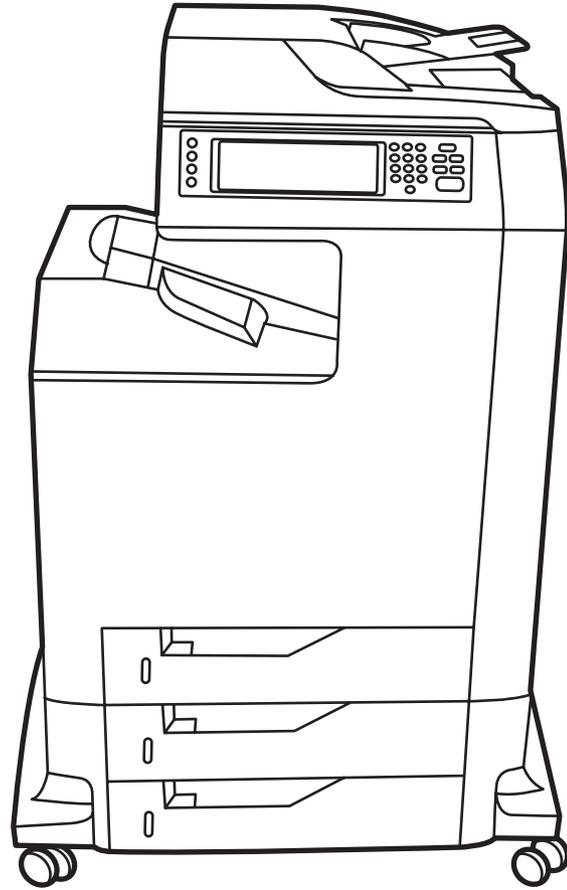


HP Color LaserJet 4730mfp

Service Manual



HP Color LaserJet 4730mfp series

Service Manual



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1 Product information

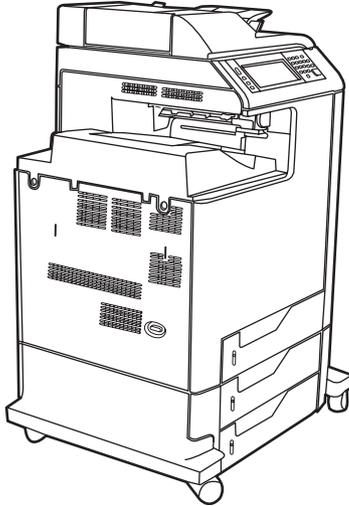
This chapter contains information about the following topics:

- [HP Color LaserJet 4730mfp series configurations](#)
- [Features and benefits of the MFP](#)
- [MFP parts and accessories](#)
- [Site requirements](#)
- [MFP specifications](#)
- [Media specifications](#)
- [Printing on special media](#)
- [Regulatory information](#)
- [Declaration of conformity \(HP Color LaserJet 4730mfp\)](#)

HP Color LaserJet 4730mfp series configurations

The HP Color LaserJet 4730mfp series is available in the following configurations.

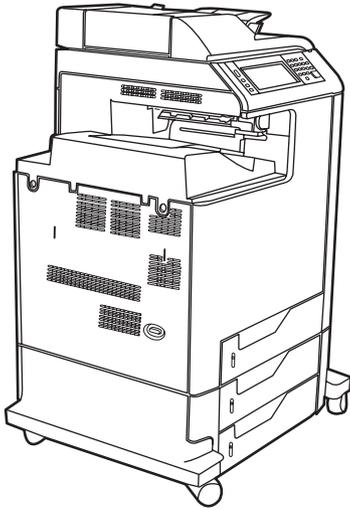
HP Color LaserJet 4730mfp (Q7517A)



The HP Color LaserJet 4730mfp comes standard with the following items:

- 100-sheet multipurpose input tray (tray 1)
- Three 500-sheet input trays
- Automatic document feeder (ADF) that holds up to 50 pages
- Duplexer
- HP Jetdirect embedded print server for connecting to a 10/100Base-T network
- 256 megabytes (MB) synchronous dynamic random access memory (SDRAM)
- Hard drive

HP Color LaserJet 4730x mfp (Q7518A)



The HP Color LaserJet 4730x mfp has the same features as the base model and also includes an analog fax accessory.

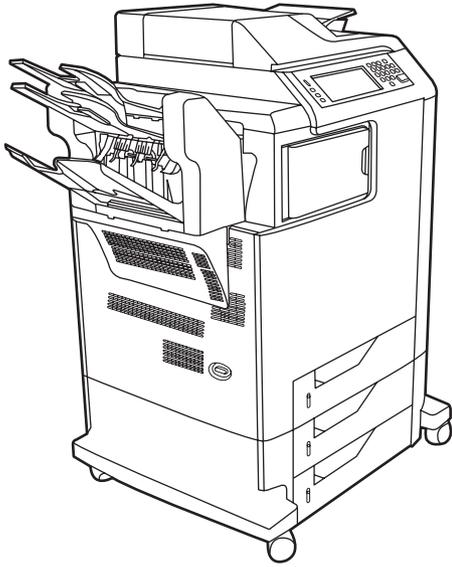
HP Color LaserJet 4730xs mfp (Q7519A)



The HP Color LaserJet 4730xs mfp has the same features as the base model and also includes the following items:

- Analog fax accessory
- Stapler/stacker accessory
- Output accessory bridge

HP Color LaserJet 4730xm mfp (Q7520A)



The HP Color LaserJet 4730xm mfp has the same features as the base model and also includes the following items:

- Analog fax accessory
- 3-bin mailbox accessory
- Output accessory bridge

Features and benefits of the MFP

The HP Color LaserJet 4730mfp series is designed to be shared by a workgroup. Use the MFP to copy and print color and black-and-white documents or to digitally send color and black-and-white documents. The MFP is a standalone copier that does not require connection to a computer. With the optional HP LaserJet analog fax accessory 300 (included with some models), the MFP can also send and receive faxes. Digital sending can be selected from the control panel.

Functions

- Two-sided printing and copying (duplexing)
- Image modification
- Color digital sending
- Document finishing

Speed and throughput

- Up to 31 pages per minute (ppm) when printing and copying on letter-size paper; up to 30 ppm when printing and copying on A4-size paper
- 25% to 400% scalability when using the scanner glass
- 25% to 200% scalability when using the automatic document feeder (ADF)
- First page prints in less than 10 seconds
- Transmit Once, Raster Image Processing (RIP) ONCE technology
- Duty cycle of up to 85,000 pages per month
- 533-megahertz (MHz) microprocessor

Resolution

- 600 dots per inch (dpi) with Resolution Enhancement technology (REt)
- HP FastRes and HP Resolution Enhancement technology (REt) for 1200 by 1200 effective dpi at full engine speed

Memory

- 256 MB of random-access memory (RAM), expandable to 512 MB by using industry-standard 100-pin double data rate dual inline memory modules (DDR DIMMs)
- Memory Enhancement technology (MEt) that automatically compresses data to use RAM more efficiently

User interface

- Graphic display on the control panel
- HP Easy Printer Care software (a Web-based status and troubleshooting tool)

- Internet-enabled supply-ordering capabilities using HP Easy Printer Care software
- Embedded Web server to gain access to support and to order supplies (for network-connected products)

Language and fonts

- HP Printer Command Language (PCL) 6
- HP PCL 5e for compatibility
- Printer Management Language
- PDF
- XHTML
- 80 scalable TrueType typefaces
- HP PostScript® 3 emulation (PS)

Copying and sending

- Modes for text, graphics, and mixed text and graphics formats
- Job-interrupt feature (at copy boundaries)
- Multiple pages per sheet
- Operator attendance animations (for example, jam recovery)
- E-mail compatibility
- Energy-saving Sleep mode
- Automatic duplex (two-sided) scanning

Print cartridges

- Each print cartridge prints up to 12,000 pages at 5% coverage
- No-shake cartridge design
- Authentic HP print cartridge detection
- Automatic toner strip removal

Paper handling

- **Input**
 - **Tray 1 (multipurpose tray):** A multipurpose tray for paper, transparencies, labels, and envelopes. Holds up to 100 sheets of paper or 10 envelopes.
 - **Trays 2, 3, and 4:** 500-sheet trays. These trays automatically detect standard paper sizes up to legal and allow printing on custom-size paper.
 - **Automatic document feeder (ADF):** Holds up to 50 sheets of paper.

- **Duplex printing and copying:** Two-sided printing and copying (printing on both sides of the paper).
- **ADF duplex scanning:** The ADF has an automatic duplexer for scanning two-sided documents.
- **Output**
 - **Standard output bin:** The standard output bin is located on the left side of the MFP. This bin can hold up to 500 sheets of paper.
 - **ADF output bin:** The ADF output bin is underneath the ADF input tray. The bin holds up to 50 sheets of paper, and the MFP automatically stops when this bin is full.
 - **Optional stapler/stacker:** The stapler/stacker staples up to 30 sheets and stacks up to 500 sheets.
 - **Optional 3-bin mailbox:** One bin stacks up to 500 sheets, and two bins stack up to 100 sheets each for a total capacity of 700 sheets.

Connectivity

- IEEE 1284C-compliant parallel connection
- Foreign Interface Harness (FIH) connection (AUX) for connecting other devices
- Local area network (LAN) connector (RJ-45) for the embedded HP Jetdirect print server
- Optional analog fax card
- Optional HP Digital Sending Software (DSS)
- Optional enhanced input/output (EIO) cards
- USB 2.0
- ACC port (accessory port with USB host capabilities)
- AUX port (auxiliary port for connecting third-party devices)

Environmental features

- The Sleep setting saves energy (meets ENERGY STAR® guidelines, Version 1.3).



NOTE See [Protecting the environment on page 33](#) for more information.

Security features

- Foreign Interface Harness (FIH)
- Secure Disk Erase
- Security lock
- Job retention
- DSS authentication

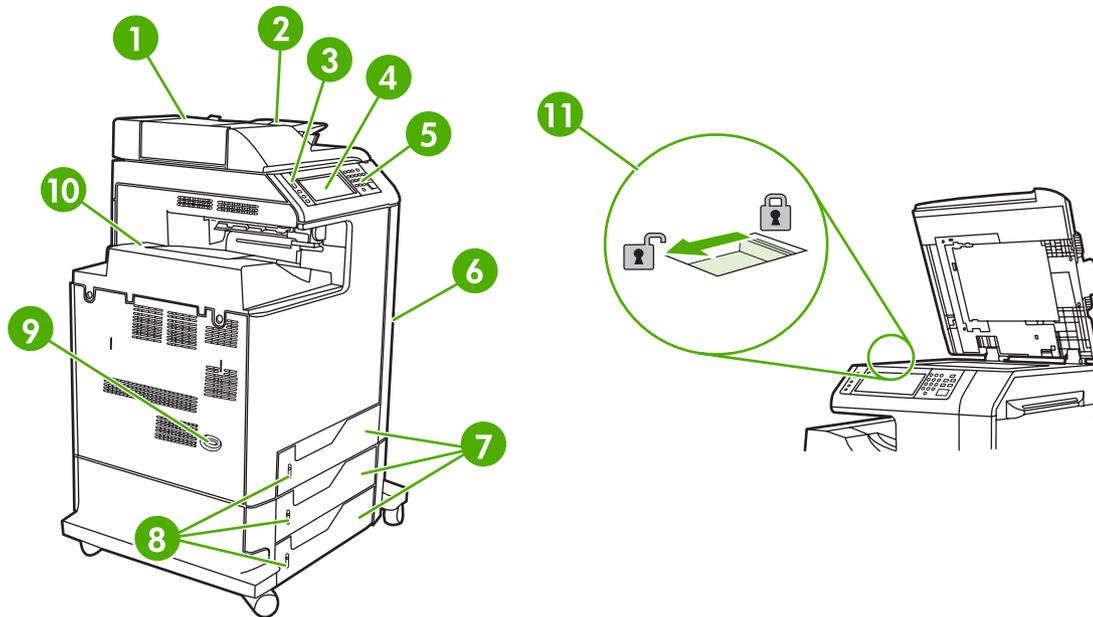
Minimum system requirements for e-mail functionality

To use the e-mail functionality, the MFP must be connected to an IP-based network that has a simple mail transfer protocol (SMTP) server. This server can either be on the local area network or at an outside Internet service provider (ISP). HP recommends that the MFP be located on the same local area network (LAN) as the SMTP server. If using an ISP, connect to the ISP by using a digital subscriber line (DSL) connection. If obtaining e-mail services from an ISP, ask the ISP to provide the correct SMTP address. Dial-up connections are not supported. If an SMTP server is not on the network, third-party software is available that allows the creation of an SMTP server. However, purchase and support of this software is the purchaser's responsibility.

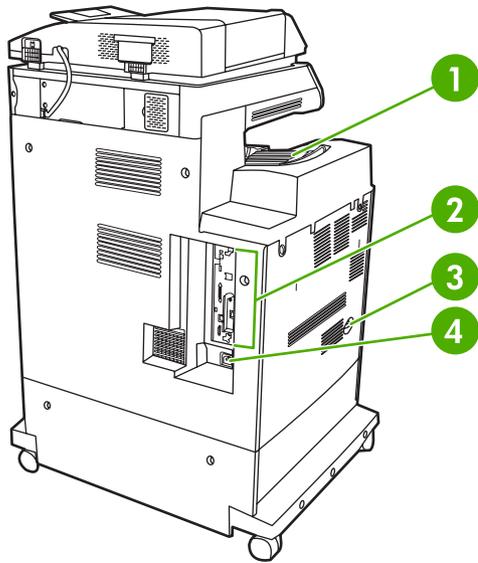
MFP parts and accessories

Before using the MFP, become familiar with the parts of the MFP.

MFP parts



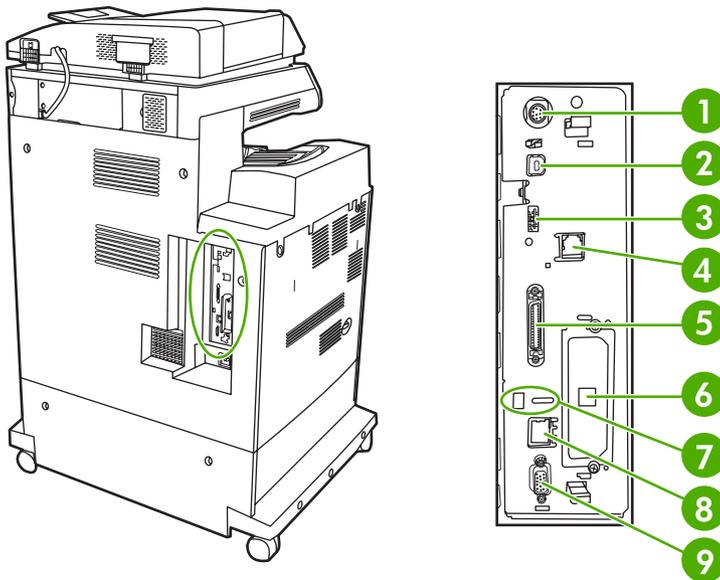
1	Automatic document feeder (ADF) top cover
2	ADF input tray for copy/scan/fax originals
3	Control panel status lights
4	Control panel display with touch-screen functionality
5	Control panel keypad
6	Right-side covers (provides access to the print cartridges and other consumables)
7	Trays 2, 3, and 4
8	Paper level indicators
9	On/off switch
10	Output bin
11	Scanner lock



1	Output bin
2	Interface ports
3	On/off switch
4	Power connection

Interface ports

The MFP has eight ports for connecting to a computer or a network. The ports are at the left rear corner of the MFP.



1	Foreign interface harness (FIH)
2	USB 2.0
3	ACC (accessory port uses host USB protocol)
4	Fax connection (for connecting to an optional analog fax accessory)
5	Parallel port
6	EIO interface expansion slot
7	Access port for Kensington lock
8	Network connection (embedded Jetdirect print server)
9	AUX port

Model and serial numbers

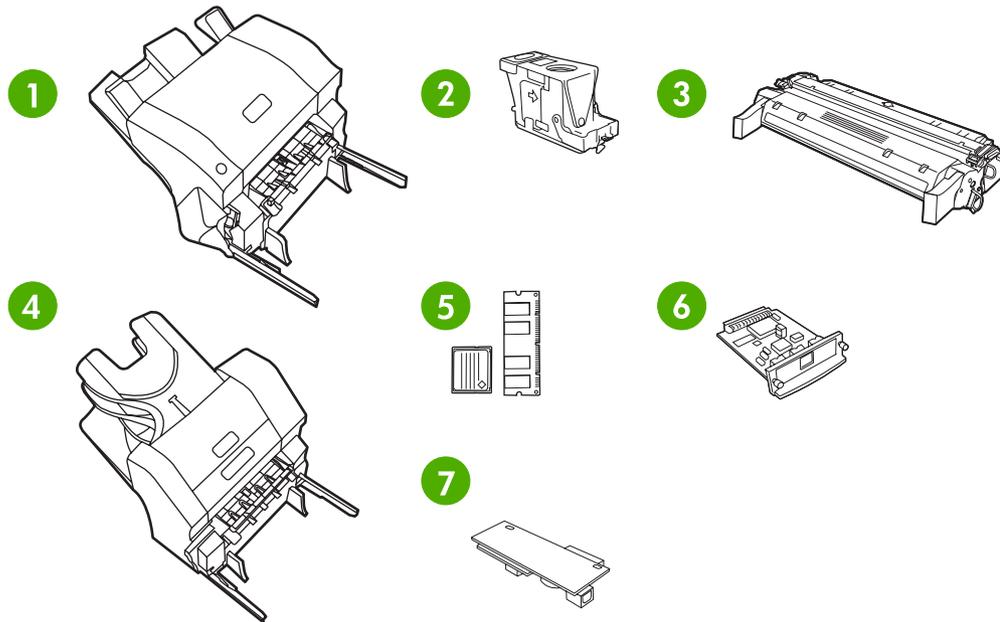
The model numbers and serial numbers are located underneath the top cover, at the rear of the MFP.

Accessories and supplies

Increase the capabilities of the MFP by adding optional accessories. For information about ordering accessories and supplies, see [Parts and supplies on page 43](#).



NOTE Use the accessories and supplies that have been specifically designed for the MFP in order to ensure optimum performance.



1	Stapler/stacker (Q7521A); includes an output accessory bridge
2	Staple cartridge (C8091A)
3	Print cartridge (four print cartridges) (Q6460A, Q6461A, Q6462A, and Q6463A)
4	3-bin mailbox (Q7523A); includes an output accessory bridge
5	Memory DIMMS and flash memory cards
6	HP Jetdirect print server (EIO card)
7	HP LaserJet analog fax accessory 300 (Q3701A)

Parts compatibility with other HP LaserJet products

Some parts and accessories for this MFP are compatible with the HP Color LaserJet 4700. [Table 1-1 Parts compatibility on page 13](#) indicates which parts and accessories can be installed on other products. It also indicates which parts from other products are *not* compatible with this MFP.

Table 1-1 Parts compatibility

Part	Description	Product number	HP Color LaserJet 4700
Print cartridges	Black (12,000 pages)	Q6460A	No
	Cyan (12,000 pages)	Q6461A	No
	Yellow (12,000 pages)	Q6462A	No
	Magenta (12,000 pages)	Q6463A	No
DIMMs	128 MB DDR DIMM	Q7721A	Yes
	256 MB DDR DIMM	Q7722A	Yes
	512 MB DDR DIMM	Q7723A	Yes
HP Jetdirect EIO cards	USB, serial, and LocalTalk	J4135A	Yes
	620n Fast Ethernet 10/100Base-TX	J7934A	Yes
Hard disk		J6054B	No
Fuser kit	110 volt	Q7502A	Yes
	220 volt	Q7503A	Yes
ETB kit		Q7504A	Yes
ADF maintenance kit		Q5597A	No

Moving the MFP

Before moving the MFP, be sure to lock the scanner. The scanner lock is underneath the scanner lid, to the left of the scanner glass.



NOTE After moving the MFP, unlock the scanner. The MFP cannot initialize correctly when the scanner is locked.

Site requirements

Place the MFP on a level floor or sturdy surface, away from direct sunlight. Allow enough space around the MFP to open the doors and trays.

Physical specifications

Table 1-2 Product dimensions

Product	Height	Depth	Width	Weight ¹
HP Color LaserJet 4730mfp	1153 mm (45.4 inches)	639 mm (25.2 inches)	788 mm (31 inches)	124 kg (273 lb)
HP Color LaserJet 4730x mfp	1153 mm (45.4 inches)	639 mm (25.2 inches)	788 mm (31 inches)	124 kg (273 lb)
HP Color LaserJet 4730xs mfp	1153 mm (45.4 inches)	639 mm (25.2 inches)	1106 mm (43.5 inches)	136 kg (298 lb)
HP Color LaserJet 4730xm mfp	1153 mm (45.4 inches)	639 mm (25.2 inches)	1106 mm (43.5 inches)	136 kg (298 lb)

¹ Without print cartridge

Table 1-3 Product dimensions

Product	Width	Depth	Height
HP Color LaserJet 4730mfp	788 mm (31 inches)	639 mm (25.2 inches)	1153 mm (45.4 inches)
HP Color LaserJet 4730x mfp	788 mm (31 inches)	639 mm (25.2 inches)	1153 mm (45.4 inches)
HP Color LaserJet 4730xs mfp	1106 mm (43.5 inches)	639 mm (25.2 inches)	1153 mm (45.4 inches)
HP Color LaserJet 4730xm mfp	1106 mm (43.5 inches)	639 mm (25.2 inches)	1153 mm (45.4 inches)

Environmental specifications

Table 1-4 Environmental specifications

Environmental condition	Recommended	Allowed	Storage/standby
Temperature (MFP and print cartridge)	17° to 25°C (62.6° to 77°F)	15° to 30°C (59° to 78°F)	-20° to 40°C (-4° to 104°F)
Relative humidity	30% to 70% relative humidity (RH)	10% to 80% RH	10% to 90%
Altitude	N/A	0 meters (0 feet) to 2600 meters (8530 feet)	N/A

MFP specifications

Electrical specifications



WARNING! Power requirements are based on the country/region where the MFP is sold. Do not convert operating voltages. This can damage the MFP and void the product warranty.

Table 1-5 Power requirements

Specification	110-volt models	230-volt models
Power requirements	110 to 127 volts ($\pm 10\%$)	220 to 240 volts ($\pm 10\%$)
	50/60 Hz (± 2 Hz)	50/60 Hz (± 2 Hz)
Rated current	9.0 Amps	4.5 Amps

Table 1-6 Power consumption (average, in watts)

Product model ^{1, 2}	Copying ³	Printing ³	Ready ^{4, 6}	On ⁵	Off
HP Color LaserJet 4730mfp	615 W	604 W	83 W	24 W	0.5 W
HP Color LaserJet 4730x mfp	615 W	604 W	83 W	24 W	0.5 W
HP Color LaserJet 4730xs mfp	615 W	604 W	83 W	24 W	0.5 W
HP Color LaserJet 4730xm mfp	640 W	626 W	86 W	25 W	0.5 W

¹ Values subject to change. See <http://www.hp.com/support/clj4730mfp> for current information.

² Power numbers are the highest values measured using all standard voltages.

³ HP Color LaserJet 4730mfp printing and copying speeds are 31 ppm letter size and 30 ppm A4 size.

⁴ Default time from Ready mode to Sleep mode is 45 minutes.

⁵ Recovery time from Sleep mode to start of printing is less than 20 seconds.

⁶ Heat dissipation in Ready mode = 288 BTU/hour.

Acoustic specifications

Table 1-7 Sound power and pressure level¹ (Product Name: X)

Sound power level	Declared per ISO 9296
Printing ²	L_{WA_d} = 6.7 Bels (A) [67 dB(A)]
Copying ³	L_{WA_d} = 6.8 Bels (A) [68 dB(A)]
Ready	L_{WA_d} = 5.8 Bels (A) [58 dB(A)]
Sound pressure level	Declared per ISO 9296
Printing ²	L_{pAm} = 50 dB (A)
Copying ³	L_{pAm} = 52 dB (A)
Ready	L_{pAm} = 37 dB (A)

¹ Values subject to change. See <http://www.hp.com/support/clj4730mfp> for current information.

² HP Color LaserJet 4730mfp series speed is 30 ppm A4 size. Configuration tested (HP Color LaserJet 4730mfp): Base model, simplex printing with A4 paper size.

³ Configuration tested (HP Color LaserJet 4730mfp): Base model, simplex copying from ADF with A4 paper size.

Image area

The MFP can place printed or copied images on the page within the following margins:

- **Printing:** 4.23 mm (0.17 inches) from each edge
- **Copying (standard):** 4.23 mm (0.17 inches) from each edge



NOTE Margins vary when using digital sending. The margins depend on the type of file being sent and its dpi resolution.

Skew specifications

The MFP has the following skew specifications:

- **Print engine** (cut-sheet paper; simplex and duplex): less than 1.5 mm (0.06 inches) over a 260 mm (10.24 inches) length
- **Print engine** (envelopes): less than 3.3 mm (0.13 inches) over a 220 mm (8.66 inches) length
- **ADF and scanner glass** (cut-sheet paper): less than 0.6%

Media specifications

This section provides comprehensive information on supported media types.

Category	Specifications
Acid content	5.5 pH to 8.0 pH
Caliper	0.094 mm (3.0 to 7.0 mils)
Curl in ream	Flat within 5 mm (0.02 inches)
Cut edge conditions	Cut with sharp blades that create no visible fray
Fusing compatibility	Must not scorch, melt, offset, or release hazardous emissions when heated to 200°C (392°F) for 0.1 second
Grain	Long grain
Moisture content	3% to 9% by weight
Smoothness	100 to 250 Sheffield

Printing and paper storage environment

Ideally, the printing and paper storage environment should be at or near room temperature, and not too dry or too humid. Remember that paper is hygroscopic; it absorbs and loses moisture rapidly.

Heat works with humidity to damage paper. Heat causes the moisture in paper to evaporate, while cold causes it to condense on the sheets. Heating systems and air conditioners remove most of the humidity from a room. As paper is opened and used, it loses moisture, causing streaks and smudging. Humid weather or water coolers can cause the humidity to increase in a room. As paper is opened and used it absorbs any excess moisture, causing light print and dropouts. Also, as paper loses and gains moisture it can distort. This can cause jams.

As a result, paper storage and handling are as important as the paper-making process itself. Paper storage environmental conditions directly affect the feed operation.

Care should be taken not to purchase more paper than can be easily used in a short time (about 3 months). Paper stored for long periods might experience heat and moisture extremes, which can cause damage. Planning is important to prevent damage to a large supply of paper.

Unopened paper in sealed reams can remain stable for several months before use. Opened packages of paper have more potential for environmental damage, especially if they are not wrapped with a moisture-proof barrier.

The paper storage environment should be properly maintained to ensure optimum MFP performance. The required condition is 20° to 24°C (68° to 75°F), with a relative humidity of 45% to 55%. The following guidelines should be helpful when evaluating the paper storage environment:

- Paper should be stored at or near room temperature.
- The air should not be too dry or too humid (due to the hygroscopic properties of paper).
- The best way to store an opened ream of paper is to rewrap it tightly in its moisture-proof wrapping. If the MFP environment is subject to extremes, unwrap only the amount of paper to be used during the day's operation to prevent unwanted moisture changes.

Envelopes

Envelope construction is critical. Envelope fold lines can vary considerably, not only between manufacturers, but also within a box from the same manufacturer. Successful printing on envelopes depends upon the quality of the envelopes. When selecting envelopes, consider the following components:

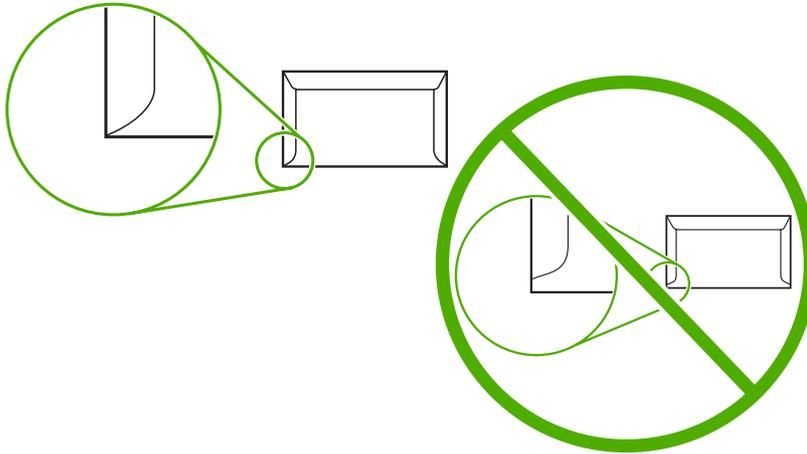
- **Weight:** The weight of the envelope paper should not exceed 105 g/m² (28 lb) or jamming might occur.
- **Construction:** Prior to printing, envelopes should lie flat with less than 6 mm (0.25 inches) curl, and should not contain air.
- **Condition:** Envelopes should not be wrinkled, nicked, or otherwise damaged.
- **Temperature:** Use envelopes that are compatible with the heat and pressure of the MFP.
- **Size:** Use only envelopes that are within the following size ranges:
 - **Minimum:** 76 x 127 mm (3 x 5 inches)
 - **Maximum:** 216 x 356 mm (8.5 x 14 inches)



NOTE Use only tray 1 to print on envelopes. Some jams might occur when using any media with a length less than 178 mm (7 inches). This might be caused by paper that has been affected by environmental conditions. For optimum performance, make sure to store and handle the paper correctly. Select envelopes in the printer driver.

Envelopes that have double side seams

Double side-seam construction has vertical seams at both ends of the envelope rather than diagonal seams. This style might be more likely to wrinkle. Be sure that the seam extends all the way to the corner of the envelope, as illustrated.



Envelopes that have adhesive strips or flaps

Envelopes that have a peel-off adhesive strip or with more than one flap that folds over to seal must use adhesives that are compatible with the heat and pressure in the MFP. The extra flaps and strips might cause wrinkling, creasing, or jams, and might even damage the fuser.

Envelope margins

The following table shows typical address margins for a commercial #10 or DL envelope.

Type of address	Top margin	Left margin
Return address	15 mm (0.6 inches)	15 mm (0.6 inches)
Delivery address	51 mm (2 inches)	89 mm (3.5 inches)



NOTE For the best print quality, position margins no closer than 15 mm (0.6 inches) from the edges of the envelope. Avoid printing over the area where the envelope seams meet.

Envelope storage

Proper storage of envelopes helps contribute to print quality. Envelopes should be stored flat. If air is trapped in an envelope, creating an air bubble, then the envelope might wrinkle during printing.

Labels



CAUTION To avoid damaging the MFP, use only labels that are recommended for use in laser printers. Never print on the same sheet of labels more than once or print on a partial sheet of labels.

