computer	HP 45711E
Disk Drive	HP 9114B
Vectra PC (or compatible)	
Language Disks	HP C1620–18004 C1620–18005
Plotter Support Disk	HP 5010–2514
Vectra Serial Interface Cable	HP 24542G
HP-IL/HP-IB Interface	HP 82169A
Parallel Interface Cable	HP C2912A
Serial Interface Cable	HP 92221P
Interface Cable	HP 17355D
HP-IB Interface Cable	HP 10833B or C
Voltmeter	HP 427A or equivalent
Gram Gauge 0 – 5000 grams	HP P/N 8750–0384
RS-232-C Test Connector	HP P/N 07440–60302

8-10. DIAGNOSTICS

8-11. SELF TEST

8-12. 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.

8-13. 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:

1. System RAM Test.
   a. Writing and reading random data.
   b. Inverting and reading the random data.
   c. Address bus cross talk test.
   d. Data bus cross talk test.
   e. Worst case transceiver timing test.
2. System ROM checksum.
3. Font ROM checksum.
4. Swath RAM and crossbar circuit test.
5. Swath RAM refresh circuit test.
6. Swath RAM in pixel mode test.

NOTE

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

7. Disk with disk echo test.
8. Disk track buffer test.

8-14. The 6809 microprocessor tests which are being run at power–up are as follows:

1. 6809 Microprocessor function.
2. 6809 ROM Checksum.

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

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

5. Configuration Jumper.

6. Disk Controller Register Check.

7. Disk drive spindle speed.

8. Disk track 0 indicator.

9. Seek/Scan ID on drive.

10. Drive size verification of jumpers.

11. READ/WRITE ECC check.

   a. Write pattern.

   b. Verify pattern.

   c. Verify ECC bytes.

   d. Write error to Disk.

   e. Read and verify error found.

   f. Correct the error.

   g. Verify data corrected.

12. Check disk drive hysteresis with successive seeks.

13. Read/verify the spare tables.

8-15. When the spare tables check is complete, the 6809 releases the disk so that the 68020 tests may be completed.

8-16. The Power-On test sequence will run until normal plotter operation begins, or until an error occurs. An error will cause the test to stop, which prevents normal plotter operation. The front panel liquid crystal display (LCD) will display failure information (Models 250/255 only). Models 240D/E will display a flashing On-Line LED on the front panel if the power-on test sequence fails to complete.

MODELS 240D/E NOTE

If models 240D/E fail to complete the power-on test sequence, the failure code indicated by the flashing On-Line LED on the front panel must be decoded by following the procedure outlined after paragraph 8-19. Use the error codes described in Table 8-4 to analyze the problem.

8-17. FRONT PANEL ERROR MESSAGES (Models 250/255 Only)

8-18. The front panel LCD will present error messages for failures in a variety of modes.

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

1. Print Engine error message. If the cutter is selected in the Plotter Setup menu, and the media is not in the cutter, the above message will appear in the display. The same message will appear if the take up reel is selected and the media is not on the take up reel. Either reset the menu selection, or route the media into the appropriate path.

NOTE

The "Media not in chosen path" error messages on the front panel indicate a problem that will prevent the plotter from going "On Line". Ensure that the media is in the appropriate path before attempting to communicate with the plotter.

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

2. Crash code error messages. The display nn is a hexadecimal code. Refer to Table 8-5 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.

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

3. Alignment error message caused by vacuum loss in the toner system. Align Media LED will light. Correct the problem and press **Reset** or cycle power. May be misaligned media, a problem in the toner system, or misaligned developer bar. Misaligned or defective media, or vacuum problems are the most common. However, a misaligned developer bar, solenoid valve failure, pump motor failure, power loss, or a wiring problem can also cause the error. Refer to Figure 8-32, Align Media Error Flowchart.

NONFATAL RS–232 ERROR. Check parity and baud rate.

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

RS-232 ERROR: Buffer Overflow. Check handshake.

5. Seen only in the RS-232-C interface. Handshake not properly set.

Demo load overflow.
Partial demo stored.
Press PREV MENU
to exit.

6. The user has attempted to store a plot as the "User Demo" which exceeds the available storage area.

8-19. MODELS 240D/E ERROR INDICATIONS AND SELF TEST ERROR CODES

8-20. At the completion of the spare tables check the 6809 releases the disk so that the 68020 tests may be completed.

8-21. 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 8-1.

8-22. 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 8-3 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

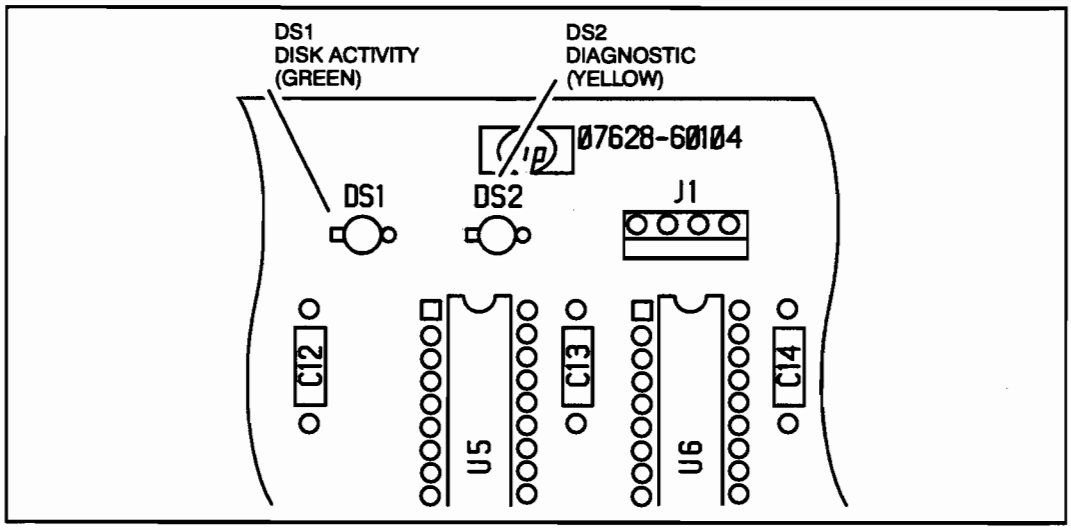


Figure 8-1. Disk Drive LEDs

(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.

Table 8-3. 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 8-4. (Plotter Error Codes, Models 240D/E)

8-23. 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 8-2 and Table 8-4. The front panel LEDs are illustrated in Figure 8-3.

8-24. 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**).

8-25. 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).

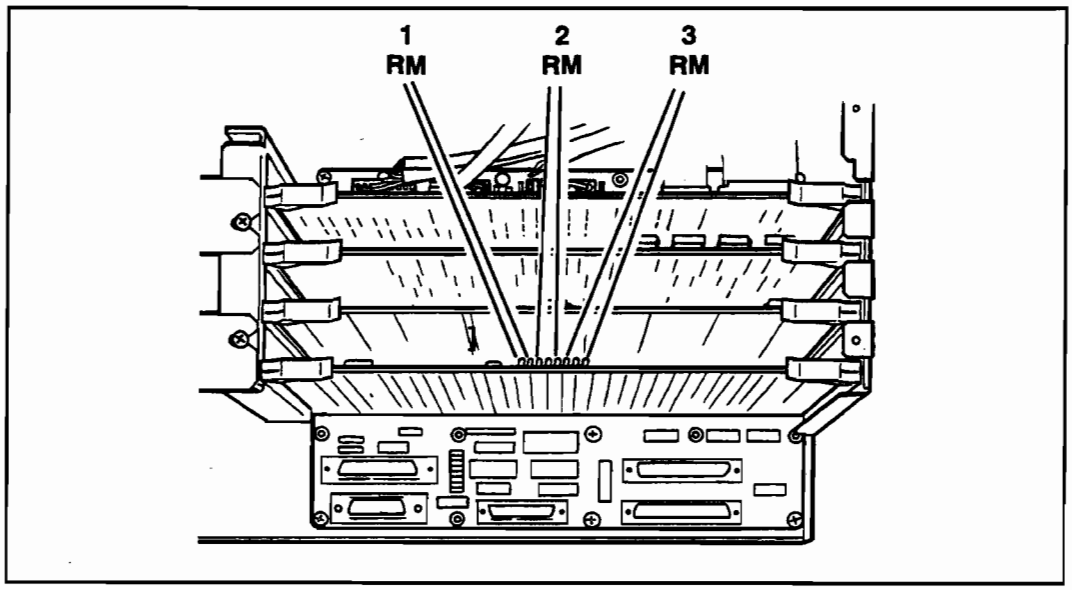


Figure 8-2. Processor PCA Self-test Error Code LEDs

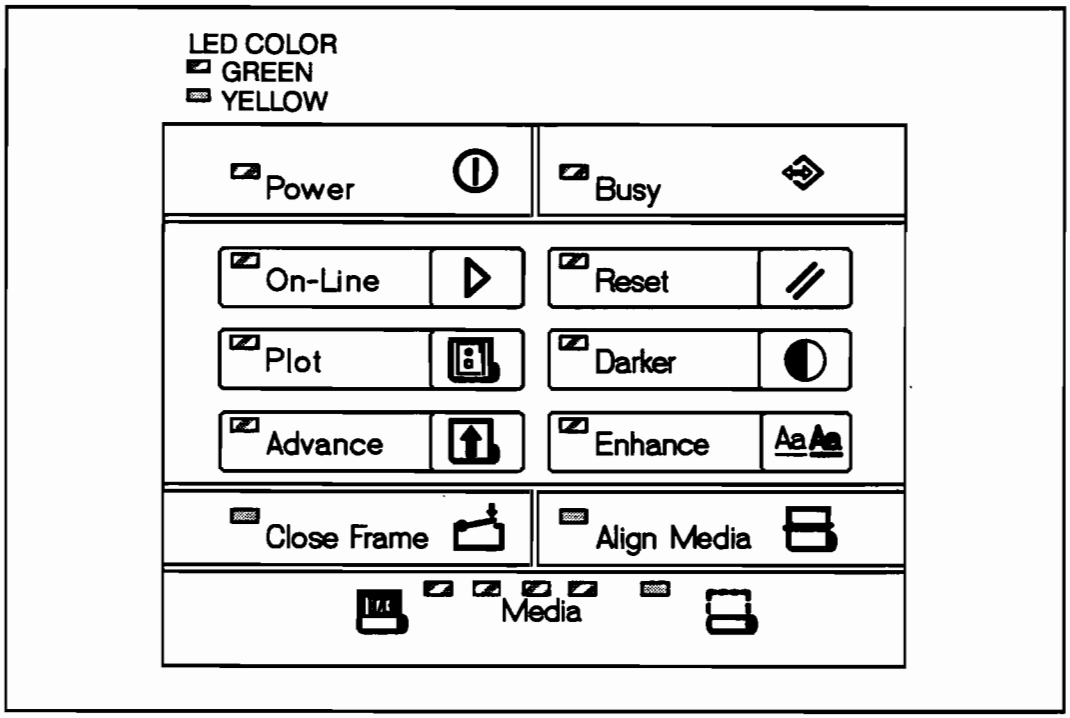


Figure 8-3. Front Panel LEDs

8-26. The steps performed in the self test are as follows:

1. Apply ac power to the plotter. The test begins.
2. A successful self-test indication is as follows:

   a. Power LED – ON steadily

   b. On-Line LED – OFF

   c. Advance LED – OFF

   d. Reset LED – ON momentarily, then OFF

   e. Busy LED – flashing momentarily,then OFF

   f. Media LED (yellow) – OFF

   g. Close Frame LED – OFF

   h. Align Media LED – OFF

3. Press the Advance button. The toner pump activates, and the media advances.
4. Upon successful completion of this portion, perform the Demonstration Plot, described later in this section.
5. If the plotter self test is not successfully completed, the Online LED on the front panel will flash to indicate an error.
6. To read the error code, proceed as follows:

   a. 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.

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

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

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

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

   f. Refer to Table 8-4 for the codes and the error conditions of the self test.

Table 8-4. Plotter Error Codes (Models 240D/E Only)

DIGIT 1			DIGIT 2			DIGIT 3			Octal Code
B	R	M	B	R	M	B	R	M	
○	○	○	○	○	○	○	○	○	000
○	○	○	○	○	○	○	○	●	001
○	○	○	○	○	○	○	●	○	002
○	○	○	○	○	○	○	●	●	003
○	○	○	○	●	○	○	○	○	020
○	○	○	○	●	○	○	○	●	021
○	○	○	○	●	○	○	●	○	022
○	○	○	○	●	○	○	●	●	023
○	○	○	○	●	○	●	○	○	024
○	○	○	○	●	○	●	○	●	025
○	○	○	○	●	○	●	●	○	026
○	○	○	○	●	○	●	●	●	027
○	○	○	○	●	●	○	○	○	030
○	○	○	○	●	●	○	○	●	031
○	○	○	○	●	●	○	●	○	032
○	○	○	○	●	●	○	●	●	033
○	○	○	○	●	●	●	○	○	034
○	○	○	○	●	●	●	○	●	035
○	○	○	○	●	●	●	●		036
○	○	○	○	●	●	●	●	●	037
○	○	○	●	●	○	○	○	○	060

B = BUSY R = Reset M = Media (Media LED is Yellow) ● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-4. Plotter Error Codes (Models 240D/E Only) (Extension)

Octal Code	Error	Suggested Remedy†
000		
001	Firmware Check failed	
002	Bad interrupt – undefined level, spurious, un-initialized	
003	Miscellaneous processor exception	P
	004 through 017 are NOT used.	
	020 through 037 are run at Power-Up.	
020	System RAM bad	P
021	System ROM bad – checksum error	P
022	Font ROM bad – checksum error	P
023	Swath RAM bad	S
024	Swath RAM bad	S
025	Refresh circuit bad	S
026	Refresh circuit bad	S
027	Dynamic bus-sizing failed for Swath RAM	S
030	Bad swath-RAM bank selector	S
031	Pixel mode Swath RAM circuitry failed	S
032	Pixel loop-back test failed *I/O DMA	I
033	Disk-track buffer failed	C
034	Disk echo test failed	C, P
035	RS-232-C loop-back test failed	I
036	Disk read different from disk write	C
037	VRC switch test failed	
	040 through 057 are not used.	
060	Disk allocation system failed	P, S, C

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C =Disk Controller PCA **S =SWATH/RAM PCA**
M =Main/Interconnect PCA
D =Disk Drive
P =Processor PCA
I =I/O DMA PCA

Table 8-4. Plotter Error Codes (Models 240D/E Only) (Continued)

DIGIT 1			DIGIT 2			DIGIT 3			Octal Code
B	R	M	B	R	M	B	R	M	
○	○	○	●	●	○	○	○	●	061
○	○	○	●	●	○	○	●	○	062
○	○	○	●	●	○	○	●	●	063
○	○	○	●	●	○	●	○	○	064
○	○	○	●	●	○	●	○	●	065
○	○	●	○	○	○	○	○	○	100
○	○	●	○	○	○	○	○	●	101
○	○	●	○	○	○	○	●	○	102
○	○	●	○	○	○	○	●	●	103
○	○	●	○	○	○	●	○	○	104
○	○	●	○	○	○	●	○	●	105
○	○	●	○	○	○	●	●	○	106
○	○	●	○	○	○	●	●	●	107
○	○	●	○	○	●	●	●	●	117
○	○	●	●	●	○	*	*	*	16*
○	○	●	●	●	●	*	*	*	17*
○	●	○	○	○	○	○	○	●	201
○	●	○	○	○	○	○	●	○	202
○	●	○	○	○	○	○	●	●	203
○	●	○	○	○	○	●	○	○	204
○	●	○	○	○	○	●	○	●	205

B = BUSY R = Reset M = Media (Media LED is Yellow) ● = ON ○ = OFF * = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-4. Plotter Error Codes (Models 240D/E Only) (Extension)

Octal Code	Error	Suggested Remedy†
061	Disk allocation system failed	P, S, C
062	Disk allocation system failed	P, S, C
063	Disk allocation system failed	P, S, C
064	Disk allocation system failed	P, S, C
065	Disk allocation system failed	P, S, C
	66 through 077 are not used.	
100	Bad address or length sent to disk	C
101	NOT USED	
102	Disk not idle	C, P
103	Disk time-out – did not respond on time	D
104	NOT USED	
105	NOT USED	
106	Re-try limit exceeded on a disk write – bad disk	D, C
107	Spurious interrupt generated by disk	C, P
	110 through 116 not used.	
117	Bad data read from disk	
16*	Bus or address error	I, S, P
17*	Illegal instruction	P
201	Sector No. in controller IC decreased after transfer.	C
202	Sector address byte overflowed	C
203	Illegal opcode or address parameter out of available data range	P, C
204	Track buffer point is past allowed range	C
205	Number of sectors transferred has overflowed	C

● = ON ○ = OFF * = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C =Disk Controller PCA **S =SWATH/RAM PCA**
M =Main/Interconnect PCA
D =Disk Drive
P =Processor PCA
I =I/O DMA PCA

Table 8-4. Plotter Error Codes (Models 240D/E Only) (Continued)

DIGIT 1			DIGIT 2			DIGIT 3			Octal Code
B	R	M	B	R	M	B	R	M	
○	●	○	○	○	○	●	●	○	206
○	●	○	○	○	○	●	●	●	207
○	●	○	○	○	●	○	○	○	210
○	●	○	○	○	●	○	○	●	211
○	●	○	○	○	●	○	●	○	212
○	●	○	○	○	●	○	●	●	213
○	●	○	○	○	●	●	○	○	214
○	●	○	○	○	●	●	○	●	215
○	●	○	○	○	●	●	●	○	216
○	●	○	○	○	●	●	●	●	217
○	●	○	○	●	○	○	○	○	220
○	●	○	○	●	○	○	○	●	221
○	●	○	○	●	○	○	●	○	222
○	●	○	○	●	○	○	●	●	223
○	●	○	○	●	○	●	○	○	224
○	●	○	○	●	○	●	○	●	225
○	●	○	○	●	○	●	●	○	226
○	●	○	○	●	○	●	●	●	227
○	●	○	○	●	●	○	○	○	230
○	●	○	○	●	●	○	○	●	231
○	●	○	○	●	●	○	●	○	232
○	●	○	○	●	●	○	●	●	233
○	●	○	○	●	●	●	○	○	234
○	●	○	○	●	●	●	○	●	235

B = BUSY R = Reset M = Media (Media LED is Yellow) ● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-4. Plotter Error Codes (Models 240D/E Only) (Extension)

Octal Code	Error	Suggested Remedy†
206	Address crossed track boundary during access	C
207	Length variable underflowed after a decrement	C
210	Seek failed	D, C
211	Disk timed out in Wait-Not-Busy	D, C
212	Disk timed out in Wait-Command-Complete	D, C
213	Index level has not changed; Is disk spinning?	D, C
214	Unable to format disk; hardware failure	D, C
215	Disk spindle test failed	D, C
216	Track 00 indicator test failed	D, C
217	Disk or disk interface hardware failed	D, C
220	System RAM on Controller PCA failed self test	C
221	Disk drive did not become ready	D, C
222	Drive did not spin or seek to track 00 on power-up	D, C
223	Disk controller IC failed echo test	C
224	Track buffer RAM failed self test	C
225	Spare area ran out of spare tracks	1
226	Unable to write to a spare	D, C
227	Unable to recover data from a track	2
230	Data on track to be spared was lost	2
231	Stepped off the spare table	1
232	Unable to write spare tables to the disk	C, D
233	Too many bad sectors on non-reserved track	C, D
234	Data read was different than data written	C
235	Verify of data area failed during format	C, D

● = ON ○ = OFF * = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C	**=Disk Controller PCA**	**2**	**=Send plot again**
M	**=Main/Interconnect PCA**	**I**	**=I/O DMA PCA**
1	**=Reformat disk**	**S**	**=SWATH/RAM PCA**
D	**=Disk Drive**	**3**	**=Reset Jumpers**
P	**=Processor PCA**		

Table 8-4. Plotter Error Codes (Models 240D/E Only) (Continued)

DIGIT 1			DIGIT 2			DIGIT 3			Octal Code
B	R	M	B	R	M	B	R	M	
○	●	○	○	●	●	●	●	○	236
○	●	○	○	●	●	●	●	●	237
○	●	○	●	○	○	○	○	○	240
○	●	○	●	○	○	○	○	●	241
○	●	○	●	○	○	○	●	○	242
○	●	○	●	○	○	○	●	●	243
○	●	○	●	○	○	●	○	○	244
○	●	○	●	○	○	●	○	●	245
○	●	○	●	○	○	●	●	○	246
○	●	○	●	○	○	●	●	●	247
○	●	○	●	○	●	○	○	○	250
○	●	○	●	○	●	○	○	●	251
○	●	○	●	○	●	○	●	○	252
○	●	○	●	○	●	○	●	●	253
○	●	○	●	○	●	●	○	○	254
○	●	○	●	○	●	●	○	●	255
○	●	○	●	○	●	●	●	○	256
○	●	○	●	○	●	●	●	●	257
○	●	○	●	●	○	○	○	○	260
○	●	○	●	●	○	○	○	●	261
○	●	○	●	●	○	○	●	○	262
○	●	○	●	●	○	○	●	●	263

B = BUSY R = Reset M = Media (Media LED is Yellow) ● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-4. Plotter Error Codes (Models 240D/E Only) (Extension)

Octal Code	Error	Suggested Remedy†
236	Processor IC failed on power-up	C
237	System ROM on controller PCA failed test	C
240	Stepper hysteresis check failed	D, C
241	Spare tables lost	1
242	Data read different from data written	D, C
243	Read/Write test failed	1, D, C
244	ECC correction test failed	C
245	Long-read part of read/write disk test failed	D, C
246	Long-read part of ECC correction test failed	D, C
247	Long-write part of read/write disk test failed	D, C
250	ECC correction check failed to write an error to disk	D, C
251	ECC correction check failed	D, C
252	Length passed would put the address out of range	P, C
253	Jumper configuration bad	3, C
254	A sector ID not found at power-up	1
255	No sector found for SECTOR-ID command	1
256	Unable to retrieve data save off spared track	2
257	Attempt to format/verify reserve track failed	D, C
260	Unable to format a cylinder	D, C
261	Unable to format a spare track	D, C
262	Multiply routine overflowed	C
263	Suspected head shift	D, C

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C	**=Disk Controller PCA**	**2**	**=Send plot again**
M	**=Main/Interconnect PCA**	**I**	**=I/O DMA PCA**
1	**=Reformat disk**	**S**	**=SWATH/RAM PCA**
D	**=Disk Drive**	**3**	**=Reset Jumpers**
P	**=Processor PCA**		

8-27. DEMONSTRATION PLOT (Models 240D/E Only)

8-28. 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.

8-29. To run the HP 240D/E demonstration plot, proceed as follows:

1. Apply ac power to the plotter (I).
2. 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 8-4. This plot still confirms that all major functions of the plotter are operational. The procedure for loading the demonstration plot is found in this manual immediately after paragraph 8-30. .

3. Wait for the successful completion of the internal self-test.
4. Press the front panel Plot button. Follow this by pressing the On-Line button immediately (Must be done within 2 seconds).
5. The back-up ROM plot is illustrated in Figure 8-4. The demonstration plot is illustrated in Figure 8-5.
6. When the plot is completed press the Advance button to advance the plot for viewing.
7. The plot may be repeated by pressing the Plot button on the front panel.

8-30. LOADING THE DEMONSTRATION PLOT (Models 240D/E Only)

8-31. If you tried to run the demonstration plot and found that the demonstration plot had not been loaded onto the 40 MB disk, use the following procedure to load the plot data:

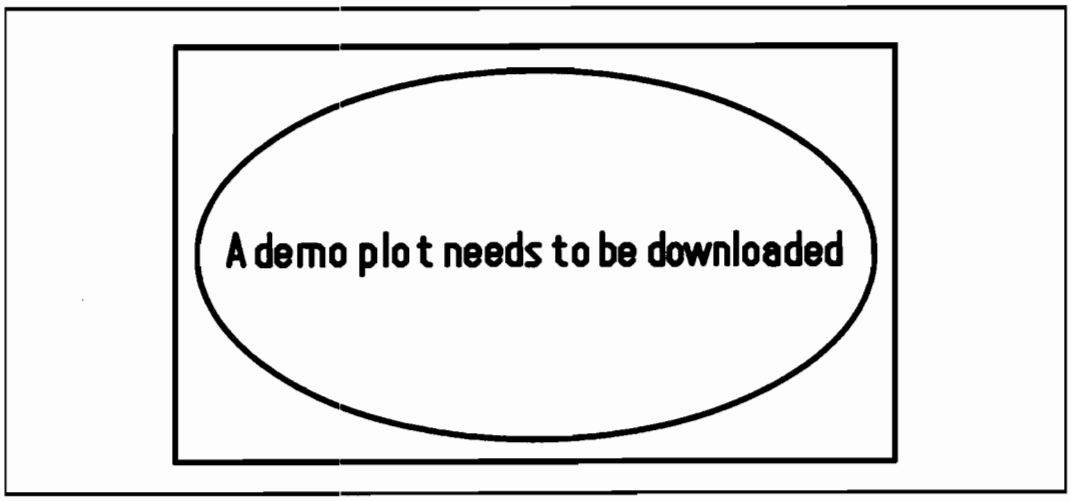


Figure 8-4. Back-up ROM Plot

1. Equipment Required.

   a. Portable PLUS Personal Computer

   b. Disk Drive HP 9114B

   c. Interface Cables 92221P , 17355D, and 82169A

   d. HP 7600 Series Service Disk P/N C1600–60401

2. The Portable PLUS is configured as follows:

a. Datacom Configuration	Serial
b. Transmission Rate (BPS)	19200
c. Word Length (bits)	8
d. Stop Bits	1
e. Parity	None
f. XON/XOFF Pacing	On
g. CTS Line	Ignore
h. DSR Line	Ignore

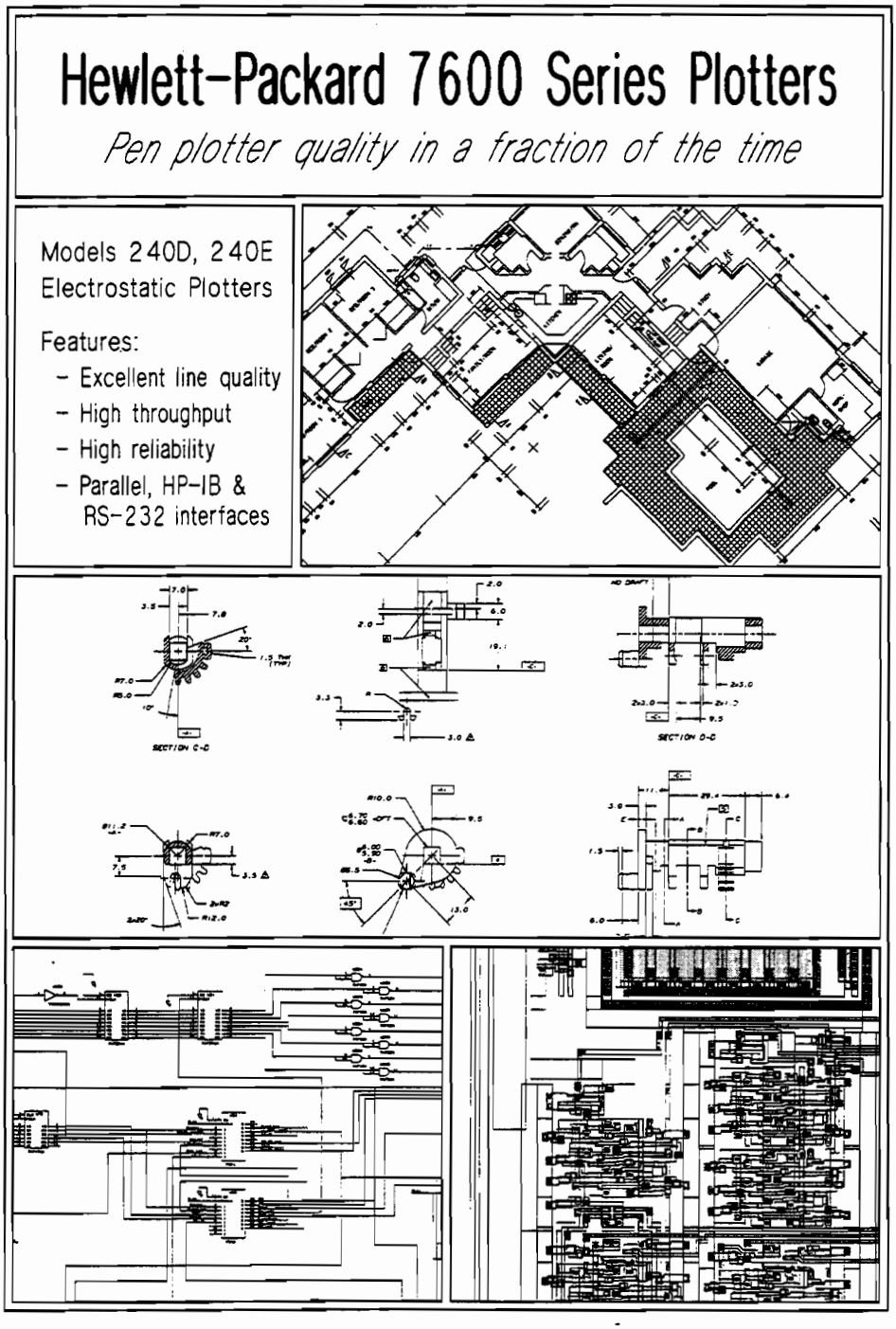


Figure 8-5. Demonstration Plot (Models 240D/E Only)

i. DCD Line — Ignore

j. Power to Interface — ON

k. Plotter Interface — Serial

3. The plotter set–up is as follows:

a. Mode — RS–232–C

b. 7586 EMULATE /HP–GL/2 — HP–GL/2

c. XON/XOFF/HARDWIRE — XON/XOFF

d. PARITY — OFF

e. BAUD — 19200

4. Connect the Portable PLUS as shown in Figure 8-6.

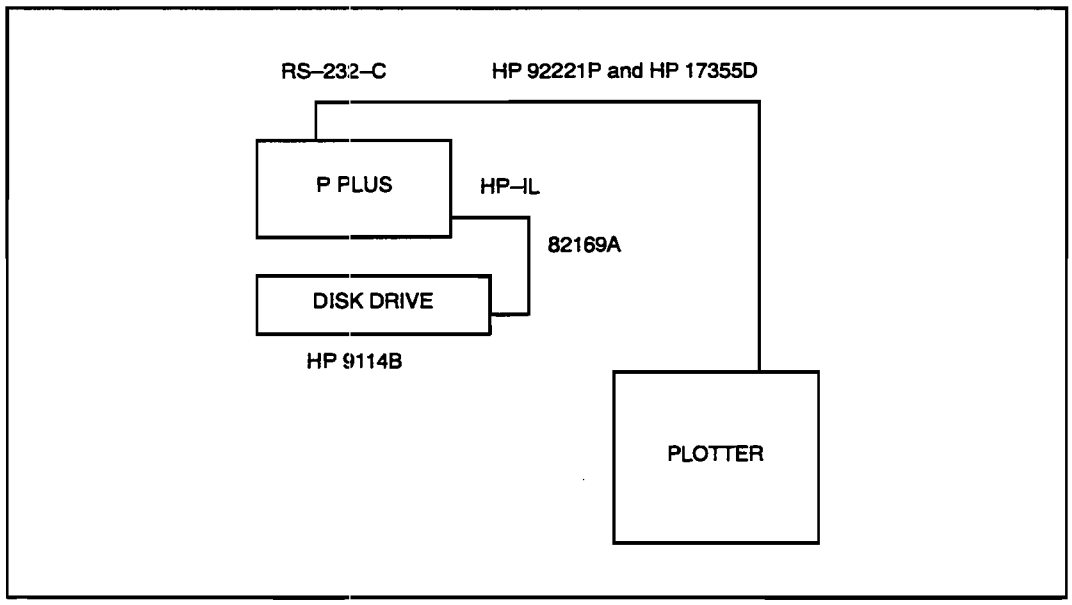


Figure 8-6. Demo Plot Setup

5. 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 9.

6. Install the service disk in the drive.

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

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

9. Follow the instructions given on the display.

10. Run the program.

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

12. Turn OFF (**O**) all equipment before disconnecting the cabling.

8-32. PROCESSOR LEDS (Models 240D/E and 250/255)

8-33. 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 8-7. 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.

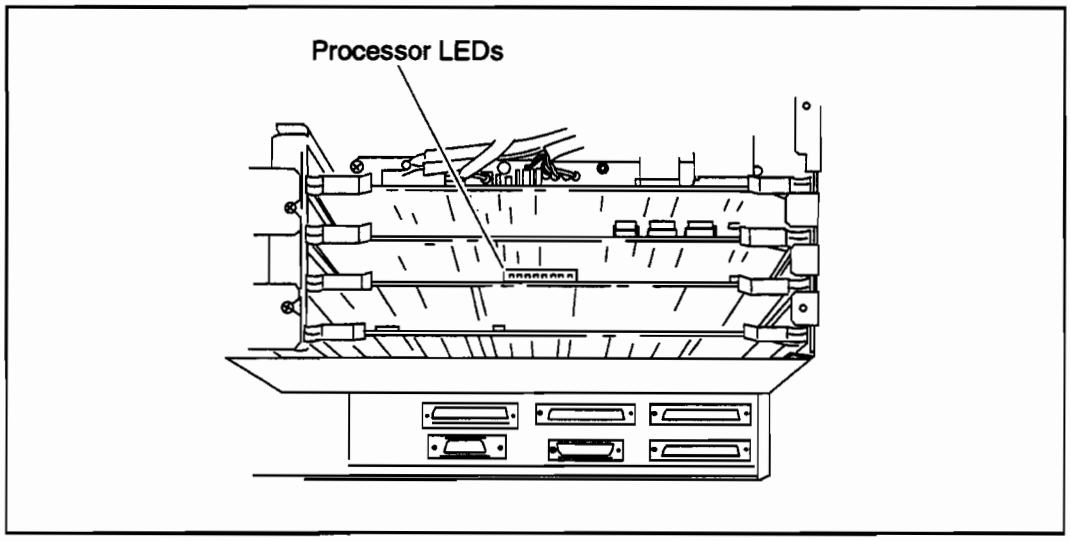


Figure 8-7. VRC LEDs

8-34. During normal operation, the LEDs will indicate the VRC processes being run. Details of the Processor LEDs (See Figure 8-8) are as follows:

1. LED 7- VRC to front panel communication.

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

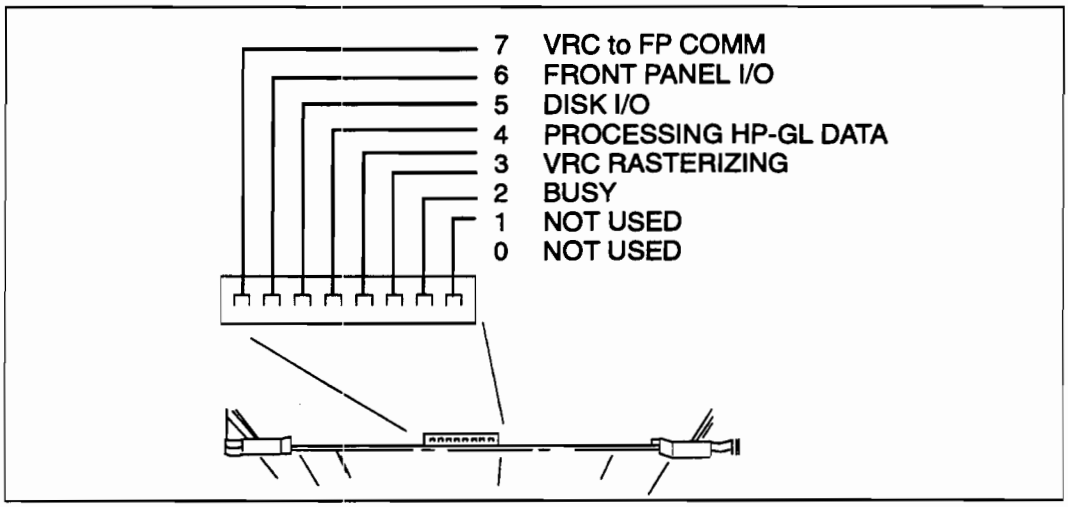


Figure 8-8. Processor LEDS

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

4. 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.

5. 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.

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

7. LEDS 1 & 0 - Not used.

8-35. If an error is encountered, these LEDs will display the crash codes which may not be displayed at the front panel. The crash codes may not be displayed at the front panel if the panel fails or the failure itself disables the panel. See Table 8-5 for the Processor PCA crash codes.

8-36. With crash codes in the 7* series, address or instruction errors are indicated. The three (3) least significant bits of the code * are the PCA-select code in the bad address or program counter. Refer to Table 8-5 for the PCA address which correlates with the failure. If the error continues after replacing a PCA, replace the hard disk or hard disk controller.

8-37. On Models 250/255, crash codes in the 8*, 9*, A* ,and B* series are most likely caused by a failure on the Disk Controller PCA or on the hard disk. Follow the suggested remedy for the specific failure unless the problem is occurring intermittently rather than on power up. If intermittent failures on power-up occur, reformat the hard disk and download the language files before replacing the hard disk or disk-controller PCA.

NOTE

If the plotter intermittently halts, locks up, or stops in the middle of executing a front panel function; or if the plotter has problems with queueing up plots, proceed to the plot management menu and change the maximum queue size. (Press the **Enter** button twice after changing.) Changing the queue size repartitions the disk, restarts the parser, and forces a restart of the processor.

8-38. DISK DRIVE CONTROLLER LEDs (Models 240D/E and 250/255)

8-39. The disk drive PCA has two (2) LEDs that are used to indicate disk activity or failure. The yellow LED should normally be "OFF". If it remains on, a failure of the disk drive controller PCA or of the hard disk is indicated. The green LED will flash indicating activity on the disk. At power-up the green LED will flash until initialization is complete and then go out.

8-40. DEMONSTRATION PLOT (Models 250/255 Only)

8-41. The factory 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.

8-42. To run the HP Models 250/255 demonstration plot, refer to chapter 3 beginning at paragraph 3-82. If the back-up ROM plot is plotted instead of the factory demo plot, follow the procedure described in this chapter under the heading, LOADING THE DISK FILES (Models 250/255 Only).

8-43. LOADING THE DISK FILES (Models 250/255 Only)

8-44. If the disk files; including the front panel languages, help messages, and demonstration plots have not been loaded onto the 40 Mbyte disk, use the following procedure to load the files and plots:

1. Equipment required:

   a. Portable PLUS Personal Computer

   b. Disk Drive HP 9114B

   c. Interface Cables 92221P, 17355D, and 82169A

   d. HP 7600 Series Service Disks
      P/N C1620-18004 Disk 1

C1620-18005 Disk 2

* Refer to Table 3-7 for firmware/disk compatibility.

2. Connect the Portable PLUS, disk drive, and plotter per Figure 8-9. Power ON (I) the disk. Turn ON (I) the Portable PLUS and configure as follows:

a. Datacom Configuration	Serial
b. Transmission Rate (BPS)	19200
c. Word Length (bits)	8
d. Stop Bits	1
e. Parity	None
f. XON/XOFF Pacing	On
g. CTS Line	Ignore
h. DSR Line	Ignore
i. DCD Line	Ignore
j. Power to Interface	ON
k. Plotter Interface	Serial

3. Turn the plotter ON (I), go to the Plotter Setup Menu and configure the plotter as follows:.

NOTE

If the language files are not present on the hard drive, the front panel LCD will be blank when the help key is pressed, or when configurations are saved by pressing the ENTER button.

a. Mode	RS-232-C
b. 7586 EMULATE/HP-GL/2	HP-GL/2
c. XON/XOFF/HARDWIRE	HARDWIRE
d. PARITY	OFF
e. BAUD	19200

4. Put the plotter ON-LINE by pressing the "ON-LINE" button.

5. Connect the Portable PLUS as shown in Figure 8-9.

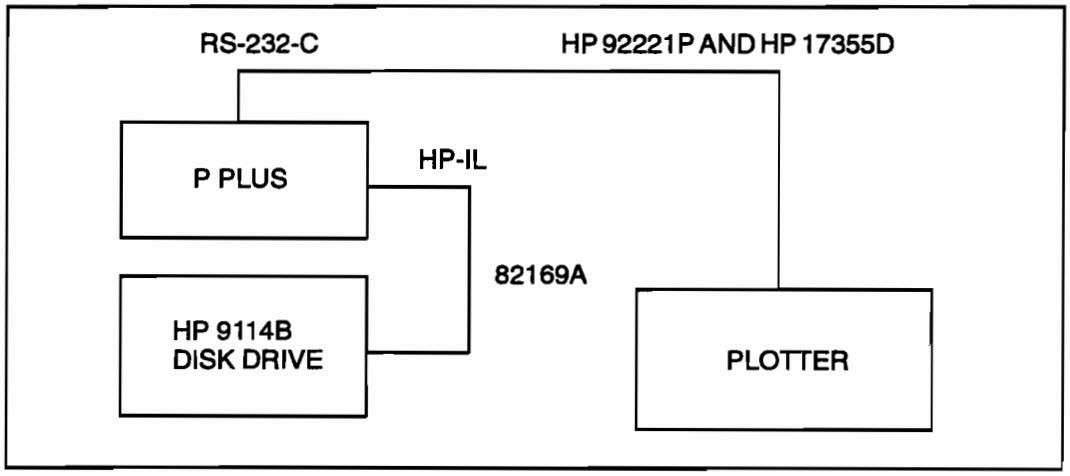


Figure 8-9. Disk File Setup

6. If the service disk programs are already loaded onto the internal "E" drive, enter DOS, type LOAD PLOT, and go to step 9.

7. Install service disk 1 in the drive.

8. Enter DOS on the Portable PLUS, select drive C, and type LOAD PLOT.

9. Follow the instructions given on the display.

10. Run the program.

NOTE

If problems are encountered when loading language files, reformat the hard disk, reduce the baud rate to 9.6 KB, and retry.

11. Upon successful completion of the program, the screen will display the message "File transfer complete. 11 files loaded to the VRC. Exit load plot utility."

12. Cycle power on the plotter and run the demonstration plot. Run the demonstration plot to verify that the files were loaded correctly.

13. Turn OFF (O) all equipment before disconnecting the cabling.

8-45. INTERNAL SERVICE TESTS

8-46. A wide variety of service diagnostics has been built into the HP Models 240D/E and 250/255 Plotters. These diagnostics are divided into groups as follows:

1. Those performed automatically at Power–Up.
2. Those that test the print engine.
3. Those that test the VRC (including I/O).
4. Those that test the entire plotter (except for I/O). The factory demonstration plot is an example.

8-47. MODELS 250/255 ERROR INDICATIONS AND SELF TEST ERROR CODES

8-48. Error indications are displayed in hexadecimal code on the front panel LCD. Refer to Table 8-5 under the column titled HEX Codes to locate specific error indications.

8-49. When the Power-On test sequence has stopped due to an error the plotter ac power must be cycled OFF (**O**).

Table 8-5. Plotter Error Codes (Models 250/255 Only)

Processor LEDs								Front Panel 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
○	○	●	○	●	○	○	○	28
○	○	●	○	●	○	○	●	29

● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Extension)

Front Panel Hex Code	Error	Suggested Remedy†
01	Operating system crash	1
02	Bad interrupt	1
03	Miscellaneous processor 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	S
18	Bad swath-RAM bank selector	I, S
19	Bad pixel circuitry on swath RAM PCA	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 test failed (factory only)	PLC PCA
20	Front panel loop test failed (factory only)	PLC, F.P.
21	Bad print engine status (factory bench run)	PLC PCA
28	Plot queue memory on processor corrupted	1, P, R, C, D
29	Plot queue memory on processor corrupted	1, P, R, C, D

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C =Disk Control PCA
D =Disk Drive
I =I/O DMA PCA
M =Main/Interconnect PCA
P =Processor PCA
S =SWATH/RAM PCA
R =Reformat Disk & retry
1 =Change Queue Size, cycle power and retry.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Continued)

Processor LEDs								Front Panel HEX Code
7	6	5	4	3	2	1	0	
○	○	●	○	●	○	●	○	2A
○	○	●	●	○	○	○	○	30
○	○	●	●	○	○	○	●	31
○	○	●	●	○	○	●	○	32
○	○	●	●	○	○	●	●	33
○	○	●	●	○	●	○	○	34
○	○	●	●	○	●	○	●	35
○	○	●	●	●	○	○	○	38
○	○	●	●	●	○	○	●	39
○	○	●	●	●	○	●	○	3A
○	○	●	●	●	○	●	●	3B
○	●	○	○	○	○	○	○	40
○	●	○	○	○	○	○	●	41
○	●	○	○	○	○	●	○	42
○	●	○	○	○	○	●	●	43
○	●	○	○	○	●	○	○	44
○	●	○	○	○	●	●	○	46
○	●	○	○	○	●	●	●	47
○	●	○	○	●	○	○	○	48
○	●	○	○	●	○	○	●	49
○	●	○	○	○	○	○	○	4F
○	●	○	●	○	○	○	○	50
○	●	○	●	○	○	○	●	51
○	●	○	●	○	○	●	○	52
○	●	○	●	○	●	○	○	54
○	●	○	●	○	●	○	●	55

● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Extension)

Front Panel Hex Code	Error	Suggested Remedy†
2A	Plot queue memory on processor corrupted	1, P, R, C, D
30	Internal assertion/Proc. memory corrupted	1, P
31	Internal assertion/Proc. memory corrupted	1, P
32	Internal assertion/Proc. memory corrupted	1, P
33	Internal assertion/Proc. memory corrupted	1, P
34	Internal assertion/Proc. memory corrupted	1, P
35	Internal assertion/Proc. memory corrupted	1, P
38	Attempt to fetch message for inactive task	1, P
39	RAM stack overflow	1, P
3A	Task not in runable RAM 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
42	Disk expected to be idle, but isn't	1, C
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 met illegal opcode in vector data	R, P, C, D
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

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C =Disk Control PCA
D =Disk Drive
I =I/O DMA PCA
M =Main/Interconnect PCA
P =Processor PCA
S =SWATH/RAM PCA
R =Reformat Disk & retry
1 =Change Queue Size, cycle power and retry.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Continued)

Processor LEDs								Front Panel HEX Code
7	6	5	4	3	2	1	0	
○	●	●	○	○	○	○	○	60
○	●	●	○	○	○	○	●	61
○	●	●	○	○	○	●	○	62
○	●	●	○	○	○	●	●	63
○	●	●	○	●	○	○	○	68
○	●	●	○	●	○	○	●	69
○	●	●	○	●	○	●	○	6A
○	●	●	○	●	○	●	●	6B
○	●	●	●	○	○	○	○	70
○	●	●	●	○	○	○	●	71
○	●	●	●	○	○	●	○	72
○	●	●	●	○	○	●	●	73
○	●	●	●	○	●	○	○	74
○	●	●	●	○	●	○	●	75
○	●	●	●	○	●	●	○	76
○	●	●	●	○	●	●	●	77
●	○	○	○	○	○	○	●	81
●	○	○	○	○	○	●	○	82
●	○	○	○	○	○	●	●	83
●	○	○	○	○	●	○	○	84

● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Extension)

Front Panel Hex Code	Error	Suggested Remedy†
60	UART output collision	1, I
61	INDONE indicated byte available GETBYTE received none	1, I
62	Engine reported Serial I/O command error	1
63	I/O – print engine timed out. Cycle power. Check VRC-to-engine cabling.	1
68	UART output collision	1, I
69	INDONE indicated byte available GETBYTE received none	1, I
6A	Front panel reported SIO command error	P
6B	I/O to Front Panel timed out	F, I
70	Processor PCA failure	1, P, C, D
71	Firmware crash	1, P, C, D
72	Spurious interrupt	1, P, C, D
73	I/O DMA failure	1, I, C, D
74	Swath-RAM failure	1, S, C, D
75	Swath-RAM (pixel mode) failure	1, S, C, D
76	Processor PCA failure	1, P, C, D
77	Disk controller	1, C, D
81	Sector number is WD201-decreased after a transfer	R, C
82	Sector address byte overflowed	R, C
83	Address is past available data range	R, C
84	Track buffer point is past allowed range	R, C

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C =Disk Control PCA
D =Disk Drive
I =I/O DMA PCA
M =Main/Interconnect PCA
P =Processor PCA
S =SWATH/RAM PCA
R =Reformat Disk & retry
1 =Change Queue Size, cycle power and retry.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Continued)

Processor LEDs								Front Panel HEX Code
7	6	5	4	3	2	1	0	
●	○	○	○	○	●	○	●	85
●	○	○	○	○	●	●	○	86
●	○	○	○	○	●	●	●	87
●	○	○	○	●	○	○	○	88
●	○	○	○	●	○	○	●	89
●	○	○	○	●	○	●	○	8A
●	○	○	○	●	○	●	●	8B
●	○	○	○	●	●	○	○	8C
●	○	○	○	●	●	○	●	8D
●	○	○	○	●	●	●	○	8E
●	○	○	○	●	●	●	●	8F
●	○	○	●	○	○	○	○	90
●	○	○	●	○	○	○	●	91
●	○	○	●	○	○	●	○	92
●	○	○	●	○	○	●	●	93
●	○	○	●	○	●	○	○	94
●	○	○	●	○	●	○	●	95
●	○	○	●	○	●	●	○	96
●	○	○	●	○	●	●	●	97
●	○	○	●	●	○	○	○	98
●	○	○	●	●	○	○	●	99
●	○	○	●	●	○	●	○	9A
●	○	○	●	●	○	●	●	9B

● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Extension)

Front Panel Hex Code	Error	Suggested Remedy†
85	Number of sectors transferred has overflowed	R, C
86	Crossed boundary during single-track access	C
87	Length variable underflowed after a decrement	R, C
88	seek failed	C, D
89	Disk command timed out in wait-not-busy	C, D
8A	Disk command timed out	D, C
8B	Index level hasn't changed; is disk spinning?	D, C
8C	Unable to format disk due to hardware failure	D, C
8D	Disk spindle test failed	D, C
8E	Track 00 indicator test failed	D, C
8F	Disk or disk interface hardware failed	C, D
90	System RAM (on controller PCA) failed its self test	C
91	Disk drive didn't become ready	D, C
92	Drive didn't spin up or seek to track 00 on power-up	D, C
93	The WD2010 failed its echo test	C
94	Track buffer RAM failed its self-test	C
95	Spare area ran out of spare tracks	R
96	Unable to write a spare	R, D, C
97	Unable to recover data from a track	R
98	Data on track to be spared was lost	R
99	Stepped off the spare table	R
9A	Unable to write spare tables to disk	R, D, C
9B	Too many bad sectors on a non-data reserved track	R, D, C

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C =Disk Control PCA
D =Disk Drive
I =I/O DMA PCA
M =Main/Interconnect PCA
P =Processor PCA
S =SWATH/RAM PCA
R =Reformat Disk & retry
1 =Change Queue Size, cycle power and retry.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Continued)

Processor LEDs								Front Panel HEX Code
7	6	5	4	3	2	1	0	
●	○	○	●	●	●	○	○	9C
●	○	○	●	●	●	○	●	9D
●	○	○	●	●	●	●	○	9E
●	○	○	●	●	●	●	●	9F
●	○	●	○	○	○	○	○	A0
●	○	●	○	○	○	○	●	A1
●	○	●	○	○	○	●	○	A2
●	○	●	○	○	○	●	●	A3
●	○	●	○	○	●	○	○	A4
●	○	●	○	○	●	○	●	A5
●	○	●	○	○	●	●	○	A6
●	○	●	○	○	●	●	●	A7
●	○	●	○	●	○	○	○	A8
●	○	●	○	●	○	○	●	A9
●	○	●	○	●	○	●	○	AA
●	○	●	○	●	○	●	●	AB
●	○	●	○	●	●	○	○	AC
●	○	●	○	●	●	○	●	AD
●	○	●	○	●	●	●	○	AE
●	○	●	○	●	●	●	●	AF

● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Extension)

Front Panel Hex Code	Error	Suggested Remedy†
9C	Read data differs from data written in format verify	R, C
9D	Verify of data area failed during format	R, D, C
9E	6809 processor failed on power-up	C
9F	System ROM (on controller PCA) failed checksum test	C
A0	Stepper hysteresis check failed	D, C
A1	Lost the spare tables	R
A2	Data read differs from that written	R, D, C
A3	Read/write test failed	R, D, C
A4	ECC correction test failed	C, D
A5	Long-read part of read/write disk test failed	R, D, C
A6	Long-read part of ECC correction check failed	R, D, C
A7	Long-write part of read/write disk test failed	R, D, C
A8	ECC correction check failed to write error to disk	R, D, C
A9	ECC correction check failed	R, D, C
AA	Length passed would put address out of range	R, C
AB	Incorrect hard drive jumper settings (Fix Jumpers)	D, C
AC	A sector ID not found on power-up (wrong format)	R
AD	No sector ID found for scan-ID command	R
AE	Unable to retrieve data save off spared track	R
AF	Reserve data area overflowed spare tracks	R

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C =Disk Control PCA
D =Disk Drive
I =I/O DMA PCA
M =Main/Interconnect PCA
P =Processor PCA
S =SWATH/RAM PCA
R =Reformat Disk & retry
1 =Change Queue Size, cycle power and retry.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Continued)

Processor LEDs								Front Panel HEX Code
7	6	5	4	3	2	1	0	
●	○	●	●	○	○	○	○	B0
●	○	●	●	○	○	○	●	B1
●	○	●	●	○	○	●	○	B2
●	●	●	●	●	●	●	●	FF

● = ON ○ = OFF ✳ = Don't care

This table extends onto the next page.

NOTE: When servicing the VRC for ANY problem, make sure the VRC fan filters are clean, and the fans are functioning correctly. If the fan filters are clogged, or the fans are not functional, the internal temperature of the VRC will be much higher than normal causing premature disk drive failure.

Table 8-5. Plotter Error Codes (Models 250/255 Only) (Extension)

Front Panel Hex Code	Error	Suggested Remedy†
B0	Data on a reserve track lost	R
B1	Reserve data spare table overflowed	R, D, C
B2	Multiply routine overflowed	C
FF	Internal (VRC) self-test passed with no failures (No action required)	No Action Needed

● = ON ○ = OFF ✳ = Don't care

† **SUGGESTED REMEDY Perform in the order indicated**

C	**=Disk Control PCA**	**S**	**=SWATH/RAM PCA**
D	**=Disk Drive**	**R**	**=Reformat Disk & retry**
I	**=I/O DMA PCA**	**1**	**=Change Queue Size, cycle power and retry.**
M	**=Main/Interconnect PCA**		
P	**=Processor PCA**		

8-50. TEST PANEL FEATURES ON MODELS 240D/E AND 250/255

8-51. See Figure 8-10 for an illustration of the test panel features.

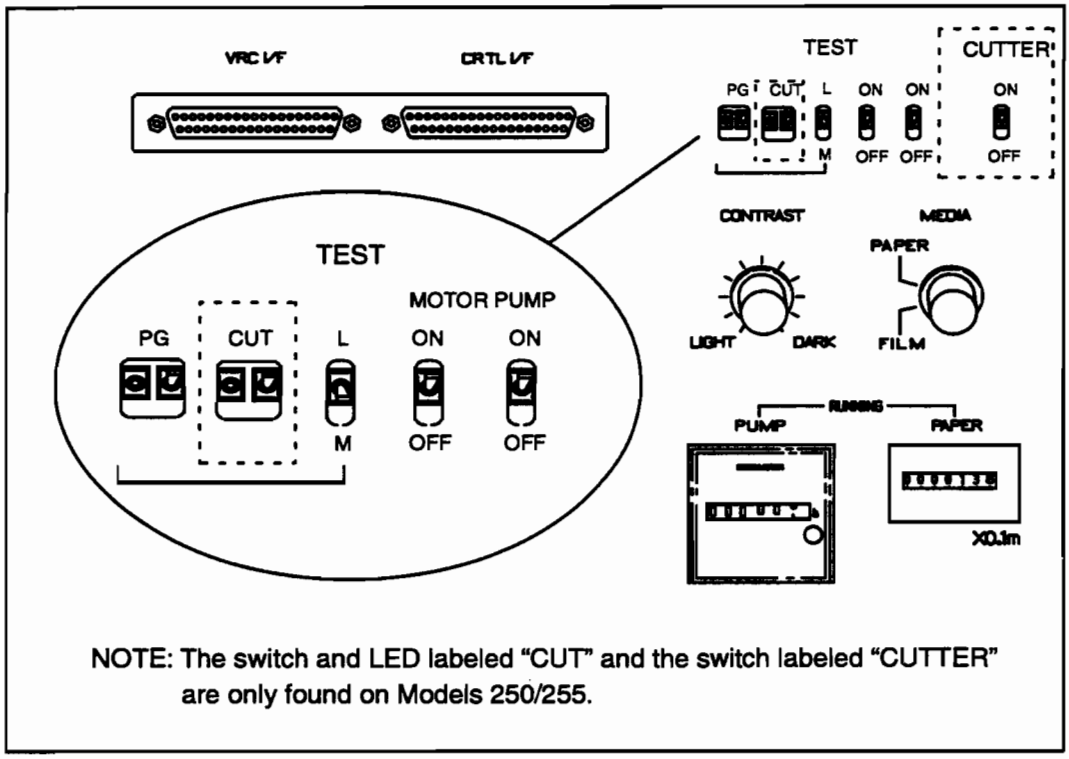


Figure 8-10. Test Panel

8-52. Refer to Table 8-6 for a description of the test panel features.

Table 8-6. Test Panel Features

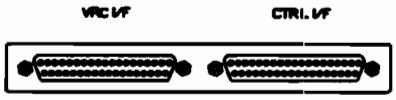
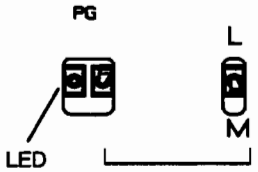
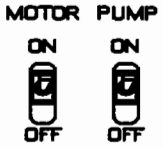
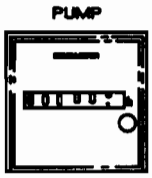
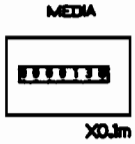
ITEM	DESCRIPTION
	CONNECTORS VRC I/F Used to connect the print engine to the VRC. CTRL I/F Used to connect the print engine to the VRC.
	L/M (Linear/Mixed) A switch used to select a linear or a mixed test pattern. PG (Page) A sprint-loaded switch used to start a test plot. When the PG switch is pressed 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.
	CONTRAST A rheostat that controls the density of the plot produced by the print engine. Rotating the control counter-clockwise decreases plot density

Table 8-6. Test Panel Features (Continued)

ITEM	DESCRIPTION
	MEDIA Switch – A two-position switch used 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.
	CUT (Models 250/255 Only) A momentary switch used to generate a cutter test pattern for adjusting the cutter timing.
	CUTTER (Models 250/255 Only) A switch used to "turn off" (disable) the cutter section of the plotter.

8-53. PRINT ENGINE TESTS (Models 240D/E and 250/255)

8-54. 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.

8-55. To verify operation, proceed as follows:

1. Turn the plotter OFF (O).
2. Ensure that media and toner are loaded.
3. Turn the plotter ON (I).
4. Open the right-front door of the plotter.
5. Press and release the PG switch on the plotter test panel once. See Figure 8-10. The LED beside the switch will light. The test will run continuously until the PG switch is pressed again.
6. 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 8-40 through Figure 8-53 for samples of the test plots.
7. Printing of the test pattern assures that the mechanical and electrical areas of the print engine are functional.

NOTE (Models 250/255 Only)

The "CUT" switch is only used to generate a cutter test pattern when adjusting the cutter timing. The "CUTTER" switch is used to switch OFF (**O**) the cutter completely.

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

8-56. VRC TESTS (Models 240D/E Only)

8-57. 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:

1. Continuous Bench-Run Test
2. Power-Up
3. Disk Test

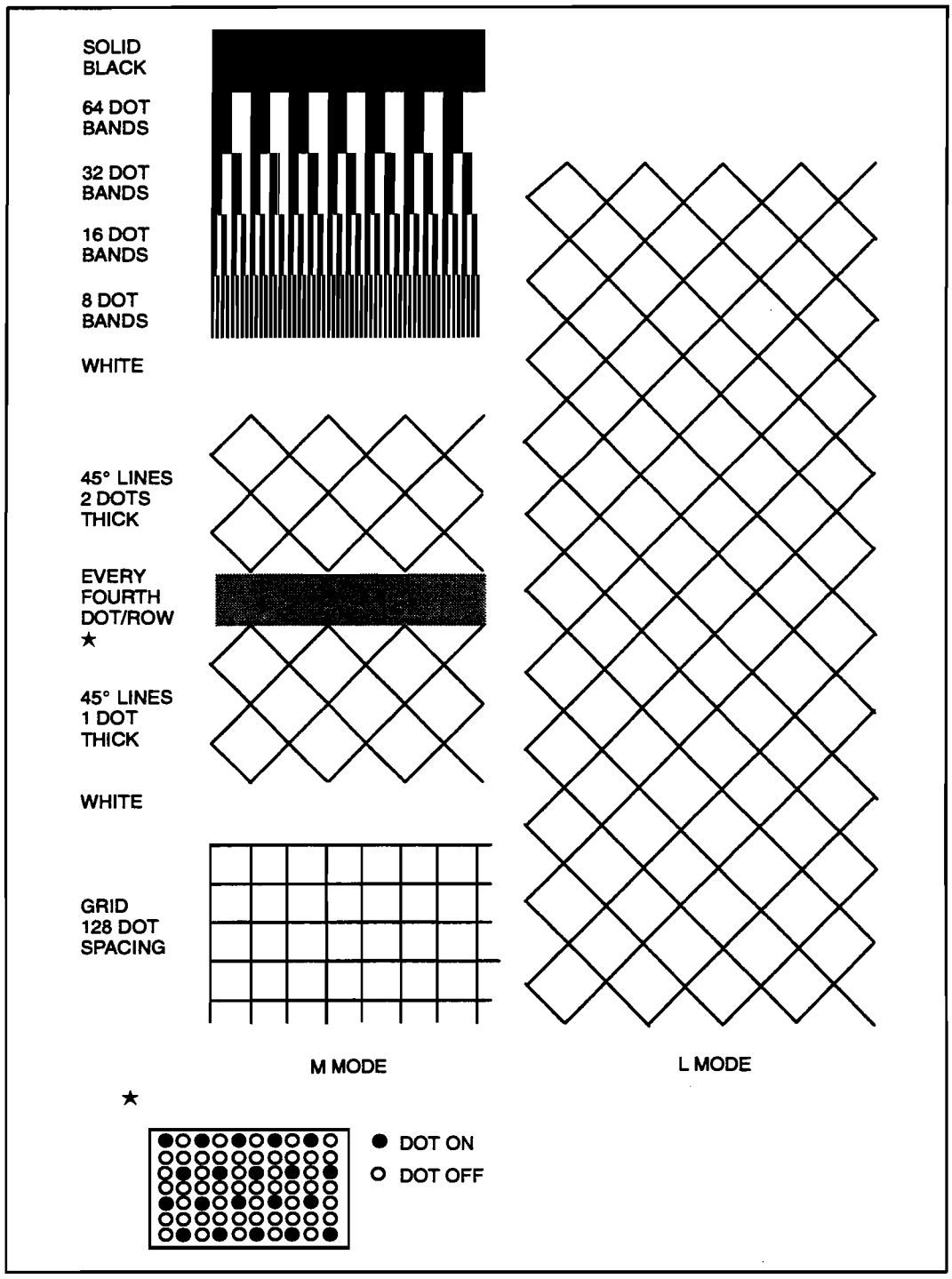


Figure 8-11. Print Engine Test Plots

4. RS-232-C Loop-Back Test

5. Switch Test

6. Disk Format

8-58. 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. 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:

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

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

3. Set the Test Mode and Bench-Run Switches ON (**I**). See Figure 8-12.

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

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

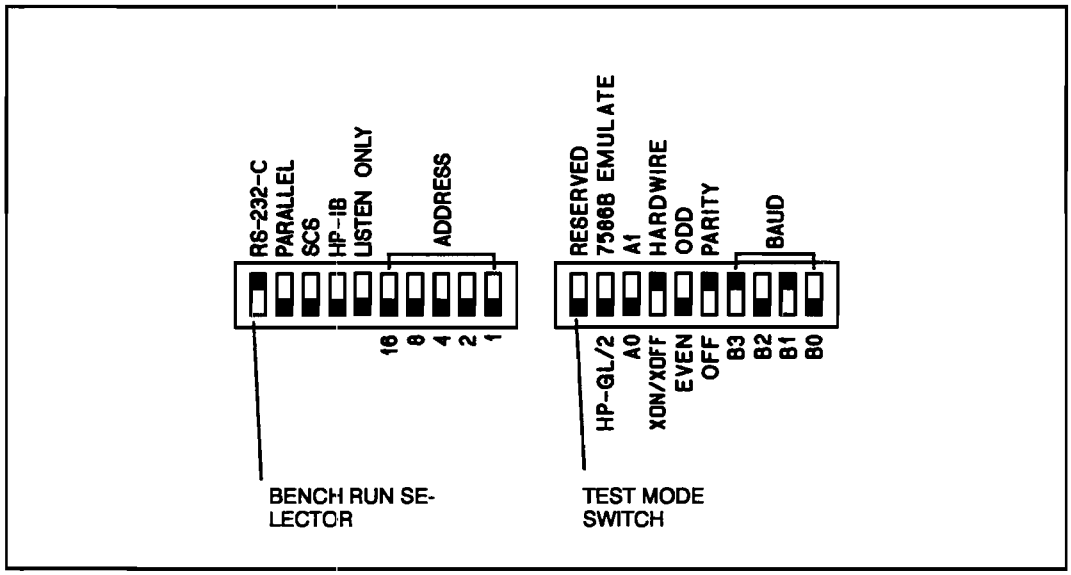


Figure 8-12. VRC Panel Switches

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

8-59. 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 8-7.

Table 8-7. 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.

8-60. To enter the selectable tests, proceed as follows:

1. Turn the plotter OFF (**O**).
2. Set the VRC Test Switch to the ON (**I**) position and the Bench Run selector OFF (**O**).
3. Disconnect the external computer interface cable from the VRC.
4. Turn the plotter ON(**I**).
5. The front panel indicators Busy, Reset, and Media will indicate the number of the test selected.
6. Press the Plot button to step through to the desired test.

NOTE

For the VRC switch test proceed to step 11. , and continue with the test.

7. 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 and begin the test.

NOTE

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

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

9. 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.

10. 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.

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

    a. Set all VRC interface switches ON(**I**).

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

    c. The Reset LED will be ON.

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

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

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

12. 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.

13. After formatting the disk, the Demo Plot must be downloaded. Refer to the procedure titled LOADING THE DEMONSTRATION PLOT in chapter 3, paragraph 3-79.

8-61. FRONT-PANEL TESTS (Models 250/255 Only)

8-62. A variety of diagnostic information is available through the front-panel indicators. The panel is illustrated in Figure 8-13. Table 8-8 lists the functions of the error indicators.

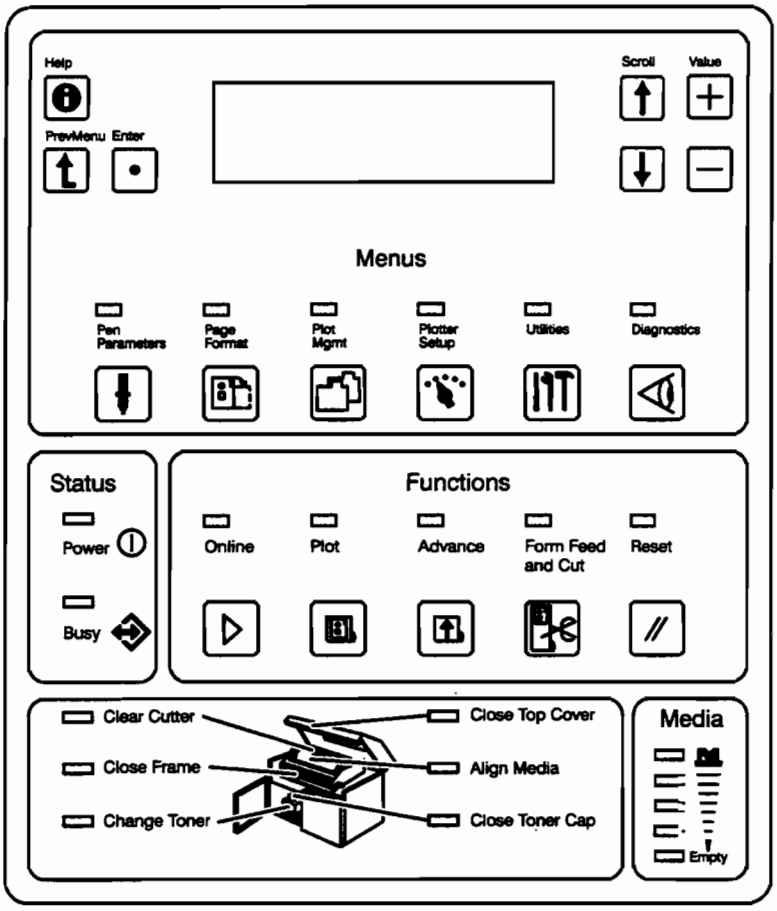


Figure 8-13. Front-Panel Indicators

Table 8-8. 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.

8-63. DIAGNOSTIC HELP MENU (Models 250/255 Only)

8-64. Within the Diagnostic Menu, "Help" displays are available to provide additional information about the menu selection.

8-65. To view the "Help" commands:

1. 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
```

2. 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.

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

4. 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.

5. The various Diagnostic Help displays are as follows:

6. 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.

8-66. FRONT-PANEL MENU (Models 250/255 Only)

8-67. 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 8-13. The following menu will be displayed:

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

8-68. 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.

8-69. 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
```

8-70. The information available in the Diagnostic menu is listed in Table 8-9.

Table 8-9. 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. Requires 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 REPETI-TIVELY	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 8-9. Diagnostic Menu (Continued)

TEST	OPTIONS	RESULT
FLUSH TONER	none	Interactive maintenance procedure. Refer to chapter 4 paragraph "4-29. " in this manual.
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 paragraph 8-79.
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

8-71. PERFORMANCE PLOT (Models 250/255 Only)

8-72. 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:

1. Ensure that no plot is being received.
2. Ensure that the Online LED is off. If ON, pressing the Online button once will toggle the LED.
3. 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
```

4. Press **Enter**.
5. The LCD display will prompt the user to go "Online".

```
Plot ready to load.

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

6. Press Online. The Online LED will go on and the busy LED will flash.
7. The performance plot will be generated. See Figure 8-14.

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.

8. 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.

