Model 3400 Series
Ruggedized Laser Printer

Operation and Maintenance Manual

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RECORD OF CHANGES

Date	Revision	Description of Change
060202	–	INITIAL RELEASE

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1. CONFIGURATION

1.1. Introduction

This chapter defines the configuration of a specific Model 3400 Series printer. Information is provided concerning system configuration (Table 1-1), field-replaceable units (Table 1-2), external cabling (Table 1-3), and external connector signal assignments (Table 1-4).

Table 1-1. System Configuration

Characteristic	Description
Top Assembly Part No.	
Input Power	110 VAC or 220VAC depending on configuration, 50/60 Hz
Memory, Standard Optional	64 Mb 320 Mb
Installation Configuration	Table Top Mount or Rack Mount depending on configuration

Table 1-2. Field Replaceable Units

Description	Part No.	Quantity Per Chassis
Toner Cartridge		1
Dust Filter, Side		1
Dust Filter, Front		1
Print Engine Assembly		1
EMI Filter		1
Circuit Breaker/Power Switch		1
Control Panel		1

Table 1-3. External Cables/Connector

Function	Part No.
Power Input	See Installation Control and Interconnect Drawings

Table 1-4. External Connector Signal Assignments

Connector	Function	Pin	Signal
J1	AC Line Power	A	AC HOT
		B	NEUTRAL
		C	CHASSIS GROUND
J2	Parallel Interface	1	DATA STROBE
		2	DATA BIT 0
		3	DATA BIT 1
		4	DATA BIT 2
		5	DATA BIT 3
		6	DATA BIT 4
		7	DATA BIT 5
		8	DATA BIT 6
		9	DATA BIT 7
		10	ACKNLG
		11	BUSY
		12	PAPER OUT
		13	SELECT
		14	AUTO LF
		15	NC
		16	LOGIC GND
		17	CHASSIS GND
		18	+5V
		19	GND
		20	GND
		21	GND
		22	GND
		23	GND
		24	GND
		25	GND
		26	GND
		27	GND
		28	GND
		29	GND
		30	GND
		31	INIT
		32	FAULT
		33	GND
		34	UNDEFINED
		35	UNDEFINED
		36	DSL
J3	USB	1	VBUS
		2	DATA -
		3	DATA +
		4	GND

J4	Ethernet 10/100BaseT	1 2 3 4 5 6 7 8	TX+ TX- RX+ NC NC RX- NC NC

2. GENERAL INFORMATION

2.1. Scope

This manual provides information and instructions required for the operation and maintenance of the Model 3400 Series printer manufactured by Datametrics Corporation.

2.2. Applicable Documents

Military Standards	
MIL-STD-461C	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
Commercial Standards	
IEEE-1284B	Standard Signaling Method, Bi-directional Parallel Peripheral Interface
Hewlett Packard	
	HP LaserJet 2400 Series User's Guide

2.3. Printer Description

The Model 3400 Series printer is a ruggedized, general-purpose laser printer that is configured in a single enclosure. The equipment is packaged using environmental management techniques that protect internal components from shock, vibration, temperature extremes, and EMI/RFI. The chassis may be configured for tabletop or rack-mount operation. The printer includes the following primary functional elements:

- Power subsystem
- Printing subsystem
- Control console
- Cooling system
- External interfaces

2.3.1. Power Subsystem

The Model 3400 Series printer operates with 110 or 220Vac input power depending on the configuration. The input power configuration is established by DMC. The power subsystem includes an EMI filter and a circuit breaker/power switch. DC voltages required for various printer functions are generated within the commercial print engine.

2.3.2. Printing Subsystem

The Model 3400 Series printer incorporates a Hewlett Packard LaserJet 2420dn print engine that provides true 1200 x 1200 dpi resolution text and graphics with a print speed of 30 pages per minute. The printer formatter includes a Motorola 400MHz processor and 64 Mb memory, which is expandable to 320 Mb. Memory Enhancement Technology (MEt) automatically compresses data, which allows printing of images that are more complex than available memory would normally permit.

The printer may be operated with any host computer that supports Windows 98, 2000, Me, NT 4.0, XP and Macintosh System 8.6 or greater. The printer supports the PCL6 printer language, which includes 45 scalable TrueType fonts and one bitmapped line printer font. Built-in HP-GL/2 vector graphics are included to produce up to 128 shades of gray. The printer supports HP PostScript Level 3 with 35 built-in PostScript language fonts. The printer automatically detects and switches to the appropriate language for the print job.

The printer automatically loads Letter, A4, Executive, B5, or Legal paper from the 250-sheet cassette. Paper may be manually fed through the upper front-panel access door. The toner cartridge will support printing of 6,000 typical single-sided pages. The printer configuration may incorporate an IEEE-1284B bi-directional parallel Centronics interface and a Universal Serial Bus (USB) 1.1 and 2.0 interface.

2.3.3. Control Console

The control console is located on the right side of the printer front panel. This console is the operator interface for print operations other than those controlled from the host computer. Controls and indicators are described in Chapter 4.

2.3.4. Cooling System

The ruggedized Model 3400 Series printer utilizes the cooling mechanism of the commercial print engine. Two fans are located on the upper left side of the inner chassis and bottom right side on the front panel. Both locations are for air intake and use air filters.

2.3.5. External Interfaces

The rear panel of the printer includes connectors for prime power and the host computer data interface. A chassis ground lug is located on the rear panel adjacent to the power connector.

2.4. Specifications

Equipment specifications for the Model 3400 Series printer are defined in Tables 2-1 through 2-3.

2.5. Options

The Model 3400 Series printer may be configured with the optional features listed in the following paragraphs. Options included in a delivered configuration are defined in Chapter 1.

2.5.1. Memory

The printer includes provisions for one memory expansion module. The base system includes 64 Mb memory, which can be expanded to a total of 320 Mb.

2.6. Supplementary Documentation

Supplementary information pertaining to the commercial hardware and software that forms a part of the Model 3400 Series printer is provided in the HP LaserJet 2400 Printer Start Guide and within the supplied CD. This information is also available at www.hp.com for the User's Guide, Getting Started Guide and the Software Technical Reference.

Table 2-1. Physical Specifications

Characteristic	Description
Dimensions	19.00” W x 21.00”D x 10.50” H [(1)]
Weight	52 lb max

[(1)] See Installation Control Drawing.

Table 2-2. Electrical Specifications

Characteristic	Description
Input Voltage	
110 Vac input (standard)	100 to 140 Vac, single-phase, 48 to 62 Hz
or 220 Vac input (optional)	187 to 253 Vac, single-phase, 48 to 62 Hz
Input Current	
110 Vac input (standard)	0.09 A / 4.3 A at 110 Vac[(1)]
or 220 Vac input (optional)	0.05 A / 1.8 A at 220 Vac[(1)]

[(1)] Sleep mode/active-printing mode.