Label construction

When selecting labels, consider the quality of each component:

- **Adhesives:** The adhesive material should be stable at 200°C (392°F), the MFP's fusing temperature.
- **Arrangement:** Only use labels that have no exposed backing between them. Labels can peel off sheets that have spaces between the labels, causing serious jams.
- **Curl:** Prior to printing, labels must lie flat with no more than 13 mm (0.5 inches) of curl in any direction.
- **Condition:** Do not use sheets of labels that have wrinkles, bubbles, or other indications of separation.



NOTE Select labels in the printer driver.

Transparencies

Transparencies used in the MFP must be able to withstand 200°C (392°F), the MFP's fusing temperature.



CAUTION To avoid damaging the MFP, use only transparencies recommended for use in HP LaserJet printers, such as HP-brand transparencies.



NOTE Select transparencies in the printer driver.

Supported types and sizes of print media

The following table lists the types of media that the MFP supports.

Table 1-8 Supported types of media

Type of media	Tray 1	Trays 2, 3, and 4	Duplexer	3-bin mailbox or stacker	Stapler
Plain	X	X	X	X	X
Preprinted	X	X	X	X	X
Letterhead	X	X	X	X	X
Transparency	X	X		X	
Prepunched	X	X	X	X	X
Labels	X	X		X	
Bond	X	X	X	X	X
Recycled	X	X	X	X	X
Color	X	X	X	X	X
Cardstock	X			X ¹²	
Rough	X	X	X	X	X
Envelope	X			X ¹²	

¹ Face-down delivery only.

² If a 3-bin mailbox is installed, select the bottom bin when printing on cardstock. Media weights that are 200 g/m² (53 lb) or heavier are supported only in the bottom bin.

Table 1-9 Tray 1 media sizes

Tray 1	Dimensions	Weight or thickness	Capacity
Paper and cardstock, standard sizes (letter/A4, legal, executive, JIS B5, A5); custom sizes	Range: 76 x 127 mm (3 x 5 inches) to 216 x 356 mm (8.5 x 14 inches)	Range: 60 g/m ² (16 lb) bond to 220 g/m ² (60 lb) bond	Maximum stack height: 10 mm (0.6 inches) Equivalent to 100 sheets of 75 g/m ² (20 lb) bond
Glossy paper (letter/A4, legal, executive, JIS B5, A5)	Range: 76 x 127 mm (3 x 5 inches) to 216 x 356 mm (8.5 x 14 inches)	Range: 75 g/m ² (20 lb) bond to 220 g/m ² (60 lb) bond	Maximum stack height: 10 mm (0.6 inches)
 NOTE Do not use inkjet papers in this MFP.			
Transparencies (letter/A4), suitable for use in color laser printers	Letter: 216 x 279 mm (8.5 x 11 inches) A4: 210 x 297 mm (8.27 x 11.7 inches)	Minimum 0.13 mm (0.005 inches) thick	Maximum stack height: 10 mm (0.6 inches)
HP Tough paper (letter/A4)	Letter: 216 x 279 mm (8.5 x 11 inches)	0.13 mm (0.005 inches) thick	Maximum stack height: 10 mm (0.6 inches)

Table 1-9 Tray 1 media sizes (continued)

Tray 1	Dimensions	Weight or thickness	Capacity
	A4: 210 x 297 mm (8.27 x 11.7 inches)		
HP Color Laser Glossy Photo Paper (letter/A4)	Letter: 216 x 279 mm (8.5 x 11 inches)	220 g/m ² (60 lb) bond	Maximum stack height: 10 mm (0.6 inches)
 NOTE Do not use inkjet papers in this MFP.	A4: 210 x 297 mm (8.27 x 11.7 inches)		
Envelopes (Com 10, Monarch, C5, DL, B5)		Range: 60 g/m ² (16 lb) bond to 90 g/m ² (24 lb) bond	20 envelopes
Labels (letter/A4, legal, executive, JIS B5, A5), suitable for use in color laser printers	Range: 76 x 127 mm (3 x 5 inches) to 216 x 356 mm (8.5 x 14 inches)	Maximum 0.23 mm (0.009 inches) thick	Maximum stack height: 10 mm (0.6 inches)

Table 1-10 Tray 2, 3, and 4 media sizes¹

Trays 2, 3, and 4	Dimensions	Weight or thickness	Capacity
Paper, standard sizes (letter/A4, legal, executive, JIS B5, A5); custom sizes	Range: 148 x 210 mm (5.83 x 8.27 inches) to 216 x 356 mm (8.5 x 14 inches)	Range: 60 g/m ² (16 lb) bond to 120 g/m ² (32 lb) bond	Maximum stack height: 56 mm (2.2 inches) Equivalent to 530 sheets of 75 g/m ² (20 lb) bond
Glossy paper (letter/A4, legal, executive, JIS B5, A5)	Range: 148 x 210 mm (5.83 x 8.27 inches) to 216 x 356 mm (8.5 x 14 inches)	Range: 75 g/m ² (20 lb) bond to 120 g/m ² (32 lb) bond	Maximum stack height: 56 mm (2.2 inches)
 NOTE Do not use inkjet papers in this MFP.			
HP Color Laser Glossy Photo & Imaging Paper (letter/A4)	Letter: 216 x 279 mm (8.5 x 11 inches) A4: 210 x 297 mm (8.27 x 11.7 inches)	120 g/m ² (32 lb) bond	Maximum stack height: 56 mm (2.2 inches)
 NOTE Do not use inkjet papers in this MFP.			
Transparencies (letter/A4), suitable for use in color laser printers	Letter: 216 x 279 mm (8.5 x 11 inches) A4: 210 x 297 mm (8.27 x 11.7 inches)	Minimum: 0.13 mm (0.005 inches) thick	Maximum stack height: 56 mm (2.2 inches)
HP Tough Paper (letter/A4)	Letter: 216 x 279 mm (8.5 x 11 inches) A4: 210 x 297 mm (8.27 x 11.7 inches)	Maximum: 0.13 mm (0.005 inches) thick	Maximum stack height: 56 mm (2.2 inches)

Table 1-10 Tray 2, 3, and 4 media sizes (continued)

Trays 2, 3, and 4	Dimensions	Weight or thickness	Capacity
Labels (letter/A4 and custom sizes), suitable for use in color laser printers	Range: 148 x 210 mm (5.83 x 8.27 inches) to 216 x 356 mm (8.5 x 14 inches)	Maximum: 0.13 mm (0.005 inches) thick	Maximum stack height: 56 mm (2.2 inches)

¹ Trays 2, 3, and 4 use custom sizes specifically for B5 ISO. These trays do not support the range of custom sizes that can be used in tray 1.

Table 1-11 Automatic duplex printing (two-sided printing)

Automatic duplex printing	Dimensions	Weight or thickness
Paper	Standard sizes: Letter: 216 x 279 mm (8.5 x 11 inches) A4: 210 x 297 mm (8.27 x 11.7 inches) 8.5 x 13: 216 x 330.2 mm (8.5 x 13 inches) Legal: 216 x 356 mm (8.5 x 14 inches) Executive: 184.2 x 266.7 mm (7.25 x 10.5 inches) JIS B5: 182 x 257 mm (7.17 x 10.12 inches)	Range: 60 g/m ² (16 lb) bond to 120 g/m ² (32 lb) bond
Glossy paper (A4/letter, 13 x 8.5 in, legal, executive, JIS B5)	See above for standard sizes supported	Range: 75 g/m ² (20 lb) bond to 120 g/m ² (32 lb) bond
 NOTE Do not use inkjet papers in this MFP.		
HP Color Laser Glossy Photo & Imaging Paper (A4/letter)	Standard sizes: Letter: 216 x 279 mm (8.5 x 11 inches) A4: 210 x 297 mm (8.27 x 11.7 inches)	120 g/m ² (32 lb) bond
 NOTE Do not use inkjet papers in this MFP.		

Table 1-12 Optional 3-bin mailbox or stacker part of the stapler/stacker supported sizes

Size	Dimensions ¹	Weight	Capacity ²
Letter	216 x 279 mm (8.5 x 11 inches)	For plain media: 60 g/m ² (16 lb) to 120 g/m ² (32 lb)	For the stacker on the stapler/stacker or the lower

Table 1-12 Optional 3-bin mailbox or stacker part of the stapler/stacker supported sizes (continued)

Size	Dimensions ¹	Weight	Capacity ²
		For thick media: 128 g/m ² (34 lb) to 199 g/m ² (53 lb)	bin on the 3-bin mailbox: 500 sheets of 75 g/m ² (20 lb) paper. For the top two bins on the 3- bin mailbox: each can hold 100 sheets of 75 g/m ² (20 lb) paper.
A4	210 x 297 mm (8.27 x 11.7 inches)		
Executive	184.2 x 266.7 mm (7.25 x 10.5 inches)		
Legal	216 x 356 mm (8.5 x 14 inches)		
B5 (JIS)	182 x 257 mm (7.17 x 10.12 inches)		
A5	148 x 210 mm (5.8 x 8.3 inches)		
Statement	140 x 216 mm (5.5 x 8.5 inches)		
8.5x13	216 x 330 mm (8.5 x 13 inches)		
Executive (JIS)	216 x 330 mm (8.5 x 13 inches)		
DPostcard (JIS)	148 x 200 mm (5.8 x 7.9 inches)		
16K	197 x 273 mm (7.75 x 10.75 inches)		
Envelope #10 ¹	105 x 241 mm (4.1 x 9.5 inches)		
Envelope Monarch #7 ¹	98 x 191 mm (3.9 x 7.5 inches)		
Envelope C5 ISO ¹	162 x 229 mm (6.4 x 9.0 inches)		
Envelope DL ISO ¹	110 x 220 mm (4.3 x 8.7 inches)		
Envelope B5 ISO ¹	176 x 250 mm (6.7 x 9.8 inches)		
Custom	Minimum: 76 x 127 mm (3 x 5 inches) Maximum: 216 x 356 mm (8.5 x 14 inches)		

Table 1-12 Optional 3-bin mailbox or stacker part of the stapler/stacker supported sizes (continued)

Size	Dimensions ¹	Weight	Capacity ²
Cardstock, transparencies, and labels are supported only in the third bin of the 3-bin mailbox.			

¹ The MFP supports a wide range of sizes. Check the MFP software for supported sizes.

² Capacity can vary depending on paper weight and thickness, as well as environmental conditions.

³ Face-down delivery only.

Table 1-13 Stapler part of the optional stapler/stacker supported sizes

Size	Dimensions	Weight	Capacity
Letter	216 x 279 mm (8.5 x 11 inches)	For plain media: 60 g/m ² (16 lb) to 120 g/m ² (32 lb)	For plain media: 30 sheets of 75 g/m ² (20 lb) paper.
		For thick media: 128 g/m ² (34 lb) to 199 g/m ² (53 lb)	For glossy media: 20 sheets For thick media: the stack height must not exceed 7 mm (0.27 inches)
A4	210 x 297 mm (8.27 x 11.7 inches)		
Legal	216 x 356 mm (8.5 x 14 inches)		
8.5x13	216 x 330 mm (8.5 x 13 inches)		
Executive(JIS)	216 x 330 mm (8.5 x 13 inches)		

Printing on special media

Use these guidelines when printing on special types of media.



NOTE Special media such as envelopes, transparencies, custom-size media, or heavy media greater than 120 g/m² should only be used in Tray 1.

To print on any special media, use the following procedure:

1. Load the media in Tray 1.
2. When the MFP prompts you for the paper type, select the correct media type for the media loaded in the tray. For example, select **PHOTO GLOSS** when loading HP Color LaserJet Glossy Photo Paper.
3. In the software application or the printer driver, set the media type to match the media type that is loaded in the media tray.



NOTE For the best print quality, always verify that the media type selected on the MFP control panel and the media type selected in the application or printer driver match the type of media loaded in the tray.

Transparencies

When printing on transparencies, use the following guidelines:

- Handle transparencies using the edges. Oils from your fingers deposited on the transparency can cause print quality problems.
- Use only overhead transparencies recommended for use in this MFP. Hewlett-Packard recommends using HP Color LaserJet Transparencies. HP products are designed to work together for optimum printing results.
- In either the software application or the driver, select **TRANSPARENCY** as the media type, or print from a tray that is configured for transparencies.



CAUTION Transparencies not designed for HP Color LaserJet printing might melt in the printer or wrap around the fuser, causing damage to the MFP.

Glossy paper

- In either the software application or the driver, select **GLOSSY, HEAVY GLOSSY, or INTERMEDIATE90-104** as the media type, or print from a tray that is configured for glossy paper.
- Use the control panel to set the media type to **GLOSSY** for the input tray being used.
- Because this affects all print jobs, it is important to return the MFP to its original settings once the job has printed.



NOTE Hewlett-Packard recommends using HP Color LaserJet Glossy Photo Paper and soft glossy papers designed for use in HP Color LaserJet printers. HP products are designed to work together for optimum printing results. If other types of glossy media are used, print quality could be compromised.

Colored paper

- Colored paper should be of the same high quality as white xerographic paper.
- Pigments used in colored media must be able to withstand the MFP's fusing temperature of 190° C (374°F) for 0.1 second without deterioration.
- The MFP creates colors by printing patterns of dots, overlaying and varying their spacing to produce various colors. Varying the shade or color of the paper will affect the shades of the printed colors.

Envelopes



NOTE Envelopes can be printed only from Tray 1. Set the tray's media size to the specific envelope size.

Adhering to the following guidelines will help ensure proper printing on envelopes and help prevent paper jams:

- Do not load more than 20 envelopes into Tray 1.
- The weight rating of envelopes should not exceed 90 g/m² (24 lb bond).
- Envelopes should be flat.
- Do not use envelopes with windows or clasps.
- Envelopes must not be wrinkled, nicked, or otherwise damaged.
- Envelopes with peel-off adhesive strips must use adhesives that can withstand the heat and pressures of the MFP's fusing process.
- Envelopes should be loaded face-down and with the postage end feeding into the MFP first.

Labels



NOTE For printing labels, set the tray's media type to **LABELS** in the MFP control panel. When printing labels, use the following guidelines:

- Verify that the labels' adhesive material can tolerate temperatures of 190°C (374°F) for 0.1 second.
- Verify that there is no exposed adhesive material between the labels. Exposed areas can cause labels to peel off during printing, which can cause paper jams. Exposed adhesive can also cause damage to MFP components.
- Do not re-feed a sheet of labels.
- Verify that the labels lie flat.
- Do not use labels that are wrinkled, bubbled, or otherwise damaged.

Heavy paper

The following heavy paper types can be used with the HP Color LaserJet 4730mfp series MFP.

Table 1-14 Supported heavy paper types

Paper type	Paper weight
Heavy and extra-heavy stock	105-163 g/m ² (28-43 lb)
Cardstock	164-220 g/m ² (43-58 lb)
Intermediate	90-105 g/m ² (24-28 lb)
HP Tough paper	5 mil

When printing on heavy paper types, use the following guidelines:

- Use Tray 1 for paper that is heavier than 120 g/m² (32 lb).
- For optimum results when printing on heavy paper, use the MFP control panel to set the media type for the tray to the appropriate paper type listed in [Table 1-14 Supported heavy paper types on page 29](#).
- In either the software application or the driver, select the appropriate paper type as the media type, or print from a tray that is configured for heavy paper.
- Because this setting affects all print jobs, it is important to return the MFP back to its original settings once the job has printed.



CAUTION In general, do not use paper that is heavier than the media specification recommended for this MFP. Doing so can cause misfeeds, paper jams, reduced print quality, and excessive mechanical wear.

HP LaserJet Tough paper

When printing on HP LaserJet Tough paper, use the following guidelines:

- Handle HP LaserJet Tough paper only by the edges. Oils from your fingers deposited on HP LaserJet Tough paper can cause print quality problems.
- Use only HP LaserJet Tough paper with this MFP. HP products are designed to work together for optimum printing results.
- In either the software application or the driver, select **TOUGH PAPER** as the media type, or print from a tray that is configured for HP LaserJet Tough paper.

Preprinted forms and letterhead

Observe the following guidelines for best results with preprinted forms and letterhead:

- Forms and letterhead must be printed with heat-resistant inks that will not melt, vaporize, or release undesirable emissions when subjected to the MFP's fusing temperature of approximately 190°C (374°F) for 0.1 second.
- Inks must be non-flammable and should not adversely affect any printer rollers.

- Forms and letterhead should be sealed in a moisture-proof wrapping to prevent changes during storage.
- Before loading preprinted paper such as forms and letterhead, verify that the ink on the paper is dry. During the fusing process, wet ink can come off of preprinted paper.
- To load pre-printed forms and letterhead into Tray 1, load them face down with the top edge of the page facing toward you.
- To load pre-printed forms and letterhead into Tray 2 or an optional tray, load them face up with the top edge of the page facing away from you.
- When duplex printing, load pre-printed forms and letterhead into Tray 2 or an optional 500-sheet tray face down with the top edge of the page towards you.

Recycled paper

This MFP supports the use of recycled paper. Recycled paper must meet the same specifications as standard paper. Hewlett-Packard recommends that recycled paper contain no more than 5% ground wood.

Weight equivalence table

The weight equivalence table shows equivalent weights for different grades of paper. A boldface type value indicates a commonly available standard weight for that grade.



NOTE Text and book grades marked with an asterisk (*) actually calculate to 51, 61, 71, and 81 but are rounded to standard book or text weights of 50, 60, 70, and 80.

Table 1-15 Weight equivalence table

Bond weight	Text/Book weight	Cover weight	Bristol weight	Index weight	Tag weight	Metric weight
16	41	22	27	33	37	60 g/m²
17	43	24	29	35	39	64 g/m²
20	50*	28	34	42	46	75 g/m²
21	54	30	36	44	49	80 g/m²
24	60*	33	41	50	55	90 g/m²
27	68	37	45	55	61	100 g/m²
28	70*	39	49	58	65	105 g/m ²
29	74	41	50	61	68	110 g/m²
32	80*	44	55	67	74	120 g/m²
36	90	50	62	75	83	135 g/m²
39	100	55	67	82	91	148 g/m ²
40	101	55	68	83	92	150 g/m²
43	110	60	74	90	100	163 g/m ²
45	115	63	77	94	104	170 g/m²

Table 1-15 Weight equivalence table (continued)

Bond weight	Text/Book weight	Cover weight	Bristol weight	Index weight	Tag weight	Metric weight
47	119	65	80	97	108	176 g/m ²
51	128	70	86	105	117	190 g/m²
53	134	74	90	110	122	199 g/m ²
54	137	75	93	113	125	203 g/m ²
58	146	80	98	120	133	216 g/m ²
65	165	90	111	135	150	244 g/m ²
66	169	92	114	138	154	250 g/m²
67	171	94	115	140	155	253 g/m ²
70	178	98	120	146	162	264 g/m ²
72	183	100	123	150	166	271 g/m ²

Regulatory information

FCC and Telecom regulations

FCC regulations

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense. The end user of this product should be aware that any changes or modifications made to this equipment without the approval of Hewlett-Packard could result in the product not meeting the Class A limits, in which case the FCC could void the user's authority to operate the equipment.



NOTE Any changes or modifications to the MFP that are not expressly approved by HP could void the user's authority to operate this equipment.

Telecom

This product is intended to be connected to the analog Public Switched Telecommunication Networks (PSTN) of European Economic Area (EEA) countries/regions. It meets requirements of EU R Directive 1999/5/EC (Annex II) and carries appropriate CE conformity marking. For more details see the [Declaration of conformity \(HP Color LaserJet 4730mfp\) on page 39](#) issued by the manufacturer.

However, due to differences between individual national PSTNs, the product may not guarantee unconditional assurance of successful operation on every PSTN termination point. Network compatibility depends on the correct setting being selected by the customer in preparation of its connection to the PSTN. Please follow the instructions provided in the user manual. If you experience network compatibility issues, please contact your equipment supplier or Hewlett-Packard help desk in the country/region of operation.

Connecting to a PSTN termination point may be the subject of additional requirements set out by the local PSTN operator.

Environmental Product Stewardship program

Protecting the environment

Hewlett-Packard Company is committed to providing quality products in an environmentally sound manner. This product has been designed with several attributes to minimize impacts on our environment.

Ozone production

This product generates no appreciable ozone gas (O₃).

Energy consumption

Power usage drops significantly while in Sleep mode, which saves natural resources and saves money without affecting the high performance of this product. This product qualifies for ENERGY STAR® (Multifunctional devices, Version 3.0), which is a voluntary program to encourage the development of energy-efficient office products.



ENERGY STAR® and the ENERGY STAR mark are U.S. registered service marks. As an ENERGY STAR partner, Hewlett-Packard Company has determined that this product meets ENERGY STAR Guidelines for energy efficiency. For more information, see <http://www.energystar.gov>.

Paper use

This product's automatic duplex feature (two-sided printing) and n-up printing (multiple pages printed on one page) capabilities can reduce media usage and the resulting demands on natural resources.

Plastics

Plastic parts over 25 grams are marked according to international standards that enhance the ability to identify plastics for recycling purposes at the end of the product's life.

HP LaserJet printing supplies

It is easy to return and recycle your empty HP LaserJet print cartridges—free of charge—with HP Planet Partners. HP is committed to providing inventive, high-quality products and services that are environmentally sound, from product design and manufacturing to distribution, operation and recycling processes. We ensure your returned HP LaserJet print cartridges are recycled properly, processing them to recover valuable plastics and metals for new products and diverting millions of tons of waste from landfills. Since this cartridge is being recycled and used in new materials, it will not be returned to you. Your empty HP LaserJet print cartridges are recycled responsibly when you participate in the HP Planet Partners program. Thank you for being environmentally responsible!

HP Printing Supplies Returns and Recycling Program Information

In many countries/regions, this product's printing supplies (print cartridges, fuser, and transfer unit) can be returned to HP through the HP Printing Supplies Returns and Recycling Program. An easy-to-use and free takeback program is available in over 35 countries/regions. Multilingual program

information and instructions are included in every new HP LaserJet print cartridge and supplies package.

Since 1992, HP has offered HP LaserJet supplies return and recycling free of charge. In 2004, HP Planet Partners for LaserJet Supplies was available in 85% of the world market where HP LaserJet supplies are sold. Postage-paid and pre-addressed labels are included within the instruction guide in most HP LaserJet print cartridge boxes. Labels and bulk boxes are also available through the Web site at <http://www.hp.com/recycle>.

Use the label to return empty, original HP LaserJet print cartridges only. Please do not use this label for non-HP cartridges, refilled or remanufactured cartridges, or warranty returns. Printing supplies or other objects inadvertently sent to the HP Planet Partners program cannot be returned.

More than 10 million HP LaserJet print cartridges were recycled globally in 2004 through the HP Planet Partners supplies recycling program. This record number represents 26 million pounds of print cartridge materials diverted from landfills. Worldwide, in 2004, HP recycled an average of 59% of the print cartridge by weight consisting primarily of plastic and metals. Plastics and metals are used to make new products such as HP products, plastic trays and spools. The remaining materials are disposed of in an environmentally responsible manner.

Paper

This product is capable of using recycled papers according to EN 12281:2002. HP recommends the use of recycled papers that contain not more than 5% ground wood, such as HP Office Recycled paper.

Material restrictions

This HP product contains mercury in the fluorescent lamp of the control panel liquid crystal display that might require special handling at end of life.

- **U.S. returns** For a more environmentally responsible return of used cartridges and supplies, HP encourages the use of bulk returns. Simply bundle two or more cartridges together and use the single, pre-paid, and pre-addressed UPS label that is supplied in the package. For more information in the U.S., call 1-800-340-2445 or visit the HP Web site at <http://www.hp.com/recycle>.
- **Non-U.S. returns** Non-U.S. customers should visit the <http://www.hp.com/recycle> Web site for information regarding availability of the HP Supplies Returns and Recycling Program.

This HP product contains a battery that might require special handling at end of life.

Type	Carbon monofluoride lithium battery
Weight	8 grams
Location	Formatter board
User removable	No

For recycling information, you can contact <http://www.hp.com/go/recycle> or contact your local authorities or the Electronics Industry Alliance at <http://www.eiae.org>.



廢電池請回收

Disposal of waste equipment by users in private households in the European Union

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



Material safety data sheet

Material Safety Data Sheets (MSDS) can be obtained by contacting the HP LaserJet Supplies Web site at <http://www.hp.com/hpinfo/community/environment/productinfo/safety.htm>.

For more information

To obtain information about the following environmental topics, visit <http://www.hp.com/go/environment> or <http://www.hp.com/hpinfo/community/environment/productinfo/safety>.

- Product environmental profile sheet for this and many related HP products
- HP's commitment to the environment
- HP's environmental management system

- HP's end-of-life product return and recycling program
- Material Safety Data Sheets (MSDS)

Country/region-specific safety statements

Laser safety statement

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration has implemented regulations for laser products manufactured since August 1, 1976. Compliance is mandatory for products marketed in the United States. The MFP is certified as a "Class 1" laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968.

Since radiation emitted inside the MFP is completely confined within protective housings and external covers, the laser beam cannot escape during any phase of normal user operation.



WARNING! Using controls, making adjustments, or performing procedures other than those specified in this user guide may result in exposure to hazardous radiation.

Canadian DOC statement

Complies with Canadian EMC Class B requirements.

«Conforme à la classe B des normes canadiennes de compatibilité électromagnétiques (CEM).»

Japanese VCCI statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づきクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Korean EMI statement

사용시 안내문 (A급 기기)

이 기기는 업무용으로 전자파장애감정을 받은 기기이오니, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비입무용으로 교환하시기 바랍니다.

Japanese cordset statement

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

Taiwan safety statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Finnish laser statement

LASERTURVALLISUUS

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

HP LaserJet 4370mfp, HP LaserJet 4730x mfp, HP LaserJet 4730xs mfp, HP LaserJet 4730xm mfp -laserkirjoitin on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalisissa käytössä kirjoittimen suojakotelointi estää lasersäteen pääsyn laitteen ulkopuolelle.

Laitteen turvallisuusluokka on määritetty standardin EN60825-1 (1994) mukaisesti.

VAROITUS!

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

VARNING!

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

HUOLTO

HP LaserJet 4370mfp, HP LaserJet 4730x mfp, HP LaserJet 4730xs mfp, HP LaserJet 4730xm mfp -kirjoittimen sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Tällaiseksi huoltotoimenpiteeksi ei katsota väriainekasetin vaihtamista, paperiradan puhdistusta tai muita käyttäjän käsikirjassa lueteltuja, käyttäjän tehtäväksi tarkoitettuja ylläpitotoimia, jotka voidaan suorittaa ilman erikoistyökaluja.

VARO!

Mikäli kirjoittimen suojakotelo avataan, olet alttiina näkymättömälle lasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

VARNING!

Om laserprinterns skyddshölje öppnas då apparaten är i funktion, utsättas användaren för osynlig laserstrålning. Betrakta ej strålen.

Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus 770-800 nm

Teho 5 mW

Luokan 3B laser

Australia

This equipment complies with Australian EMC requirements.

Declaration of conformity (HP Color LaserJet 4730mfp)

Declaration of Conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company
Manufacturer's Address: 11311 Chinden Boulevard,
Boise, Idaho 83714-1021, USA

declares that the product

Product Name: HP Color LaserJet 4730 MFP, 4730x MFP, 4730xs MFP, 4730xm MFP
Product Numbers: Q7517A, Q7518A, Q7519A, Q7520A

Regulatory Model Number: Including accessories: Q7521A, Q7522A, Q7523A, BOISB-0308-00
Product Options: BOISB-0503-00⁴⁾
ALL

Toner Cartridge: Q6460A, Q6461A, Q6462A, Q6463A

conforms to the following Product Specifications:

Safety: IEC 60950-1:2001 / EN60950-1: 2001
IEC 60825-1:1993 +A1 +A2 / EN 60825-1:1994 +A11 +A2 (Class 1 Laser/LED Product)
GB4943-2001

EMC: CISPR 22:1997 / EN 55022:1998 - Class A¹⁾
EN 61000-3-2:2000
EN 61000-3-3:1995 + A1:2001
EN 55024:1998+A1:2001
FCC Title 47 CFR, Part 15 Class A / ICES-003, Issue 4²⁾
GB9254-1998

TELECOM: TBR-21:1998; EG 201 121:1998

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC, the R&TTE Directive 1999/5/EC (Annex II) and carries the CE-Marking accordingly.

1) The product was tested in a typical configuration with Hewlett-Packard Personal Computer Systems. Compliance testing of product to standard with exception of Clause 9.5, which is not yet in effect.

2) This Device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

3) For regulatory purposes, this product is assigned a Regulatory model number (BOISB-0503-00). This number should not be confused with the product name or the product number(s).

4) All worldwide modular approvals for analog fax accessory obtained by Hewlett-Packard under the regulatory model number BOISB-0308-00 incorporate the Multi-Tech Systems MT5634SMI Socket Modem Module.

Boise, Idaho 83713, USA

21 December, 2004

For regulatory topics only:

Australia Contact: Product Regulations Manager, Hewlett-Packard Australia Ltd., 31-41 Joseph Street, Blackburn, Victoria 3130, Australia

European Contact: Your Local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE / Standards Europe, Herrenberger Strasse 140, D-71034 Böblingen, Germany, (FAX: +49-7031-14-3143)

USA Contact: Product Regulations Manager, Hewlett-Packard Company, PO Box 15, Mail Stop 160, Boise, ID 83707-0015, USA, (Phone: 208-396-6000)

2 Service approach

This chapter contains information about the following topics:

- [Service approach](#)
- [Parts and supplies](#)
- [HP available services](#)
- [Hewlett-Packard Limited Warranty Statement](#)
- [Print Cartridge Limited Warranty Statement](#)
- [HP maintenance agreements](#)

Service approach

MFP repair normally begins by using the MFP internal diagnostics and the following three-step process.

1. Isolate the problem to the major system (for example, the host computer, the network or server, or the MFP system).
2. Determine if the problem is located in the accessories, the scanner assembly, or in the MFP engine.
3. Troubleshoot the problem using the procedures in Chapter 7.

After a faulty part is located, the MFP can usually be repaired at the assembly level by replacing field replaceable units (FRUs). Some mechanical assemblies might need to be repaired at the subassembly level. Hewlett-Packard does not support replacement of components on the printed circuit assemblies.

Parts and supplies

Field-replaceable part and accessory part numbers are found in chapter 8 of this manual. Order replacement parts from Hewlett-Packard Customer Support-Americas (HPCS-A) or Hewlett-Packard Customer Support-Europe (HPCS-E).



CAUTION Use only accessories specifically designed for this MFP. Accessories can be ordered from an authorized service or support provider.

Ordering parts, supplies, and accessories over the Internet

To order supplies in the US, contact <http://www.hp.com/go/ljsupplies>. To order supplies worldwide, see <http://www.hp.com/ghp/buyonline.html>. To order accessories, see <http://www.hp.com>.