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

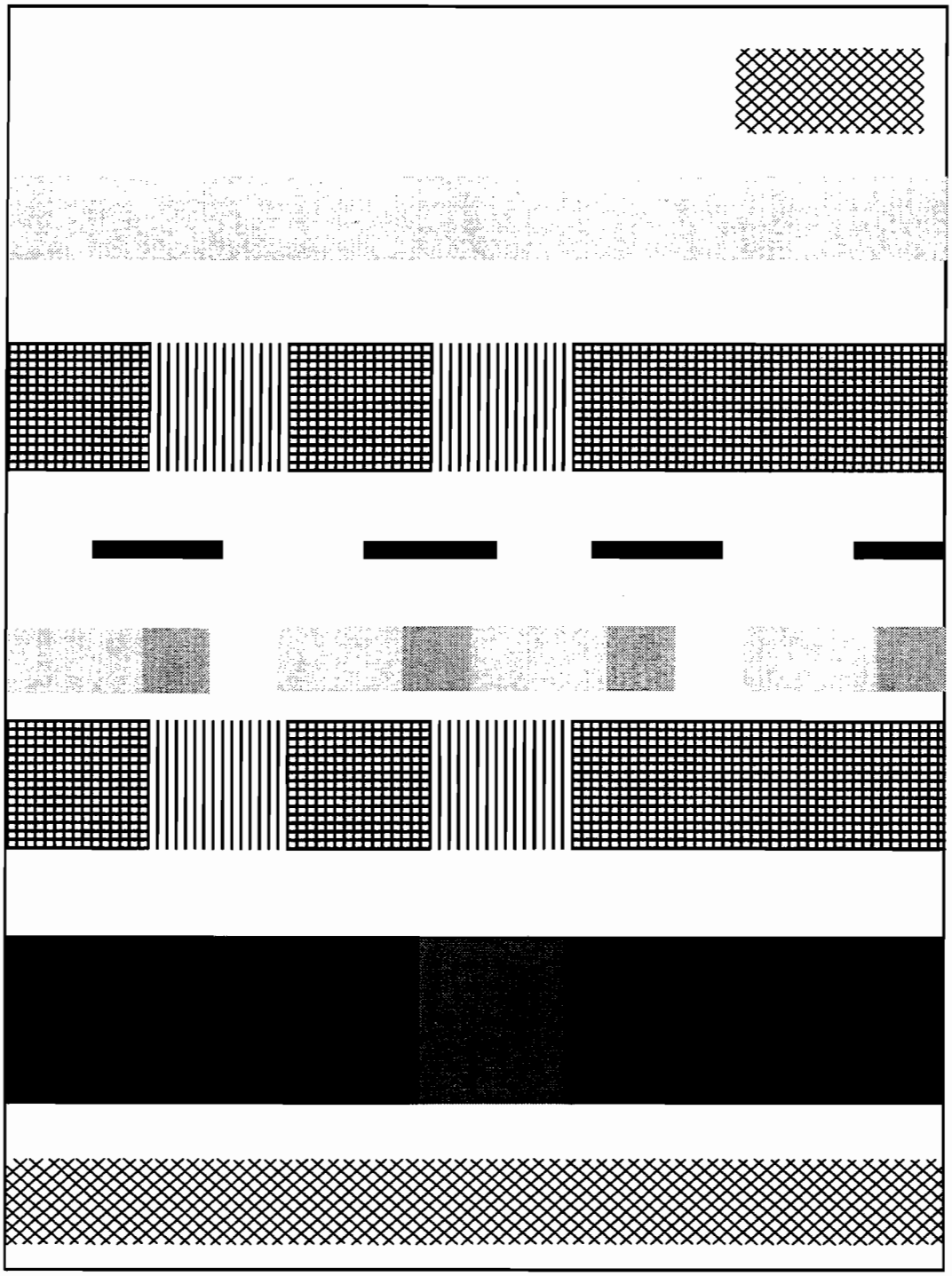
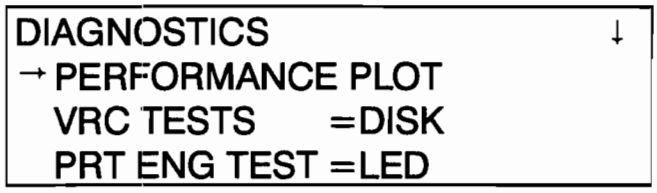


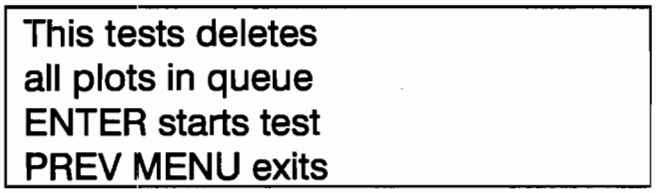
Figure 8-14. Performance Plot

8-73. VRC TESTS (Models 250/255 Only)

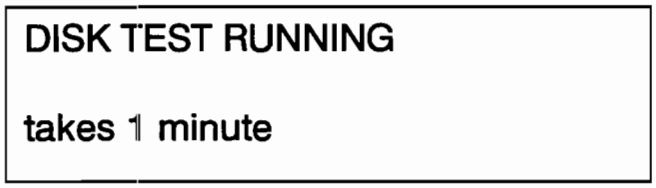
8-74. DISK TEST. The disk test is a 1 minute read/write test of the VRC hard disk. To perform the test, proceed as follows:



1. **Scroll ↓** to the **VRC TESTS.**
2. Press **Value +** or **Value –** button until the **DISK** selection appears.
3. Press **Enter.** The following display will appear:



4. Press **Enter** to start the test.
5. While running, the LCD will display:



6. A pass is indicated by:

```
Disk Test passed

PREV MENU exits
```

7. If an error is encountered during the test, the display will show a crash code. Refer to Table 8-5.

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

8-75. RS-232-C LOOPBACK TEST.To perform the loopback test, proceed as follows:

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

1. **Scroll** ↓ to the **VRC TESTS.**

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

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

```
Install the RS-232-C
loopback connector
ENTER starts test
PREV MENU exits
```

4. Install the loopback connecter (HP P/N 07440-60302) in the RS-232-C Interface connecter on the VRC.

5. Press **Enter.**

6. A pass is indicated by:

```
LOOPBACK TEST PASSED

ENTER repeats test
PREV MENU EXITS
```

7. If an error is encountered during the test, the display will show a crash code.Refer to Table 8-5. The code will be displayed as a hexidecimal number.

8-76. SERVICE MENU (Models 250/255 Only)

8-77. Within the Diagnostics Menu is a submenu for service technicians. This menu provides access to plotter calibration, disk format, and the VRDY display.

8-78. To enter the Service Menu:

1. Select the Diagnostic Menu.
2. At any point in this menu, press **Scroll** ↓ and the **Diagnostic** button at the same time.
3. The display appears as follows:

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

4. Pressing **Scroll** ↓ twice will display:

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

8-79. SET CALIBRATION

8-80. To adjust the calibration of the plotter output in the axis of media movement (X-axis):

1. Plot a line in the x axis.
2. Measure that line and perform the following computation:

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

† measured

3. Enter the service menu.
4. The select arrow will appear at the **SET CAL** line.
5. Press the **Value +** or **Value –** button to select the value computed.
6. The range is 90.00 to 110.00 in increments of hundredths.

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

```
PROCESSING COM-
MAND
```

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

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

8-81. 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.

8-82. To reformat the hard disk drive in the VRC:

1. Select the Diagnostic Menu.
2. At any point in this menu, press **Scroll** ↓ and the **Diagnostic** button at the same time.
3. The display appears as follows:

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

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

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

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

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

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

7. During formatting, the display is:

```
DISK FORMATTING

Format takes 20 min
```

8. Cycle power.

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

8-83. VRDY

8-84. 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

8-85. 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. See Figure 8-15.

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

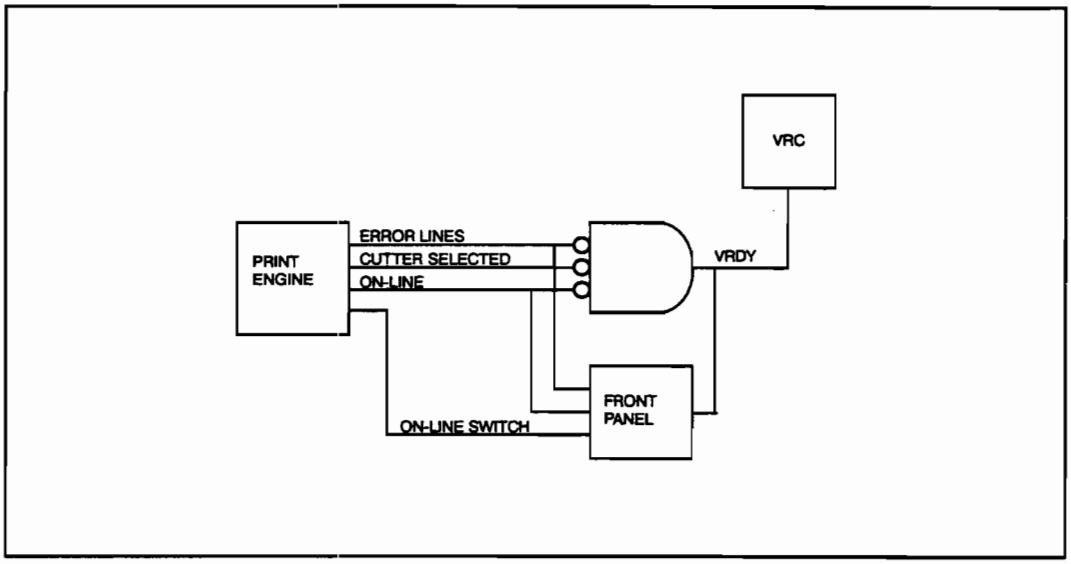


Figure 8-15. VRDY Block Diagram

8-86. DATA COMMUNICATION TESTS (Models 240D/E and 250/255)

8-87. 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 8-2. The following tests are on the disk (HP part number C1600-60401):

1. RS-232-C Communication Test.
2. HP-IB Parallel Communication Test.
3. Centronics Communication Test.
4. Hardwire Handshake Test.

5. XON/XOFF Handshake test.

8-88. RS-232-C COMMUNICATION TEST. The RS-232-C test is performed as follows:

1. Equipment Required:

   a. Portable PLUS Personal Computer.

   b. Disk Drive HP 9114B.

   c. Interface Cable 92221P.

2. The Portable PLUS is configured as follows:

a. Datacom Configuration	Serial
b. Transmission Rate (BPS)	19200
c. Word Length (bits)	8
d. Stop Bits	1
e. Parity	None
f. XON/XOFF Pacing	On
g. CTS Line	Ignore
h. DSR Line	Ignore
i. DCD Line	Ignore
j. Power to Interface	ON
k. Plotter Interface	Serial

3. Plotter Set Up

a. Mode	RS–232–C
b. 7586 EMULATE/ HP–GL/2	7586 Emulate
c. XON/XOFF/HARDWIRE	XON/XOFF
d. PARITY	OFF
e. BAUD	19200

4. Connect the Portable PLUS as shown in Figure 8-16.

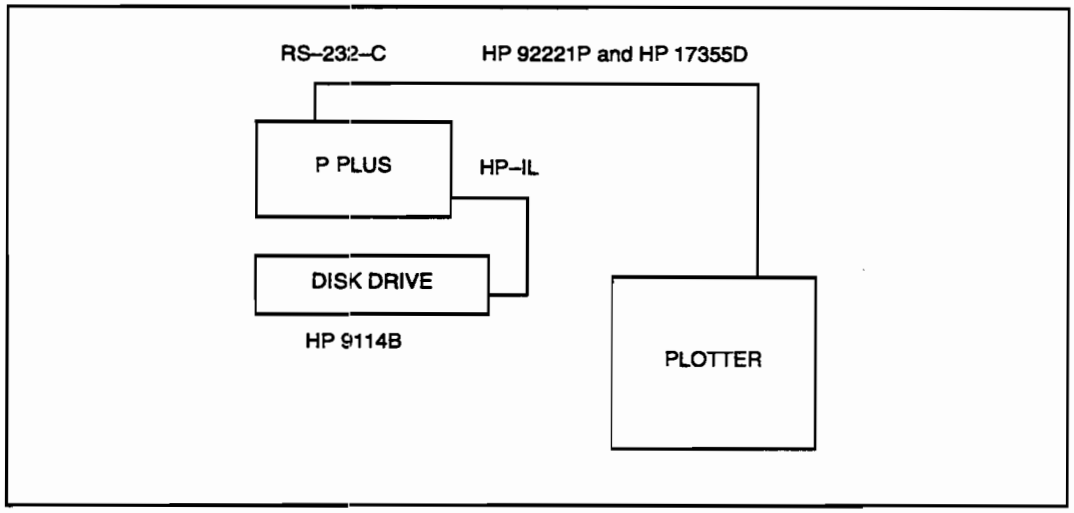


Figure 8-16. RS-232-C Test

5. Turn the Portable PLUS and the disk drive ON (I).

6. Install the service disk in the drive.

7. Turn the plotter ON (I).

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

9. Follow the instructions given on the display.

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

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

8-89. **HP-IB COMMUNICATION TEST.** The HP-IB Test is performed as follows:

1. Equipment Required:

   a. Portable PLUS Personal Computer.

   b. Disk Drive HP 9114B.

   c. HP-IL/HP-IB Interface HP 82169A.

d. Interface Cable HP 10833B or C.

2. The Portable PLUS is configured as follows:

   a. System Configuration HP–IB:05

3. Plotter Set Up:

   a. Mode HP–IB

   b. ADDRESS 05

   c. 7586 EMULATE/ HP–GL/2 HP–GL/2

4. Connect the Portable PLUS as shown in Figure 8-17.

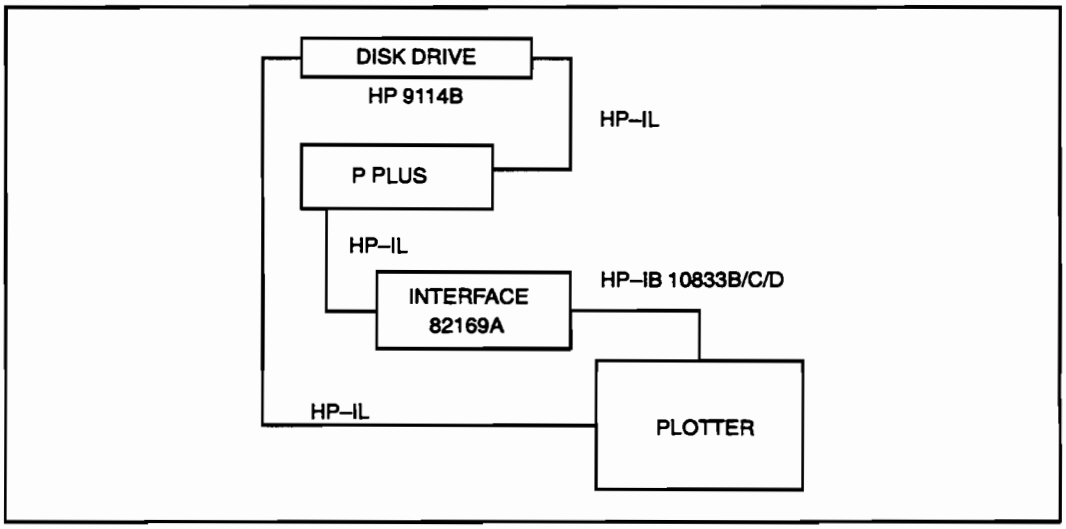


Figure 8-17. HP-IB Test

5. Turn the Portable PLUS and the disk drive ON (I).

6. Install the service disk in the drive.

7. Turn the plotter ON (I).

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

9. Follow the instructions given on the display.

10. Upon successful completion of the test turn OFF (O) all equipment before disconnecting.

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

8-90. CENTRONICS COMMUNICATION TEST. The CENTRONICS Test is performed as follows:

1. Equipment Required:

   a. Portable PLUS Personal Computer.

   b. Disk Drive HP 9114B.

   c. Serial-to-Parallel converter. (i.e. Black Box model number NW–PI015A)

   d. Interface Cable HP 92221P.

   e. Interface Cable HP 40242D.

2. The Portable PLUS is configured as follows:

a. Datacom Configuration	Serial
b. Transmission Rate (BPS)	19 200
c. Word Length (bits)	8
d. Stop Bits	1
e. Parity	None
f. XON/XOFF Pacing	On
g. CTS Line	Ignore
h. DSR Line	Ignore
i. DCD Line	Ignore
j. Power to Interface	ON
k. Plotter Interface	Serial

3. Consult the user manual for the serial-to-parallel converter configuration information.

4. Plotter Set Up:

a. Mode CENTRONICS

b. 7586 EMULATE
/HP–GL/2 HP–GL/2

5. Connect the Portable PLUS as shown in Figure 8-18.

6. 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 NO TAG

7. Install the service disk in the drive.

8. Turn the plotter ON (I).

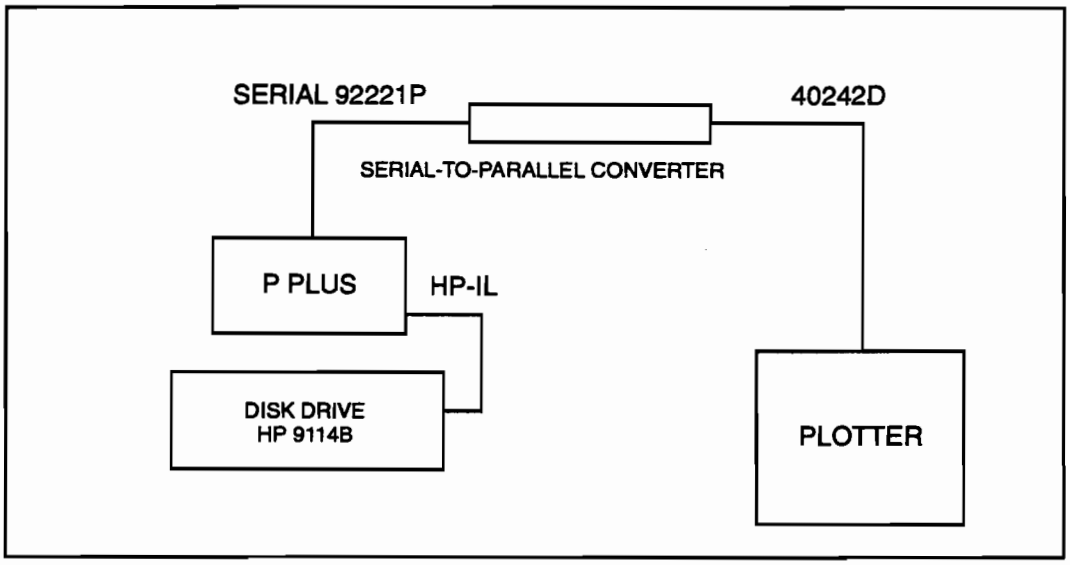


Figure 8-18. Centronics Test

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

10. Follow the instructions given on the display.

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

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

8-91. TROUBLESHOOTING CHART

8-92. The following troubleshooting chart, Table 8-10, lists some of the more common error indications that may occur with the operation of the plotter. Check the possible causes and take the necessary action to correct the problem.

Table 8-10. Troubleshooting Chart

INDICATION	POSSIBLE CAUSE	ACTION
Front Panel Error Indication		
Align media indicator ON or horn beeping	Dry/wrinkled Media	Advance media 6 - 8 inches or replace media.
	Recording media incorrectly loaded	Reload the media.
	Out of media	Load media.
	Plugged toner bar holes	Clean toner bar holes.
	Loss of vacuum in the toner system	Troubleshoot the vacuum system.
	Circuit defect	Troubleshoot the toner pump, solenoid, and drive circuitry. (MCD PCA)
Close frame indicator ON	Upper frame not locked	Lock the upper frame.
	Switch misaligned or failed	Troubleshoot switch circuit. Repair or replace switch.
Close toner cap indicator ON (Models 250/255 only)	No toner bottle installed	Install toner bottle.
	Siphon arm not fully down.	Fully seat the siphon arm.
	Circuit defect	Troubleshoot switch circuit.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Front Panel Error Indication (Continued)		
"Media not in chosen path" (Models 250/255 only)	Incorrect setting, media not routed correctly	Enter correct front panel setting. route media correctly.
Plotter will not go On-Line (Models 240D/E only)	Out of media	Load media.
	Error condition	Check indication, i.e. align media, top cover, etc.
	I/O interfacing problems	Check plotter configuration. Check VRC cabling. Correct as necessary.
Plotter will not go ON-Line (Models 250/255 only)	Out of media / media not in correct path	Load media. ensure proper media path.
	Cutter malfunction	Check for undetected jam. Clear as necessary. Troubleshoot cutter switches, rotation sensor, and front media sensor.
NOTE: Rotation sensor will not give a failure indication if defective.		
	I/O interfacing problems	Check plotter configuration. Check VRC cabling. Correct as necessary.
	Interlock/error conditions	Check/correct error condition.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Front Panel Error Indication (Continued)		
At power-up, the front panel never displays any indicator lights. (Models 240D/E only)	Defective 5 V power LPS1	Replace power supply. Troubleshoot ac circuit. (in-rush resistor, R1)
OR The front panel does not display any messages or lights. (Models 250/255 only)	Defective front panel Defective RMC PCA	Replace front panel. Replace RMC PCA
Operational Error Indication		
No media advance	Stepper motor or drive circuit	Troubleshoot motor and drive circuit. There are 3 fuses (1/phase) of 2 A each on the MCD PCA.
Plot start, media advance, but no image	Vacuum system problems	Lightly tap on solenoid housing. If problem not solved, troubleshoot per flowchart Figure 8-34.
Plotter power ON, media movement, toner system operational, media checked, but NO IMAGE on media.	NO high voltage being supplied to writing head Defective PED or CED PCAs	Troubleshoot/Replace HVPS. After HVPS is checked, replace 1 PED & 1 CED on same side of head.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operational Error Indication (Continued)		
Plotter power ON, media movement, toner system operational, media checked, but NO IMAGE on media (Continued)	Check writing head for burned electrode/s	Replace writing head after replacing PED and CED PCAs.
Internal Demo plot attempted. "Plot needs to be downloaded" plotted	Disk reformatted, but plot not down-loaded	Download Demo file onto disk on Models 240D/E. Download language files and demo plot on Models 250/255.
Media skew	Defective media roll	Replace media.
	Defective media spindle	Replace media spindle.
	Pinch Roller center bearing out of adjustment	Adjust center bearing per procedure in chapter 7 paragraph 7-14.
	Cutter or TUR malfunction on Models 250/255	Change media handling system to verify the problem, and correct the problem.
Media Counter MC1 operational, but no media advance	MCD PCA, +24 V LVPS or wiring defective	Check +24 V at connector 6. Replace LVPS if necessary. Then, if necessary, replace the MCD PCA.
	Media advance motor, PM1 defective	Replace the motor, PM1.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operation Error Indication (Continued)		
Test patterns OK, but no controller plotting	Bad VRC connections, problem in VRC, or problem in VRC interface.	Check VRC by running a Demo plot. Check interface cables. Check for front panel error indications. Repair as necessary.
	RMC PCA defective	Replace the RMC PCA.
The following front panel error indications and/or failure modes apply only to Model 250 and 255 plotters.		
Front Panel Error Indication		
"Initializing please wait" displayed continually and cannot be cleared	Front panel not comunicating with the VRC	Check/reconnect print engine and VRC cables. Troubleshoot the VRC. (possible VRC power supply or I/O problem)
	Front panel malfunction	Replace the front panel.
	RMC PCA malfunction	Replace the RMC PCA.
LCD blank after initializing message, or goes blank when performing front panel functions	Disk reformatted and language not downloaded	Download language files from the service disks.
French or German language or "Help" menus not available from front panel	Disk reformatted and language not downloaded	Download language files from the service disks.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Front Panel Error Indication (Continued)		
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 switch circuit.
Close Top Cover Indicator ON	Top cover open	Close top cover.
	Circuit defect	Troubleshoot switch circuit.
Clear Cutter Indicator ON	Media jam in cutter	Clear media from the cutter.
	Cutter derail	Reposition the blade, or replace the cutter.
	Switch lever dislodged	Reposition the switch, or replace the switch assembly.
NOTE: Rotation sensor will not give a failure indication if defective except for a possible "Clear Cutter" indication.		
Operational Error Indication		
Cutter not operational	Not selected (or turned OFF on test panel)	Select TUR on front panel, or turn ON the test panel cutter switch.
	Loose connection	Check electrical connections. Correct as necessary.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operational Error Indication (Continued)		
Cutter not operational (Continued)	Defective media input sensor	Replace media input sensor.
	Bad roller motor	Check voltage and resistance. Replace if necessary.
	Belt loose or missing	Tighten or replace belt.
	Drive cable loose, broken, or disconnected	Replace Y-axis cutter assembly.
	Cutter motor bad	Troubleshoot motor circuit.
	L or R sensor switches defective	Troubleshoot sensor circuits.
	Broken or dislodged switch lever.	Replace switch assembly.
	Defective rotation sensor	Replace rotation assembly.
	Time-out indication. Blade did not complete its travel in the allotted time (1.2 s)	Replace Y-axis cutter assembly.
	MCD PCA defective	Replace MCD PCA.
	Media eject sensor defective	Replace media eject sensor.,

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Operational Error Indication (Continued)		
Cut not straight (at right angles to the media) or cutter jam when cutting.	Electric brake inoperative	Troubleshoot brake circuit.
	Brake weak	Replace electric brake.
Take-Up-Reel (TUR) not operational	Not selected	Select Take-Up-Reel.
	Loose motor or sensor connections	Check electrical connections. Correct as necessary.
	Defective motor	Check coil resistance (1-2 ohms). Check voltage at J59 with TUR driving (6 Vdc under load) (9-10 Vdc open circuit). Check sensor connections and operation.
Take-Up-Reel jam error	Take-Up-Reel motor	Replace Take-Up-Reel motor.
Plot Quality Problem descriptions begoinning on the next page apply to all Model 240D/E and 250/255 plotters.		

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
The following Plot Quality Problem descriptions apply to all Model 240D/E and 250/255 plotters.		
Plot Quality Problems		
First plot(s) very light	Low humidity environment	Advance media 1 - 2 meters. Replace media roll. Increase the humidity of the environment (30% to 80% RH recommended).
	Depleted toner	Replace toner.
Random streaking	Low humidity environment	Advance media 1 - 2 meters before plotting. Increase the humidity of the environment (30% to 80% RH recommended.
	Contrast setting too high	Lower the contrast setting.
Solid lines (usually one pixel width) through length of plot (indicates scratch on media surface)	Debris on developer bar	Clean developer bar and grooves.
	Scratched developer bar	repair developer bar by removing scratch or burr. Refer to service note C1620A-07 for procedure.
Excessive flaring	Low humidity environment	Advance media 1 - 2 meters before plotting. Increase the humidity of the environment (30% to 80% RH recommended.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Plot Quality Problems (Continued)		
Excessive flaring (Continued)	Contrast setting too high	Lower the contrast setting.
	Defective media	Replace media with media from a different lot number.
Toner smear through the plot	Dry/wrinkled translucent media	Advance media 1 meter before plotting
	Inoperative solenoid valve	Replace solenoid valve.
	Toner bath vacuum holes clogged	Clean out toner bath grooves and holes. Flush system.
	Weak toner pump	Replace pump.
	Media slippage (causing vacuum loss)	Perform center bearing adjustment.
Scrape mark or tear two inches in from right margin of the media	Out-of-media switch (SSW4) misadjusted or inoperative	Adjust the out-of-media switch, or replace switch if necessary.
Low density image	Dirty or corroded writing head	Polish and clean the head.
	Weak toner	Replace the toner. Toner should be replaced after 500 to 700 meters of media per bottle.

Table 8-10. Troubleshooting Chart (Continued)

INDICATION	POSSIBLE CAUSE	ACTION
Plot Quality Problems (Continued)		
Low density image (Continued)	Temperature or humidity out of optimal range (Temperature 15 to 25 °C) (Humidity 40 - 60% RH)	Retest the plotter after environmental conditions have been corrected.
	Poor grade of media	Use HP Premium grade 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 HP approved supplies.
NOTE: For additional information on specialized plot quality problems and their solutions, see the series of sample plots starting at Figure 8-40.		

8-93. INTERLOCK LEDS (Models 240D/E and 250/255)

8-94. 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:

1. Turn the plotter OFF (**O**).
2. Remove the two screws securing the right–hand cover. Refer to the disassembly procedures if necessary.
3. 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.

4. Move the panel aside so that the LEDs may be observed.
5. 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.

6. Initiate the operational mode which caused the error and observe the LEDs on the MCD PCA. See Figure 8-19 to determine the interlock circuit involved.

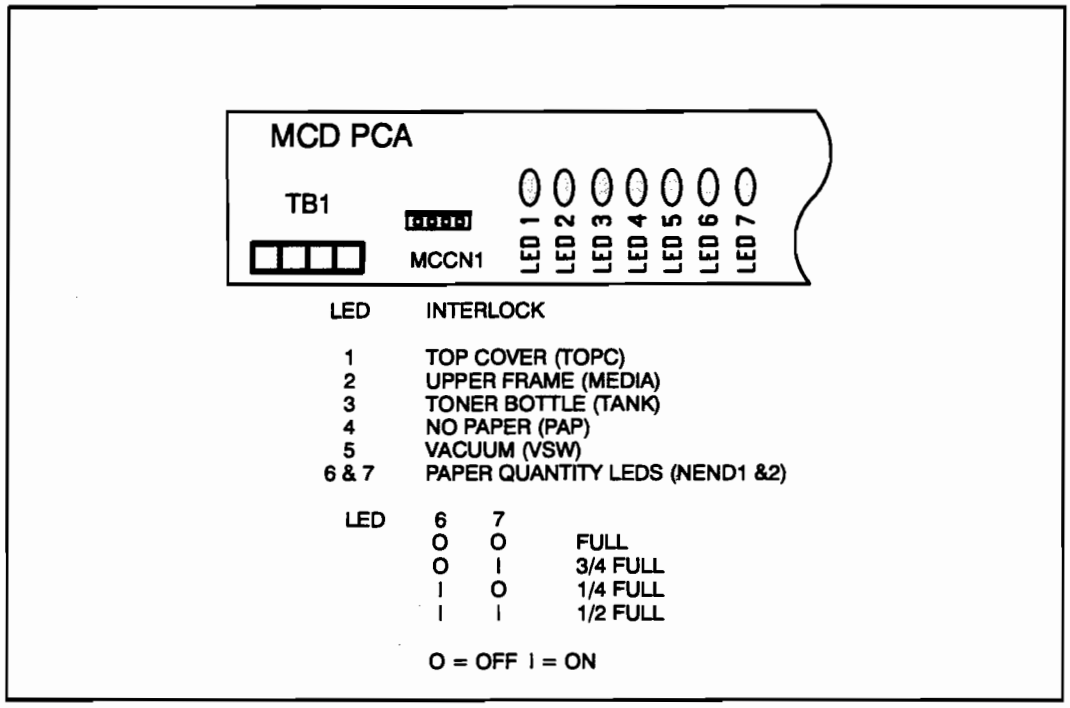


Figure 8-19. MCD Interlock LEDs

8-95. POWER SUPPLY SYSTEM TROUBLESHOOTING (Models 240D/E and 250/255)

8-96. The plotter power supply consists of three units; LPS1 (+5 V), LPS2 (+24 V), (See Figure 8-21.), 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.

8-97. +5 V POWER SUPPLY (LPS1). The following items can be checked to determine the operational status of the +5 V power supply:

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

8-98. If any of the previous items do not appear to be functioning correctly, perform the following:

1. Using the voltmeter, check the ac line voltage. It must be between 99 and 132 Vac.
2. Disconnect the +5 V leads at the RMC PCA TB1.
3. Using the voltmeter, measure the +5 V at LPS1. See Figure 8-21. If not within specifications, replace the LPS1.
4. Reconnect the leads at TB1 and measure the +5 V. If not within specifications, replace the RMC PCA.

8-99. If the +5 V is not present at the +5 V (LPS1) test points described above, troubleshoot the ac line voltage and the in-rush resistor (R1) as follows:

1. Using the voltmeter, check the ac line voltage. It must be between 99 and 132 Vac. If the voltage is not present, or is outside of the limits, troubleshoot the in-rush resistor (R1) before proceeding. To test R1 perform the following:
   a. Turn OFF (**O**) power and disconnect the line cord.
   b. Remove the right side cover of the plotter. Refer to chapter 6 if necessary.
   c. Using the ohmmeter, measure between the test points shown in Figure 8-20. There should be a reading of approximately 10 ohms. If there is an infinite resistance, R1 is defective (open) and must be replaced. Refer to chapter 6 the removal and replacement procedure.

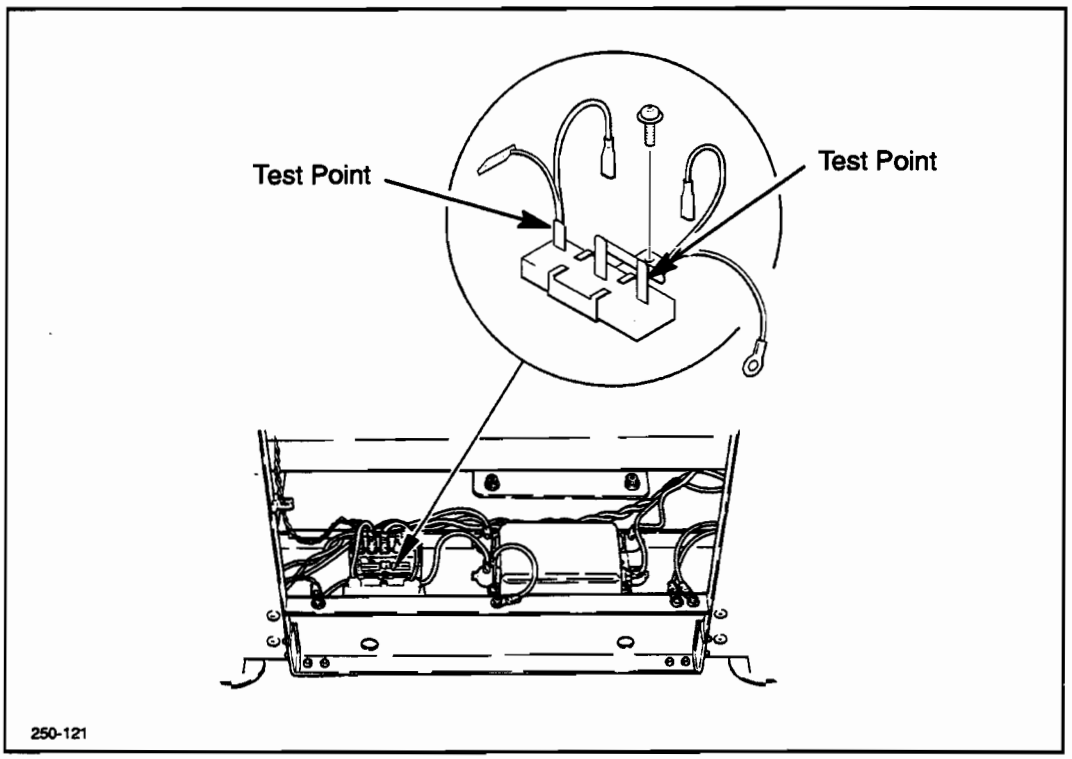


Figure 8-20. In-Rush Resister Test Points (Models 240D/E and 250/255)

d. After replacing R1 and before switching on the plotter, Check the fuses on the VRC and low voltage power supplies. If a defective fuse is found, replace the power supply before powering on the plotter.

8-100. **+24V POWER SUPPLY(LPS2).** The following items can be checked to determine the status of the +24 V power supply:

- Media Counter.
- Fan operation.
- Manual media feed.
- Toner flow.
- LPS2 LED ON (Inside the rear cover).
  See Figure 8-21.

8-101. If any of the previous items do not appear to be functioning correctly, perform the following:

1. Using a voltmeter check the ac line voltage. It must be between 99 and 132 Vac.
2. Check the power supply jumpers for proper location. See Figure 8-21.
3. Disconnect the +24V output leads at TB1 of the MCD PCA.
4. Using the voltmeter measure the output voltage (+24V).
5. If the LPS2 output is normal the power supply is good.
6. Reconnect the output leads at TB1 and check the voltage again.
7. If the output voltage is not within tolerance, disconnect other components in the +24 V circuits to isolate the problem.

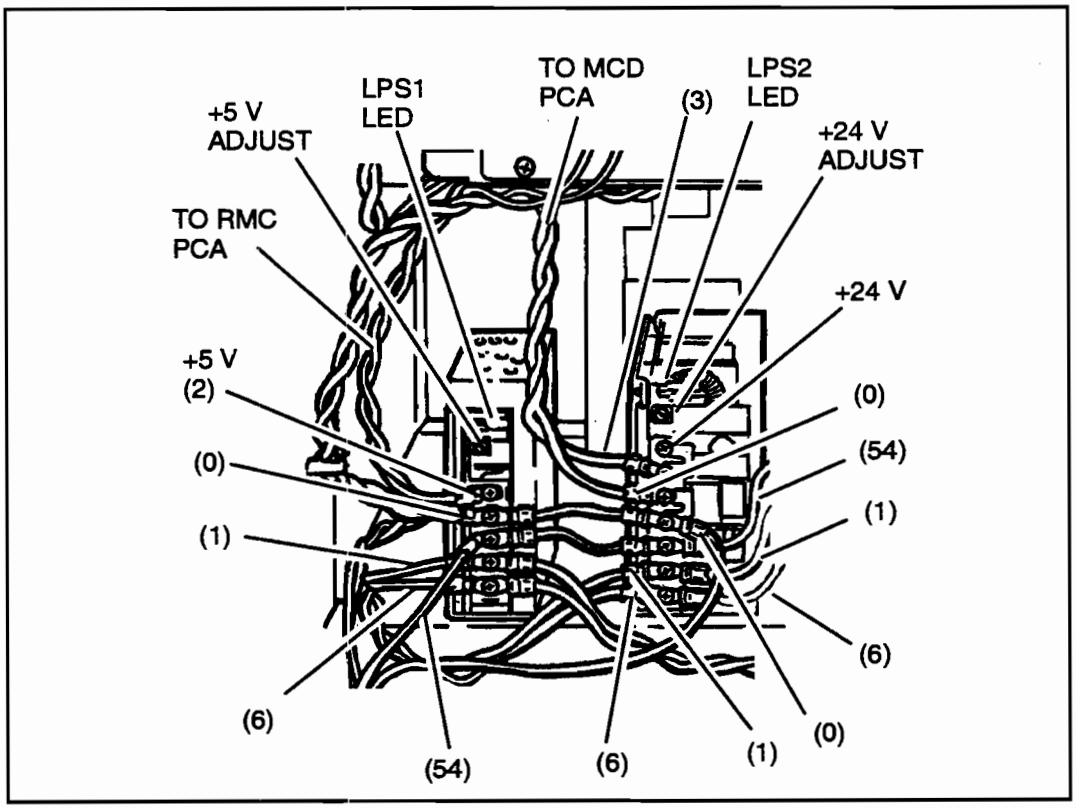


Figure 8-21. Low Voltage Power Supplies

8-102. 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 "DEVELOPING SYSTEM (TONER) FAILURES", paragraph 8-117.

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.

8-103. To troubleshoot the high voltage power supply, proceed as follows:

1. Turn the plotter line switch ON (I).
2. After initialization is complete, turn OFF the motor switch on the test panel.
3. After removing the rear panel, press the PG switch on the plotter test panel to start the plotter test mode. this will activate the high voltage.
4. With the rear cover open, remove connectors PCN4 and PCN5 from the back of the HPS1 power supply. See Figure 8-22.
5. Using the voltmeter, check the power supply output: See Figure 8-23.
   a. PCN4 pin 1(+330V) to pin 3 (GND/earth)
   b. PCN4 pin 4(+330V) to pin 6 (GND/earth)
   c. PCN5 pin 1(−250V) to pin 4(GND/earth)
   d. PCN5 pin 2 (−250V) to pin 5 (GND/earth)
6. If the "POWER ON" LED on the high voltage power supply (HPS1) does not light, disconnect PCN4 and PCN5, and check the resistances between pins on the plug. Re-

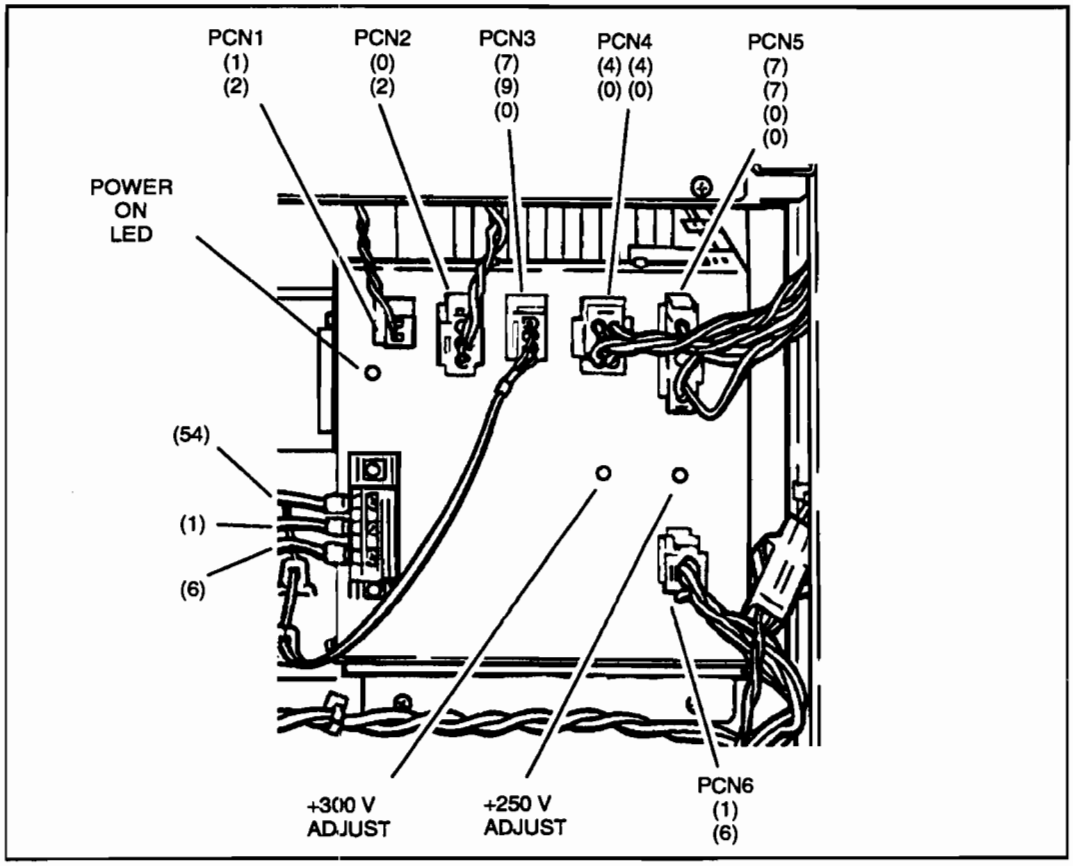


Figure 8-22. HPS1 Connectors

sistance reading should be infinity between any two pins on PCN4. On PCN5, the readings should be infinity between pins 1 and 4, pins 2 and 5, and pins 1 and 2. The reading between pins 4 and 5 should be 27.3 ohms.

7. If a resistance reading in step "6. " is incorrect, trace the problem to the involved CED PCA, PED PCA, or interconnecting wiring and repair or replace.

8. If the resistance readings at step "6. " were correct, replace the high voltage power supply.

9. If a repair or replacement was accomplished at step "7. ", check the resistance readings at step 6. If they are correct, return to the beginning of this procedure and check the high voltage again. If the high voltage power supply "Power-On" LED fails to light, or one of the voltage readings at step "5. " is not adjustable to its nominal value, replace the high voltage power supply. The locations of the adjustment potentiometers are shown in Figure 8-22.

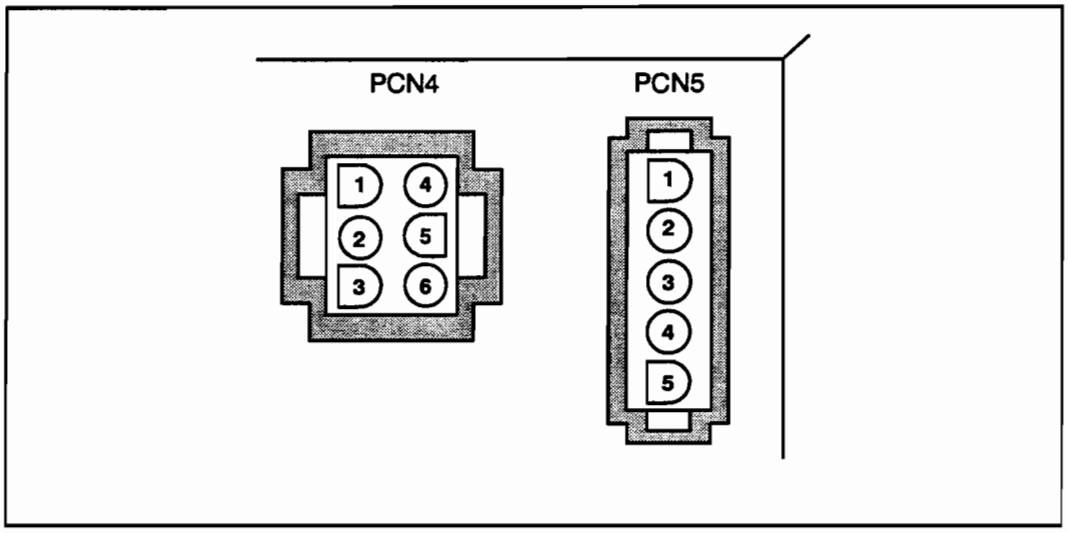


Figure 8-23. HPS Connector Pin Configuration

8-104. PCA TROUBLESHOOTING (Models 240D/E and 250/255)

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.

8-105. **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.

8-106. 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.

8-107. 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.

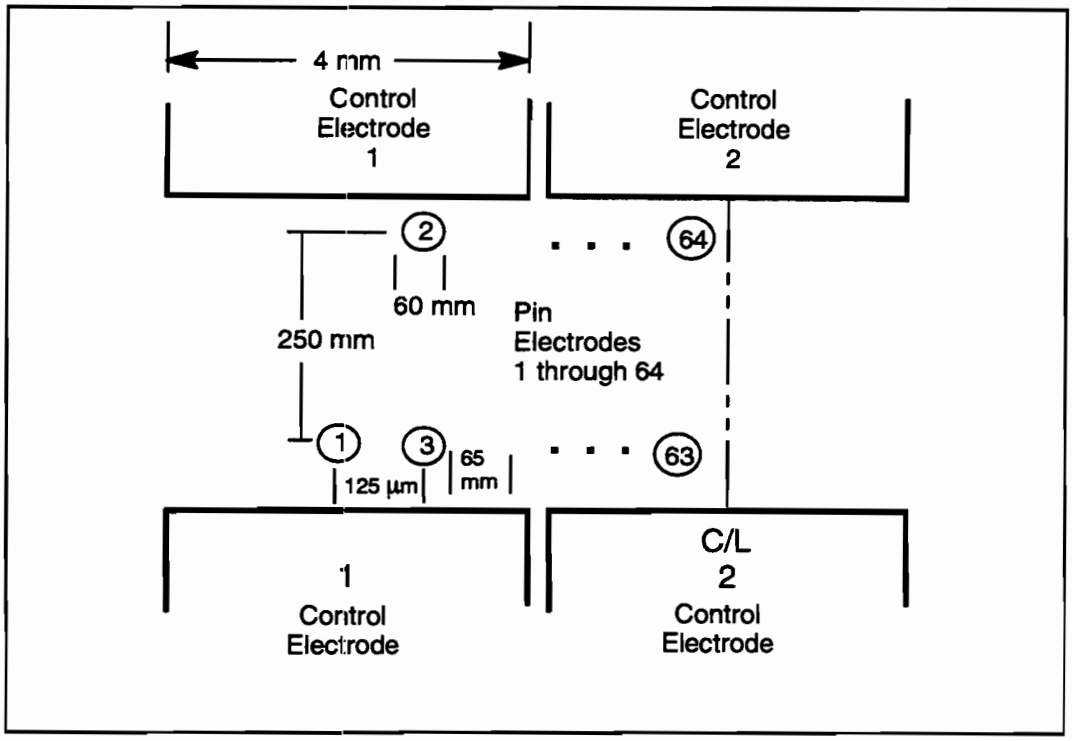


Figure 8-24. Electrode Configuration

8-108. 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.

8-109. **CONTROL ELECTRODE DRIVER PCA (CED) TROUBLE-SHOOTING.** Identical control electrode driver PCAs are used for the left and right sides.

8-110. A defective Control Electrode Driver is always characterized by a missing vertical line 4 mm (64 dots) wide as shown in Figure 8-46. Figure 8-24 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.

8-111. PLOTTING FAILURES (Models 240D/E and 250/255)

8-112. Refer Figure 8-30 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 8-30 to support assembly level repair.

8-113. **CONTROLLER OPERATION.** Figure 8-25 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.

8-114. **INTERNAL FAILURE TROUBLESHOOTING.** When it has been determined that the plotting failure is internal to the plotter, refer to the troubleshooting chart, Table 8-10, and the troubleshooting flowcharts Figure 8-30 through Figure 8-39.

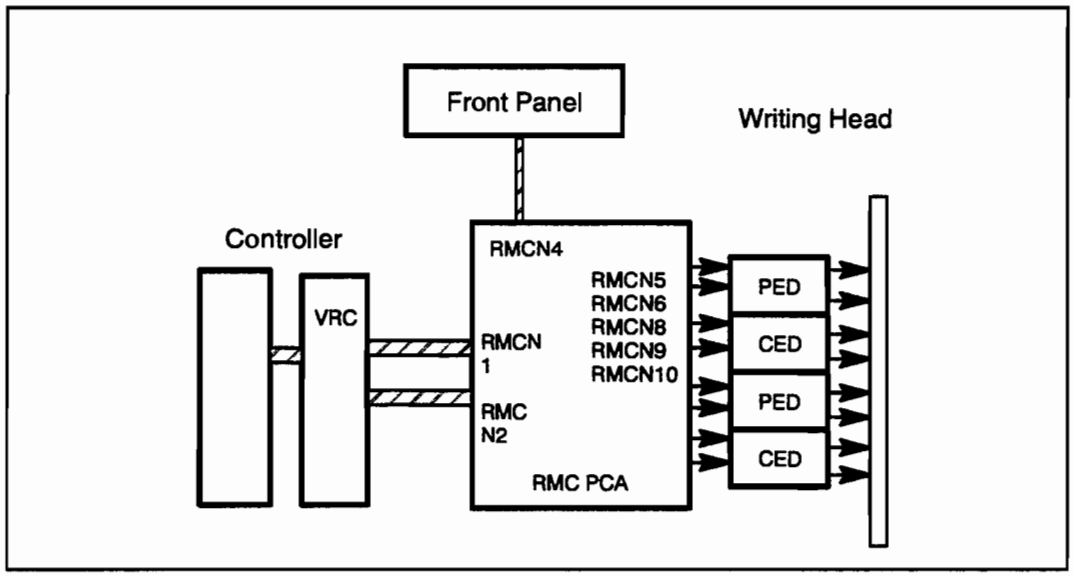


Figure 8-25. Controller Operation

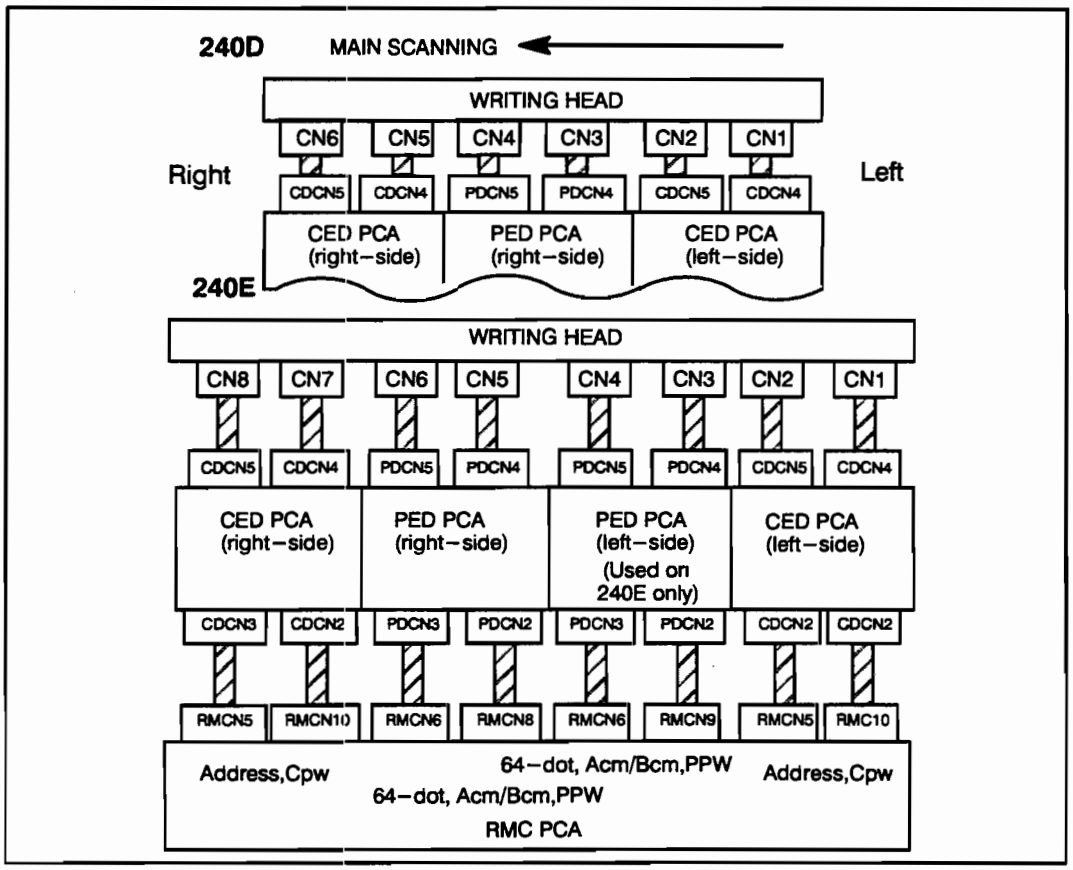


Figure 8-26. Writing Head Control

8-115. MEDIA ADVANCE TROUBLESHOOTING (Models 240D/E and 250/255)

8-116. 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 MCD PCA. Refer to the troubleshooting chart, Table 8-10, for media advance troubleshooting. See Figure 8-27 for the block diagram of the media drive motor circuit.

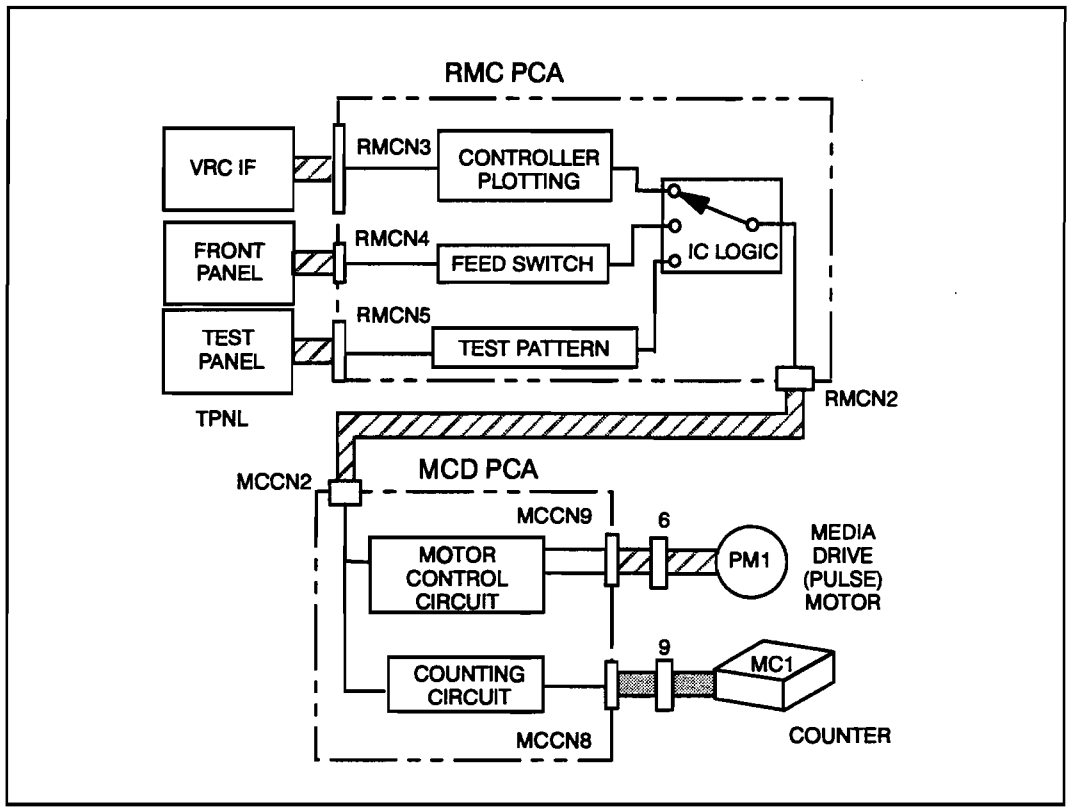


Figure 8-27. Media Drive Circuit

8-117. DEVELOPING SYSTEM (TONER) FAILURES (Models 240D/E and 250/255)

8-118. 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 observing the tubing from the toner bottle. See the Developing System Block Diagram in Figure 8-28.

8-119. 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.

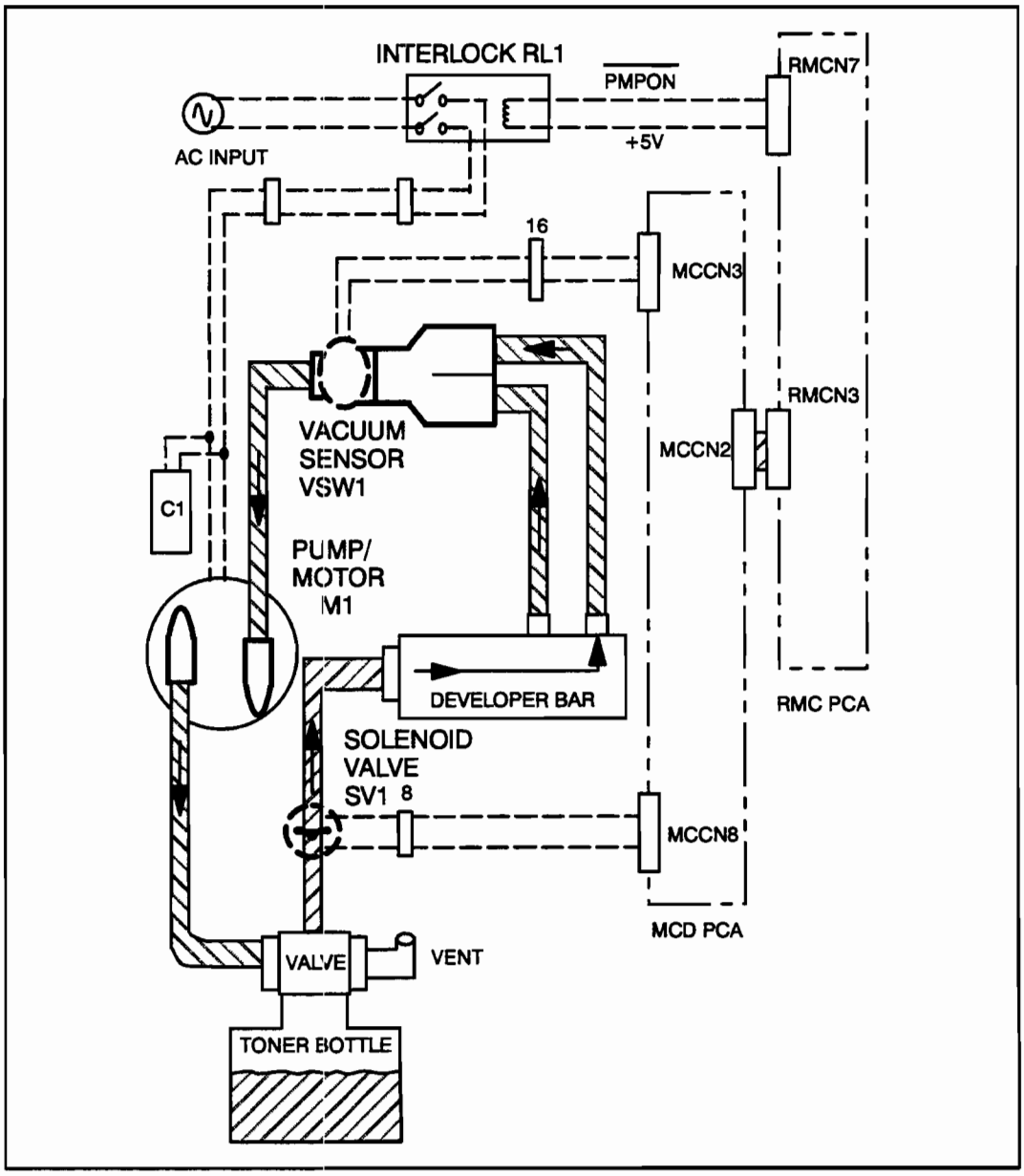


Figure 8-28. Developing System Block Diagram

8-120. Most problems in the toner flow are indicated by the Align Media LED on the front panel and by the audible alarm. 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 8-34 and Figure 8-35 will assist in troubleshooting the developer system.

8-121. FAN OPERATION (Models 240D/E and 250/255)

8-122. 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 8-29. Noting fan operation may also help in isolation print engine failures. The following procedures can be used to verify proper fan operation.8-111

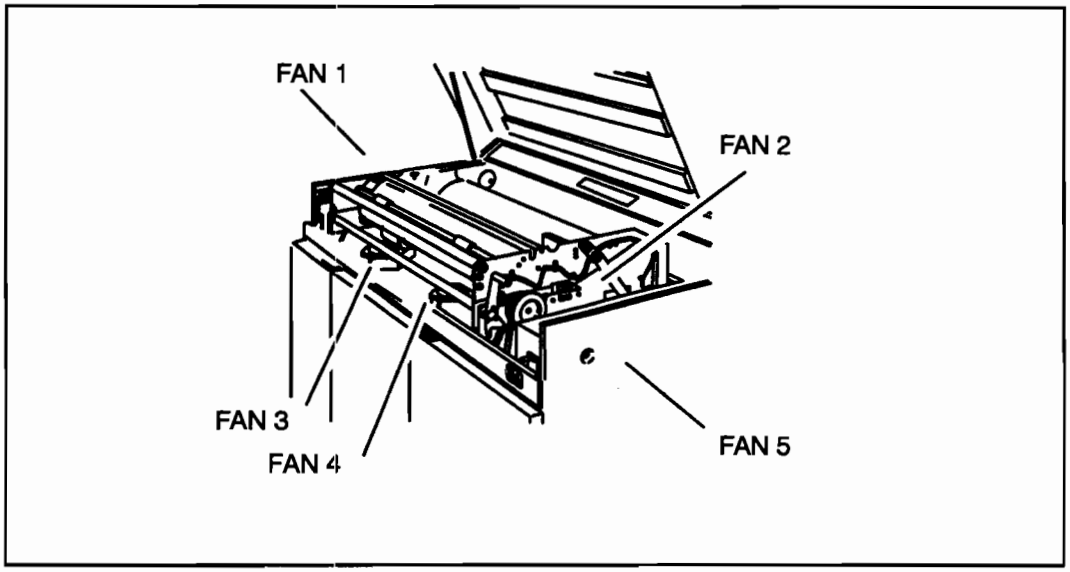


Figure 8-29. Fan Location

8-123. **FANS 1 AND 2.** Fan 1 and 2 operation is checked as follows:

1. If fans 1 and 2 run when the power is turned ON the fans are normal.
2. If the fans do not start when power is applied. Check for +24V at connector 7 located between the fans and the MCD PCA.
3. If +24V is present, replace the fans. If the voltage is not present proceed to step 4.
4. Check the connection of MCCN8 at the MCD PCA.
5. 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 6.
6. Using the voltmeter, check the +24V input to the MCD PCA at TB1 of the PCA.
7. If the +24V is normal at the input but not present at MCCN8 replace the MCD PCA.
8. If the voltage is not present at TB1, check the output of LPS2. Replace the power supply if necessary.

8-124. **FANS 3 AND 4.** To check the operation of fans 3 and 4 and their associated circuitry, proceed as follows:

1. Press the PG switch on the plotter test panel to start the plotter test mode.
2. Fans 3 and 4 should start. The active low FAN signal is required as a common to operate these fans.
3. 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.8-112
4. If +24V and the low FAN signal are present, replace the fans. If the voltage is not present proceed to step 5.
5. Check the connection of MCCN8 at the MCD PCA.
6. 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 7.
7. Using the voltmeter, check the +24V input to the MCD PCA at TB1 of the PCA.
8. If the +24V is normal at the input but not present at MCCN8 replace the MCD PCA.

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

8-125. **FAN 5.** Fan 5 may be checked as follows:

1. Remove the right side cover from the plotter.
2. Turn on the plotter. Fan 5 should be running.
3. 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 4.
4. Check the connection of MCCN8 at the MCD PCA.
5. Using the voltmeter, check for +24V at MCCN8 pins 1(+) and 2(G). If the voltage is present replace the cabling to the fan.
6. If the voltage is not present, check for +24V at TB1 of the MCD PCA.
7. If +24V is present, replace the MCD PCA.
8. If the voltage is not present at TB1, check the output of LPS2. Replace the power supply if necessary.

8-126. TROUBLESHOOTING FLOWCHARTS

8-127. 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.