Table 2-3. Environmental Specifications

Characteristic	Description
Temperature	
Operating	-10 to 45^{o}C
Non-operating	-20 to 55^{o}C
Relative humidity (non-condensing)	10 to 90%
Altitude	
Operating	15,000 ft
Non-operating	50,000 ft
Random vibration (non-operating)	0.01 g^2/Hz at 10 to 2,000 Hz (3.86G's)
Shock (non-operating)	20 g, 11 ms
Acoustic noise	< 50 dBA at 1 m
EMI/EMC	MIL-STD-461, Methods CE03, CS01, CS02, CS06, RE02, RS02, and RS03.
Fungus	No fungus-nutrient materials

3. INTRODUCTION

3.1. Scope

This chapter provides information and instructions required for installation of the Model 3400 Series printer. Information is included concerning chassis installation configuration, unpacking, toner cartridge installation, paper supply provisions, connecting of external cabling, software installation, and storage.

3.2. Chassis Installation Configuration

The Model 3400 Series printer is either a table top mount or rackmount configuration. Typical chassis dimensions applicable to the installation environment are identified in Figure 3-1. Refer to the Installation Control Drawing for specific dimensions for a configuration.

3.3. Unpacking

Follow the steps listed below to unpack the Model 3400 Series printer and prepare the unit for installation. Packing materials should be retained for future use.

a. Carefully remove the printer from the shipping container. Inspect the unit for any evidence of damage.

b. Open the paper cassette tray access door. Slide the paper tray out of the printer and remove the shipping retainer from the tray.

3.4. Toner Cartridge Installation

The Model 3400 Series printer is shipped without the toner cartridge installed. Follow the procedure defined below to install the cartridge.

a. Remove the toner cartridge from its packaging. Gently shake the cartridge to evenly distribute the toner.

Caution
To prevent damage, do not expose the cartridge to light for more than a few minutes.

b. Remove the sealing tape from the cartridge.

c. Open the top cover and front cover of the printer.

d. Unfasten the print engine door and open fully.

e. Insert the cartridge in the print-engine carriage in the direction of the arrows provided on the cartridge. Move the cartridge into the guides until it stops securely in the printer.

f. Close the print engine door.

g. Close the top cover and front cover of the printer.

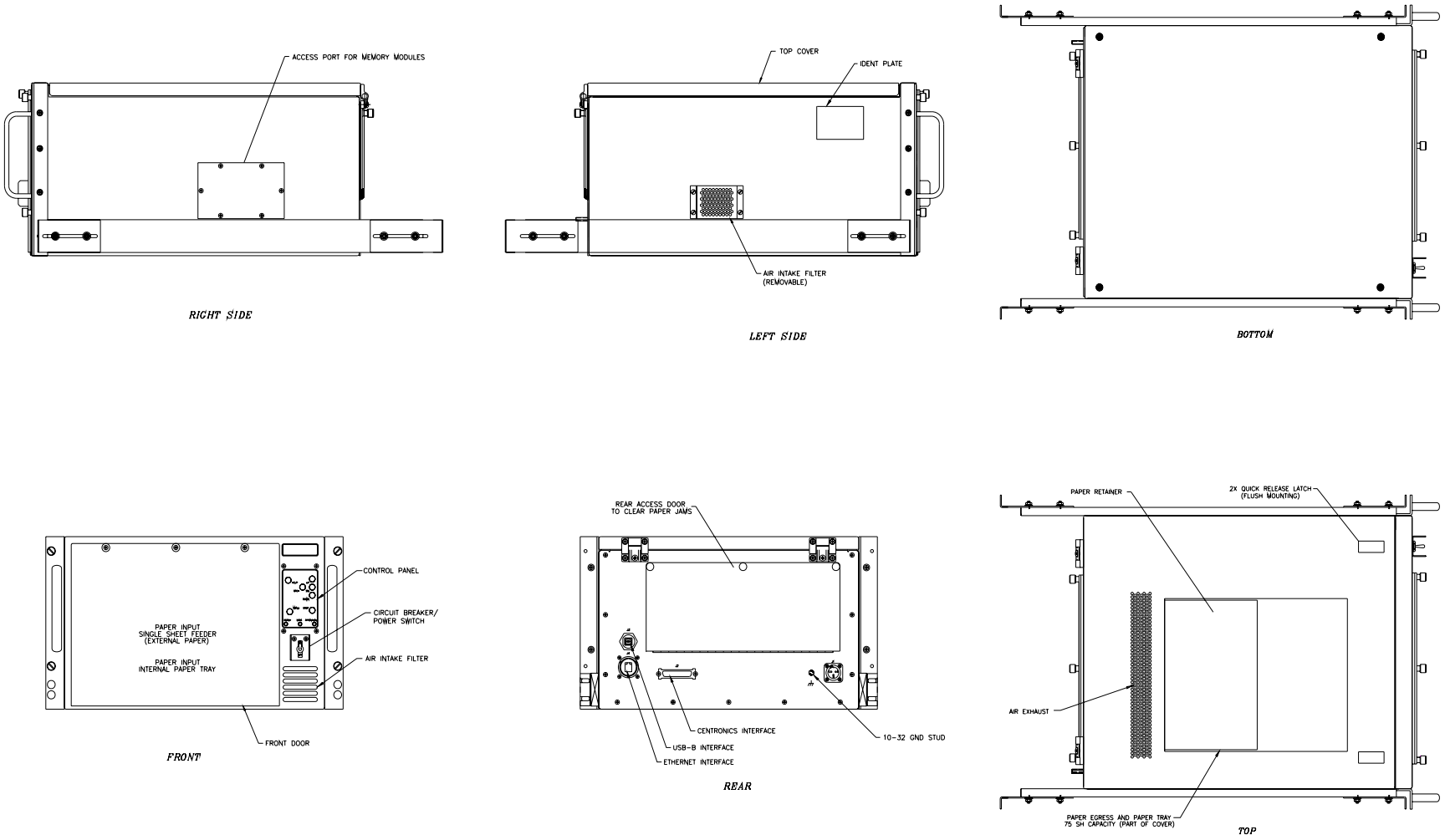


Figure 3-1. Installation Dimensions

3.5. Paper Supply

The paper cassette tray will accommodate approximately 250 sheets of letter, A4, executive, B5 (ISO), B5 (JIS), legal or up to 8.5 in. x 13 in. paper. The cassette is accessible through the lower front panel door. Cassette guides may be adjusted to accommodate the supported media sizes. Paper supply specifications are provided in Table 3-1. Paper can be manually fed at the entry point accessible through the upper front panel door.