Ordering directly through the embedded Web server (for MFPs with network connections)

Use the following steps to order printing supplies directly through the embedded Web server.

1. In the Web browser on the computer, type the IP address for the MFP. The MFP status window appears. Or, go to the URL provided in the alert email.
2. Click **Other Links**.
3. Click **Order Supplies**. The browser opens to a page in which you can choose to send information about the MFP to HP. You also have the option to order supplies without sending the MFP information to HP.
4. Select the part numbers you want to order and follow the instructions on the screen.

Exchange program

HP offers remanufactured assemblies for some parts. These are identified in chapter 8 and can be ordered from Hewlett-Packard Customer Support-Americas (HPCS-A) or Hewlett-Packard Customer Support-Europe (HPCS-E).

Supplies

Paper and print cartridges can be ordered directly from Hewlett-Packard. See chapter 8 for ordering information.

World Wide Web

Printer drivers, updated HP printer software, and product and support information can be obtained from the following URL:

In the U.S.: <http://www.hp.com/support/clj4730mfp>

Printer drivers can be obtained from the following sites:

In China: <ftp://www.hp.com.cn/support/clj4730mfp>

In Japan: <ftp://www.jpn.hp.com/support/clj4730mfp>

In Korea: <http://www.hp.co.kr/support/clj4730mfp>

In Taiwan: <http://www.hp.com.tw/support/clj4730mfp>

or the local driver Web site: <http://www.dds.com.tw>

HP Service Parts Information

Parts identification and pricing information can also be found on the World Wide Web at <http://www.hp.com/go/HPparts>.

HP available services

Online services

For 24-hour access to information using a modem or Internet connection:

World Wide Web URL: for the HP Color LaserJet 4730mfp series MFPs, updated HP printer software, product and support information, and printer drivers in several languages can be obtained from <http://www.hp.com/support/clj4730mfp>. (Sites are in English.)

Visit: http://www.hp.com/support/net_printing for information about network printing using HP Jetdirect print servers.

HP Instant Support Professional Edition (ISPE) is a suite of Web-based troubleshooting tools for desktop computing and printing products. ISPE helps you quickly identify, diagnose, and resolve computing and printing problems. The ISPE tools may be accessed from <http://instantsupport.hp.com>.

Telephone support

HP provides free telephone support during the warranty period. When you call, you will be connected to a responsive team waiting to help you. For the telephone number for your country/region, see the flyer that shipped in the box with the product, or visit <http://welcome.hp.com/us/en/wwcontact.html>. Before calling HP have the following information ready: product name and serial number, date of purchase, and description of the problem.

You can also find support on the Internet at <http://www.hp.com>. Click the **support & drivers** block.

Software utilities, drivers, and electronic information

Visit: http://www.hp.com/go/clj4730mfp_software for the HP Color LaserJet 4730mfp series MFPs. The Web page for the drivers might be in English, but you can download the drivers themselves in several languages.

Call: See the flyer that shipped in the box with the MFP.

HP direct ordering for accessories or supplies

In the United States, supplies can be ordered from <http://www.hp.com/sbso/product/supplies>. In Canada, supplies can be ordered from <http://www.hp.ca/catalog/supplies>. In Europe, supplies can be ordered from <http://www.hp.com/go/ljsupplies>. In Asia-Pacific, supplies can be ordered from <http://www.hp.com/paper/>.

Accessories can be ordered from <http://www.hp.com/go/accessories>.

HP service information

To locate HP-authorized dealers, call 1-800-243-9816 (U.S.) or 1-800-387-3867 (Canada). For service for your product, call the customer support number for your country/region. See the flyer that shipped in the box with the MFP.

HP service agreements

Call: 1-800-835-4747 (U.S.) or 1-800-268-1221 (Canada).

Extended Service: 1-800-446-0522

HP support and information for Macintosh computers

Visit: <http://www.hp.com/go/macosex> for Macintosh OS X support information and HP subscription service for driver updates.

Visit: <http://www.hp.com/go/mac-connect> for products designed specifically for the Macintosh user.

Hewlett-Packard Limited Warranty Statement

HP product	Duration of Limited Warranty
HP Color LaserJet 4730mfp	1 year, on-site
HP Color LaserJet 4730x mfp	
HP Color LaserJet 4730xs mfp	
HP Color LaserJet 4730xm mfp	

HP warrants HP hardware, accessories, and supplies against defects in materials and workmanship for the period specified above. If HP receives notice of such defects during the warranty period, HP will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.

HP warrants that HP software will not fail to execute its programming instructions, for the period specified above, due to defects in material and workmanship when properly installed and used. If HP receives notice of such defects during the warranty period, HP will replace software media which does not execute its programming instructions due to such defects.

HP does not warrant that the operation of HP products will be uninterrupted or error free. If HP is unable, within a reasonable time, to repair or replace any product to a condition as warranted, customer will be entitled to a refund of the purchase price upon prompt return of the product.

HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by HP, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTY, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.

FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND; THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

The warranty period begins on the date of the delivery or on the date of installation if installed by HP. If customer schedules or delays HP installation more than 30 days after delivery, warranty begins on the 31st day from delivery.

Print Cartridge Limited Warranty Statement

This HP Print Cartridge is warranted to be free from defects in materials and workmanship.

This warranty does not apply to print cartridges that (a) have been refilled, refurbished, remanufactured or tampered with in any way, (b) experience problems resulting from misuse, improper storage, or operation outside of the published environmental specifications for the printer product or (c) exhibit wear from ordinary use.

To obtain warranty service, please return the product to place of purchase (with a written description of the problem and print samples) or contact HP customer support. At HP's option, HP will either replace products that prove to be defective or refund your purchase price.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTY IS EXCLUSIVE AND NO OTHER WARRANTY OR CONDITION, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

TO THE EXTENT ALLOWED BY LOCAL LAW, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.

THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

HP maintenance agreements

HP has several types of maintenance agreements that meet a wide range of support needs. Maintenance agreements are not part of the standard warranty. Support services vary by location. Contact HP Customer Care or go to <http://www.hp.com/services/carepack> to determine the services that are available and for more information about maintenance agreements. In general, the MFP will have the following maintenance agreements:

Priority Onsite Service

This agreement provides 4-hour service response to the customer's site for calls made during normal HP business hours.

Next business day

This agreement provides next-business-day service, Monday through Friday. This service agreement comes standard with the MFP for a period of one year. The customer can purchase an extension of this agreement.

Installation and maintenance kit replacement

An HP-authorized service or support provider will come to the customer's site to install the MFP or to replace the maintenance kits.

3 Installation and configuration

This chapter contains information about the following topics:

- [Installation checklist](#)
- [Unpacking the MFP](#)
- [Loading detectable standard-sized media into Tray 2, 3, and 4](#)
- [Loading undetectable standard-sized media into Tray 2, 3, and 4](#)
- [Connecting power](#)
- [Installing print cartridges](#)
- [Installing a new control panel overlay](#)
- [Testing the MFP operation](#)
- [Sleep delay](#)
- [Connecting to a computer or network](#)
- [Printer software](#)
- [Printer drivers](#)
- [Printer drivers for Macintosh computers](#)
- [Software for Macintosh computers](#)
- [Network configuration](#)
- [Security features](#)
- [Optional output and input devices](#)

Installation checklist

When setting up the MFP for the first time, perform the following tasks to ensure that the MFP is installed correctly.

Table 3-1 HP Color LaserJet 4730mfp installation

✓	Item	Details
	Verify that the MFP is connected to an adequate power source.	A minimum of 10A (110V) or 5A (220V) circuit required. Uninterruptible Power Supplies (UPS) are not recommended. Do <i>not</i> use a power strip. Any devices attached to the same power source can lead to intermittent problems.
	Verify that MFP resides in an adequate space.	Adequate space so that the MFP may be accessed from all sides. Tight space makes the system difficult to access for jam clearing and service.
	Verify that surface has adequate, level support.	Ensure the MFP is on a level and stable surface. Ensure wheel locks are engaged.
	Verify that all orange tape and packaging materials have been removed.	See details in the <i>HP Color LaserJet 4730mfp series Getting Started Guide</i> .
	Verify that the print cartridges and paper have been installed in the MFP.	Use known good quality paper.
	Verify the I/O cable, such as a LAN, USB, or parallel cable, has been connected to the corresponding I/O port on the MFP.	See details in the <i>HP Color LaserJet 4730mfp series Getting Started Guide</i> .
	Verify the scanner shipping lock has been moved to the unlocked position.	See details in the <i>HP Color LaserJet 4730mfp series Getting Started Guide</i> .
	Verify the correct language and date/time are set.	See details in the <i>HP Color LaserJet 4730mfp series Getting Started Guide</i> .
	Configure the e-mail gateways.	Press Menu , scroll to and touch Configure Device, Sending, E-MAIL, and FIND GATEWAYS . If auto-discovery does not find the e-mail gateways, obtain the addresses from your network administrator and manually configure these on the MFP.
	If the fax accessory is installed, ensure it is properly configured.	Press Menu , scroll to and touch Fax , and then FAX SETUP SETTINGS . Fill in the date/time, location and fax header information. See details in the <i>HP LaserJet Analog Fax Accessory 300 User Guide</i> .
	Print the configuration pages.	Press Menu , touch Information , and then touch PRINT CONFIGURATION .
	On the configuration page printouts, verify the following: <ul style="list-style-type: none"> • LDAP gateway address displays. • SMTP gateway address displays. • All optional devices display (for example, the stapler/stacker or the 3-bin mailbox). 	The HP Color LaserJet 4730mfp information and training CD provides detailed information on how to read the configuration page.

Table 3-1 HP Color LaserJet 4730mfp installation (continued)

✓	Item	Details
	<ul style="list-style-type: none">• If the fax accessory is installed, the modem status reads <i>Operational/Enabled</i>.• On the Embedded Jetdirect Page, verify that the status reads <i>I/O Card Ready</i> and that you have a valid IP address.	
	Verify you can copy from the copier glass of the MFP.	Place configuration page face down on copier glass and press Start .
	Verify you can copy from the Automatic Document Feeder (ADF).	Place configuration page face up in ADF and press Start .
	Verify you can send a fax from the MFP, if the fax accessory is installed.	Place document face-up in the ADF and use the keypad to send to a known functioning fax number.
	Verify you can send an e-mail.	Place document face-up in the ADF, and use the keypad to enter an e-mail address (LDAP must be configured for this to function).
	Verify you can print to the MFP.	After loading the printing system software on a networked computer, print a test page from the driver.
	Verify that all users have access to the User Training.	http://www.hp.com/go/usemymfp

Unpacking the MFP

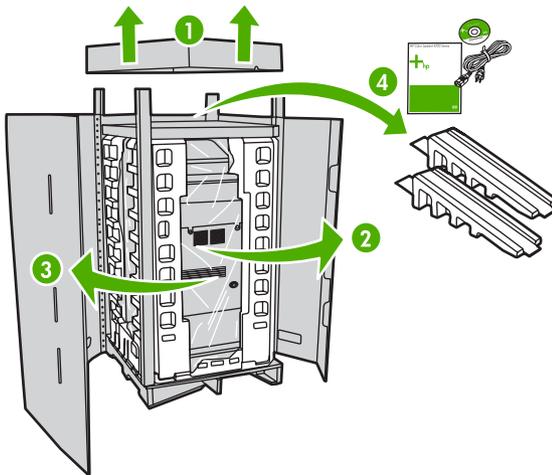


NOTE Save all the packing materials in case you need to repack and transport the MFP at a later date.

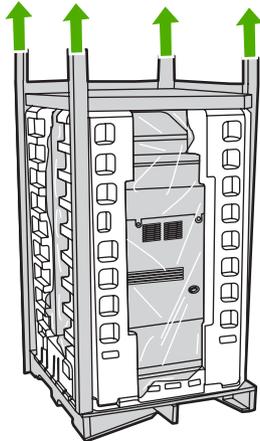


WARNING! The HP Color LaserJet 4730mfp series MFP weighs approximately 124 kg (273 lb). HP recommends having three or more people move or position the MFP.

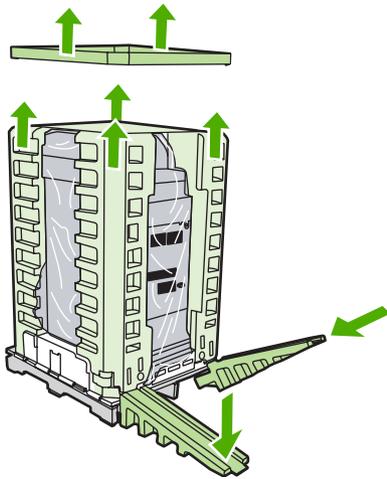
1. Remove the top of the box and remove the outer cardboard wrapping from the sides of the MFP. Remove the ramps, power supply cord, CD-ROM, and user documentation from the top of the packing box.



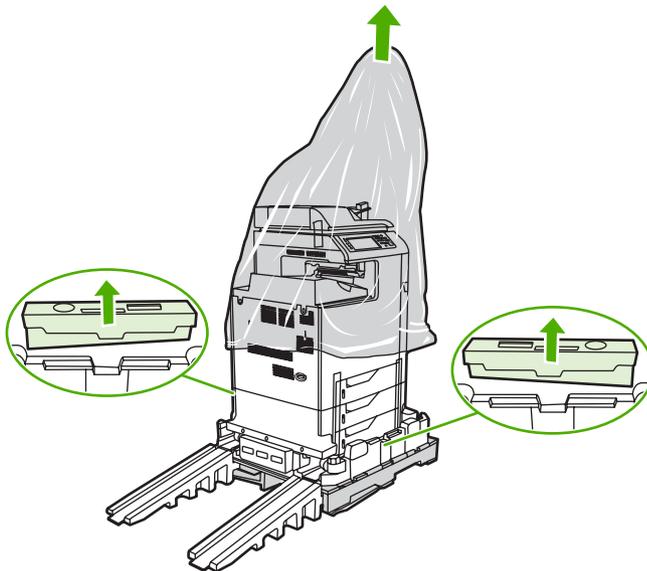
2. Remove the corner brackets.



3. Remove the inner cardboard frame and foam corner packaging, and install the ramps.



4. Remove the shipping blocks and plastic bag that surround the MFP.

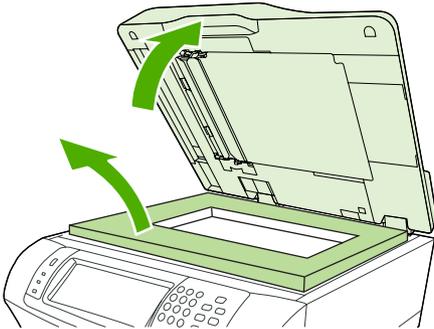


5. Roll the MFP down the ramps into the prepared location.

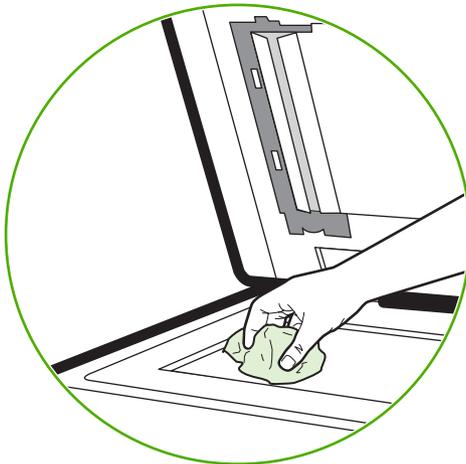
 **CAUTION** Do not attempt to move the MFP by yourself. At least two people must move the MFP into the prepared location. While two people can move the MFP, using three or four people to unpack and install the MFP is easier and safer.



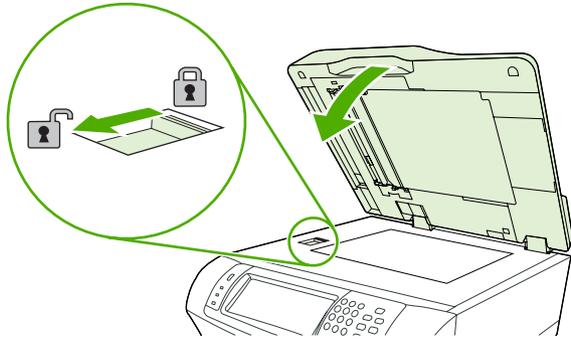
6. Remove the packing tape from the front and rear of the MFP.
7. Open the scanner glass and remove the foam packaging.



8. Clean the scanner glass by wiping it gently with a clean, slightly damp, lint-free cloth.



9. Unlock the scanner.



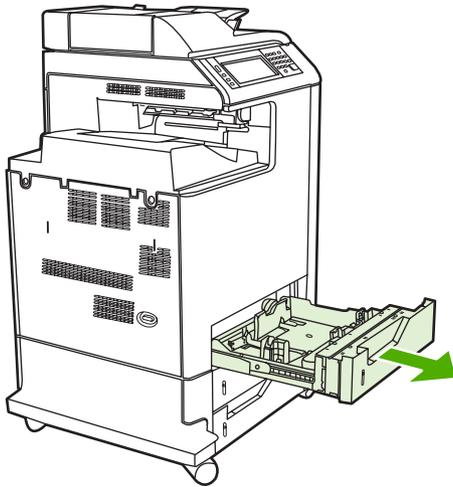
Loading detectable standard-sized media into Tray 2, 3, and 4

- CAUTION** If paper is loaded in Trays 2 through 4 when the MFP is in Sleep mode, the new paper will not be sensed when the MFP comes out of Sleep mode. This could cause the wrong paper to be used for a print job. Be sure to wake the MFP before loading paper in these trays.

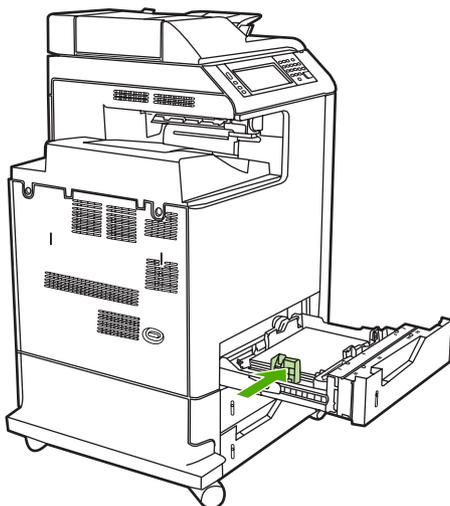
The following detectable standard-sized media is supported in Trays 2 through 4: letter, legal, executive, A4, A5, and (JIS) B5.

- CAUTION** Do not print cardstock, envelopes, heavy or extra-heavy paper, or unsupported sizes of media from the 500-sheet trays. Print on these types of media only from Tray 1. Do not overfill the input tray or open it while it is in use. Doing so can cause jams in the MFP.

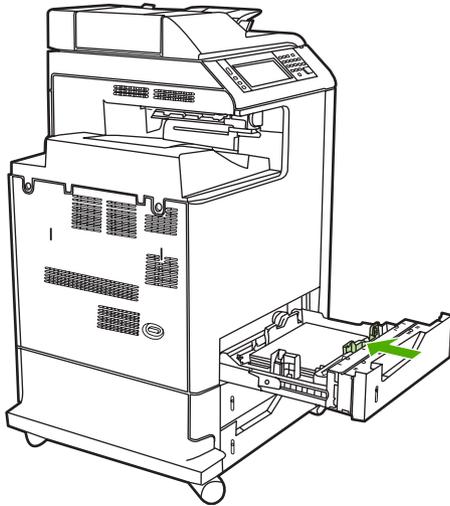
1. Slide open the tray from the MFP.



2. Adjust the rear media-length guide by squeezing the guide adjustment latch and sliding the back of the tray to the length of the media being used.



3. Slide the media-width guides open to the size for the media you are using.



4. Load media into the tray face up.

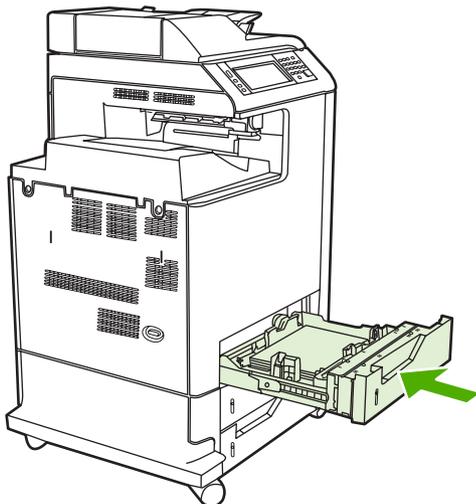


NOTE For best performance, load the tray completely full without splitting or fanning the ream of paper. Splitting or fanning the ream might cause a multi-feed problem, which could result in a paper jam. The capacity of the paper tray can vary. For example, if using 75 g/m² (20 lb) paper, the tray holds a full ream of 500 sheets. If the media is heavier than 75 g/m² (20 lb), the tray will not hold a full ream, and the number of sheets must be reduced accordingly. Do not overfill the tray because the MFP might not pick up the paper.

NOTE If the tray is not properly adjusted, the MFP might display an error message or the media might jam.

NOTE If duplex printing, place the paper face-down.

5. Slide the tray into the MFP. The MFP will display the tray's media type and size. If the configuration is not correct, press **OK** on the product control panel. If the configuration is correct, touch **Exit**.



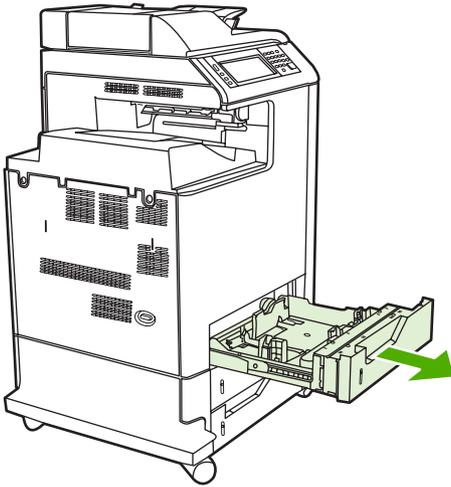
Loading undetectable standard-sized media into Tray 2, 3, and 4

Undetectable standard-sized media sizes are not marked in the tray, but are listed in the **Size** menu for the tray.

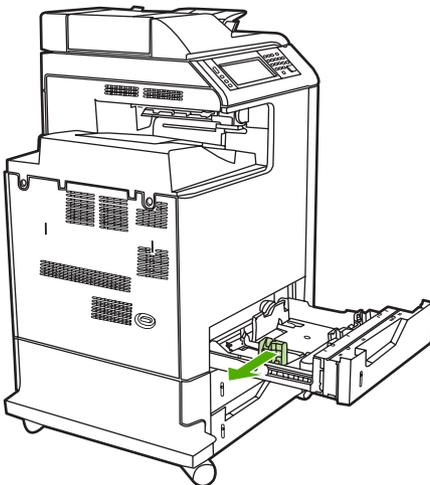
The following undetectable standard-sized media is supported in the 500-sheet trays: executive (JIS), 8.5 x 13, double Japan postcard, and 16K.

 **CAUTION** Do not print cardstock, envelopes, heavy or extra-heavy paper, or unsupported sizes of media from the 500-sheet trays. Print on these types of media only from Tray 1. Do not overfill the input tray or open it while it is in use. Doing so can cause paper jams.

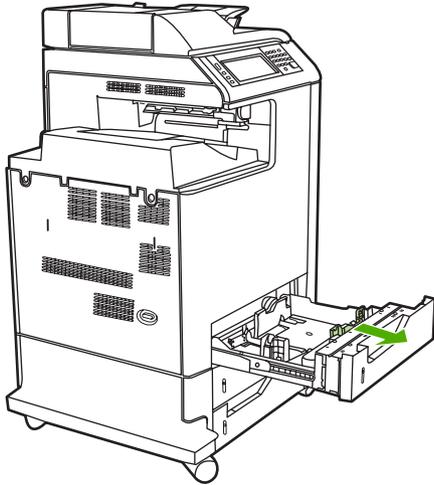
1. Slide open the tray from the MFP.



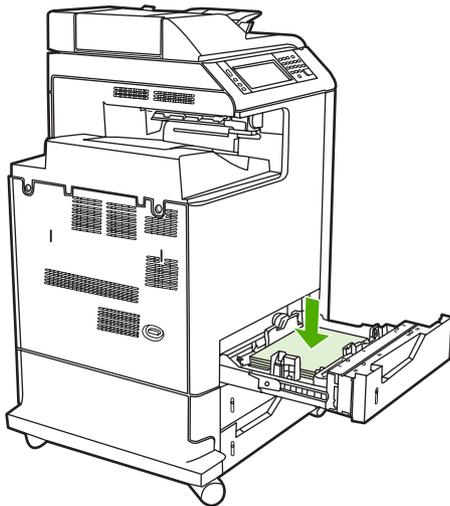
2. Adjust the rear media-length guide by squeezing the guide adjustment latch and sliding the back of the tray to the length of the media being used.



- Slide the media-width guides open to the size for the media you are using.



- Load media into the tray face-up.

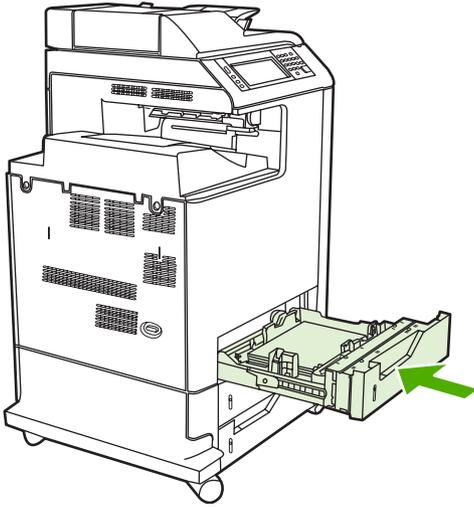


NOTE For best performance, load the tray completely full without splitting or fanning the ream of paper. Splitting or fanning the ream might cause a multi-feed problem, which could result in a paper jam. The capacity of the paper tray can vary. For example, if using 75 g/m² (20 lb) paper, the tray holds a full ream of 500 sheets. If the media is heavier than 75 g/m² (20 lb), the tray will not hold a full ream, and the number of sheets must be reduced accordingly. Do not overfill the tray because the MFP might not pick up the paper.

NOTE If the tray is not properly adjusted, the MFP might display an error message or the media might jam.

NOTE If duplex printing, place the paper face-down.

5. Slide the tray into the MFP. The MFP will display the tray's media type and size. If the configuration is not correct, touch **OK** on the product control panel and select the correct size.



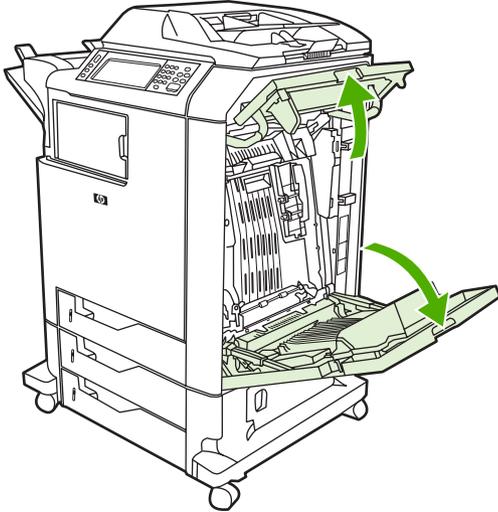
Connecting power

1. Plug the AC power cord into the MFP and into the power outlet.
2. Turn the MFP on.

Installing print cartridges

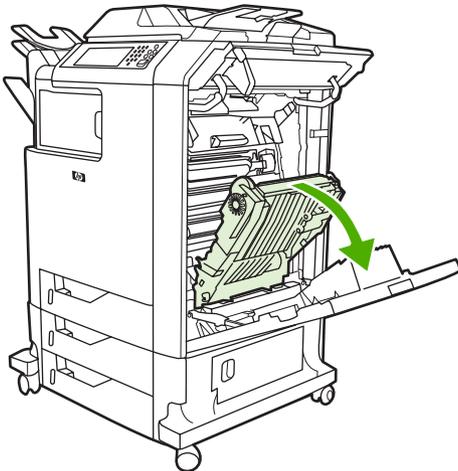
For additional information on installing and managing print cartridges, see [Managing print cartridges on page 108](#).

1. Open the covers on the right side of the MFP.



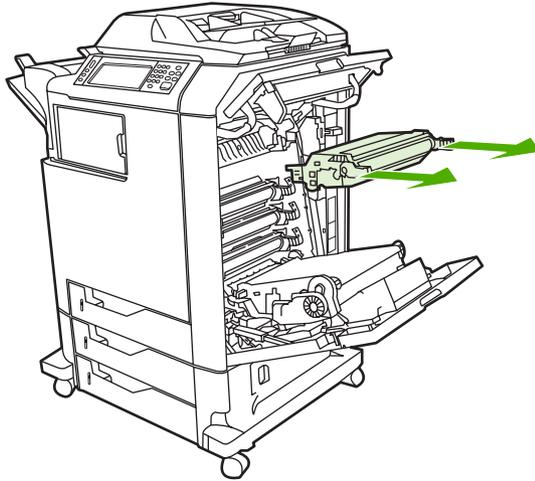
 **CAUTION** The fuser might be hot.

2. Grasp the green handle and pull down the ETB.

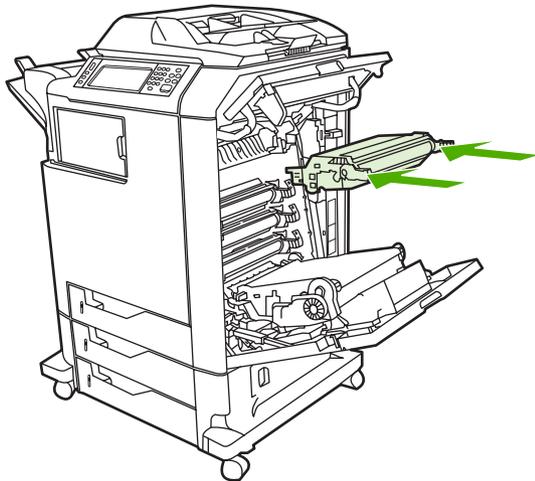


 **CAUTION** Do not place any item on the transfer belt while it is open. If the belt is punctured, print quality problems could result.

3. Remove the used print cartridge from the MFP.



4. Remove the new print cartridge from the bag. Place the used print cartridge in the bag for recycling.
5. Align the print cartridge with the tracks inside the MFP and insert the cartridge until it is completely seated.



NOTE The print cartridge tape seal is removed automatically when the print cartridge is installed in the MFP.

NOTE If a cartridge is in the wrong slot, the product control panel will display the message **INCORRECT [COLOR] CARTRIDGE**.