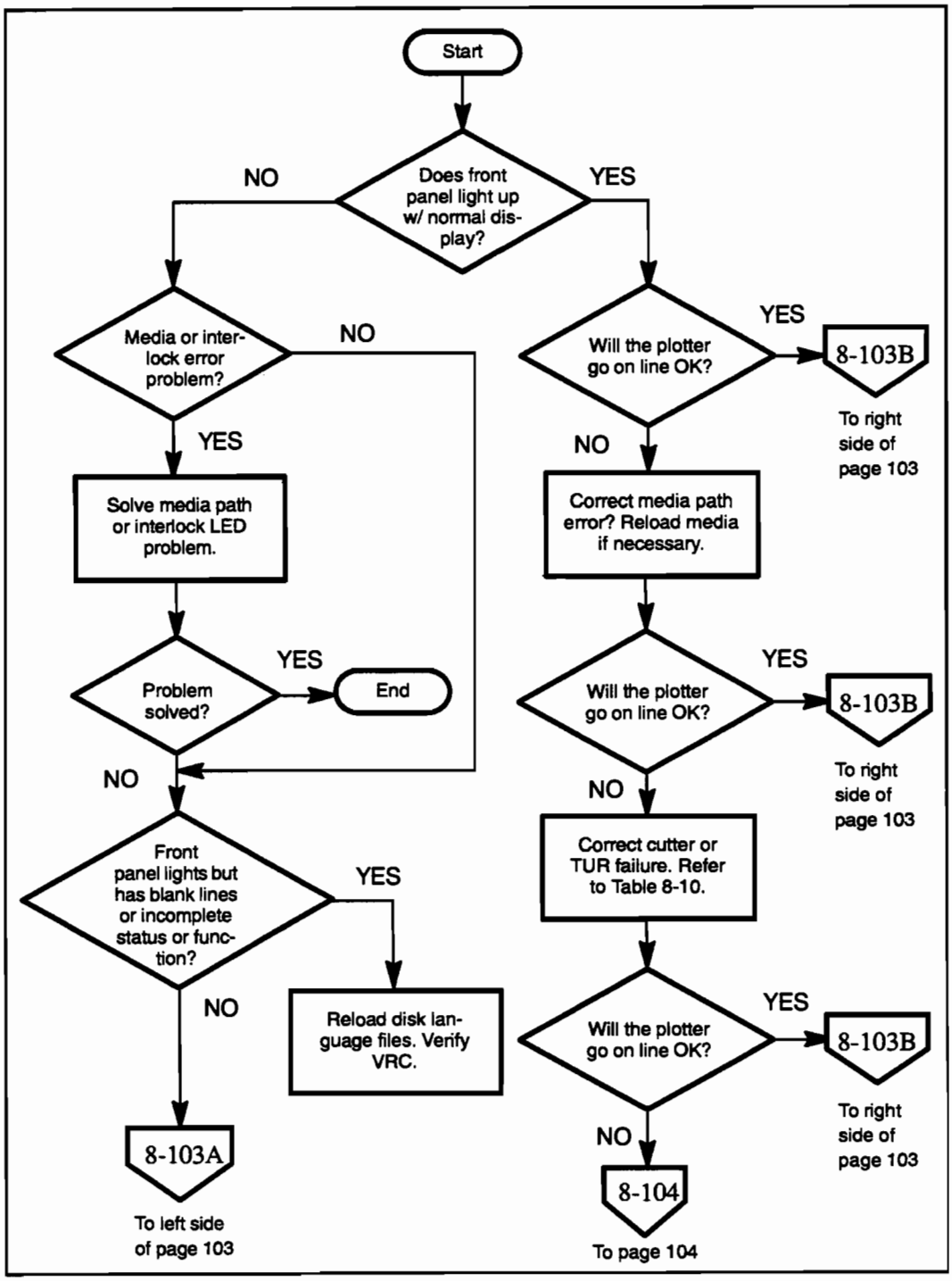


Figure 8-30. General Plotting Failure Flowchart (Models 240D/E and 250/255)

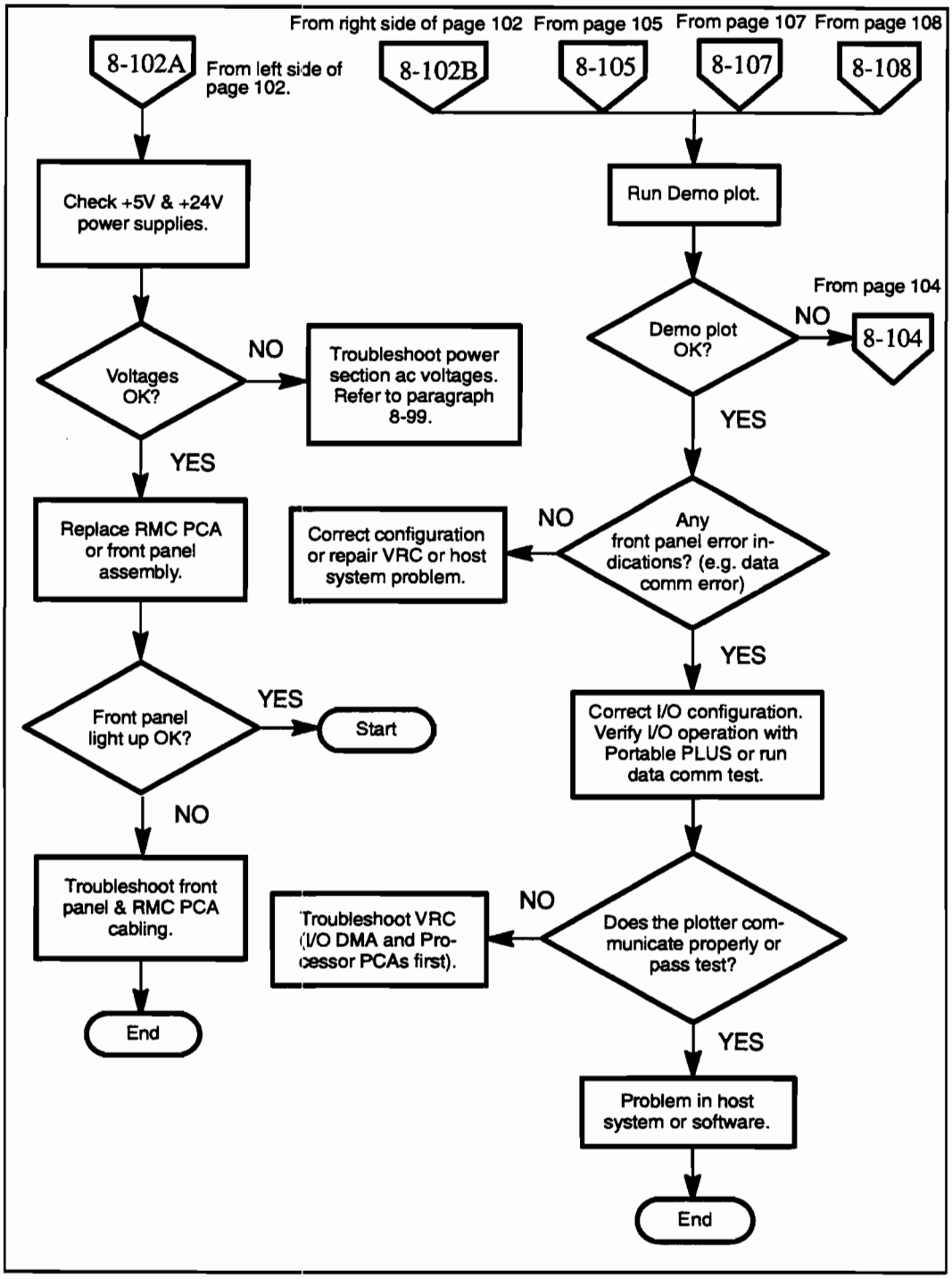


Figure 8-30. General Plotting Failure (Models 240D/E and 250/255) (Continued)

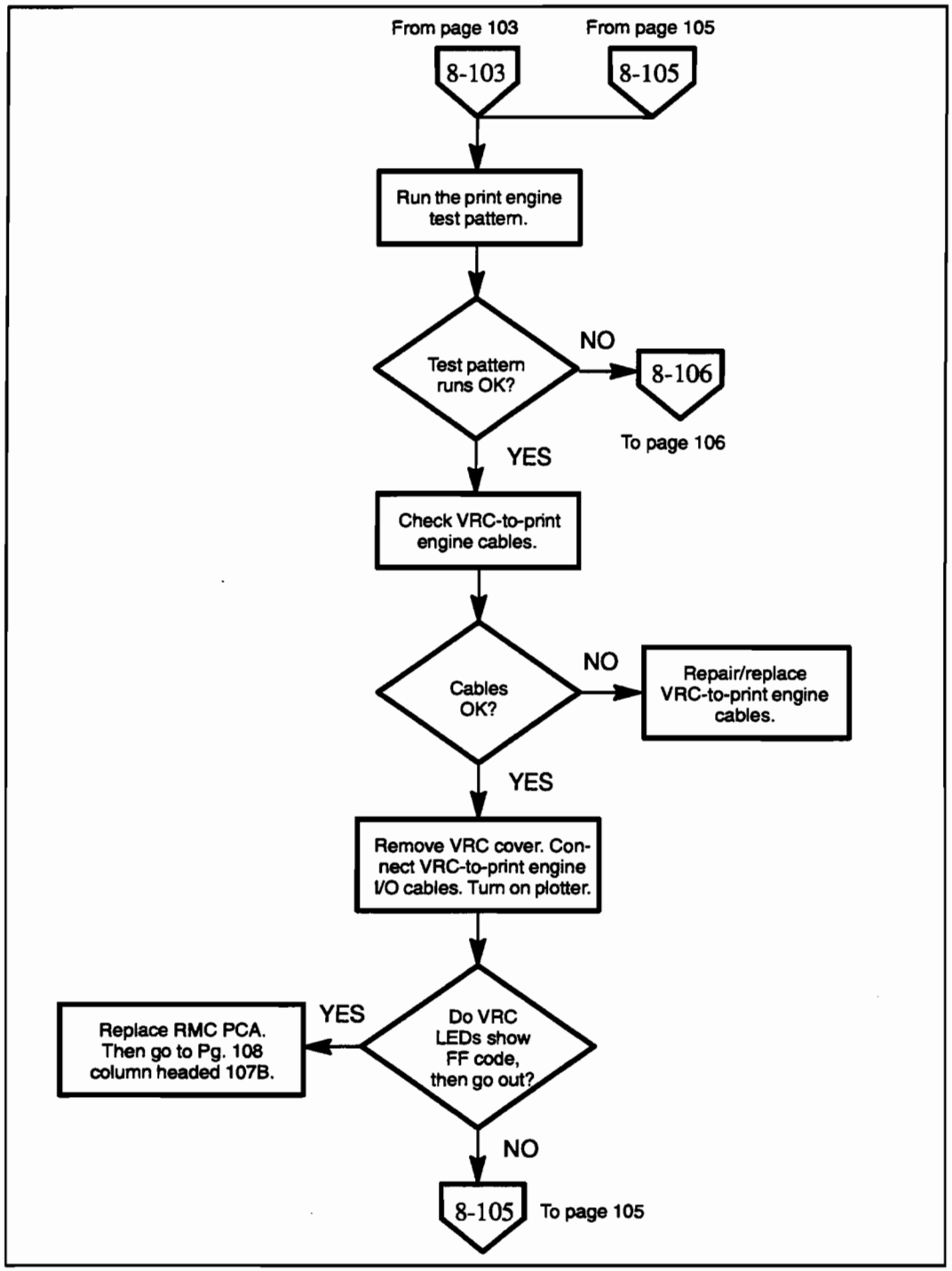


Figure 8-30. General Plotting Failure (Models 240D/E and 250/255) (Continued)

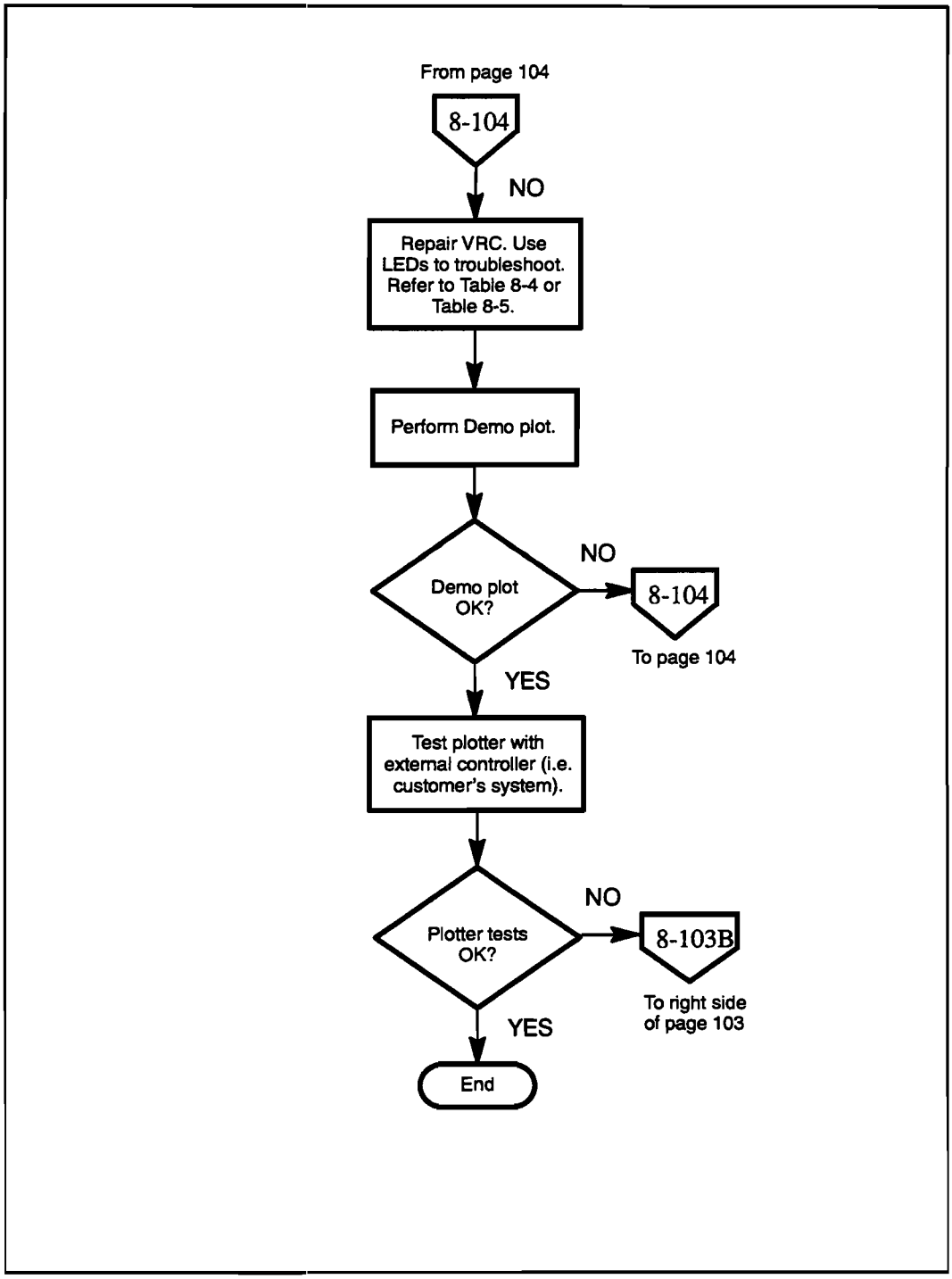


Figure 8-30. General Plotting Failure (Models 240D/E and 250/255) (Continued)

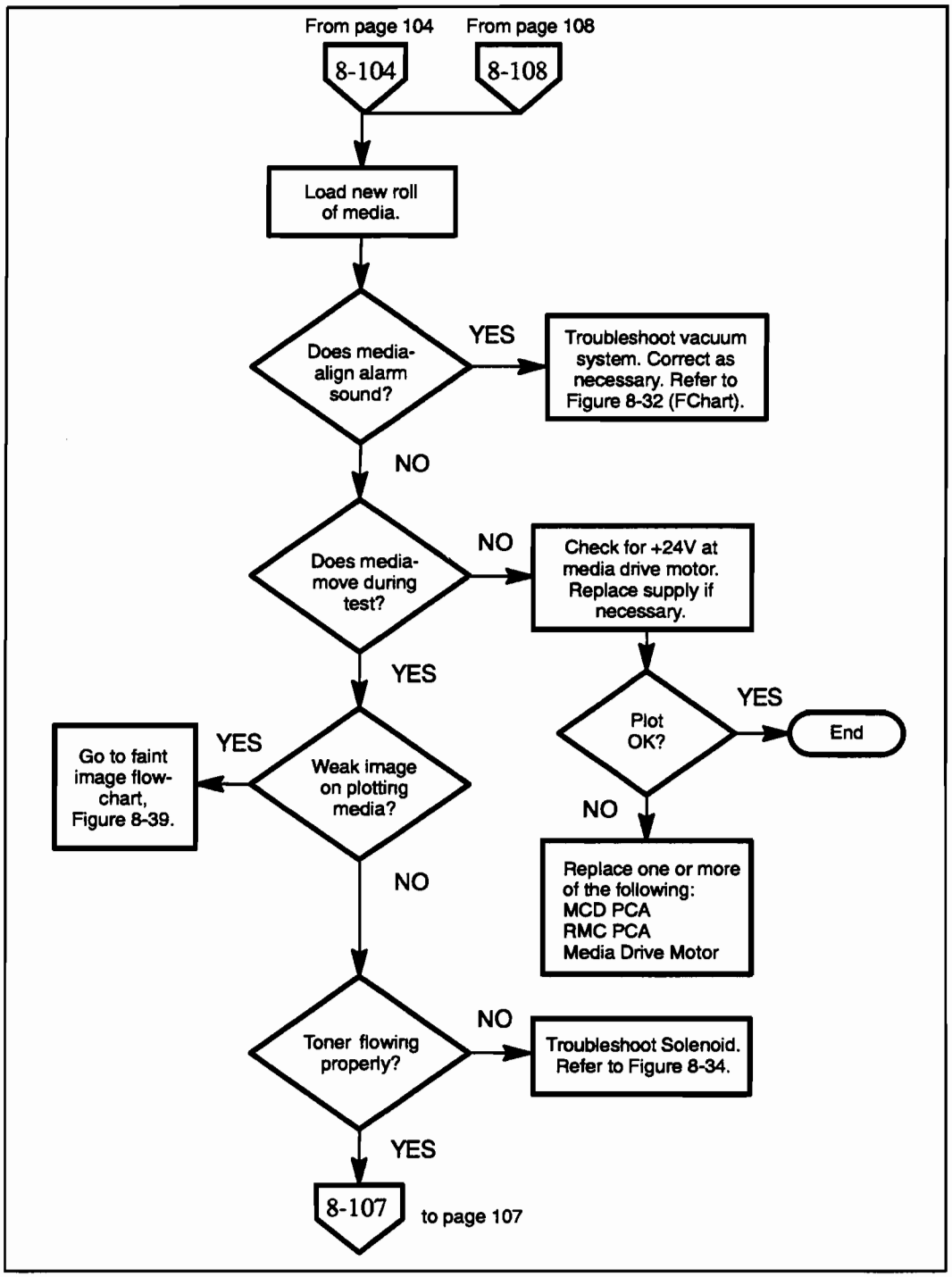


Figure 8-30. General Plotting Failure (Models 240D/E and 250/255) (Continued)

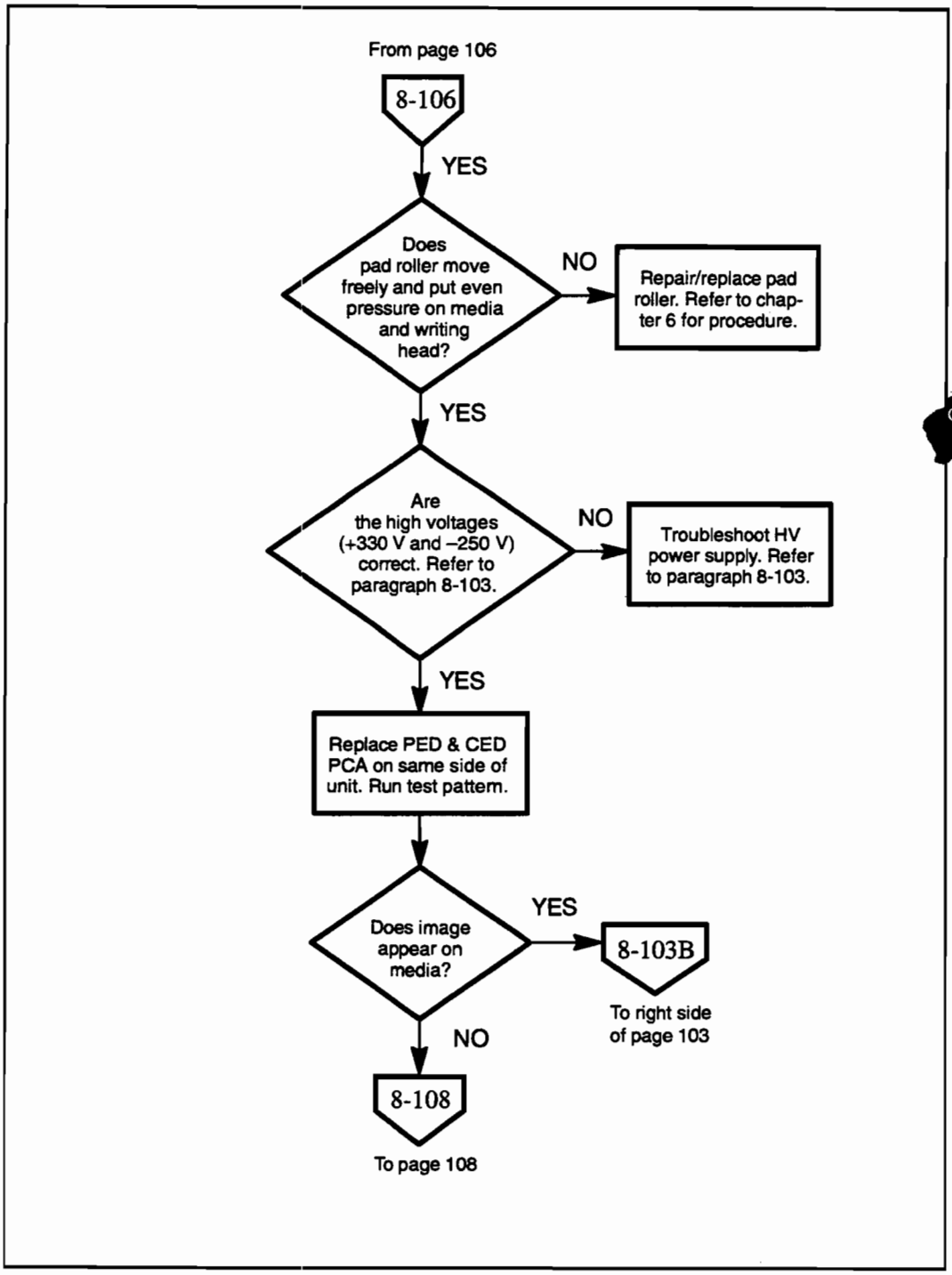


Figure 8-30. General Plotting Failure (Models 240D/E and 250/255) (Continued)

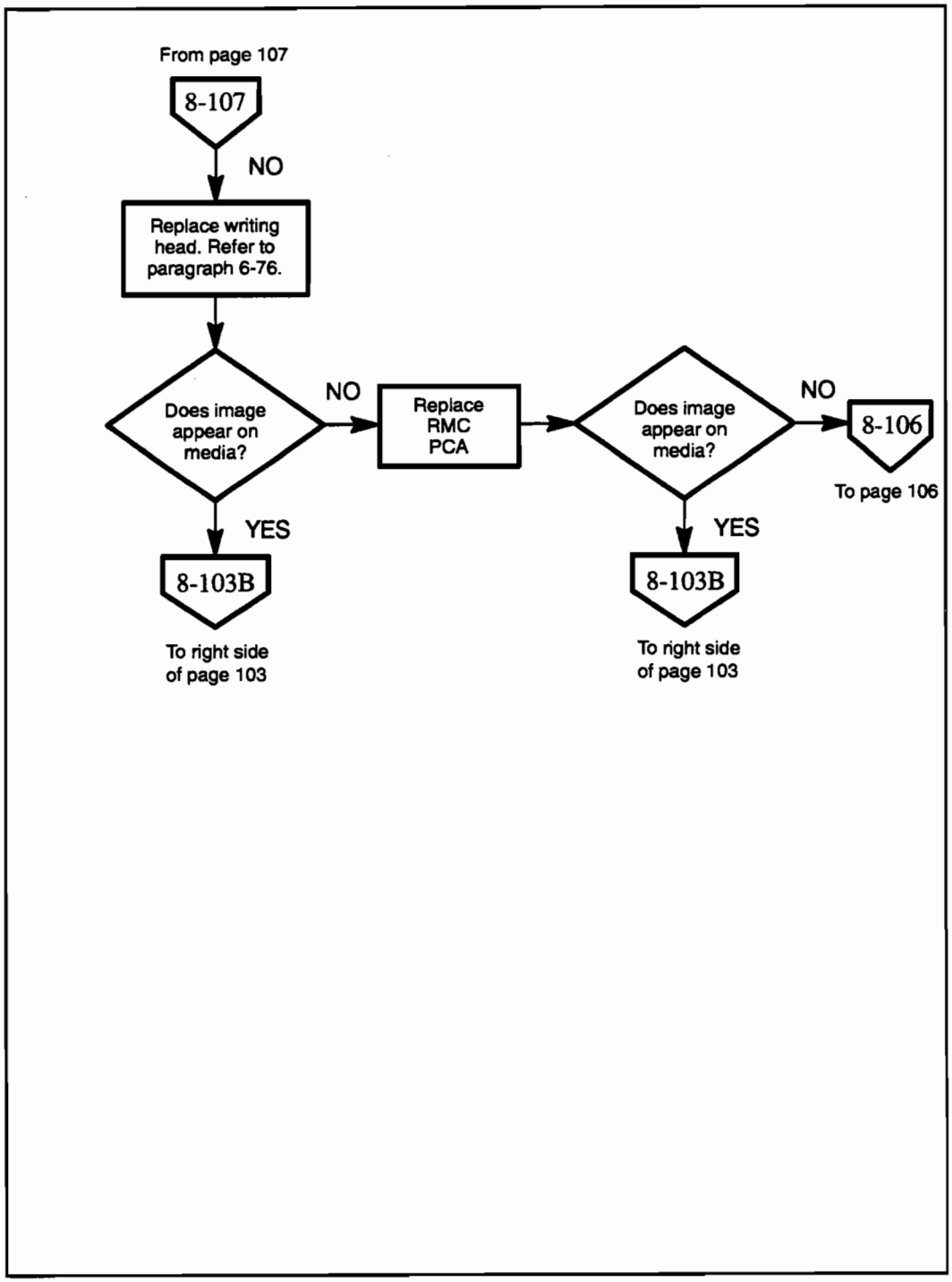


Figure 8-30. General Plotting Failure (Models 240D/E and 250/255) (Continued)

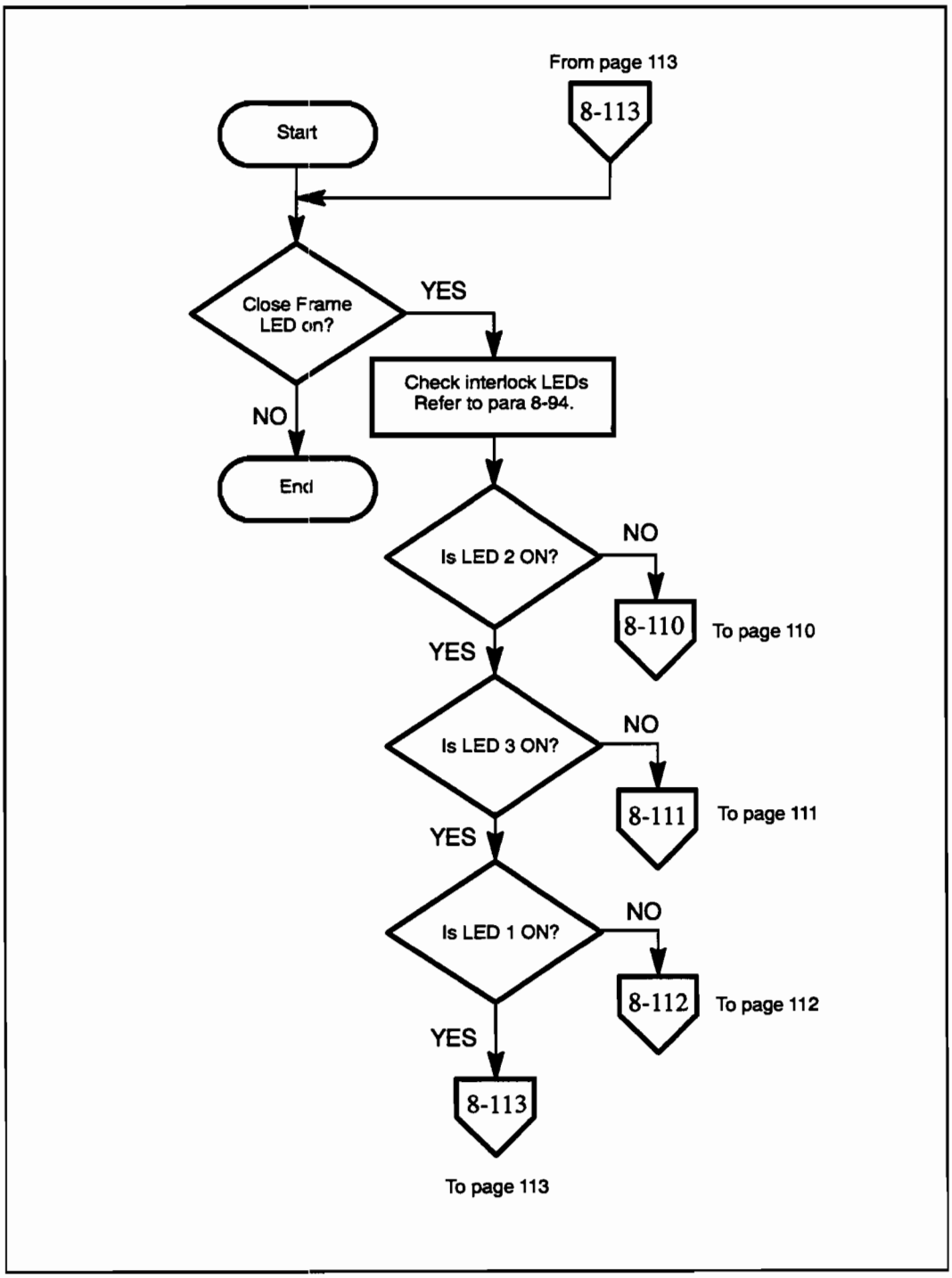


Figure 8-31. Close Frame Error Flowchart

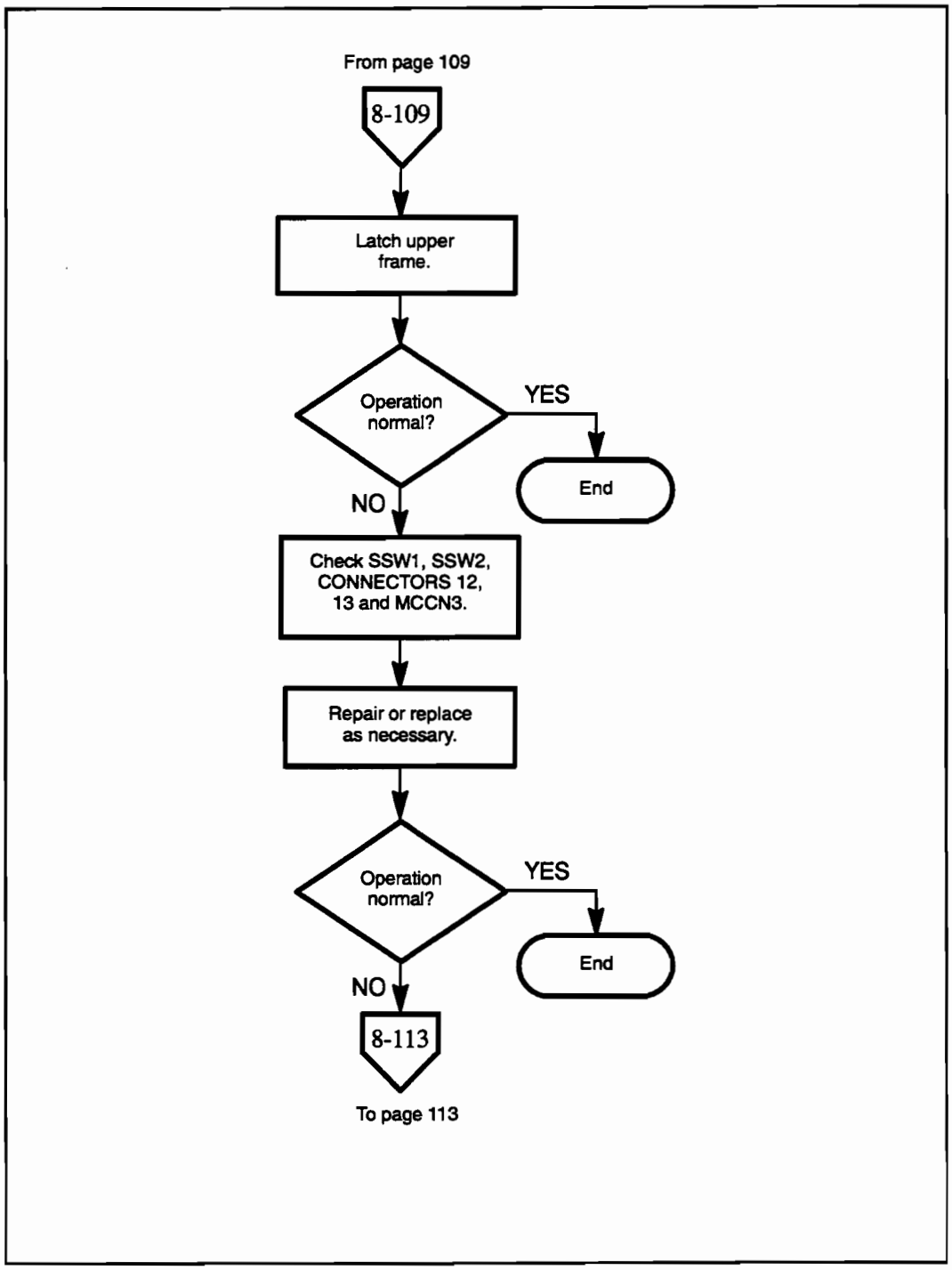


Figure 8-31. Close Frame Error (Continued)

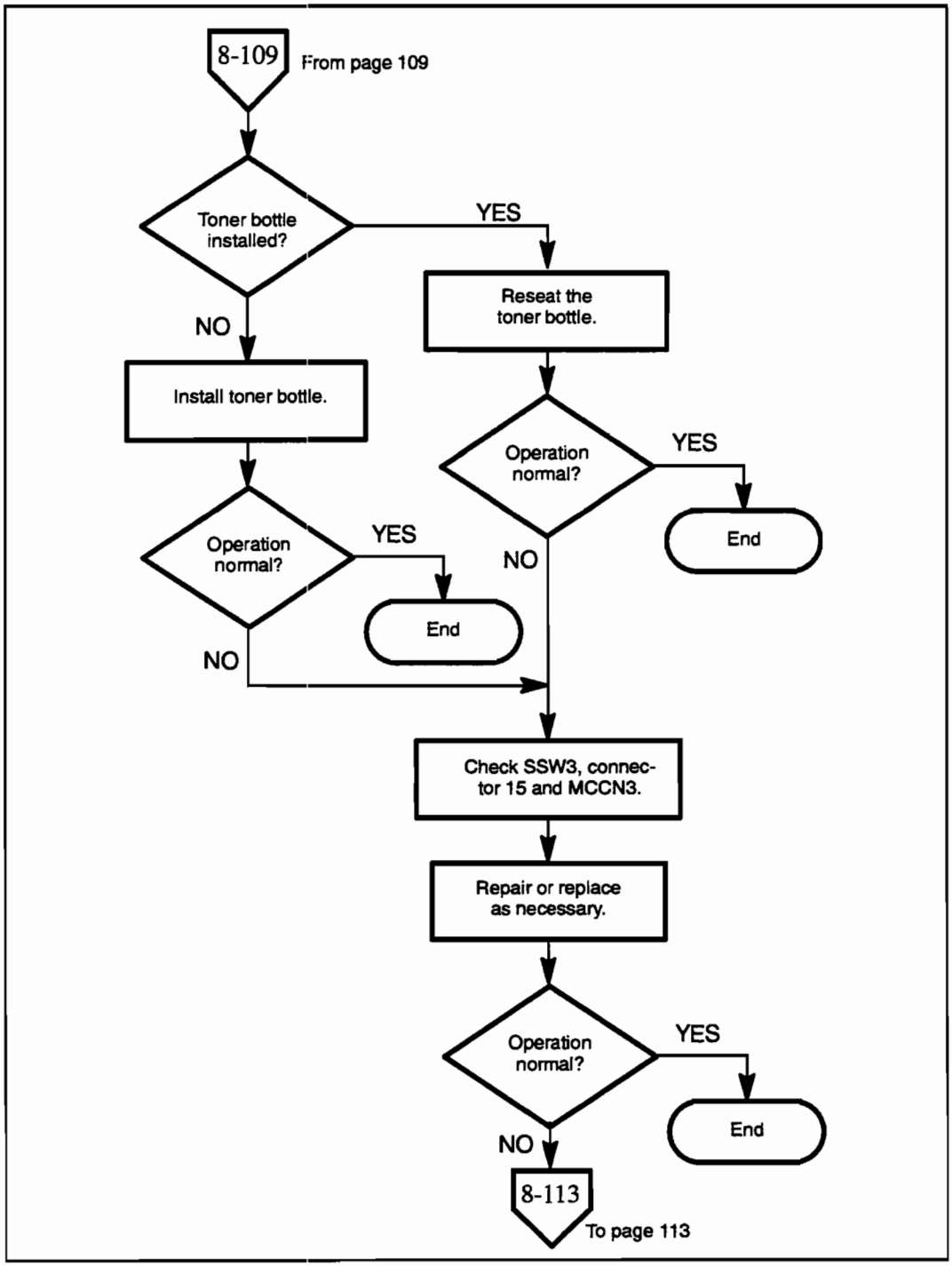


Figure 8-31.Close Frame Error (Continued)

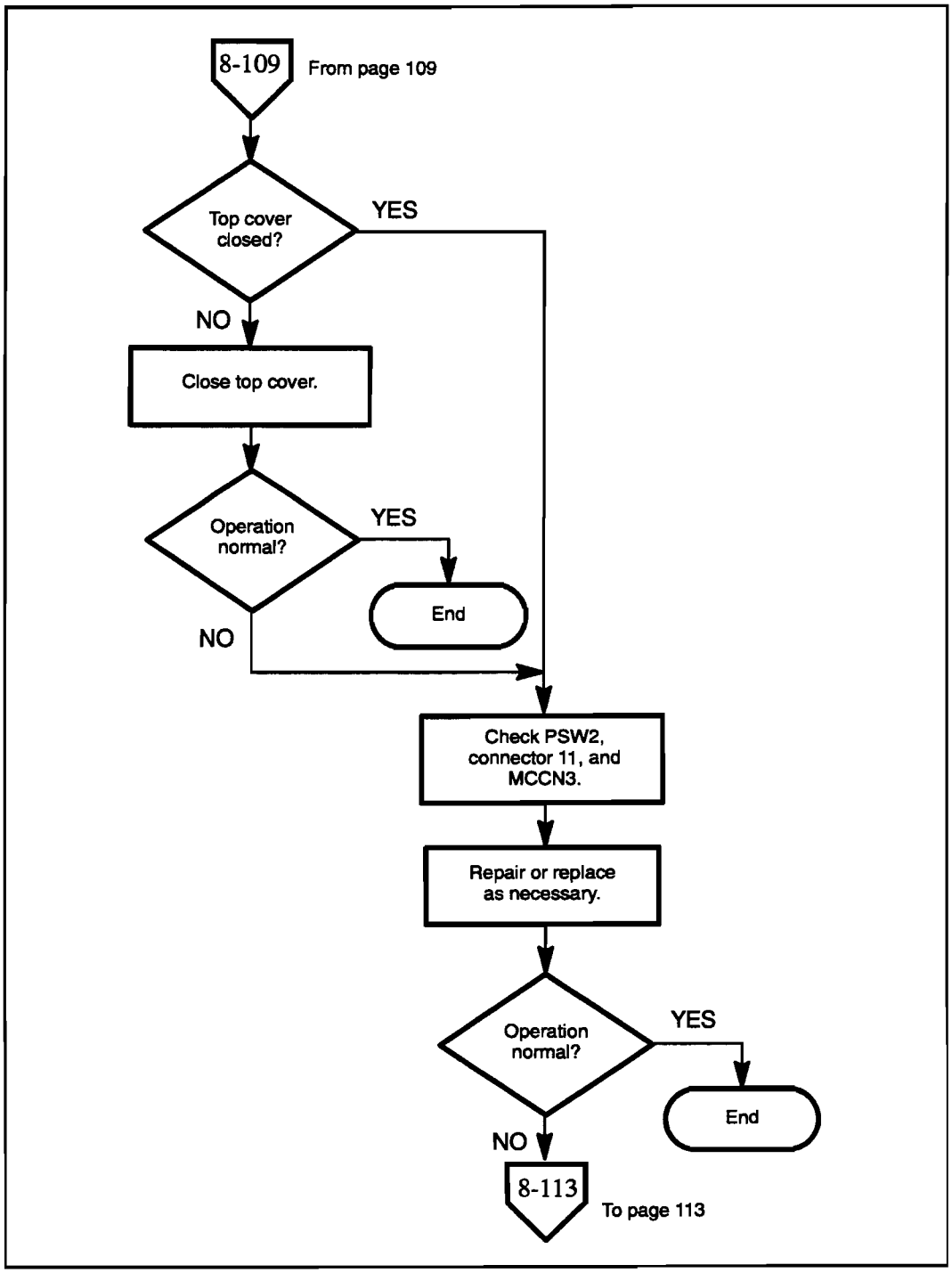


Figure 8-31.Close Frame Error (Continued)

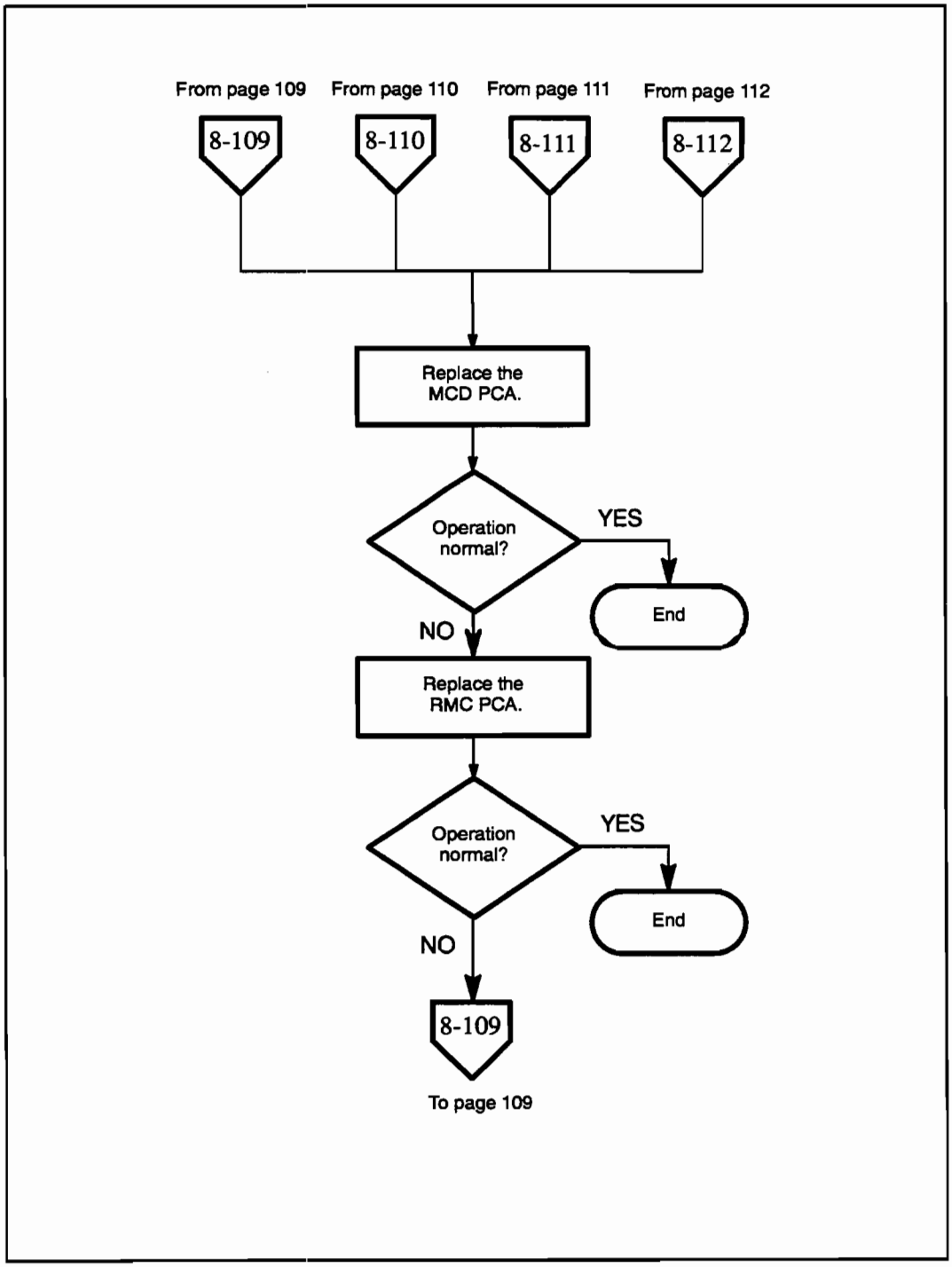


Figure 8-31. Close Frame Error (Continued)

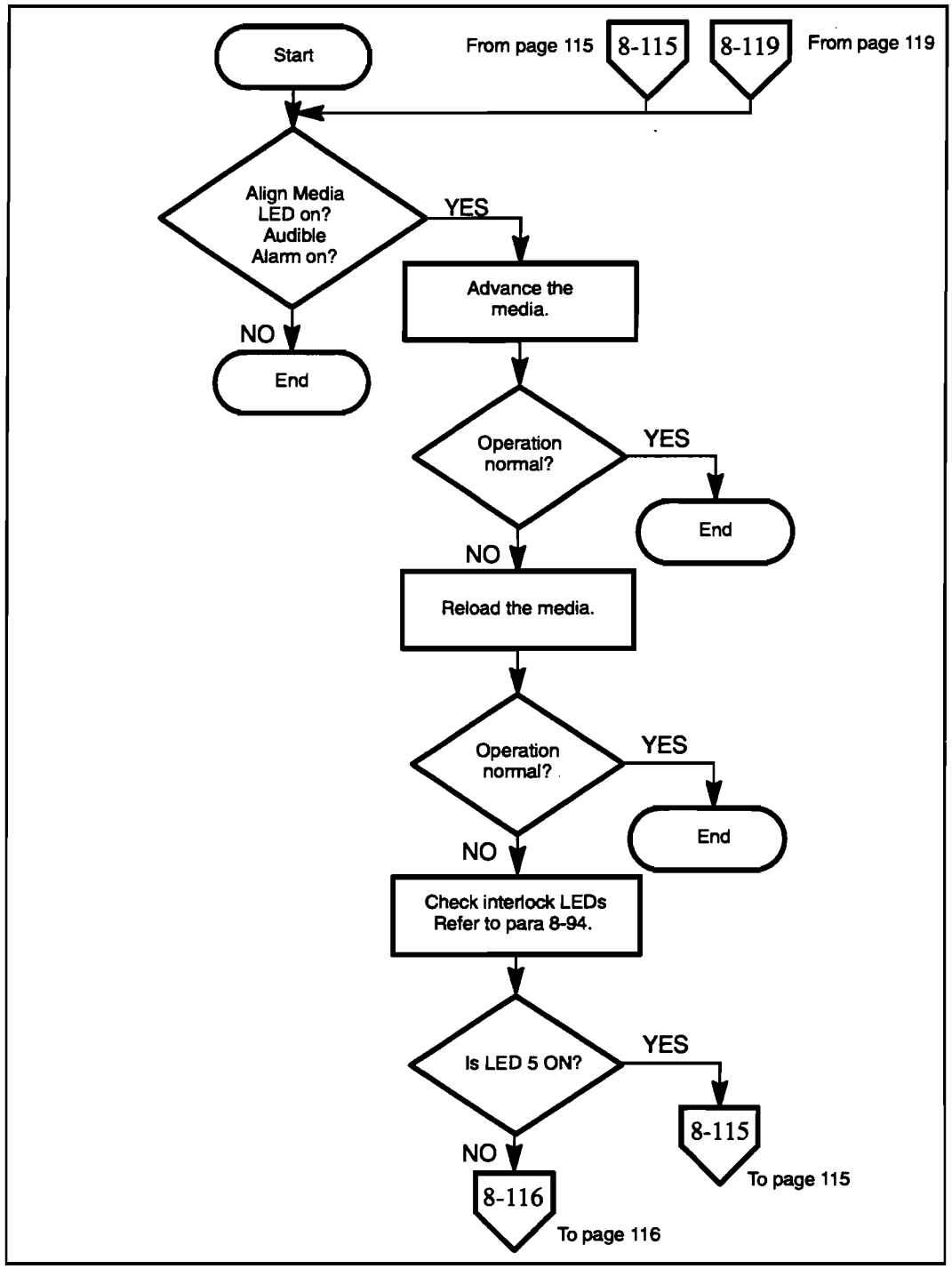


Figure 8-32. Align Media Error Flowchart

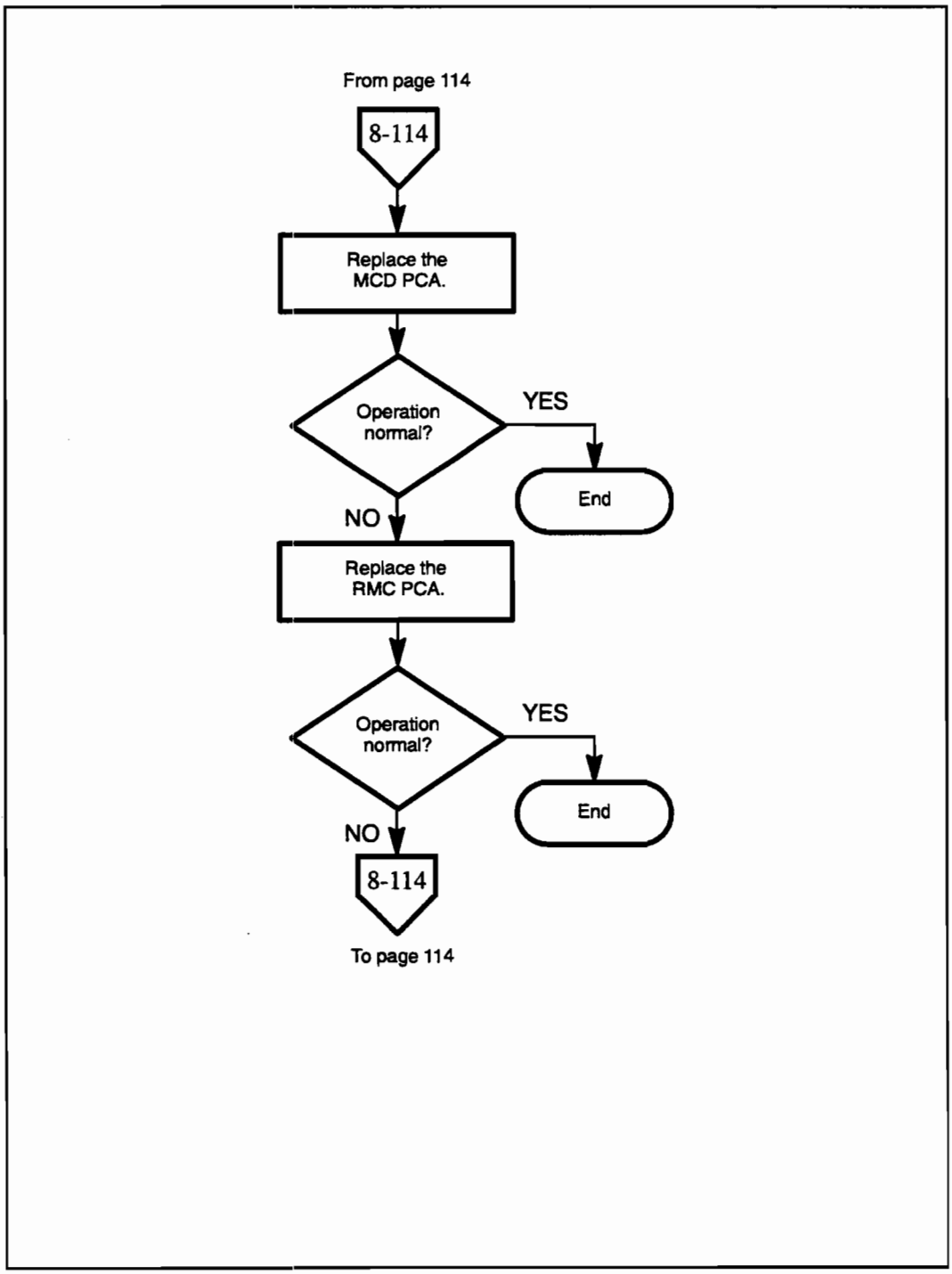


Figure 8-32. Align Media Error Flowchart (Continued)

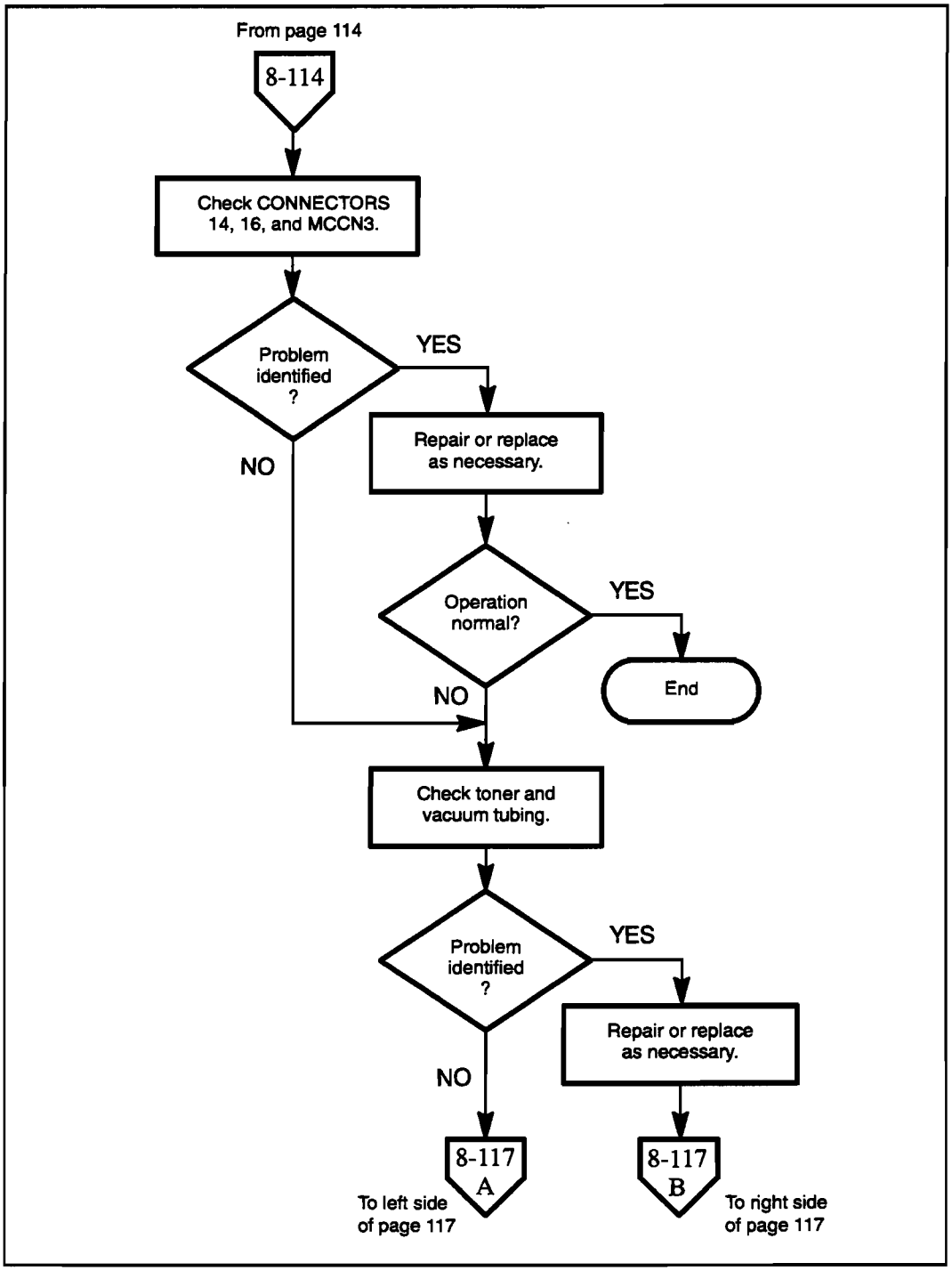


Figure 8-32. Align Media Error Flowchart (Continued)

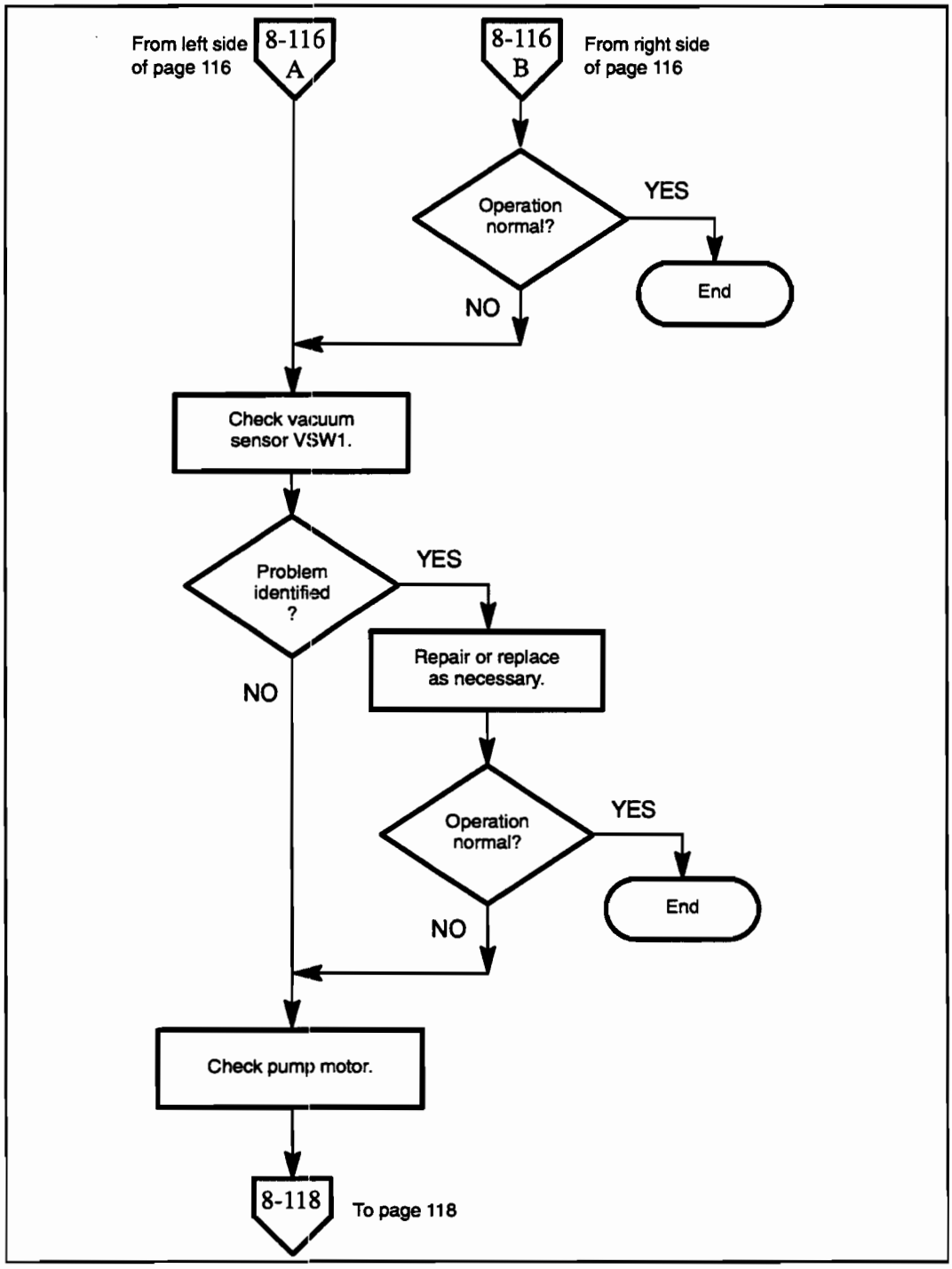


Figure 8-32. Align Media Error Flowchart (Continued)

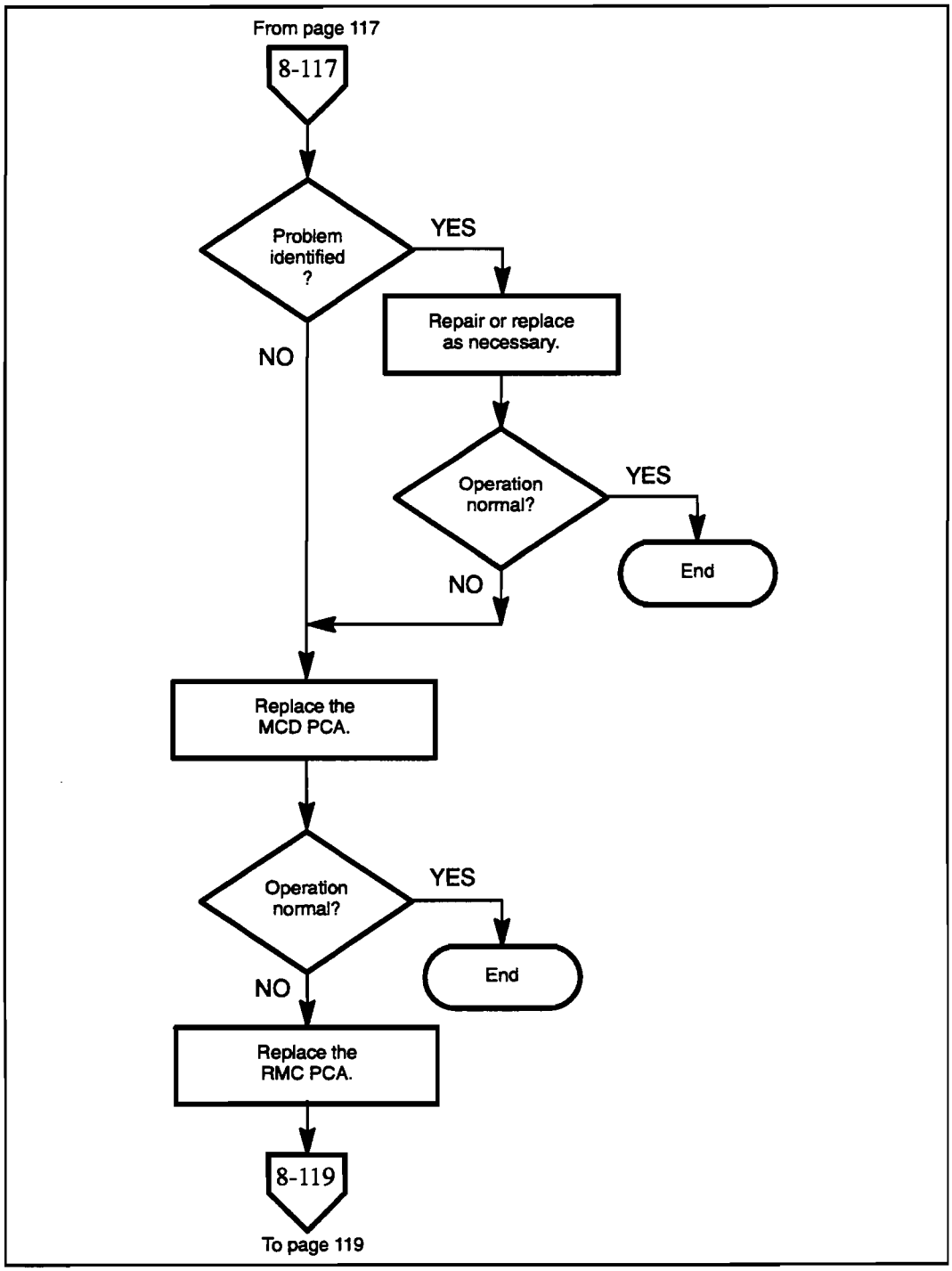


Figure 8-32. Align Media Error Flowchart (Continued)

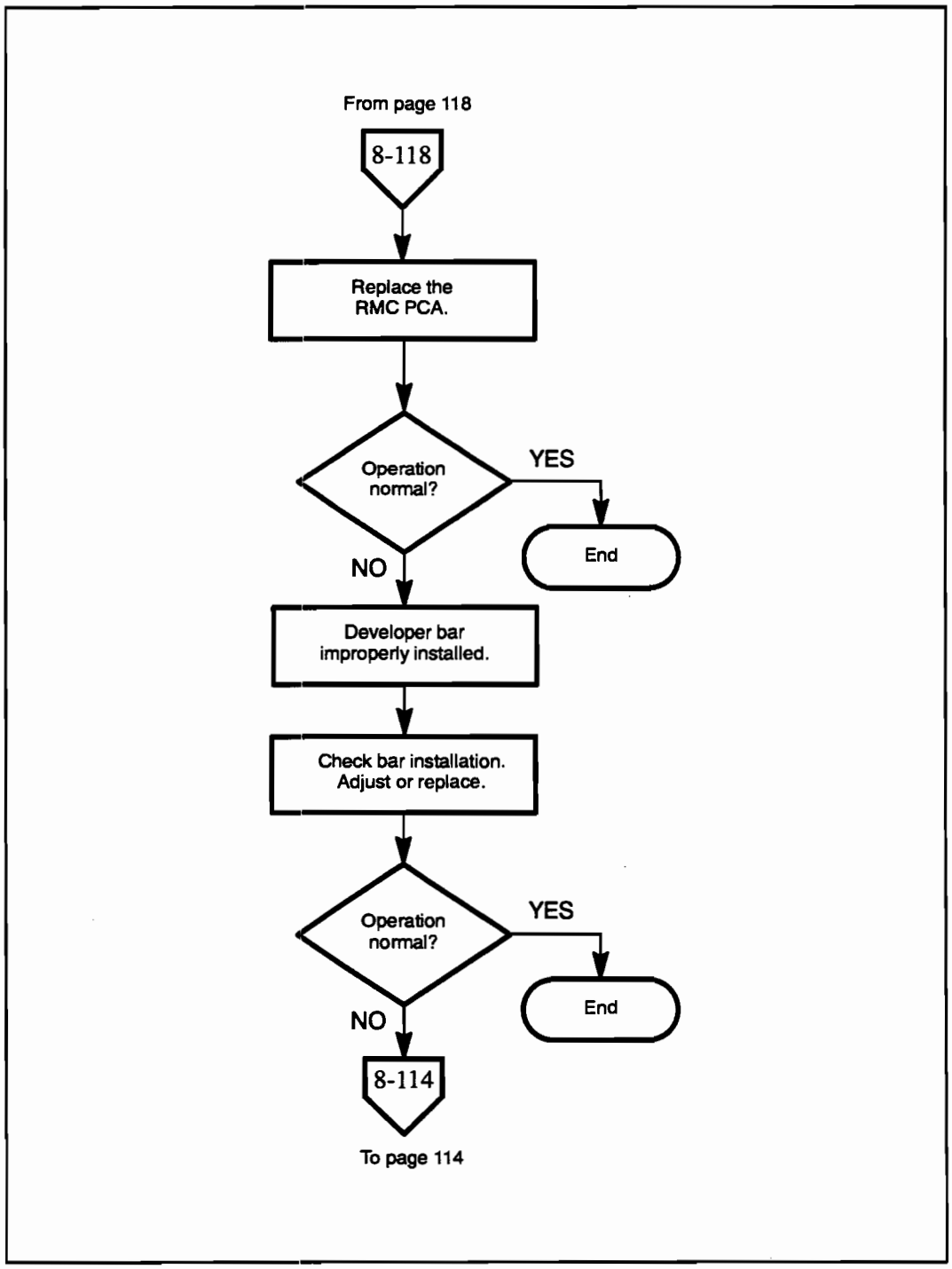


Figure 8-32. Align Media Error Flowchart (Continued)

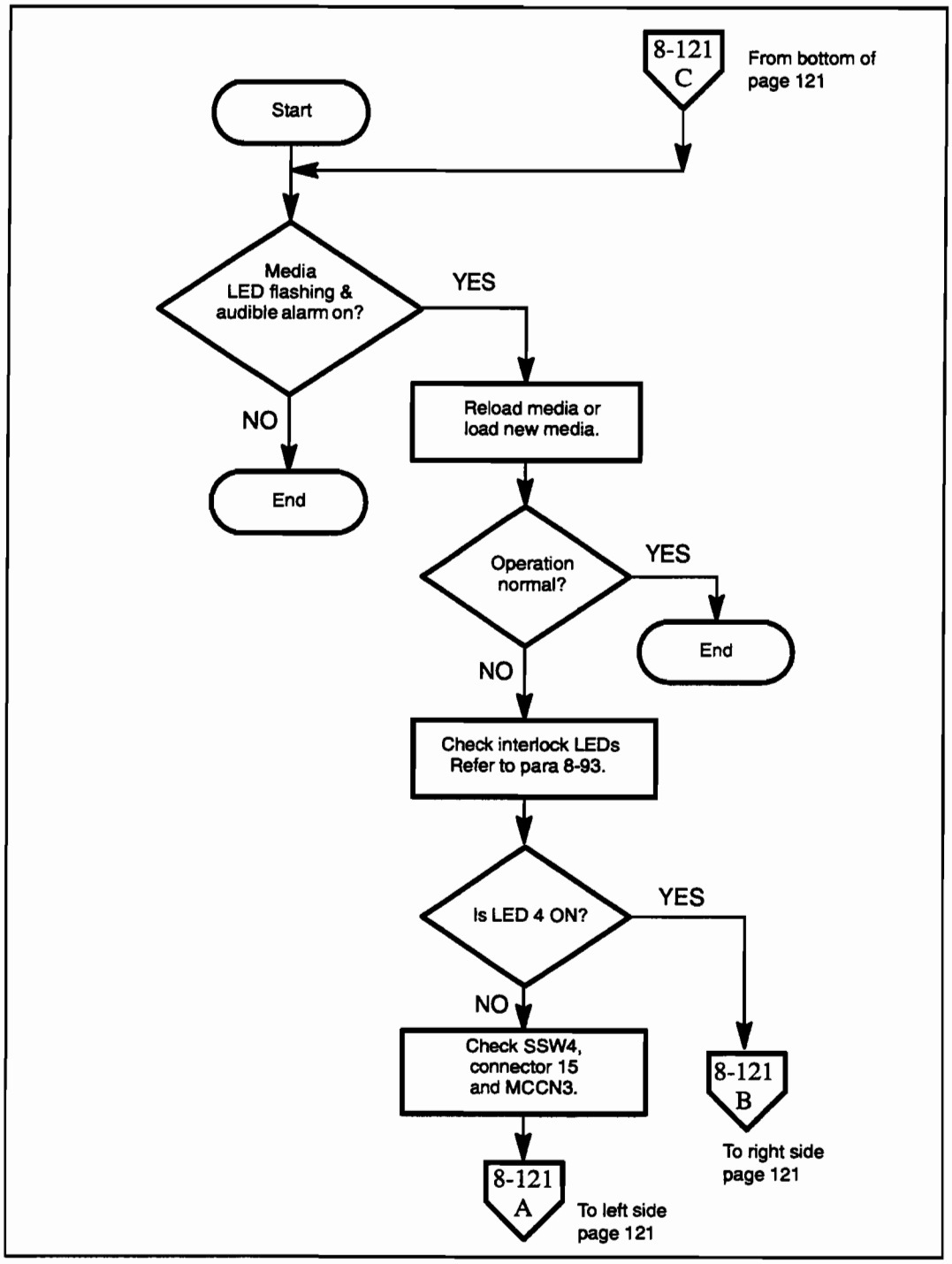


Figure 8-33. Media Quantity Error Flowchart

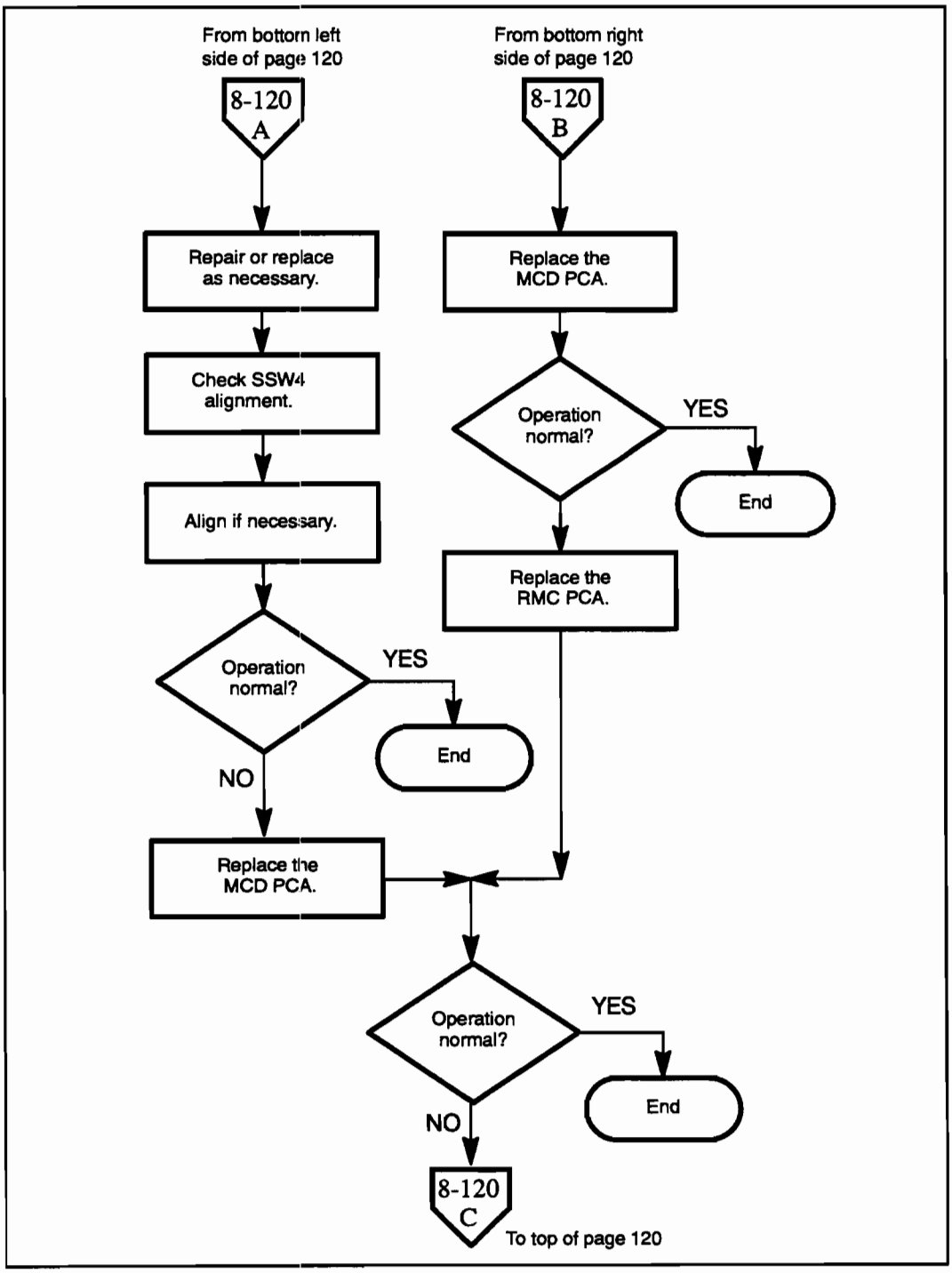


Figure 8-33. Media Quantity Error Flowchart (Continued)

SOLENOID TROUBLESHOOTING NOTE

The Toner/vacuum system will develop a vacuum regardless of the condition of the solenoid valve! This is because the vacuum system "pulls" toner through the system and develops a vacuum in the developer bar with or without toner being present. The MCD PCA is not able to detect if the toner solenoid "opens" and allows toner to flow through the system. Follow the solenoid troubleshooting flowchart to troubleshoot the toner system.