Table 3-1. Paper Supply Specifications

Paper Source	Paper Type	Dimensions	Weight
Manual Feed Tray 1 (upper)	Bond	3 x 5 in. minimum (76 x 127 mm) 8.5 x 14 in. maximum (216 x 356 mm)	16 to 53 lb (60 to 199 g/m^2)
	Transparency	Same as bond paper	0.0039 to 0.0045 in. thick (0.099 to 0.114 mm)
	Labels	Same as bond paper	0.005 to 0.007 in. thick (0.127 to 0.178 mm)
	Envelopes	Same as bond paper	24 lb maximum (90 g/m^2)
Cassette Tray 2 (lower)	Letter	8.5 x 11 in. (216 x 279 mm)	16 to 32 lb (60 to 117 g/m^2)
	A4	8.3 x 11.7 in. (210 x 297 mm)	
	Executive	7.3 x 10.5 in. (191 x 267 mm)	
	B5 (ISO)	6.9 x 9.9 in. (176 x 250 mm)	
	B5 (JIS)	7.2 x 10 in. (182 x 257 mm)	
	Legal	8.5 x 14 in. (216 x 356 mm)	
	8.5 x 13 in.	8.5 x 13 in. (216 x 330 mm)	

3.6. External Cable Installation

All external interfaces for the Model 3400 Series printer are located at the rear panel (Figure 3-2). External connector signal assignments are defined in Chapter 1. Refer to the Installation Control Drawing and Interconnect Drawing for specific connector interfaces. Perform the following steps to connect external cabling.

a. Verify that the front panel circuit breaker is in the “off” position.

b. Connect the system ground cable to the ground stud on the rear panel.

c. Install the host computer data interface cable.

d. Connect the power cable to the ac input connector on the rear panel.

Caution
Verify that the ac power source conforms to the input power label on the unit near the power connector.

3.7. Software Installation

The HP LaserJet 2400 Series software must be installed before the Model 3400 Series printer can be used. Information and instructions required for installation and configuration of printer software are provided in the HP LaserJet 2400 Series User’s Guide and the HP Network Installation Guide on the supplied CD.

For foreign language operation it is necessary to perform the following additional software and driver installation.

a. The printer language is changed from the control panel. To select the language go to "Configure Device” and then the "System Setup" submenu and then select the language.

b. To setup the print driver for a foreign language the driver must be reinstalled using the foreign language driver. The latest driver is available from the HP website at www.hp.com/support. Select “download drivers and software”, then select HP 2420dn, then select the operating system, select the PCL6 driver, then select the language, and then select “download”.

3.8. Limited Operation, Storage, and Transportation

If the printer is not operated for more than 1 week, the toner cartridge should be removed and stored in a humidity-controlled environment. This provision is particularly important when the equipment is used in a high-humidity environment. If the printer is to be stored or transported, the unit should be packaged as originally shipped. The printer can be stored or transported in any manner that is consistent with the environmental conditions identified in Table 2-3.

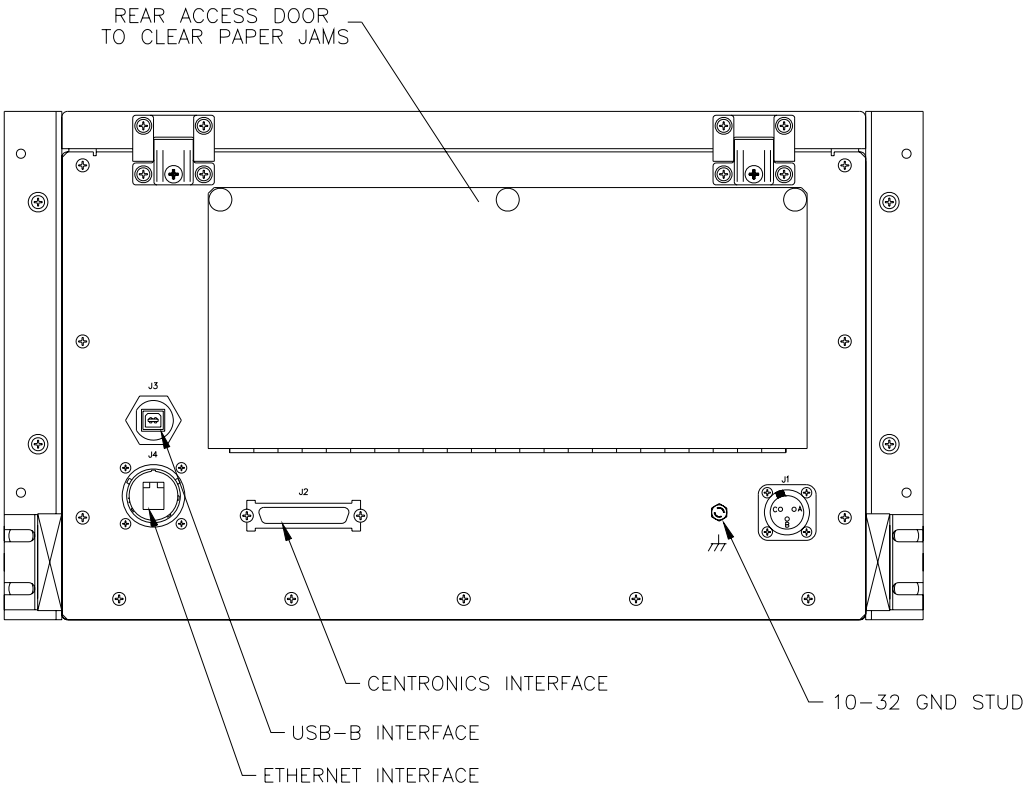


Figure 3-2. Rear Panel

4. OPERATION

4.1. Introduction

This chapter provides information concerning printer controls and indicators, test printing, normal operation, error conditions, and shutdown. Before the unit is powered up for the first time, verify that the installation procedures defined in Chapter 3 have been performed.

4.2. Controls and Indicators

All controls and indicators required for operation of the Model 3400 Series printer are located at the front panel of the unit (Figure 4-1). Control console switches and indicators are shown in Figure 4-2. Controls and indicators are described in Table 4-1. Printer status indications for normal operation are identified in Table 4-2.