6. Close the front cover and then close the top cover. After a short while, the product control panel should display **Ready**.
7. Installation is complete. Place the used print cartridge in the box in which the new cartridge arrived. See the enclosed recycling guide for recycling instructions.
8. If a non-HP print cartridge was installed, check the product control panel for further instructions.

For additional help, go to <http://www.hp.com/support/clj4730mfp>.

Installing a new control panel overlay

Some MFP models are shipped without the product control panel overlay installed or a different overlay may be used from the one that is installed. Overlays are available for several languages. If setting up an MFP for a language other than English, follow this procedure.

1. Remove the backing from the adhesive side of the label.
2. Position the new label over the top of the product control panel.
3. Press the label firmly down onto the control panel.



NOTE When applying the overlay, start at the center and press the overlay into place towards the edges of the control panel.

4. Press **Menu** to enter the **MENUS**.
5. Scroll to and touch **Configure Device**.
6. Scroll to and touch **SYSTEM SETUP**.
7. Scroll to and touch **LANGUAGE**.
8. Scroll to and touch the desired language.
9. Press **Menu**.

Testing the MFP operation

Print a configuration page to ensure that the MFP is working correctly.

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Information**.
3. Scroll to and touch **PRINT CONFIGURATION**.

The message **Printing... CONFIGURATION** appears on the display until the MFP finishes printing the configuration page. The MFP returns to the **Ready** state after printing the configuration page.



NOTE If the MFP is configured with an HP Jetdirect print server or a paper handling device, an additional configuration page will print that provides information about those devices.

Sleep delay

The adjustable Sleep mode feature reduces power consumption when the MFP has been inactive for an extended period. The length of time before the MFP enters Sleep mode can be set to **1 MINUTE**, **15 MINUTES**, **30 MINUTES**, **45 MINUTES**, **60 MINUTES**, **90 MINUTES**, **2 HOURS**, or **4 HOURS**. The default setting is **30 MINUTES**.



NOTE The MFP display dims when the MFP is in Sleep mode. This mode does not affect MFP warm-up time.

Setting Sleep delay

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **SYSTEM SETUP**.
4. Scroll to and touch **SLEEP DELAY**.
5. Scroll to and touch the desired sleep-delay period. The settings are saved and the control panel returns to the **SYSTEM SETUP** menu.
6. Press **Menu**.



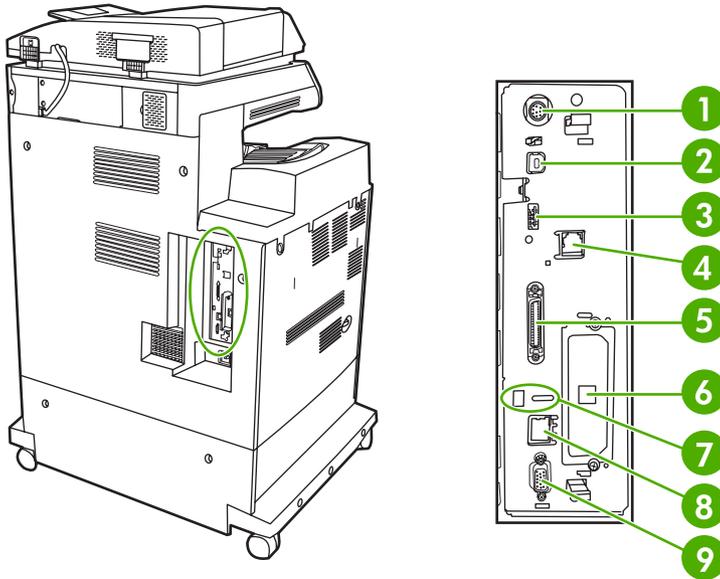
CAUTION If paper is loaded in Trays 2, 3, or 4 when the MFP is in Sleep mode, the new paper will not be sensed when the MFP comes out of Sleep mode. This could cause the wrong paper to be used for a print job. Be sure to wake the MFP before loading paper in these trays.

Disabling/enabling Sleep mode

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **RESETS**.
4. Press **SLEEP MODE**.
5. Scroll to and touch **ON** or **OFF**. The settings are saved.
6. Press **Menu**.

Connecting to a computer or network

The MFP has eight ports for connecting to a computer or a network. The ports are at the right rear corner of the MFP.



1	Foreign interface harness (FIH)
2	USB 2.0
3	Host USB (This accessory port uses host USB protocol.)
4	Fax connection (for connecting to an optional analog fax accessory)
5	Parallel port
6	EIO interface expansion slot
7	Kensington lock
8	Network connection (embedded HP Jetdirect print server)
9	Accessory port

Network connection

When installing the MFP on a network, connect the network cable to the embedded HP Jetdirect print server before installing the MFP software.

For complete information about installing the MFP on a network, see the network installation guide that was included with the MFP.

Parallel connection

Install the MFP software before connecting the MFP directly to a computer or to a print server with a parallel cable.

For complete information about installing connecting the MFP directly to a print server, see the network installation guide that was included with the MFP.

Fax connection

The HP Color LaserJet 4730x mfp, HP Color LaserJet 4730xs mfp, and HP Color LaserJet 4730xm mfp models are equipped with an HP LaserJet analog fax accessory already installed. Windows users can also install the optional HP Digital Sending Software (HP DSS), which provides digital faxing services.

For complete instructions for configuring the fax accessory and for using the fax features, see the *HP LaserJet Analog Fax Accessory 300 User Guide*. A printed copy of this guide is provided with the HP Color LaserJet 4730x mfp, HP Color LaserJet 4730xs mfp, and HP Color LaserJet 4730xm mfp.

Analog faxing

When the analog fax accessory is installed, the MFP can function as a standalone fax machine.

The HP Color LaserJet 4730x mfp, HP Color LaserJet 4730xs mfp, and HP Color LaserJet 4730xm mfp models are equipped with an HP LaserJet analog fax accessory already installed. For the HP Color LaserJet 4730mfp (base model), this accessory can be ordered as an option.

Connecting the fax accessory to a phone line

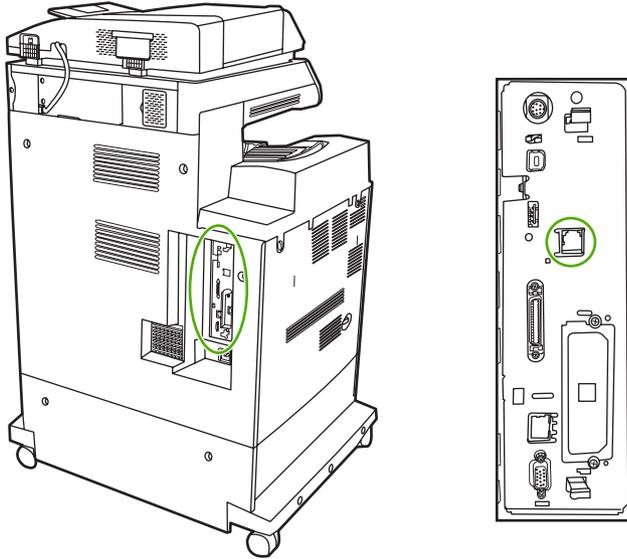
When connecting the fax accessory to a phone line, ensure that the phone line being used for the fax accessory is a dedicated line that is not used by any other devices. Also, this line should be an analog line because the fax will not function correctly if it is connected to some digital PBX systems. If unsure whether an analog or digital phone line is to be used, contact your telecom provider.



NOTE HP recommends using the phone cord that comes with the fax accessory to ensure that the accessory functions correctly.

Follow these instructions to connect the fax accessory to a phone jack.

1. Locate the phone cord that is included with the fax accessory kit. Connect one end of the phone cord into the fax accessory phone jack that is on the formatter. Push the connector until it clicks.



CAUTION Be sure to connect the phone line to the fax accessory port, which is located in the center of the formatter. Do not connect the phone line to the HP Jetdirect port, which is nearer the bottom of the formatter.

2. Connect the other end of the phone cord into the phone jack on the wall. Push the connector until it clicks.

Configuring and using the fax features

Before the fax features can be used, configure them in the product control panel menus. For complete information about configuring and using the fax accessory and for information about troubleshooting problems with the fax accessory, see the *HP LaserJet Analog Fax Accessory 300 User Guide* provided with the fax accessory.

Digital faxing

Digital faxing is available when installing the optional HP Digital Sending Software. For information about ordering this software, go to <http://www.hp.com/go/digitalsending>.

With digital faxing, the MFP does *not* need to be connected directly to a phone line. Instead, the MFP can send a fax in one of three ways:

- **LAN fax** sends faxes through a third-party fax provider.
- **Microsoft Windows 2000 fax** is a fax modem and Digital Sender Module on a computer that allows the computer to operate as a turnkey gateway fax.
- **Internet fax** uses an Internet fax provider to process faxes, and the fax is delivered on a traditional fax machine or sent to the user's e-mail.

For complete information about using digital faxing, see the documentation that is provided with the HP Digital Sending Software.

Printer software

Included with the MFP is a CD-ROM containing the printing system software. The software components and printer drivers on this CD-ROM help to use the MFP to its fullest potential. See the Getting Started Guide for installation instructions.



NOTE For the latest information about the printing system software components, refer to the readme file on the Web at <http://www.hp.com/support/clj4730mfp>. For information about installing the printer software, view the Install Notes on the CD-ROM included with the MFP.

This section summarizes the software included on the CD-ROM. The printing system includes software for end users and network administrators operating in the following operating environments:

- Microsoft Windows 98 and Windows Me
- Microsoft Windows 2000, XP (32-bit), and Server 2003 (32-bit)
- Apple Mac OS 9.1 and later and Mac OS 10.2 and later



NOTE For a list of the network environments supported by the network administrator software components, see [Network configuration on page 87](#).

NOTE For a list of printer drivers, updated HP printer software, and product support information, go to <http://www.hp.com/support/clj4730mfp>.

Software

Software features

Automatic Configuration, Update Now, and Preconfiguration features are available with the HP Color LaserJet 4730mfp series MFP.

Driver Autoconfiguration

The HP LaserJet PCL 6 and PCL 5c drivers for Windows and the PS drivers for Windows 2000 and Windows XP feature automatic discovery and driver configuration for MFP accessories at the time of installation. Some accessories that Driver Autoconfiguration supports are the duplexing unit, optional paper trays, and dual inline memory modules (DIMMs). If the environment supports bidirectional communication, the installer presents Driver Autoconfiguration as an installable component by default for a Typical Installation and for a Custom Installation.

Update Now

If the configuration of the HP Color LaserJet 4730mfp MFP has been modified since installation, the driver can be automatically updated with the new configuration in environments that support bidirectional communication. Click the **Update Now** button to automatically reflect the new configuration in the driver.



NOTE The Update Now feature is not supported in environments where shared Windows 2000 or Windows XP clients are connected to Windows 2000 or Windows XP hosts.

HP Driver Preconfiguration

HP Driver Preconfiguration is a software architecture and set of tools that allows HP software to be customized and distributed in managed corporate printing environments. Using HP Driver Preconfiguration, information technology (IT) administrators can preconfigure the printing and device defaults for HP printer drivers before installing the drivers in the network environment. For more information, see the *HP Driver Preconfiguration Support Guide*, which is available at <http://www.hp.com/support/clj4730mfp>.

Installing the printing system software

The following sections contain instructions for installing the printing system software.

The MFP comes with printing system software and printer drivers on a CD-ROM. The printing system software on the CD-ROM must be installed to take full advantage of the MFP features.

If a CD-ROM drive is not available, download the printing system software from the Internet at <http://www.hp.com/support/clj4730mfp>.



NOTE Obtain Model Scripts for UNIX® and Linux by downloading them from the Internet or by requesting them from an HP-authorized service or support provider. For Linux support see <http://www.hp.com/go/linux>. For UNIX support see http://www.hp.com/go/jetdirectunix_software.

Download the latest software free of charge at <http://www.hp.com/support/clj4730mfp>.

Installing Windows printing system software for direct connections

This section explains how to install the printing system software for Microsoft Windows 98, Windows Me, Windows 2000, and Windows XP.

When installing the printing software in a direct-connect environment, always install the software before connecting the parallel or USB cable. If the parallel or USB cable was connected before the software installation, see [Installing the software after the parallel or USB cable has been connected on page 75](#).

Either a parallel or USB cable can be used for the direct connection. However, parallel and USB cables cannot be connected at the same time. Use an IEEE 1284-compatible cable or a standard 2-meter USB cable.

Installing the printing system software

1. Close all software programs that are open or running.
2. Insert the MFP CD-ROM into the CD-ROM drive.

If the welcome screen does not open, start it by using the following procedure:

- On the **Start** menu, click **Run**.
 - Type the following: X:\setup (where X is the letter of the CD-ROM drive).
 - Click **OK**.
3. When prompted, click **Install Printer** and follow the instructions on the computer screen.
 4. Click **Finish** when the installation has completed.

5. The computer may need to be restarted.
6. Print a Test Page or a page from any software program to make sure that the software is correctly installed.

If installation fails, reinstall the software. If this fails, check the installation notes and readme files on the MFP CD-ROM or the flyer that came with the product, or go to <http://www.hp.com/support/clj4730mfp> for help or more information.

Installing Windows printing system software for networks

The software on the MFP CD-ROM supports network installation with a Microsoft network. For network installation on other operating systems, go to <http://www.hp.com/support/clj4730mfp>.

The HP Jetdirect embedded print server in the HP Color LaserJet 4730mfp includes a 10/100 Base-TX network port. For other available HP Jetdirect print servers, see [Parts and supplies on page 43](#) or go to <http://www.hp.com/support/clj4730mfp>.

The installer does not support MFP installation or MFP object creation on Novell servers. It supports only direct-mode network installations between Windows computers and an MFP. To install the MFP and create objects on a Novell server, use an HP utility (such as HP Web Jetadmin) or a Novell utility (such as NWAdmin).

Installing the printing system software

1. If installing the software on Windows 2000 or Windows XP, administrative privileges are required.
2. Make sure that the HP Jetdirect print server and MFP are properly connected to the network. Print a configuration page (see [Testing the MFP operation on page 67](#)). On the second page of the configuration page, locate the IP address that is currently configured. This address may be needed to initially identify the MFP on the network and complete the installation.
3. Close all software programs that are open or running.
4. Insert the MFP CD-ROM into the CD-ROM drive.

If the welcome screen does not open, start it by using the following procedure:

- On the **Start** menu, click **Run**.
 - Type the following: X:\setup (where X is the letter of the CD-ROM drive).
 - Click **OK**.
5. When prompted, click **Install Printer** and follow the instructions on the computer screen.
 6. Click **Finish** when installation has completed.
 7. The computer may need to be restarted.
 8. Print a Test Page or a page from any software program to make sure that the software is correctly installed.

If installation fails, reinstall the software. If this fails, check the installation notes and readme files on the MFP CD-ROM or the flyer that came with the product, or go to <http://www.hp.com/support/clj4730mfp> for help or more information.

Setting up a Windows computer to use the network MFP with Windows-sharing

If the computer will print directly to the MFP, share the MFP on the network so that other network users can print to it.

See the Windows documentation that came with the operating system to enable Windows-sharing. After the MFP is shared, install the printer software on all computers that share the MFP.

Installing the software after the parallel or USB cable has been connected

If you have already connected a parallel or USB cable to a Windows computer, the **New Hardware Found** dialog box appears when you turn on the computer.

Installing the software for Windows 98 or Windows Me

1. In the **New Hardware Found** dialog box, click **Search CD-ROM drive**.
2. Click **Next**.
3. Follow the instructions on the computer screen.
4. Print a Test Page or a page from any software program to make sure that the software is correctly installed.

If installation fails, reinstall the software. If this fails, check the installation notes and readme files on the MFP CD-ROM or the flyer that came with the product, or go to <http://www.hp.com/support/clj4730mfp> for help or more information.

Installing the software for Windows 2000 or Windows XP

1. In the **New Hardware Found** dialog box, click **Search**.
2. On the **Locate Driver Files** screen, select the **Specify a Location** check box, clear all other check boxes, and then click **Next**.
3. Type the letter for the root directory. For example, X:\ (where "X:\" is the letter of the root directory on the CD-ROM drive).
4. Click **Next**.
5. Follow the instructions on the computer screen.
6. Click **Finish** when installation has completed.
7. Select a language and follow the instructions on the computer screen.
8. Print a Test Page or a page from any software program to make sure that the software is correctly installed.

If installation fails, reinstall the software. If this fails, check the installation notes and readme files on the MFP CD-ROM or the flyer that came with the product, or go to <http://www.hp.com/support/clj4730mfp> for help or more information.

Uninstalling the software

This section explains how to uninstall the printing system software.

Removing software from Windows operating systems

Use the Uninstaller in the HP Color LaserJet 4730mfp/Tools program group to select and remove any or all of the Windows HP printing system components.

1. Click **Start** and then click **Programs**.
2. Point to **HP Color LaserJet 4730mfp** and then click **Tools**.
3. Click **Uninstaller**.
4. Click **Yes**.
5. Follow the instructions on the computer screen to complete the uninstallation.

Software for networks

For a summary of available HP network installation and configuration software solutions, see the *HP Jetdirect Print Server Administrator's Guide*. You can find this guide on the CD-ROM included with the MFP.

HP Web Jetadmin

HP Web Jetadmin allows users to manage HP Jetdirect-connected printers within their intranet using a Web browser. HP Web Jetadmin is a browser-based management tool, and should be installed only on a single network administration server. It can be installed and run on these systems:

- Fedora Core and SuSe Linux
- Windows 2000 Professional, Server, and Advanced Server
- Windows XP Professional Service Pack 1
- Windows Server 2003

When installed on a host server, HP Web Jetadmin can be accessed by any client through a supported web browser, such as Microsoft Internet Explorer 5.5 and 6.0 or Netscape Navigator 7.0.

HP Web Jetadmin has the following features:

- Task-oriented user interface provides configurable views, saving network managers significant time.
- Customizable user profiles let network administrators include only the function viewed or used.
- Instant e-mail notification of hardware failure, low supplies, and other MFP problems can be routed to different people.
- Remote installation and management from anywhere using only a standard Web browser.
- Advanced autodiscovery locates peripherals on the network, without manually entering each printer into a database.
- Simple integration into enterprise management packages.
- Ability to quickly find peripherals based on parameters such as IP address, color capability, and model name.

- Ability to easily organize peripherals into logical groups, with virtual office maps for easy navigation.
- Ability to manage and configure multiple printers at once.

To download a current version of HP Web Jetadmin and to see the latest list of supported host systems, visit HP Customer Care Online at <http://www.hp.com/go/webjetadmin>.

UNIX

The HP Jetdirect Printer Installer for UNIX is a simple printer installation utility for HP-UX and Solaris networks. It is available for download from HP Customer Care Online at http://www.hp.com/go/jetdirectunix_software.

Utilities

The HP Color LaserJet 4730mfp is equipped with several utilities, which make it easy to monitor and manage the MFP on a network.

HP Easy Printer Care Software

The HP Easy Printer Care Software is a software program that you can use for the following tasks:

- Viewing color usage information
- Checking the printer status
- Checking the supplies status
- Setting up alerts
- Viewing printer documentation
- Gaining access to troubleshooting and maintenance tools

You can view the HP Easy Printer Care Software when the printer is directly connected to your computer or when it is connected to a network. Perform a complete software installation in order to use the HP Easy Printer Care Software.

For more information on HP Easy Printer Care Software, see [Using the HP Easy Printer Care Software on page 636](#) or visit <http://www.hp.com/go/easyprintercare>.

Embedded Web server

This MFP is equipped with an embedded Web server, which allows access to information about the MFP and network activities. A Web server provides an environment in which web programs may run, much in the same way that an operating system, such as Windows, provides an environment for programs to run on your computer. The output from these programs can then be displayed by a Web browser, such as Microsoft Internet Explorer or Netscape Navigator.

When a Web server is "embedded", that means it resides on a hardware device (such as a printer) or in firmware, rather than as software that is loaded on a network server.

The advantage of an embedded Web server is that it provides an interface to the MFP that anyone can access with a network-connected computer or a standard Web browser. There is no special software to install or configure. For more information about the HP embedded Web server, see the *Embedded Web Server User Guide*. This guide is on the CD-ROM included with the MFP.

Features

The HP embedded Web server allows users to view MFP and network card status and manage printing functions from their computer. With the HP embedded Web server, users can do the following:

- View MFP status information.
- Determine the remaining life on all supplies and order new ones.
- View and change tray configurations.
- View and change the MFP product control panel menu configuration.
- View and print internal pages.
- Receive notification of MFP and supplies events.
- Add or customize links to other Web sites.
- Select the language in which to display the embedded Web server pages.
- View and change network configuration.
- Restrict access to color printing.

For a complete explanation of the features and functionality of the embedded Web server, see [Embedded Web server on page 77](#).

Other components and utilities

Several software applications are available for Windows and Mac OS users, as well as for network administrators.

Windows	Mac OS	Network administrator
<ul style="list-style-type: none">• Software installer — automates the printing system installation• Online Web registration	<ul style="list-style-type: none">• PostScript Printer Description files (PPDs) — for use with the Apple PostScript drivers that come with the Mac OS• HP LaserJet Utility (available from the Internet) — a printer management utility for Mac OS users	<ul style="list-style-type: none">• HP Web Jetadmin— a browser-based system management tool. See http://www.hp.com/go/webjetadmin for the latest HP Web Jetadmin software• HP Jetdirect Printer Installer for UNIX — available for download from http://www.hp.com/support/net_printing

Printer drivers

The product comes with software that allows the computer to communicate with the product (by using a printer language). This software is called a printer driver. Printer drivers provide access to product features, such as printing on custom-sized paper, resizing documents, and inserting watermarks.

Supported printer drivers

The following printer drivers are provided for the product. If the desired printer driver is not on the product CD-ROM or is not available on <http://www.hp.com>, contact the manufacturer or distributor of the program that is being used, and request a driver for the product.



NOTE The most recent drivers are available at <http://www.hp.com>. Depending on the configuration of Windows-based computers, the installation program for the product software automatically checks the computer for Internet access in order to obtain the latest drivers.

Table 3-2 Supported printer drivers

Operating system ¹	PCL 6 printer driver	PCL 5 printer driver	PS printer driver	PPD ² printer driver
Microsoft Windows 98	X	X	X	
Windows Millennium (Me)	X	X	X	
Windows 2000	X	X	X	
Windows XP	X	X	X	
Windows Server 2003	X	X	X	
Mac OS 9.1 or later			X	X
Mac OS 10.2 or later			X	X

¹ Not all product features are available from all drivers or operating systems. See the context-sensitive help in the printer driver for available features.

² PostScript (PS) Printer Description files (PPDs)

Additional drivers

The following drivers are not included on the CD-ROM, but are available from the Internet.

- OS/2 PCL printer driver.
- OS/2 PS printer driver.
- UNIX model scripts.
- Linux drivers.
- HP OpenVMS drivers.



NOTE The OS/2 printer drivers are available from IBM.

Obtain Model Scripts for UNIX® and Linux by downloading them from the Internet or by requesting them from an HP-authorized service or support provider. For Linux support see <http://www.hp.com/go/linux>. For UNIX support see http://www.hp.com/go/jetdirectunix_software.

Selecting the correct printer driver

Select a printer driver based on the operating system that is being used and the way that the product is to be used. See the printer driver Help for the features that are available.

- The PCL 6 printer driver can provide the best overall performance and access to MFP features.
- The PCL 5 printer driver is recommended for general office monochrome and color printing.
- Use the PostScript (PS) driver if printing primarily from PostScript-based programs such as Adobe PhotoShop® and CorelDRAW®, for compatibility with PostScript Level 3 needs, or for PS flash font support.



NOTE The product automatically switches between PS and PCL printer languages.

Printer driver Help (Windows)

Printer driver Help is separate from program Help. The printer driver Help provides explanations for the buttons, check boxes, and drop-down lists that are in the printer driver. It also includes instructions for performing common printing tasks, such as printing on both sides, printing multiple pages on one sheet, and printing the first page or covers on different paper.

Activate the printer driver Help screens in one of the following ways:

- Click the **Help** button.
- Press the **F1** key on the computer keyboard.
- Click the question-mark symbol in the upper-right corner of the printer driver.
- Right-click on any item in the driver, and then click **What's This?**.

Gaining access to Windows printer drivers

Use one of the following methods to open the printer drivers from the computer:

Table 3-3 Gaining access to Windows printer drivers

Operating System	To change the settings for all print jobs until the software program is closed	To change the print job default settings (for example, turn on Print on Both Sides by default)	To change the configuration settings (for example, add a tray or enable/disable Manual Duplexing)
Windows 98 and Windows Millennium (Me)	<ol style="list-style-type: none"> 1. On the File menu in the software program, click Print. 2. Select the HP Color LaserJet 4730mfp, and then click Properties. <p>The steps can vary; this procedure is most common.</p>	<ol style="list-style-type: none"> 1. Click Start, click Settings, and then click Printers. 2. Right-click the HP Color LaserJet 4730mfp icon, and then select Properties (Windows 98 and Me). 	<ol style="list-style-type: none"> 1. Click Start, click Settings, and then click Printers. 2. Right-click the HP Color LaserJet 4730mfp icon, and then select Properties. 3. Click the Configure tab.
Windows 2000, XP, and Server 2003	<ol style="list-style-type: none"> 1. On the File menu in the software program, click Print. 2. Select the HP Color LaserJet 4730mfp, and then click Properties or Preferences. <p>The steps can vary; this procedure is most common.</p>	<ol style="list-style-type: none"> 1. Click Start, click Settings, and then click Printers or Printers and Faxes. 2. Right-click the HP Color LaserJet 4730mfp icon, and then select Printing Preferences. 	<ol style="list-style-type: none"> 1. Click Start, click Settings, and then click Printers or Printers and Faxes. 2. Right-click the HP Color LaserJet 4730mfp icon, and then select Properties. 3. Click the Device Settings tab.

Printer drivers for Macintosh computers

The MFP comes with printer driver software that uses a printer language to communicate with the MFP. Printer drivers provide access to MFP features, such as printing on custom-sized paper, resizing documents, and inserting watermarks.

Supported Macintosh printer drivers

A Macintosh printer driver and the necessary PPD files are included with the MFP. If the desired printer driver is not on the MFP CD, check the installation notes and the late-breaking readme files to see if the printer driver is supported. If it is not supported, contact the manufacturer or distributor of the software program being used, and request a driver for the MFP.



NOTE The most recent drivers are available at <http://www.hp.com>.

Gaining access to Macintosh printer drivers

Use one of the following methods to open the printer drivers from the computer.

Table 3-4 Gaining access to Macintosh printer drivers

Operating System	To change the settings for all print jobs until the software program is closed	To change the print job default settings (for example, turn on Print on Both Sides by default)	To change the configuration settings (for example, add a physical option such as a tray, or turn on or off a driver feature such as Allow Manual Duplexing)
Mac OS v9.1 or later	<ol style="list-style-type: none">1. On the File menu, click Print.2. Change settings on the various pop-up menus.	<ol style="list-style-type: none">1. On the File menu, click Print.2. As settings are changed on the pop-up menu, click Save Settings.	<ol style="list-style-type: none">1. Click the desktop printer icon.2. From the Printing menu, click Change Setup.

Table 3-4 Gaining access to Macintosh printer drivers (continued)

Operating System	To change the settings for all print jobs until the software program is closed	To change the print job default settings (for example, turn on Print on Both Sides by default)	To change the configuration settings (for example, add a physical option such as a tray, or turn on or off a driver feature such as Allow Manual Duplexing)
Mac OS X v10.2	<ol style="list-style-type: none"> 1. On the File menu, click Print. 2. Change settings on the various pop-up menus. 	<ol style="list-style-type: none"> 1. On the File menu, click Print. 2. Change the settings on the various pop-up menus, and then, on the Presets pop-up menu, click Save as and type a name for the preset. <p>These settings are saved in the Presets menu. To use the new settings, select the saved preset option every time a program is opened and a job is printed.</p>	<ol style="list-style-type: none"> 1. In the Finder, on the Go menu, click Applications. 2. Open Utilities, and then open Print Center. 3. Click on the print queue. 4. On the Printers menu, click Show Info. 5. Click the Installable Options menu.
Mac OS X v10.3	<ol style="list-style-type: none"> 1. On the File menu, click Print. 2. Change settings on the various pop-up menus. 	<ol style="list-style-type: none"> 1. On the File menu, click Print. 2. Change settings on the various pop-up menus, and then, on the Presets pop-up menu, click Save as and type a name for the preset. <p>These settings are saved in the Presets menu. To use the new settings, select the saved preset option every time you open a program and print.</p>	<ol style="list-style-type: none"> 1. Open Printer Setup Utility by selecting the hard drive, clicking Applications, clicking Utilities, and then double-clicking Printer Setup Utility. 2. Click on the print queue. 3. On the Printers menu, click Show Info. 4. Click the Installable Options menu.



NOTE Configuration settings might not be available in Classic mode.

Software for Macintosh computers

The HP installer provides PostScript® Printer Description (PPD) files, Printer Dialog Extensions (PDEs), and the HP Printer Utility for use with Macintosh computers.

If both the MFP and the Macintosh computer are connected to a network, use the MFP embedded Web server (EWS) to configure the MFP. For more information, see [Embedded Web server on page 77](#).

Installing Macintosh printing system software for networks

This section describes how to install Macintosh printing system software. The printing system software supports Mac OS v9.1 and later and Mac OS X v10.2 and later.

The printing system software includes the following components:

- **PostScript Printer Description (PPD) files**

The PPDs, in combination with the Apple PostScript printer drivers, provide access to MFP features. An installation program for the PPDs and other software is provided on the compact disc (CD) that came with the MFP. Use the Apple PostScript printer driver that comes with the computer.

- **HP Printer Utility**

The HP Printer Utility provides access to features that are not available in the printer driver. Use the illustrated screens to select MFP features and complete the following tasks with the MFP:

- Name the MFP.
- Assign the MFP to a zone on the network.
- Assign an internet protocol (IP) address to the MFP.
- Download files and fonts.
- Configure and set the MFP for IP or AppleTalk printing.

Use the HP Printer Utility when the MFP uses a universal serial bus (USB) or is connected to a TCP/IP-based network.



NOTE The HP Printer Utility is supported for Mac OS X v10.2 or later.

For more information about using the HP Printer Utility, see [Software for Macintosh computers on page 84](#).

To install printer drivers for Mac OS v9.1 and later

1. Connect the network cable between the HP Jetdirect print server and a network port.
2. Insert the CD into the CD-ROM drive. The CD menu runs automatically. If the CD menu does not run automatically, double-click the CD icon on the desktop.
3. Double-click the **Installer** icon in the HP LaserJet Installer folder.
4. Follow the instructions on the computer screen.