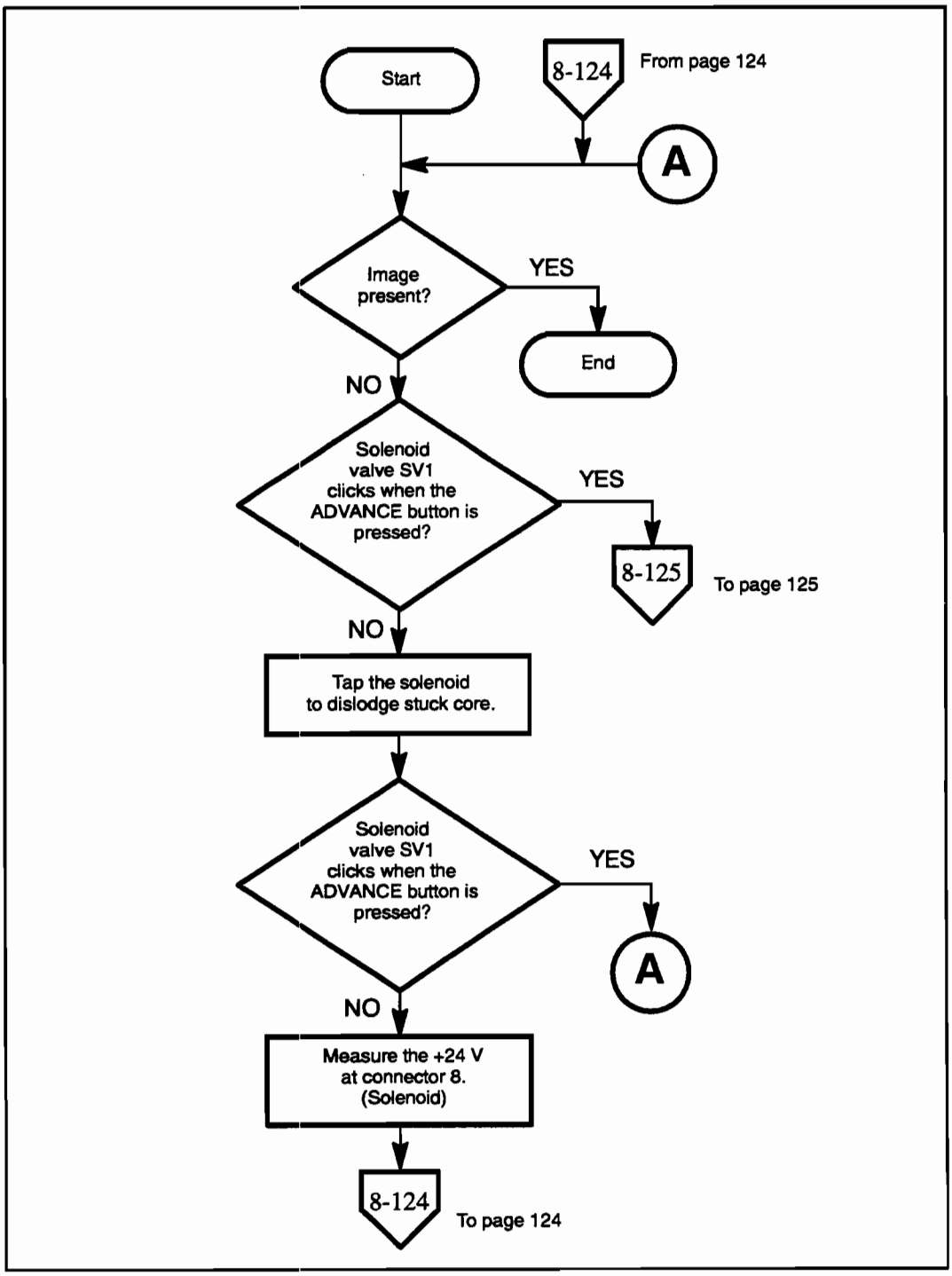


Figure 8-34. Solenoid Troubleshooting Flowchart

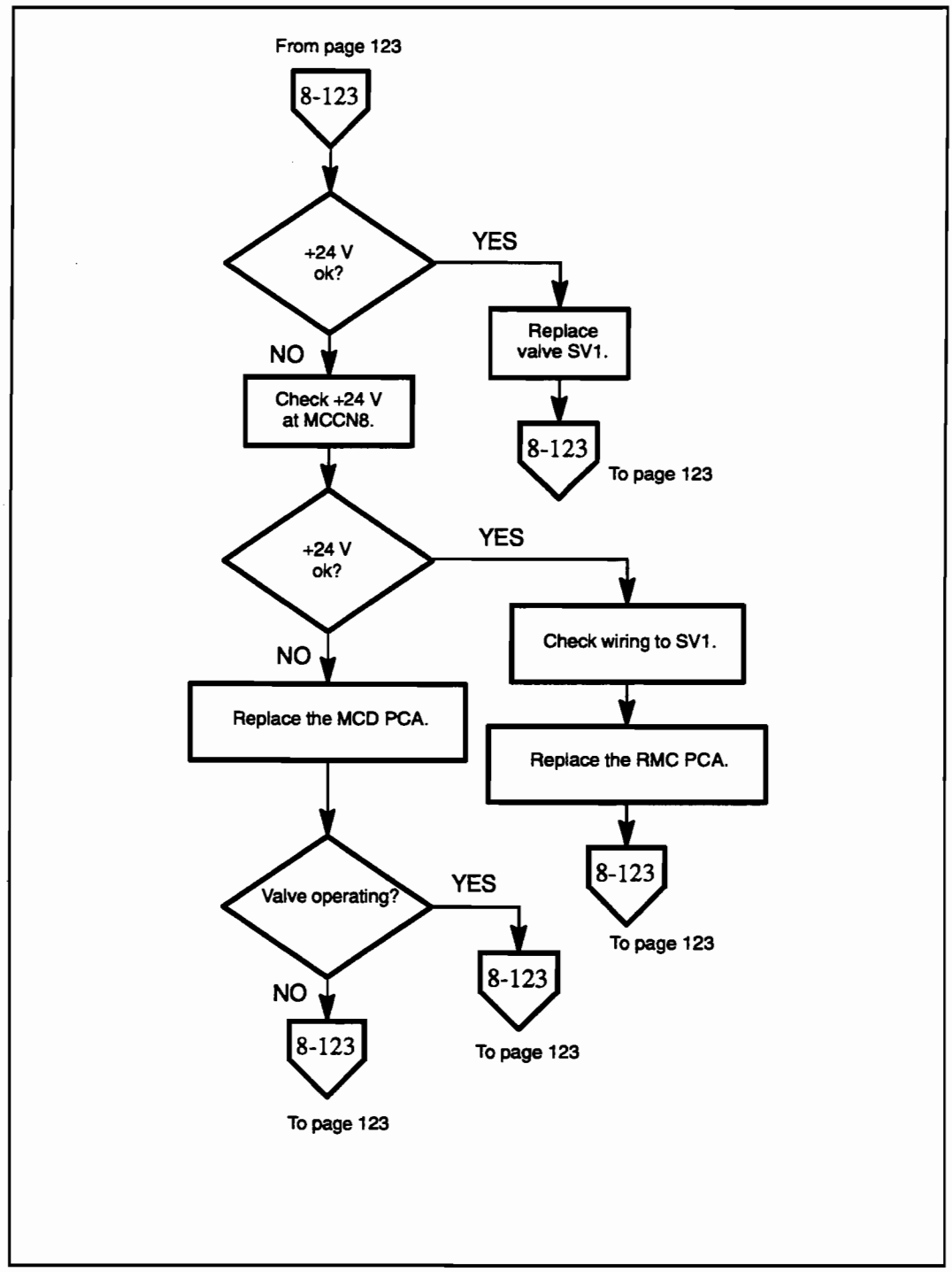


Figure 8-34. Solenoid Troubleshooting Flowchart (Continued)

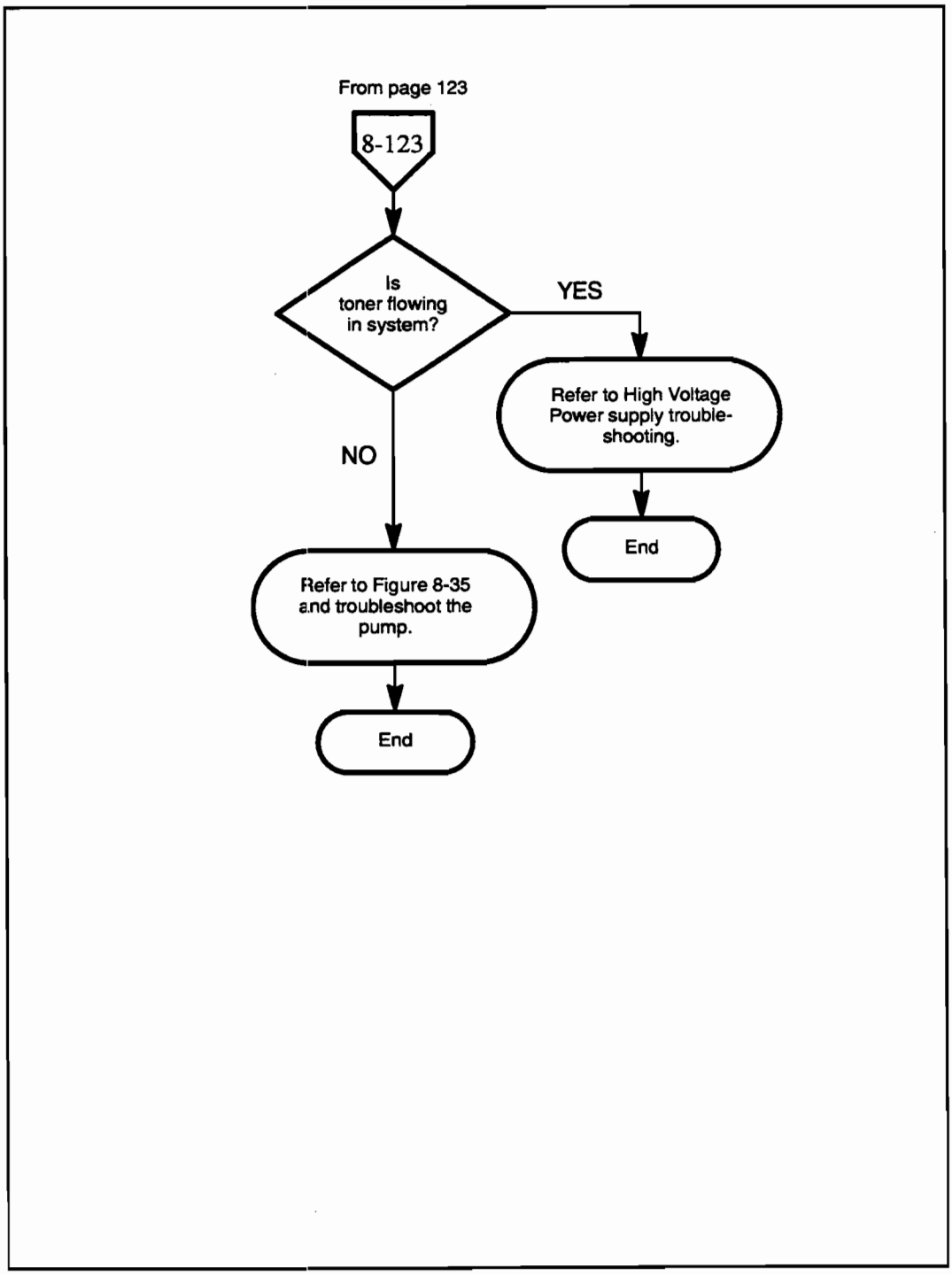


Figure 8-34. Solenoid Troubleshooting Flowchart (Continued)

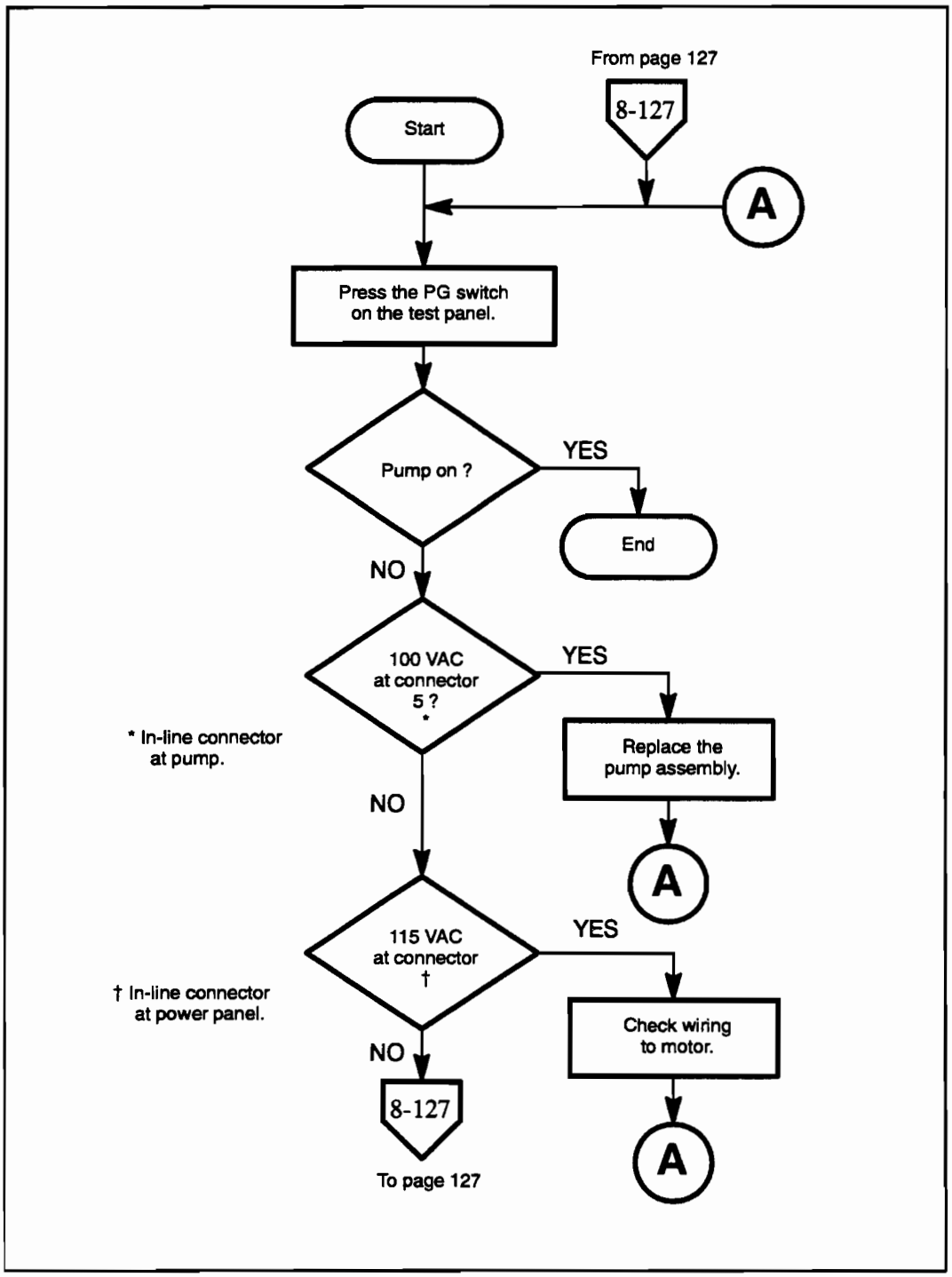


Figure 8-35. Toner Pump Troubleshooting Flowchart

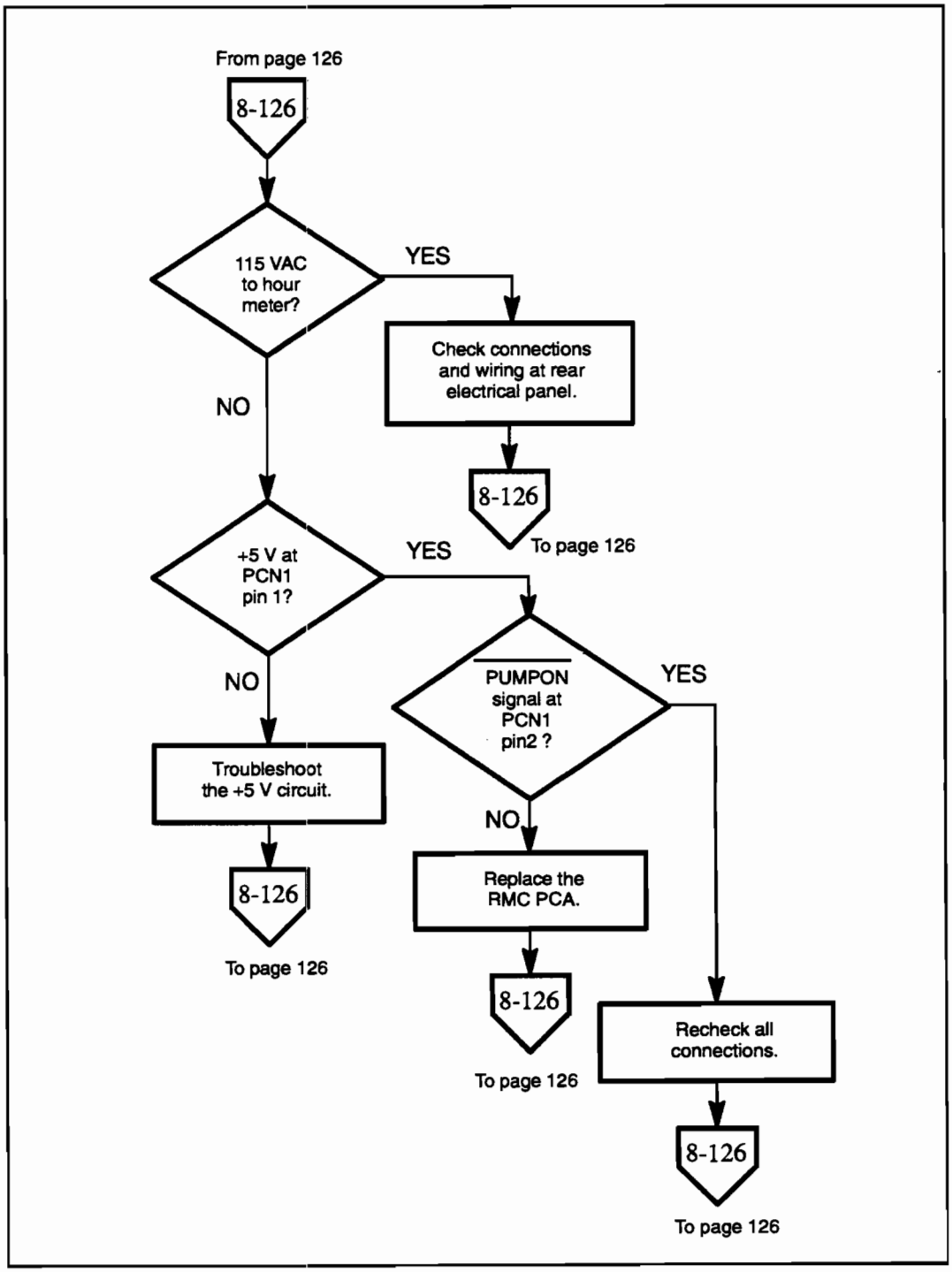


Figure 8-35. Toner Pump Troubleshooting Flowchart (Continued)

8-128. MODEL 250/255 TROUBLESHOOTING

8-129. Troubleshooting flowcharts included here cover logical troubleshooting for the cutter, the take-up reel, and a faint plotter image. Troubleshooting flowcharts in the preceding pages of this chapter apply to the remainder of the plotter.

8-130. CUTTER FLOWCHART

8-131. The following flowchart (See Figure 8-37) covers the sensors, motors and mechanics of the cutter. In addition to checking for the 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 8-36. 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.

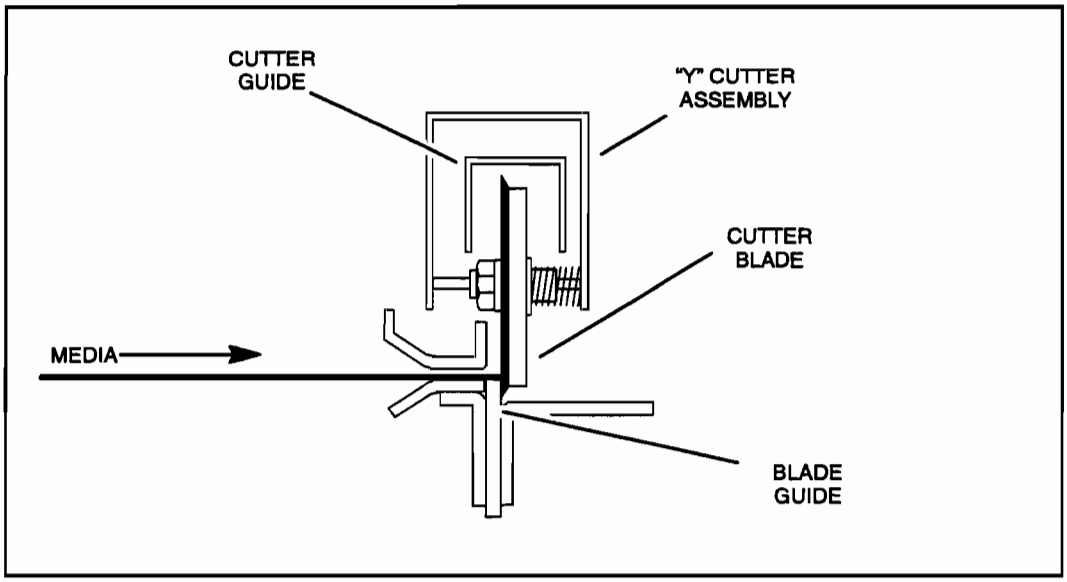


Figure 8-36. Cutter Blade Positioning

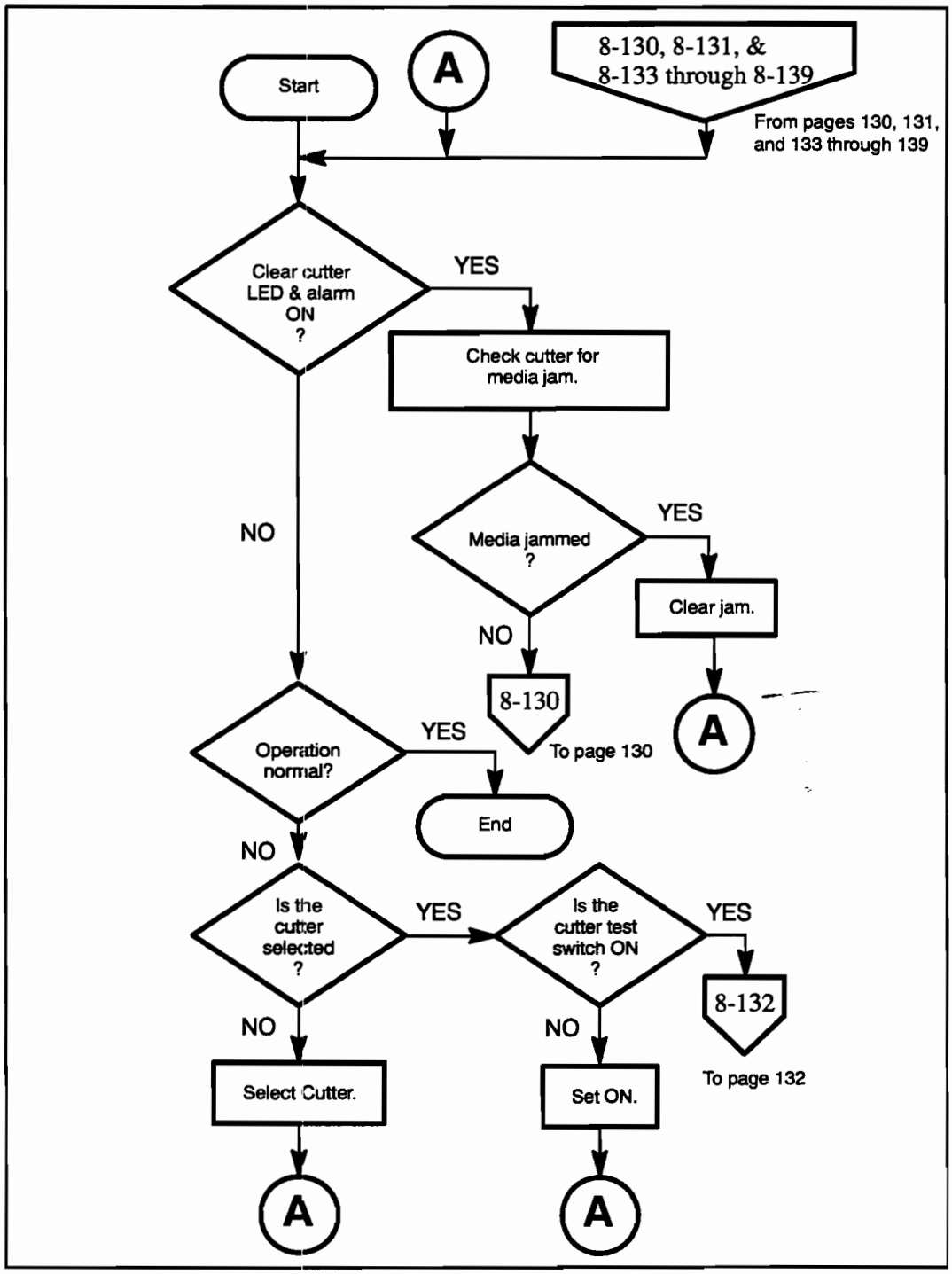


Figure 8-37. Cutter Troubleshooting Flowchart

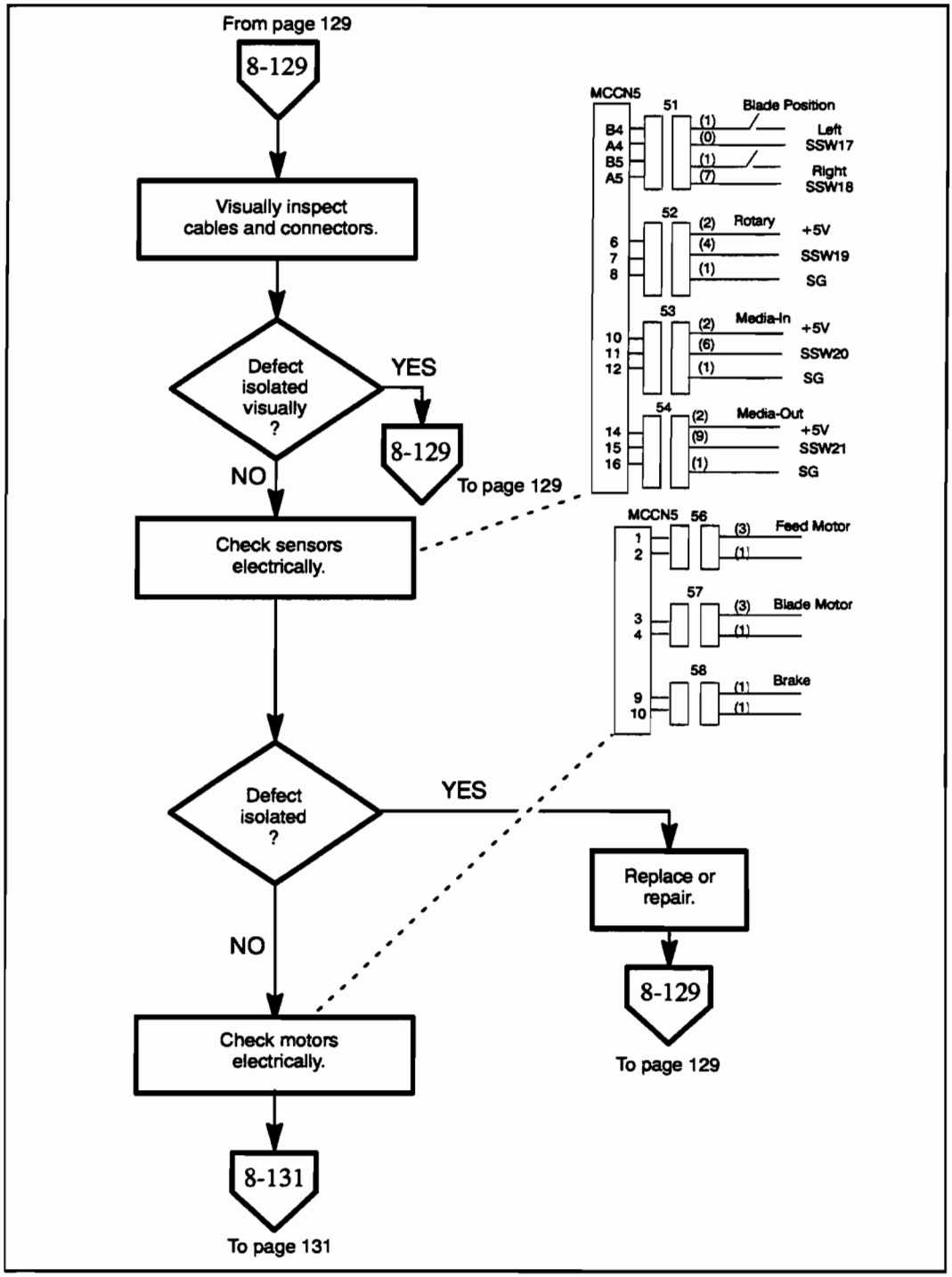


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

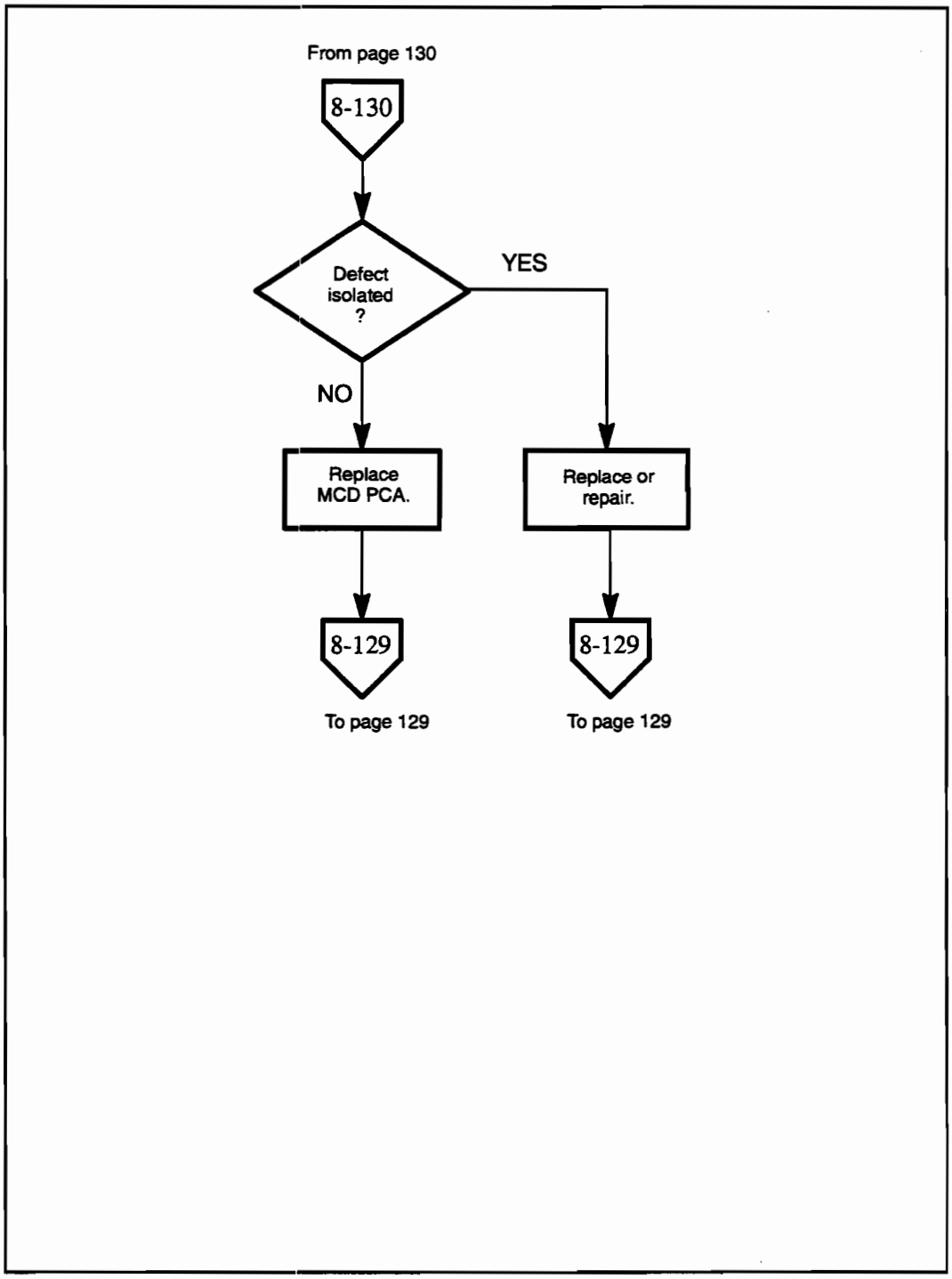


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

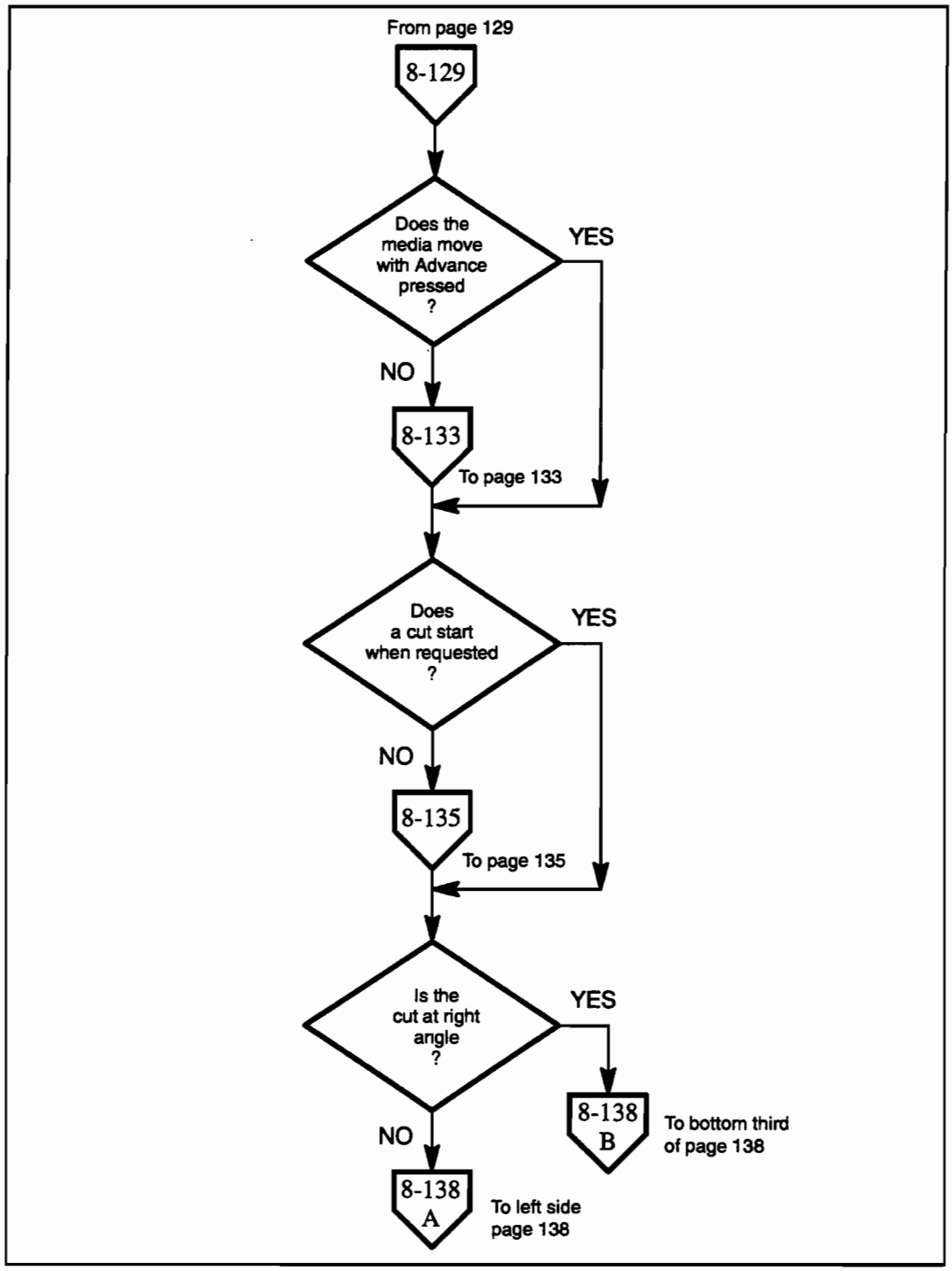


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

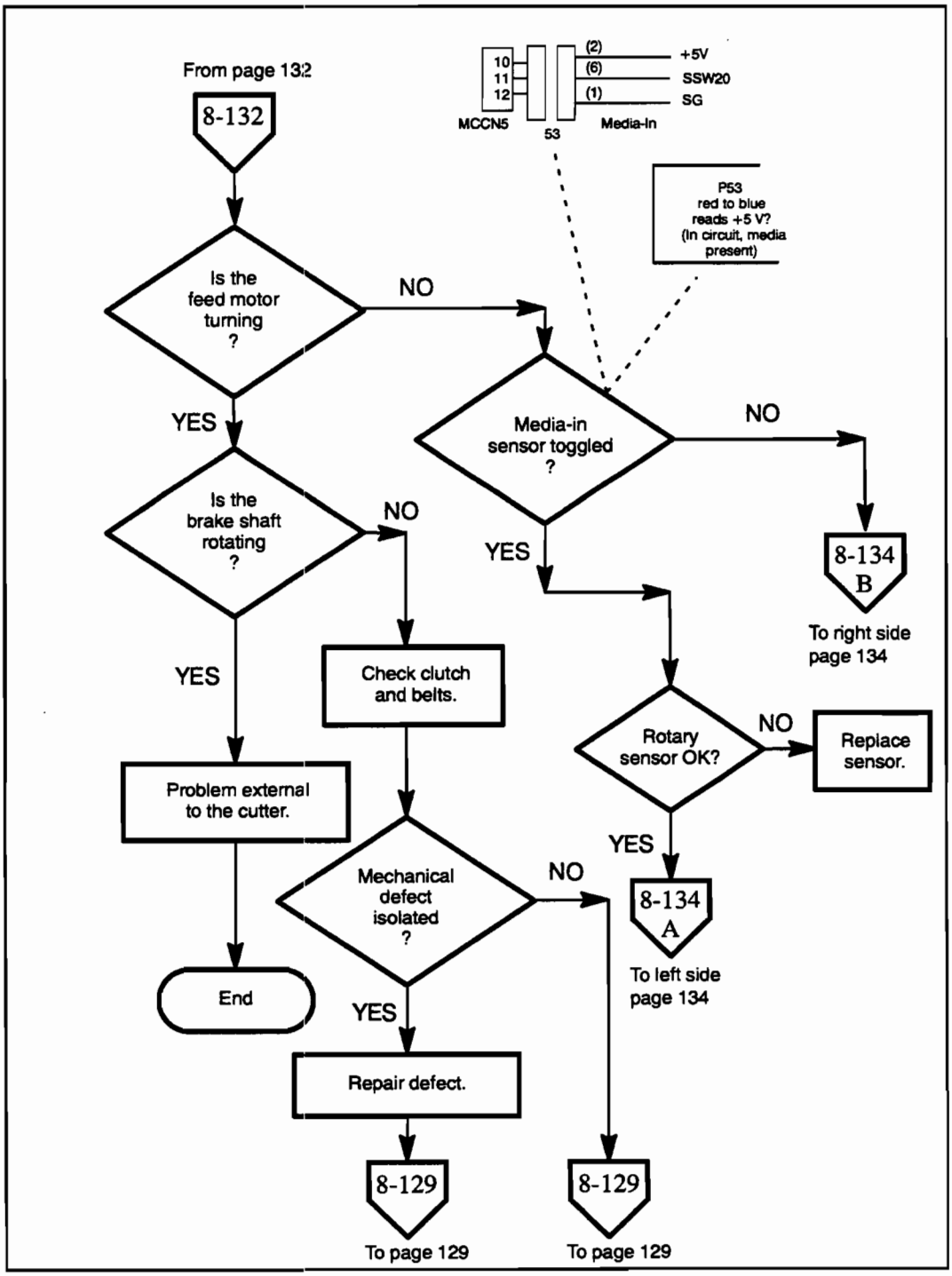


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

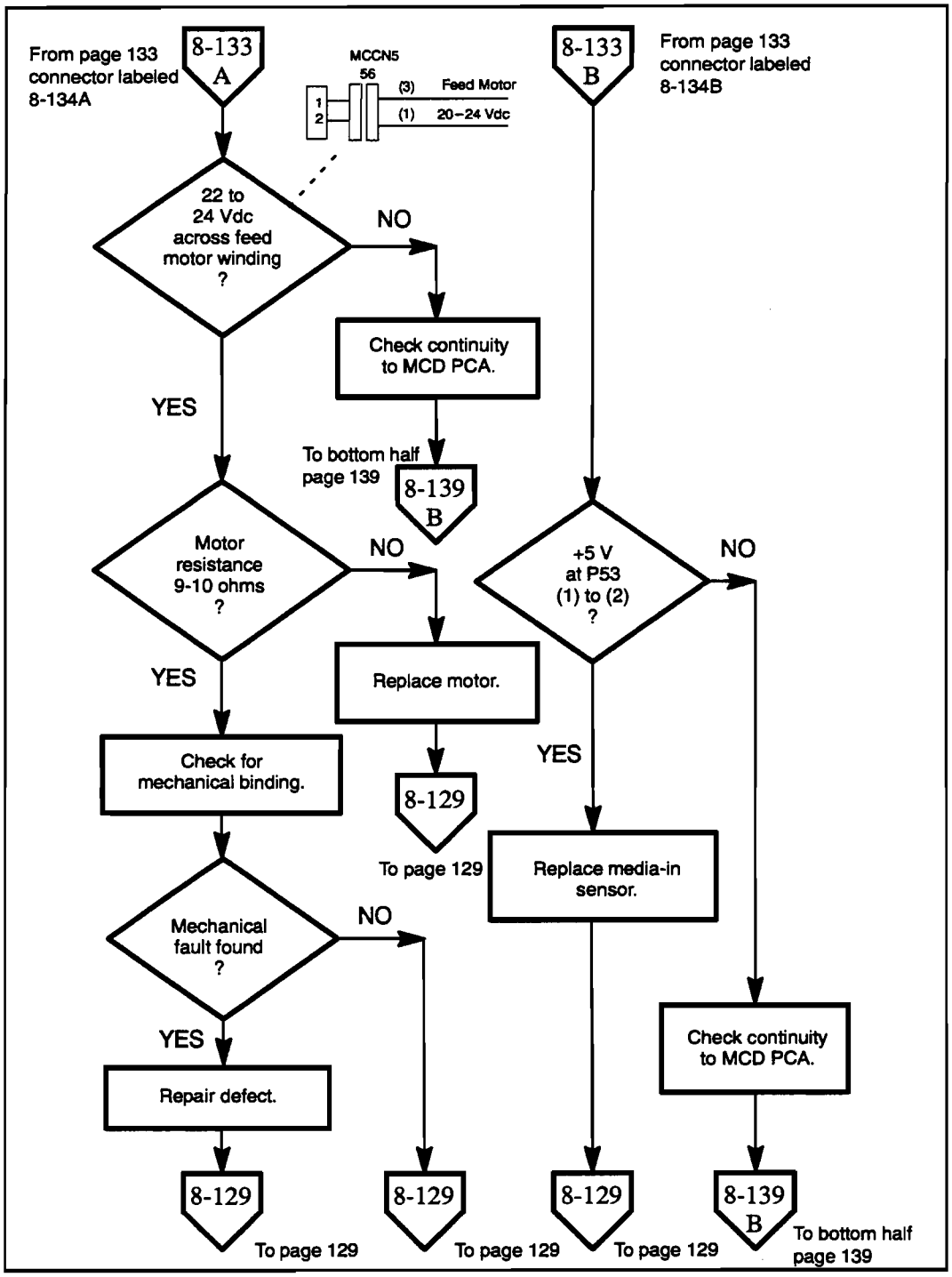


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

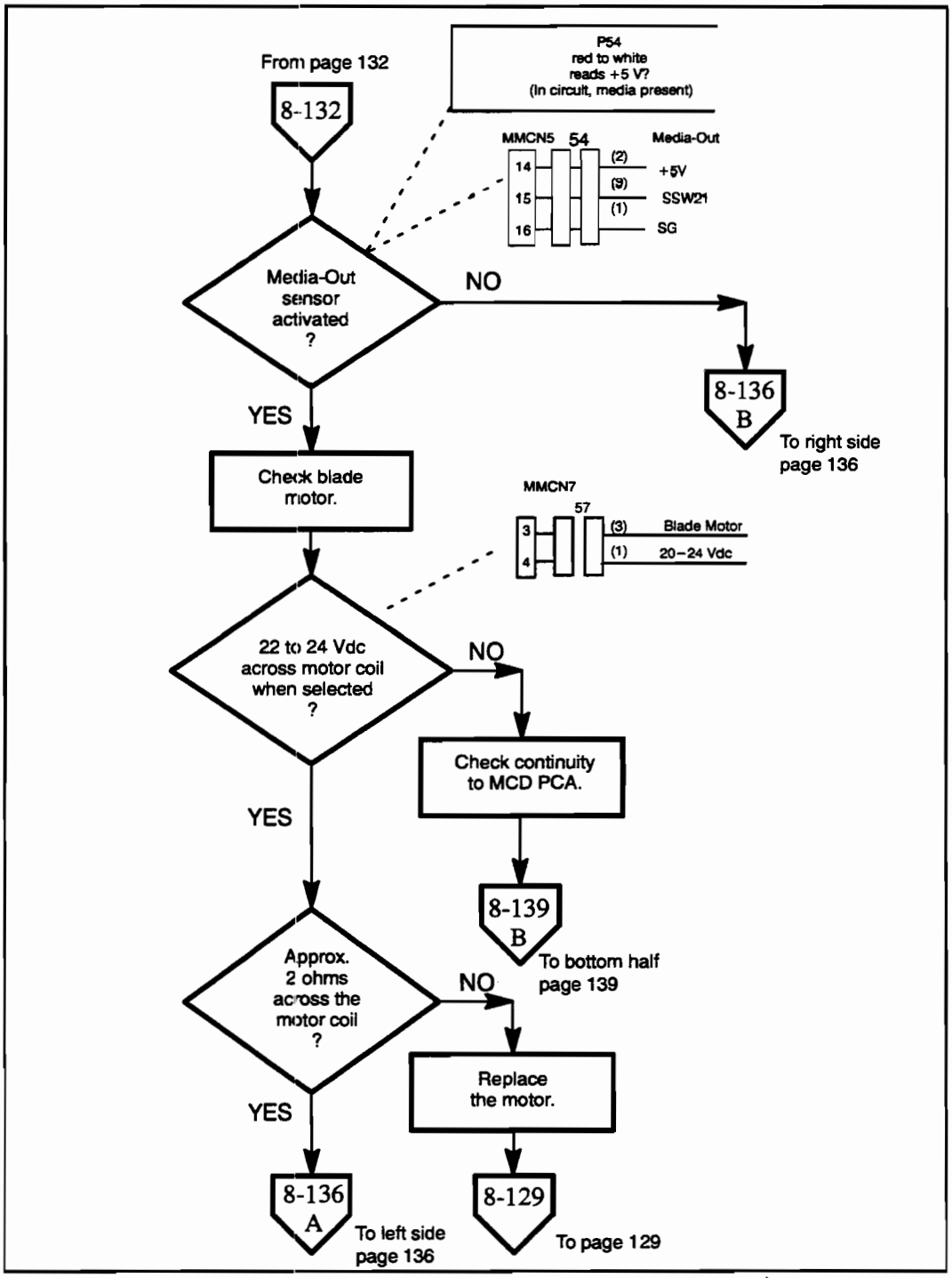


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

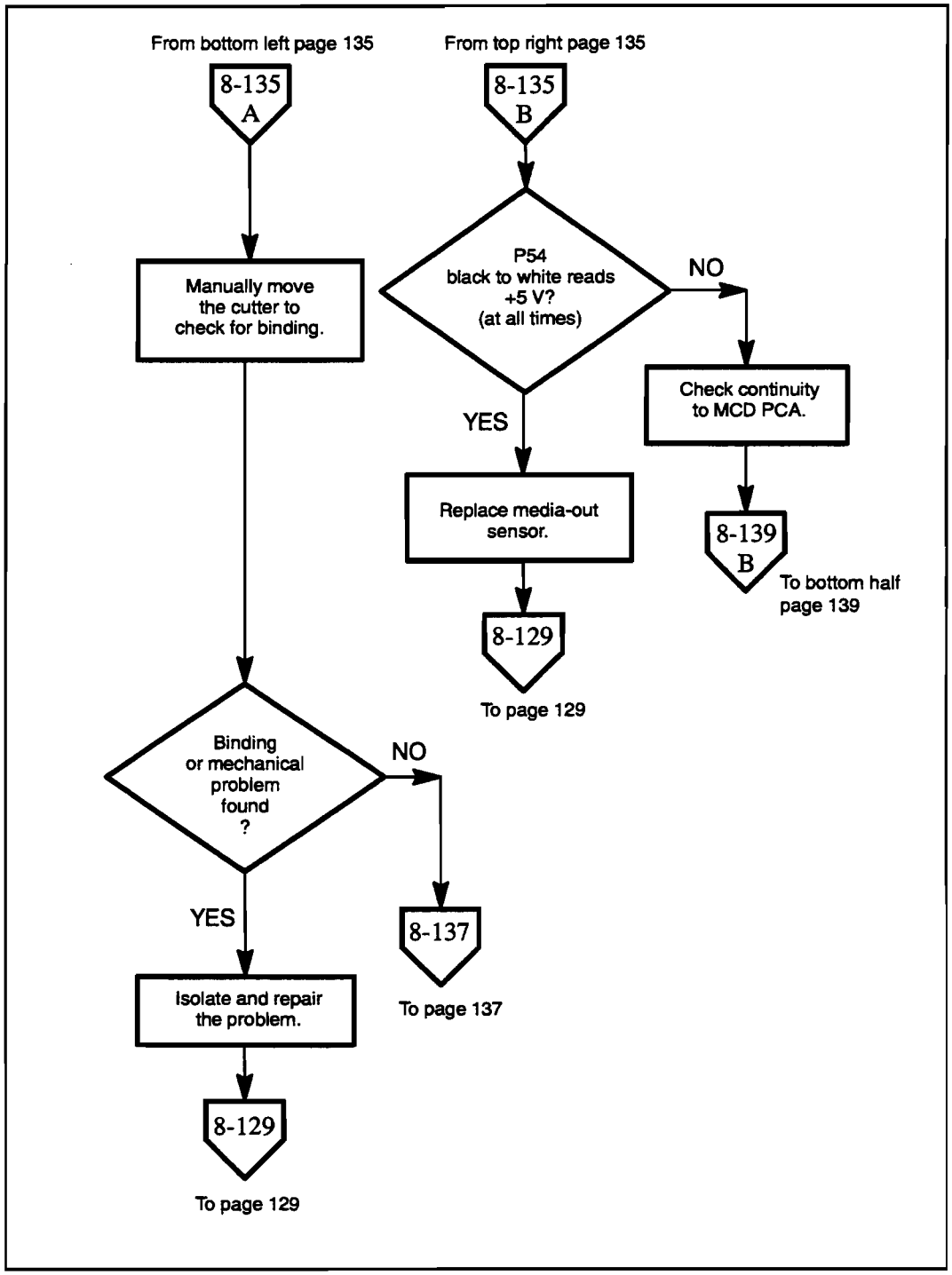


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

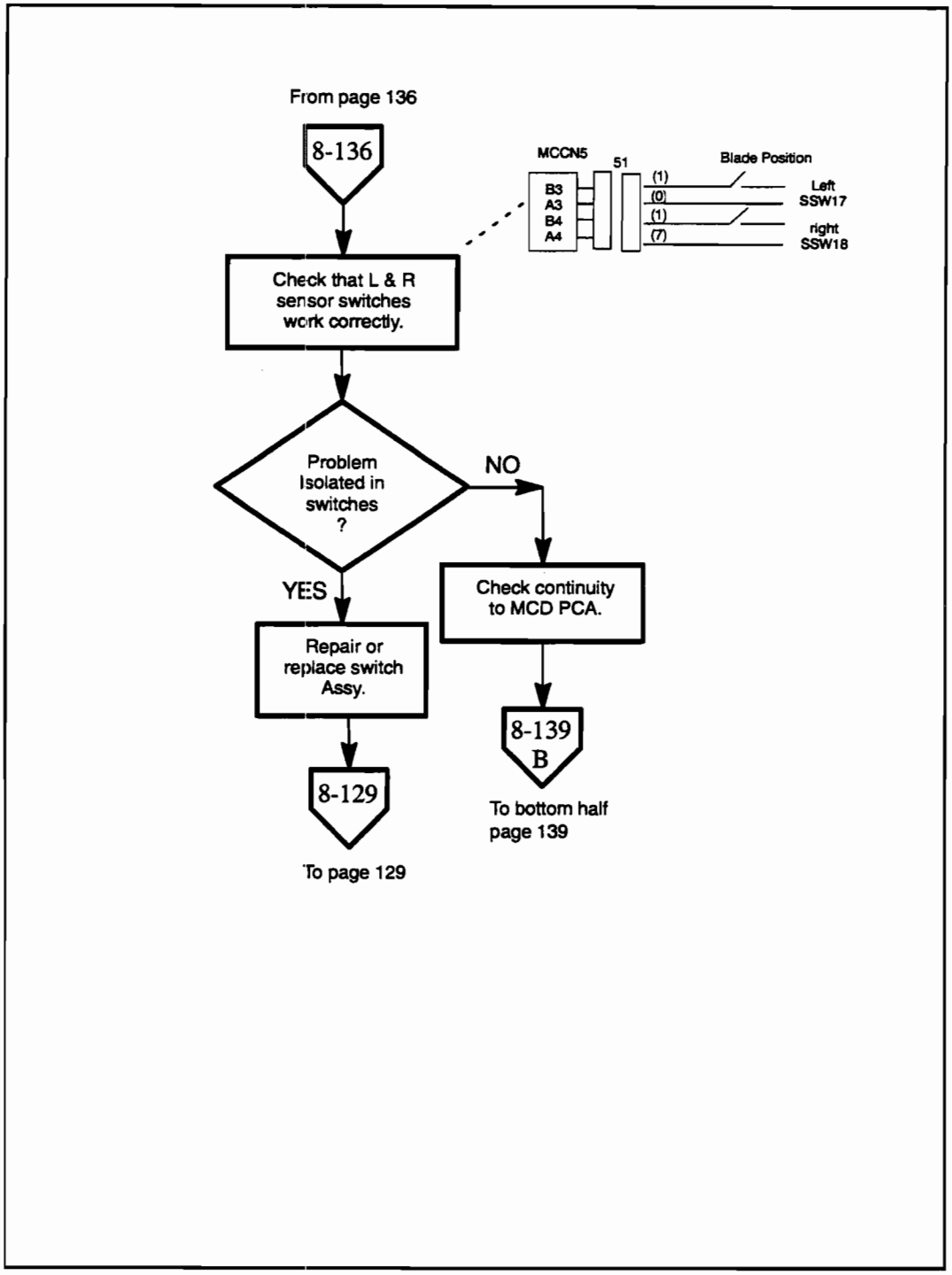


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

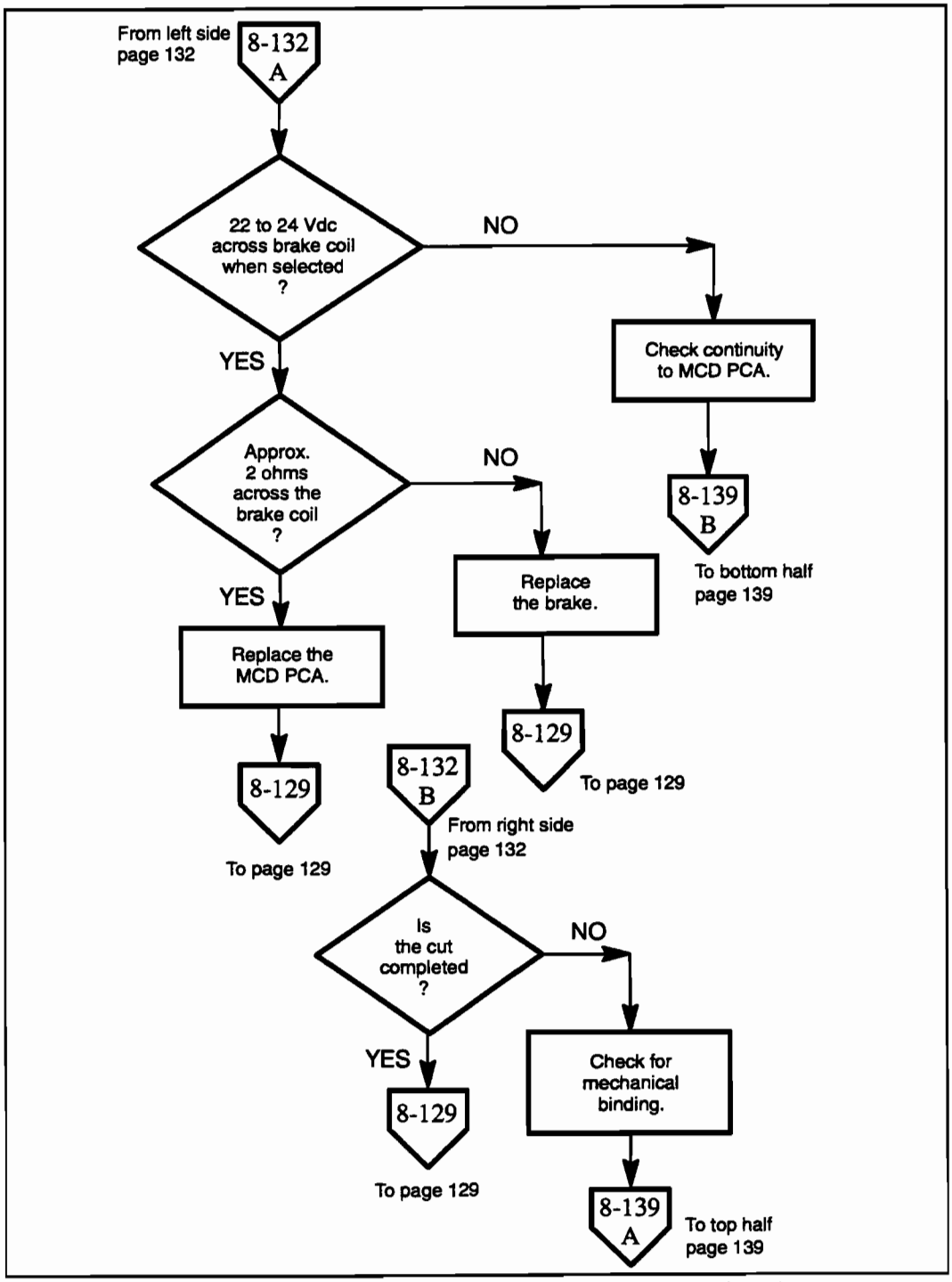


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

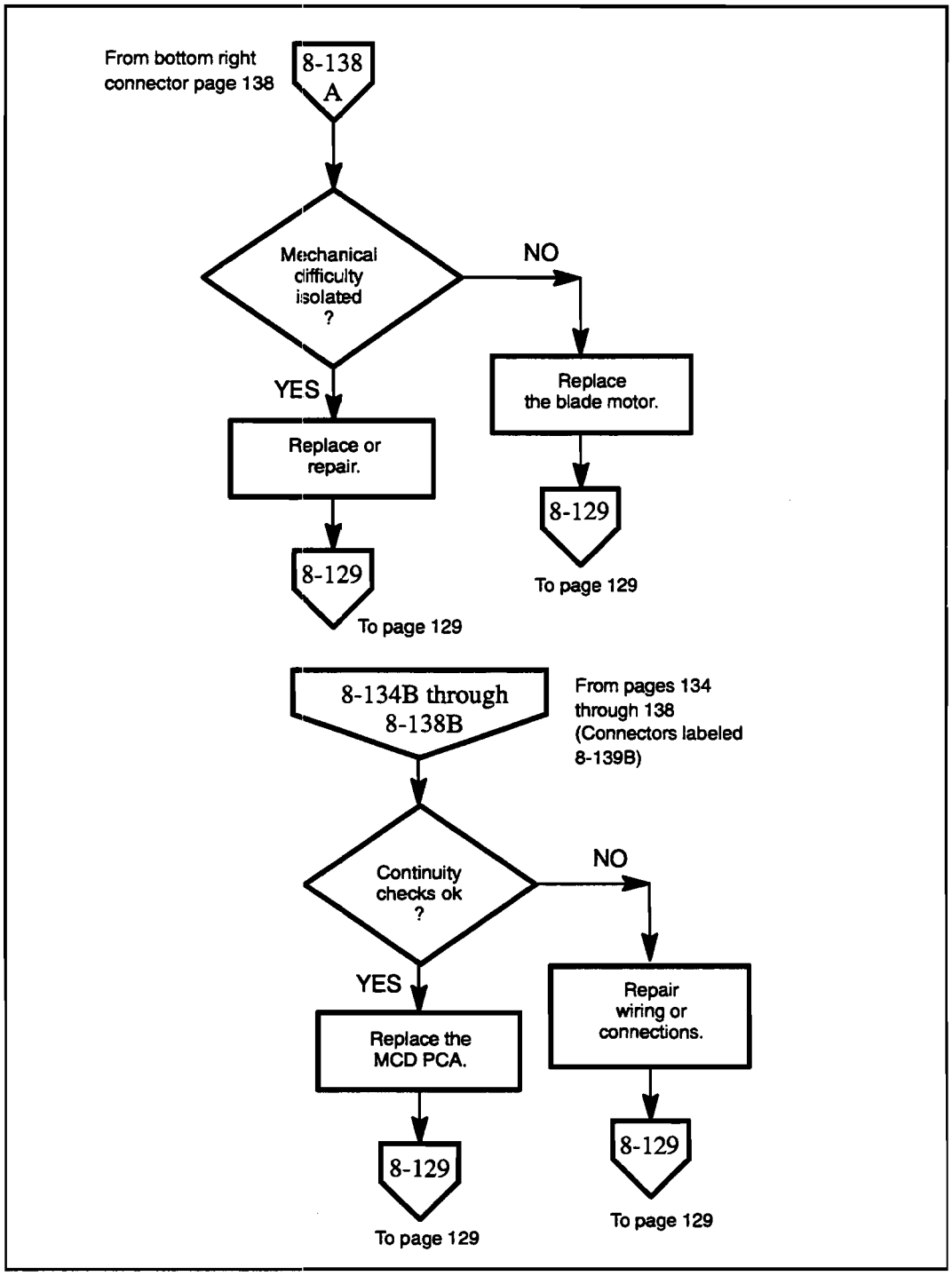


Figure 8-37. Cutter Troubleshooting Flowchart (Continued)

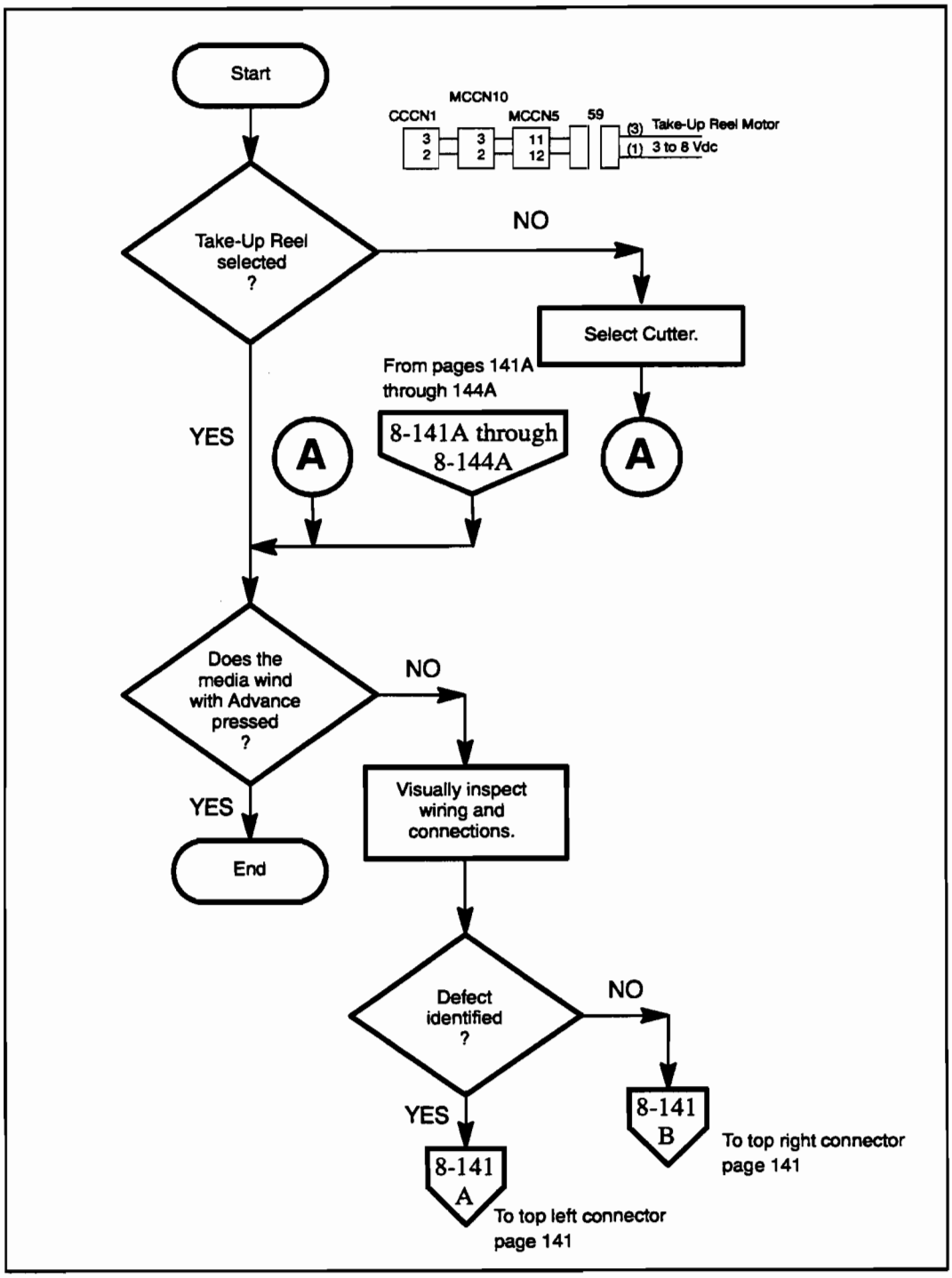


Figure 8-38. Take-Up-Reel Troubleshooting Flowchart

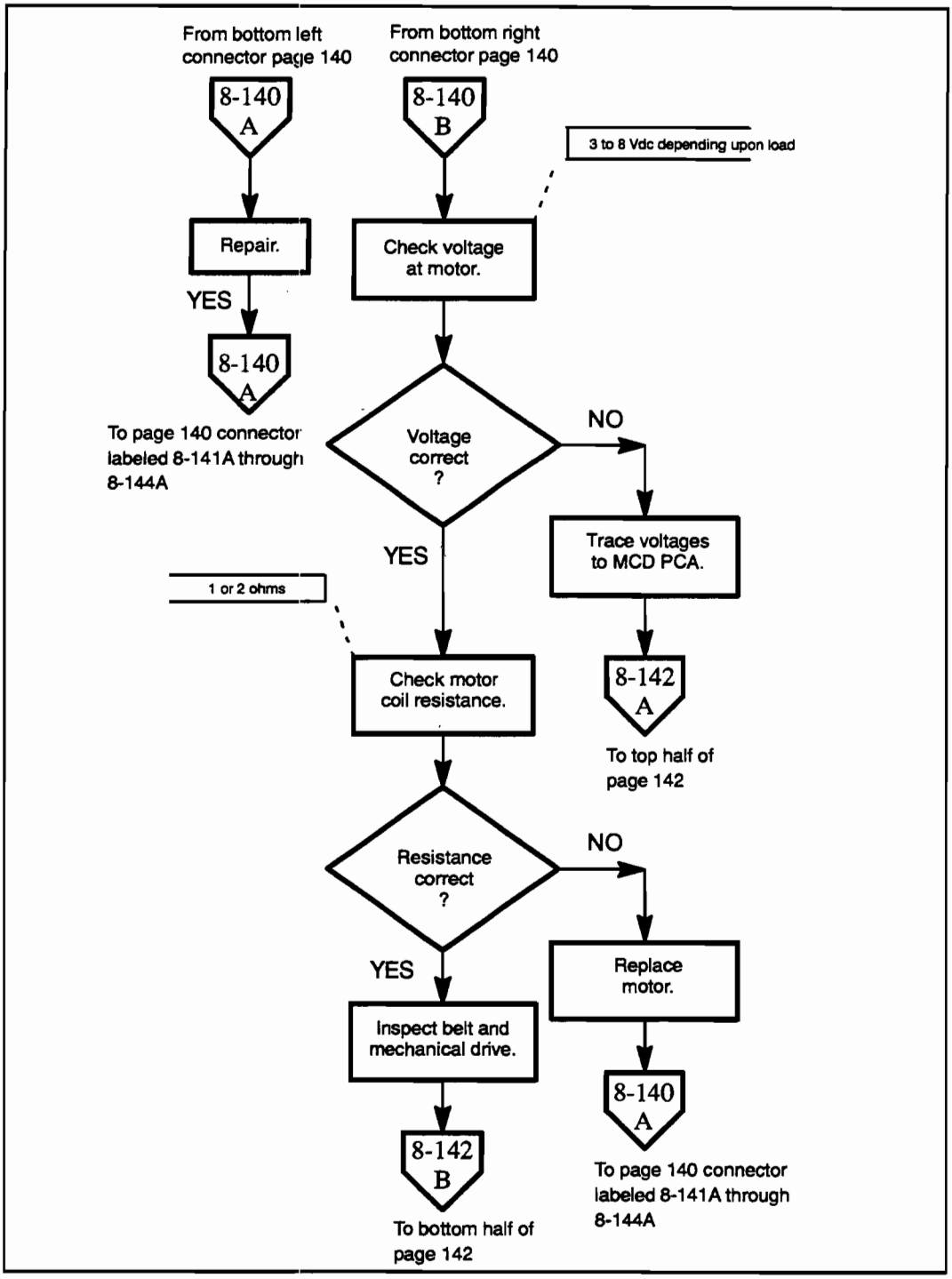


Figure 8-38. Take-Up-Reel Troubleshooting Flowchart (Continued)