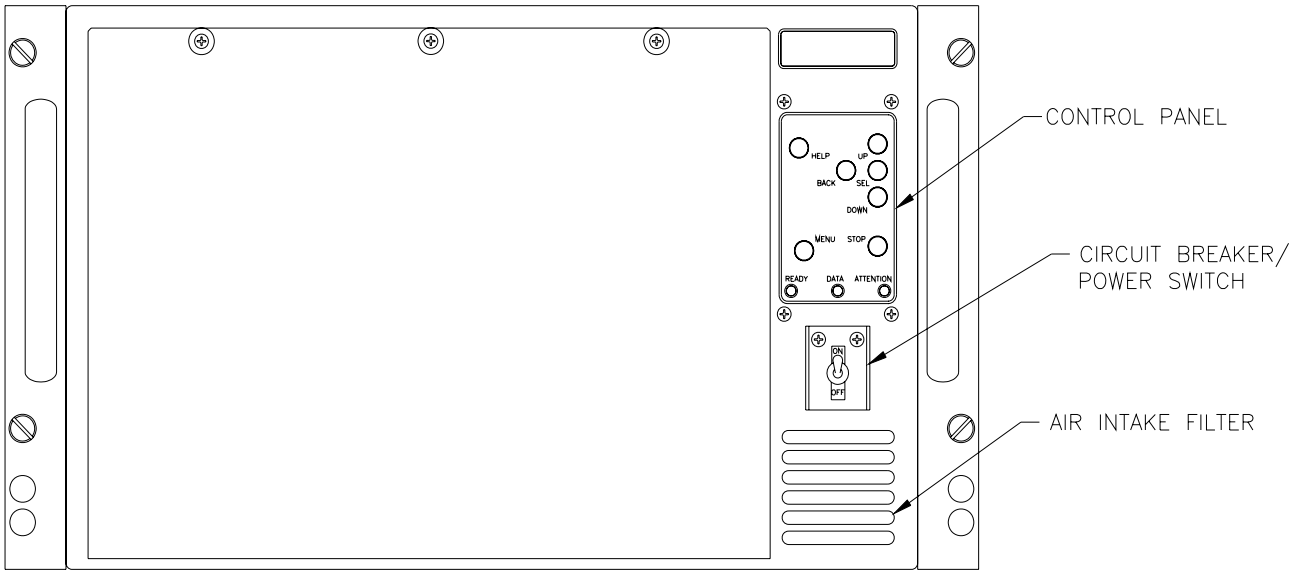


Figure 4-1. Front Panel

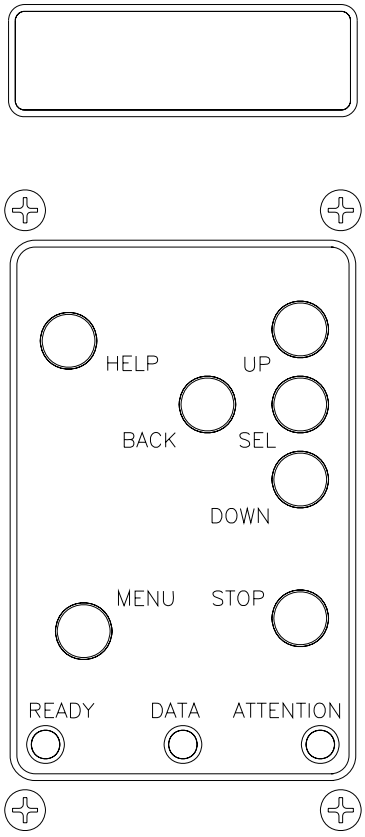


Figure 4-2. Control Console

Table 4-1. Controls and Indicators

Identification	Description	Function
	Circuit breaker/switch	On/off switch and over current-protection device for prime power.
READY	Green LED	Illumination indicates that the printer is ready to perform print operations.
DATA	Green LED	Illumination indicates that the printer is receiving or processing data from the host.
ATTENTION	Yellow LED	Illumination indicates that the printer has incurred an error condition. See the display for information.
HELP	Switch	Displays information about the message.
UP	Switch	Scroll up and change value in the display.
SEL	Switch	The Select switch accepts the item/value in the display.
DOWN	Switch	Scroll down and change value in the display.
BACK	Switch	Scrolls back one level in the menu.
STOP	Switch	Terminates a print job that is in progress. When pressed, the LED's will blink until memory is cleared. When printer memory is cleared, the READY LED will illuminate.
MENU	Switch	Opens the menu display.

Table 4-2. Printer Status Indications During Normal Operation

LED	Action	Description
READY	On	Printer is ready.
	Off	Printer is offline (paused) or has an error.
	Blinking	Printer is going offline.
DATA	On	Data is in printer memory waiting to be printed.
	Off	No data is in printer memory.
	Blinking	Printer is printing the data.
ATTENTION	On	Printer has an error and is displayed on the LCD. Turn printer off and then on and review the error message.
	Off	Printer has no errors.
	Blinking	Printer has a recoverable error displayed on the LCD.

4.3. Configuration and Test Printouts

4.3.1. PCL/PostScript

PCL test pages may be printed from the printer control panel. PostScript test pages can be printed in the same manner if the unit is configured with the PostScript option. Configuration and test printouts contain the following information:

Test Type	Description	Test Execution
Test Page	Provides an example of overall print quality.	Accessible from the HP LaserJet Utility area of the system software.
Menu Map	Identifies the current settings and available menus and items for the printer.	Accessible from the HP LaserJet Utility area of the system software and from the control panel. Press SEL/Information/Print Menu Map.
Configuration Page	Identifies the current printer settings and options installed for the printer.	Accessible from the HP LaserJet Utility area of the system software and from the control panel. Press SEL/Information/Print Configuration.

Supplies Status Page	Identifies the life of the print cartridge and number pages/jobs printed.	Accessible from the HP LaserJet Utility area of the system software and from the control panel. Press SEL/Information/Print Supplies Status Page.
Font list	Identifies fonts that are currently installed in the printer.	Accessible from the HP LaserJet Utility area of the system software and from the control panel. Press SEL/Information/Print PS Font List or Print PCL Font List.

4.3.2. Ethernet Print Server

The Fast Ethernet is an embedded print server and when a configuration print is invoked, the print will list all of the Ethernet information.

4.4. Normal Operation

Follow the instructions defined below to operate the printer under normal conditions.

a. Power-up the host computer.

b. Place the printer power switch in the “on” position.

c. Verify that the READY LED illuminates after completion of the self-test/warm-up sequence. Once the printer has achieved a ready state, no manual intervention is required to conduct routine print tasks. Operational parameters are not affected by normal power on/off cycles.

4.4.1. Manual Paper Feeding

Specifications for manual-feed media are defined in Table 3-1. Follow the instructions defined below to conduct print operations with media fed manually.

a. Lower the TRAY 1 (upper) access door.

b. Slide the paper guides slightly wider than the media.

c. Position the media in the center of the paper guides with the print side up.

d. Move the media into the manual-feed entry point of the print engine.

e. Verify that operational software is configured for manual feed.

f. Initiate the print job.