5. On the computer hard drive, open **Applications**, open **Utilities**, and then open **Desktop Printer Utility**.
6. Double-click **Printer (AppleTalk)**.
7. Next to **AppleTalk Printer Selection**, click **Change**.
8. Select the MFP, click **Auto Setup**, and then click **Create**.



NOTE The icon on the desktop looks generic. All of the print panels appear in the print dialog box with each software program.

To install printer drivers for Mac OS X v10.2 and later

1. Connect the network cable between the HP Jetdirect print server and a network port.
2. Insert the CD into the CD-ROM drive.

The CD menu runs automatically. If the CD menu does not run automatically, double-click the CD icon on the desktop.
3. Double-click the **Installer** icon in the HP LaserJet Installer folder.
4. Follow the instructions on the computer screen.
5. On the computer hard drive, open **Applications**, open **Utilities**, and then open **Print Center** or **Printer Setup Utility**.



NOTE If you are using Mac OS X v10.3, then the **Printer Setup Utility** has replaced the **Print Center**.

6. Click **Add Printer**.
7. Select **Rendezvous** as the connection type.
8. Select the MFP from the list.
9. Click **Add Printer**.
10. Close the Print Center or the Printer Setup Utility by clicking the close button in the upper-left corner.

Installing Macintosh printing system software for direct connections (USB)



NOTE Macintosh computers do *not* support parallel port connections.

This section explains how to install the printing system software for Mac OS v9.1 and later and Mac OS X v10.2 and later.

The Apple PostScript driver must be installed in order to use the PPD files. Use the Apple PostScript driver that came with your Macintosh computer.

To install the printing system software

1. Connect a USB cable between the USB port on the MFP and the USB port on the computer. Use a standard 2-meter (6.56-foot) USB cable.
2. Insert the MFP CD into the CD-ROM drive and run the installer.

The CD menu runs automatically. If the CD menu does not run automatically, double-click the CD icon on the desktop.
3. Double-click the **Installer** icon in the HP LaserJet Installer folder.
4. Follow the instructions on the computer screen.
5. For Mac OS v9.1 and later:
 - a. On the computer hard drive, open **Applications**, open **Utilities**, and then open **Print Center**.
 - b. Double-click **Printer (USB)**, and then click **OK**.
 - c. Next to **USB Printer Selection**, click **Change**.
 - d. Select the MFP, and then click **OK**.
 - e. Next to **Postscript Printer Description (PPD) File**, click **Auto Setup**, and then click **Create**.
 - f. On the **Printing** menu, click **Set Default Printer**.

For Mac OS X v10.2 and later: USB queues are created automatically when the MFP is attached to the computer. However, the queue will use a generic PPD if the installer has not been run before the USB cable is connected. To change the queue PPD, open the Print Center or Printer Setup Utility, select the correct printer queue, and then click **Show Info** to open the **Printer Info** dialog box. In the pop-up menu, select **Printer Model**, and then, in the pop-up menu in which **Generic** is selected, select the correct PPD for the MFP.

6. Print a test page or a page from any software program to make sure that the software is correctly installed.

If installation fails, reinstall the software. If this fails, see the installation notes or late-breaking readme files on the MFP CD or the flyer that came with the product, or go to <http://www.hp.com/support/clj4730mfp> for help or more information.



NOTE The icon on the Mac OS v9.x desktop looks generic. All of the print panels appear in the Print dialog box with each software program.

To remove software from Macintosh operating systems

To remove the software from a Macintosh computer, drag the PPD files to the trash can.

Network configuration

Configure certain network parameters on the MFP as needed. Configure these parameters from installation software, the MFP product control panel, the embedded Web server, or management software, such as HP Web Jetadmin or the HP LaserJet Utility for Macintosh.



NOTE For more information about using the embedded Web server, see [Embedded Web server on page 77](#).

For more information about supported networks and network configuration tools, see the *HP Jetdirect Print Server Administrator's Guide*. The guide comes with MFPs in which an HP Jetdirect print server is installed.

This section contains the following instructions for configuring network parameters from the MFP product control panel:

- Configuring TCP/IP parameters.
- Disabling unused network protocols.

Configuring TCP/IP parameters

Use the MFP product control panel to configure these TCP/IP parameters:

- IP address (4 bytes)
- Subnet mask (4 bytes)
- Default gateway (4 bytes)

To manually configure TCP/IP parameters from the MFP control panel

Use manual configuration to set an IP address, subnet mask, and default gateway.

Setting an IP address

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **I/O**.
4. Scroll to and touch **JETDIRECT MENU**.
5. Scroll to and touch **TCP/IP**.
6. Scroll to and touch **CONFIG METHOD**.
7. Scroll to and touch **MANUAL** or **MANUAL SETTINGS**.
8. Scroll to and touch **IP Address: X**.
9. Use the right and left arrows to select each byte of the IP address, and then use the numeric keypad to enter the value of each byte.
10. Touch **OK**.

Setting the subnet mask

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **I/O**.
4. Scroll to and touch **JETDIRECT MENU**.
5. Scroll to and touch **TCP/IP**.
6. Scroll to and touch **CONFIG METHOD**.
7. Scroll to and touch **MANUAL**.
 - Scroll to and touch **MANUAL SETTINGS**.
8. Scroll to and touch **SUBNET MASK**



NOTE The first three sets of numbers are highlighted.

9. Use the right and left arrows to select each byte of the subnet mask, and then use the numeric keypad to enter the value of each byte.
10. Touch **OK**.

Setting the default gateway

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **I/O**.
4. Scroll to and touch **JETDIRECT MENU**.
5. Scroll to and touch **TCP/IP**.
6. Scroll to and touch **CONFIG METHOD**.
7. Scroll to and touch **MANUAL** or **MANUAL SETTINGS**.
8. Scroll to and touch **DEFAULT GATEWAY**.



NOTE The first set of 3 numbers shows the default settings. If there is not a number highlighted, a highlighted empty underscore appears.

9. Use the right and left arrows to select each byte of the default gateway, and then use the numeric keypad to enter the value of each byte.
10. Touch **OK**.

Disabling network protocols (optional)

By factory default, all supported network protocols are enabled. Disabling unused protocols has the following benefits:

- Decreases MFP-generated network traffic.
- Prevents unauthorized users from printing to the MFP.
- Provides only pertinent information on the configuration page.
- Allows the MFP control panel to display protocol-specific error and warning messages.



NOTE TCP/IP configuration cannot be disabled on the HP Color LaserJet 4730mfp.

Disabling IPX/SPX



NOTE Do not disable this protocol if Windows 95/98, Windows NT, Me, 2000, and XP users will be printing to the MFP using direct-mode IPX/SPX.

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **I/O**.
4. Scroll to and touch **JETDIRECT**.
5. Scroll to and touch **IPX/SPX**.
6. Scroll to and touch **ENABLE**.
7. Scroll to and touch **ON** or **OFF**.
8. Touch **OK**.

Disabling DLC/LLC

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **I/O**.
4. Scroll to and touch **JETDIRECT**.
5. Scroll to and touch **DLC/LLC**.
6. Scroll to and touch **ENABLE**.
7. Scroll to and touch **ON** or **OFF**.
8. Press **OK**.

Disabling AppleTalk

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **I/O**.
4. Scroll to and touch **JETDIRECT**.
5. Scroll to and touch **APPLETALK**.
6. Scroll to and touch **ENABLE**.
7. Scroll to and touch **ON** or **OFF**.
8. Press **OK**.

Security features

Several important security features are available for the MFP. Use the information in this section to configure these features to meet the user's needs.

Securing the embedded Web server

Assign a password for access to the embedded Web server so that unauthorized users cannot change the MFP settings.

To secure the embedded Web server

1. Open the embedded Web server by entering the IP address.
2. Click the **Settings** tab.
3. On the left side of the window, click **Security**.
4. Type the password next to **New Password**, and type it again next to **Verify Password**.
5. Click **Apply**. Make note of the password, and store it in a safe place.

Foreign Interface Harness (FIH)

The Foreign Interface Harness (FIH) provides a portal on the MFP. By using the FIH and third-party equipment, information about copies that are made on the MFP can be tracked.

Requirements

- Windows 9X, Windows Me, Windows 2000, or Windows XP
- Access to third-party accounting hardware solutions, such as Equitrac or Copitrak devices

Using the FIH

To use the FIH, download and install the FIH software. The software is available from <http://www.hp.com/support/clj4730mfp>. The software is used to enable or disable the FIH portal. Use the software to set and change the administrator personal identification number (PIN).

Administrators can use the PIN option to configure the FIH to prevent any unauthorized changes. Changes can be made only with the correct PIN authentication.



NOTE It is important to remember the PIN that is assigned to the FIH administration software. The PIN is required to make any changes to the FIH.

To enable the FIH portal

1. Double-click the FIH.EXE file. The **Foreign Interface Harness** dialog box appears.
2. Click **OK**.
3. Click **Enable**.
4. If a PIN has not been previously entered, click **No**. If a PIN was entered previously, click **Yes**. If clicking **No**, type and confirm the PIN, and then click **OK**. If clicking **Yes**, type the PIN and click **OK**.



NOTE The PIN must be numeric.

5. Click the appropriate button for the type of connection: **Direct** or **Network**. If selecting **Direct**, type the MFP port. If selecting **Network**, type the IP address and port for the MFP.



NOTE The IP address for the MFP can be found on the configuration page. Print a configuration page from the product control panel by touching **Menu**, touching **Information**, and then touching **PRINT CONFIGURATION**.

If an incorrect IP address is typed, an error message will display. Otherwise, the portal is enabled.

To disable the FIH portal

1. Double-click the FIH.EXE file. The **Foreign Interface Harness** dialog box appears.
2. Click **OK**.
3. Click **Disable**.
4. Type the PIN and click **OK**.
5. Click the appropriate button for the type of connection: **Direct** or **Network**. If **Direct** is selected, type the MFP port and click **OK**. If **Network** is selected, type the IP address and port for the MFP, and then click **OK**. The portal is disabled.



NOTE If the PIN number is lost and the portal needs to be disabled, try using the default PIN that is listed to disable it. For assistance, use the HP Instant Support service, which is available through the embedded Web server or at <http://instantsupport.hp.com>.

Secure Disk Erase

To protect deleted data from unauthorized access on the MFP hard drive, use Secure Disk Erase. Secure Disk Erase is a security feature that securely erases print and copy jobs from the hard drive.

Secure Disk Erase offers the following levels of disk security:

- **Non-Secure Fast Erase.** This is a simple file-table erase function. Access to the file is removed, but actual data is retained on the disk until it is overwritten by subsequent data-storage operations. This is the fastest mode. Non-Secure Fast Erase is the default erase mode.
- **Secure Fast Erase.** Access to the file is removed, and the data is overwritten with a fixed identical character pattern. This is slower than Non-Secure Fast Erase, but all data is overwritten. Secure Fast Erase meets the U.S. Department of Defense 5220-22.M requirements for the clearing of disk media.
- **Secure Sanitizing Erase.** This level is similar to the Secure Fast Erase mode. In addition, data is repetitively overwritten by using an algorithm that prevents any residual data persistence. This mode will impact performance. Secure Sanitizing Erase meets the U.S. Department of Defense 5220-22.M requirements for the sanitization of disk media.

Data affected

Data affected (covered) by the Secure Disk Erase feature includes stored jobs, proof and hold jobs, disk-based fonts, disk-based macros (forms), and temporary files that are created during the print and copying process.



NOTE Stored jobs will be securely overwritten only when they have been deleted through the **RETRIEVE JOB** menu on the MFP after the appropriate erase mode has been set.

This feature will not impact data that is stored on flash-based product non-volatile RAM (NVRAM) that is used to store default settings, page counts, and similar data. This feature does not affect data that is stored on a system RAM disk (if one is used). This feature does not impact data that is stored on the flash-based system boot RAM.

Changing the Secure Disk Erase mode does not overwrite previous data on the disk, nor does it immediately perform a full-disk sanitization. Changing the Secure Disk Erase mode changes how the MFP cleans up temporary data for jobs after the erase mode has been changed.

Gaining access to Secure Disk Erase

Use HP Web Jetadmin to gain access to and set the Secure Disk Erase feature.

Additional Information

For additional information about the HP Secure Disk Erase feature, see the HP support flyer or go to <http://www.hp.com/go/webjetadmin/>.

Job storage features

Several job storage features are available for this MFP. These features include printing private jobs, storing print jobs, quick-copying jobs, and proofing and holding jobs.

For more information about job storage features, see [Job storage features on page 93](#).

DSS authentication

Optional Digital Sending Software (DSS) for the MFP is available for purchase separately. The software provides an advanced sending program that contains an authentication process. This process requires users to type a user identification and a password before they can use any of the DSS features that require authentication.

See [Parts and supplies on page 43](#) for ordering information.

Locking the control panel menus

To prevent someone from changing MFP configuration, the control panel menus can be locked. This prevents unauthorized users from changing the configuration settings such as the SMTP server. The following procedure describes how to restrict access to the control panel menus by using the HP Web Jetadmin software. (See [Using HP Web Jetadmin software on page 639](#).)

To lock the control panel menus

1. Open the HP Web Jetadmin program.
2. Open the **DEVICE MANAGEMENT** folder in the drop-down list in the **Navigation** panel. Navigate to the **DEVICE LISTS** folder.
3. Select the MFP.
4. In the **Device Tools** drop-down list, select **Configure**.

5. Select **Security** from the **Configuration Categories** list.
6. Type a **Device Password**.
7. In the **Control Panel Access** section, select **Maximum Lock**. This prevents unauthorized users from gaining access to configuration settings.

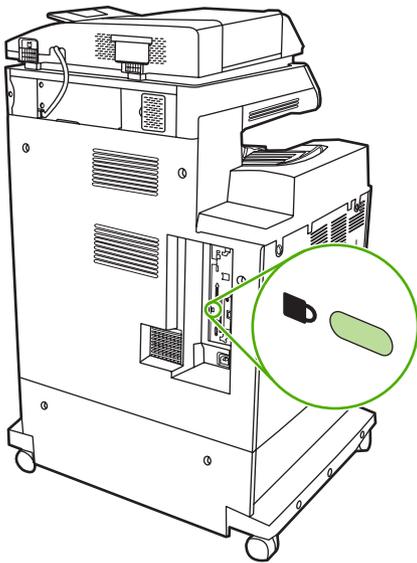
Locking the formatter cage

A Kensington lock can be placed on the formatter cage to prevent unauthorized access to components on the formatter. If interested in purchasing a Kensington locking accessory for the formatter cage on an HP Color LaserJet 4730mfp, please contact HP at <http://www.hp.com/support/clj4730mfp>.



NOTE A Kensington lock is typically used for locking laptop computers in order to prevent theft.

The following figure indicates where the lock should be placed.



Optional output and input devices

Optional paper-handling devices are available for the MFP.

- 3-bin mailbox with output accessory bridge
- Stapler/stacker with output accessory bridge

Each of these accessories comes with an installation guide that explains how to install it. After installing an accessory, print a configuration page to verify that the accessory was installed successfully. If the accessory is installed correctly, it is listed on the configuration page in the section for **Paper trays and options**.

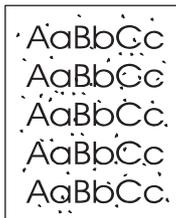
4 Maintenance

This chapter contains information about the following topics:

- [Using the cleaning page](#)
- [Cleaning the MFP](#)
- [Calibrating the scanner](#)
- [Performing preventive maintenance](#)
- [Managing print cartridges](#)
- [Approximate replacement intervals for supplies](#)
- [ETB life under different circumstances](#)
- [Changing print cartridges](#)
- [Replacing supplies](#)
- [MFP memory and fonts](#)
- [Installing memory and fonts](#)
- [Setting the real-time clock](#)
- [Configuring and verifying an IP address](#)
- [Upgrading the firmware](#)

Using the cleaning page

During printing, toner and dust particles can accumulate inside the MFP. Over time, this buildup can cause print quality problems, such as toner specks or smearing. This MFP has a cleaning mode that can correct and prevent these problems.



Processing a cleaning page

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **PRINT QUALITY**.
4. Scroll to and touch **PROCESS CLEANING PAGE**.



NOTE The MFP prints a cleaning page with a pattern and provides further instructions.

Cleaning the MFP

To maintain print quality, clean the MFP thoroughly whenever print-quality problems occur and every time you replace the print cartridge.



WARNING! Avoid touching the fusing area when cleaning the MFP. It can be hot.



CAUTION To avoid permanent damage to the print cartridge, do not use ammonia-based cleaners on or around the MFP except as directed.

Cleaning the outside of the MFP

- Clean the outside of the MFP if it is visibly marked.
- Use a soft, lint-free cloth dampened with water, or with water and a mild detergent.

Cleaning the touchscreen

Clean the touchscreen whenever it is necessary to remove fingerprints or dust. Wipe the touchscreen gently with a clean, water-dampened, lint-free cloth.



CAUTION Use water only. Solvents or cleaners can damage the touchscreen. Do not pour or spray water directly onto the touchscreen.

Cleaning the scanner glass

- Clean the scanner glass only if dirt is visible, or if experiencing a decrease in copy quality, such as streaking.
- Clean the scanner glass by wiping it gently with a clean, slightly damp, lint-free cloth. Use an ammonia-based surface cleaner only when a water-dampened cloth does not clean the scanner glass. Spray or pour the cleaner onto the cleaning cloth. Do not spray or pour the cleaner onto the scanner glass.



CAUTION Do not pour or spray liquids directly onto the scanner glass. Do not press hard on the glass surface. (The glass could break.)

Cleaning the ADF delivery system

Clean the ADF only if it is visibly marked or dirty, or if you are experiencing a decrease in copy quality (such as streaking).

To clean the ADF delivery system

1. Open the scanner lid.

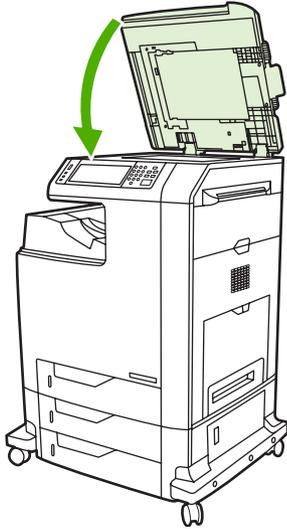


2. Locate the white vinyl ADF backing.



3. Clean the ADF backing with a clean, damp, lint-free cloth. Use an ammonia-based surface cleaner only when a water-dampened cloth does not clean the ADF components.
4. Clean the scanner glass by wiping it gently with a clean, slightly damp, lint-free cloth. Use an ammonia-based surface cleaner only when a water-dampened cloth does not clean the scanner glass.

5. Close the scanner lid.



To clean the ADF rollers

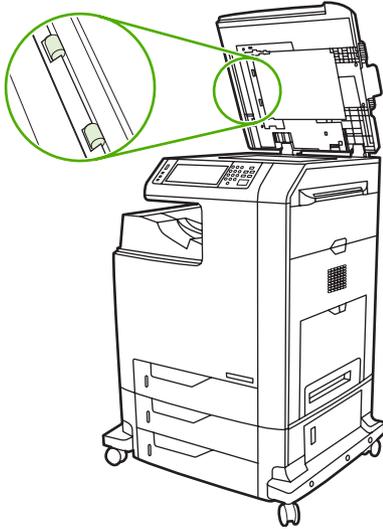
You should clean the rollers in the ADF if you are experiencing misfeeds or if your originals show marks as they exit the ADF.

 **CAUTION** Clean the rollers only if experiencing misfeeds or marks on the originals, and dust is on the rollers. Cleaning the rollers frequently could introduce dust into the device.

1. Open the scanner lid.



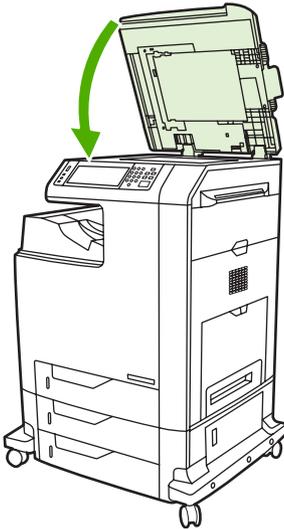
2. Locate the rollers adjacent to the white vinyl ADF backing.



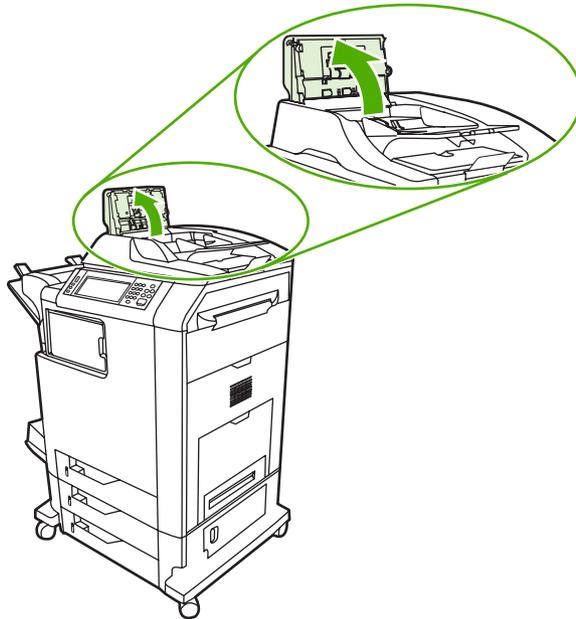
3. Wipe the rollers gently with a clean, water-dampened, lint-free cloth.

 **CAUTION** Do not pour water directly onto the rollers. Doing so might damage the device.

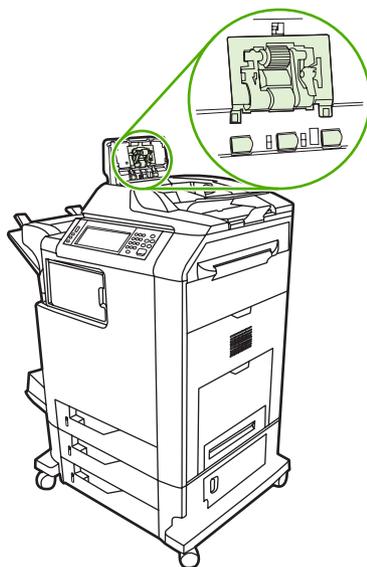
4. Close the scanner lid.



5. Pull the release lever to open the ADF cover.



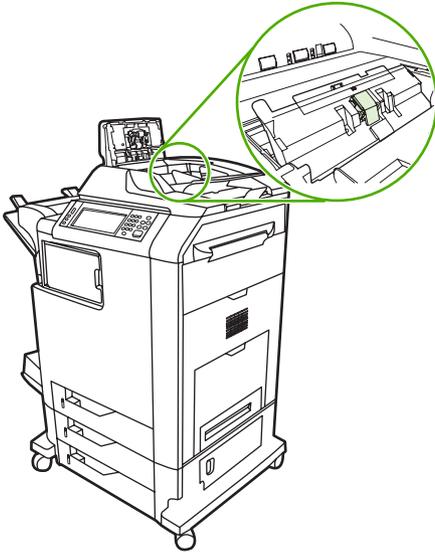
6. Locate the rollers.



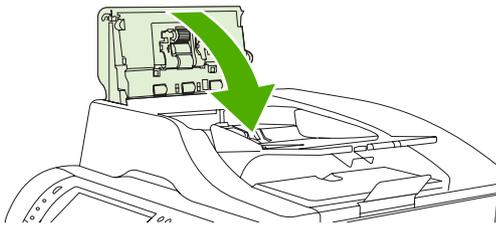
7. Wipe the rollers with a clean, water-dampened, lint-free cloth.

 **CAUTION** Do not pour water directly onto the rollers. Doing so might damage the device.

8. Locate the separation pad.



9. Wipe the pad with a clean, water-dampened, lint-free cloth.
10. Close the ADF cover.



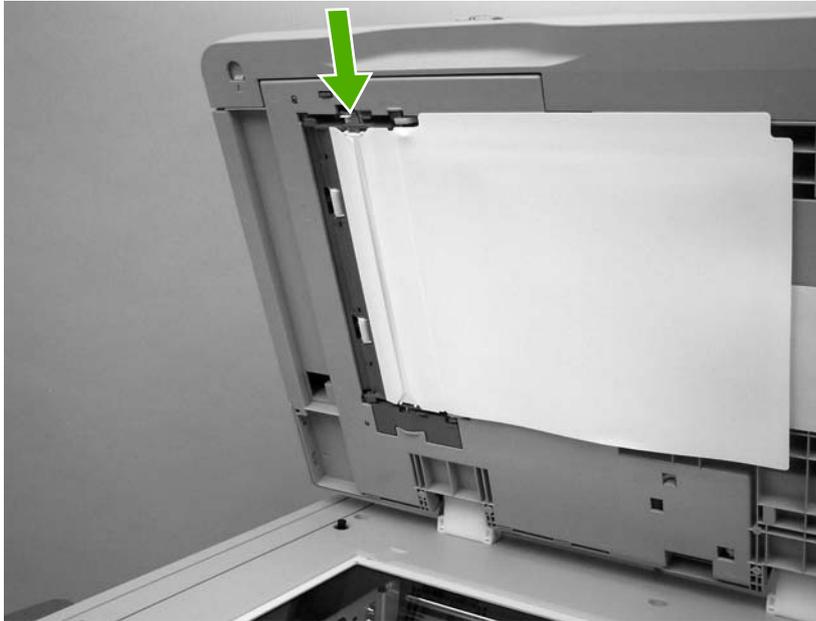
Cleaning the mylar strip

Clean the mylar strips on the underside of the scanner lid only if you are experiencing a decrease in copy quality (such as vertical lines) during copying using the ADF.

To clean the mylar strip

1. Open the scanner lid.

2. Locate the mylar strip.



3. Clean the mylar strip with a clean, damp, lint-free cloth.
4. Close the scanner lid.



NOTE Replacement mylar strips are stored in an envelope that is underneath the white vinyl ADF backing. Follow the instructions that are in the envelope.

Calibrating the scanner

Calibrate the scanner to compensate for offsets in the scanner imaging system (carriage head) for ADF and flatbed scans. Because of mechanical tolerances, the scanner's carriage head might not read the position of the image accurately. During the calibration procedure, scanner offset values are calculated and stored. The offset values are then used when producing scans so that the correct portion of the document is captured.

Scanner calibration should be carried out only if experiencing offset problems with the scanned images. The scanner is calibrated before it leaves the factory. It needs to be calibrated again only rarely.

Before calibrating the scanner, print the calibration target.

To print the calibration target

1. Place letter or A4-size paper in tray 1, and adjust the side guides.
2. Press **Menu** to enter the **MENUS**.
3. Scroll to and touch **DIAGNOSTICS**.
4. Scroll to and touch **CALIBRATE SCANNER**.
5. Touch **OK** to print the first pass of the calibration target.
6. Place the first pass of the calibration target face-down in tray 1 so that the arrows are facing into the MFP.
7. Touch **OK** to print the second pass. The final calibration target *must* look like the following figure.



CAUTION If the calibration target does not look like the figure shown here, the calibration process will fail and the quality of scans will be degraded. *The black areas must extend completely to the short edges of the page. If they do not, use a black marker to extend the black areas to the edge of the page.* Press **Stop** to cancel the calibration.

8. Place the calibration target face-up into the ADF, and adjust the side guides. Touch **OK** to continue.
9. After the calibration target has passed through the ADF once, place it in the ADF face down. Touch **OK** to continue.
10. Place the calibration target face-down on the scanner glass and touch **OK**. After this pass, the calibration is complete.

The product control panel displays the message **Scanner calibration successful** to indicate success or the message **Scanner calibration failed** to indicate that the calibration failed.

Performing preventive maintenance

The MFP requires periodic maintenance to maintain optimum performance. A product control panel message alerts you when it is time to purchase the preventive maintenance kit.

ADF maintenance kit

After feeding 90,000 pages through the ADF, a **Replace Document Feeder Kit** message appears on the product control panel display. This message appears approximately one month before the kit needs to be replaced. Order a new kit when this message appears.

The ADF maintenance kit includes the following items:

- One pickup roller assembly
- One separation pad
- One mylar sheet kit
- An instruction sheet

Follow the instructions that come with the kit to install it.

After replacing the kit, reset the ADF maintenance kit count.

To reset the ADF maintenance kit count

1. Turn the MFP off and then on.
2. When XXXMB appears on the product control panel display, press and hold **6** until all three LEDs flash once and then stay on. (This might take up to 20 seconds.)
3. Release **6** and then press **3** twice.
4. Press **6** to select **NEW DOCUMENT FEEDER KIT**.
5. The MFP completes its initialization sequence. The ADF maintenance kit counter is automatically reset.

Managing print cartridges

This section provides information about HP print cartridges, their life expectancies, how to store them, and how to identify genuine HP supplies. Information also appears about non-HP print cartridges.

HP print cartridges

When a genuine HP print cartridge is used, several types of information are available, such as the following:

- Amount of toner remaining
- Estimated number of pages remaining
- Number of pages printed

Changing print cartridges

When a print cartridge approaches the end of its useful life, the product control panel displays a message recommending that a replacement be ordered. The MFP can continue to print using the current print cartridge until the product control panel displays a message instructing the user to replace the cartridge.

The MFP uses four colors and has a different print cartridge for each color: black (K), magenta (M), cyan (C), and yellow (Y).

Replace a print cartridge when the MFP product control panel displays a **REPLACE <COLOR> CARTRIDGE** message. The product control panel display will also indicate the color that should be replaced (if a genuine HP cartridge is currently installed).

Replacing a print cartridge



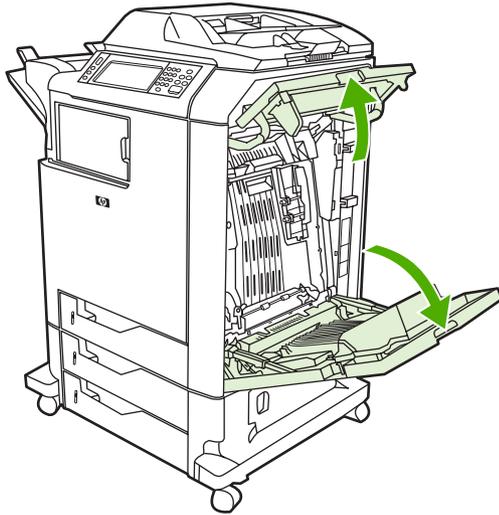
CAUTION If toner gets on clothing, wipe it off with a dry cloth and wash the clothes in cold water. Hot water sets toner into fabric.