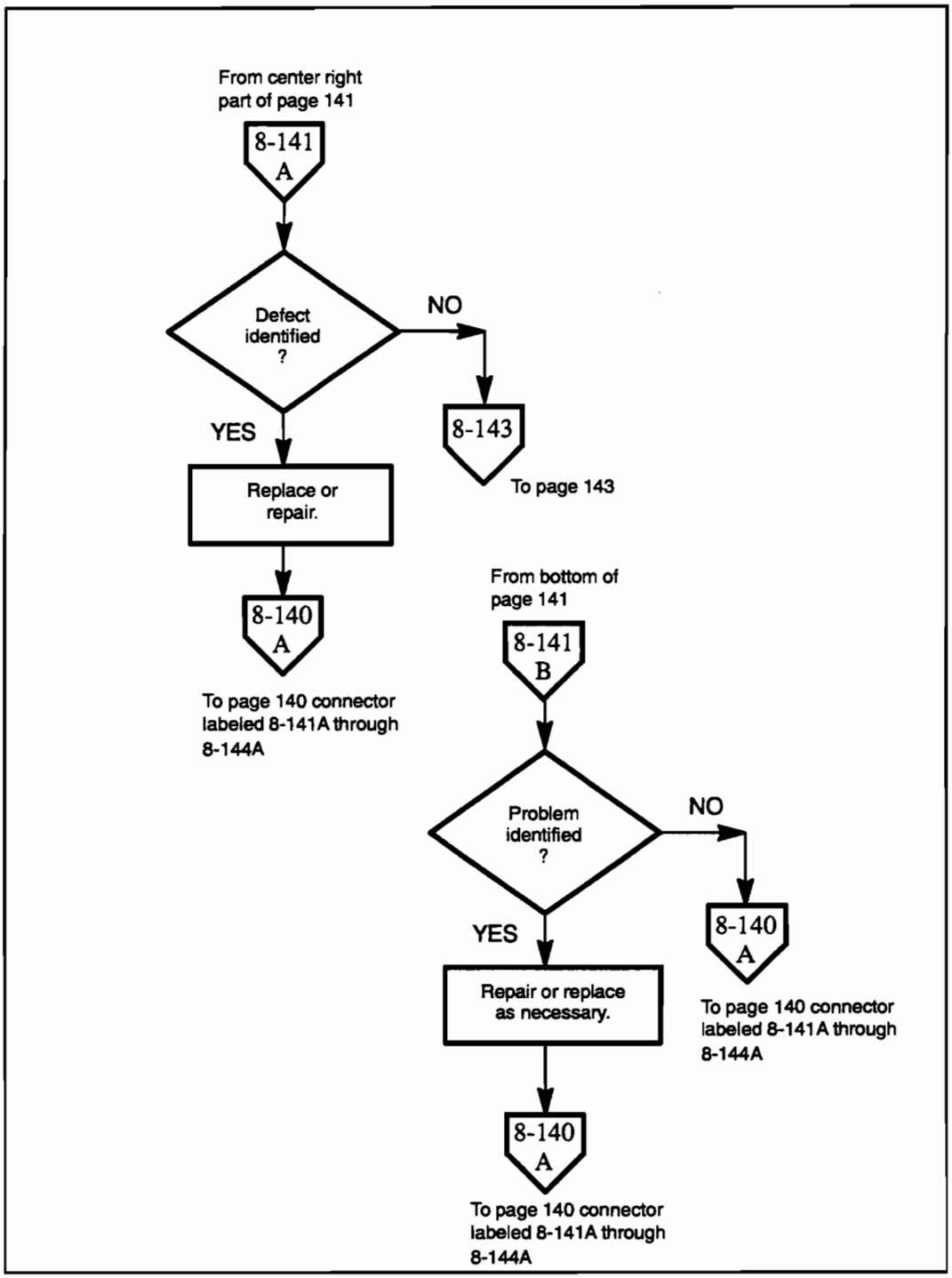


Figure 8-38. Take-Up-Reel Troubleshooting Flowchart (Continued)

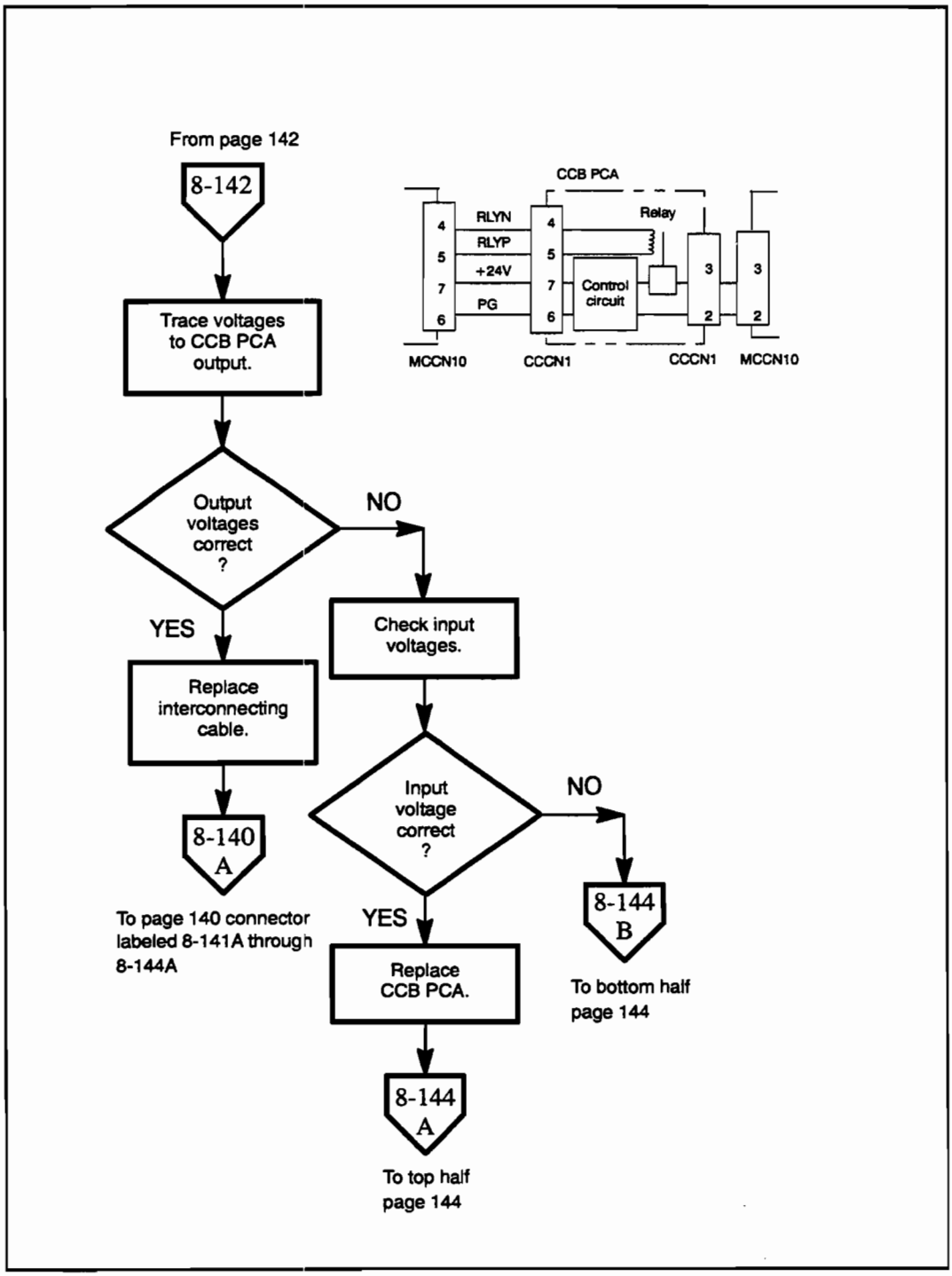


Figure 8-38. Take-Up-Reel Troubleshooting Flowchart (Continued)

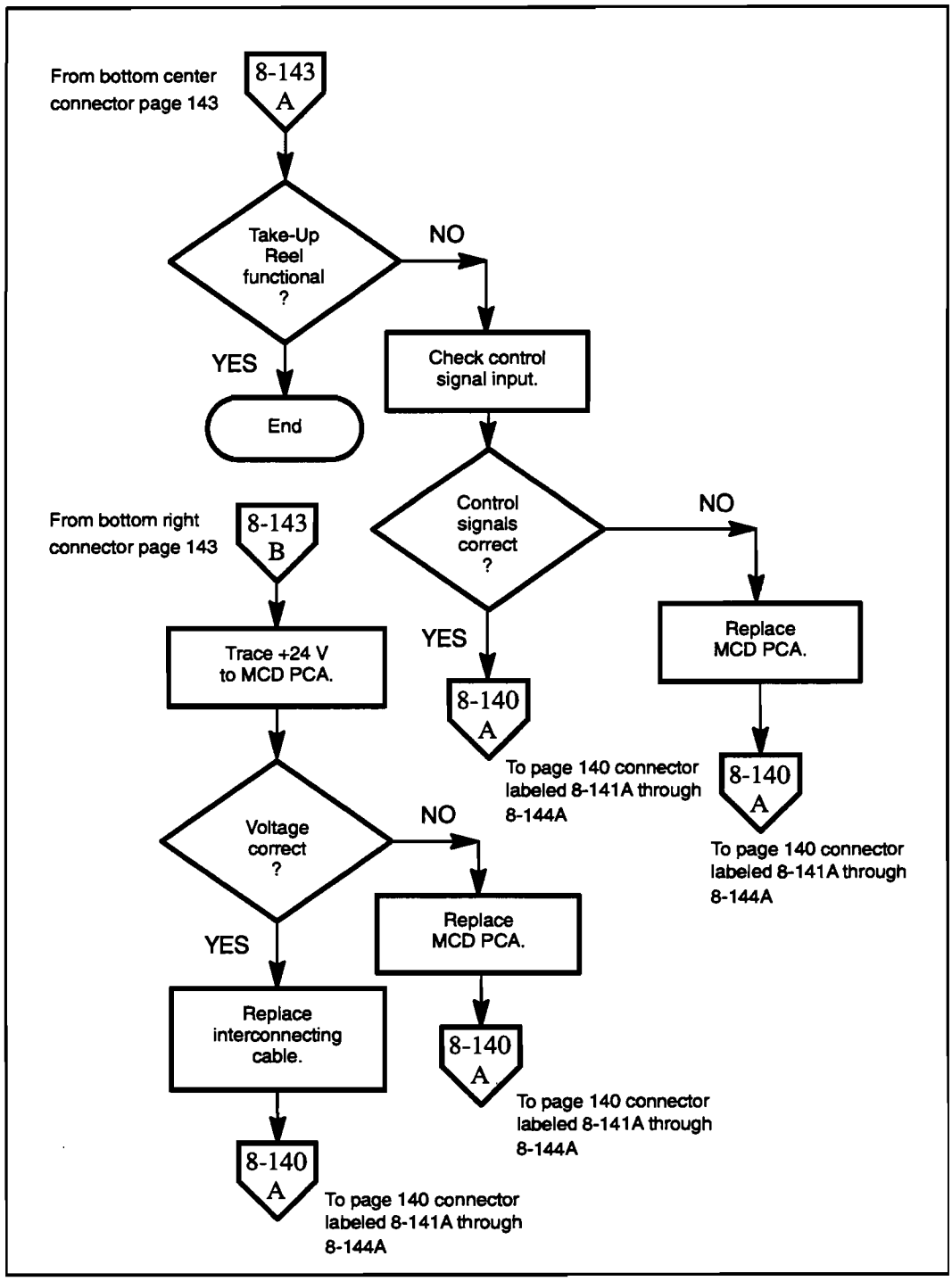


Figure 8-38. Take-Up-Reel Troubleshooting Flowchart (Continued)

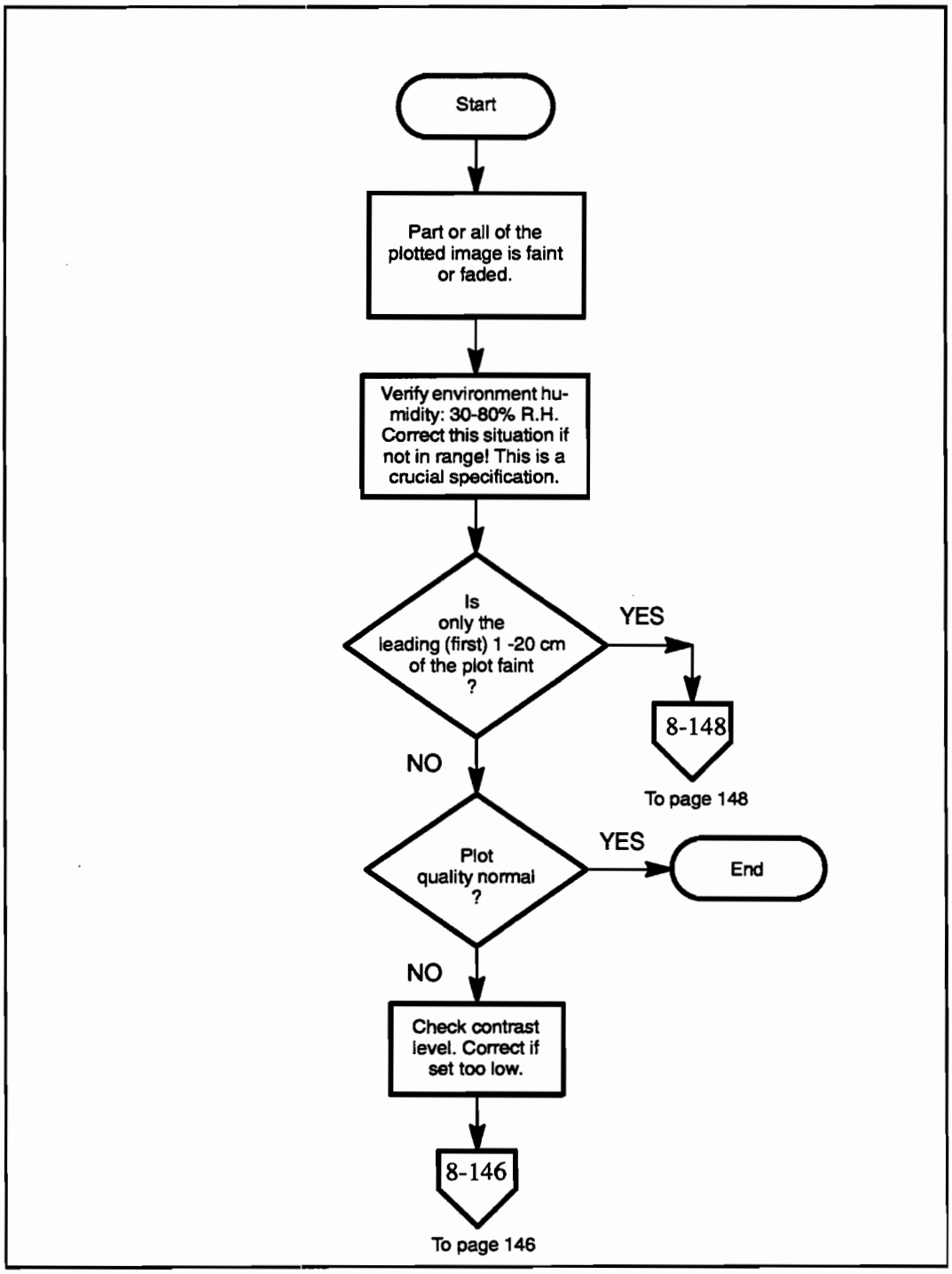


Figure 8-39. Faint Plotting Image Troubleshooting Flowchart

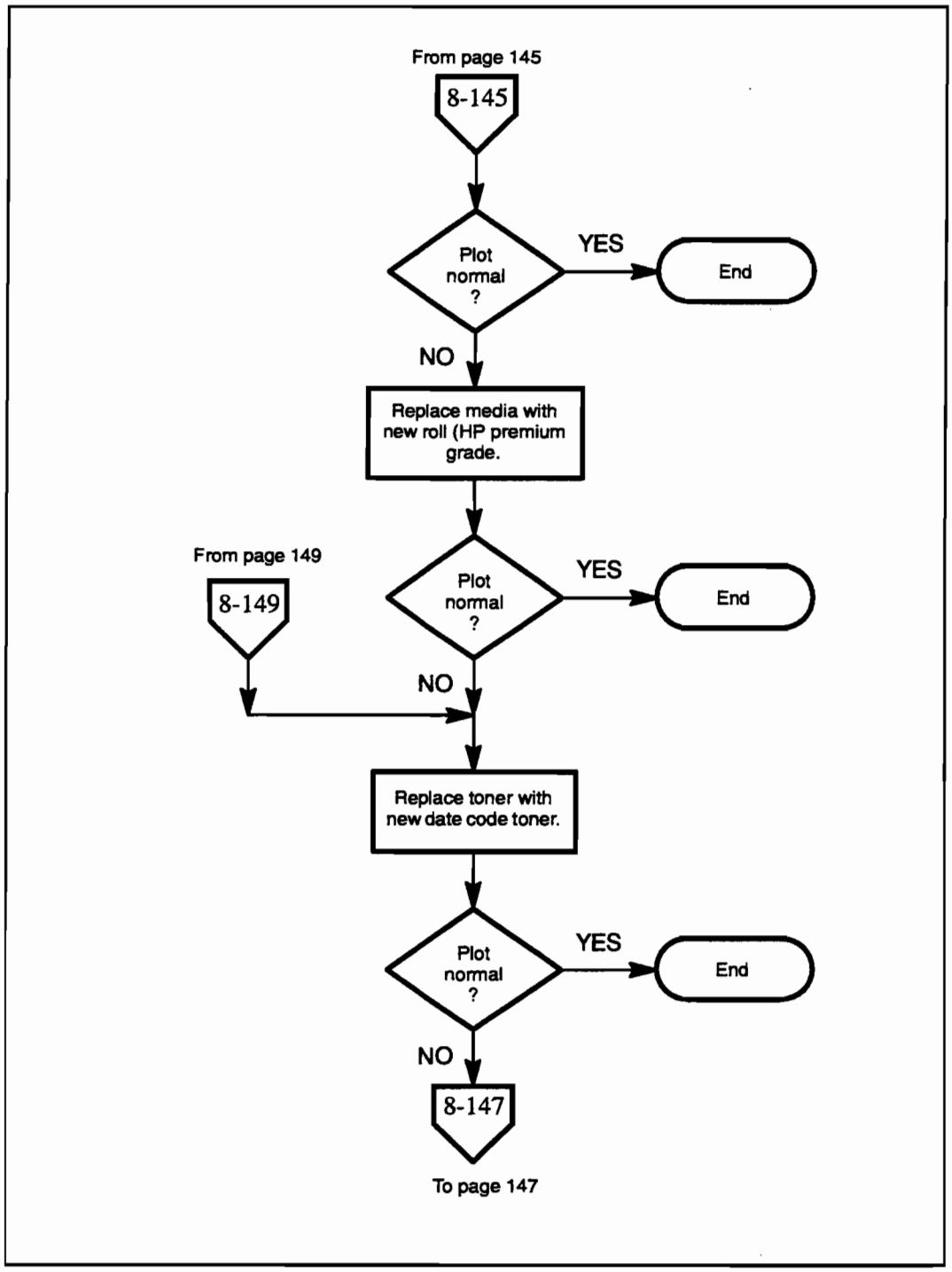


Figure 8-39. Faint Plotting Image Troubleshooting Flowchart (Continued)

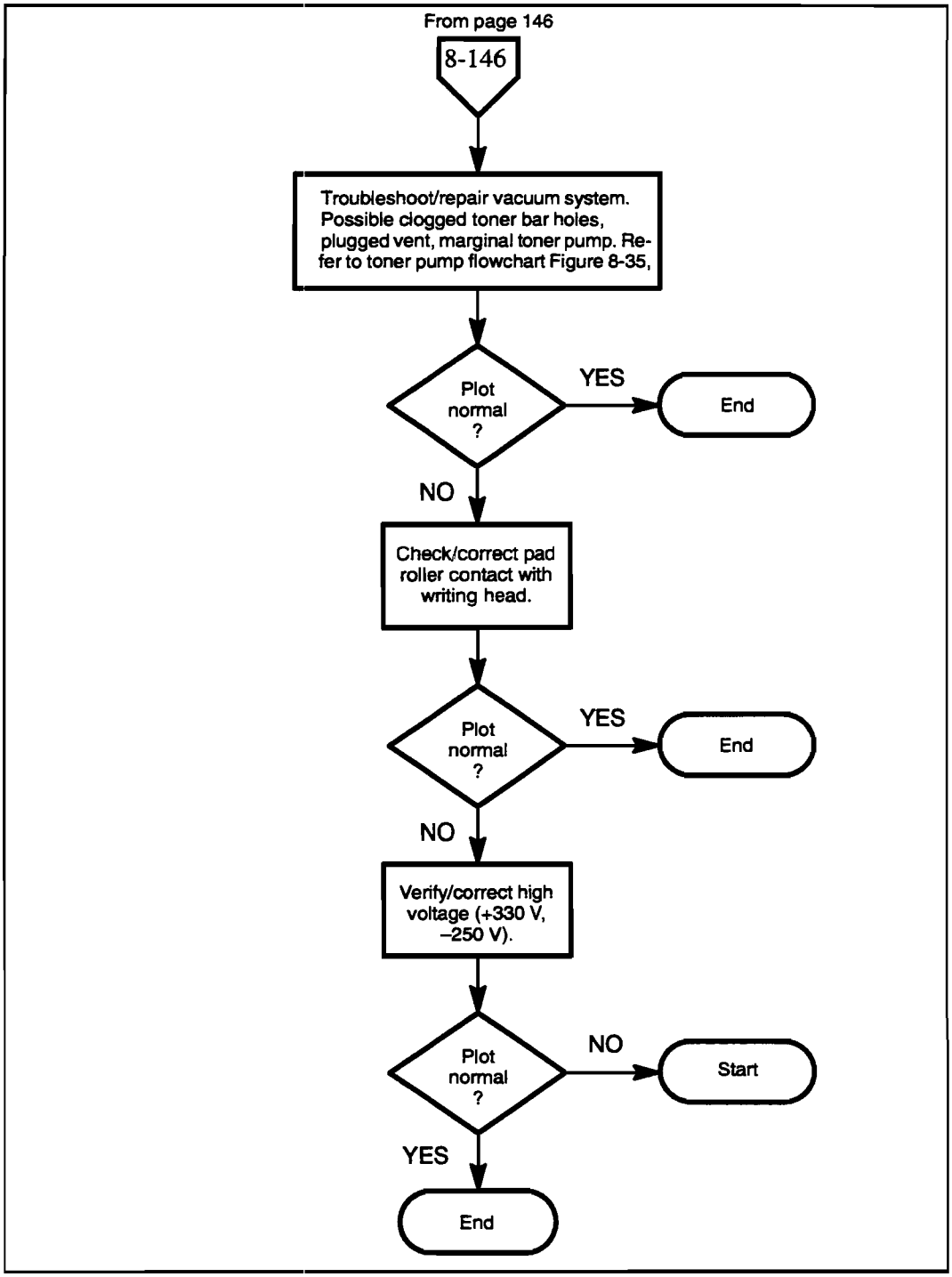


Figure 8-39. Faint Plotting Image Troubleshooting Flowchart (Continued)

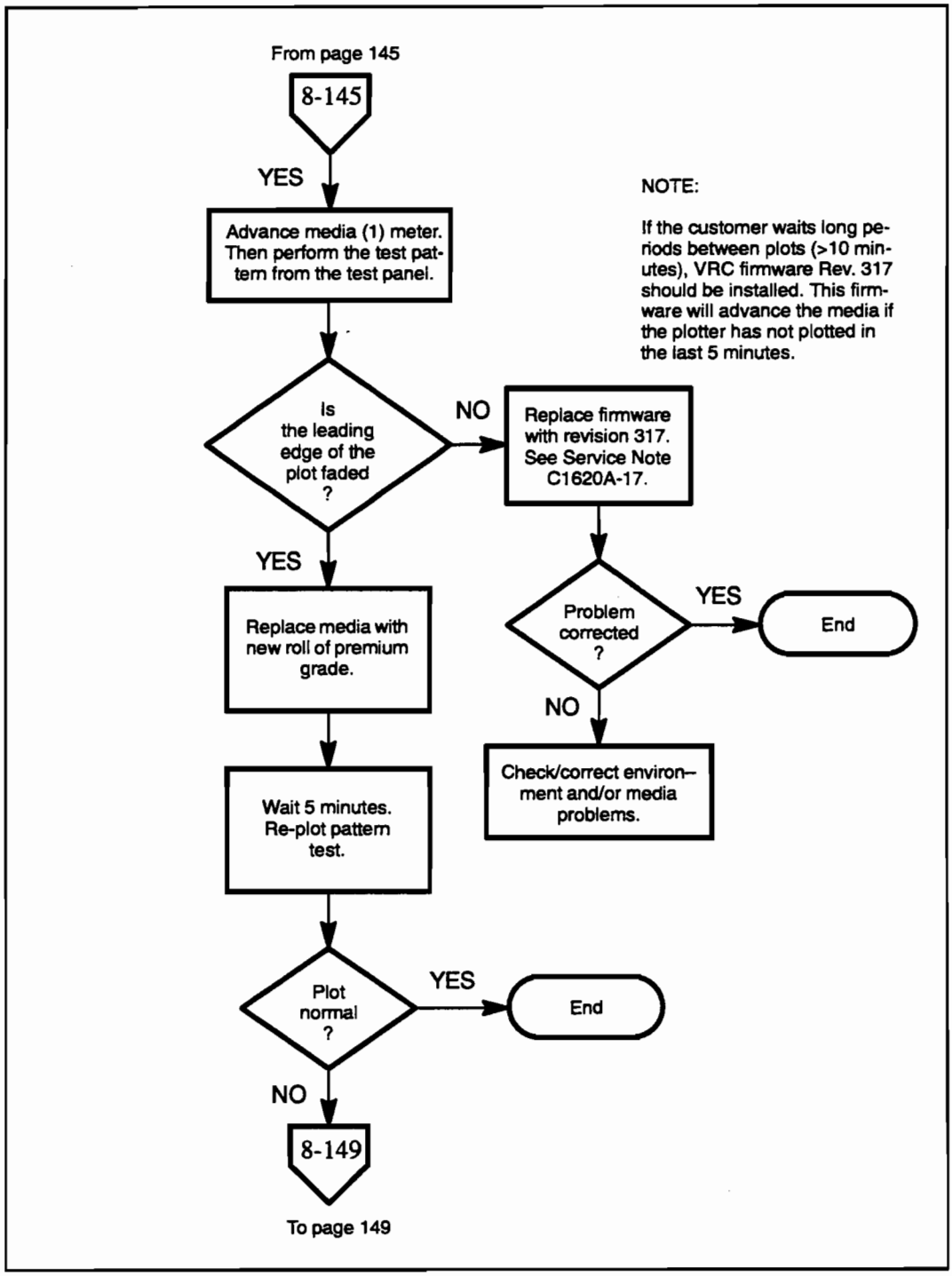


Figure 8-39. Faint Plotting Image Troubleshooting Flowchart (Continued)

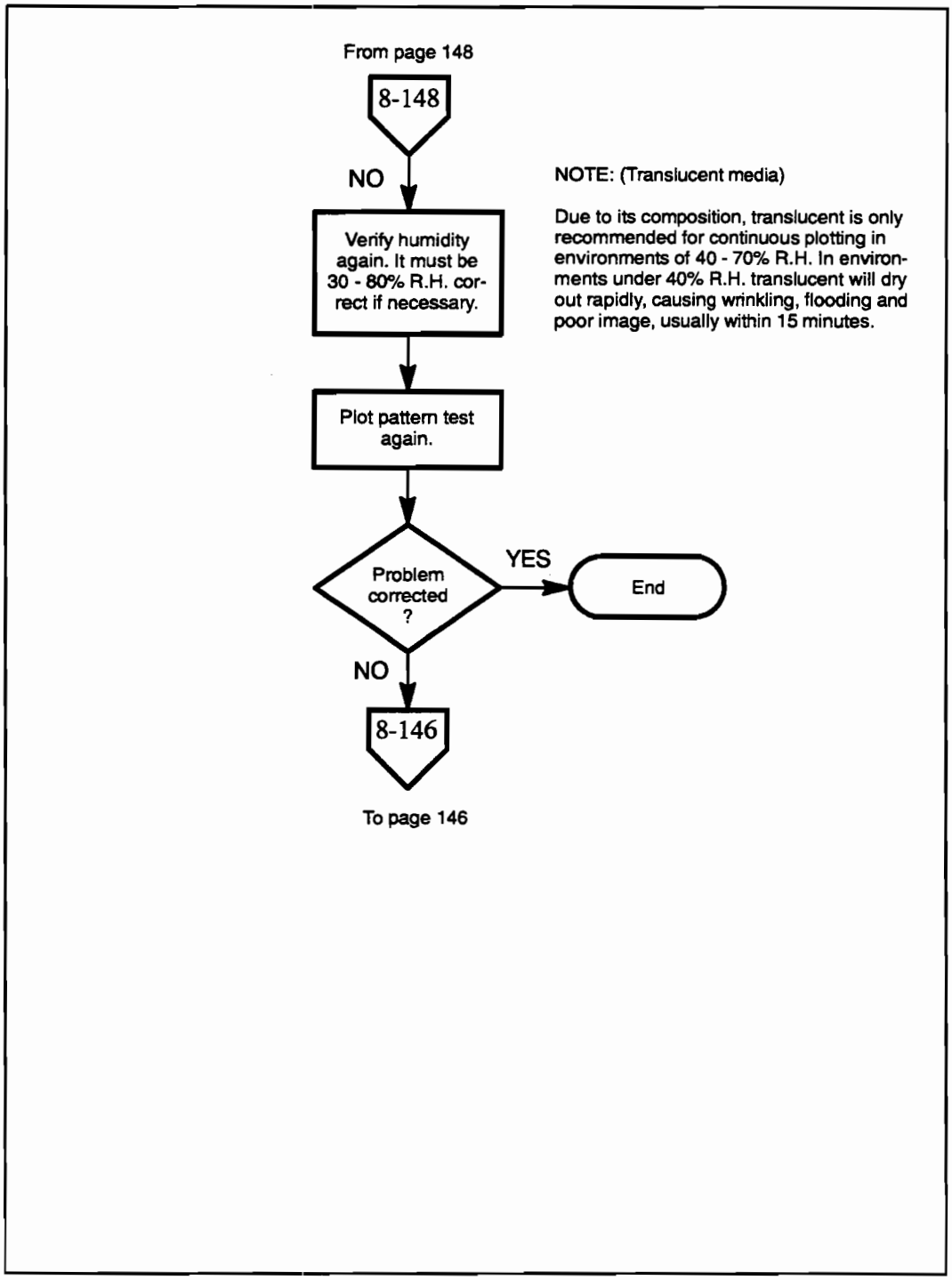
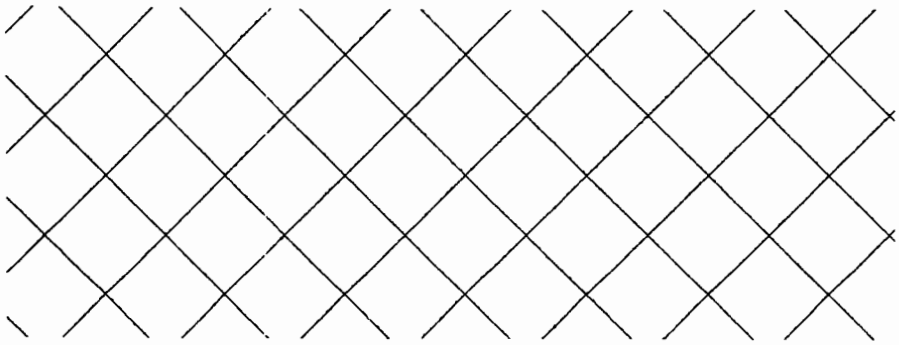


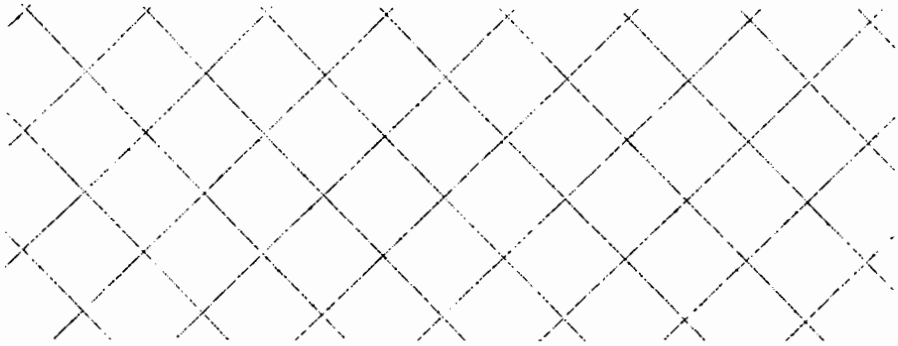
Figure 8-39. Faint Plotting Image Troubleshooting Flowchart (Continued)

8-132. PLOTTING FAILURES (Models 240D/E and 250/255)

8-133. The first step in troubleshooting a plotting failure is to determine whether or not the plotter output is unacceptable. The following plot samples are designed to help you identify plotter output that is unacceptable and to provide possible solutions to plotter output problems. Where identification is difficult, both a normal sample and a problem sample are provided.



Normal Plot



Dropout

Definition: Narrow lines (usually under three (3) pixels in thickness) which are broken up and not continuous. The lines may appear worse in a diagonal direction.

Solutions: Dropout is usually caused by dry media/environment, or depleted toner. First, clean the writing head. Then replace media toner. Raise the humidity to a minimum of 30%.

NOTE: Some amount of dropout is common when plotting 1 pixel lines (0.06 mm). Better results will be achieved with two or three pixel widths (0.12 mm or 0.18 mm).

Figure 8-40. Sample, Dropout

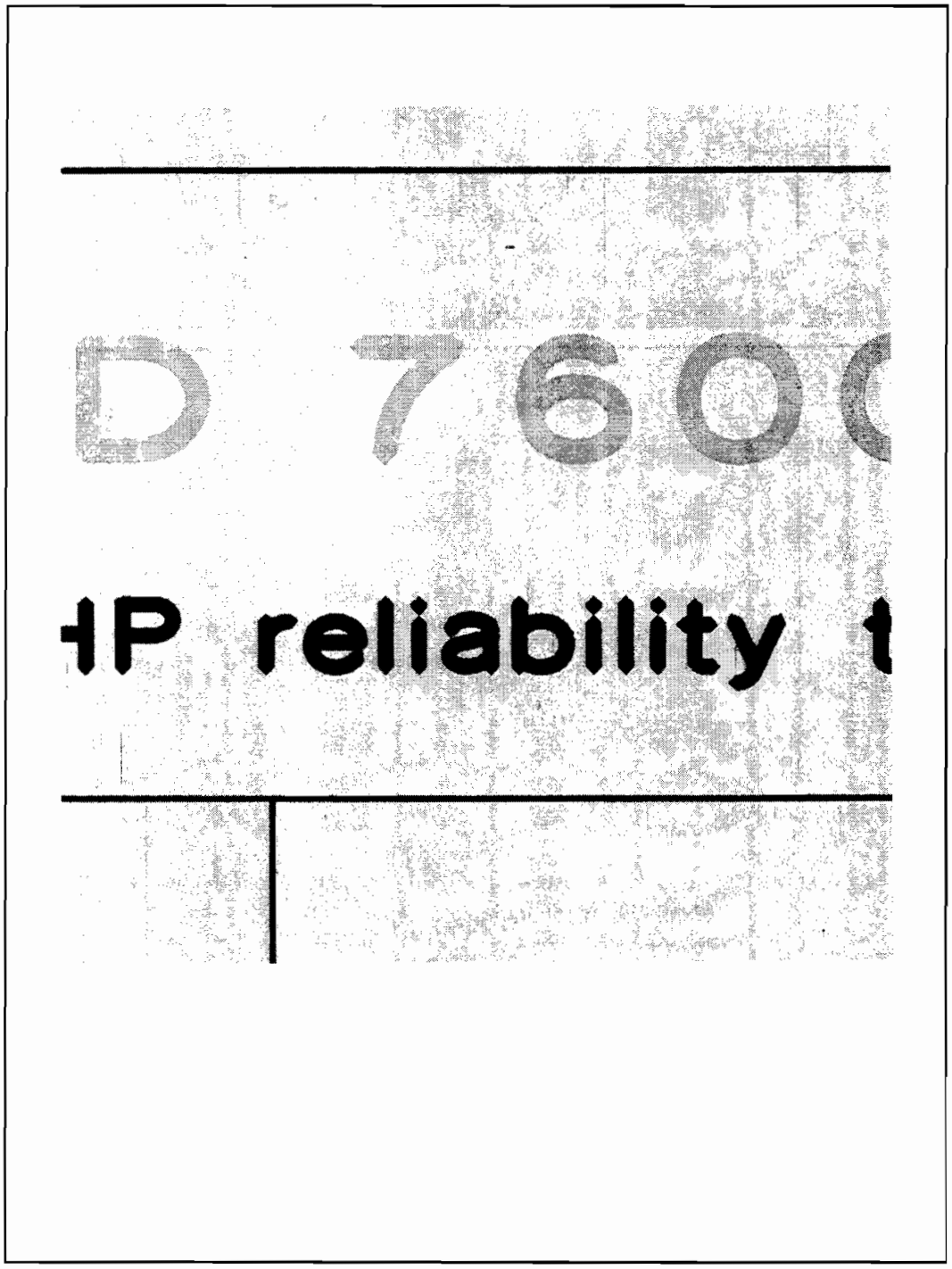
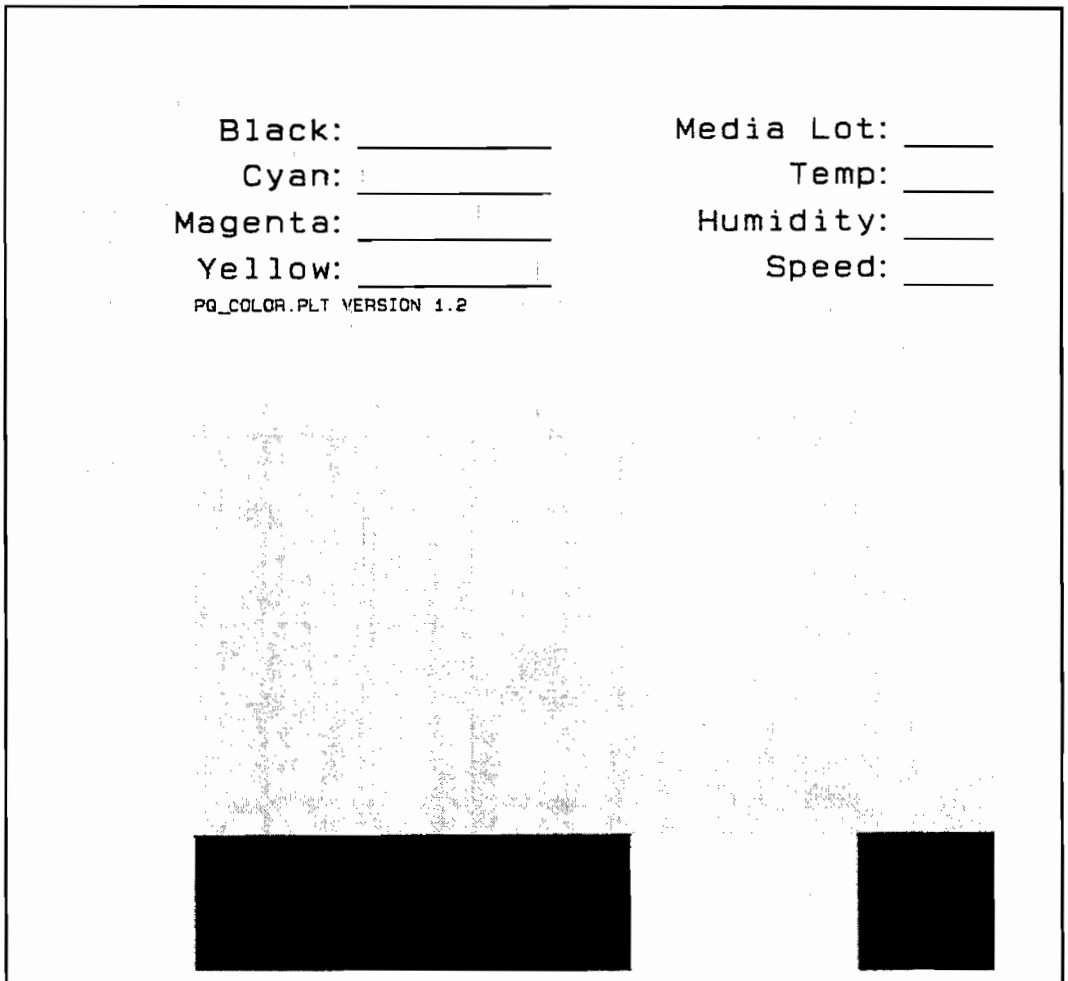


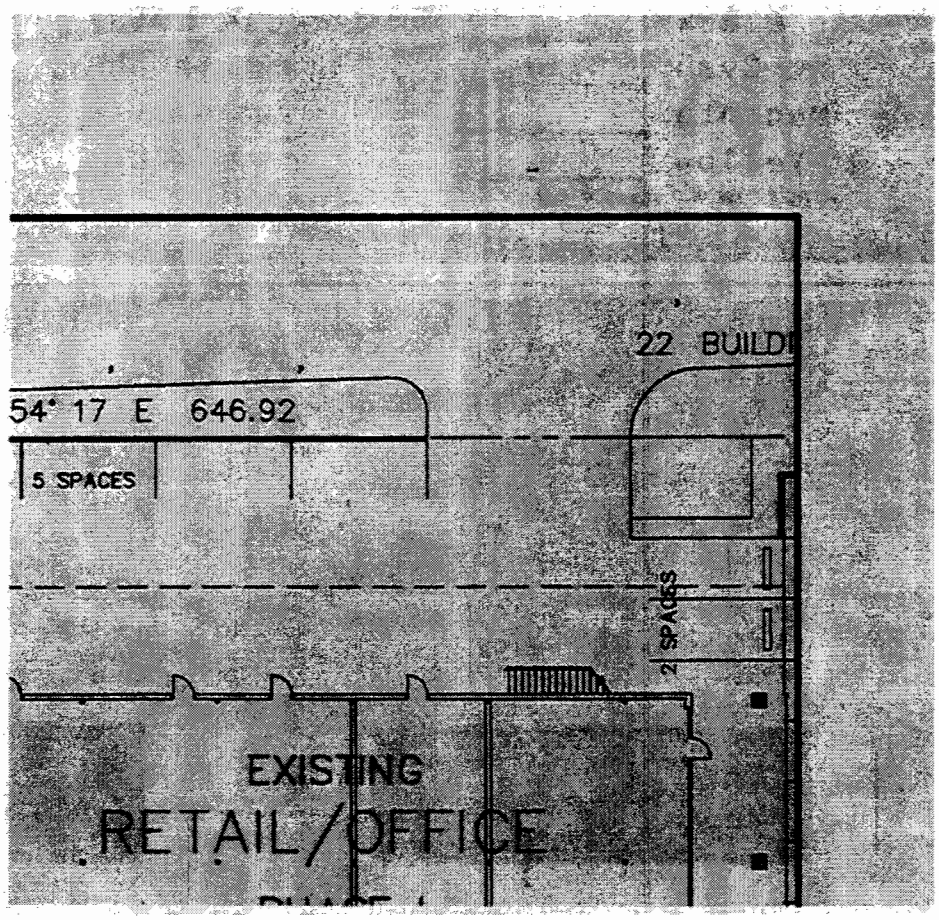
Figure 8-41. Sample, Normal Nib Writing



Definition: Extraneous, vertical, single-pixel lines seen on the imaged plot. Under magnification, they are seen as a series of independent dots. May be from 10 mm to half a plot in length. Mostly seen in dry plotting environments or with dry media.

Solutions: Check/raise humidity level. Must be a minimum of 30%. Replace media with new roll. Replace writing head if necessary.

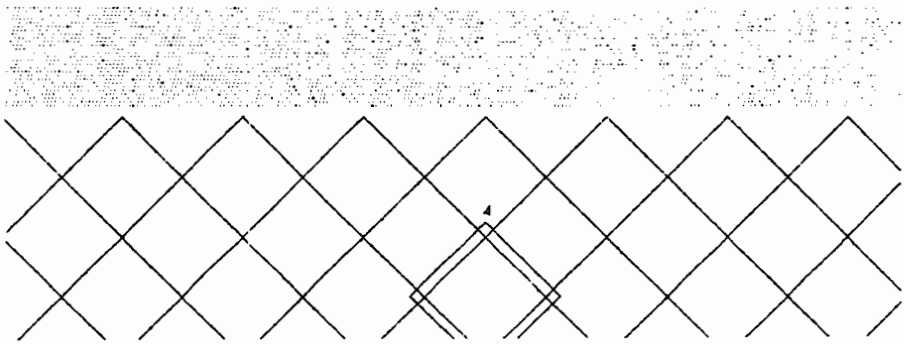
Figure 8-42. Sample, Excessive Nib Writing



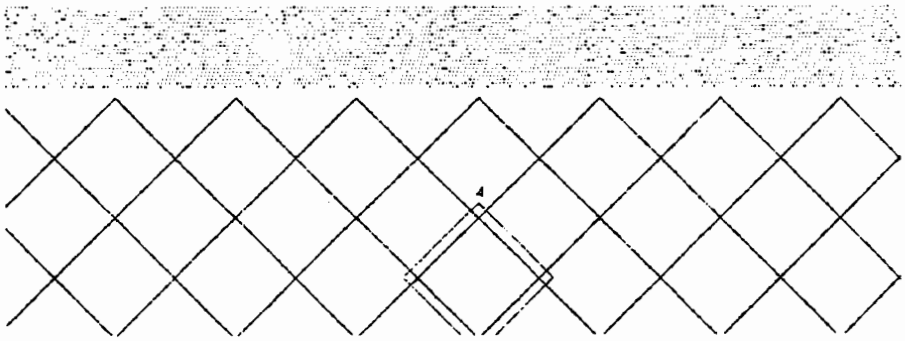
Definition: Extraneous, vertical, lines seen on imaged plot. Under magnification they are seen as a continuous line. They may extend the length of the plot. The scratch lines are usually caused by debris or other marks in the writing head or developer bar which scratch the media causing toner lines.

Solutions: Polish and clean writing head with isopropyl alcohol. Wipe down the developer bar with alcohol wipes.

Figure 8-43. Sample, Plot Scratches



Normal

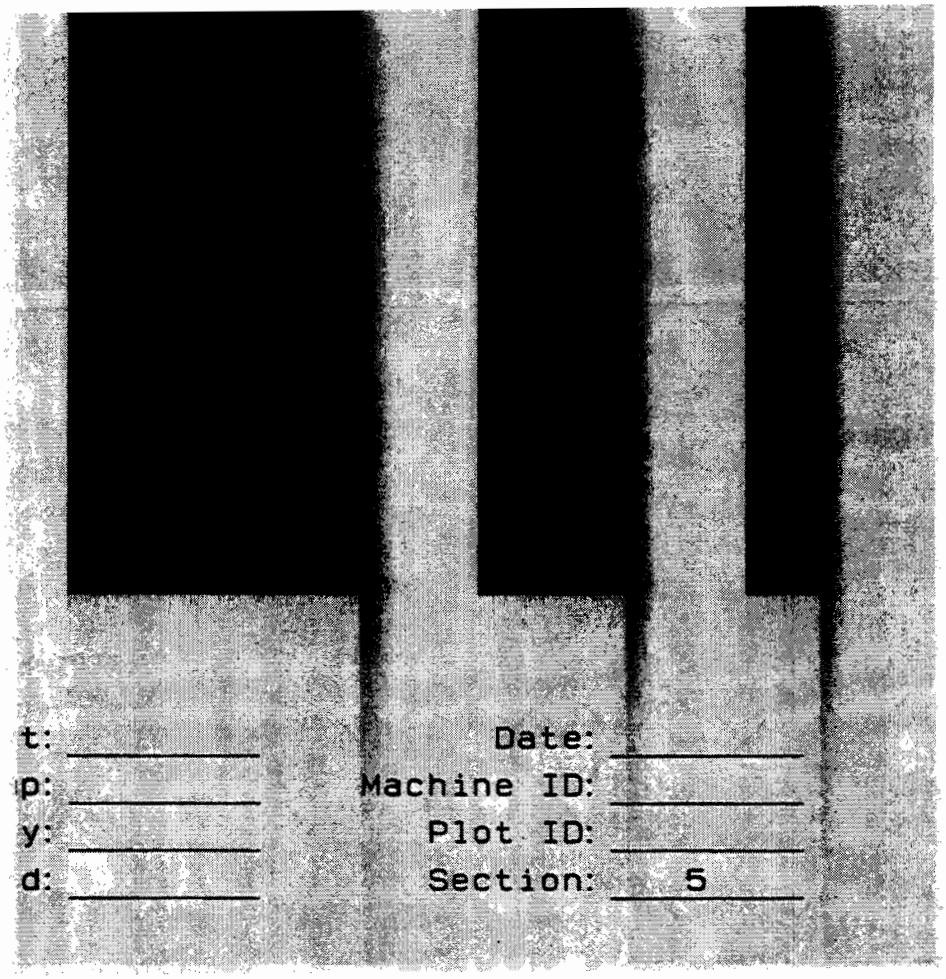


Excessive

Definition: Extraneous single dots seen in the imaged area most commonly called by customers as extra dots on the edges of lines. Flares are also commonly seen in area fill as extra (darker) dots.

Solutions: Clean the writing head with alcohol wipes. Check/raise the humidity to a minimum of 30%. Replace the media with a fresh roll. Replace toner.

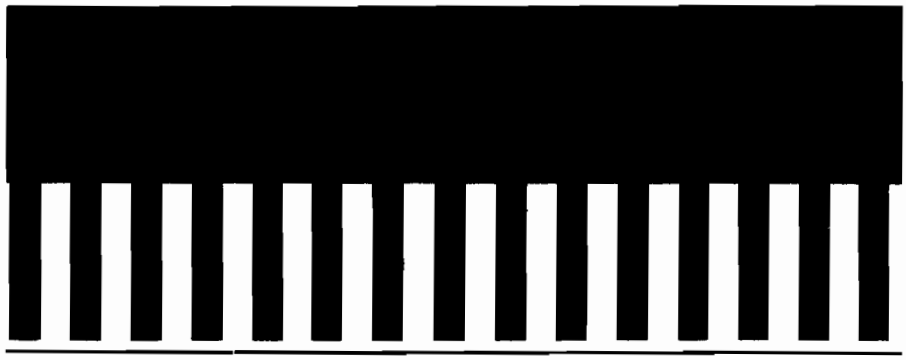
Figure 8-44. Sample, Flaring



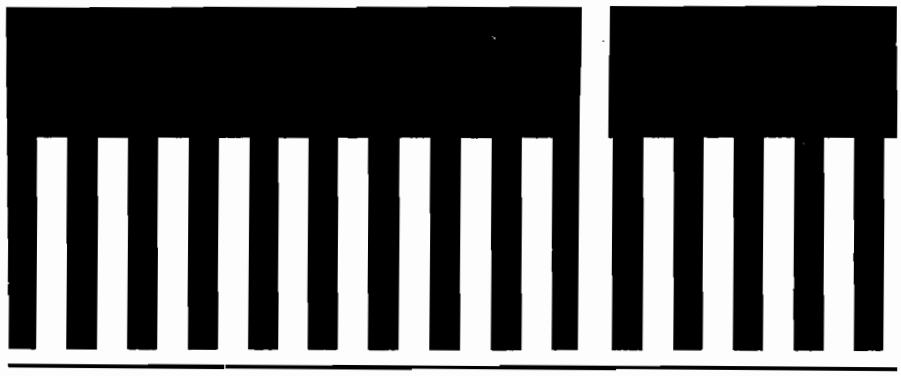
Definition: Slight vertical and/or right horizontal (toner flow direction) toner smearing off of area fills or text.

Solutions: Replace the toner and/or replace the media. (Use only HP approved supplied.)

Figure 8-45. Sample, Image Tailing



Normal Plot

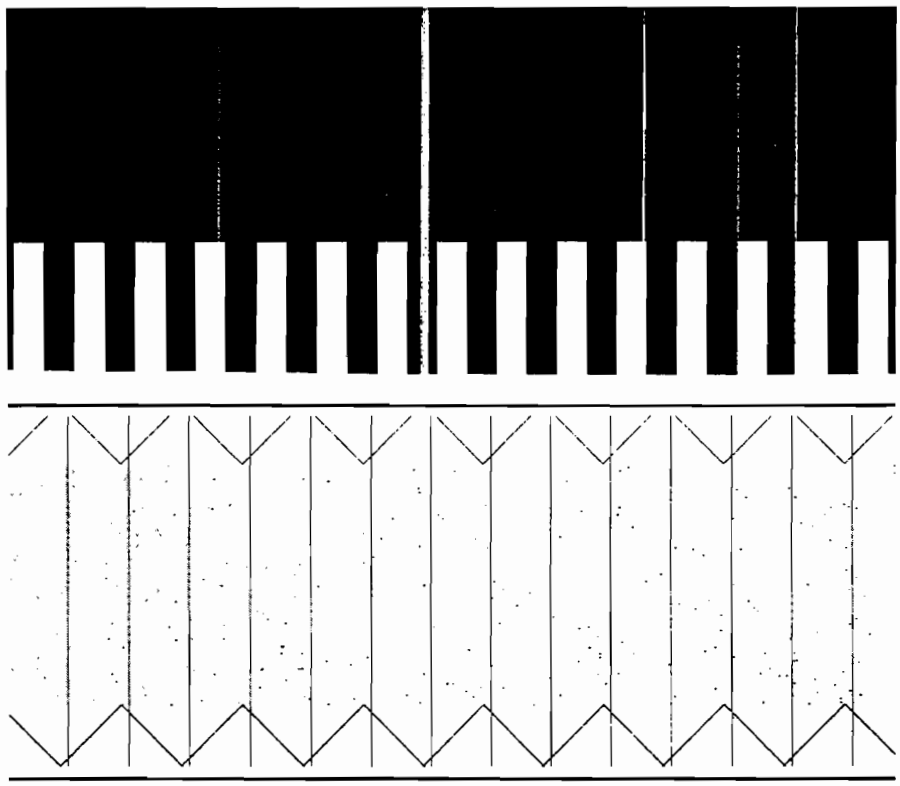


Control Electrode Failure

Definition: One of the plotter control electrodes is no longer energizing the media. This causes missing vertical bars (areas) in the plot.

Solutions: Since the plotter has two (2) identical CED PCA's, the PCA's may be switched. If the missing vertical bars in the plot change position after the switch, the problem is in a PCA. If not, the problem is either in the writing head or circuit paths to the writing head.

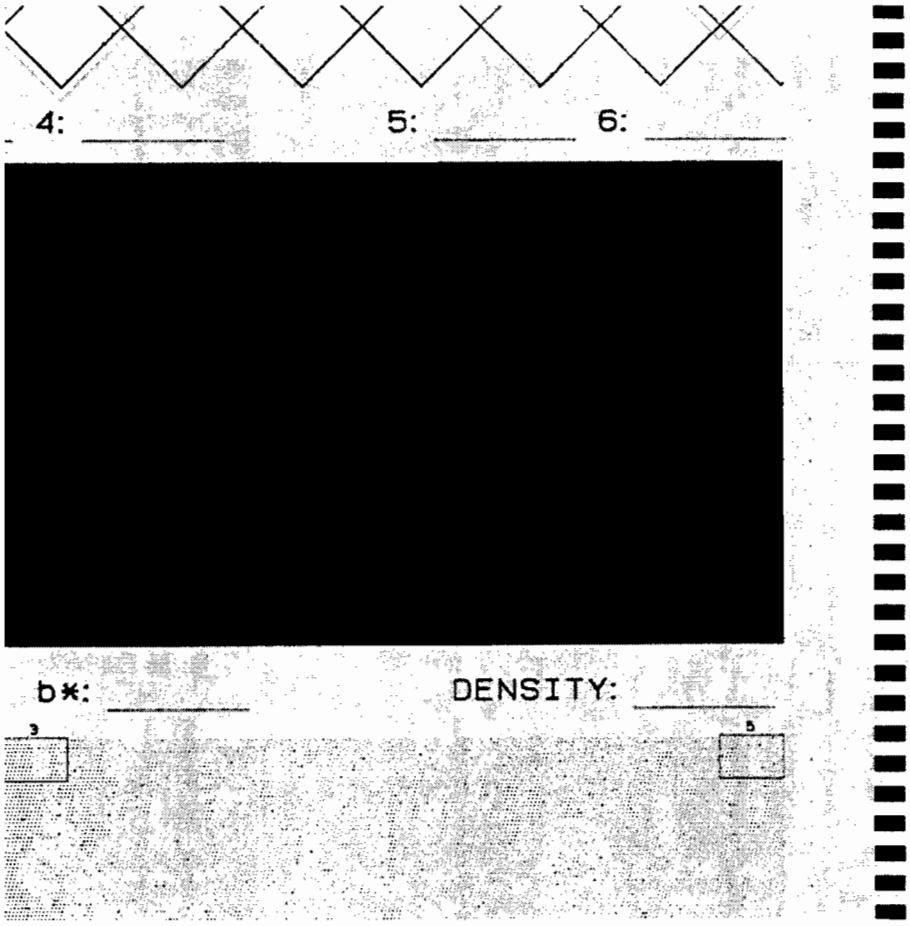
Figure 8-46. Sample, Control Electrode Failure



Definition: One of the plotter's pin electrodes is either no longer energizing the media (pin off), or one of the pin electrodes is always on (shorted out). If the PED is off, there will be thin, blank (white), vertical lines in the plot. If the pin is ON (shorted out), you will see thin, black, vertical lines through the plot.

Solutions: Since a dirty writing head can sometimes cause similar problems it is best to polish and clean the writing head first before replacing any parts. If cleaning and polishing does not solve the problem, replace the PED PCA. If the failure is still not corrected, the problem is either in the writing head or wiring harness(es).

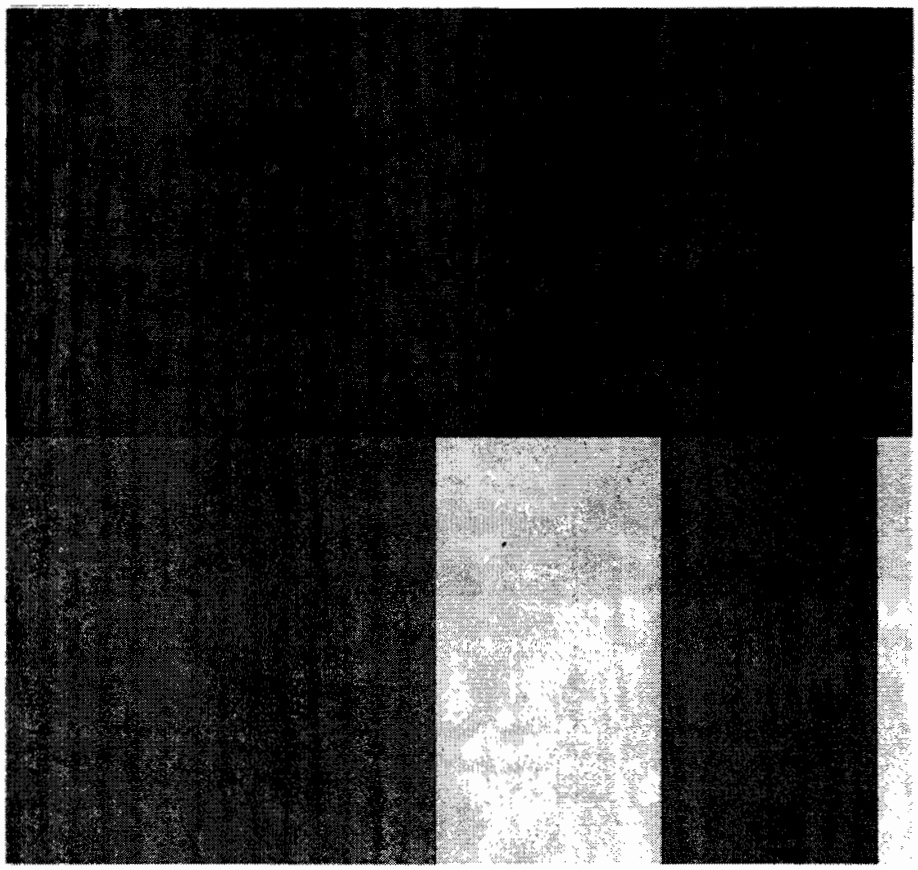
Figure 8-47. Sample, Pin Electrode Failure



Definition: Normally referred to as a "gray" white area (non-plotted). This problem is especially noticeable at the edge of the media where the white media meets the developer bar edge.

Solutions: Background is common on the 7600 series electrostatic plotters. As toner formulations vary slightly, so will the amount of background. If the background is unacceptable, replacement of the media and toner is recommended. Clean grooves and holes in the developer bar. Check for broken ground wire.

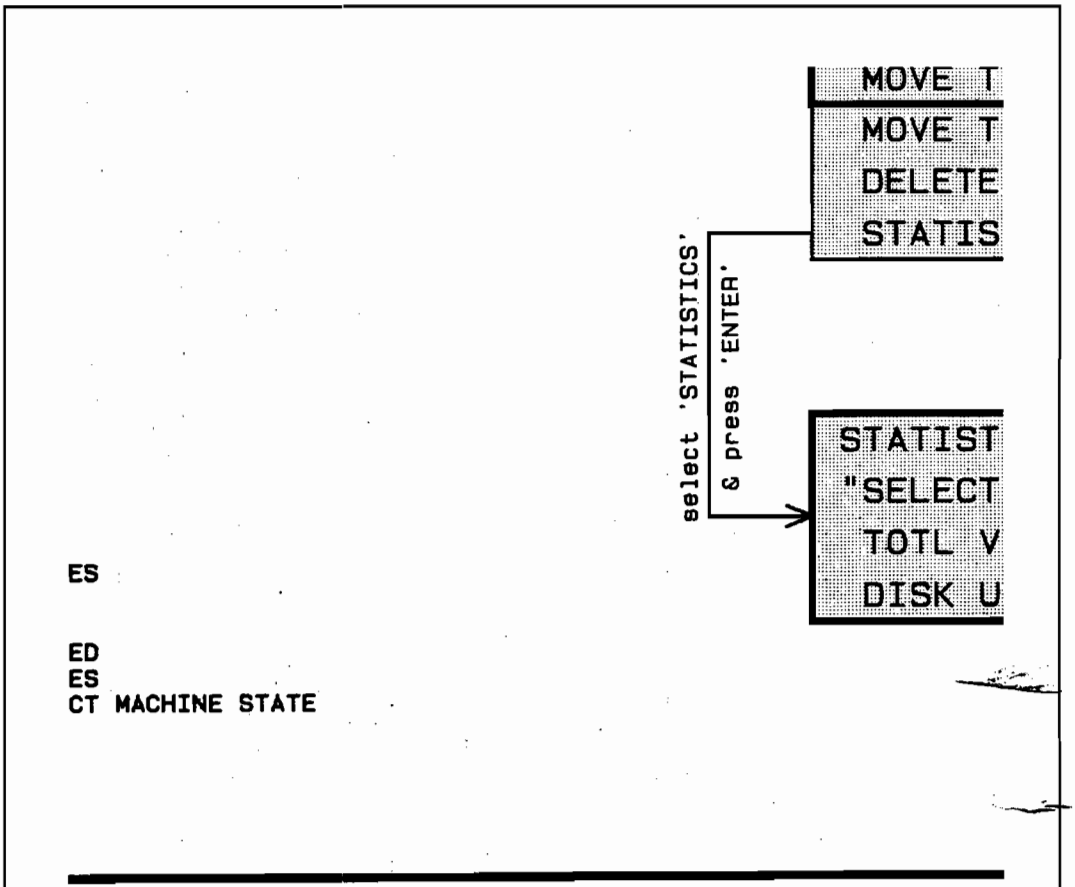
Figure 8-48. Sample, Excessive Background



Definition: Vertical patterning seen in solid area fill. Occurs primarily at low humidity levels and increases with dry media. May be worse at high plotting speeds. Not normally seen on shaded or half-tone area fills.

Solutions: Replace dry media, replace spent toner. Measure and/or correct humidity to a minimum of 30% RH.

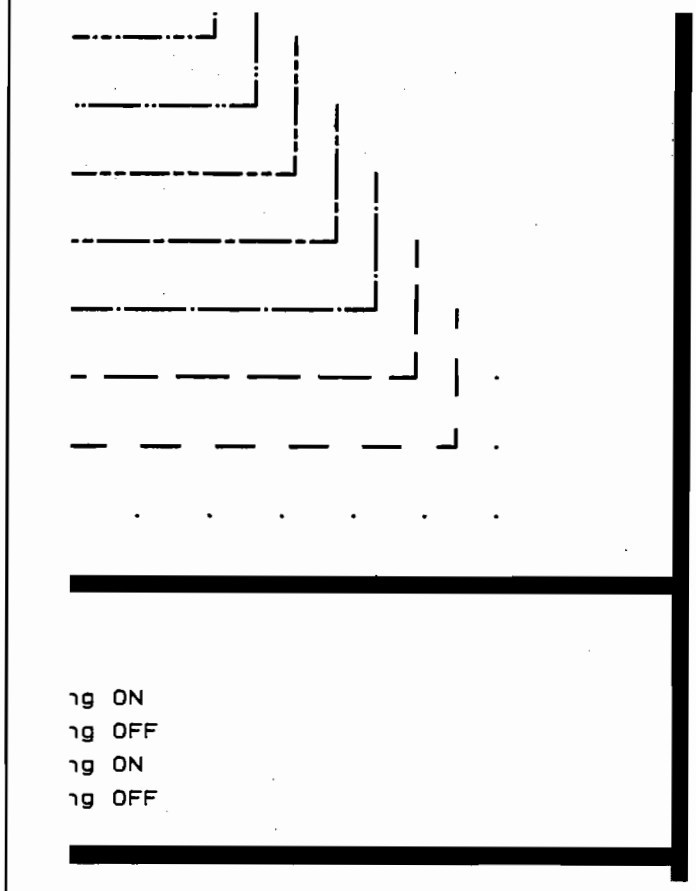
Figure 8-49. Sample, Banding



Definition: A very faint image of the developer bar is seen approximately 55 mm from a horizontally imaged black line. The image may or may not extend the full width of the media. It is caused by a discharge of electrostatic buildup on the back of the media that was not properly discharged by the static grounding brush.

Solutions: Since the grounding brush is stainless steel, it can be cleaned very easily by wiping the ends of the brush with alcohol wipes. This will remove the paper dust which causes the loss of conductivity to the media. This solution does not apply to film.

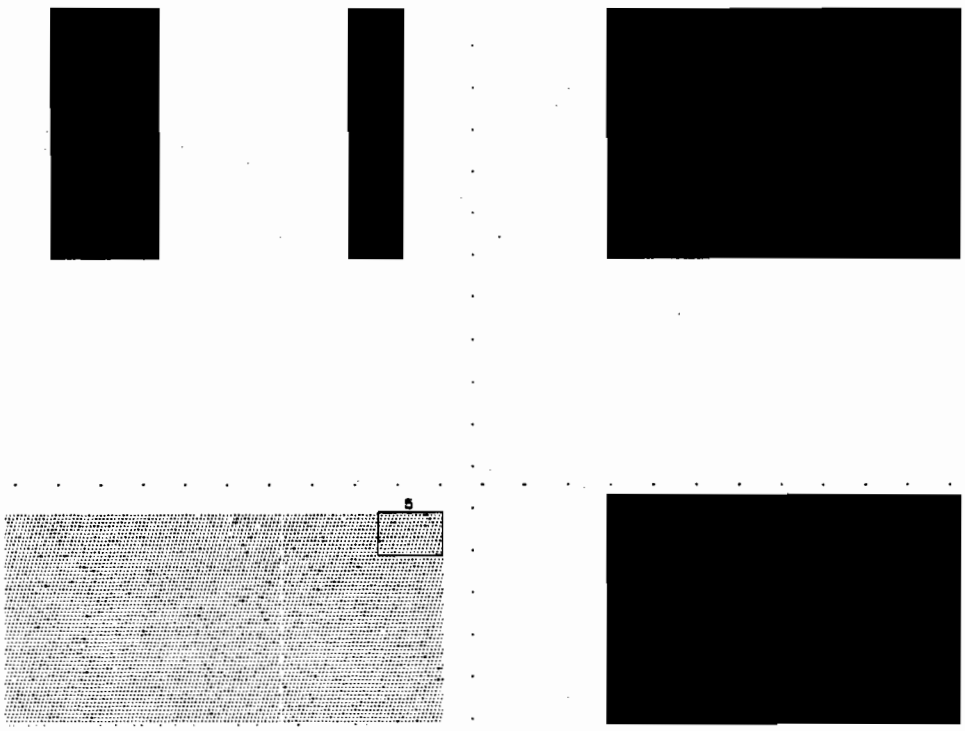
Figure 8-50. Sample, Ghosting



Definition: Abnormal or excessive toner stains on the media. This may occur inside or outside of the imaged area.

Solutions: Low humidity will cause the media to dry out and wrinkle. This may cause vacuum leakage and/or toner flooding. translucent media is the most susceptible to flooding. Measure/correct the humidity range to within 30 - 80% R.H. The toner solenoid being stuck open may also cause toner flooding (tapping the solenoid may free it.)
* Firmware revision 317 will allow the plotter to automatically advance the media after 5 minutes of idle time to eliminate leading edge wrinkle and fading. Refer to service note C1620A-17.

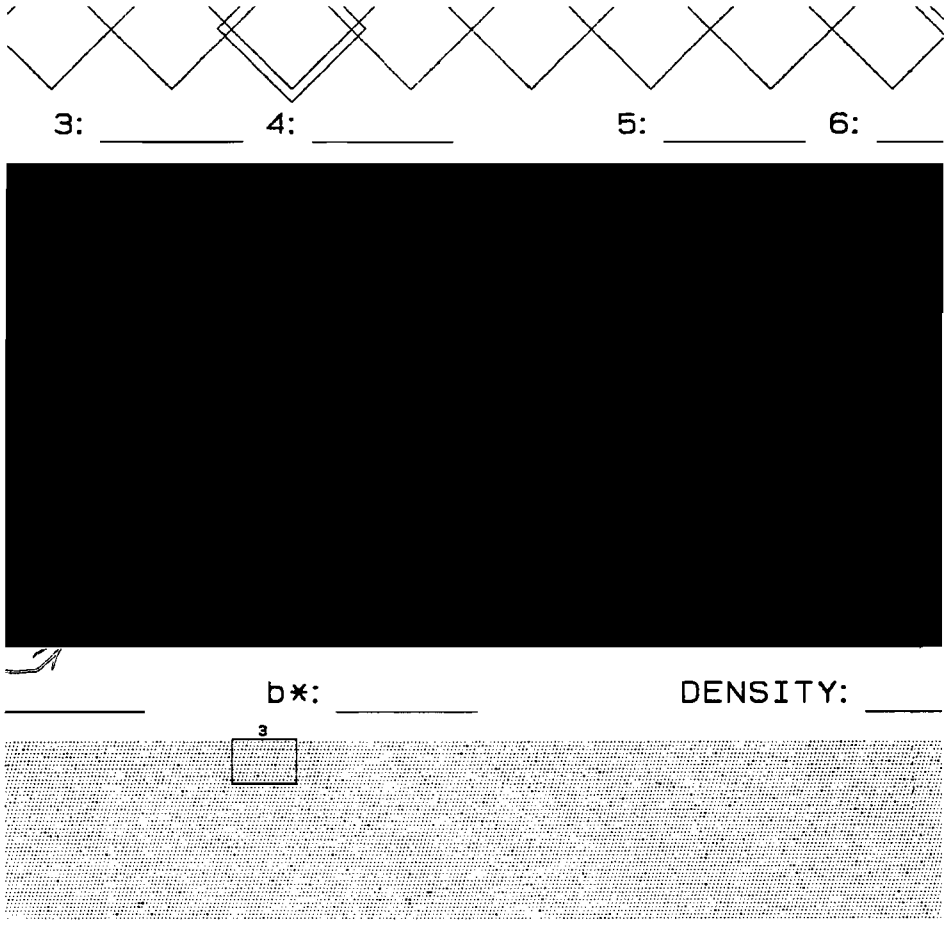
Figure 8-51. Sample, Toner Flooding



Definition: Usually seen as little or no background under area fills. This will make the normal background seem darker.