> Note
>
> Introduction of media into the manual feeder while a print job is in progress may cause a jam to occur.

g. When manual feed operations are complete, raise and secure the front panel door.

4.4.2. Stopping a Print Job

A print job can be terminated from the application software, from a print queue, or by pressing the front panel STOP switch. If a job has not started printing, terminate the process with the application software or at the print queue. If printing has started, terminate the process by pressing the STOP switch. The printer will finish any pages that are already moving through the printer and delete the rest of the job. Pressing the STOP switch during a print operation will cancel only the current job.

4.5. Error Conditions

When the printer incurs an error condition, a status indication will be displayed at the control console. Refer to Chapter 6 for a description of console error indications and recommended corrective action.

4.5.1. Clearing Paper Jams

Paper jams are most commonly caused by one of the following conditions:

- Paper cassette tray loaded improperly or overfilled.
- Paper cassette tray removed.
- Print media does not meet specifications (Table 3-1).
- Paper guide at rear of print engine is not secured in closed position.

Paper jams normally occur in the paper feed, toner cartridge, or rear paper guide areas (Figure 4-3). Procedures for clearing obstructions in the paper path are identified in the following paragraphs.

4.5.1.1. Paper Feed Area

a. Open the paper cassette tray access door.

b. Remove the cassette tray.

c. If media has lodged between the paper feed and toner cartridge areas, try first to remove the paper from the toner cartridge area.

d. To remove media from the paper feed area, move the media to the right and then pull it out the front of the printer.

e. Verify that media is positioned correctly in the paper cassette tray.

f. Install the paper cassette tray. Raise and secure the front panel door.

4.5.1.2. Toner Cartridge Area

a. Open the top cover of the printer.

b. Unfasten the toner cartridge retainer.

c. Pull the toner cartridge toward the front panel and remove the cartridge from the chassis.

Caution
To prevent damage, do not expose the cartridge to light for more than a few minutes.

d. If the leading edge of the media is visible, gently pull the paper out of the printer.

e. If the media has entered the output area, refer to 4.5.1.3.

f. Insert the cartridge in the print-engine carriage in the direction of the arrows provided on the cartridge. Move the cartridge into the guides until it stops securely in the printer.

g. Fasten the toner cartridge retainer.

h. Close and secure the top cover of the printer.

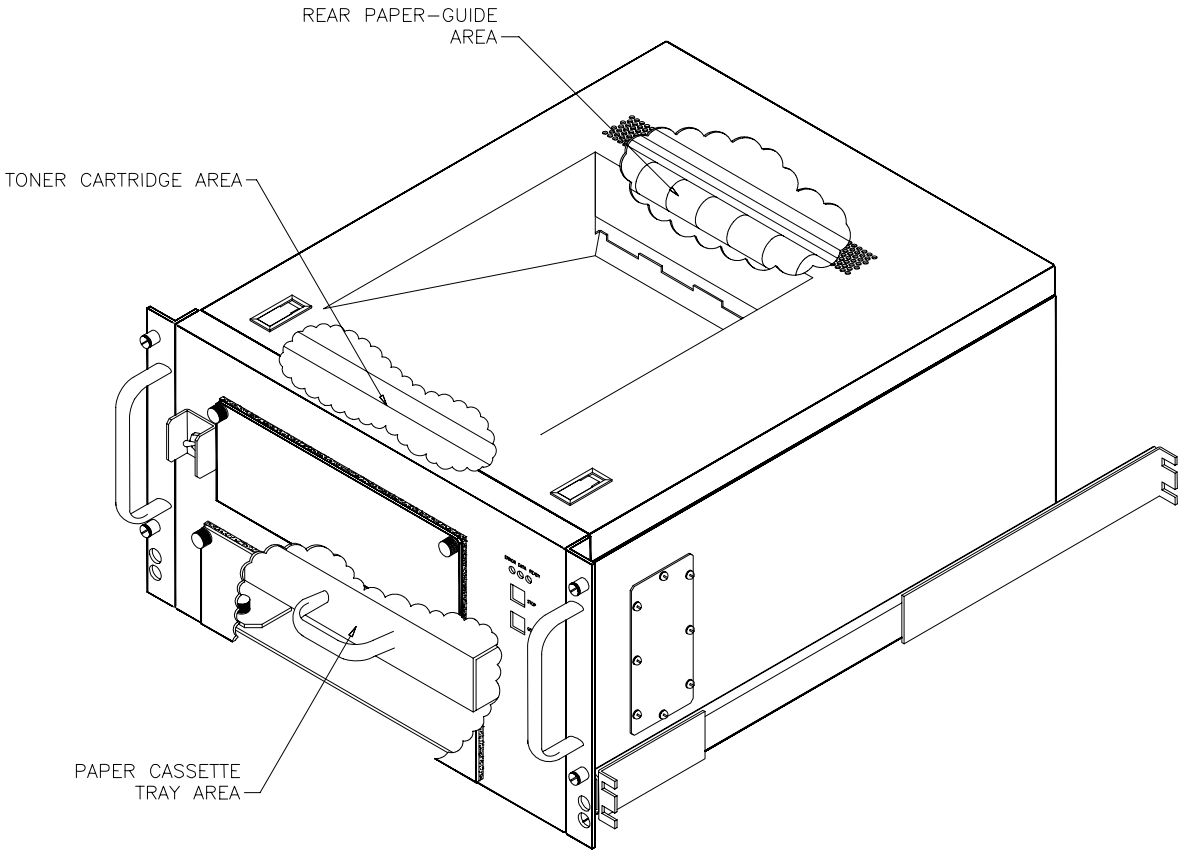


Figure 4-3. Paper Jam Areas

Note
If the ATTENTION indicator remains illuminated after paper is removed, there is still jammed paper inside the printer. If torn media remains in the printer and is not accessible, cycle printer power to rotate print engine rollers. Reopen the printer and remove media fragments.

4.5.1.3. Rear Paper-Guide Area

a. Open the top cover of the printer.

b. Lift the captive fastener that secures the hinged paper guide at the rear of the print engine and lower.

c. If the leading edge of the media has reached the output (top) area, pull the release lever located at right rear of printer engine and pull the paper out the top. If the media has not reached the top of the printer, pull the release lever and pull the paper out the back of the printer. It may be necessary to open the access door located at the rear of the printer to aid in pulling the paper out.

d. Close and secure the hinged paper guide at the rear of the print engine.

e. Close and secure the top cover of the printer.