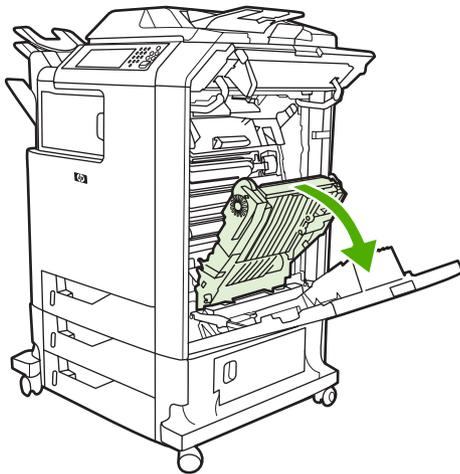
NOTE For information about recycling used print cartridges, visit the HP LaserJet Supplies Web site at <http://www.hp.com/go/recycle>.

To replace the print cartridge

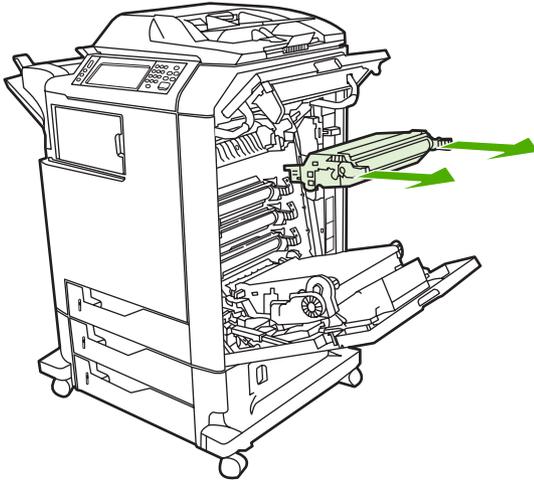
1. Using the handles, open the covers on the right side of the MFP.



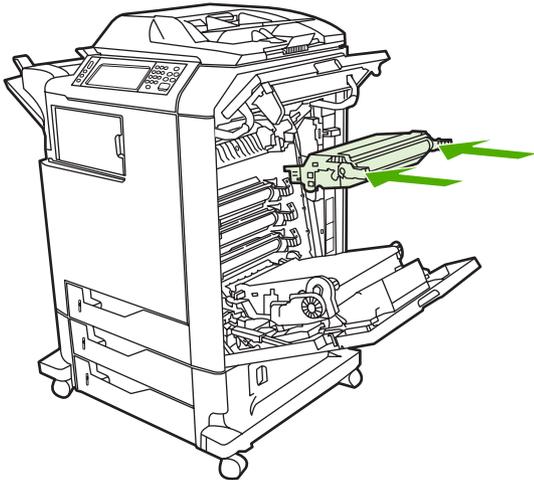
2. Grasp the green handle on the transfer unit and pull down to open it.



3. Remove the used print cartridge from the MFP.

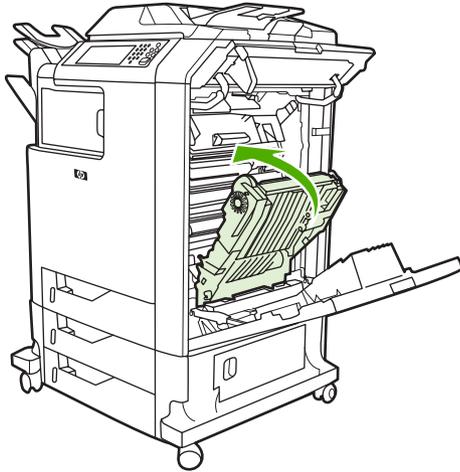


4. Remove the new print cartridge from the bag. Place the used print cartridge in the bag for recycling.

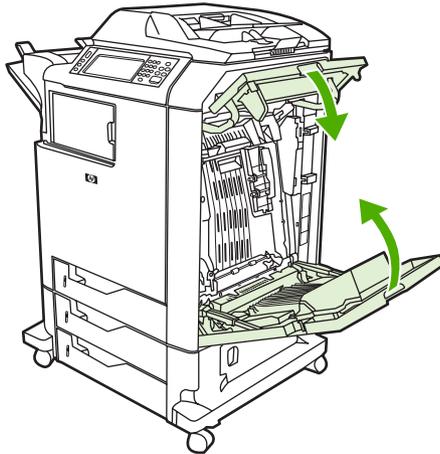


5. Align the print cartridge with the tracks inside the MFP and insert the print cartridge until it is completely seated.

6. Close the transfer unit.



7. Close the covers on the right side of the MFP. After a short while, the product control panel should display **Ready**.



Non-HP print cartridges

Hewlett-Packard Company cannot recommend use of non-HP print cartridges, either new or remanufactured. Because they are not HP products, HP cannot influence their design or control their quality. Service or repair that is required as a result of using a non-HP print cartridge will *not* be covered under the MFP warranty.

When a non-HP print cartridge is used, certain features, such as remaining toner volume data may not be available.

Using genuine HP supplies ensures the availability of all HP printing features.

Print cartridge authentication

The MFP will let users know if a print cartridge is not a genuine HP print cartridge when the cartridge is inserted into the MFP. If you believe that you purchased a genuine HP supply, go to <http://www.hp.com/go/antcounterfeit>.

Print cartridge storage

Do not remove the print cartridge from its package until you are ready to use it.

Always store the print cartridge in the proper environment. The storage temperature should be between -20°C and 40°C (-4°F to 104°F). The relative humidity should be between 10% and 90%.



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

Print cartridge life expectancy

The life of the print cartridge depends on the amount of toner that print jobs require and the length of life for the components inside the cartridge. When printing text at approximately 5% coverage (typical for a business letter), the HP print cartridge lasts an average of 12,000 pages. The page-yield specification that HP provides is a general guideline. Actual yield can vary according to usage conditions.

At any time, you can verify life expectancy by checking the supply level, as described below.

Checking the supply level

Check the supply (toner) level by using the product control panel, embedded Web server, or HP Web Jetadmin, or by printing a supplies status page.

Using the product control panel

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Information**.
3. Scroll to and touch **SUPPLIES STATUS**.

Using the embedded Web server

1. In a browser, enter the IP address for the MFP home page. This goes to the MFP status page.
2. On the left side of the screen, click **Supplies Status**. This goes to the supplies status page, which provides print cartridge information.

Using HP Web Jetadmin

In HP Web Jetadmin, select the MFP. The device status page shows print cartridge information.

Printing a supplies status page

Use the supplies status page to obtain information about the print cartridge that is installed in the MFP, the amount of toner that remains in the print cartridge, and the number of pages and jobs that have been processed. The page also lets users know when they should schedule the next preventive maintenance for each maintenance kit.

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Information**.

3. Scroll to and touch **PRINT SUPPLIES STATUS PAGE**.
4. Touch **OK**.

Approximate replacement intervals for supplies

The following table lists the estimated replacement intervals for supplies and the control panel messages that prompt when to replace each item. Usage conditions and print patterns can cause results to vary.

Item	Control panel message	Page count	Approximate time period ²
Black cartridges	REPLACE BLACK CARTRIDGE	12,000 pages ¹	3 months
Color cartridges	REPLACE <COLOR> CARTRIDGE	12,000 pages ¹	3 months
Transfer kit	REPLACE TRANSFER KIT	120,000 pages ³	40 months
Fuser kit	REPLACE FUSER KIT	150,000 pages ³	50 months

¹ Approximate average A4-/letter-size page count based on 5% coverage of individual colors.

² Approximate transfer unit life is based on 4,000 pages per month.

³ Approximate fuser unit life is based on 4,000 pages per month.

Use the embedded Web server to order supplies. For more information, see [Using the embedded Web server on page 112](#).

ETB life under different circumstances

Depending on the MFP workload, the customer will need to replace the ETB once or twice in the life of the MFP. In order to help plan supplies purchases, the HP Color LaserJet 4730mfp MFP calculates an estimated remaining number of pages that can be printed with the ETB.

The number of pages the ETB can print is a function of two factors:

- The number of times the belt goes from a stationary to a rotating state (spins up)
- The number of pages that have been printed on the belt

Unless print jobs are queued back to back, each print job requires the belt to spin up.

Think of the ETB as having a limited number of wear units. It has 200,000 wear units when it is new. Each time the belt spins up, it uses two wear units. Each time it prints a page, the belt uses one wear unit.

Because most print jobs are not queued, the average number of pages per job, or job length, is a factor in how fast the ETB will wear out. The shorter the average job, the more quickly the ETB will wear out.

[Figure 4-1 ETB total page count according to average job length on page 115](#) shows how many pages an ETB can print, given various average job lengths.

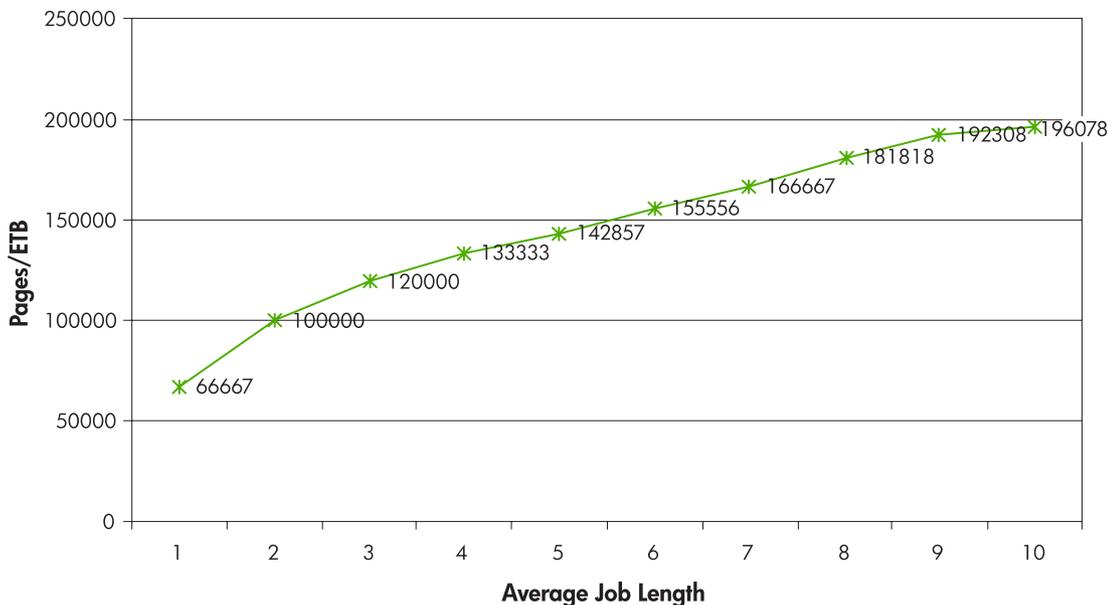


Figure 4-1 ETB total page count according to average job length

The MFP assumes an average print job length of three pages to estimate how many pages are remaining on the ETB. With an average job length of three pages, the ETB will print 120,000 pages.

If all print jobs are exactly three pages long, for each page printed the number of estimated pages remaining would decrease by one, beginning with the maximum 120,000 pages. If the job length is less than three pages, the estimated-pages-remaining number decreases more quickly than the rate at which the number of pages actually printed increases. If the job length is greater than three pages, the number of pages remaining decreases less quickly than the rate at which the actual number of pages printed increases.

Changing print cartridges

When a print cartridge approaches the end of its useful life, the product control panel displays a message recommending that a replacement be ordered. The MFP can continue to print using the current print cartridge until the product control panel displays a message instructing users to replace the cartridge.

The MFP uses four colors and has a different print cartridge for each color: black (K), magenta (M), cyan (C), and yellow (Y).

Replace a print cartridge when the MFP control panel displays a **REPLACE <COLOR> CARTRIDGE** message. The product control panel display will also indicate the color that should be replaced (if a genuine HP cartridge is currently installed).

Replacing print cartridges

For instructions on replacing print cartridges, see [Replacing a print cartridge on page 108](#).



CAUTION If toner gets on clothing, wipe it off with a dry cloth and wash the clothes in cold water. Hot water sets toner into fabric.



NOTE For information about recycling used print cartridges, visit the HP LaserJet Supplies Web site at <http://www.hp.com/go/recycle>.

Replacing supplies

When using genuine HP supplies, the MFP automatically notifies you when supplies are nearly depleted. The notification to order supplies allows ample time to order new supplies before they need to be replaced.

Locating supplies

Supplies are identified by their labeling and their blue plastic handles.

The following figure illustrates the location of each supply item.

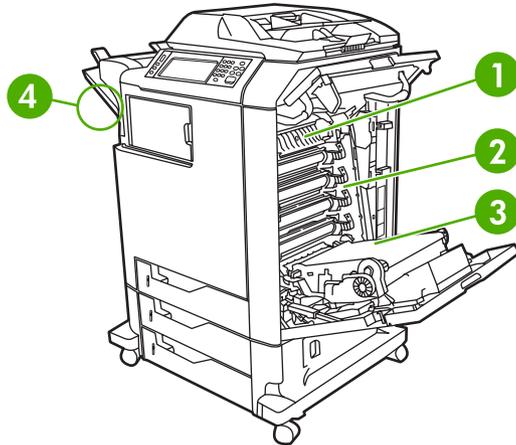


Figure 4-2 Supply item locations

1	Fuser
2	Print cartridges
3	ETB (image transfer unit)
4	Stapler cartridge

Supply replacement guidelines

To facilitate the replacement of supplies, keep the following guidelines in mind when setting up the MFP.

- Allow sufficient space above and in the front of the MFP for removing supplies.
- The MFP should be located on a flat, sturdy surface.

For instructions on installing supplies, see the installation guides provided with each supply item or see more information at <http://www.hp.com/support/clj4730mfp>. When you connect, select **Solve a Problem**.



CAUTION HP recommends the use of genuine HP products in this MFP. Use of non-HP products may cause problems requiring service that is not covered by the HP extended warranty or service agreements.

Making room around the MFP for replacing supplies

The following illustration shows the clearance necessary in front of, above, and to the side of the MFP for replacing supplies.

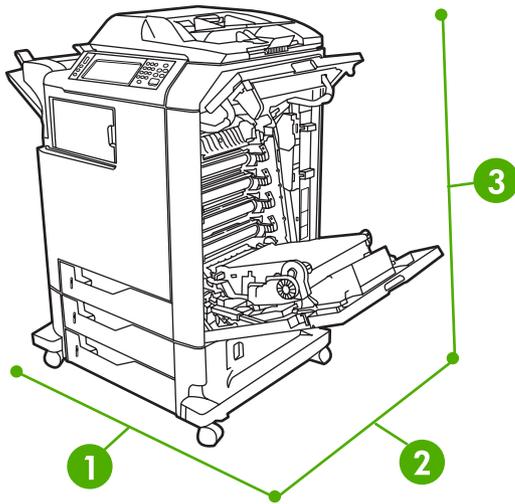


Figure 4-3 Supplies replacement clearance diagram

1	1160 mm (45.7 inches); if stapler/stacker or 3-bin mailbox is installed: 1460 mm (47.5 inches)
2	980 mm (38.6 inches)
3	1050 mm (41.4 inches)

Replacing the ETB

Replace the ETB when a **REPLACE TRANSFER KIT** message appears on the product control panel display.

1. Turn the MFP off.
2. Open the right upper and lower covers.
3. Lower the ETB by pulling the green handle at the top of the unit downward.
4. Press the small blue latches located on either side of the bottom of the ETB and lift the unit out of the MFP.
5. Install the new ETB.
6. Close the right upper and lower covers.
7. Supplies ordering information is also available from the embedded Web server. See [Using the embedded Web server on page 112](#) for more information.

Replacing the fuser

Replace the fuser when a **REPLACE FUSER KIT** message appears on the product control panel display.

1. Turn the MFP off.
2. Open the right upper cover.
3. Grasp the purple handles on the fuser.
4. Remove the old fuser from the MFP.
5. Install the new fuser.
6. Close the right upper cover.
7. Supplies ordering information is also available from the embedded Web server. See [Parts and supplies on page 43](#) for more information.

Replacing the stapler cartridge

The stapler cartridge contains 5,000 staples.

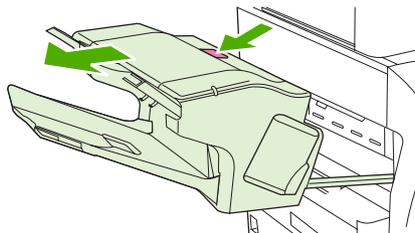
Replace the stapler cartridge if the MFP control panel display prompts users with a **STAPLER LOW ON STAPLES** message (at this point, the stapler cartridge has 20 to 50 staples left) or a **STAPLER OUT OF STAPLES** message. If the stapler runs out of staples and the stapler/stacker is configured to **CONTINUE**, jobs continue to print to the stapler/stacker, but they are not stapled. If the stapler/stacker is configured to stop, printing stops until a new stapler cartridge is loaded.



NOTE HP recommends replacing the stapler cartridge as soon as the **STAPLER OUT OF STAPLES** message is displayed. Although some usable staples remain in the cartridge, they could fall into the stapler mechanism and cause product failure.

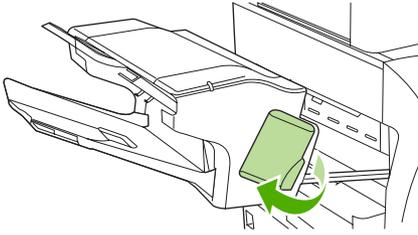
Loading a new stapler cartridge

1. Press and hold the release button on the top of the stapler/stacker. Pull the stapler/stacker away from the MFP.

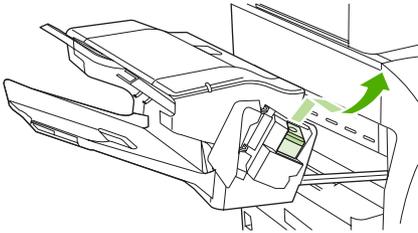


NOTE For information on ordering a new stapler cartridge (part number C8091A), see [Parts and supplies on page 43](#).

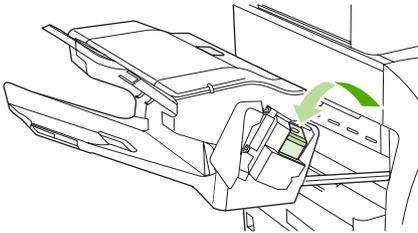
2. Open the staple cartridge cover.



3. Grasp the green staple cartridge handle and pull the old staple cartridge out of the stapler unit.

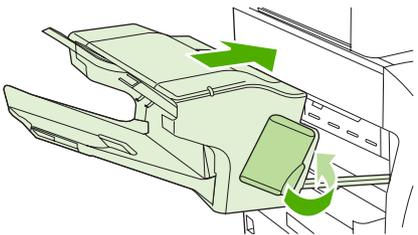


4. Insert the new staple cartridge into the stapler unit and push down on the green handle until the unit snaps into place.



NOTE To obtain a new stapler cartridge, order part number C8091A.

5. Close the staple cartridge cover, and slide the stapler/stacker into the MFP.



MFP memory and fonts

The MFP has 256 MB of synchronous dynamic random-access memory (RAM) expandable to 512 MB by using industry-standard 100-pin double data rate dual inline memory modules (DDR DIMMS).



NOTE Memory specification: HP Color LaserJet 4730mfp uses 100-pin small outline dual inline memory modules (SODIMM) that support 128 or 256 MB of RAM.

The MFP also has three flash memory card slots for MFP firmware, fonts, and other solutions.

- The first flash memory card is reserved for MFP firmware.



NOTE Use the first flash memory card slot for firmware only. The slot is marked "Firmware Slot".

- The two additional flash memory card slots enable the user to add fonts and third-party solutions, such as signatures and personalities. The slots are marked "Slot 2" and "Slot 3". For more information about types of solutions available, go to <http://www.hp.com/go/gsc>.



NOTE Flash memory cards adhere to Compact Flash specifications and size.



CAUTION Do not insert a flash memory card that is designed for use with a digital camera into the MFP. The MFP does not support photo printing directly from a flash memory card. If a camera-type flash memory card is installed, the product control panel displays a message asking if the flash memory card should be reformatted. If the card is reformatted, all data on the card will be lost.

Add more memory to the MFP to support printing of complex graphics or PostScript documents, or use of many downloaded fonts. Additional memory also allows the MFP to print multiple collated copies at maximum speed.



NOTE Single inline memory modules (SIMMs) / dual in-line memory modules (DIMMs) used on previous HP LaserJet MFPs are not compatible with this MFP.

NOTE To order SODIMMs, see [Parts and supplies on page 43](#).

Before ordering additional memory, see how much memory is currently installed by printing a configuration page.

Printing a configuration page

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Information**.
3. Scroll to and touch **PRINT CONFIGURATION**.
4. Touch **OK** to print the configuration page.

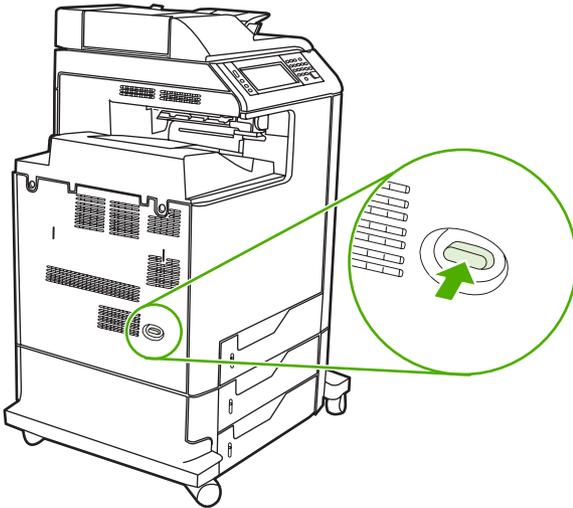
Installing memory and fonts

Additional memory can be installed in the MFP. A font card that will allow the MFP to print characters for languages such as Chinese or the Cyrillic alphabet can also be installed.

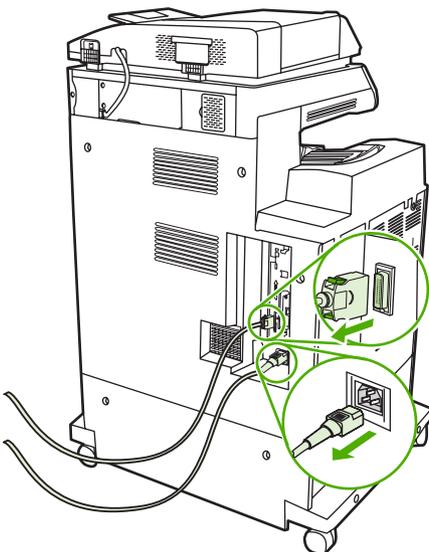
CAUTION Static electricity can damage DIMMs. When handling DIMMs, either wear an antistatic wrist strap, or frequently touch the surface of the DIMM antistatic package and then touch bare metal on the MFP.

Installing DDR memory DIMMs

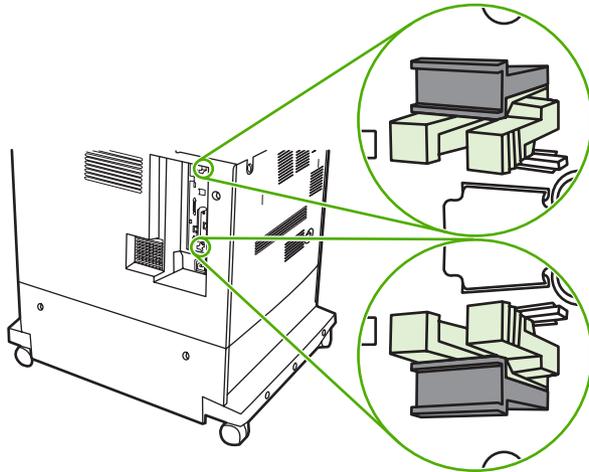
1. Turn the MFP off.



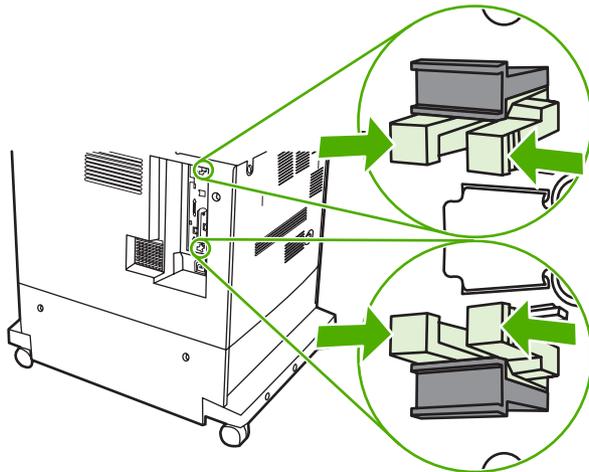
2. Disconnect all power and interface cables.



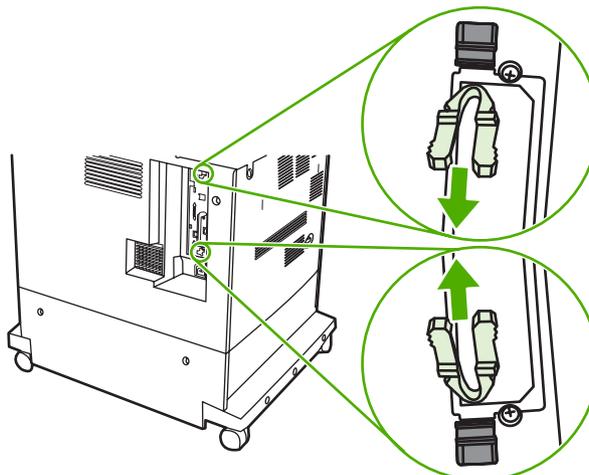
3. Locate the formatter board in the rear of the MFP.



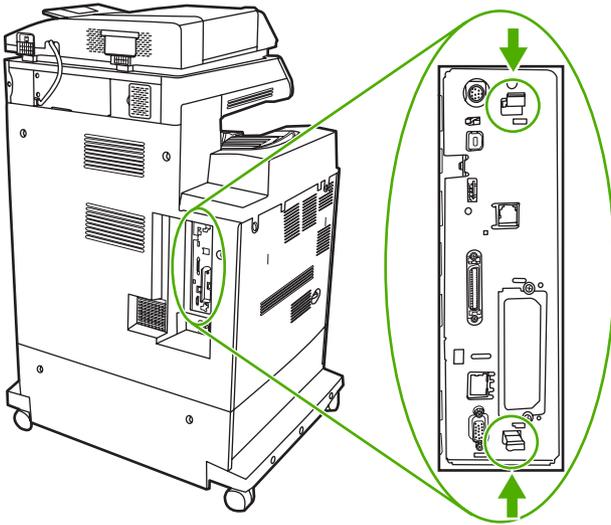
4. Locate the gray formatter pressure release tabs on the formatter board in the rear of the MFP.



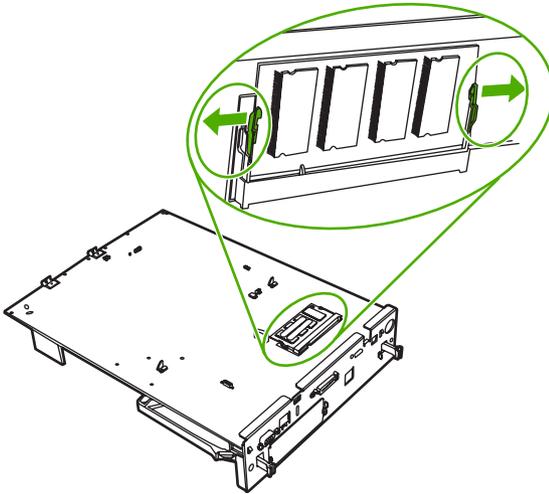
5. Gently squeeze the tabs and pull them out of the formatter.



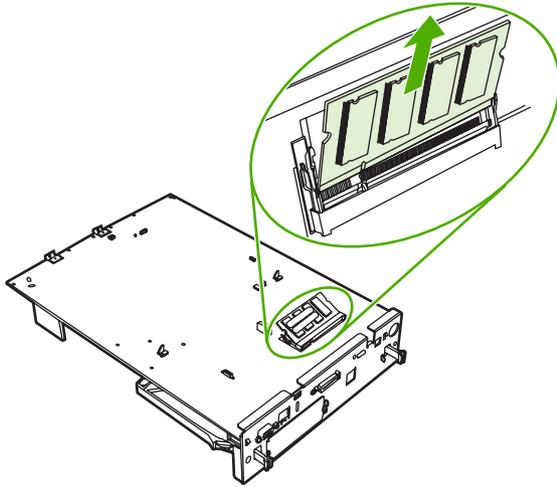
6. Gently pull on the black tabs at the top and bottom of the formatter board and pull the formatter board from the MFP. Place the formatter board on a clean, flat, grounded surface.



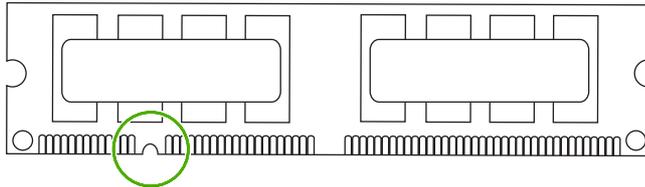
7. To replace a DDR DIMM that is currently installed, spread the latches apart on each side of the DIMM holder on the rear of the formatter.



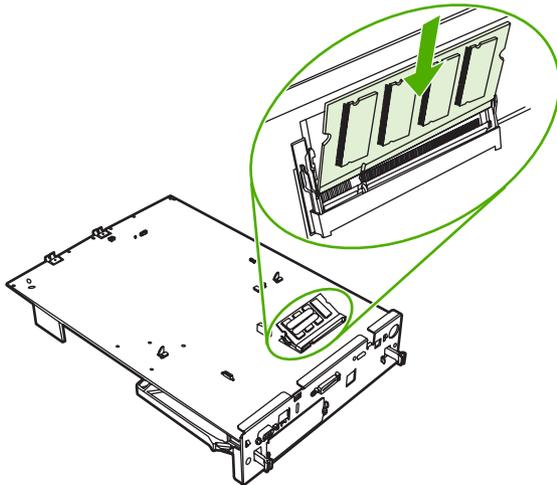
8. Lift the DDR DIMM up at an angle, and pull it out.



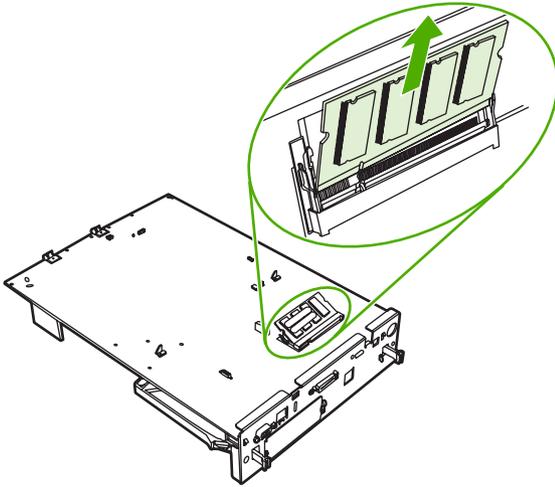
9. Remove the new DIMM from the antistatic package. Locate the alignment notch on the bottom edge of the DIMM.