Solutions: Caused by defective or marginal media. Replace the roll of media with a roll having a different lot number.

Figure 8-52. Sample, Inverse Background



Definition: Usually seen as area fills which have light and/or dark bands (stripes). These diagonal or horizontal bands can extend through part or all of the area fill.

Solutions: Caused by improper toner flow and/or inadequate vacuum. Clean the developer bar and clear any blockage. A marginal or defective toner pump may also cause this failure. Flushing the vacuum system is also recommended.

Figure 8-53. Sample, Striation

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CHAPTER 9

PRODUCT HISTORY

9-1. INTRODUCTION

9-2. This chapter describes the differences between earlier models of HP Models 240D/E and 250/255 plotters and the latest version documented in this manual.

9-3. With the print engine and the vector-to-raster converter (VRC) having separate serial numbers, this chapter is divided into two sections; the first covering the print engine, and the second covering the VRC.

9-4. These earlier models of the engine and VRC are identified by their serial number prefix, and the date codes on their printed-circuit assemblies (PCAs). For ease of reference, each of the sections is divided into two major topics:

- History of Assemblies
- History of Printed Circuit Assemblies

9-5. Hewlett-Packard's printed-circuit assemblies have three major identification features:

a. PART NUMBER. PCAs having the same part number are directly interchangeable. If a PCA is revised in any way that makes it non-interchangeable with previously issued PCAs of the same part number, a new part number is assigned to the revised PCA.

b. REVISION LETTER. This letter identifies the most recent revision to the etched circuit pattern. The original issue is identified with the letter A. If the master artwork for a printed circuit board is revised in order to alter performance or manufacture, the revision letter is changed to the next letter in the alphabetical sequence.

c. ASSEMBLY DATE CODE. The date code on the PCA is a four-digit number which identifies the assembly level by date code. the PCA date code is changed when a component or component part number is changed, which alters the performance of the pca. The first two digits represent the last two digits of the current year and are derived by subtracting 60 from the current year. The last two digits represent the week in that year. For example: 2702 = second week in 1987. Any digits following a hyphen in the date code represent the division that manufactured the PCA.

9-6. PRINT ENGINE HISTORY

9-7. The following paragraphs describe the changes which have been made to the print engine.

9-8. HISTORY OF PRINT ENGINE ASSEMBLIES BY SERIAL NUMBER PREFIX

9-9. Table 9-1 and Table 9-2 are quick-reference tables that list, by plotter serial number prefix, the assemblies that differ from those documented in this manual. Also referenced are Item Numbers under which these differences are described in this section.

9-10. Table 9-3 and Table 9-4 list the assemblies, other than PCAs, that are described under each item in this section.

9-11. HISTORY OF PRINT ENGINE PRINTED-CIRCUIT ASSEMBLIES

9-12. Table 9-5 is a quick–reference table that lists PCAs by part number and date code. Listed next to the part number and date code of the PCAs are the Items located in this chapter that describe the differences between the PCA in question and the level of that PCA described in the main body of this manual.

Table 9-1. Print Engine Assembly Reference by Serial Number Prefix (Models 240D/E)

SERIAL NUMBER PREFIX	ASSEMBLIES	ITEMS
2820	Lower Frame Assembly 1 Power Panel Assembly	1 2

Table 9-2. Print Engine Assembly Reference by Serial Number Prefix (Models 250/255)

SERIAL NUMBER PREFIX	ASSEMBLIES	ITEMS
	NO CHANGE	

Table 9-3. Print Engine Item Description (Models 240D/E)

ITEM	ASSEMBLIES
1	Lower Frame Assembly 1
2	Power Panel Assembly

Table 9-4. Print Engine Item Description (Models 250/255)

ITEM	ASSEMBLIES
	NO CHANGES

Table 9-5. Print Engine PCA Reference by Date Code

PCA	DATE CODE	ITEMS
NO CHANGES		

ITEM 1

Except for the following, and any applicable higher numbered items, the Lower Frame Assembly 1 at prefix 2820 is the same as documented in the main body of this manual.

REF DES	DESCRIPTION	240D P/N	CD	QTY	240E P/N	CD
18	SCREW P4 X 20	DXZPR20SMW	3	4	DXZP420SMW	3
33	BLOCK-DEVELOPER	K4311227	4	2	K4311227	4

ITEM 2

Except for the following, and any applicable higher numbered items, the Power Panel Assembly at prefix 2820 is the same as documented in the main body of this manual.

REF DES	DESCRIPTION	240D P/N	CD	QTY	240E P/N	CD
8	PANEL, OUTLET	K4311417	7	1	K4311417	7
9	TERMINAL	T-6500-16-BK	1	3	T-6500-16-BK	1
10	WASHER SPRING	DXZWA5B	6	6	DXZWA5B	6
15	PANEL, POWER	K2310473	0	1	K2310473	0

9-13. VRC HISTORY

9-14. The following paragraphs describe the changes which have been made to the VRC.

9-15. HISTORY OF C1600V VRC ASSEMBLIES FOR MODELS 240D/E BY SERIAL NUMBER PREFIX

9-16. Table 9-6 is a quick-reference table that lists, by plotter number serial prefix, the assemblies that differ from those documented in this manual. Also referenced are Item Numbers under which these differences are described in this section.

Table 9-6. VRC Assembly Reference by Serial Number Prefix (Models 240D/E)

SERIAL NUMBER PREFIX	ASSEMBLIES	ITEMS
2814A	PCA-PROCESSOR	4
2901A	PCA-PROCESSOR	3
2916A	PCA-PROCESSOR	2
2932A	PCA-PROCESSOR	1

9-17. Table 9-7 lists the assemblies, other than PCAs, that are described under each item in this section.

Table 9-7. VRC Item Description (Models 240D/E)

ITEM	ASSEMBLIES
	NO CHANGES

9-18. HISTORY OF C1600V VRC PRINTED-CIRCUIT ASSEMBLIES FOR MODELS 240D/E

9-19. Table 9-8 is a quick-reference table that lists PCAs by description and date code. Listed next to the description and date code of the PCAs are the items located in this section that describe the differences between the PCA in question and the level of that PCA described in the main body of this manual.

Table 9-8. VRC PCA Reference by Date Code (Models 240D/E)

PCA	DATE CODE	ITEMS
PROCESSOR	2814-11	4
PROCESSOR	2901-11	3
PROCESSOR	2916-11	2
PROCESSOR	2932-11	1

ITEM 1

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1600-68112	6	1	PROCESSOR PCA (NEW)
	C1600-69112	8	1	PROCESSOR PCA (EXCHANGE)
U1	C1600-18013	1	1	VRC EPROM (REV 18)
U2	C1600-18023	3	1	VRC EPROM (REV 18)
U3	C1600-18033	5	1	VRC EPROM (REV 18)
U4	C1600-18043	7	1	VRC EPROM (REV 18)

ITEM 2

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1600-68106	8	1	PROCESSOR PCA (NEW)
	C1600-69106	0	1	PROCESSOR PCA (EXCHANGE)
U1	C1600-18012	0	1	VRC EPROM (REV 17)
U2	C1600-18022	2	1	VRC EPROM (REV 17)
U3	C1600-18032	4	1	VRC EPROM (REV 17)
U4	C1600-18042	6	1	VRC EPROM (REV 17)

NOTE

Revision 16 was never released

ITEM 3

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1600-68102	4	1	PROCESSOR PCA (NEW)
	C1600-69102	6	1	PROCESSOR PCA (EXCHANGE)
U1	C1600-18011	9	1	VRC EPROM (REV 15)
U2	C1600-18021	1	1	VRC EPROM (REV 15)
U3	C1600-18031	3	1	VRC EPROM (REV 15)
U4	C1600-18041	5	1	VRC EPROM (REV 15)

ITEM 4

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1600-68101	3	1	PROCESSOR PCA (NEW)
	C1600-69101	5	1	PROCESSOR PCA (EXCHANGE)
U1	C1600-18010	8	1	VRC EPROM (REV 14)
U2	C1600-18020	0	1	VRC EPROM (REV 14)
U3	C1600-18030	2	1	VRC EPROM (REV 14)
U4	C1600-18040	4	1	VRC EPROM (REV 14)

9-20. HISTORY OF C1623A VRC ASSEMBLIES FOR MODELS 250/255 BY SERIAL NUMBER PREFIX

9-21. Table 9-9 is a quick-reference table that lists, by plotter number serial prefix, the assemblies that differ from those documented in this manual. Also referenced are Item Numbers under which these differences are described in this section.

Table 9-9. VRC Assembly Reference by Serial Number Prefix (Models 250/255)

SERIAL NUMBER PREFIX	ASSEMBLIES	ITEMS
2940A	PCA-PROCESSOR	4
3007A	PCA-PROCESSOR	4
3017A	PCA-PROCESSOR	3
3030A	PCA-PROCESSOR	2
3051A	PCA-PROCESSOR	1

9-22. Table 9-10 lists the assemblies, other than PCAs, that are described under each item in this section.

Table 9-10. VRC Item Description (Models 250/255)

ITEM	ASSEMBLIES
	NO CHANGES

9-23. HISTORY OF C1623A VRC PRINTED-CIRCUIT ASSEMBLIES FOR MODELS 250/255

9-24. Table 9-11 is a quick-reference table that lists PCAs by description and date code. Listed next to the description and date code of the PCAs are the items located in this section that describe the differences between the PCA in question and the level of that PCA described in the main body of this manual.

Table 9-11. VRC PCA Reference by Date Code

PCA	DATE CODE	ITEMS
PROCESSOR	2940–11	4
PROCESSOR	3007–11	4
PROCESSOR	3017–11	3
PROCESSOR	3030–11	2
PROCESSOR	3051–11*	1

* The differences described in ITEM 1 refer to VRC code revision 315 which was done before obsolescence. After obsolescence, the date code remained 3051–11, but code revision 317 was implemented. Part numbers for code revision 317 are documented in the main body of this manual and are backward compatible with all prior processor and EPROM versions.

ITEM 1

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1623-68106	5	1	PROCESSOR PCA
	C1623-69106	7	1	PROCESSOR PCA (EXCHANGE)
U9	C1623-18011	6	1	VRC EPROM (REV 315)
U10	C1623-18012	7	1	VRC EPROM (REV 315)
U11	C1623-18013	8	1	VRC EPROM (REV 315)
U13	C1623-18014	9	1	VRC EPROM (REV 315)

ITEM 2

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1623-68105	5	1	PROCESSOR PCA
	C1623-69105	6	1	PROCESSOR PCA (EXCHANGE)
U9	C1623-18007	0	1	VRC EPROM (REV 215)
U10	C1623-18008	1	1	VRC EPROM (REV 215)
U11	C1623-18009	2	1	VRC EPROM (REV 215)
U13	C1623-18010	5	1	VRC EPROM (REV 215)

ITEM 3

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1623-68104	3	1	PROCESSOR PCA
	C1623-69104	5	1	PROCESSOR PCA (EXCHANGE)
U9	C1623-18007	0	1	VRC EPROM (REV 215)
U10	C1623-18008	1	1	VRC EPROM (REV 215)
U11	C1623-18009	2	1	VRC EPROM (REV 215)
U13	C1623-18010	5	1	VRC EPROM (REV 215)

ITEM 4

REF DES	PART NUMBER	CD	QTY	DESCRIPTION
23	C1623-68102	1	1	PROCESSOR PCA
	C1623-69102	3	1	PROCESSOR PCA (EXCHANGE)
U9	C1623-18003	6	1	VRC EPROM (REV 207)
U10	C1623-18004	7	1	VRC EPROM (REV 207)
U11	C1623-18005	8	1	VRC EPROM (REV 207)
U13	C1623-18006	9	1	VRC EPROM (REV 207)

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CHAPTER 10

PARTS AND DIAGRAMS

10-1. EXCHANGE ASSEMBLIES

10-2. Exchange assemblies for the HP 7600 Models 240D/E are listed in Table 10-10.

10-3. Exchange assemblies for the HP 7600 Models 250/255 are listed in Table 10-27.

10-4. REPLACEABLE PARTS

10-5. Replaceable parts in the HP Models 240D/E are listed in Table 10-1 through Table 10-9 and illustrated in Figure 10-1 through Figure 10-9. Replaceable parts in the HP 7600 Models 250/255 are listed in Table 10-11 through Table 10-24 and illustrated in Figure 10-10 through Figure 10-23..

10-6. ILLUSTRATED PARTS BREAKDOWNS

10-7. Illustrated Parts Breakdowns (IPBs) are included immediately after each table of replaceable parts. IPBs include Figure 10-1 through Figure 10-23.

10-8. DIAGRAMS

10-9. Functional block, electrical, cabling, and connector pin diagrams are shown in chapter 11.

10-10. PRODUCT SERVICE RECORD SHEET

10-11. A product service record sheet for the use of the Customer Engineer is included as the last page of this chapter.

Table 10-1. Parts List, Frame Assembly 1

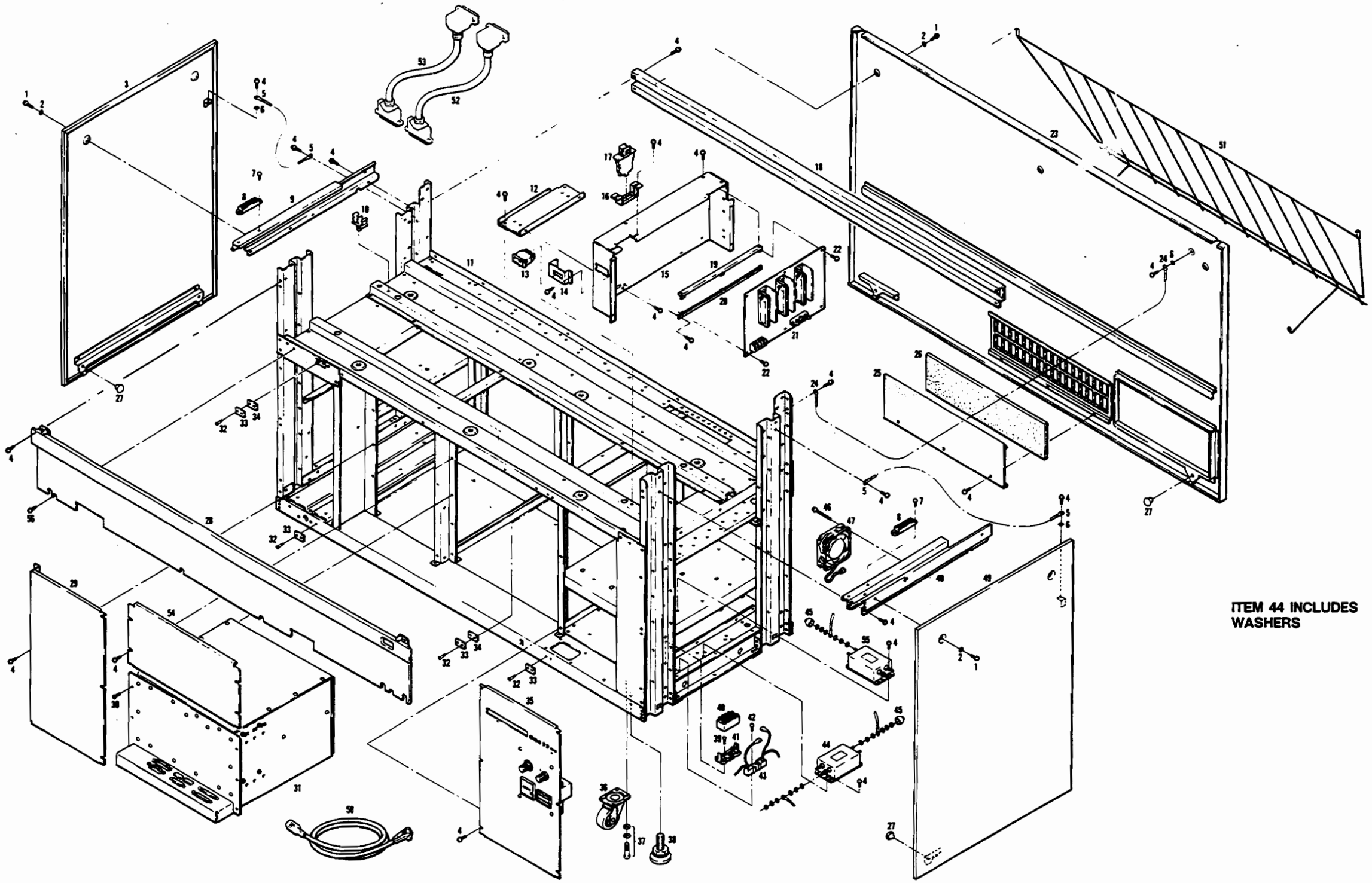
REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X8SMWBNI			DXZP4X8SMWBNI	2	7	SCREW, P4 X 8 SMW BNI
2	TM-147-2	7	7	TM-147-2	7	7	WASHER-PLASTIC
3	K1310300B–H	3	1	K1310300B–H	3	1	COVER-LEFT SIDE
4	DXZP4X8SMW	7	55	DXZP4X8SMW	7	55	SCREW, P4 X 8 SMW
5	PH3–8–38	9	2	PH3–8–38	9	2	FG STRAP 8
6	DXZWC4B	6	3	DXZWC4B	6	3	WASHER-STAR, M4
7	DXZP3X10SMW	1		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–L1	0	1	K1310264–L1	8	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–L1	3	1	K2310416–L1	3	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 10-1. 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	PH3–8–39	1	1	PH3–8–39	1	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 10-8)
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
40	K3M10268	6	1	K3M10268	6	1	RELAY

Table 10-1. 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 (R1)
44	MAS–1215–22	8	1	MBS–1215–22	0	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–L1	5	1	K3310685A–L1	5	1	SUPPORT BAR-RIGHT SIDE (A)
49	K1310300A–H	2	1	K1310300A–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
55	MAS–1215–33	1	1	MAS–1215–33	1	1	FILTER-NOISE
56	DXZB4X8CR	6	4	DXZB4X8CR	6	4	SCREW, B4X8
							NOTES ITEMS 19, 20, AND 22 ARE PART OF THE MCD PCA ASSEMBLY (ITEM 21). ITEM 37 INCLUDES PART NUMBERS DXZCS6X10 (SCREW), DXZWA6B (SPRING WASHER)(, AND DXZWG6 (FLAT WASHER).



ITEM 44 INCLUDES WASHERS

Figure 10-1. Frame Assembly 1
Illustrated Parts Breakdown

Table 10-2. Parts List, Frame Assembly 2

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
1	K1310305-H-L1	0	1	K1310305-H-L1	0	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-L1	0	1	K1310264-L1	8	1	MAIN FRAME
9	K3310854	0	1	K3310854	0	1	VENT-AIR
10	UH30-06-360	4	1	UH30-06-360	4	1	TUBE 2 (360 MM)
11	UH30-08-565	3	1	UH30-08-565	3	1	TUBE 4 (565 MM)
12							
13							
14							
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 10-2. 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	K3310687	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							
25	K4311100	6	1	K4311100	6	1	COVER-REAR, CABLE HOLE
26	K3M10250–2	7	1	K3M10250–2	7	1	LOW VOLTAGE POWER SUPPLY UNIT J (+5V)
27	K3M10251	1	1	K3M10251	1	1	LOW VOLTAGE POWER SUPPLY UNIT K (+24V)
28	PH3–8–38	9	2	PH3–8–38	9	2	FG STRAP 8
29	K2310475-H	0	1	K2310474-H	6	1	COVER-CENTER
30	K1310299-H	2	1	K1310299-H	2	1	DOOR-TEST PANEL
31							
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 10-7)
35	K3310661	1	1	K3310661	1	1	LABEL, TONER BOTTLE, CAUTION

Table 10-2. Parts List, Frame Assembly 2 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
36	DXZWC4B	6	2	DXZWC4B	6	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, 17, 19, AND 20 ARE PART OF THE RMC PCA (ITEM 18).

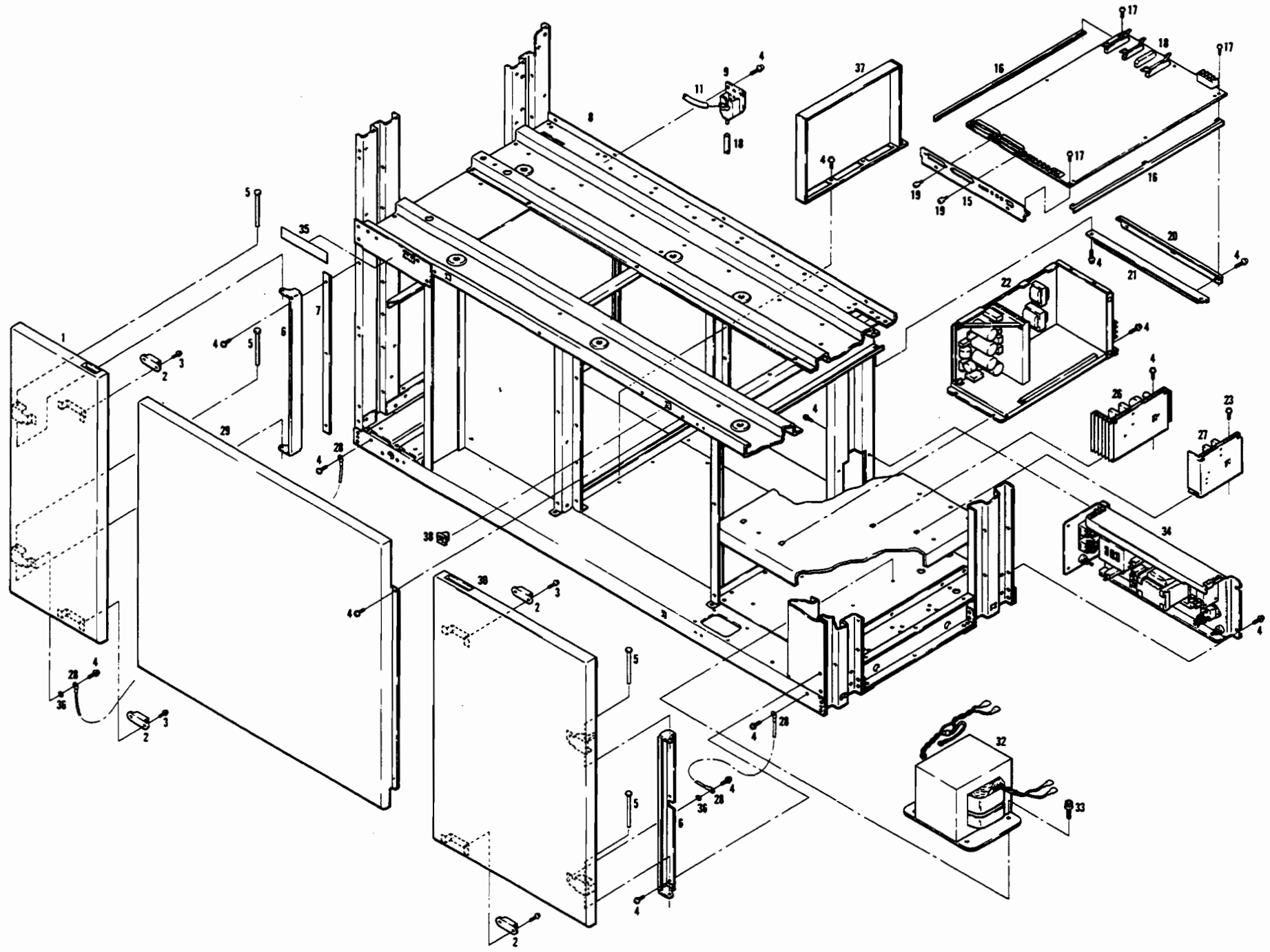


Figure 10-2. Frame Assembly 2
Illustrated Parts Breakdown

Table 10-3. 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 (ONLY)
2	DX2FN4	9	8	DX2FN4	9	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				K3310787A	6	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	PLATE-MOUNTING, SPRING
12	DXZP5X14SW	1	10	DXZP5X14SW	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	K3310856	4	1	K3310856	4	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 10-3. Parts List, Frame Assembly 3 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
21	UH30-08–565	3	1	UH30-08–565	3	1	TUBE 4 (565 MM)
22	UH30-08–630	3	2	UH30-08–630	3	2	TUBE 5 (630 MM)
23	UH30-08–1200	8	1	UH30-08–1200	8	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	UH30-08–650	7	1	UH30-08–650	7	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	K3310653	4	1	PLATE-MOUNTING, PUMP
36							
37	PH3–8–41	6	1	PH3–8–41	6	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

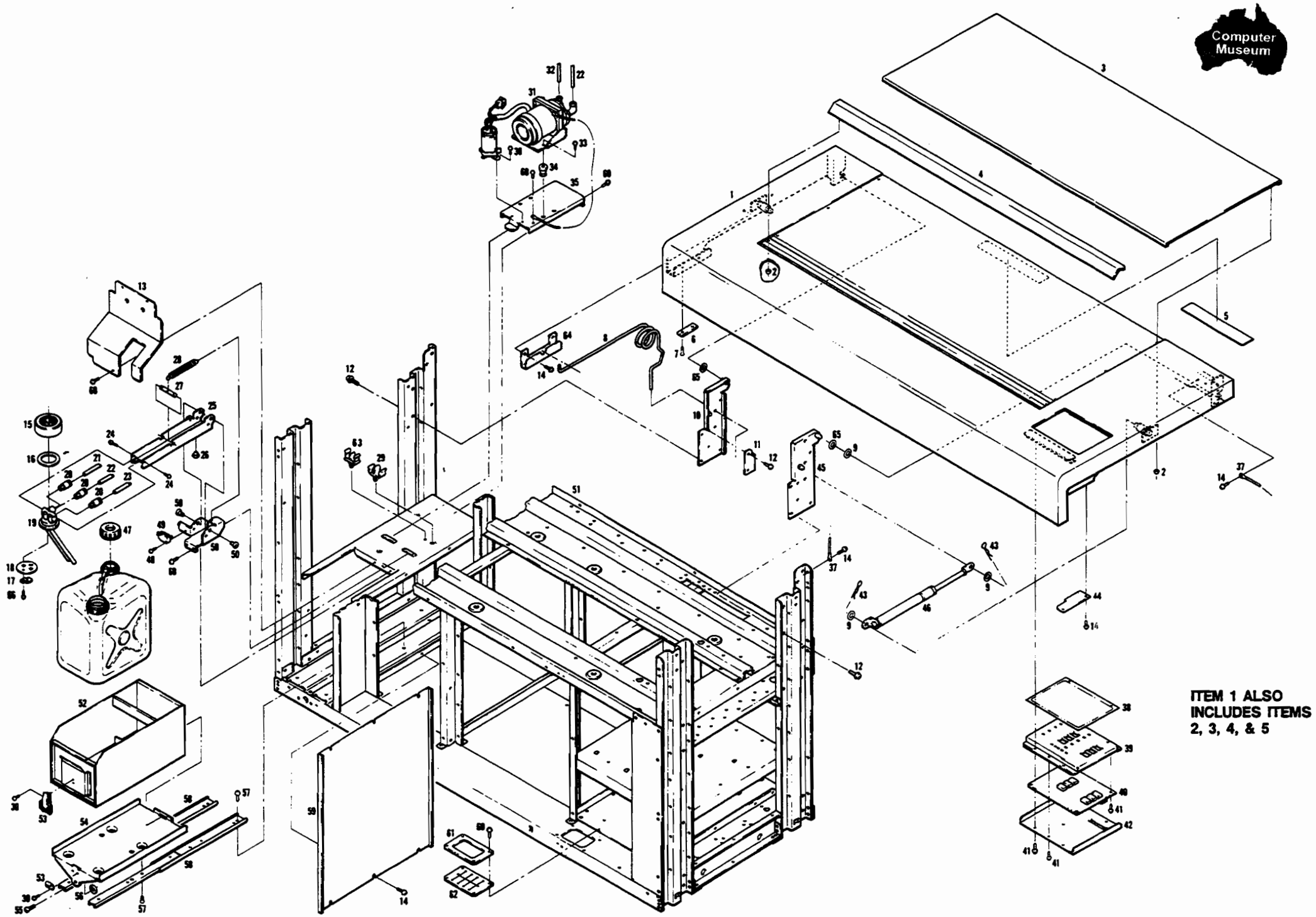
Table 10-3. Parts List, Frame Assembly 3 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	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	0	1	K3M10289	0	1	DAMPER
47							
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–L1	0	1	K1310264–L1	0	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 10-3. Parts List, Frame Assembly 3 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
61	K4311190	5	1	K4311190	5	1	BRACKET-RUBBER PLATE
62	K310251	4	1	K4310251	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
66	DXZB3X8TTB	9	1	DXZB3X8TTB	9	1	SCREW, B3X8TTB
							NOTE ITEMS 38, 39, 40, 41, AND 42 MAY BE ORDERED USING HP PART NUMBER K3M10283.

THE PARTS LIST FOR FRAME ASSEMBLY 3 IS ON THE PREVIOUS FOUR PAGES OF THIS MANUAL.



ITEM 1 ALSO INCLUDES ITEMS 2, 3, 4, & 5

Figure 10-3. Frame Assembly 3
Illustrated Parts Breakdown

Table 10-4. 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	2	DXZP5X14SW	1	2	SCREW, P5 X 14 SW
7	K3M10304	4	2	K3M10305	6	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–L1	0	1	K2210198B–L1	0	1	PLATE, LEFT-SIDE
12	K3310855	2	2	K3310855	2	2	SHAFT-COUPLING
13	K4311265	4	2	K4311265	4	2	SHAFT-CONNECTOR
14							
15	K4311373	3	2	K4311261	6	2	SPRING-PAD
16	K4210144B	6	2	K4210144B	6	2	ARM-ROLLER (B)
17	K4311214A	6	4	K4311214A	6	4	SCREW-SUPPORT (A)
18	K4311492	5	2	K4311492	5	2	BEARING – ROLLER
19	K3M10298	9	2	K3M10298	9	2	SWITCH-SENSOR
20	DXZP2X10SMW	0	4	DXZP2X10SMW	0	4	SCREW, P2 X 10 SMW

Table 10-4. Parts List, Upper Frame Assembly (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E 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	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–L1	8	1	K3310730–L1	1	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							
38	DXZWC4B	6	2	DXZWC4B	6	2	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 10-4. 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	PH3–8–75	7	1	PH3–8–75	7	1	HARNESS, NO-PAPER SWITCH
46	DXZ4035	8	48	DXZ4035	8	49	CLIP-WIRE
47	K2210198A–L1	9	1	K2210198A–L1	9	1	PLATE-RIGHT SIDE, UPPER FRAME
48	PH3–8–37	7	1	PH3–8–37	7	1	FG STRAP 7
49	K4311255	3	2	K4311255	3	2	STOPPER
50	DXZP5X25SMW	4	2	DXZP5X25SMW	4	2	SCREW, P5 X 25 SMW
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	FLW688ZZ	5	4	FLW688ZZ	5	4	BEARING-BALL

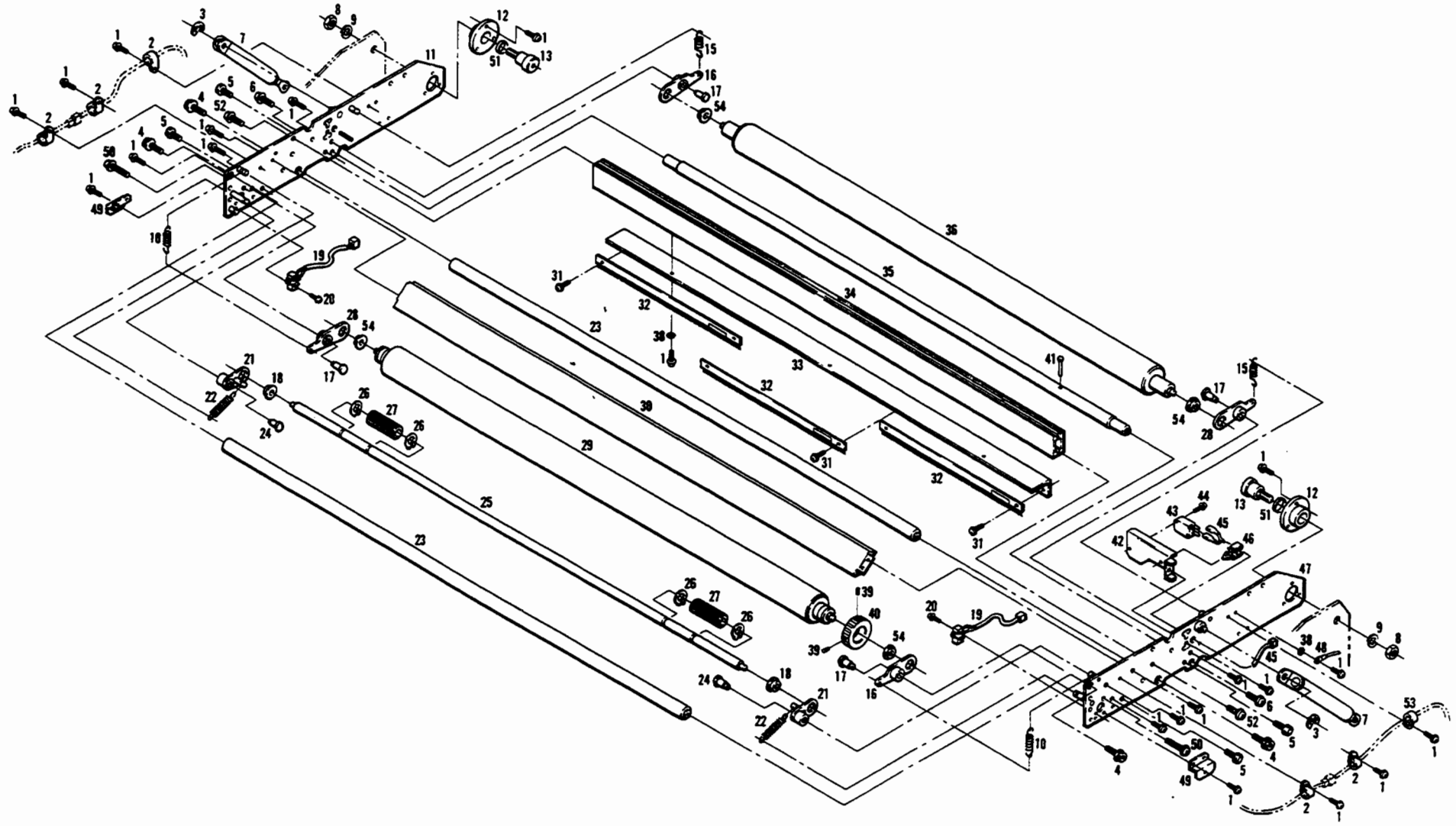


Figure 10-4. Upper Frame Assembly
Illustrated Parts Breakdown

Table 10-5. 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	UH30-08–45	9	1	UH30-08–45	9	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	PH3–8–76	9	1	PH3–8–76	9	1	VACUUM INTERLOCK (VSW) HARNESS
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	DXZB5X14TTB	4	4	DXZB5X14TTB	4	4	SCREW, B5 X 14 TTB
16	K4311222	4	2	K4311222	4	2	CASE-BEARING
17	K2210193B–L1	0	1	K2210193B–L1	0	1	PLATE-LEFT SIDE
18	DXZP4X20SMW	3	2	DXZP4X20SMW	3	2	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 10-5. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	QTY	DESCRIPTION
21	DXZISTW-12	8	3	DXZISTW-12	8	3	RING, ISTW-12 (SEE NOTES)
22	SEE NOTES	7	1	SEE NOTES	7	1	WHEEL-MEDIA ALIGNMENT
23	DXZCS4X14	8	3	DXZCS4X14	8	3	SCREW, CS 4 X 14 (SEE NOTES)
24	DXZWA4B	4	3	DXZWA4B	4	3	WASHER-SPRING, S4 (SEE NOTES)
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	K3M10326	0	1	K3M10327	2	1	HEAD-WRITING
	C1600-69307	3	1	C1600-69308	4	1	HEAD-WRITING (EXCHANGE)
30	UH30-06–105	5	1	UH30-06–105	5	1	TUBE 1 (105 MM)
31							
32	K4311416	5	2	K4311416	5	2	PLATE-ISOLATION, DEVELOPER
33	K3310857	6	2	K3310857	6	2	BLOCK-DEVELOPER
34	K2310578	2	1	K2310579	4	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	3	DXZFSCS4X8	3	3	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 10-5. 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	DXZP4X35SW	4	4	SCREW, P4 X 35 SW
42	K3M10252	3	2	K3M10252	3	2	FAN 3, 4
43	K4210141B	0	1	K4210141B	9	1	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	UH30-08–390	2	1	UH30-08–595	9	1	TUBE 8 (MODEL 240D: 390 MM), (MODEL 240E: 595 MM) (SEE NOTES)
53	DXZPB8-01	9	1	DXZPB8-01	9	1	TUBE JOINT 4 (SEE NOTES)
54	UH30-08–290	1	1	UH30-08–395	7	1	TUBE 9 (MODEL 240D: 290 MM), (MODEL 240E: 395 MM)
55	DXZPL8-02	2	1	DXZPL8-02	2	1	TUBE JOINT 3 (SEE NOTES)
56	PH3–8–34	1	1	PH3–8–34	1	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 10-5. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	240D PART NUMBER	C D	QTY	240E PART NUMBER	C D	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–L1	9	1	K2210193A–L1	9	1	PLATE-RIGHT SIDE
75	DXZFSCS5X12	8	4	DXZFSCS5X12	8	4	SCREW, FSCS 5 X 12
76	K4311240	2	1	K4311240	2	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	PH3–8–39	1	1	PH3–8–39	1	1	FG STRAP 7

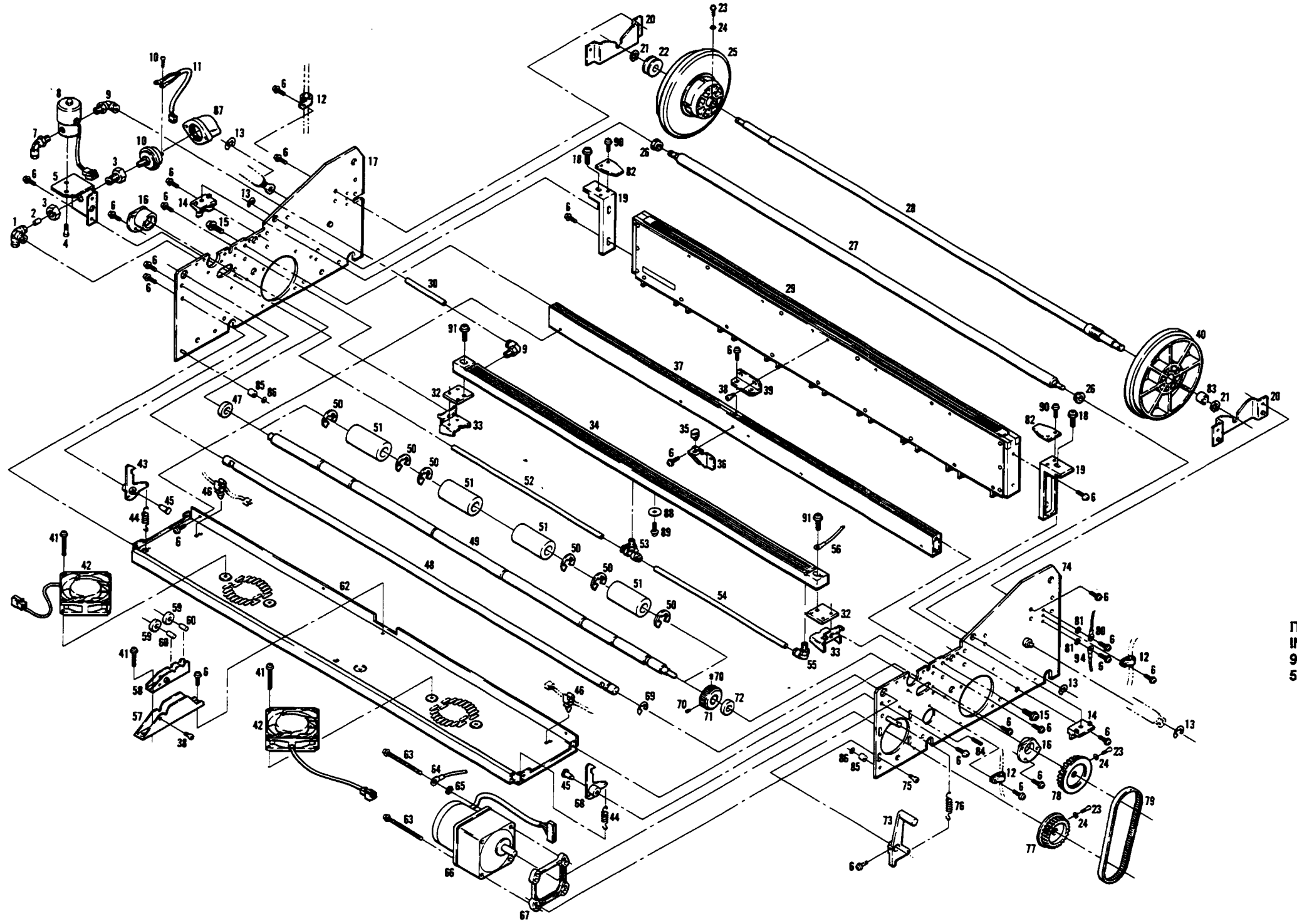
Table 10-5. Parts List, Lower Frame Assembly 1 (Continued)

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 (SEE NOTES)
89				DXZF4X10	4	1	SCREW F4X10 (SEE NOTES)
90	DXZB4X8CR	6	4	DXZB4X8CR	6	4	SCREW-B4X8CR
91	DXZP4X30SMW	4	2	DXZP4X30SMW	4	2	SCREW-P4X30SMW (SEE NOTES)
92	DXZSN-6A	0	2	DXZSN-6A	0	2	CLAMP-NYLON
93	PH3–8–38	9	1	PH3–8–38	9	1	FG STRAP 8
							NOTES
	K3M10263	6	1	K3M10264	8	1	ITEMS 21,22,23,24, 25, 28, 40, AND 83 ARE PART OF THE SPOOL ASSEMBLY AND CAN BE ORDERED USING THE PART NUMBERS LISTED TO THE LEFT.

Table 10-5. 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).
	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	DEVELOPER BAR ASSEMBLY (ITEMS 9, 32, 33, 34, 53, 54, 55, 88,89, AND 91 ARE PART OF THE DEVELOPER BAR ASSEMBLY.)

THE PARTS LIST FOR LOWER FRAME ASSEMBLY 1 IS ON THE PREVIOUS SIX PAGES OF THIS MANUAL.



ITEM 34 ALSO INCLUDES ITEMS 9, 18, 32, 33, 34, 52, 53, 54 & 55.

Figure 10-5. Lower Frame Assembly 1
Illustrated Parts Breakdown

Table 10-6. 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	K3M10300	6	1	K3M10300	6	1	SWITCH-SENSOR, NEAR END OF PAPER
14	DXZP3X6SW	0	4	DXZP3X6SW	0	4	SCREW, P3 X 6 SW
15	K2210193B–L1	6	1	K2210193B–L1	6	1	PLATE-LEFT SIDE
16	K4210142	2	1	K4210142	2	1	LIMITER ASSEMBLY
17							
18							
19	DXZP4X10SMW	2	15	DXZP4X10SMW	2	15	SCREW, P4 X 10 SMW
20	K4311232	5	1	K4311232	5	1	ACTUATOR-MEDIA

Table 10-6. 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	K2310394–0	6	1	K2310392–0	2	1	BOX-MEDIA
29	K2310451–L1	7	1	K2310450–L1	5	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–L1	9	1	K2210193A–L1	9	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)
40	DXZP3X6SMW	4	1	DXZP3X6SMW	4	1	SCREW, P3 X 6 SMW

THE PARTS LIST FOR LOWER FRAME ASSEMBLY 2 IS ON THE TWO PREVIOUS PAGES OF THIS MANUAL.

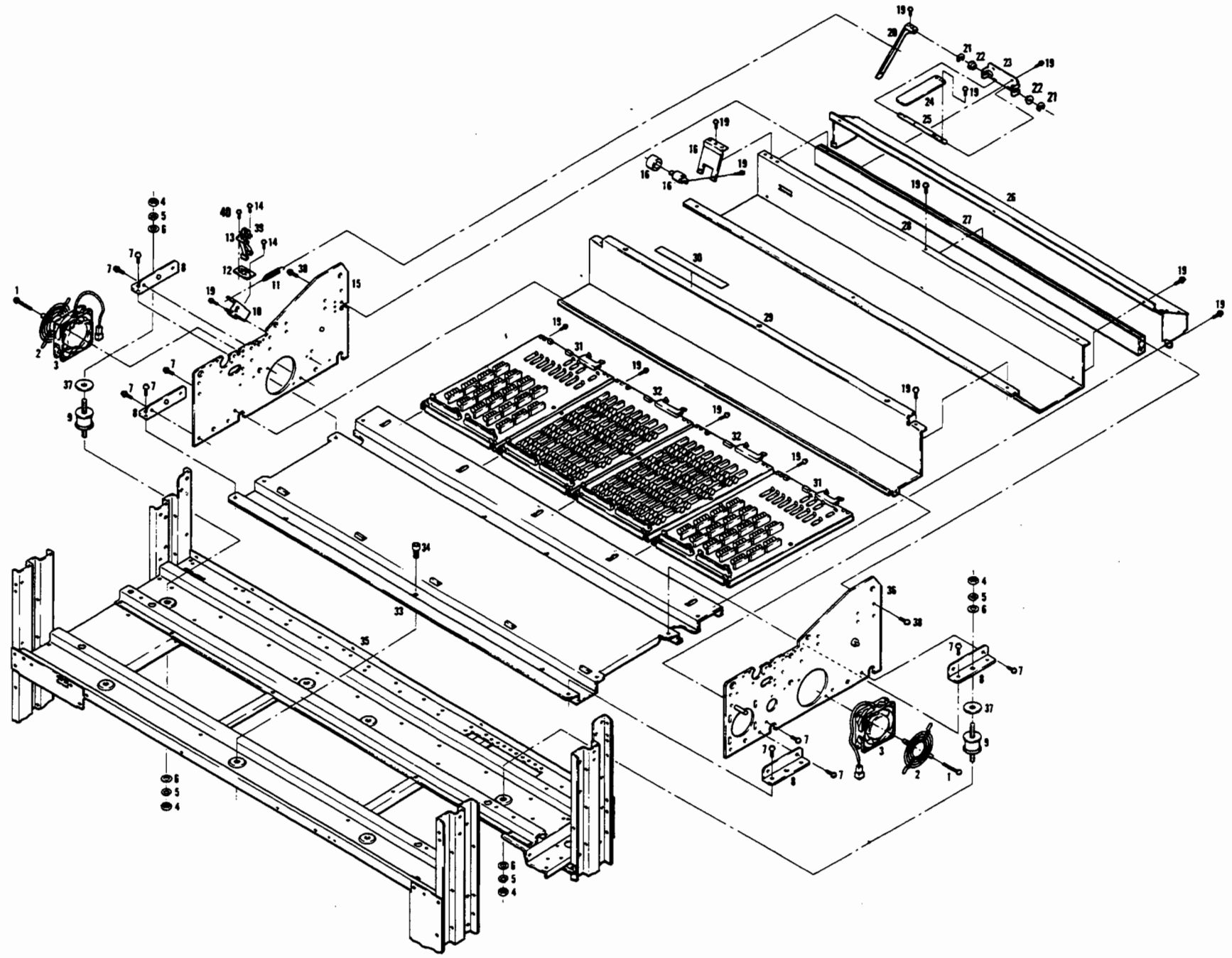


Figure 10-6. Lower Frame Assembly 2
Illustrated Parts Breakdown

7600–E–106–3

Table 10-7. Parts List, Power Panel Assembly

REF DES	240D PART NUMBER	C D	QTY	240E 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–L1	8	1	K4311299–L1	8	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	K4311499–L1	2	1	K4311499–L1	2	1	PANEL-OUTLET
9							
10							
11	K3310865	3	1	K3310865	3	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	K2310506–L1	4	1	K2310506–L1	4	1	PANEL-POWER
16	K4210196	5	1	K4210196	5	1	INLET-AC
17	K3310783–L1	2	1	K3310783–L1	2	17	COVER-VOLTAGE SWITCH
18	K4311482	4	1	K4311482	4	1	LABEL-VOLTAGE

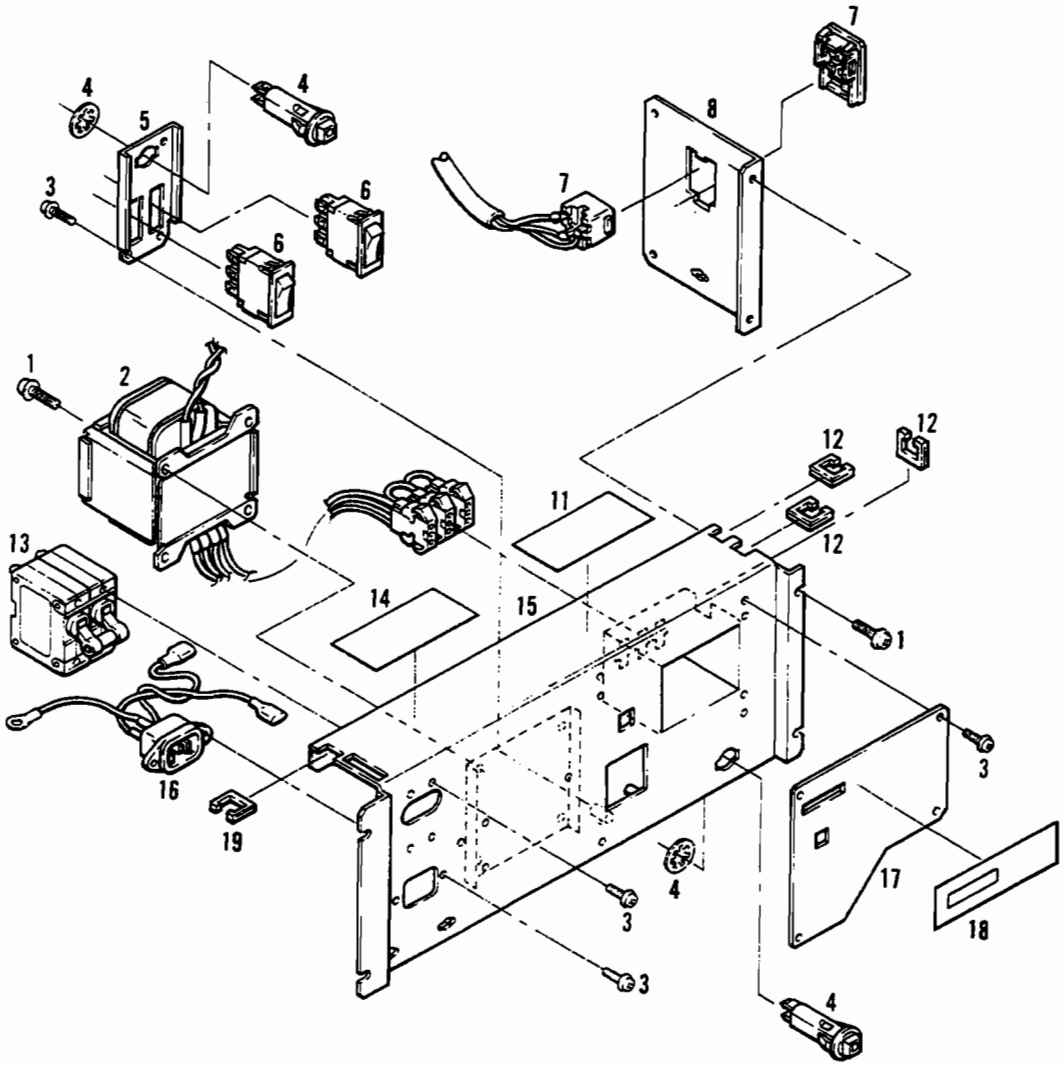


Figure 10-7. Power Panel Assembly
Illustrated Parts Breakdown

7600–A–107–1R

Table 10-8. 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–L1	3	1	K3310755–L1	3	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

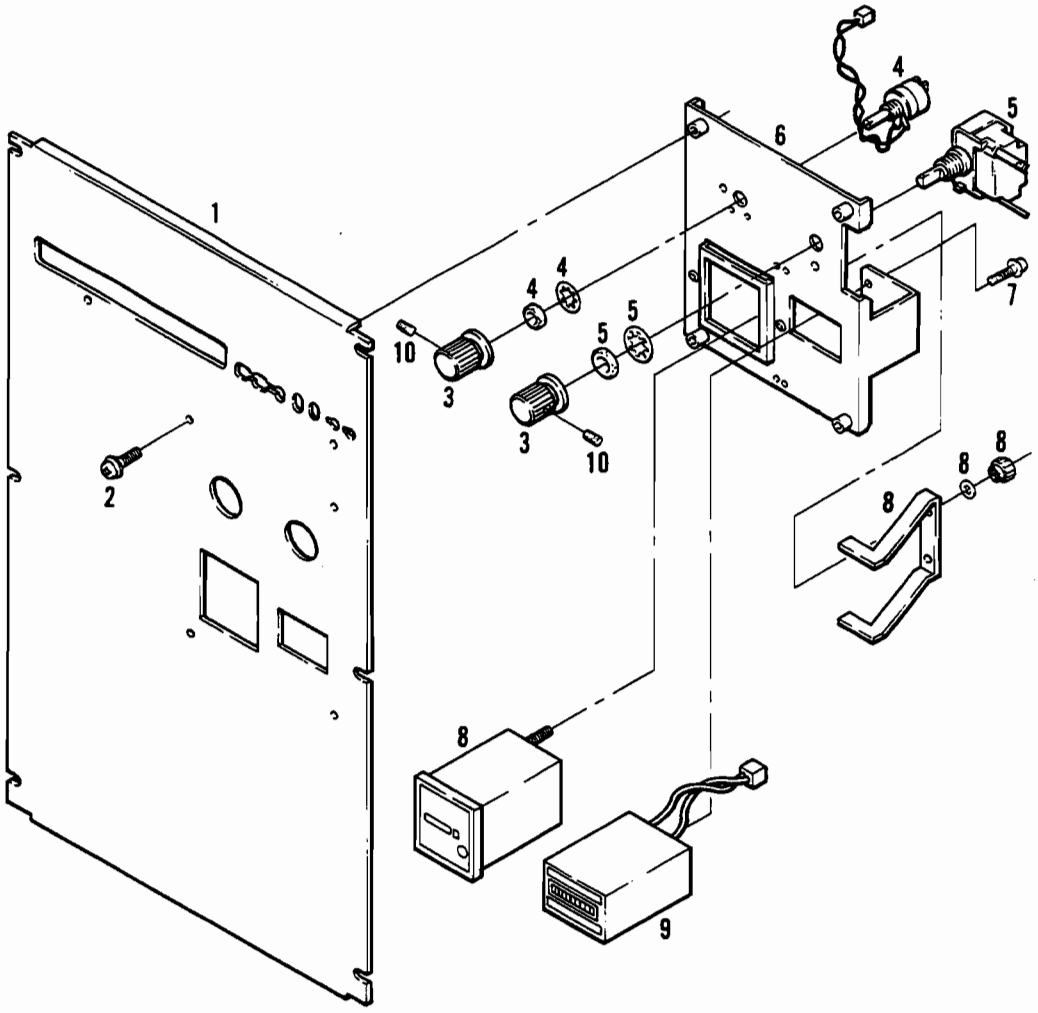


Figure 10-8.Test Panel Assembly
Illustrated Parts Breakdown

7600–A–108–2

Table 10-9. 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 10-9. 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
	C1600-69103	7	1	C1600-69103	7	1	PCA-DMA I/O (EXCHANGE)
23	C1600-68112	6	1	C1600-68112	6	1	PCA-PROCESSOR
	C1600-69112	8	1	C1600-69112	8	1	PCA-PROCESSOR (EXCHANGE)
24	C1600-68107	9	1	C1600-68107	9	1	PCA-SWATH/RAM
	C1600-69107	1	1	C1600-69107	1	1	PCA-SWATH/RAM (EXCHANGE)
25	C1600-68104	6	1	C1600-68104	6	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 10-9. 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
	0957-0033	8	1	0957-0033	8	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

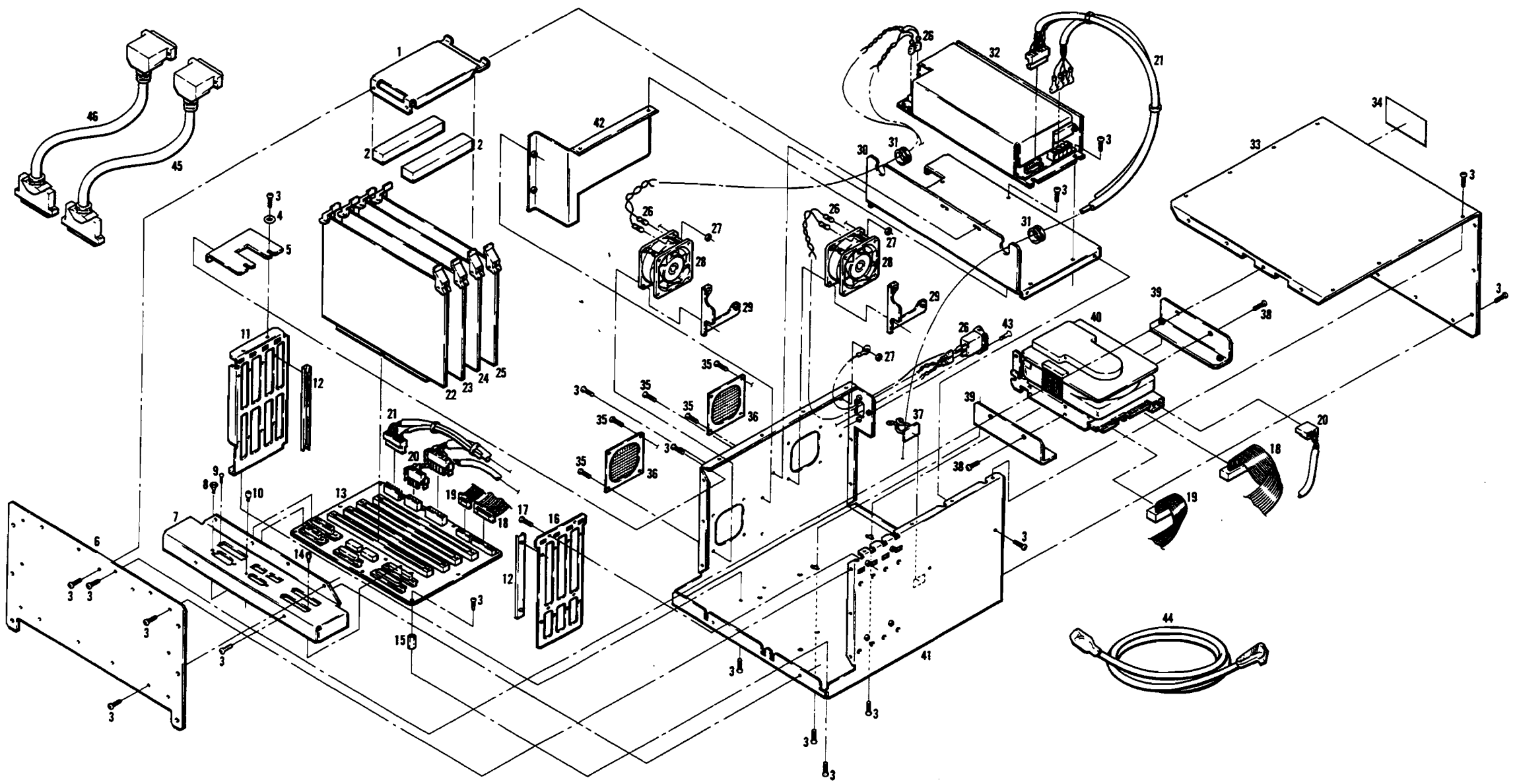


Figure 10-9. Vector-to-Raster Converter
Illustrated Parts Breakdown

Table 10-10. 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	DISK DRIVE, VRC

Table 10-11. 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	K1310300B-H	3	1	K1310300B-H	3	1	COVER-LEFT SIDE (INCLUDES LABEL)
4	DXZP4X8SMW	7	49	DXZP4X8SMW	7	49	SCREW, P4 X 8 SMW
5	PH3–8–38	9	2	PH3–8–38	9	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–L2	1	1	K1310264–L2	9	1	MAIN FRAME (USA)
	K1310265–L3	2	1	K1310264–L3	0	1	MAIN FRAME (EUROPE)
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–L2	4	1	K2310416–L2	4	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 10-11. 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–CH	9	1	K3310987–CH	1	1	U.S.A.
	K3M10430	1	1	K3M10431	3	1	EUROPE
24	PH3–8–39	1	1	PH3–8–39	1	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	DXZP4X10SW	2	2	DXZP4X10SW	2	2	SCREW, P4 X 10 SW

Table 10-11. 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	K3M10368	8	1	U.S.A.
	K3M10368	8	1	K3M10368	8	1	EUROPE
41							DELETED
42	DXZP3X6SW	0	1	DXZP3X6SW	0	1	SCREW, P3 X 6 SW
43							RESISTOR
	K3M10369	0	1	K3M10369	0	1	U.S.A.
	K3M10369	0	1	K3M10369	0	1	EUROPE
44	MAS-1215-33	1	1	MAS-1215-33	1	1	FILTER-NOISE (EUROPE)
	MBS–1215–22	0	1	MBS–1215–22	0	1	FILTER-NOISE (USA)
45	K4310977	2	8	K4310977	2	8	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–L1	5	1	K3310685A–L1	5	1	SUPPORT BAR-RIGHT SIDE (A)
49	K1310300A-H	2	1	K1310300A-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 10-11. 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	DXZB4X8CR	6	4	DXZB4X8CR	6	4	SCREW, B4X8
							NOTES
							ITEMS 19 20, AND 22 ARE PART OF THE MCD PCA ASSEMBLY (ITEM 21).
							ITEM 37 INCLUDES PART NUMBERS DXZCS6X10, (SCREW, DXZWA6B (SPRING WASHER), AND DXZWG6 (FLAT WASHER).

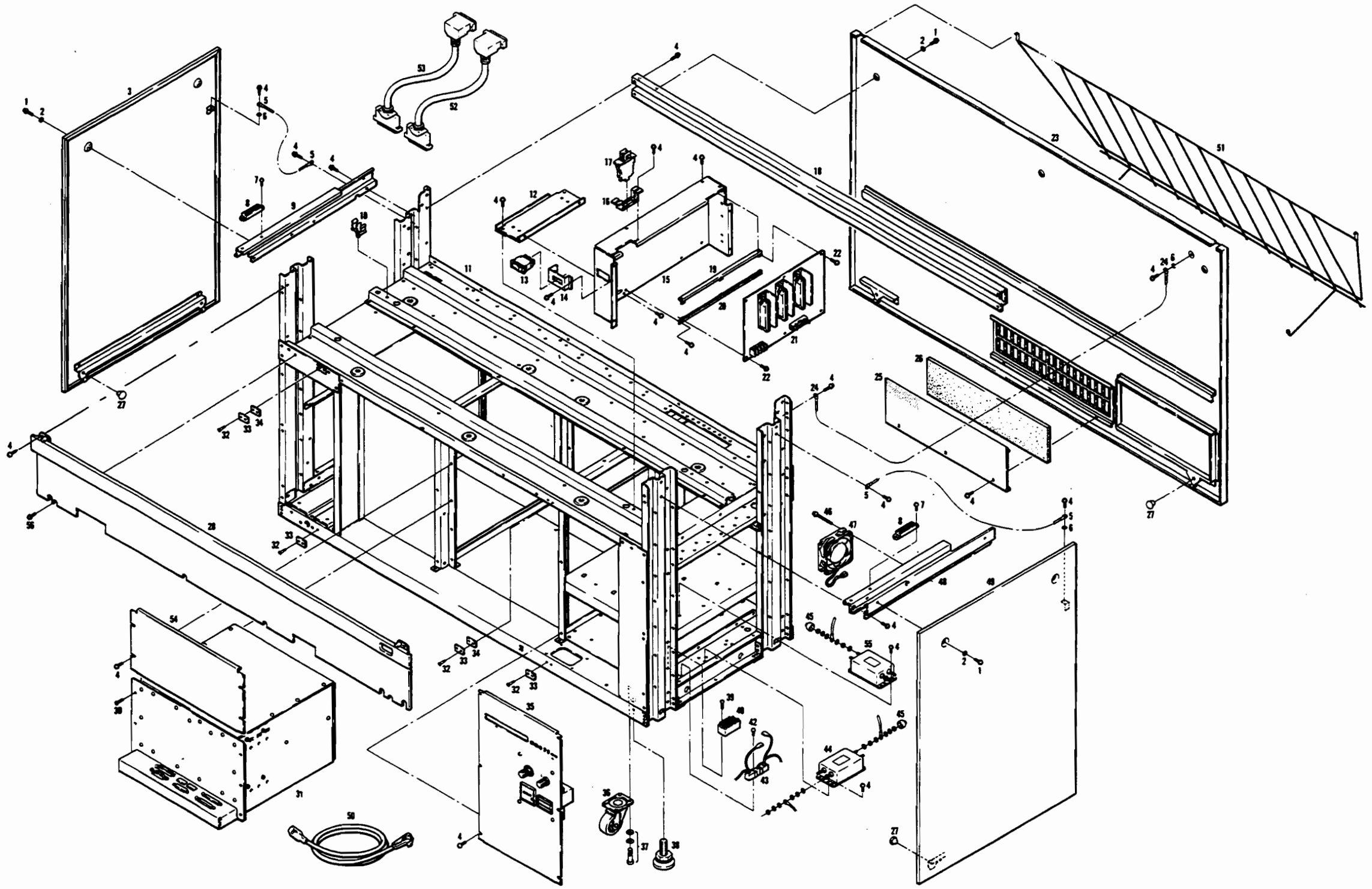


Figure 10-10. Frame Assembly 1
Illustrated Parts Breakdown

Table 10-12. Parts List, Frame Assembly 2

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K1310345–H–L1	4	1	K1310345–H–L1	4	1	DOOR-TONER (USA)
	K1310345–H–L2	5	1	K1310345–H–L2	5	1	DOOR-TONER (EUROPE)
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
	1304801-30050	1	4	1304801-30050	1	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–L2	1	1	K1310264–L2	9	1	MAIN FRAME (USA)
	K1310265–L3	2	1	K1310264–L3	0	1	MAIN FRAME (EUROPE)
9	K3310854	0	1	K3310854	0	1	VENT-AIR
10	UH30-06–360	4	1	UH30-06–360	4	1	TUBE 2 (360 MM)
11	UH30-08–565	1	1	UH30-08–565	1	1	TUBE 4 (565 MM)
12							
13							
14							
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 10-12. Parts List, Frame Assembly 2 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	K3310687	5	1	K3310687	5	1	BAR-SUPPORT, RMC
22	K3M10249	6	1	K3M10249	6	1	HIGH VOLTAGE POWER SUPPLY UNIT E (USA)
	K3M10361	4	1	K3M10361	4	1	HIGH VOLTAGE POWER SUPPLY UNIT F (EUROPE)
23	DXZP3X8SMW	6	2	DXZP3X8SMW	6	2	SCREW, P3 X 8 SMW
24	DXZP3X6SMW	4	4	DXZP3X6SMW	4	4	SCREW, P3 X 6 SMW
25							DELETED
26	K3M10250–2	7	1	K3M10250–2	7	1	LOW VOLTAGE POWER SUPPLY UNIT J (+5V) (USA)
	K3M10362	6	1	K3M10362	6	1	LOW VOLTAGE POWER SUPPLY UNIT L (+5V) (EUROPE)
27	K3M10251	1	1	K3M10251	1	1	LOW VOLTAGE POWER SUPPLY UNIT K (+24V) (USA)
	K3M10363	8	1	K3M10363	8	1	LOW VOLTAGE POWER SUPPLY UNIT M (+24V) (EUROPE)
28	PH3–8–38	9	2	PH3–8–38	9	2	FG STRAP 8
29	K2310475-H	0	1	K2310474-H	6	1	COVER-CENTER
30	K1310346-H	3	1	K1310346-H	3	1	DOOR-TEST PANEL
31							
32	DXZ70743A	8	1	DXZ70743A	8	1	TRANSFORMER-MAIN, T1
33	DXZFSCS5X12	8	4	DXZFSCS5X12	8	4	SCREW, FSCS 5 X 12

Table 10-12. Parts List, Frame Assembly 2 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
34							PANEL ASSEMBLY-AC POWER (REFER TO TABLE 9-7.)
35	K3310661	1	1	K3310661	1	1	LABEL, TONER BOTTLE CAUTION (ENGLISH)
	K3311034	3	1	K3311034	3	1	LABEL, TONER BOTTLE CAUTION (GERMAN)
36	DXZWC4B	6	2	DXZWC4B	6	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, 17, 19, AND 20 ARE PART OFTHE RMC PCA (ITEM 18).