4.5.1.4. Duplexer Area

a. Open the paper cassette tray access door.

b. Remove the cassette tray.

c. Pull the green lever on the front of the printer to open the bottom of the duplexer.

d. Reach in and pull out the jammed paper.

e. Lift the bottom of the duplexer back up until it clicks into place.

f. Reinstall the cassette tray.

g. Close the paper cassette tray access door.

4.6. Shutdown

The printer enters standby mode when no data is being received from the host computer. It is not necessary to power down the printer when the unit is not used for limited periods. When the printer is to be taken out of service, perform the following shutdown sequence:

a. Ensure that the printer is not receiving data from the host computer.

b. Place the printer power switch in the “off” position.

5. FUNCTIONAL DESCRIPTION

5.1. Introduction

This chapter describes the major functional elements of the Model 3400 Series printer. Information is provided concerning power distribution, the printing subsystem, control console, and cooling system. Chassis interconnections are identified in Figure 5-1.

5.2. Printer Description

The Model 3400 Series printer provides laser hardcopy output of data received from a host computer. The standard printer configuration incorporates an IEEE-1284B bi-directional parallel interface (Centronics). The unit is also configured with 10/100Base-T Ethernet and a USB 2.0 Port. The mechanical and electrical subsystems of the printer are described in the following paragraphs.

5.2.1. Power Distribution

The Model 3400 Series printer utilizes the primary power subsystem of the commercial print engine. Prime power enters the chassis at the rear panel J1 connector. The power is sent through an EMI filter that provides attenuation of interference related to input voltage and output current. Prime power exits the filter and is routed to a 10-ampere circuit breaker/power switch at the front panel. The load side of the circuit breaker provides ac power to the print engine input-power connector. A chassis ground stud is located on the rear panel of the unit.

5.2.2. Printing Subsystem

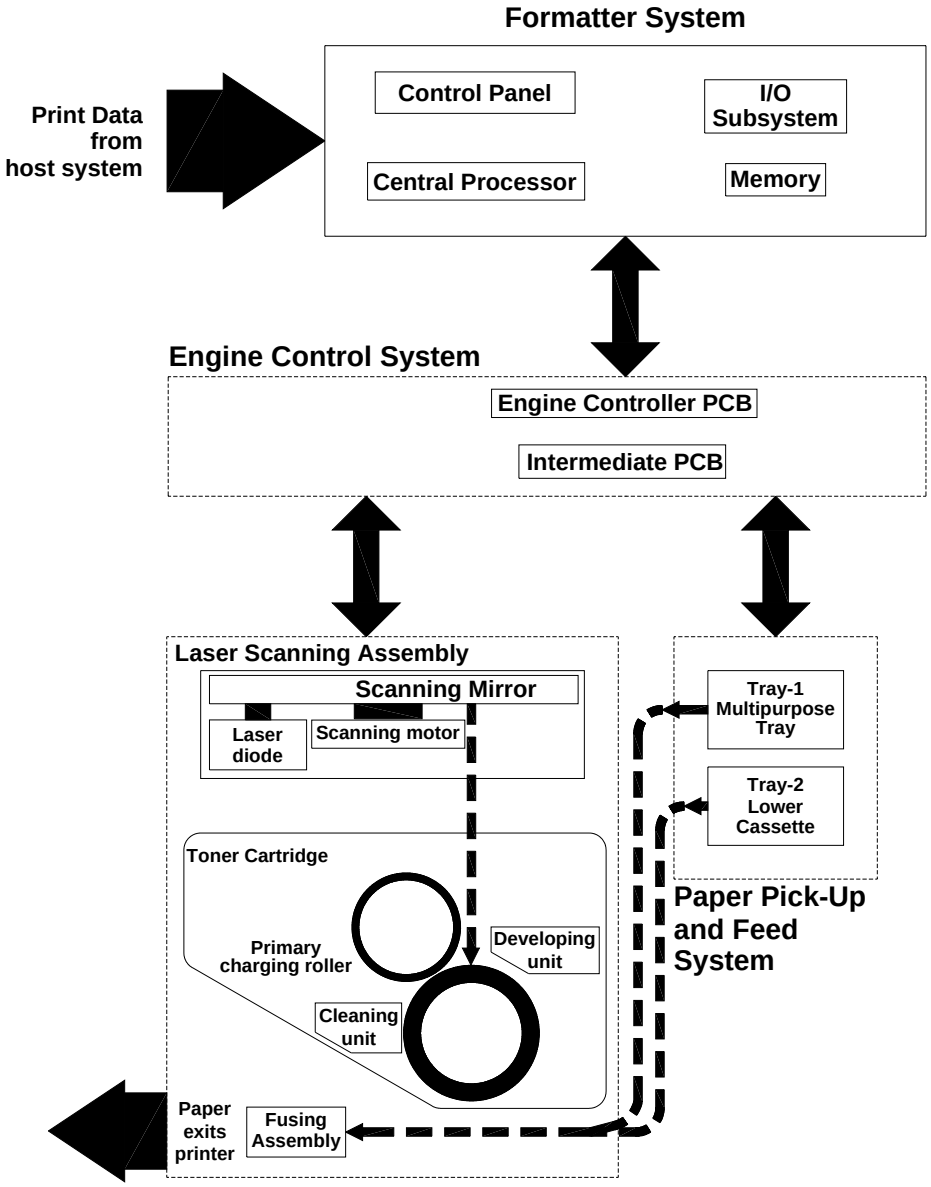
The Model 3400 Series printer incorporates the printing subsystem architecture of the Hewlett Packard LaserJet 2420dn as follows:

- “Formatter System” – Receives print data from the host, processes the image, and transfers it to the Engine Control System. The Formatter System also provides the interface between the user and the printer (Control Panel).

- “Engine Control System” – Monitors and controls all of the printer’s mechanical and electrical subsystems. It is the center of the printer’s operation.

- “Image Formation System” – Produces the actual physical image on the page.

- “Paper Pick and Feed System” – Moves paper or other print media through the printer from one of the selected input trays (Tray 1 or 2) to the selected output bin (top or rear).



5.2.2.1. Print Cycle

The formatter system and the engine control assembly system share information during printer operation. The engine controller assembly – intermediate PCB – formatter connector forms a link, which operates as a data bus. This lets printer status, command information, and dot-image data to be passed between the two systems. The events described in the table below take place during normal printer operation.

Figure 5-1. Chassis Interconnections

5.2.2.2. Paper Movement

The paper feed system automatically picks print media from either Tray 1 or Tray 2 and delivers it to the registration roller. Before the media reaches the registration roller, the separation pad separates any excess sheets of media and the registration shutter corrects the media's skew.