10. Holding the DIMM by the edges, insert it into the DIMM holder on the rear of the formatter. When installed correctly, the metal contacts are not visible.

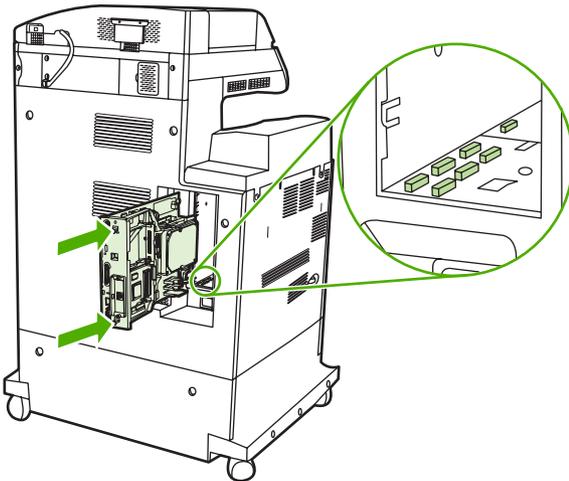


11. Push the DIMM holder flat against the back of the formatter.

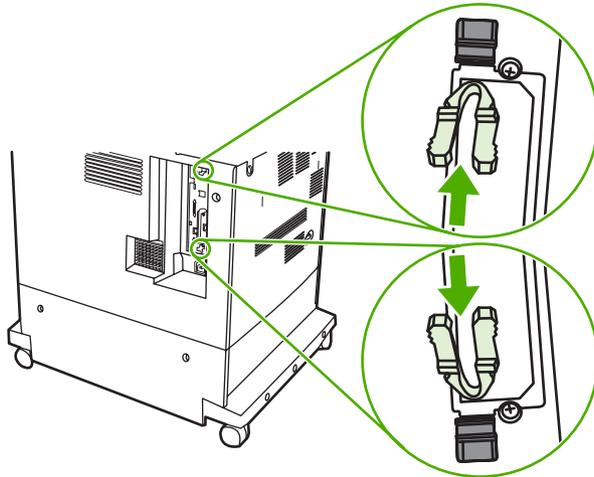


NOTE If there is difficulty when inserting the DIMM, make sure the notch on the bottom of the DIMM is aligned with the bar in the slot. If the DIMM still does not go in, confirm that the correct type of DIMM is being installed.

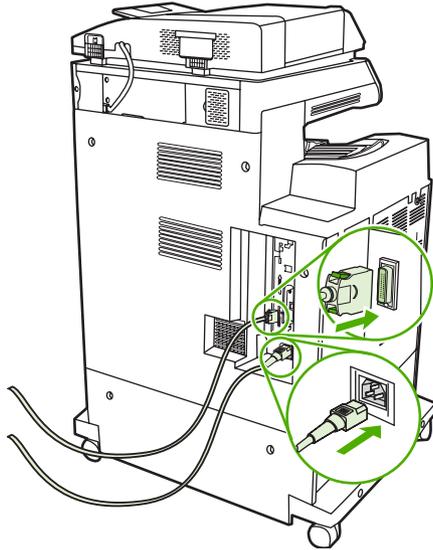
12. Align the formatter board in the tracks at the top and bottom of the slot, and then slide the board back into the MFP.



13. Reinsert the formatter pressure release tabs into the formatter.



14. Reconnect the power cable and interface cables, and turn the MFP on.

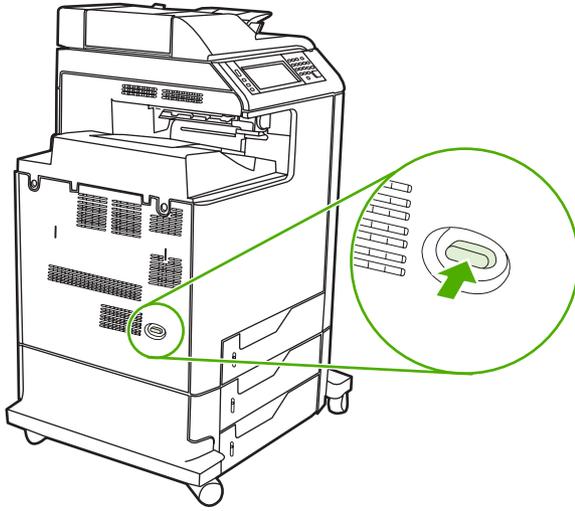


15. If a new memory DIMM was installed, go to [Enabling memory on page 132](#).

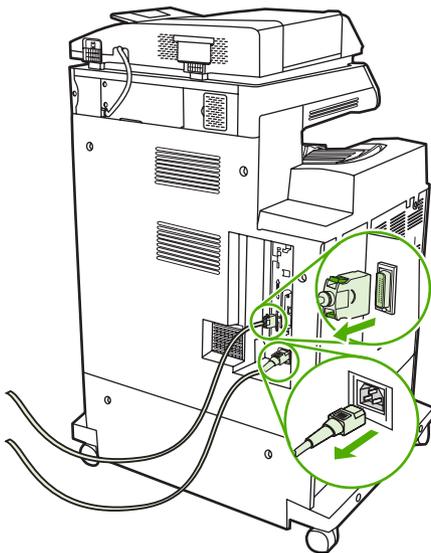
Installing a flash memory card

CAUTION Do not insert a flash memory card that is designed for use with a digital camera into the MFP. The MFP does not support photo printing directly from a flash memory card. If a camera-type flash memory card is installed, the product control panel displays a message asking if the flash memory card should be reformatted. If the card is reformatted, all data on the card will be lost.

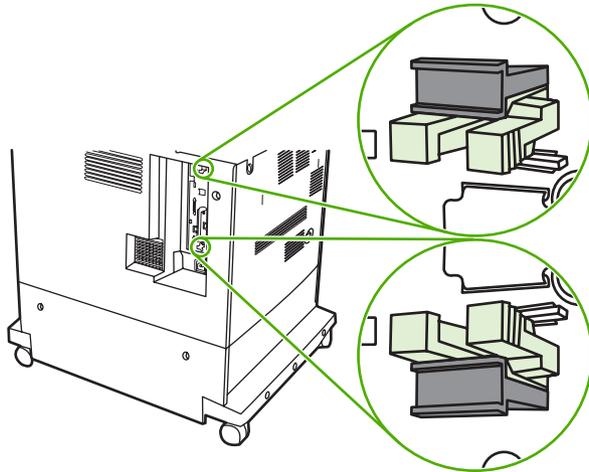
1. Turn the MFP off.



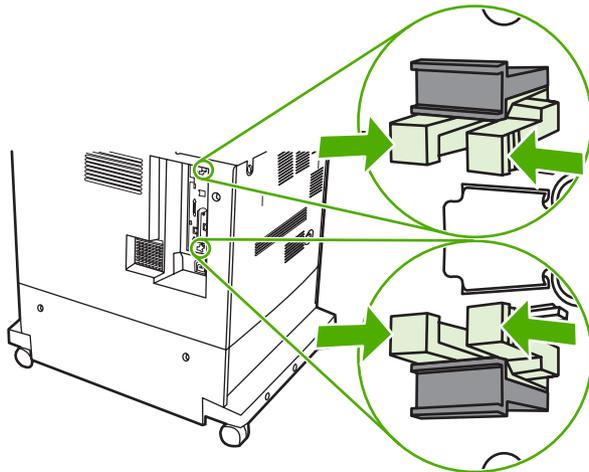
2. Disconnect all power and interface cables.



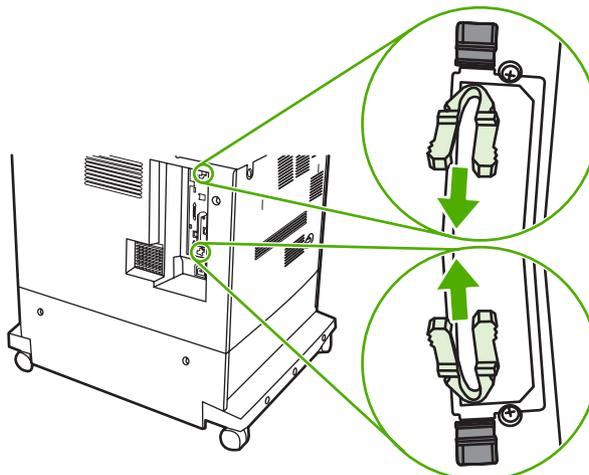
3. Locate the formatter board in the rear of the MFP.



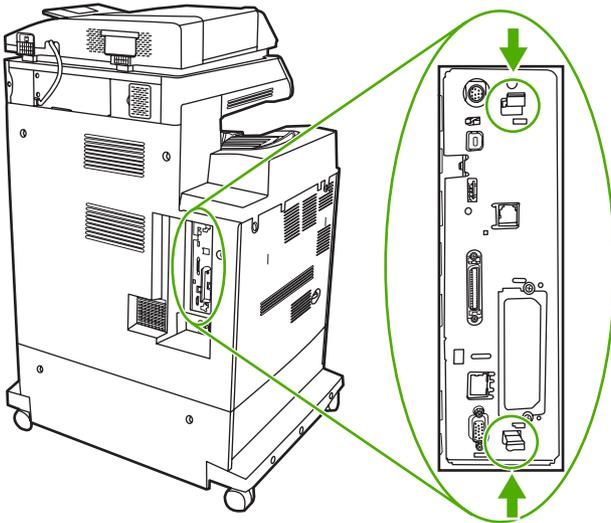
4. Locate the gray formatter pressure release tabs on the formatter board in the rear of the MFP.



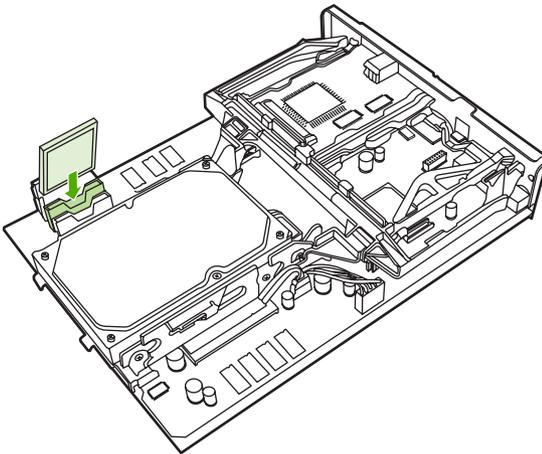
5. Gently squeeze the tabs and pull them out of the formatter.



6. Gently pull on the black tabs at the top and bottom of the formatter board and pull the formatter board from the MFP. Place the formatter board on a clean, flat, grounded surface.



7. Align the groove on the side of the flash memory card with the notches in the connector and push it in the slot until it is fully seated.

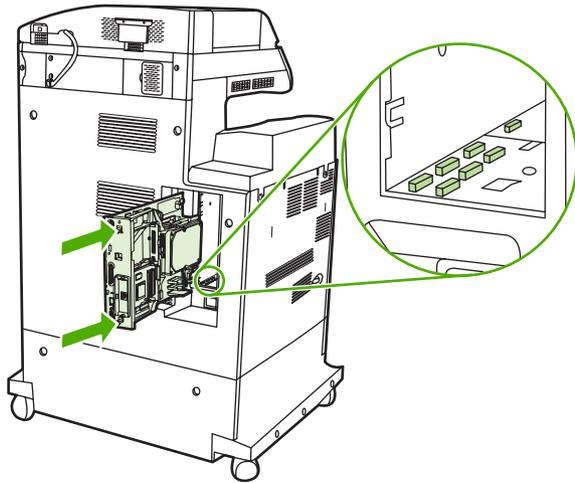


CAUTION Do not insert the flash memory card at an angle.

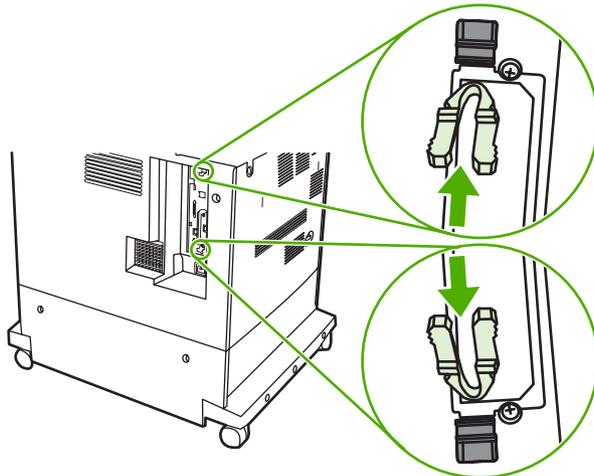


NOTE The first flash memory slot marked "Firmware Slot" is reserved for firmware only. Slots 2 and 3 should be used for all other solutions.

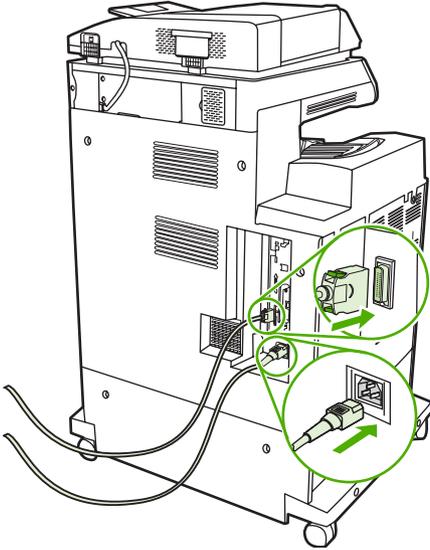
8. Align the formatter board in the tracks at the top and bottom of the slot, and then slide the board back into the MFP.



9. Reinsert the formatter pressure release tabs into the formatter.



10. Reconnect the power cable and interface cables, and turn the MFP on.



Enabling memory

After a new memory DIMM is installed, set the printer driver to recognize the newly added memory.

To enable memory for Windows 98 and Windows Me

1. On the **Start** menu, point to **Settings**, and click **Printers**.
2. Right-click the MFP and select **Properties**.
3. On the **Configure** tab, click **More**.
4. In the **Total Memory** field, type or select the total amount of memory that is now installed.
5. Click **OK**.

To enable memory for Windows 2000 and Windows XP

1. On the **Start** menu, point to **Settings**, and click **Printers** or **Printers and Faxes**.
2. Right-click the MFP and select **Properties**.
3. On the **Device Settings** tab, click **Printer Memory** (in the **Installable Options** section).
4. Select the total amount of memory that is now installed.
5. Click **OK**.

Setting the real-time clock

Use the real-time clock feature to set the date and time settings. The date and time information is attached to stored print, fax, and digital-send jobs, so that the most recent versions of stored print jobs can be identified. The MFP can also be set to automatically warm up and prepare for use at a specified time each day.

Setting the date and time

When setting the date and time you can set the date format, date, time format, and time.

To set the date format

1. Press **Menu**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **SYSTEM SETUP**.
4. Scroll to and touch **DATE/TIME**.
5. Scroll to and touch **DATE FORMAT**.
6. Scroll to and touch the appropriate format. The settings are saved and the product control panel returns to the **DATE/TIME** submenu.
7. Scroll to and touch **Exit** to exit the menu.

To set the date

1. Press **Menu**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **SYSTEM SETUP**.
4. Scroll to and touch **DATE/TIME**.
5. Scroll to and touch **DATE**.
6. Scroll to and touch the appropriate options to set the correct month, day of the month, and the year.



NOTE The order of modifying the month, date of the month, and year depends upon the date-format setting.

7. The settings are saved and the product control panel returns to the **DATE/TIME** submenu.
8. Touch **Exit** to exit the menu.

To set the time format

1. Press **Menu**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **SYSTEM SETUP**.

4. Scroll to and touch **DATE/TIME**.
5. Scroll to and touch **TIME FORMAT**.
6. Touch the appropriate format. The settings are saved and the product control panel returns to the **DATE/TIME** submenu.
7. Scroll to and touch **Exit** to exit the menu.

To set the time

1. Press **Menu**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **SYSTEM SETUP**.
4. Scroll to and touch **DATE/TIME**.
5. Scroll to and touch **TIME**.
6. Touch the appropriate options to set the correct hour, minute, and AM/PM setting.



NOTE The order of modifying the hour, minute, and AM/PM setting depends upon the time-format setting.

7. The settings are saved and the product control panel returns to the **DATE/TIME** submenu.
8. Touch **Exit** to exit the menu.

Setting the wake time

Use the wake time feature to wake the MFP at a set time each day. If a wake time is set, use an extended Sleep-delay period. See [Setting the Sleep delay on page 135](#).

To set the wake time

1. Press **Menu**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **SYSTEM SETUP**.
4. Scroll to and touch **WAKE TIME**.
5. Touch the day of the week for which the wake time is being set.
6. Scroll to and touch **CUSTOM**.
7. Touch the appropriate options to set the correct hour, minute, and AM/PM setting.
8. To wake the MFP at the same time each day, on the **APPLY TO ALL DAYS** screen, touch **YES**.

-or-

To set the time for individual days, touch **NO**, and repeat steps 5 through 7 for each day.

9. The settings are saved and the product control panel returns to the **WAKE TIME** submenu.
10. Touch **Exit** to exit the menu.

Setting the Sleep delay

Use the Sleep-delay feature to set the period of time that the MFP must be idle before it enters the Sleep mode.



NOTE If the Sleep-delay feature is turned off in the **RESETS** menu, the MFP never enters the Sleep mode. Selecting a Sleep-delay value automatically turns the Sleep feature on. The default value for the Sleep-delay setting is 45 minutes.

To set the Sleep delay

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **SYSTEM SETUP**.
4. Touch **SLEEP DELAY**.
5. Scroll to and touch the Sleep-delay setting that you want.
6. The settings are saved and the product control panel returns to the **SYSTEM SETUP** submenu.
7. Touch **Exit** to exit the menu.

Configuring and verifying an IP address

Use any of three options to assign and configure TCP/IP addresses on an HP Jetdirect print server:

- HP Web Jetadmin
- Embedded Web server
- Control panel

TCP/IP assignment

The system administrator or primary user is responsible for determining the TCP/IP address for a specific print server. To confirm the TCP/IP address or to learn how to use TCP/IP on a network, go to the HP Web site at <http://www.hp.com>. Click **Search** in the upper-left corner of the Web page and search for **TCP/IP Overview**.

Automatic discovery

The product is equipped with an HP Jetdirect embedded print server. If a BootP or DHCP server is available during product installation, the print server is automatically assigned an IP address for use on the network. The print server defaults to 192.0.0.192 (Legacy default) or to 169.254.x.x (Auto IP) if the print server cannot obtain an IP address over the network from a BootP or DHCP server. The default that is assigned depends on the particular network (small/private or enterprise) by using sensing algorithms.

To determine the new IP address, print a configuration page and check the TCP/IP status and address.

Dynamic host configuration protocol (DHCP)

When the product is turned on, the HP Jetdirect print server broadcasts DHCP requests. The DHCP automatically downloads an IP address from a network server. The DHCP servers maintain a fixed set of IP addresses and only loan an IP address to the print server. Consult the operating system documentation to set up a DHCP service on your network.

Verifying the TCP/IP configuration

Print a configuration page at the product control panel. Check the TCP/IP status and the TCP/IP addresses. If the information is incorrect, check the hardware connections (cables, hubs, routers, or switches) and reconfirm the validity of the IP address.

Changing an IP address

Use the following procedures to change the product TCP/IP address.

To change an IP address by using HP Web Jetadmin

Open HP Web Jetadmin. Type the TCP/IP address in the **Quick Device Search** field and click **Go**. At the top menu bar, follow this procedure for discovery options.

1. In the drop-down menu, click **Devices**.
2. In the drop-down menu, click **New Devices**. Click **Go**.

3. Click the appropriate column header (such as IP address or Device Model) to arrange the list of available devices in ascending or descending order.
4. Highlight the product to configure, and click **Open Device**.
5. From the sub-menu at the top of the HP Web Jetadmin screen, click **Configuration**.
6. Click the network link located on the left side of the configuration screen.
7. Type the new IP information. Scroll down for more options.
8. Click **Apply** to save the settings.
9. Click the **Refresh** button located next to the question mark on the right side of the screen.
10. Verify the IP information by clicking **Status Diagnostics** or by printing a configuration page.

To change an IP address by using the embedded Web server

The MFP has an embedded Web server that can be used to modify the TCP/IP parameters. In order to use the embedded Web server, the HP Jetdirect print server must have an IP address already configured. On a network, this is done automatically during initial product installation.

1. In a supported Web browser, type the current IP address of the HP Jetdirect print server as the URL. The **Device Status** page of the embedded Web server appears.
2. Click **Networking**. Use this page to modify the MFP network configuration.

To change an IP address by using the control panel

To manually configure or verify the IP address by using the product control panel, follow the instructions below.

1. Press **Menu** to enter the **MENUS**.
2. Scroll to and touch **Configure Device**.
3. Scroll to and touch **I/O**.
4. Scroll to and touch **EMBEDDED JETDIRECT MENU**.
5. Touch **TCP/IP**.
6. Scroll to and touch **CONFIG METHOD**.
7. Scroll to and touch **MANUAL**.
8. Scroll to and touch **MANUAL SETTINGS**.
9. Scroll to and touch **IP Address: X**.
10. Touch the left and right arrows to select each byte of the IP address.
11. Use the numeric keypad to enter the value of each byte.
12. Touch **OK** to save the IP address.
13. Scroll to and touch **SUBNET MASK**.
14. Touch the left and right arrows to select each byte of the subnet mask.

15. Use the numeric keypad to enter the value of each byte of the subnet mask.
16. Touch **OK** to save the subnet mask.
17. Scroll to and touch **DEFAULT GATEWAY**.
18. Touch the left and right arrows to select each byte of the default gateway.
19. Use the numeric keypad to enter the value of each byte of the default gateway.
20. Touch **OK** to save the default gateway.

Upgrading the firmware

The MFP has remote firmware update (RFU) capability. Use the information in this section to upgrade the MFP firmware. The overall process involves the following steps:

1. Determine the current level of firmware that is installed on the MFP.
2. Go to the HP Web site and find out whether a firmware update is available. If an update is available, download the latest firmware to the computer.
3. Transfer the new firmware from the computer to the MFP.

Determining the current level of firmware

To determine the current level of firmware, view the configuration information on the MFP control panel. To view the configuration information, follow these instructions.

1. Press **Menu**.
2. Touch **Information**.
3. Touch **PRINT CONFIGURATION**. The configuration page prints.
4. The firmware datecode is listed in the section called **Device Information**. The firmware datecode has this format: YYYYMMDD XX.XXX.X. The first string of numbers is the date, where YYYY represents the year, MM represents the month, and DD represents the date. For example, a firmware datecode of 20040225 represents February 25, 2004.

Downloading the new firmware from the HP Web site

To find the most recent firmware upgrade for the MFP, go to http://www.hp.com/go/clj4730mfp_software. This page provides instructions for downloading the new firmware version.

Transferring the new firmware to the MFP

Use one of the following methods to update the firmware.

Using FTP to upload the firmware through a browser

Follow these steps to update the MFP firmware by using FTP through a browser.

To use a browser for firmware update



NOTE These instructions can be used for both Windows and Macintosh operating systems.

1. Print a configuration page and note the TCP/IP address shown on the EIO Jetdirect page.
2. Open a browser window.
3. In the address line of the browser, type `ftp://<ADDRESS>`, where <ADDRESS> is the address of the MFP. For example, if the TCP/IP address is 192.168.0.90, type `ftp://192.168.0.90`.

4. Locate the downloaded .RFU file for the MFP.
5. Drag and drop the .RFU file onto the **PORT1** icon in the browser window.



NOTE The MFP turns off and then on automatically to activate the update. When the update process is complete, a **Ready** message displays on the MFP control panel.

Using FTP to upgrade the firmware on a network connection



NOTE The MFP can receive an .RFU file update as long as it is in a Ready state.

The elapsed time for an update depends on the I/O transfer time, as well as the time that it takes for the MFP to reinitialize. The I/O transfer time depends on a number of things, including the speed of the host computer that is sending the update. If the remote firmware update process is interrupted before the firmware is downloaded (while **Receiving upgrade** appears on the product control panel display), the firmware file must be sent again. If power is lost during the flash DIMM update (while the **Performing upgrade** message appears on the control panel display), the update is interrupted and the message **Resend upgrade** appears (in English only) on the control panel display. In this case, you must send the upgrade by using the parallel port. Finally, any jobs that are ahead of the RFU job in the queue are completed before the update is processed.

Follow these instructions to perform the upgrade by using FTP.



NOTE The firmware update involves a change in the format of nonvolatile random-access memory (NVRAM). Any menu settings that are changed from the default settings might return to default settings and must be changed again if you want settings that are different from the defaults.

To upgrade the firmware on a network connection by using FTP

1. Take note of the IP address on the HP Jetdirect page. The HP Jetdirect page is the second page that prints when you print the configuration page.



NOTE Before upgrading the firmware, make sure that the MFP is not in Sleep mode. Also make sure that any error messages are cleared from the product control panel display.

2. Open an MS-DOS command prompt on your computer.
3. Go to the folder where the firmware file is stored.
4. Type: `ftp <TCP/IP address>`. For example, if the TCP/IP address is 192.168.0.90, type `ftp 192.168.0.90`.
5. Press **Enter** on the keyboard.
6. When prompted for the user name, press **Enter**.
7. When prompted for the password, press **Enter**.
8. Type `bin` at the command prompt.
9. Press **Enter**. The message **200 Types set to I, Using binary mode to transfer files** appears in the command window.

10. Type `put` and then the file name (for example, if the file name is `4730mfp.efn`, type `put 4730mfp.efn`).
11. The following series of messages appears in the command window:

```
200 PORT command successful  
150 Opening BINARY mode data connection  
226 Ready  
-or-  
226 Processing Job  
-or-  
226 Transfer complete  
-or-
```

12. The download process begins and the firmware is updated on the MFP. This can take approximately five minutes. Let the process finish without further interaction with the MFP or computer.



NOTE The MFP automatically turns off and then on again after processing the upgrade.

13. At the command prompt, type: `bye` to exit the ftp command.
14. At the command prompt, type: `exit` to return to the Windows interface.

Using HP Web Jetadmin to upgrade the firmware

This procedure requires that HP Web Jetadmin Version 7.0 or later be installed on the computer. See [Using HP Web Jetadmin software on page 639](#). Complete the following steps to update a single device through HP Web Jetadmin after downloading the .RFU file from the HP Web site.

1. Start HP Web Jetadmin.
2. Open the **Device Management** folder in the drop-down list in the **Navigation** panel. Navigate to the **Device Lists** folder.
3. Expand the **Device Lists** folder and select **All Devices**. Locate the MFP in the list of devices, and then click to select it.

To upgrade the firmware for multiple HP LaserJet 4730mfps, select all of them by pressing the **Ctrl** key while clicking the name of each MFP.

4. Locate the drop-down box for **Device Tools** in the upper-right corner of the window. Select **Update Printer Firmware** from the action list.
5. If the name of the .RFU file is not listed in the **All Available Images** box, click **Browse** in the **Upload New Firmware Image** dialog box and navigate to the location of the .RFU file that you downloaded from the Web at the start of this procedure. If the filename is listed, select it.
6. Click **Upload** to move the .RFU file from your hard drive to the HP Web Jetadmin server. After the upload is complete, the browser window refreshes.

7. Select the .RFU file from the **Printer Firmware Update** drop-down menu.
8. Click **Update Firmware**. HP Web Jetadmin sends the selected .RFU file to the MFP. The product control panel shows messages that indicate the progress of the upgrade. At the end of the upgrade process, the control panel shows the **Ready** message.

Using MS-DOS commands to upgrade the firmware

To update the firmware by using a network connection, follow these instructions.

1. From a command prompt or in an MS-DOS window, type the following: `copy /B <FILENAME> \\<COMPUTERNAME>\<SHARENAME>`, where <FILENAME> is the name of the .RFU file (including the path), <COMPUTERNAME> is the name of the computer from which the MFP is being shared, and <SHARENAME> is the MFP share name. For example: `C:\>copy /b C:\9200fw.RFU \\YOUR_SERVER\YOUR_COMPUTER.`



NOTE If the file name or path includes a space, you must enclose the file name or path in quotation marks. For example, type: `C:\>copy /b "C:\MY DOCUMENTS\3500FW.RFU" \\YOUR_SERVER\YOUR_COMPUTER.`

2. Press **Enter** on the keyboard. The product control panel shows a message that indicates the progress of the firmware upgrade. At the end of the upgrade process, the product control panel shows the **Ready** message. The message **1 file(s) copied** displays on the computer screen.

Upgrading the HP Jetdirect firmware

The HP Jetdirect network interface in the MFP has firmware that can be upgraded separately from the MFP firmware. This procedure requires that you install HP Web Jetadmin Version 7.0 or later on the computer. See [Using HP Web Jetadmin software on page 639](#). Complete the following steps to update the HP Jetdirect firmware by using HP Web Jetadmin.

1. Open the HP Web Jetadmin program.
2. Open the **Device Management** folder in the drop-down list in the **Navigation** panel. Navigate to the **Device Lists** folder.
3. Select the device that you want to update.
4. In the **Device Tools** drop-down list, select **Jetdirect Firmware Update**.
5. Under **Jetdirect firmware version** the HP Jetdirect model number and current firmware version are listed. Make a note of these.
6. Go to http://www.hp.com/go/wja_firmware.
7. Scroll down to the list of HP Jetdirect model numbers and find the model number you wrote down.
8. Look at the current firmware version for the model, and see if it is later than the version you wrote down. If it is, right-click on the firmware link, and follow the instructions on the Web page to download the new firmware file. The file must be saved into the <drive>:\PROGRAM FILES\HP WEB JETADMIN\DOC\PLUGINS\HPWJA\FIRMWARE\JETDIRECT folder on the computer that is running the HP Web Jetadmin software.
9. In HP Web Jetadmin, return to the main device list and select the digital sender again.
10. In the **Device Tools** drop-down list, select **Jetdirect Firmware Update** again.
11. On the HP Jetdirect firmware page, the new firmware version is listed under **Jetdirect Firmware Available on HP Web Jetadmin**. Click the **Update Firmware Now** button to update the Jetdirect firmware.

5 Theory of operation

This chapter provides information about the following topics:

- [Basic operation](#)
- [Formatter system](#)
- [Engine control system](#)
- [Laser/scanner system](#)
- [Image formation system](#)
- [Pickup/feed system](#)
- [Scanner system](#)
- [2 X 500-sheet paper feeder](#)
- [Output devices](#)

Basic operation

The HP Color LaserJet 4730mfp functions are divided into the following systems:

- Engine control system
- Laser/scanner system
- Image formation system
- Pickup/feed system
- Scanner system
- 2 X 500-sheet paper feeder
- Output devices

The engine control system controls the laser/scanner system, the image formation system, and the pickup/feed system. The engine control system performs the printing operation after receiving a print command from the external device through the formatter. The engine control system also receives status from each system and sends necessary information back to the formatter.