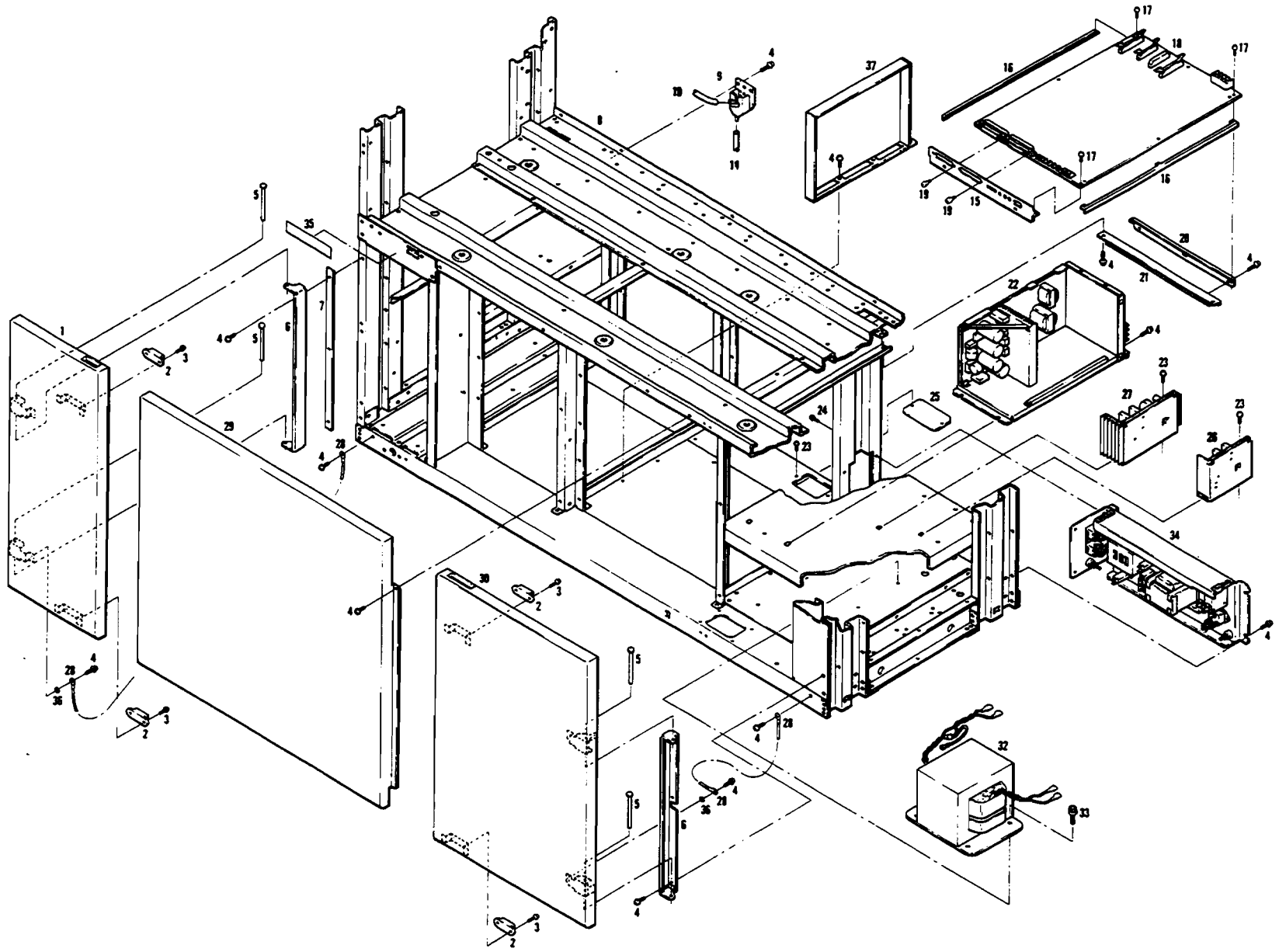


Figure 10-11.Frame Assembly 2
Illustrated Parts Breakdown

Table 10-13. Parts List, Frame Assembly 3

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K3M10254	7	1	K3M10254	7	1	PUMP ASSEMBLY
2	UH30-08-650	7	1	UH30-08-650	7	1	TUBE 6 (650 MM)
3	UH30-08-630	3	2	UH30-08-630	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	K3310653	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	K3M10357	5	1	K3M10358	7	1	COVER, TOP
11	K3310977B	0	1	K3310977A	9	1	CHUTE, MEDIA EJECT (USA)
	K3210232B	1	1	K3210232A	0	1	CHUTE, MEDIA EJECT (EUROPE)
12	K2310556	6	1	K2310556	6	1	SHEET, CONTROL PANEL
13	K2310528	4	1	K2310528	4	1	PLATE, CONTROL PANEL
14	K4210293	1	1	K4210293	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							

Table 10-13. Parts List, Frame Assembly 3 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	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 P4 X 8 SMW
27	DXZSN–8A	2	4	DXZSN–8A	2	4	CABLE STRAP
28	PH3-8-05	0	1	PH3-8-05	0	1	CONTROL PANEL CABLE ASSEMBLY
29	K4311420	4	1	K4311420	4	1	ACTUATOR, INTERLOCK
30	DXZP4X8SMW	7	1	DXZP4X8SMW	7	1	SCREW, P4 X 8 SMW
31	PH3–8–41	6	1	PH3–8–41	6	1	FG STRAP 11
32	DXZF3X8	8	2	DXZF3X8	8	2	SCREW F3 X 8
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	K4310251	4	1	K4310251	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 10-13. Parts List, Frame Assembly 3 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	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							UNAVAILABLE
49	DXZB3X6TTB	7	2	DXZB3X6TTB	7	2	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	PIPE JOINT
53	K4311279	3	1	K4311279	3	1	SEAL-TEFLON
54	K3310856	4	1	K3310856	4	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 58)

Table 10-13. 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	UH30-08–565	3	1	UH30-08–565	3	1	TUBE 4 (565 MM)
65	UH30-08–1200	8	1	UH30-08–1200	8	1	TUBE 7 (1200 MM)
66	DXZ1H75	0	1	DXZ1H75	0	1	HOLDER-ROD
67	K3310784B	1	1	K3310784B	1	1	BRACKET-LEFT, TOP COVER
68	DXZWE8	6	6	DXZWE8	6	6	WASHER, HW8
69	DXZSTW-PM8X1	3	1	DXZSTW-PM8X1	3	1	WASHER, PLASTIC
70	K3310784A	0	1	K3310784A	0	1	BRACKET- RIGHT, TOP COVER
71	K1310265–L2	1	1	K1310264–L2	9	1	MAIN FRAME (USA)
	K1310265–L3	2	1	K1310264–L3	0	1	MAIN FRAME (EUROPE)
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
79	DXZB3X8TTB	9	1	DXZB3X8TTB	9	1	SCREW, B3 X 8 TTB
80	DXZ5359	1	1	DXZ5359	1	1	HOLDER–ROD

THE PARTS LIST FOR FRAME ASSEMBLY 3
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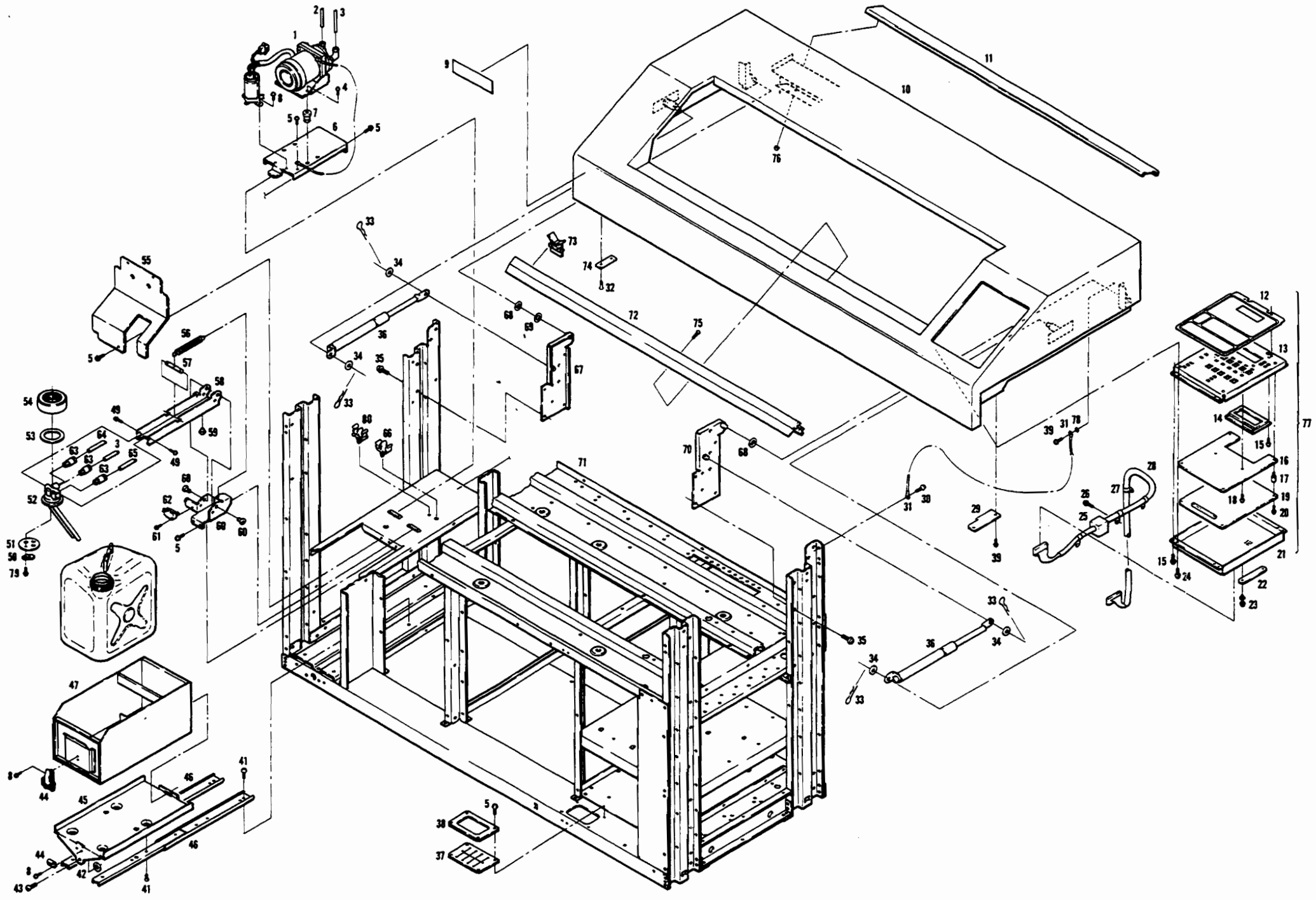


Figure 10-12. Frame Assembly 3
Illustrated Parts Breakdown

Table 10-14. Parts List, Upper Frame Assembly

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	DXZP4X10SMW	2	33	DXZP4X10SMW	2	33	SCREW, P4 X 10 SMW
2	DXZSN-4A	8	5	DXZSN-4A	8	5	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	K3M10291	5	2	K3M10292	7	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–L1	0	1	K2210198B–L1	0	1	PLATE, LEFT-SIDE
12	K3310855	2	2	K3310855	2	2	SHAFT-COUPLING
13	K4311265	4	2	K4311265	4	2	SHAFT-CONNECTOR
14							
15	K4311373	3	2	K4311261	6	2	SPRING-PAD
16	K4210144B	6	2	K4210144B	6	2	ARM-ROLLER (B)
17	K4311214A	6	4	K4311214A	6	4	SCREW-SUPPORT (A)
18	K4311492	5	2	K4311492	5	2	BEARING – ROLLER
19	K3M10298	9	2	K3M10298	9	2	SWITCH-SENSOR
20	DXZP2X10SMW	0	4	DXZP2X10SMW	0	40	SCREW, P2 X 10 SMW

Table 10-14. 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	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	K3M10372	7	1	K3M10373	9	1	PINCH ROLLER
30	K3310748–L2	9	1	K3310730–L2	2	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							
38	DXZWC4B	6	2	DXZWC4B	6	2	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 10-14. 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	PH3–8–75	7	1	PH3–8–75	7	1	HARNESS, NO-PAPER SWITCH
46	DXZ4035	8	1	DXZ4035	8	1	CLIP-WIRE
47	K2210198A–L1	9	1	K2210198A–L1	9	1	PLATE-RIGHT SIDE, UPPER FRAME
48	PH3–8–37	7	1	PH3–8–37	7	1	FG STRAP 7
49	K4311255	3	2	K4311255	3	2	STOPPER
50	DXZP5X25SMW	4	2	DXZP5X25SMW	4	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
55	FLW688ZZ	5	4	FLW688ZZ	5	4	BEARING-ROLLER

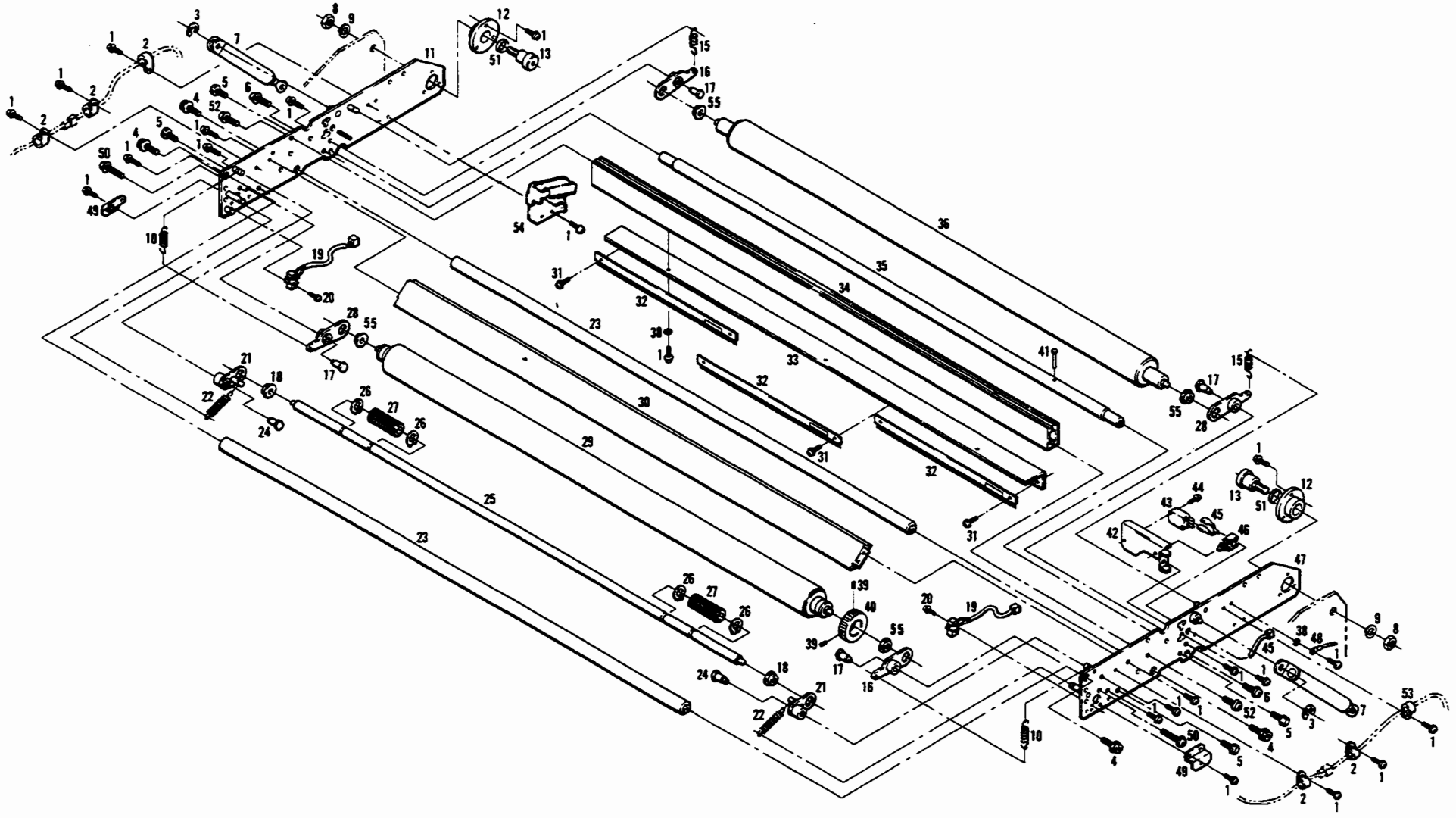


Figure 10-13. Upper Frame Assembly
Illustrated Parts Breakdown

7600–C–104–6

Table 10-15. 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	UH30-08–45	9	1	UH30-08–45	9	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	PH3–8–76	9	1	PH3–8–76	9	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	BLOCK, RECORDING HEAD
15	DXZB5X14TTB	4	4	DXZB5X14TTB	4	4	SCREW, B5 X 14 TTB
16	K4311222	4	2	K4311222	4	2	CASE-BEARING
17	K2210193B–L1	0	1	K2210193B–L1	0	1	PLATE-LEFT SIDE
18	DXZP4X20SMW	3	2	DXZP4X20SMW	3	2	SCREW, P4 X 20 SMW
19	K4311229	8	2	K4311229	8	2	MOUNT-HEAD
20	K4311234	9	2	K4311234	9	2	PLATE-MEDIA SUPPORT
				NOTES ARE AT THE END OF THIS PARTS LIST			

Table 10-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
21	DXZISTW-12	8	3	DXZISTW-12	8	3	RING, ISTW-12 (SEE NOTES)
22	K4311271	7	1	K4311271	7	1	WHEEL, MEDIA ALIGNMENT (SEE NOTES)
23	DXZCS4X14	8	3	DXZCS4X14	8	3	SCREW, CS 4 X 14 (SEE NOTES)
24	DXZWA4B	4	3	DXZWA4B	4	3	WASHER-SPRING, S4 (SEE NOTES)
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	K3M10326	0	1	K3M10327	2	1	HEAD-WRITING
	C1600–69307	3	1	C1600–69308	4	1	HEAD-WRITING (EXCHANGE)
30	UH30-06–105	5	1	UH30-06–105	5	1	TUBE 1 (105 MM)
31							
32	K4311416	5	2	K4311416	5	2	PLATE-ISOLATION, DEVELOPER
33	K3310857	6	2	K3310857	6	2	BLOCK-DEVELOPER
34	K2310578	2	1	K2310579	4	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	3	DXZFSCS4X8	3	3	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 10-15. 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	DXZP4X35SW	4	4	SCREW, P4 X 35 SW
42	K3M10252	3	2	K3M10252	3	242	FAN 3, 4
43	K4210141B	0	1	K4210141B	9	1	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	UH30-08–390	2	1	UH30-08–595	9	1	TUBE 8 (MODEL 250: 390 MM), (MODEL 255: 595 MM) (SEE NOTES)
53	DXZPB8-01	9	1	DXZPB8-01	9	1	TUBE JOINT 4 (SEE NOTES)
54	UH30-08–290	1	1	UH30-08–395	7	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	PH3–8–34	1	1	PH3–8–34	1	1	FG STRAP 4
57	N/A			K4311223	6	1	SUPPORT-CENTER (1)
58	N/A			K4311224	8	1	SUPPORT-CENTER (2)
		NOTES ARE AT THE END OF THIS PARTS LIST					

Table 10-15. 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			K4311668	8	1	RETAINER
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, M6
66	K3M10253	5	1	K3M10253	5	1	MOTOR-STEPPING ASSEMBLY (SEE NOTES)
67	SEE NOTES		1	SEE NOTES		1	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–L1	9	1	K2210193A–L1	9	1	PLATE-RIGHT SIDE
75	DXZFSCS5X12	8	4	DXZFSCS5X12	8	4	SCREW, FSCS 5 X 12
76	N/A			DXZP3X6SW	0	1	SCREW P3 X 6
77	N/A			K3M10506	2	1	BEARING ASSEMBLY
		NOTES ARE AT THE END OF THIS PARTS LIST					

Table 10-15. Parts List, Lower Frame Assembly 1 (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
76	K4311240	2	1	K4311240	2	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	PH3–8–39	1	1	PH3–8–39	1	1	FG STRAP 9
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 (SEE NOTES)
89				DXZF4X10	4	1	SCREW F4X10 (SEE NOTES)
90	DXZB4X8CR	6	4	DXZB4X8CR	6	4	SCREW-B4X8CR
91	DXZP4X30SMW	4	2	DXZP4X30SMW	4	2	SCREW-P4X30SMW (SEE NOTES)
92	DXZSN-6A	0	2	DXZSN-6A	0	2	CLAMP-NYLON
94	PH3–8–38	9	1	PH3–8–38	9	1	FG STRAP 8
				NOTES ARE AT THE END OF THIS PARTS LIST			

Table 10-15. 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 21, 22, 23, 24, 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).

MORE NOTES ARE ON THE NEXT PAGE OF THIS PARTS LIST

Table 10-15. 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	DEVELOPER BAR ASSEMBLY (ITEMS 9, 32, 33, 34, 53, 54, 55, 88, 89, AND 91 ARE PART OF THE DEVELOPER BAR ASSEMBLY.)

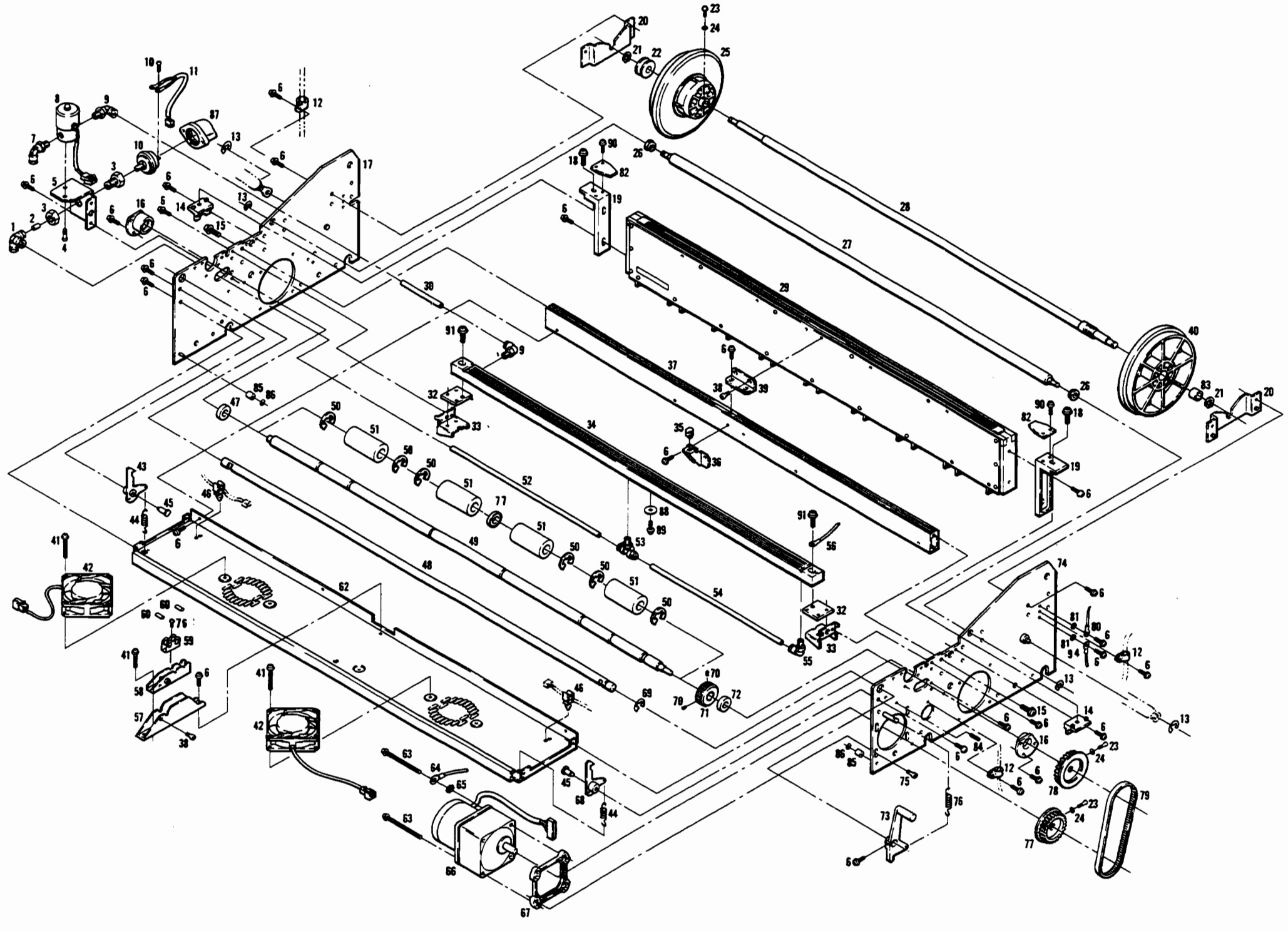


Figure 10-14. Lower Frame Assembly 1
Illustrated Parts Breakdown

Table 10-16. 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–L1	0	1	K2210193B–L1	0	1	PLATE-LEFT SIDE
16	K4210142	2	1	K4210142	2	1	LIMITER – ASSEMBLY
17							
18							
19	DXZP4X10SMW	2	15	DXZP4X10SMW	2	15	SCREW, P4 X 10 SMW
20	K4311232	5	1	K4311232	5	1	ACTUATOR-MEDIA

Table 10-16. 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 (USA)
	K3210230A	6	1	K310230B	7	1	SHIELD, REAR, PCA (EUROPE)
27	K3310624	3	2	K3310605	3	2	STAY #1
28	K2310394–L1	5	1	K2310392–L2	2	1	BOX-MEDIA
29	K2310451–L2	8	1	K2310450–L2	6	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	CED (EXCHANGE)
32	K3M10243	4	1	K3M10243	4	2	PCA-PIN ELECTRODE DRIVER (PED)
	C1600–69301	7	1	C1600–69301	7	2	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			MAIN FRAME
36	K2210193A–L1	8	1	K2210193A–L1	8	1	PLATE-RIGHT SIDE
37				DXZWG10	0	2	WASHER
38	DXZB5X14TTB	4	4	DXZB5X14TTB	4	4	SCREW, B5 X 14TTB
39	K3M10301	8	1	K3M10301	8	1	SWITCH-SENSOR, NEAR END OF PAPER (SSW6)
40	DXZP3X6SMW	4	1	DXZP3X6SMW	4	1	SCREW, P3 X 6SMW

THE PARTS LIST FOR LOWER FRAME ASSEMBLY 2 IS ON THE TWO PREVIOUS PAGES OF THIS MANUAL.

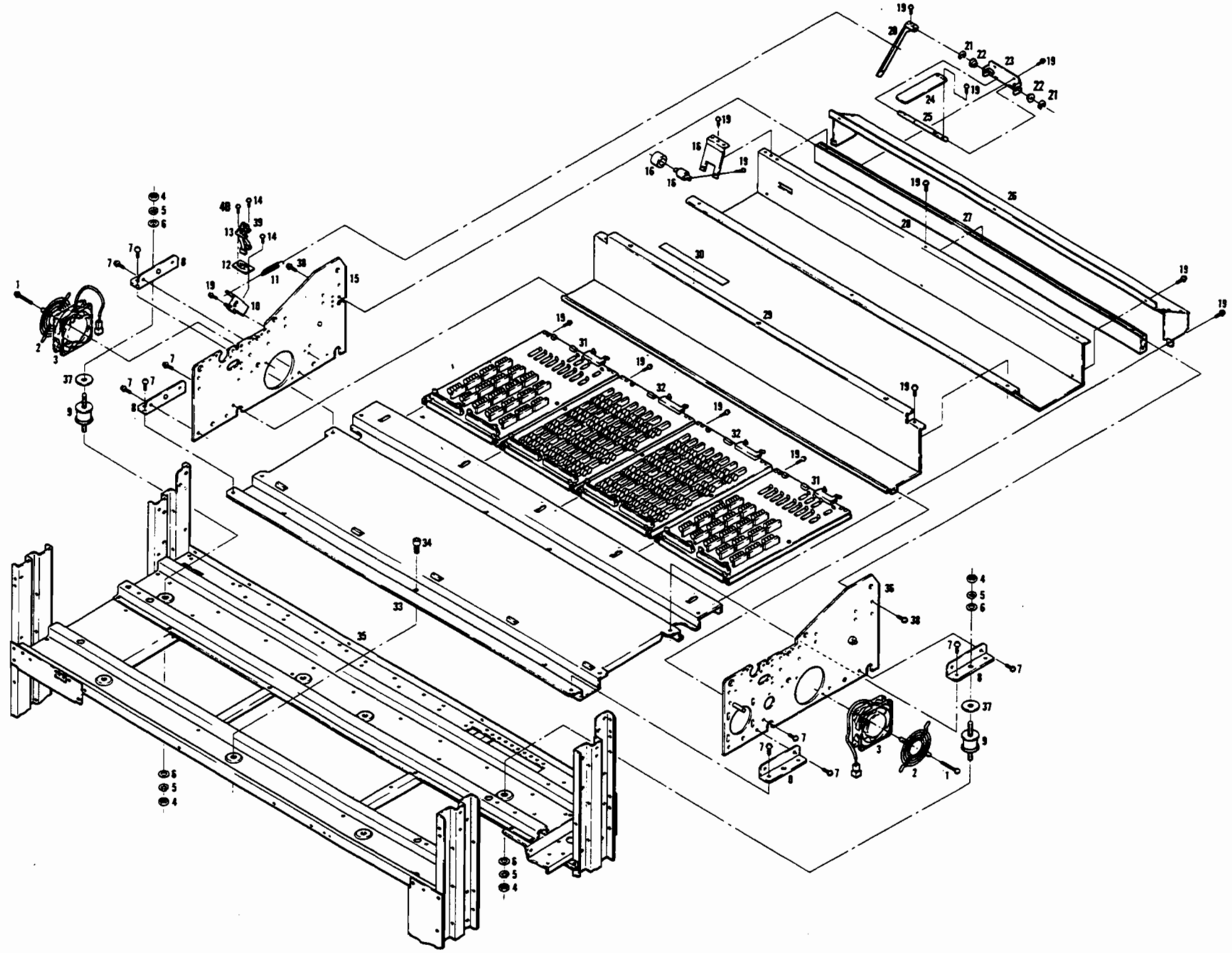


Figure 10-15. Lower Frame Assembly 2
Illustrated Parts Breakdown

7600–E–106–3

Table 10-17. Parts List, Lower Frame Assembly 2 (Model 250/255 Differences)

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
1	K3210266A	1	1	K3210266B	2	1	PLATE, FRONT SHIELD (EUROPE ONLY)
2	K4311724	8	1	K4311724	8	1	BRACKET
3							DELETED
4				TM-96-1	2	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	SHAFT – BEARING
11				K3M10506	2	1	BEARING ASSEMBLY
12	K3310630	6	1	K3310612	8	1	SHAFT, ROLLER
13				K4311668	8	1	RETAINER
14				DXZP4X35SW	4	1	SCREW, P4 X 35SW
15				K4311224	8	1	SUPPORT – CENTER (2)
16				DXZP4X10SMW	2	2	SCREW P4X10SMW
17				K4311223	6	1	SUPPORT – CENTER (1)
18				DXZFSCS 4X8	3	1	SCREW FSCS 4 X 8

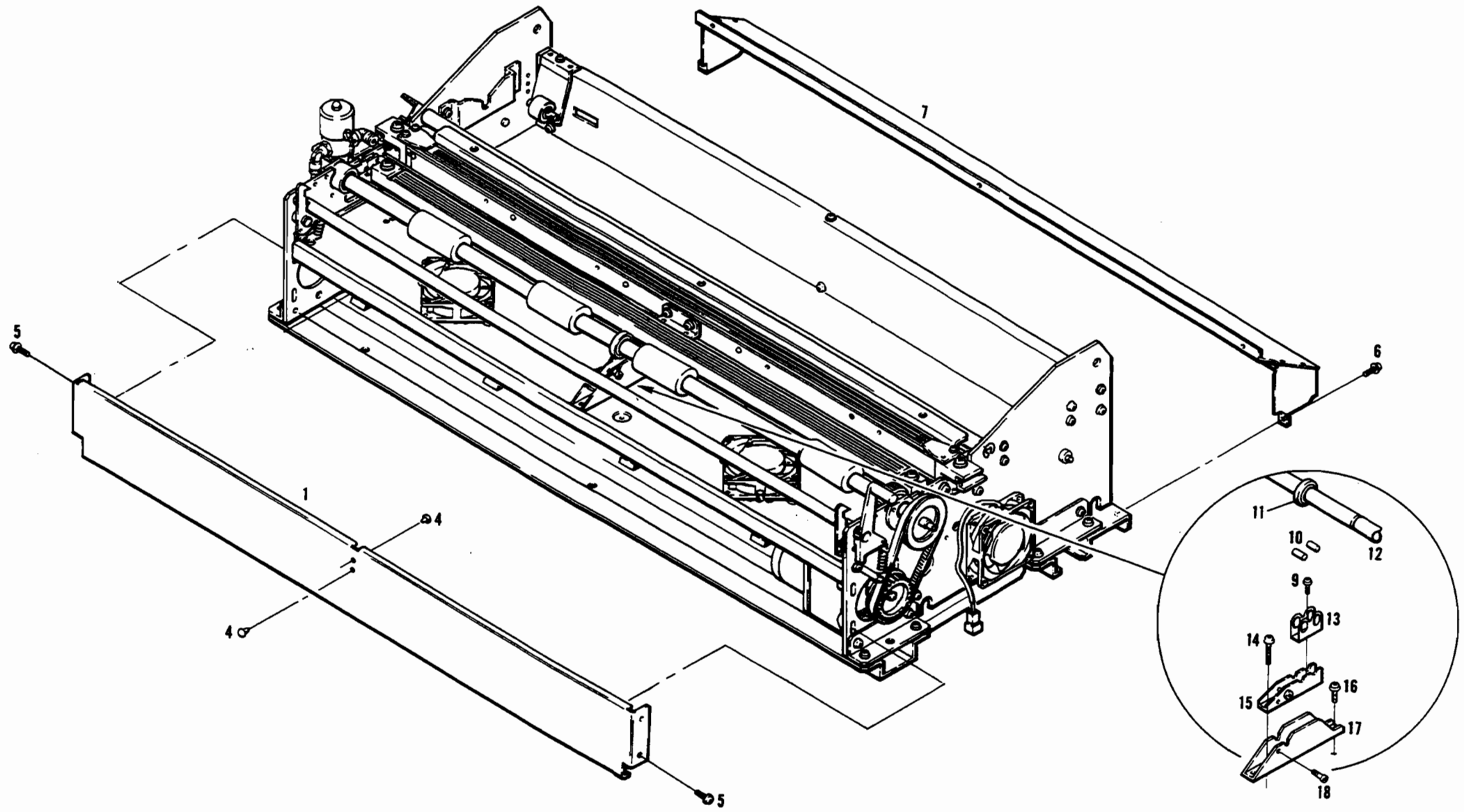


Figure 10-16. Lower Frame Assembly
(Model 250/255 Differences)
Illustrated Parts Breakdown

Table 10-18. Parts List, Power Panel Assembly

REF DES	250 PART NUMBER	CD	QTY	255 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–L1	8	1	K4311299–L1	8	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							
10							
11							
12	DXZEDS-1	1	3	DXZEDS-1	1	3	EDGE SADDLE
13	NRLR2100-15-AA	4	1	NRLR2100-15-AA	4	1	CIRCUIT BREAKER, CB1 (USA)
	NRLR2100-15-AA	4	1	NRLR2100-15-AA	4	1	CIRCUIT BREAKER, CB1 (EUROPE)
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) (USA)
	K3311057–0	5	1	K3311057–0	5	1	COVER-VOLTAGE SWITCH (NO LABEL) (EUROPE)
18	K4322482	4	1	K4322482	4	1	LABEL-VOLTAGE
19	EDS–1717U	1	1	EDS–1717U	1	1	EDGE SADDLE

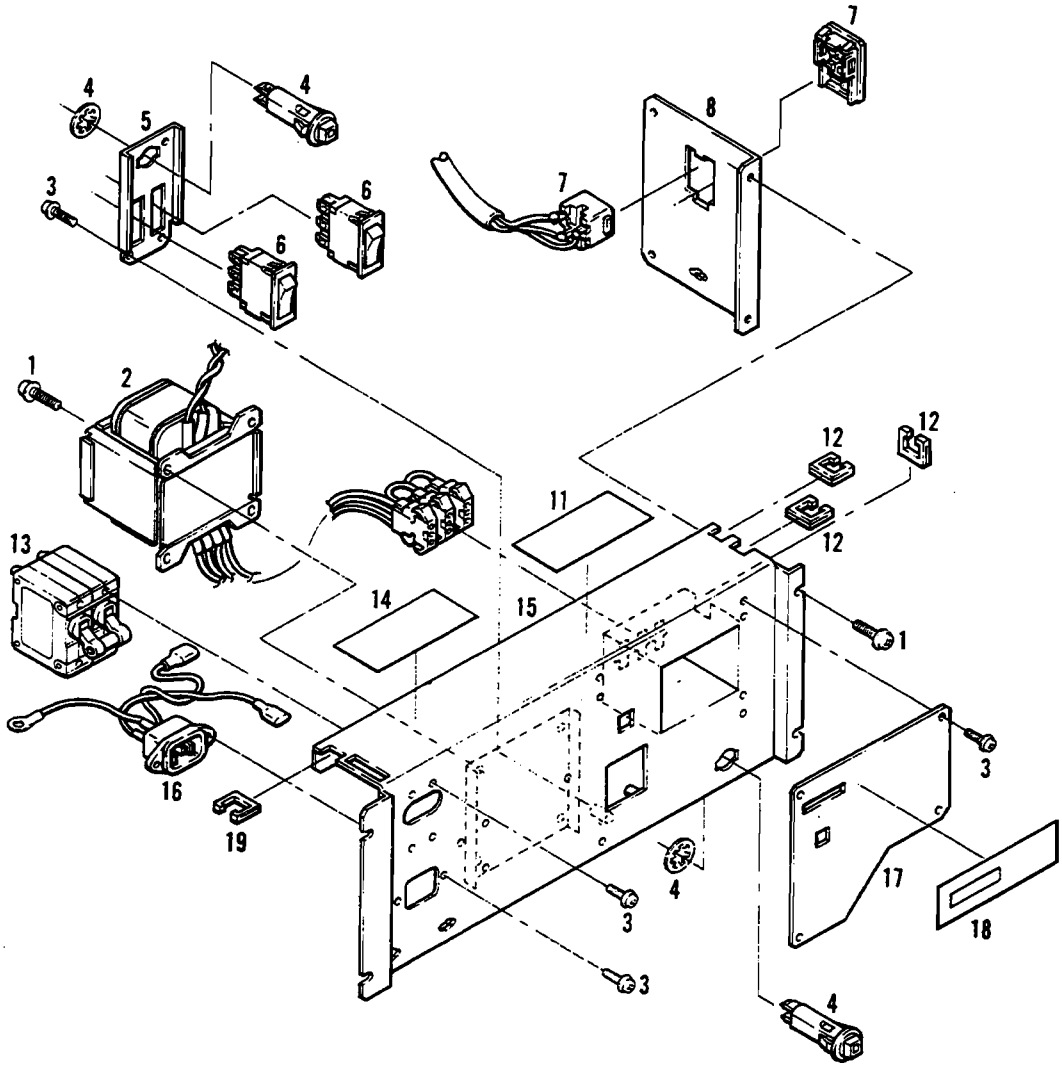


Figure 10-17. Power Panel Assembly
Illustrated Parts Breakdown

7600–A–107–4

Table 10-19. Parts List, Test Panel Assembly

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K2310541	5	1	K2310541	5	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 (USA)
	K4210274	1	1	K4210274	1	1	CONTROL-VOLUME, RV1 (EUROPE)
5	ARA25	9	1	ARA25	9	1	SWITCH-ROTARY, RSW1
6	K3310755–L1	3	1	K3310755–L1	3	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

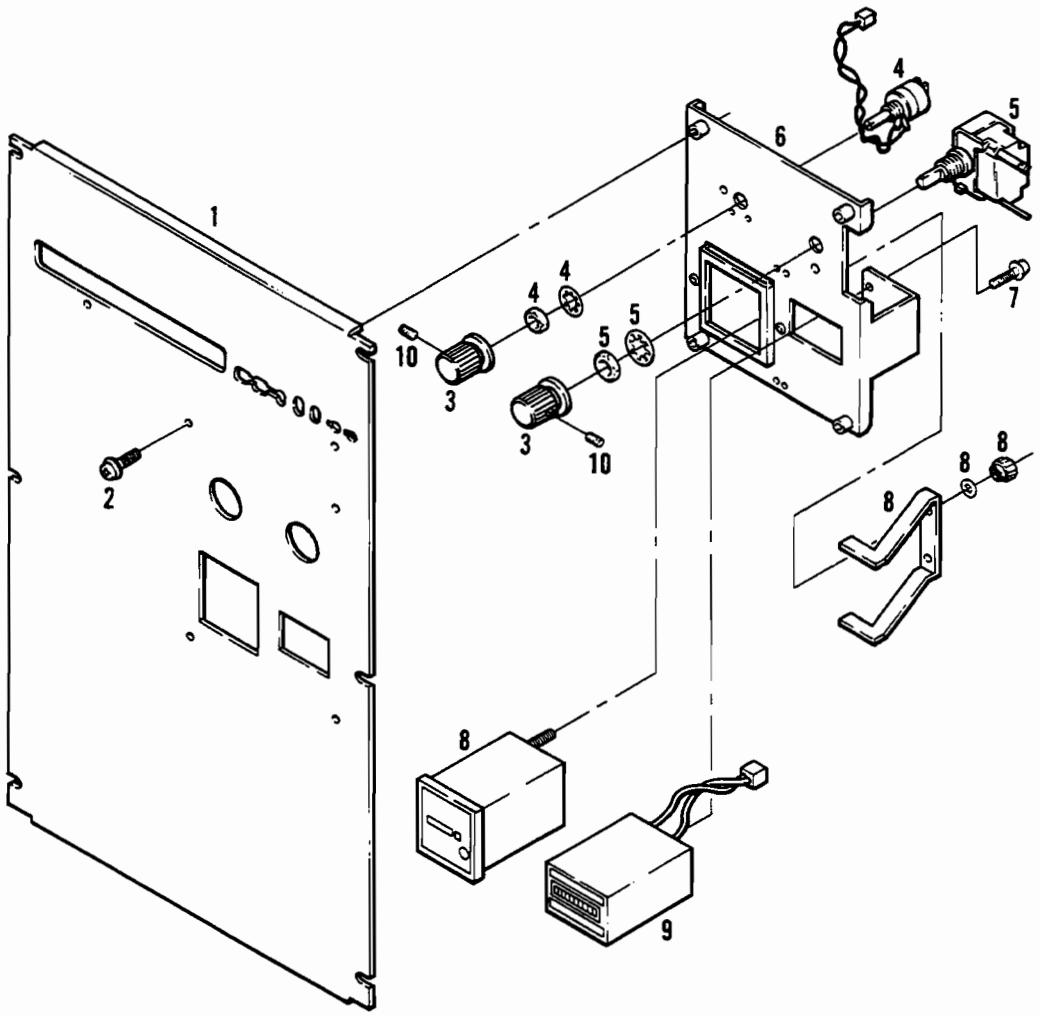


Figure 10-18. Test Panel Assembly
Illustrated Parts Breakdown

7600–A–108–2

Table 10-20. Parts List, Power Units

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
1	K3M10249	6	1	K3M10249	6	1	POWER SUPPLY, HIGH VOLTAGE (HPS 1) (USA)
	K3M10361	4	1	K3M10361	4	1	POWER SUPPLY, HIGH VOLTAGE (HPS 1 (EUROPE)
2	K3M10251	1	1	K3M10251	1	1	POWER SUPPLY, LOW VOLTAGE (+24V) (LPS 2) (USA)
	K3M10363	8	1	K3M10363	8	1	POWER SUPPLY, LOW VOLTAGE (+24V) (LPS 2) (EUROPE)
3	K3M10250–2	7	1	K3M10250–2	7	1	POWER SUPPLY, LOW VOLTAGE (+5V) (LPS1) (USA)
	K3M10362	6	1	K3M10362	6	1	POWER SUPPLY, LOW VOLTAGE (+5V) (LPS1) (EUROPE)
4	MAS-1215-33	1	1	MAS-1215-33	1	1	FILTER – NOISE (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)

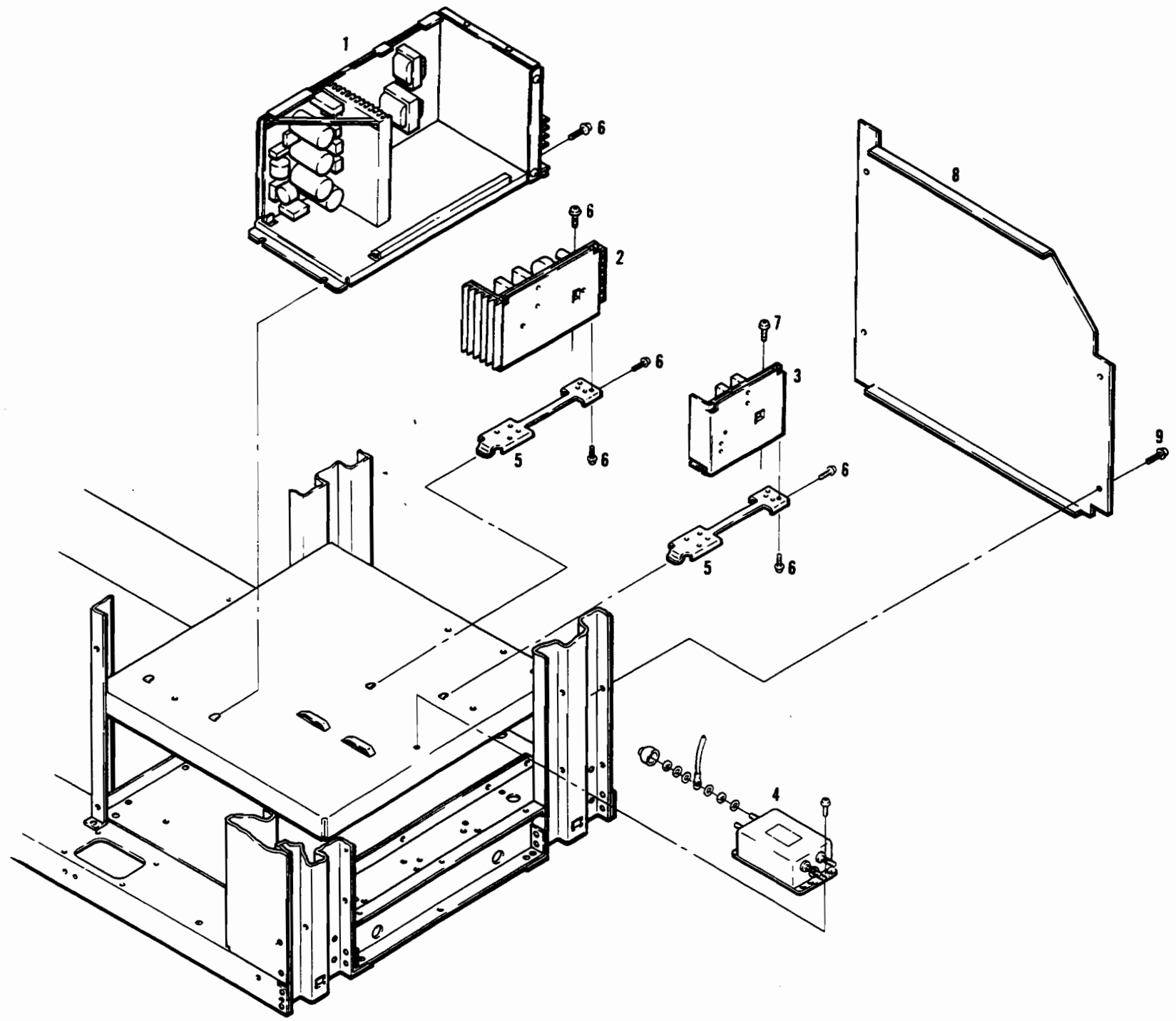


Figure 10-19. Power Units
Illustrated Parts Breakdown

Table 10-21. 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 10-21. 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	BEARING
22	K3M10399	3	1	K3M10399	3	12	SLEEVE ASSEMBLY-RIGHT (INCLUDES 20 AND 21)
23	K2310555A–L1	8	1	K2310555A–L1	8	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 P5 X 8SMW

THE PARTS LIST FOR THE TAKE-UP REEL ASSEMBLY IS ON THE TWO PREVIOUS PAGES OF THIS MANUAL.

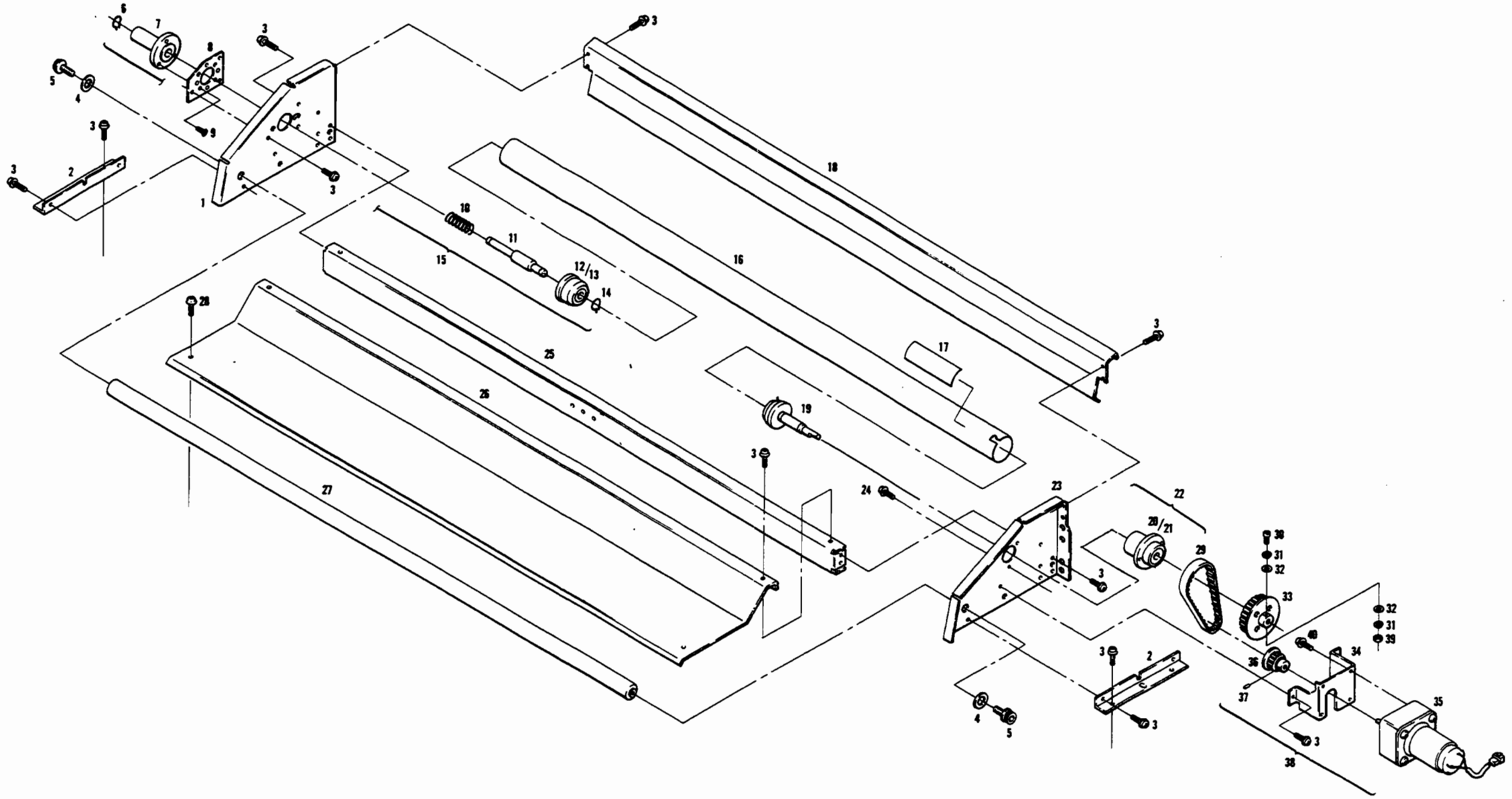


Figure 10-20. Take-Up Reel Assembly
Illustrated Parts Breakdown

Table 10-22. 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 P5 X 14SW
4	DXZSSK3X3	3	11	DXZSSK3X3	3	11	SCREW SSK 3 X 3
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	DXZP4X8SW	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–L1	9	1	K2310533–L1	1	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 10-22. 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	K4311761	6	1	K4311761	6	1	BLOCK, RUBBER
24	K4311698	1	1	K4311698	1	1	LEVER, TENSION
25	K3310958	0	1	K3310959	2	1	COVER-BOTTOM
26	K3310931–L1	7	1	K3310932–L1	9	1	STAY (1)
27	K4311594	1	2	K4311594	1	2	SUPPORT, CENTER
28	K4311591A	4	2	K4311591A	4	2	SPACER (A)
29	DXZP3X14SW	9	2	DXZP3X14SW	9	2	SCREW P3 X 14SW
30	DXZP3X8SW	2	2	DXZP3X8SW	2	2	SCREW P3 X 8SW
31	1480201-48020	8	4	1480201-48020	8	4	GRIP RING
32	K4311849	2	2	K4311849	2	2	SHAFT, ACTUATOR
33	K4311632	3	2	K4311632	3	2	ACTUATOR, SENSOR
34	DXZP3X6SW	0	11	DXZP3X6SW	0	11	SCREW P3 X 6SW
35	K4311633	5	2	K4311633	5	2	BRACKET, SENSOR MOUNTING
36	K3M10378	9	3	K3M10378	9	3	PCA, PHOTO SENSOR (PHS-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, EJECT SENSOR (SSW21)
39	PH3-8-86	0	1	PH3-8-86	0	1	CABLE ASSEMBLY, SUPPLY SENSOR (SSW20)
40	PH3-8-85	8	1	PH3-8-85	8	1	CABLE ASSEMBLY, ROTARY SENSOR (SSW19)

Table 10-22. Parts List, Cutter (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
41							
42							
43A							
43B	K4311847B	8	6	K4311847B	8	8	SPRING, PINCH ROLLER FRONT
44							
45							
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							
55							
56							
57							DELETED
58	K2310531A–L1	8	1	K2310531A–L1	8	1	PLATE, CUTTER-RIGHT
59	LF1360ZZ	9	1	LF1360ZZ	9	1	BEARING
60	K4311410	3	1	K4311410	3	1	HOLDER, BEARING (2)
61	K3210264A	7	3	K3210264A	7	3	ROLLER ASSEMBLY, REAR
62	K3210264B	8	3	K3210264B	8	3	ROLLER ASSEMBLY, FRONT
63	K3210265	0	1	K3210265	0	1	ROTATION SENSOR ASSEMBLY

Table 10-22. 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	DXZP4X8SW	3	2	DXZP4X8SW	3	2	SCREW P4 X 8SW
63							SCREW
64	DXZP3X14SW	9	3	DXZP3X14SW	9	3	SCREW P3 X 14SW
65	DXZF3X6	6	2	DXZF3X6	6	2	SCREW F3 X 6
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	DXZP3X6SW	0	3	DXZP3X6SW	0	3	SCREW P3 X 6SW
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	K4311726	2	2	K4311726	2	2	PLATE, RUBBER
79	K4311604	4	1	K4311604	4	1	PULLEY, CLUTCH
80	K4311598	9	1	K4311598	9	1	STOPPER, CLUTCH

Table 10-22. Parts List, Cutter (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
81	DXZP3X14SW	9	4	DXZP3X14SW	9	4	SCREW P3 X 14SW
82	K3M10401	0	1	K3M10401	0	1	BRAKE ASSEMBLY, FEED ROLLER (INCLUDES BRAKE & SET SCREW[4])
83	K4311383	4	1	K4311383	4	1	SPACER (2)
84	DXZ1F54	3	1	DXZ1F54	3	1	CLIP, WIRE
85	K3310949	1	1	K3310949	1	1	BRACKET, CONNECTER
86	DXZ2U46	5	1	DXZ2U46	5	1	CLIP, WIRE
87	DXZP3X8SMW	6	2	DXZP3X8SMW	6	2	SCREW P3X8SMW
88	K3310939A	9	1	K3310939A	9	1	PLATE, ANGLE-LEFT
89	DXZWA5	6	2	DXZWA5	6	2	WASHER, SPRING S5
90	DXZN05	9	2	DXZN05	9	2	NUT M5
91	DXZ4035	8	5	DXZ4035	8	5	CLIP, WIRE
92	K4311600	6	2	K4311600	6	2	PLATE, CLUTCH (2)
93							
94	1480201–48060	6	1	1480201–48060	6	1	GRIP RING
95	K4311760A	3	2	K4311760A	3	2	CUSHION, RUBBER (A)
96	K4311760B	4	2	K4311760B	4	2	CUSHION, RUBBER (B)

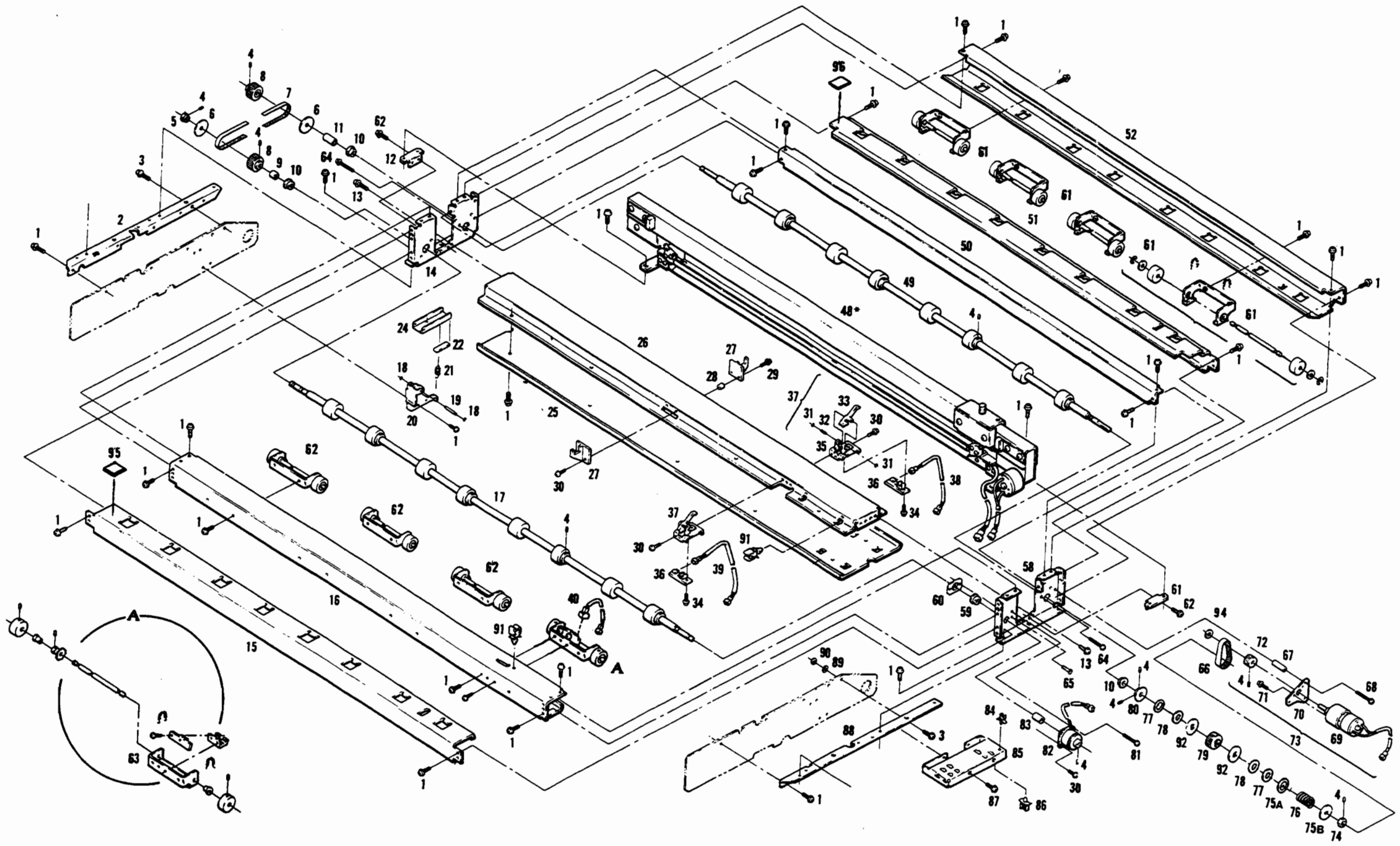
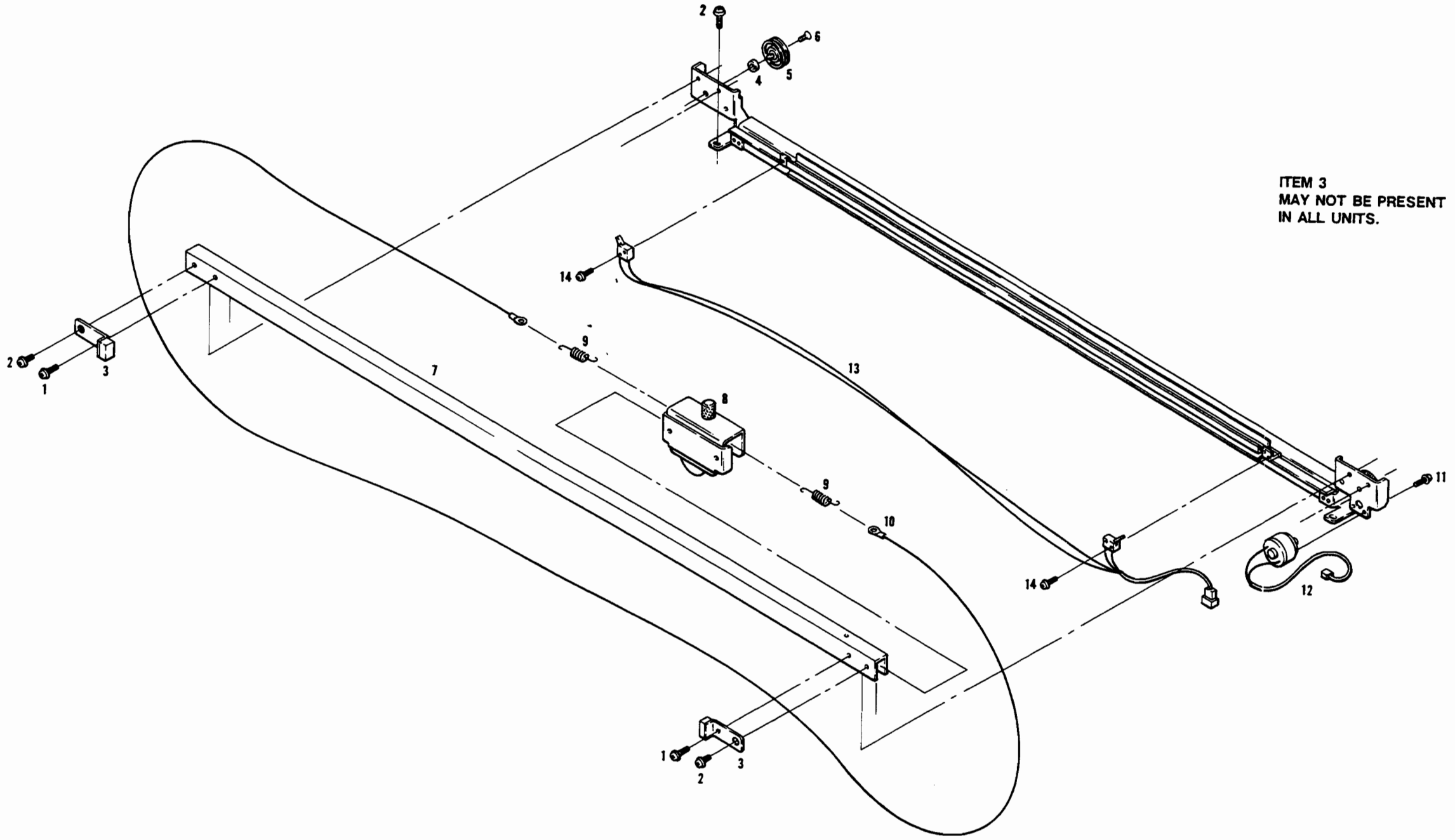


Figure 10-21. Cutter Assembly
Illustrated Parts Breakdown

Table 10-23. Parts List, Y-Axis Cutter

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
	K3M10375	3	1	K3M10376	5	1	Y-AXIS ASSEMBLY
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 (INCLUDES HOUSING)
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 AND SSW18)
14							SCREW



ITEM 3
MAY NOT BE PRESENT
IN ALL UNITS.

Figure 10-22. Y-Axis Cutter
Illustrated Parts Breakdown

Table 10-24. 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 10-24. 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

* See end of this parts list for P/Ns of latest revision of EPROMS for the processor PCA.

Table 10-24. 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
	0957-0033	8	1	0957-0033	8	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
*							
U9	C1623–18015	0	1	C1623–18015	0	1	EPROM
U10	C1623–18016	1	1	C1623–18016	1	1	EPROM
U11	C1623–18017	2	1	C1623–18017	2	1	EPROM
U12	C1623–18018	3	1	C1623–18018	3	1	EPROM

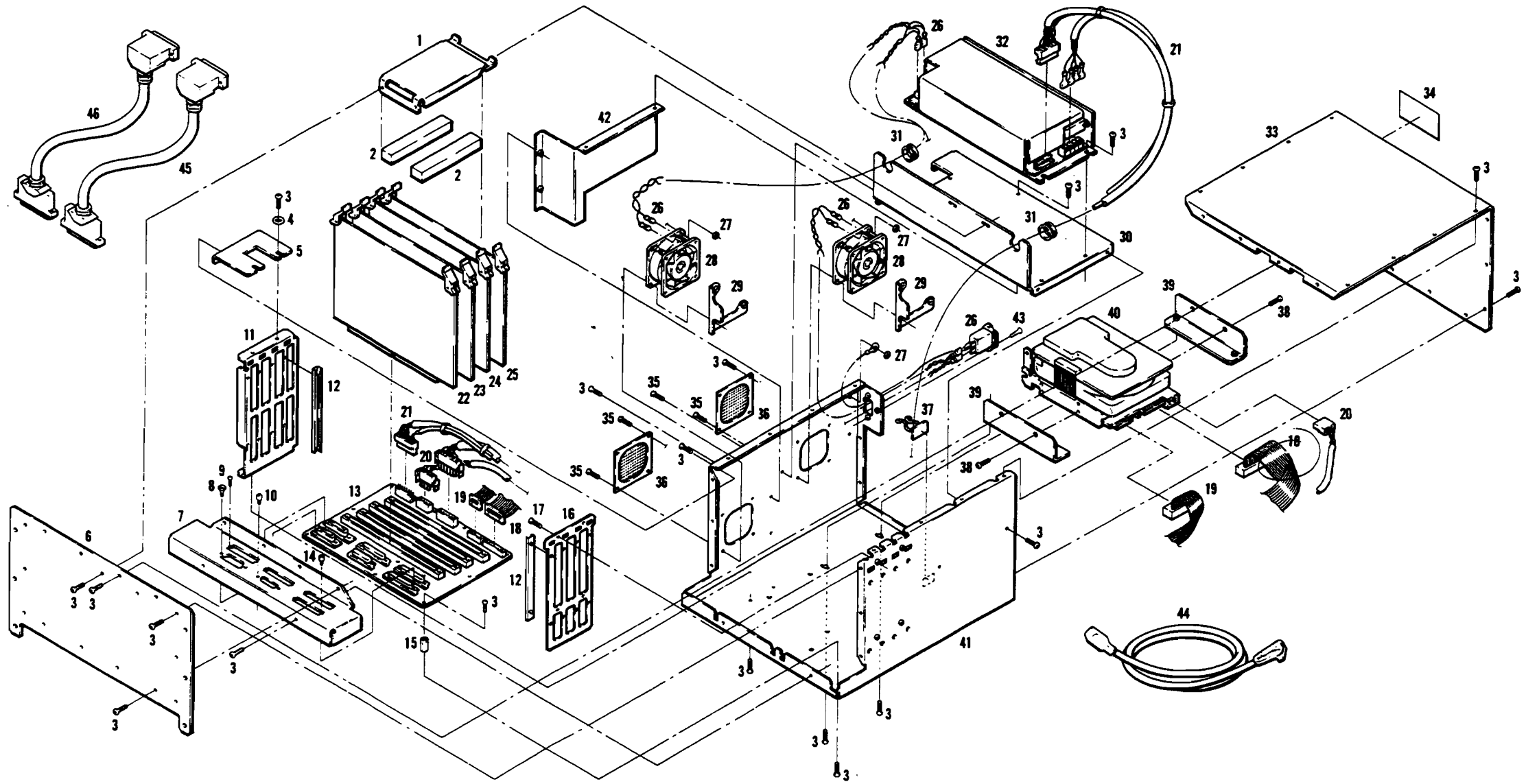


Figure 10-23. Vector-to-Raster Converter
Illustrated Parts Breakdown

Table 10-25. Parts List, Print Engine PCAs

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	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 (PHS-1)

Table 10-26. 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
	PH3-8-97	3	1	PH3-8-97	3	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

Table 10-26. Parts List, Cable Assemblies (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
16	PH3-8-78	3	1	PH3-8-78	3	1	NEAR END 2 SENSOR (SSW6) HARNESS
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
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
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 ASSEMBLY FLAT (RMCN3)

Table 10-26. Parts List, Cable Assemblies (Continued)

REF DES	250 PART NUMBER	C D	QTY	255 PART NUMBER	C D	QTY	DESCRIPTION
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)
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 10-27. Parts List, Exchange Assemblies (Model 250/255)

REF DES	250 PART NUMBER	CD	QTY	255 PART NUMBER	CD	QTY	DESCRIPTION
	C1600-69301	7	1	C1600-69301	7	2	PCA-PIN ELECTRODE DRIVER (PED)
	C1600-69302	8	2	C1600-69303	9	2	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
	0957-0033	8	1	0957-0033	8	1	DISC DRIVE, VRC

Table 10-28. Parts List, C1643A Processor Upgrade Kit (Model 240D/E Only)

REF DES	240D PART NUMBER	CD	QTY	240E PART NUMBER	CD	QTY	DESCRIPTION
	C1623–68103	2	1	C1623–68103	2	1	Swath Ram PCA
	C1623–68106	5	1	C1623–68106	5	1	Processor PCA
	C1643–90001	0	1	C1643–90001	0	1	User's Manual
	C1620–90022	8	1	C1620–90022	8	1	Reference Guide

Table 10-29. Parts List, HP Model C1621A/C1622A Take-Up Reel (Models 240D/E Only)

REF DES	C1621A PART NUMBER	C D	QTY	C1622A PART NUMBER	C D	QTY	DESCRIPTION
	C1621–90000	3	1	C1621–90000	3	1	HARDWARE SUPPORT DOCUMENT
	C1621–90002	5	1	C1621–90002	5	1	INSTALLATION AND USER'S GUIDE
1	C1621–00018	4	1	C1622–00003	8	1	LABEL, HP LOGO
2	C1621–60002	2	1	C1621–60002	2	1	COVER ASSY, LEFT
3	C1621–0019	5	1	C1621–0019	5	1	SLEEVE, PLATE ADJUST
4	C1621–00004	8	1	C1621–00004	8	1	SIDE PLATE, LEFT
5	C1621–0014	0	1	C1621–0014	0	1	MOUNT, MOTOR
6	0535–0043	6	6	0535–0043	6	6	NUT, HEX M4 X .7
7	1500–0807	8	1	1500–0807	8	1	PULLEY, DRIVE
8	1500–0808	9	1	1500–0808	9	1	BELT, DRIVE
9	1500–0330	2	1	1500–0330	2	1	PULLEY, MOTOR
10	C1621–00015	3	1	C1621–00015	3	1	PLATE, BELT ADJUST
11	0515–1544	2	2	0515–1544	2	2	SCREW, MOTOR
12	3050–0893	9	1	3050–0893	9	1	WASHER, METRIC
13	0515–0780	6	6	0515–0780	6	6	SCREW, MET
14	C1621–60010	2	1	C1621–60010	2	1	MOTOR ASSY
15	C1621–00005	9	1	C1621–00005	9	1	SIDEPLATE, RIGHT
16	0515–1597	5	6	0515–1597	5	6	SCREW, M4X 0.7 X 14
17	C1621–60100	1	1	C1621–60100	1	1	PCA, MAIN
18	C1621–60001	1	1	C1621–60001	1	1	COVER ASSY, RIGHT
19	N/A			N/A			POWER MODULE (SEE CHAPTER 3 FOR SELECTION)
20	C1621–60007	7	1	C1621–60007	7	1	SWITCH ASSEMBLY

Table 10-29. Parts List, HP Model C1621A/C1622A Take-Up Reel (Models 240D/E Only) (Continued)

REF DES	C1621A PART NUMBER	C D	QTY	C1622A PART NUMBER	C D	QTY	DESCRIPTION
21	C1621–00025	3	1	C1621–00025	3	1	LABEL, POWER
22	C1621–60102	3	1	C1621–60102	3	1	PCA, POWER
23	C1621–60006	6	1	C1621–60006	6	1	CABLE ASSEMBLY, POWER
24	C1621–60005	5	2	C1622–60001	2	2	SPINDLE, SLOTTED
25	C1621–00017	3	4	C1621–00017	3	4	LABEL, PAPER LOAD
26	0510–0244	7	4	0510–0244	7	4	SNAP RING
27	C1621–20005	1	1	C1621–20005	1	1	SLEEVE, LEFT
28	2190–0586	2	3	2190–0586	2	3	WASHER, METRIC
29	0515–0175	3	3	0515–0175	3	3	SCREW, MET
30	1460–2167	1	1	1460–2167	1	1	SPRING
31	C1621–20007	3	1	C1621–20007	3	1	SHAFT, IDLER
32	C1621–60004	4	1	C1621–60004	4	1	HUB ASSY, LEFT
33	C1621–60003	3	1	C1621–60003	3	1	HUB ASSEMBLY, RIGHT
34	C1621–60003	3	1	C1621–60003	3	1	SLEEVE ASSEMBLY, RIGHT
35	C1621–00003	7	1	C1622–00001	6	1	BASE
36	0515–0896	5	8	0515–0896	5	8	SCREW, MET
37	C1622–00004	9	1	C1622–00004	9	1	LABEL SERIAL
38	C1621–00008	2	1	C1622–00005	0	1	PLATE, TOP
39	N/A			N/A			NUT (PART OF PRINT ENGINE)

THE PARTS LIST FOR THE C1621A/C1622A TAKE-UP REEL ASSEMBLY IS ON THE PREVIOUS TWO PAGES OF THIS MANUAL.