A top-of-page sensor detects the leading edge of the page. The paper is synchronized to the leading edge of the image on the photosensitive drum and transferred to the paper. After the transferring stage of the image formation process, the paper is fed to the fusing assembly and fused.

The paper exits the printer through the top or rear output bins.

5.2.3. Control Console

All controls and indicators required for printer operation are located at the front panel of the unit. The primary control panel includes the READY/DATA/ATTENTION indicators and the HELP/UP/SEL/DOWN/BACK/STOP/MENU switches. The control panel assembly interfaces with the print engine formatter circuit board. The circuit breaker/power switch interfaces with the line filter and print engine power-input connector. Printer controls and indicators are described in Chapter 4.

5.2.4. Cooling

The ruggedized Model 3400 Series printer utilizes the cooling mechanism of the commercial print engine. Cooling air is drawn into the unit by two fans located on the upper left side of the inner chassis and the bottom right of the front panel. The fans are powered by the print engine dc power subsystem. Air is forced across print engine components and exhausted at the top of the chassis.

6. MAINTENANCE

6.1. Introduction

This chapter provides information and instructions concerning Model 3400 Series printer tools and test equipment, periodic maintenance, fault isolation, and the removal and installation of replaceable components and subassemblies.

6.2. Tools and Test Equipment

The following tools and test equipment are required to maintain the printer:

- Common hand tools
- Digital voltmeter
- Host computer with compatible data interface

6.3. Periodic Maintenance

6.3.1. Print Engine

Normal print operations result in the depositing of residual paper and toner particles within the printer interior. The print mechanism may be cleaned with a lint-free cloth and the brush located in the toner cartridge cavity. As a minimum, the printer interior should be cleaned whenever the toner cartridge is replaced. Detailed information pertaining to cleaning of the printer interior is provided in the HP LaserJet 2400 Series User's Guide.

6.3.2. Dust Filter

The air-inlet filter on the left side of the chassis may be removed and replaced or washed with a mild detergent. The required frequency of cleaning is a function of the particulate concentration of the operating environment.

6.4. Fault Isolation

If front panel status indicators reflect a normal operational state (Table 4-2) and the printer will not function properly, refer to Table 6-1. If indicators reflect an error condition, refer to the status descriptions and recommended corrective action provided in Table 6-2. A description of secondary status indications is provided in Table 6-3 and Table 6-4.

WARNING

POTENTIALLY LETHAL VOLTAGES EXIST WITHIN THE PRINTER. SERIOUS INJURY MAY RESULT IF SAFETY PRECAUTIONS ARE NOT OBSERVED. FAULT DIAGNOSIS PROCEDURES REQUIRE THAT INTERNAL COMPONENTS BE TESTED WHEN PRIME POWER IS APPLIED. THESE COMPONENTS MUST ONLY BE TOUCHED WITH THE APPROPRIATE TEST EQUIPMENT.

Table 6-1. General Fault Isolation

Fault Condition	Recommended Action
Printed page is not produced when job is issued from host computer.	Verify that host software is configured for the correct media location (cassette or manual feed). Use the software utility or control panel to print a test page. If test page does not print: • Check the paper supply in the cassette tray. • Verify that the print queue is clear and that the printer has not been paused. • If a jam occurs, refer to 4.5.1.
Printed page is blank or of poor quality.	Redistribute toner in cartridge. Clean inside of printer (6.3.1). Check paper type and quality (Table 3-1). Adjust print density through the host software. Verify that EconoMode is deselected in the host software. Verify that printer and host computer are configured for the same language (PCL/ Postscript). Install a new toner cartridge. Verify that sealing tape is removed from toner cartridge.
Front panel indicators reflect an error state.	Refer to Table 4.2
Print operations are conducted successfully, but control panel switches or indicators do not respond correctly.	Replace control panel. If control panel replacement does not correct problem, replace formatter board.

6.5. Replaceable Components and Subassemblies

The following paragraphs include information concerning replaceable components and subassemblies. Item locations are shown in Figure 6-1. The following items are replaceable within an organizational-level maintenance activity:

- Toner Cartridge
- Dust Filter
- Control Panel Assembly
- EMI Filter
- Circuit Breaker/Power Switch
- Memory Modules
- Print Engine Assembly
- Paper Cassette Tray

WARNING
POTENTIALLY LETHAL VOLTAGES EXIST WITHIN THE PRINTER. SERIOUS INJURY MAY RESULT IF SAFETY PRECAUTIONS ARE NOT OBSERVED. DISCONNECT THE POWER SOURCE BEFORE PERFORMING REPAIR PROCEDURES.

Note
Observe precautions relating to electrostatic discharge (ESD) when handling components that include integrated circuitry.

6.5.1. Toner Cartridge Replacement

Removal:

a. Open the top cover and front cover of the printer.

b. Open the print engine door.

c. Pull the toner cartridge toward the front panel and remove the cartridge from the chassis.

Installation:

a. Remove the new toner cartridge from the packaging material.

b. Gently shake the cartridge to evenly distribute the toner.

c. Remove the sealing tape from the cartridge.

d. Insert the cartridge in the print-engine carriage in the direction of the arrows provided on the cartridge. Move the cartridge into the guides until it stops securely in the printer.

e. Close the print engine door.

f. Close and secure the top cover and front cover of the printer.

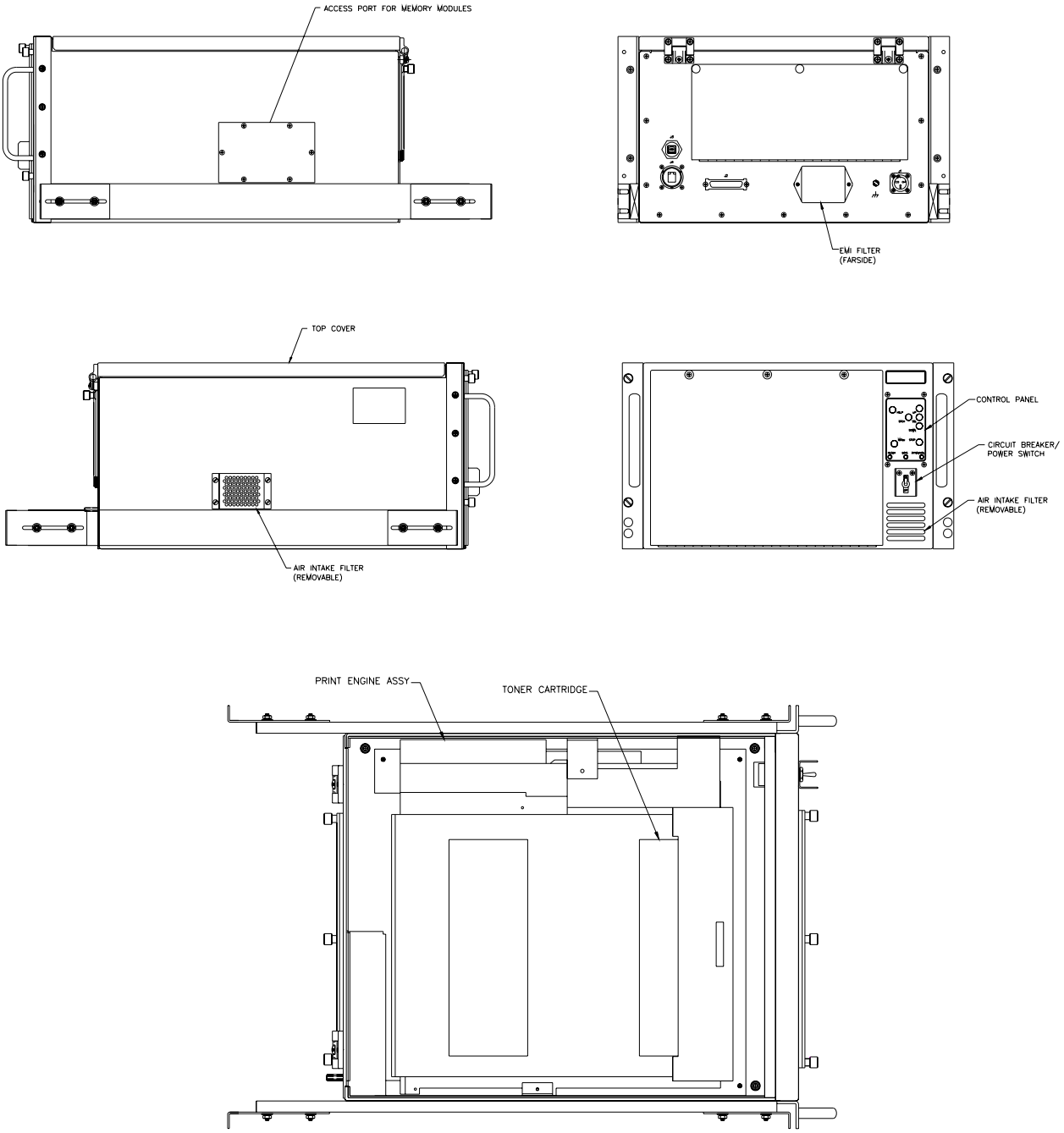


Figure 6-1. Field Replaceable Units

6.5.2. Dust Filter Replacement

Removal:

a. Remove the filter cover from the left side of the printer chassis wall.
b. Remove the dust filter from the filter cover.

Installation:

a. Position the dust filter on the filter cover.
b. Install the filter cover to the chassis.

6.5.3. Control Panel Assembly Replacement

Removal:

a. Open the top cover of the printer.
b. Disconnect the control panel harness at the control panel.
c. Remove the four screw that secure the control panel to the front panel.
d. Remove the control panel and shield from the inside of the front panel.

Installation:

a. Position the control panel and shield on the front of the chassis.
b. Install the hardware that secures the control panel to the front panel.
c. Connect the control panel harness.
d. Close and secure the top cover of the printer.

6.5.4. EMI Filter Replacement

Removal:

a. Open the top cover of the printer.
b. Remove the two nuts that secure the EMI filter cover to the inside of the rear panel. Remove the cover from the chassis.
c. Remove the two nuts that secure the EMI filter to the inside of the rear panel.
d. Disconnect EMI filter harness terminals (note wire assignments).
e. Remove the EMI filter from the chassis.

Installation:

a. Position the EMI filter on the floor of the chassis near the filter-mounting studs.
b. Connect EMI filter harness terminals.
c. Position the EMI filter on the inside of the rear panel and install the hardware that secures the filter.
d. Position the EMI filter cover on the inside of the rear panel and install the hardware that secures the cover.
e. Close and secure the top cover of the printer.

6.5.5. Circuit Breaker/Power Switch Replacement

Removal:

a. Open the top cover of the printer.
b. Disconnect ac harness terminals from the load side of the EMI filter (note wire assignments).
c. Disconnect the ac input power connector from the print engine
d. Cut the cable straps that secure the circuit breaker/power switch harness to the chassis.
f. Remove the nut and two screws that secure the circuit breaker/power switch to the front panel. Remove the switch, ON/OFF faceplate and guard from the front panel.

Installation:

a. Position the circuit breaker/power switch in the front panel. Position the guard and ON/OFF faceplate on the switch.
b. Install the hardware that secures the circuit breaker/power switch to the front panel.
c. Connect the ac input power connector to the print engine.
d. Connect ac harness terminals to the load side of the EMI filter.
e. Position the EMI filter cover on the inside of the rear panel and install the hardware that secures the cover.
f. Secure the circuit breaker/power switch harness to the chassis with new cable straps.
g. Close and secure the top cover of the printer.

6.5.6. Memory Module Replacement

Removal:

a. Loosen the six screws that secure the memory access cover on the right side of the chassis. Remove the cover from the chassis.

b. Disengage the memory module retention clips and remove the module from the formatter board.

Installation:

a. Position the memory module in the formatter board connector. Secure the module by engaging the retention clips.

b. Position the memory access cover on the right side of the chassis and tighten the hardware that secures the cover.

6.5.7. Print Engine Assembly Replacement

Removal:

a. Open the top cover of the printer.

b. Disconnect the ac input power connector from the print engine.

c. Disconnect the data I/O interface cable(s) from the formatter board.

c. Disconnect the control panel interface cable connector.

d. Remove the four nuts that secure the print engine base plate to the outer chassis floor.

e. Lift the print engine out of the chassis.

f. Remove the four nuts that secure the print engine. Do not remove the spacers.

g. Remove the print engine from the base plate.

Installation:

a. Position the print engine on the base plate.

b. Secure the hardware that mounts the print engine to the base plate.

c. Lower the print engine assembly into the chassis. Ensure that the base plate is positioned on the four mounting studs on the chassis floor.

d. Install the hardware that secures the base plate to the chassis floor.

e. Connect the control panel interface cable connector.

f. Connect the data I/O interface cable(s) to the formatter board.

g. Connect the ac input power connector to the print engine.

h. Close and secure the top cover of the printer.

6.5.8. Paper Cassette Tray Replacement

Removal:

a. Open the front door.

b. Pull the cassette tray straight out of the compartment.

Installation:

a. Load the required paper (Table 3-1) in the cassette tray.

b. Slide the cassette tray into the printer chassis.

c. Raise and secure the front door.