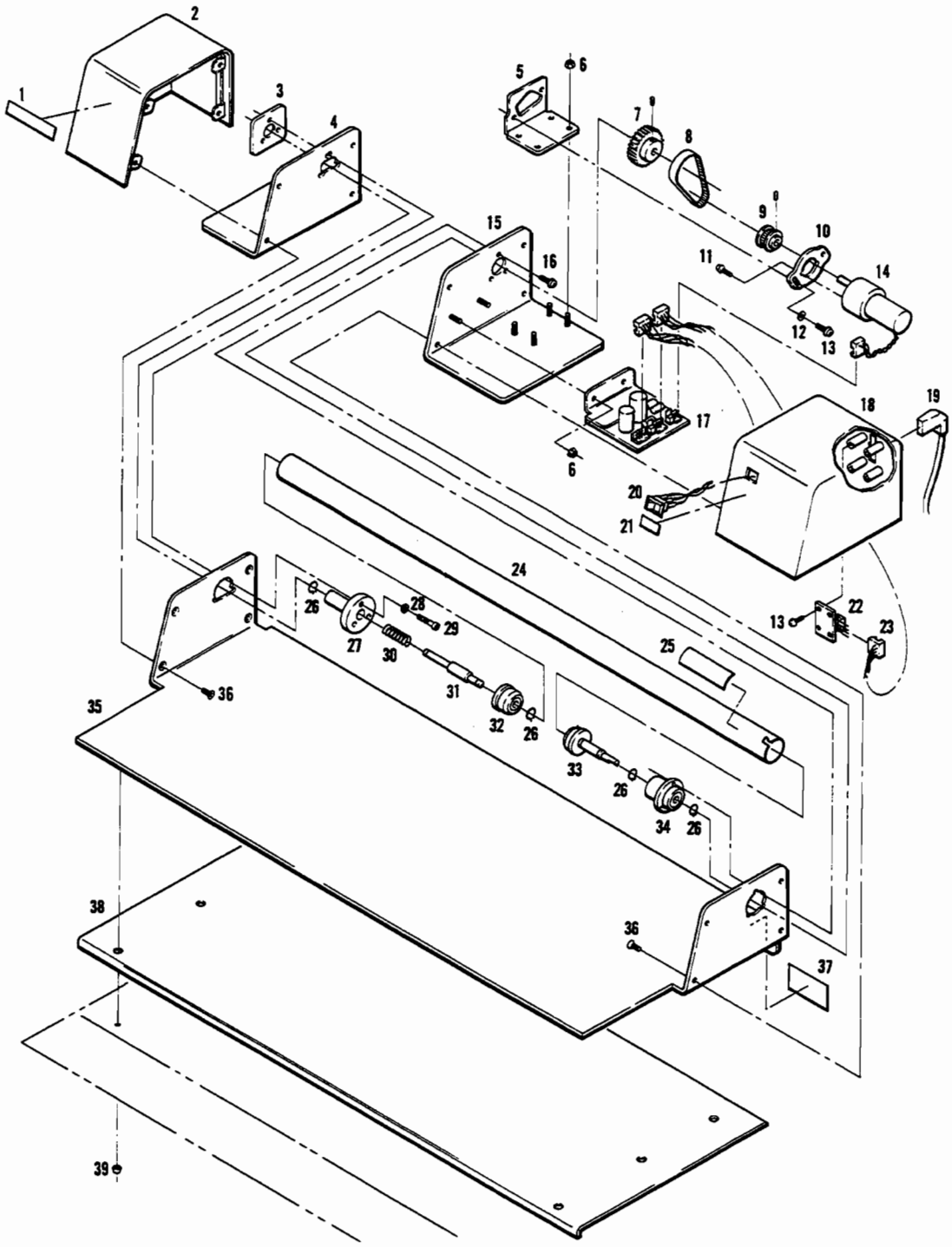


Figure 10-24. C1621A/C1622A Take-Up Reel Assembly
Illustrated Parts Breakdown

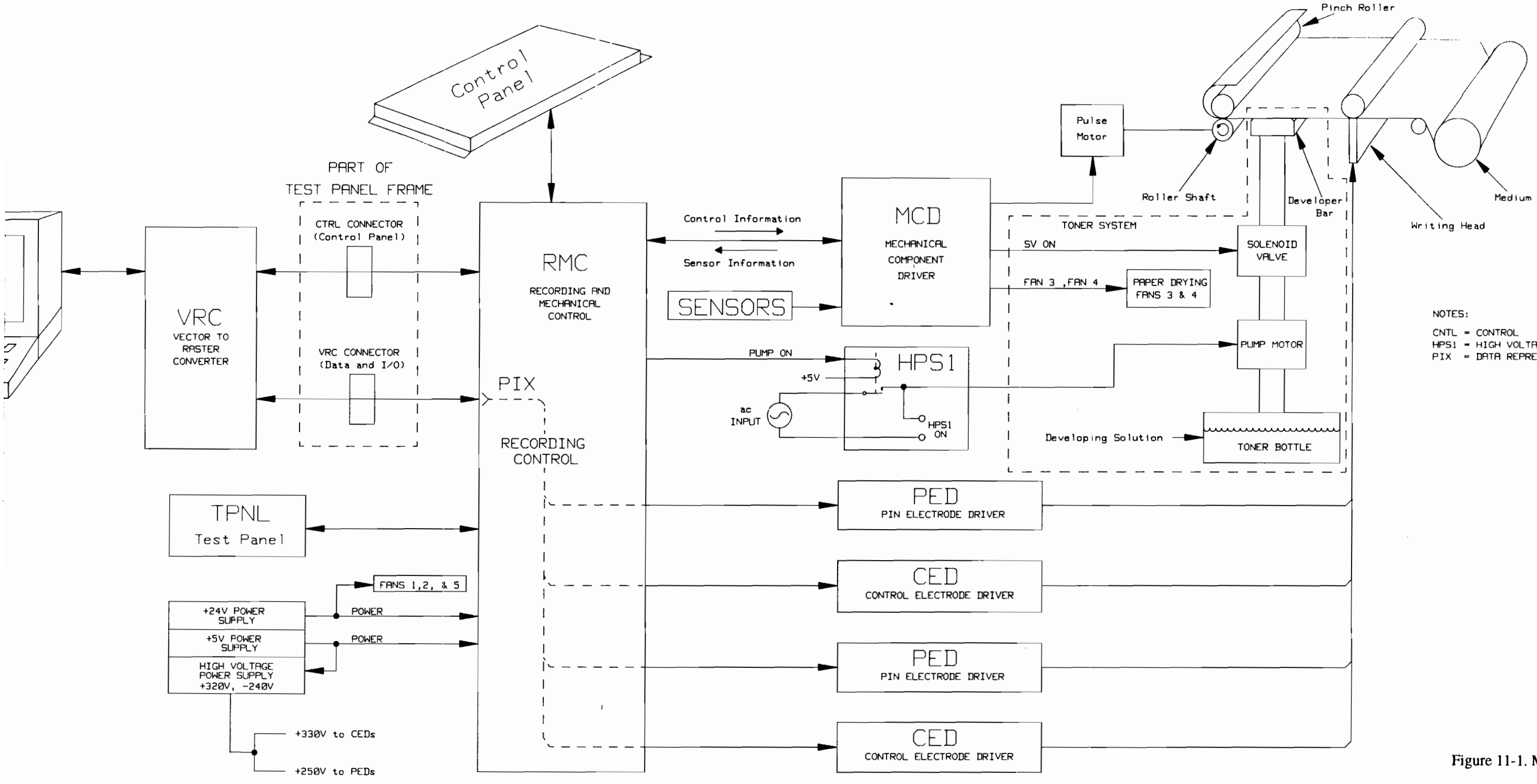
C1621–C–1–1

CHAPTER 11

DIAGRAMS

11-1. BLOCK DIAGRAMS

11-2. 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 chapter.



NOTES:

CNTL = CONTROL
HPS1 = HIGH VOLTAGE POWER SUPPLY (1 OF 1)
PIX = DATA REPRESENTING GRAPHICS DOTS (PIXELS

Figure 11-1. Model 240D/E Functional Block Diagram

OF MAIN POWER PANEL

Main Power

CB1

10 A

NF1

NOISE FILTER

RELAY 1
COIL SHOWN ON
POWER DISTRIBUTION
WIRING DIAGRAM 3

RELAY 1

FRONT OF PLOTTER

PSW1

PSW3

PSW4

100-120V

BRN

BLU

UR

MR

LR

UL

ML

LL

220-240V

BRN BLU WHT BLK

T1

220 Vac

120 Vac

CB3

8 A

BRN

PSW3 AND 4 CONTACT LABELS

UR = UPPER RIGHT
MR = MIDDLE RIGHT
LR = LOWER RIGHT
UL = UPPER LEFT
ML = MIDDLE LEFT
LL = LOWER LEFT

Q

53 OR 58-62 Hz

d. Automatically Tripped)

Converter

USER PANEL

CB2

8 A

CN2

CONTROLLER

VRC POWER SUPPLY

+5 V
+12 V
-12 V

VRC PCAs

NOTE: VRC is connected to controller jack.

NOISE FILTER NF2

MCCN3

BLK

PSW2

BRN

TO MECHANICAL CONTROL DRIVER

TOP COVER INTERLOCK SWITCH

(LPS1) +5V, 10A LOW VOLTAGE POWER SUPPLY

FG
H
N
+5V
SG

TB1

+5V RECORDING & MECHANICAL CONTROL

TO POINT B
POWER DISTRIBUTION
WIRING DIAGRAM 2

(LPS2) +24V, 4.5A LOW VOLTAGE POWER SUPPLY

+24V
SG

+24V MECHANICAL COMPONENT DRIVER

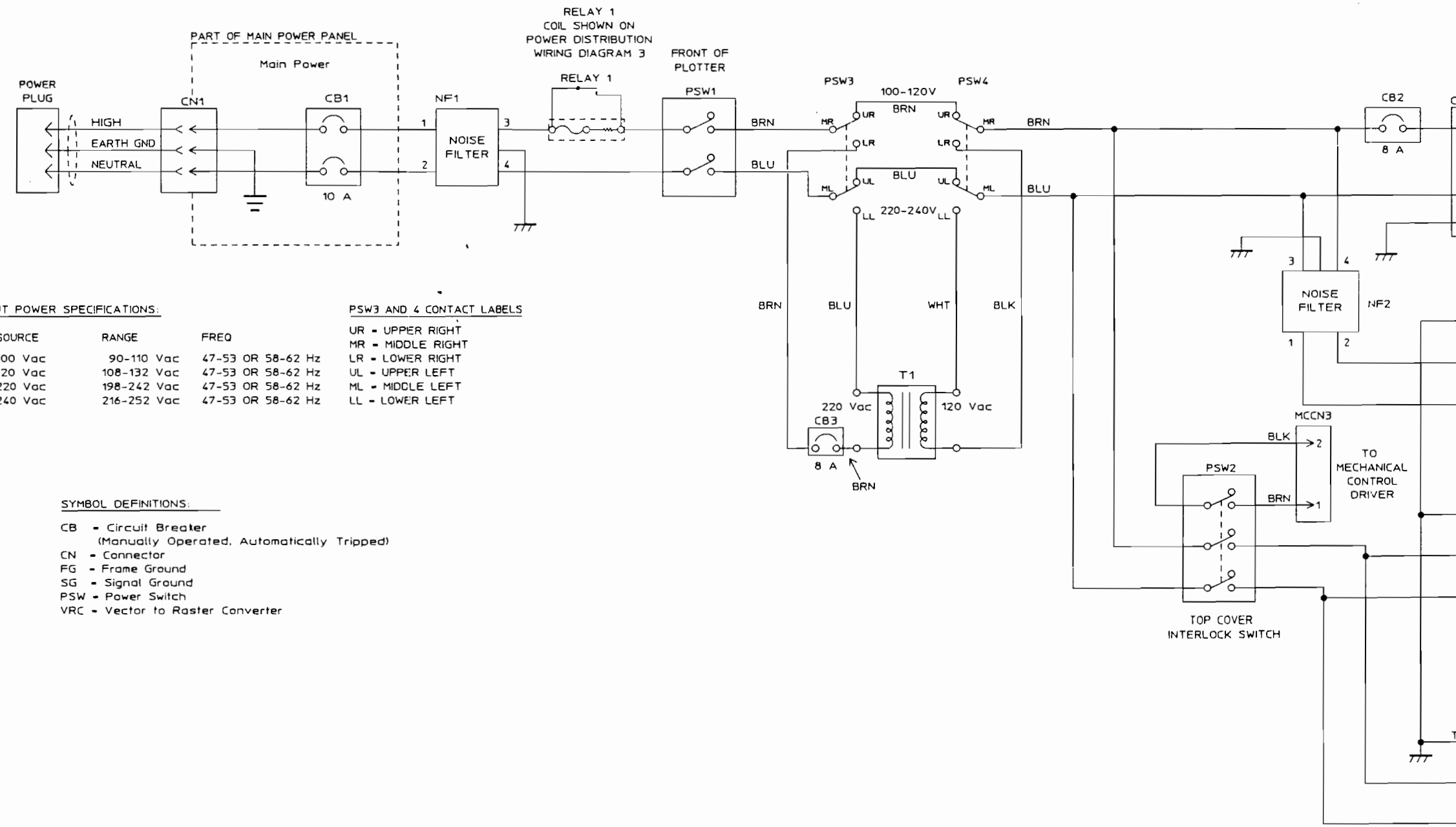
TO FG

TO H

TO N

100-120 Vac
TO POINT A
POWER DISTRIBUTION
WIRING DIAGRAM 2

Figure 11-2. 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 Breaker
(Manually Operated, Automatically Tripped)
CN = Connector
FG = Frame Ground
SG = Signal Ground
PSW = Power Switch
VRC = Vector to Raster Converter

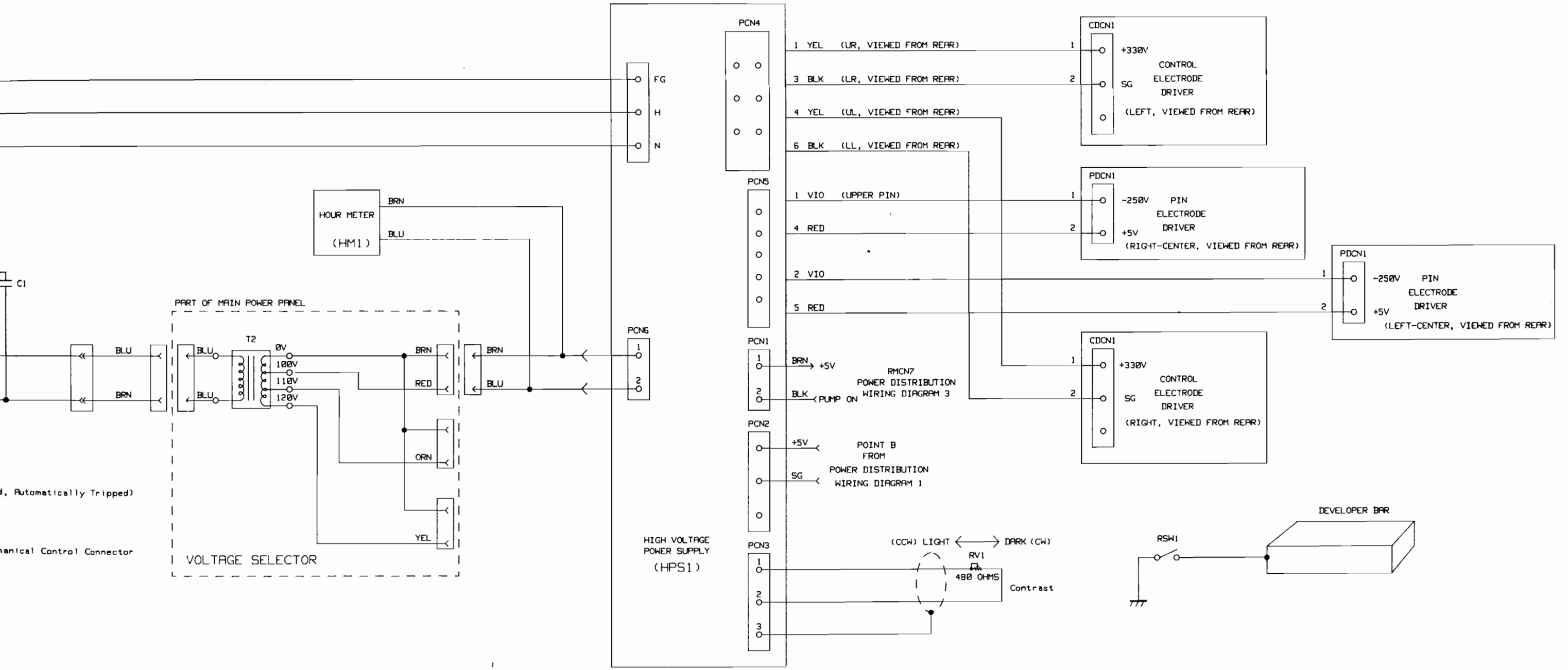
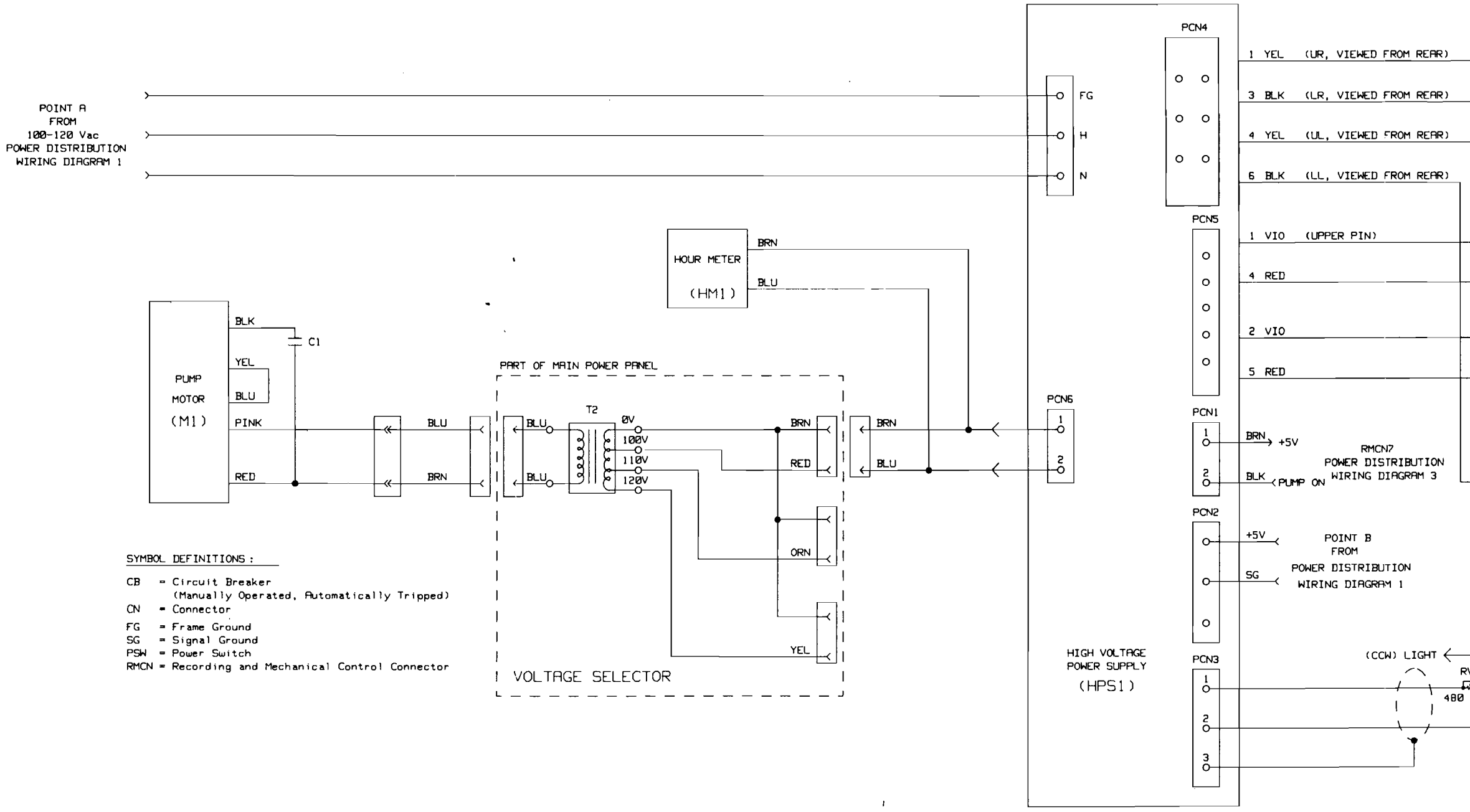


Figure 11-3. Power Distribution Diagram
(Sheet 2 of 4)



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

MCON8 <-----> MECHANICS | RMCN7 <-----> POWER SUPPLY | MCON3 <-----> SENSOR SWITCHES | RMCN4 <-----> OPCN1

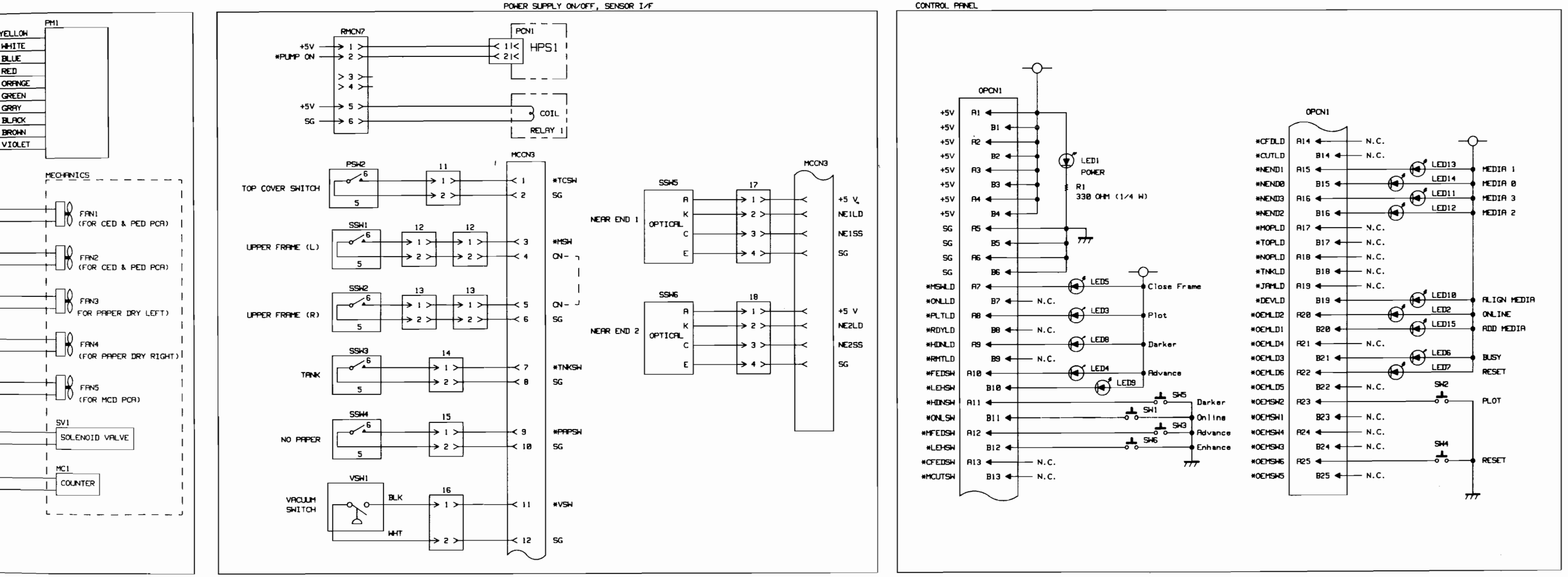
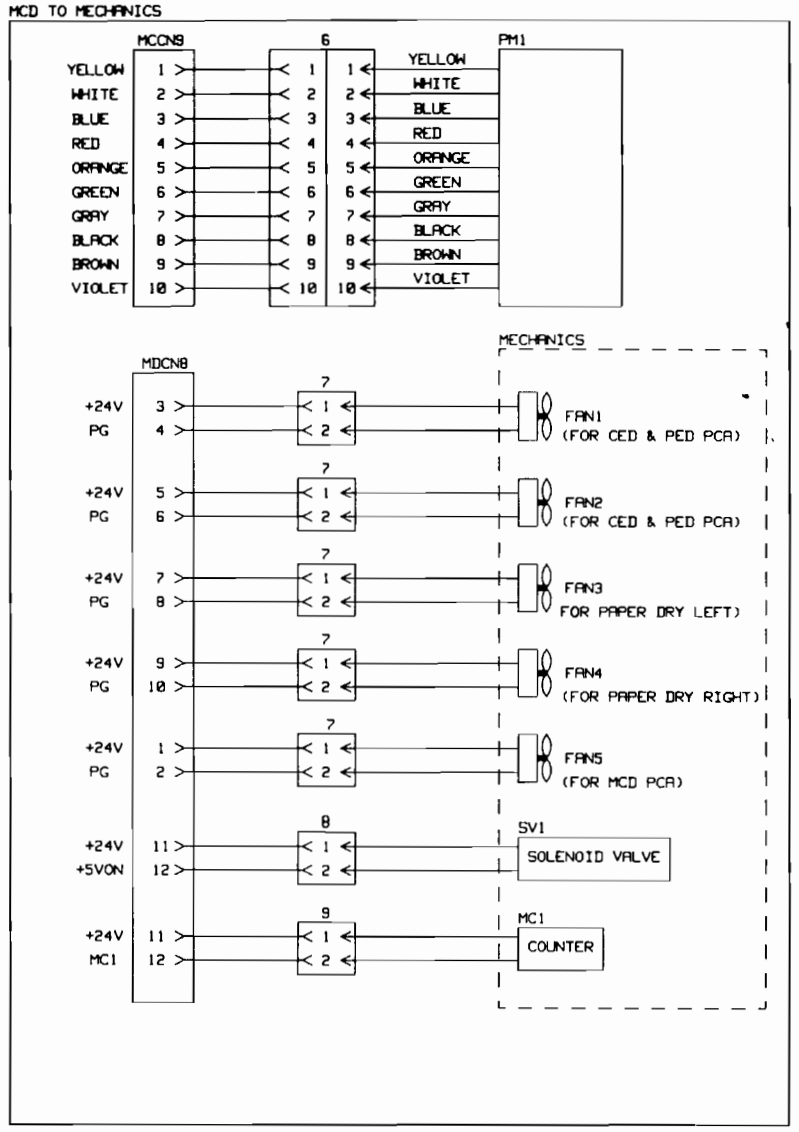
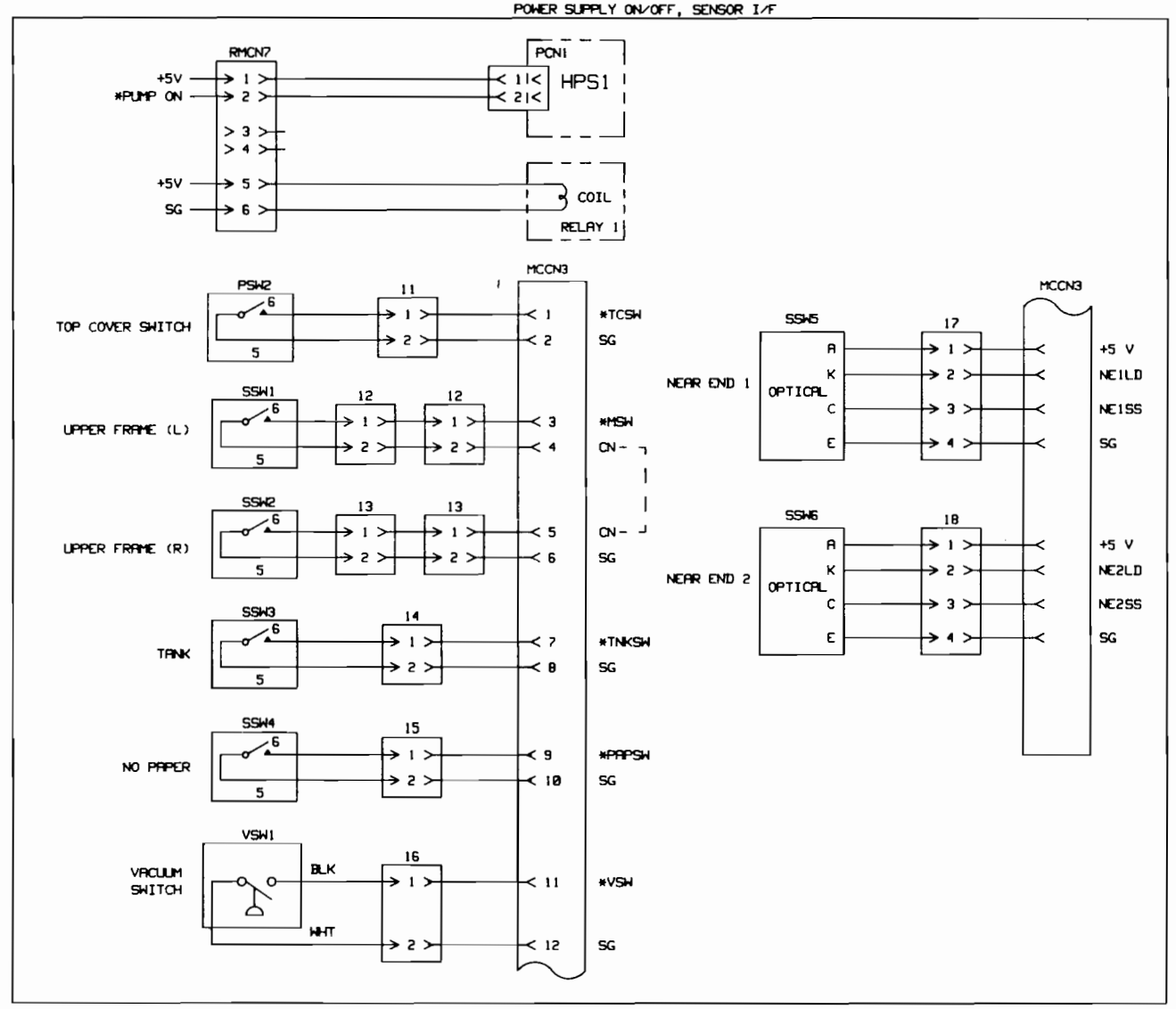


Figure 11-4. Power Distribution Diagram
(Sheet 3 of 4)

MCON8<-----PM1 MCON8<-----MECHANICS RMCN7<------POWER SUPPLY MCON3<-----SENSOR SWITCHES





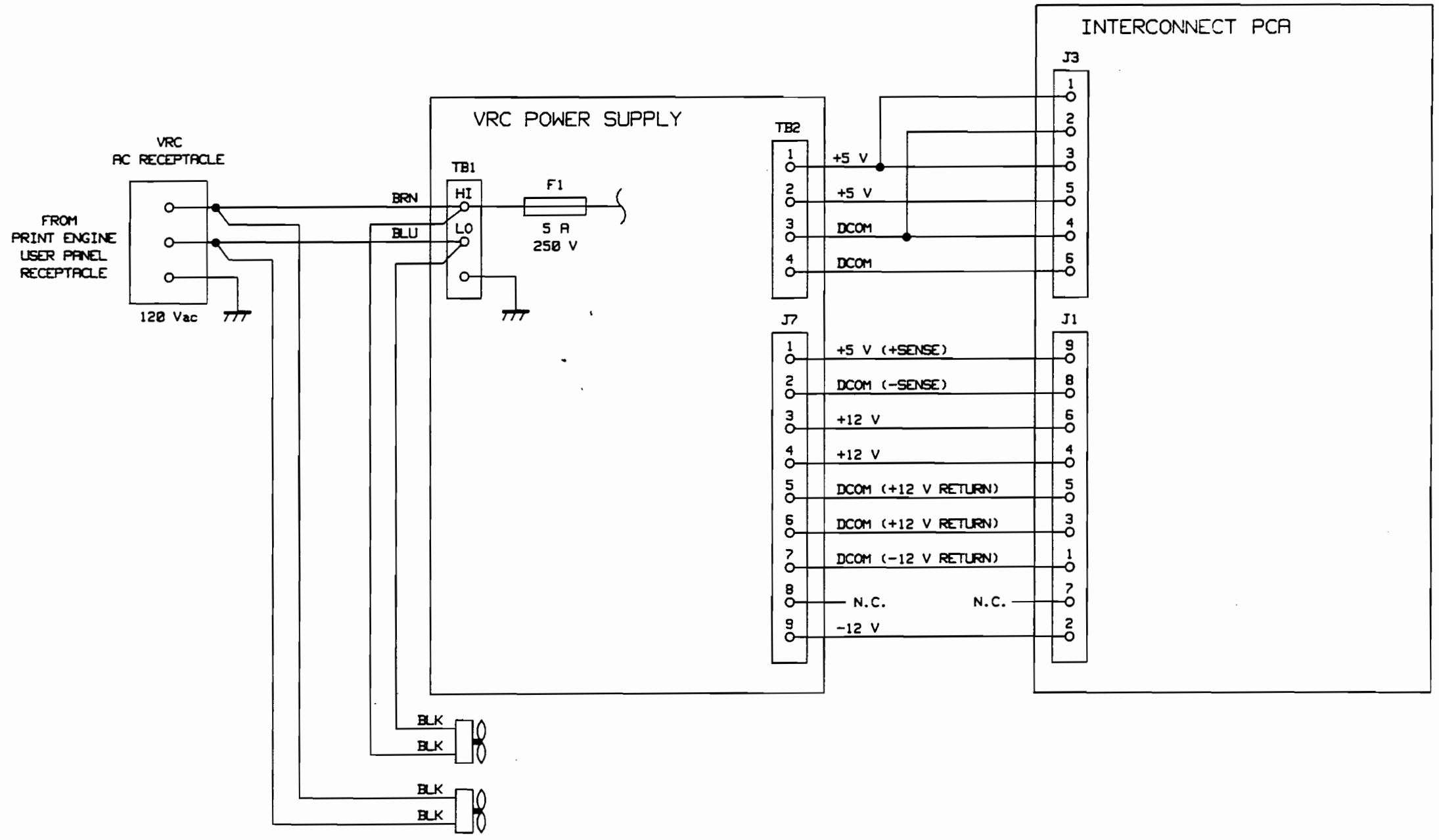
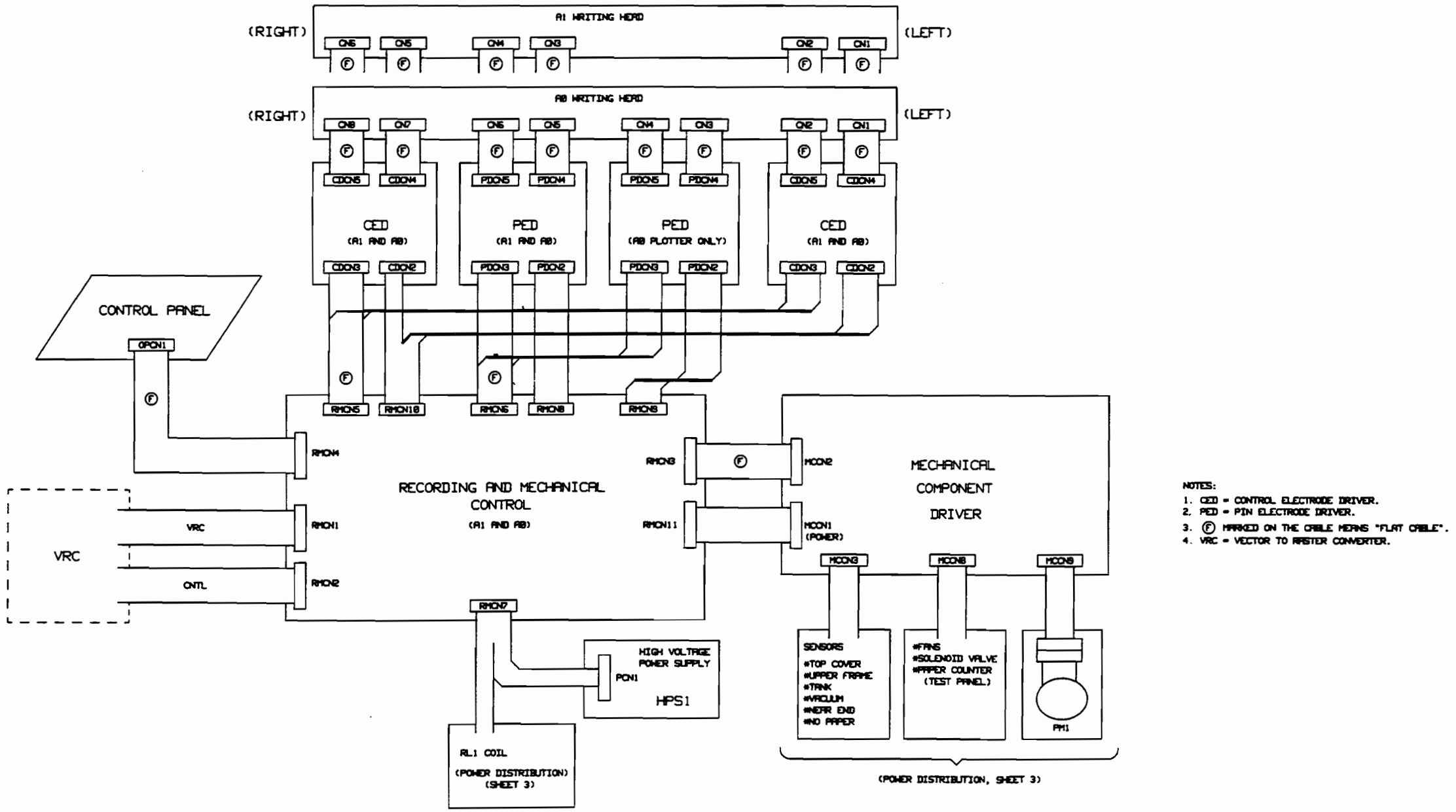


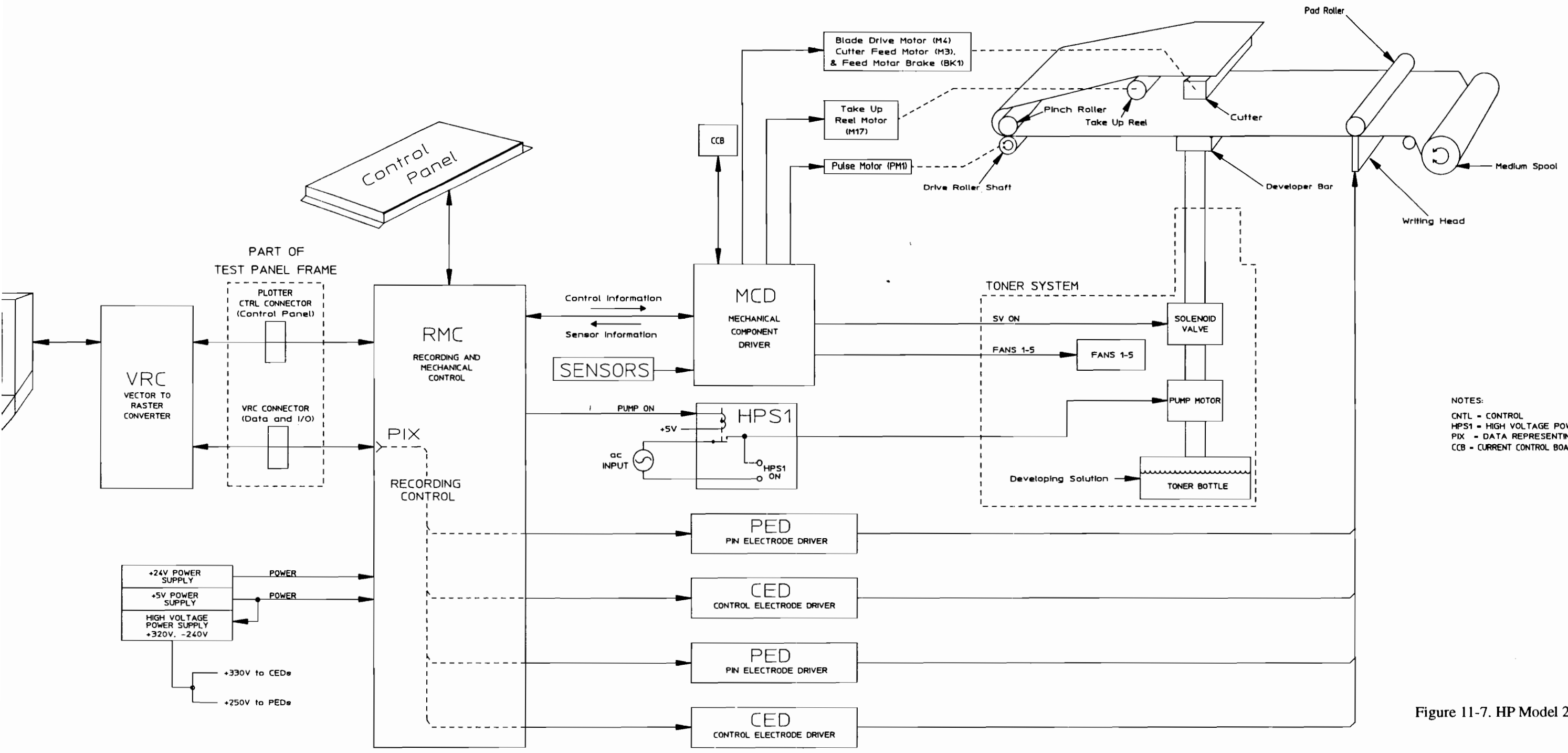
Figure 11-5. Power Distribution Diagram
(Sheet 4 of 4)



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 11-6. Interconnecting Cabling Diagram



NOTES:

CNTL = CONTROL
HPS1 = HIGH VOLTAGE POWER SUPPLY (1 OF 1)
PIX = DATA REPRESENTING GRAPHICS DOTS (PIXELS)
CCB = CURRENT CONTROL BOARD (TAKE UP REEL)

Figure 11-7. HP Model 250/255 Functional Block Diagram

RT OF MAIN POWER PANEL

Main Power

CB1

10 A

NF1

NOISE FILTER

1

2

3

4

RELAY 1
COIL SHOWN ON
POWER DISTRIBUTION
WIRING DIAGRAM 3

RELAY 1

FRONT OF PLOTTER

PSW1

BRN

BLU

PSW3

PSW4

100–120V

MR

UR

LR

UL

ML

LL

220–240V

BRN

BLU

WHT

BLK

T1

220 Vac

120 Vac

CB3

8 A

BRN

REQ

7-53 OR 58-62 Hz
7-53 OR 58-62 Hz
7-53 OR 58-62 Hz
7-53 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

ed, Automatically Tripped)

Converter

USER PANEL

CB2

8 A

CN2

CONTROLLER

VRC POWER SUPPLY

+5 V

+12 V

-12 V

VRC PCAs

NOTE: VRC is connected to controller jack.

NOISE FILTER

NF2

MCCN3

BLK

PSW2

BRN

TO MECHANICAL CONTROL DRIVER

TOP COVER INTERLOCK SWITCH

FG

H

N

+5V, 10A LOW VOLTAGE POWER SUPPLY

(LPS1)

+5V

SG

LPS1 STRAP

PH3-8-51 (A1)
PH3-3-51E (A0)

TB1

+5V

SG

RECORDING & MECHANICAL CONTROL

TO POINT B
POWER DISTRIBUTION
WIRING DIAGRAM 2

LPS2 STRAP

PH3-8-52 (A1)
PH3-3-52E (A0)

+24V

SG

+24V, 4.5A LOW VOLTAGE POWER SUPPLY

(LPS2)

+24V

SG

MECHANICAL COMPONENT DRIVER

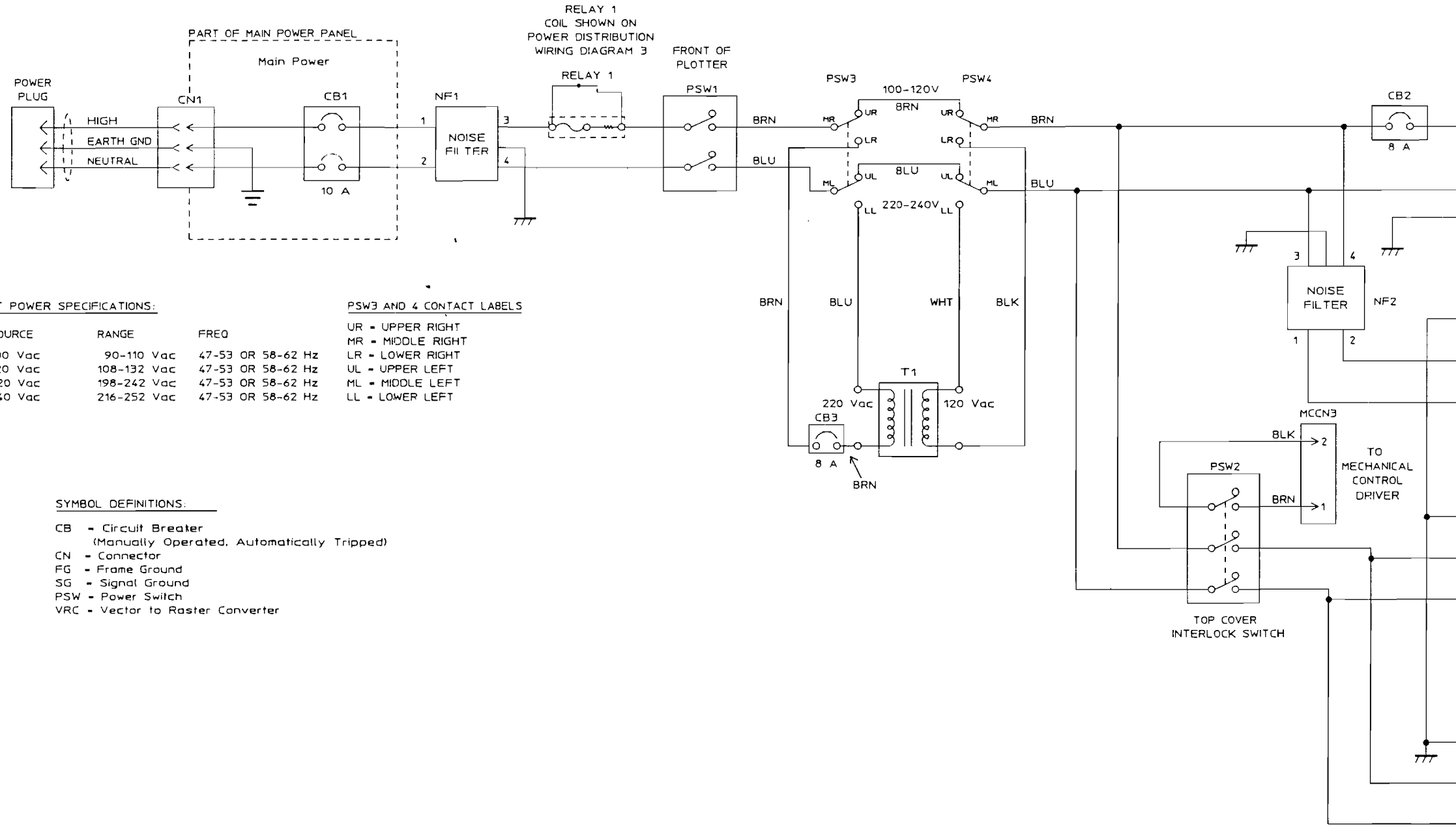
TO FG

TO H

TO N

100–120 Vac
TO POINT A
POWER DISTRIBUTION
WIRING DIAGRAM 2

Figure 11-8. 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

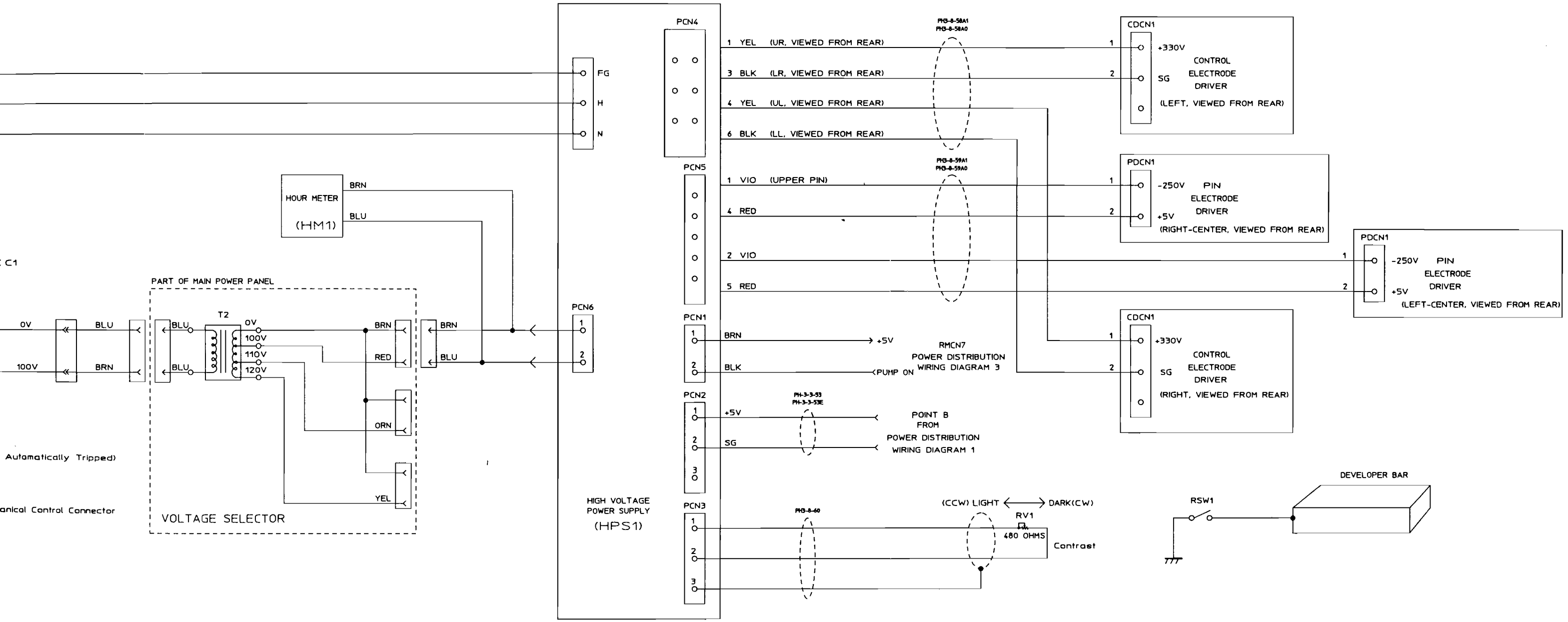


Figure 11-9. Power Distribution Diagram
(Sheet 2 of 5)

POINT A
FROM
100-120 Vac
POWER DISTRIBUTION
WIRING DIAGRAM 1

FG
H
N

HOUR METER
(HM1)
BRN
BLU

PUMP
MOTOR
(M1)
BLK
YEL
BLU
PINK
RED
C1
0V
100V
BLU
BRN

PART OF MAIN POWER PANEL

T2
BLU
BLU
0V
100V
110V
120V
BRN
RED
ORN
YEL

VOLTAGE SELECTOR

BRN
BLU

PCN6
1
2

HIGH VOLTAGE
POWER SUPPLY
(HPS1)

PCN4
1 YEL (UR, VIEWED FROM REAR)
3 BLK (LR, VIEWED FROM REAR)
4 YEL (UL, VIEWED FROM REAR)
6 BLK (LL, VIEWED FROM REAR)

PCN5
1 VIO (UPPER PIN)
4 RED
2 VIO
5 RED

PCN1
BRN +5V
BLK PUMP ON

PCN2
+5V
SG

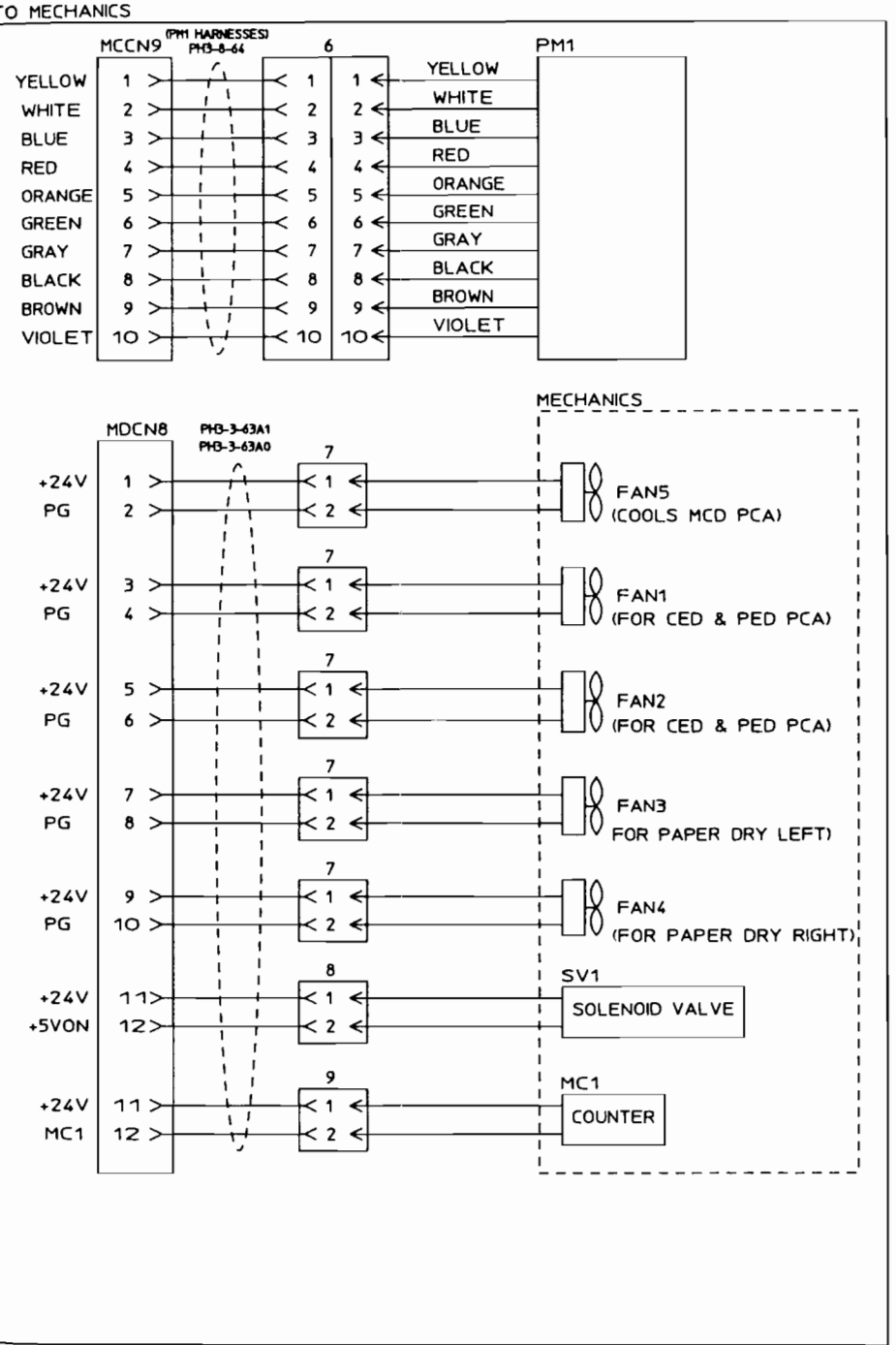
PCN3

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

MCCN9<----->PM1 MCCN8<----->MECHANICS RMCN7<----->POWER SUPPLY MCCN3<----->SENSOR SWITCHES

MCD TO MECHANICS



POWER SUPPLY ON/OFF, SENSOR I/F

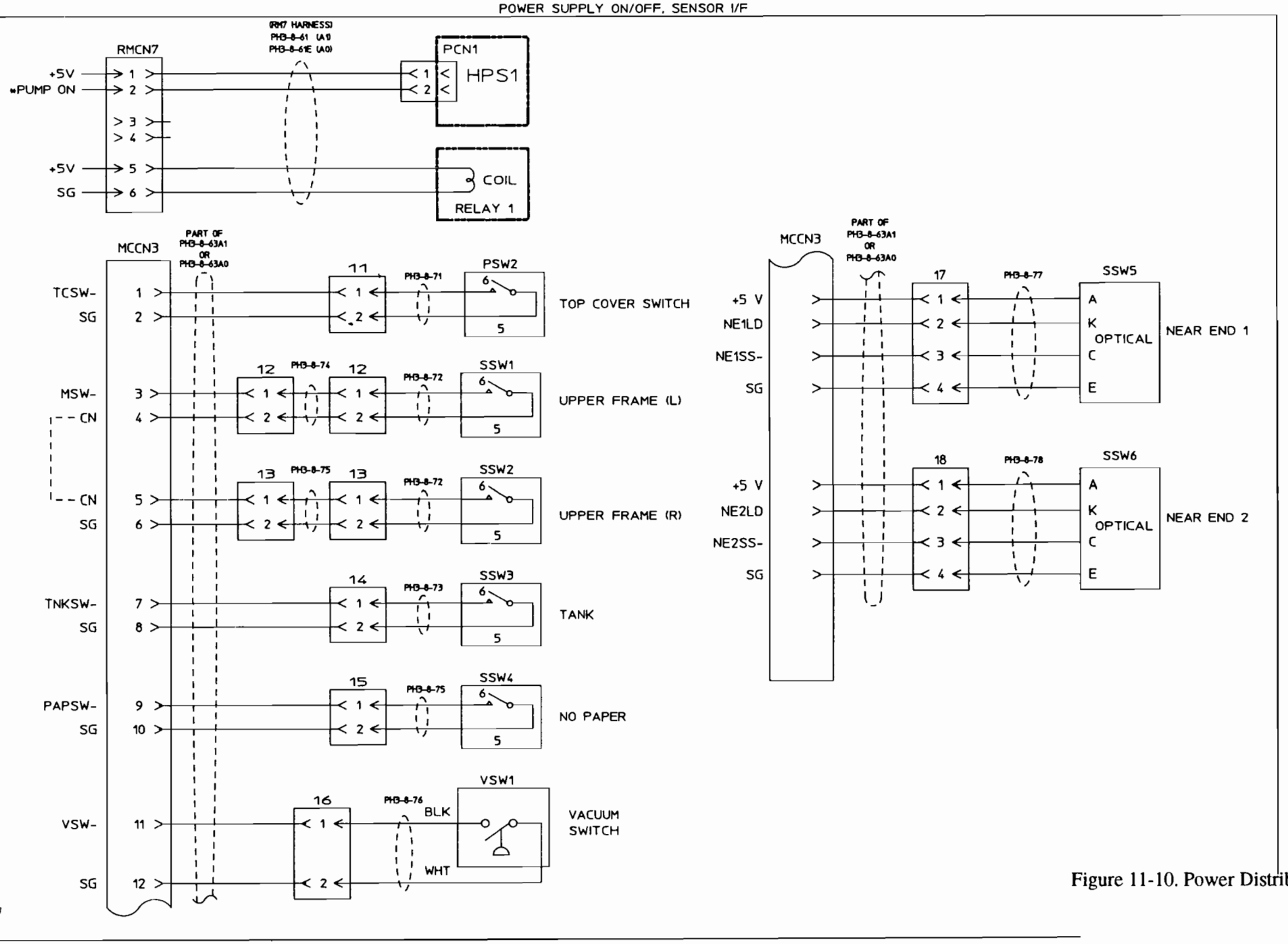


Figure 11-10. Power Distribution Diagram (Sheet 3 of 5)

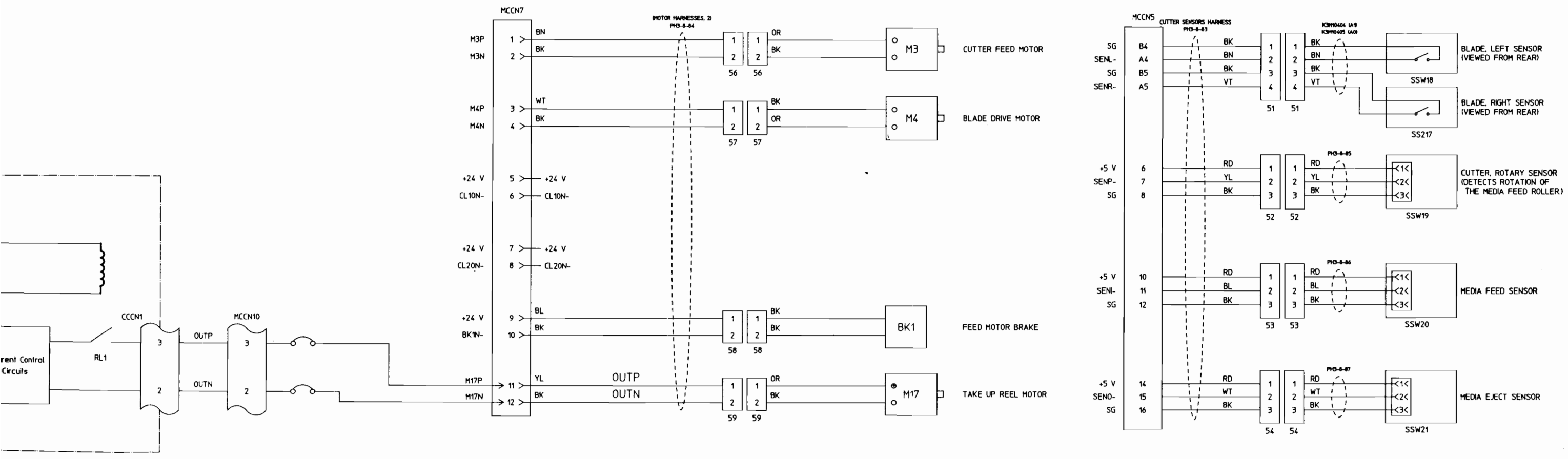


Figure 11-11. Power Distribution Diagram
(Sheet 4 of 5)

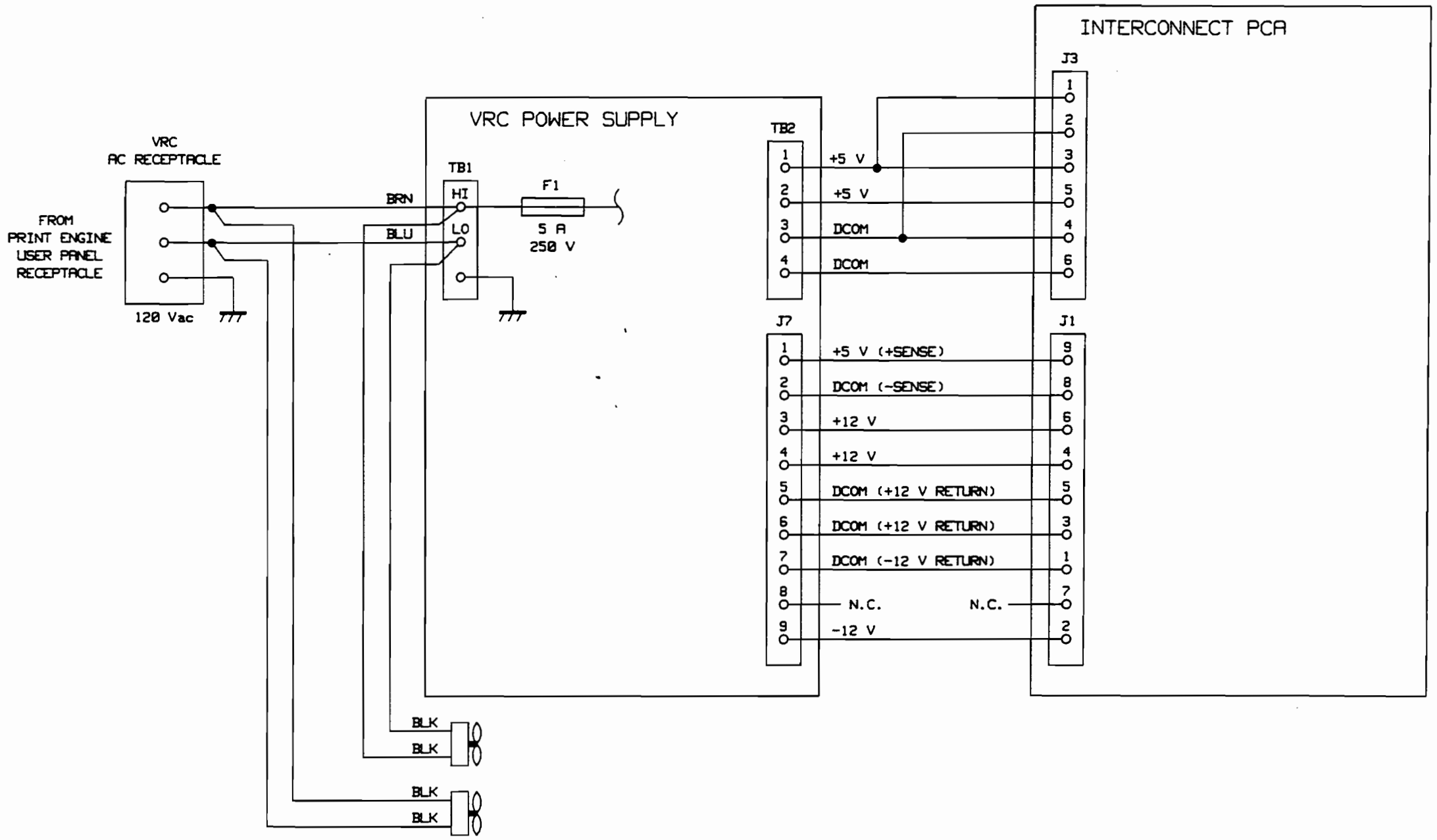


Figure 11-12. Power Distribution Diagram
(Sheet 5 of 5)

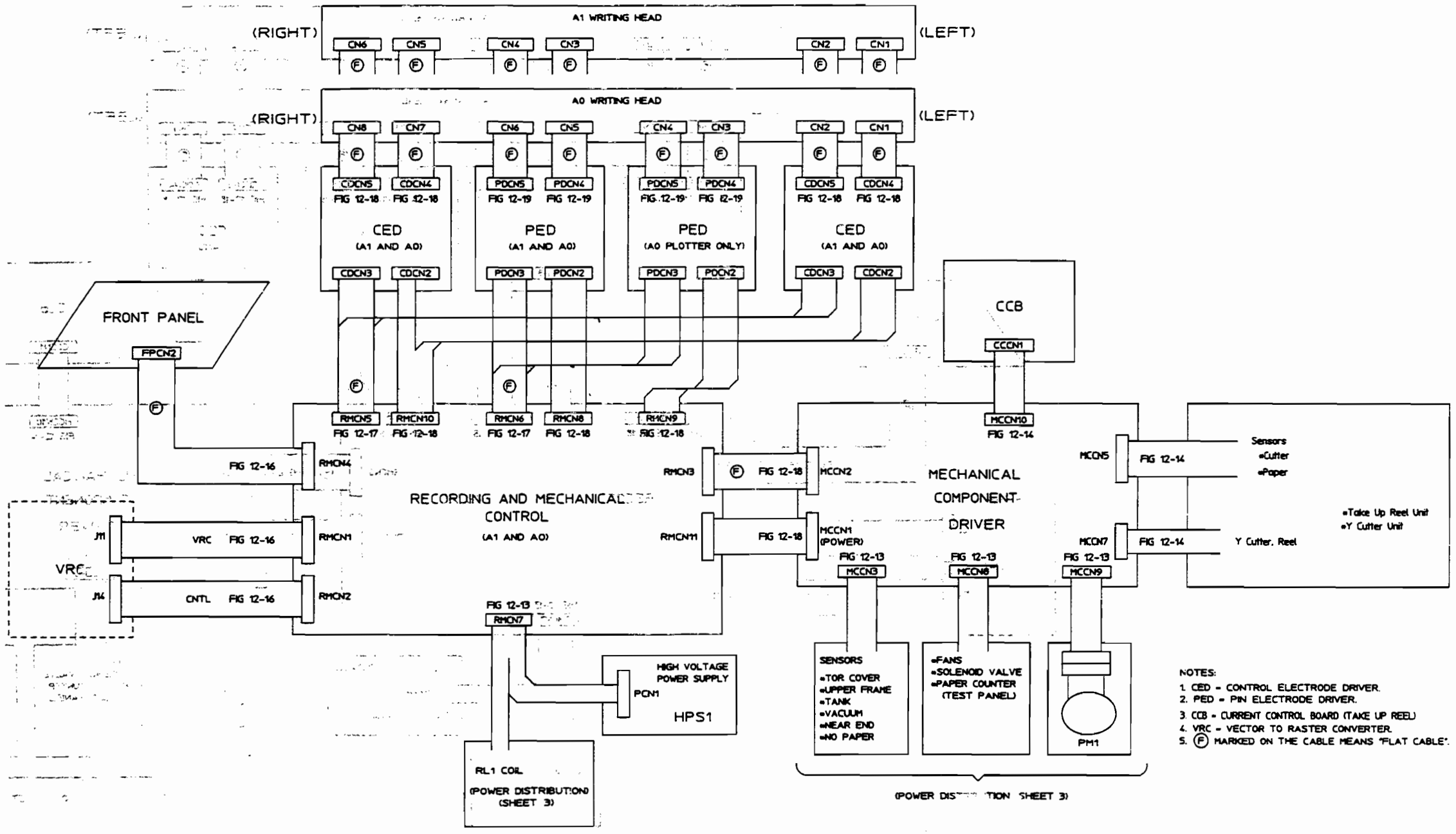


Figure 11-13. Interconnecting Cabling Diagram