This chapter describes each of these four systems thoroughly.

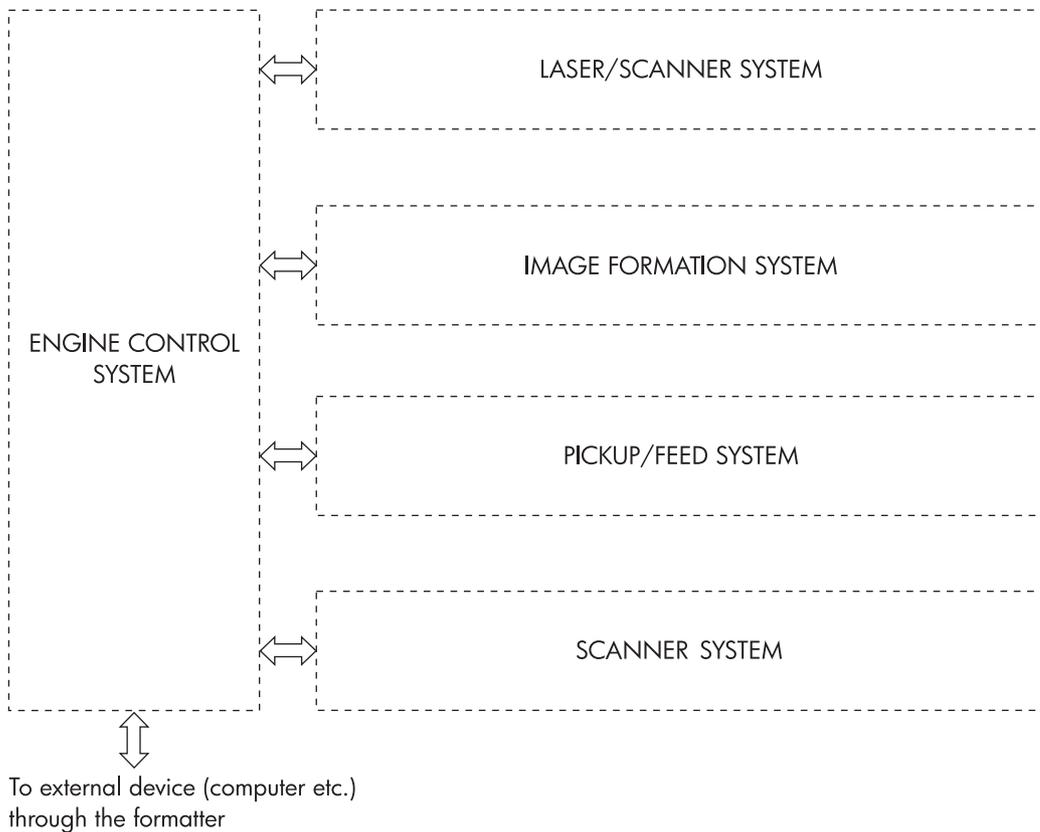


Figure 5-1 Basic system operation

Operation sequence

A microcomputer in the engine control system controls the operation sequence for the MFP. The basic operation sequence (see [Table 5-1 Basic operation sequence on page 147](#)) describes the main operational periods from the point when the MFP is turned on until a print operation is completed and each motor stops rotating.



NOTE In the following table, “ETB” stands for “electrostatic transfer/transport belt.”

Table 5-1 Basic operation sequence

Period		Purpose	Remark
WAIT (wait period)	From the time the power switch is turned on until the ETB cleaning is completed.	To clear a potential on the drum surface and to clean the ETB.	During this period, the MFP checks the toner level and detects whether the cartridges are present. The MFP also executes the pulse width modulation adjustment, color registration adjustment, and image density calibration control as required.
STBY (standby period)	From the end of the WAIT or LSTR period or last rotation until the formatter inputs a print command or until the power is turned off.	To keep the MFP ready to print.	When the formatter sends a Sleep command, the MFP enters Sleep mode.
INTR (initial rotation period)	From immediately after the formatter inputs a print command until the TOP signal is sent to the formatter.	To stabilize the photosensitive drum sensitivity in preparation for a print operation.	When the formatter sends a print command in preparation for printing.
PRINT (print period)	From the end of the INTR period until the leading edge detection sensor detects paper and then turns off the transfer positive bias.	To form an image on the photosensitive drum according to the video signal input from the formatter and to transfer the toner image to the paper.	After the power is turned on, the cartridge is cleaned every 35 pages and the ETB is cleaned every 100 pages.
LSTR (last rotation period)	From the end of the PRINT period until the drum motor stops.	To deliver the paper out of the MFP and to clean the ETB.	The last rotation period lasts until the instant the formatter sends a print command. Then the initial rotation period starts again.

Operation sequence (scanner)

Period (sequence)	Description
Power on	During this time, the scanner motors rotate, the MFP checks the status of all the sensors, the scanner lamp is illuminated, the optical scan head moves from its home position, the scanner calibrates, and then the optical scan head returns to its home position.
Initialization	The period of time after the initial power-on sequence and before the MFP is ready to scan or copy. During this time, the scanner and ADF initialization is completed, scanner calibration is performed, and the ADF checks for media in the input tray.

Period (sequence)	Description
Standby	The period of time from the end of the initialization sequence until a request for a scan. During this time, the MFP might go into Sleep mode and the scan carriage rests in its home position.
Scan	The period of time immediately following a request for a scan. The scanner fan turns on, the scan start position is adjusted, the MFP performs the scan, and data is sent to the formatter.

Power on sequence

The power on sequence initializes the MFP and checks for possible malfunctions or paper jams. [Figure 5-2 Power on sequence on page 149](#) shows the MFP status from power on to standby mode.

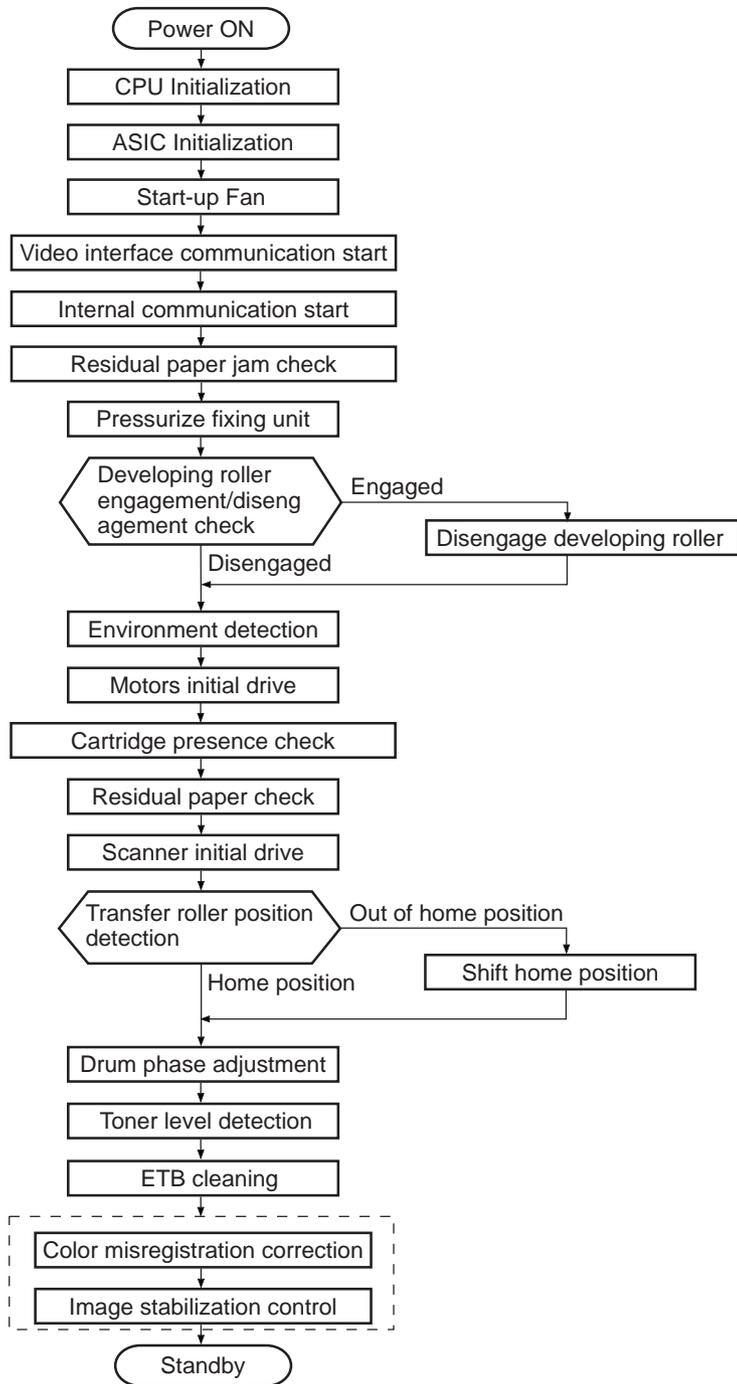


Figure 5-2 Power on sequence

Formatter system

The formatter PCB is responsible for the following actions:

- Receiving and processing print data from the various MFP interfaces
- Monitoring control panel inputs and relaying MFP status information (through the product control panel and the bidirectional I/O)
- Developing and coordinating data placement and timing with the print engine
- Storing font information
- Communicating with the host computer through the bidirectional interface
- Controlling the Sleep mode

The formatter monitors the MFP continuously through the video interface. When the MFP is ready to print, the formatter sends a signal to the DC controller, which turns the laser on or off based on the signal. [Figure 5-3 Formatter system on page 150](#) shows the formatter system.

The formatter also provides the electrical interface and mounting locations for an EIO card, two memory DIMMs, two additional flash memory cards (a third slot is reserved for firmware), hard disk, and optional analog fax accessory.

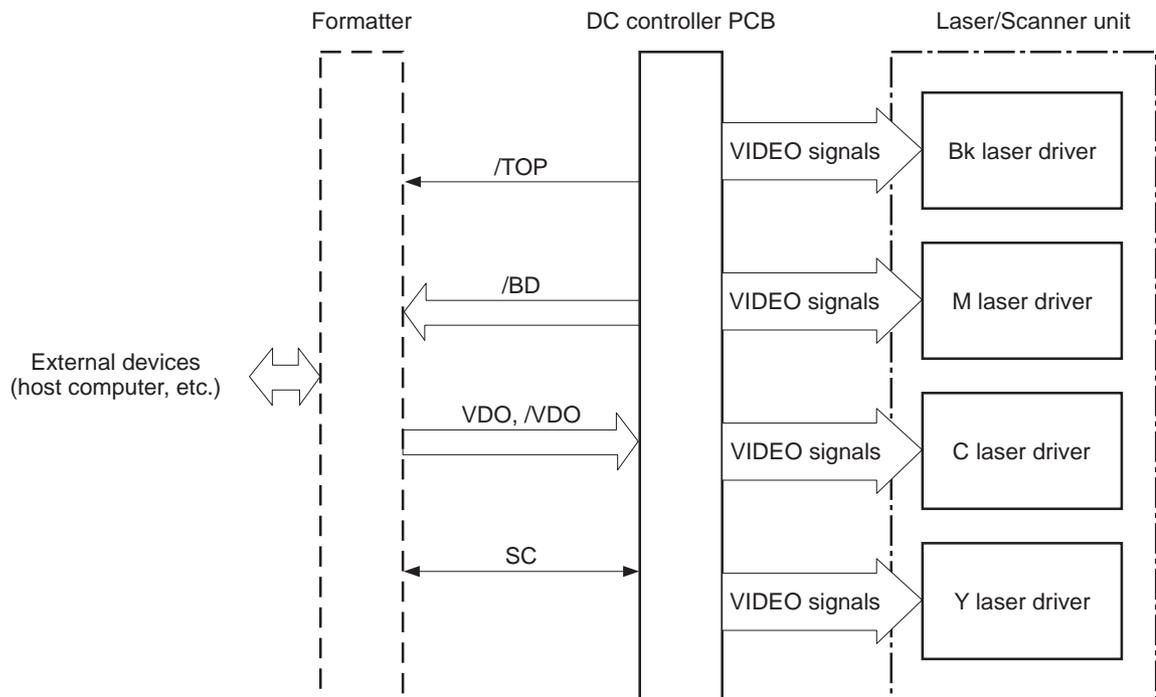


Figure 5-3 Formatter system

Sleep mode

This feature conserves power after the MFP has been idle for an adjustable length of time. Set the time length in the **Configure Device** menu, under **SYSTEM SETUP**. When the MFP is in Sleep mode, the product control panel backlight is turned off, but the MFP retains all printer settings,

downloadable fonts, and macros. The default setting is **30 MINUTES**. You can turn Sleep mode off in the **Configure Device** menu, under **RESETS**.

The MFP exits Sleep mode and enters the warm-up cycle when any of the following occurs:

- A print job, valid data, or a PML or PJJL command is received at the parallel port, EIO card, or USB 2.0 connector.
- A product control panel button is pressed.
- The right upper and lower covers are opened.
- The engine test button is pressed.



NOTE MFP error messages override the **Sleep mode on** message. The MFP enters Sleep mode at the appropriate time, but the error message continues to appear.

Image Resolution Enhancement technology (REt)

The formatter contains circuitry for Image Resolution Enhancement technology (REt), which modifies the standard video dot data on its way to the DC controller PCB to produce “smoothed” line edges. The REt can be turned on or off from the product control panel or from some software programs. The default setting is medium.



NOTE The REt settings that are sent from software programs or printer drivers override the control panel settings.

Input/Output

This section explains the MFP input/output (I/O) capabilities.

Parallel interface

The formatter receives incoming data through its bidirectional interface (IEEE-1284). The I/O provides high-speed and two-way communication between the MFP and the host, allowing the user to change MFP settings and monitor MFP status from the host computer. The user can configure the HIGH SPEED item on the control panel menu. (This item is found by navigating to the **Configure Device** menu, navigating to the **I/O** menu, and selecting **PARALLEL INPUT**.) The default setting, **YES**, allows the I/O to run at the higher speeds supported by most newer computers. When set to **NO**, the parallel interface runs at the slower mode that is compatible with older computers. The user can also configure the **ADVANCED FUNCTIONS** item. The default setting, ON, allows for two-way parallel communications. The OFF mode disables the advanced functionality. The I/O is compatible with the bidirectional parallel interface standard.

USB 2.0 connector

The HP Color LaserJet 4730mfp supports a USB 2.0 connector on the back of the MFP. You must use an A-to-B type USB cable.

ACC accessory port

This MFP also includes a third-party accessory (ACC) port that uses USB host protocol.

Flash

Optional flash is available in 4 MB flash memory DIMMs for storing forms, fonts, and signatures.

Hard disk

The hard disk is mounted in an EIO slot on the formatter. The hard disk is used to create multiple original prints (copies) and store forms, fonts, and signatures.

CPU

The HP LaserJet 4730mfp formatter incorporates a 533 MHz RISC processor.

FIH (foreign interface harness)

The FIH allows connection to third-party devices, such as copy counters and biometric security devices.

MFP memory

If the MFP encounters difficulty managing available memory, a clearable warning message will appear on the product control panel.

Some MFP messages are affected by the auto-continue and clearable warning settings from the **Configure Device** menu, under **SYSTEM SETUP**. If **Clearable Warning = Job** is set on the product control panel, warning messages appear on the control panel display until the end of the job from which they were generated. If **Clearable Warning = On** is set, warning messages appear on the control panel until is pressed. If an error occurs that prevents printing and **Autocontinue = Off** is set, the message appears until **Ignore** is touched.

Read-only memory

Besides storing microprocessor control programs, the read-only memory (ROM) stores dot patterns of internal character sets (fonts).

Random-access memory

The random-access memory (RAM) contains the page, I/O buffers, and the font storage area. It stores printing and font information received from the host system, and can also serve to temporarily store a full page of print-image data before the data is sent to the print engine. Memory capacity can be increased by adding DIMMs to the formatter. Note that adding memory (DIMMs) might also increase the print speed for complex graphics.

DIMM slots

The DIMM slots can be used to add memory, fonts, or firmware upgrades.

Flash memory

To upgrade MFP firmware, upload a new firmware image to the MFP.

Nonvolatile memory

The MFP uses nonvolatile memory (NVRAM) to store I/O and information about the print environment configuration. The contents of NVRAM are retained when the MFP is turned off or disconnected.

PJL overview

Printer job language (PJL) is an integral part of configuration, in addition to the standard printer command language (PCL). With standard cabling, PJL allows the MFP to perform the following functions:

- Two-way communication with the host computer through a bidirectional parallel connection. The MFP can tell the host about such things as the control panel settings, and the control panel settings can be changed from the host.
- Dynamic I/O switching allows the MFP to be configured with a host on each I/O. The MFP can receive data from more than one I/O simultaneously, until the I/O buffer is full. This can occur even when the MFP is offline.
- Context-sensitive switching allows the MFP to automatically recognize the personality (PS or PCL) of each job and configure itself to serve that personality.
- Isolation of print environment settings from one print job to the next. For example, if a print job is sent to the MFP in landscape mode, the subsequent print jobs print in landscape only if they are formatted for landscape printing.

PML

The printer management language (PML) allows remote configuration and status readback through the I/O ports.

Control panel

The formatter sends and receives MFP status and command data to and from a control panel board.

Scanner interface

The formatter receives data from the scanner to produce copies and to send scanned data in e-mail format.

Engine control system

The engine control system is the brain of the HP Color LaserJet 4730mfp. It controls all the other systems according to commands from the formatter. The engine control system consists of the following:

- DC controller PCB
- High-voltage PCB
- Low-voltage power supply PCB
- Formatter

Each of these components is described in this chapter.

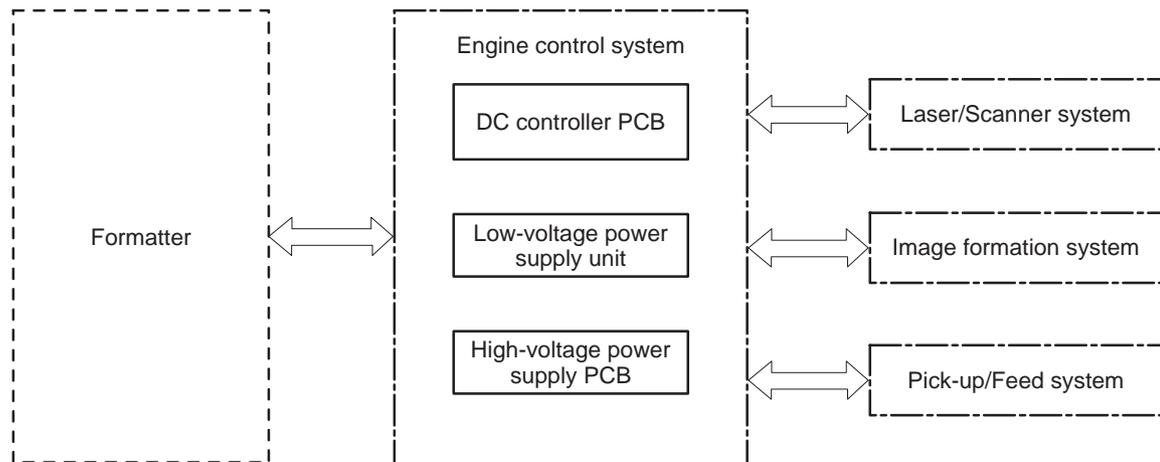


Figure 5-4 Engine control system



NOTE In this manual, the abbreviation "PCB" stands for "printed circuit board". Components described as a PCB can consist of a single circuit board or a circuit board plus other parts, such as cables and sensors.

DC controller PCB

The DC controller controls the print operation sequence for the MFP. The sequence of events is as follows:

1. Power is turned on.
2. The low-voltage power supply PCB supplies DC power to the DC controller.
3. The CPU in the DC controller starts to control MFP operations.
4. The MFP enters the standby period.
5. Based on the print command and the image data input from the formatter, the CPU sends a signal to drive the laser diode, the motors, and the solenoids.



NOTE See the general circuit diagram for detailed information about the MFP circuitry.

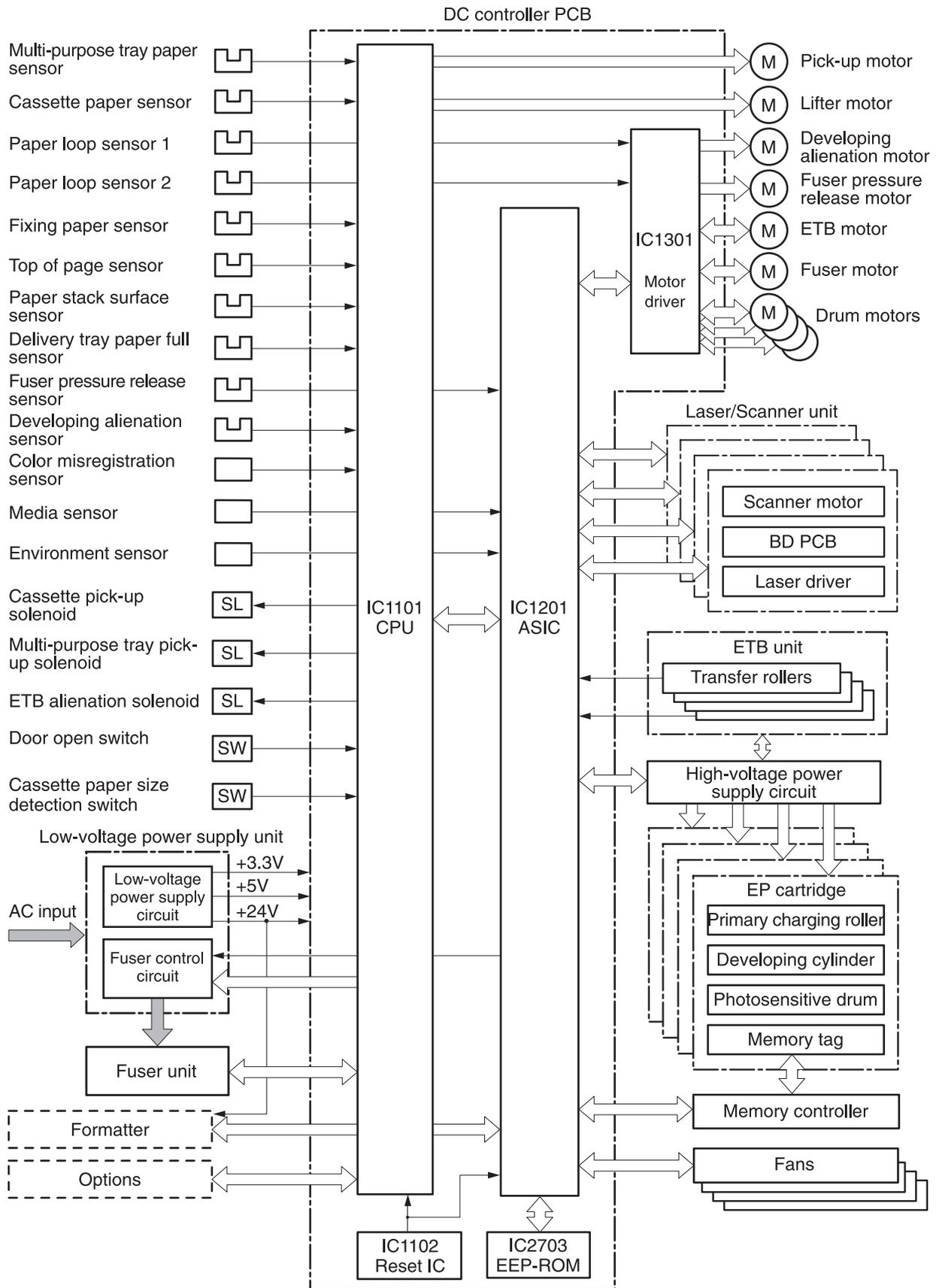


Figure 5-5 DC controller PCB

Block operation

The blocks that make up the DC controller PCB include:

- CPU. The CPU is a single-chip microcomputer with built-in ROM and RAM. It controls the MFP engine sequence, ASIC, fuser, pickup motor and lifter motor, solenoids, sensors, and switches.
- ASIC. Interfaces with the IC, memory, and external devices.
- Motor driver ASIC. Controls each motor in response to commands from the CPU.
- Reset IC. Monitors voltage and resets the CPU and ASIC when the power is turned on.
- EEPROM. Stores backup data.

Motors, fans, and environment sensor

The MFP has ten motors, ten fans, and one environment sensor. Seven of the motors are DC motors; the other three are stepping motors. [Figure 5-6 Motors and fans on page 157](#) shows the locations of the motors and fans. [Table 5-2 Function of motors, fans, and environment sensor on page 157](#) explains the function of each component.

Two of the stepping motors and six of the seven DC motors are used for paper feeding and image formation. The remaining stepping motor is the developing disengaging motor. The remaining two DC motors are fan motors.

Since the MFP transfers an image in four colors in line onto the media, small changes in the rotational speed of the motor are likely to cause color misalignment. The DC motors used for image formation are precisely controlled to account for rotational speed fluctuation.

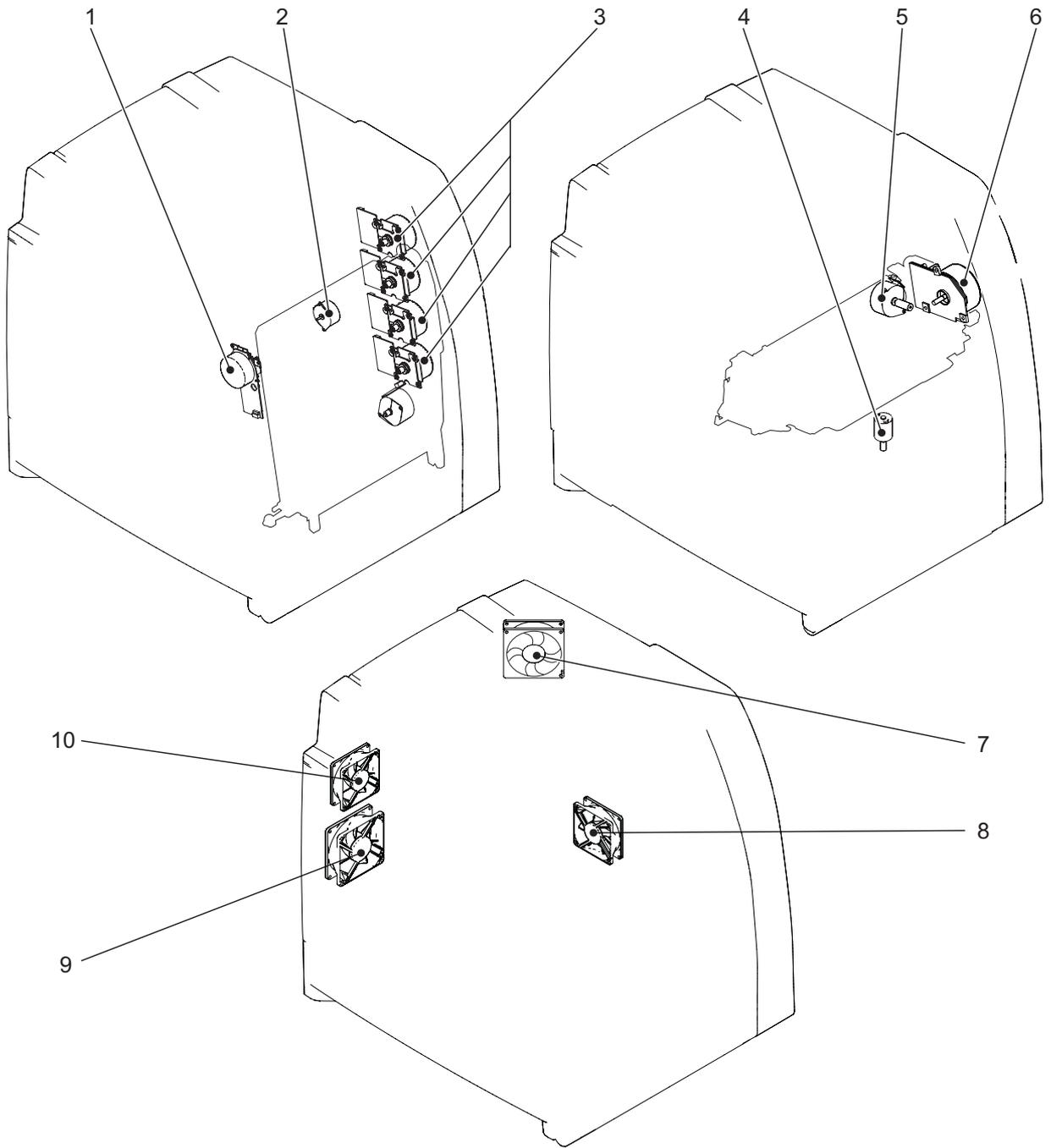


Figure 5-6 Motors and fans

Table 5-2 Function of motors, fans, and environment sensor

Name	Function	Type	Failure detection
M1: Yellow (Y) cartridge motor	Drives the photosensitive drum, developing cylinder, and stirrer plate	DC motor	Yes
M2: Cyan (C) cartridge motor			
M3: Magenta (M) cartridge motor			

Table 5-2 Function of motors, fans, and environment sensor (continued)

Name	Function	Type	Failure detection
M4: Black (K) cartridge motor			
M5: Fuser motor	Drives the fuser pressure roller and delivery roller	DC motor	Yes
M6: Fuser pressure release motor	Drives the fuser pressure release mechanism	Stepping motor	No
M7: ETB motor	Drives the ETB	DC motor	Yes
M8: Developing alienation motor	Disengages the photosensitive drums from the developing cylinder	Stepping motor	No
M9: Pickup motor	Drives the pickup roller and feed roller	Stepping motor	No
M10: Lifter motor	Moves the lifters	DC motor	No
FAN1: Rear exhaust fan	Exhausts heat around the ETB, drum motors, and formatter	DC motor	Yes
FAN2: Cartridge fan	Exhausts heat around the fuser and cartridges	DC motor	Yes
FAN3: Delivery fan	Exhausts heat around fuser and delivery unit	DC motor	Yes
FAN4: Power supply fan	Exhausts heat around the pickup motor and low-voltage power supply	DC motor	Yes
Duplexer fan	Exhausts heat around the duplexer	DC motor	Yes
ETB fan	Exhausts heat around the ETB assembly	DC motor	Yes
Fuser fan	Exhausts heat around the fuser	DC motor	Yes
Control fan #1	Exhausts heat around the formatter and DC controller	DC motor	Yes
Control fan #2	Exhausts heat around the formatter and DC controller	DC motor	Yes
Sub power supply fan	Exhausts heat around the sub power assembly	DC motor	Yes
Environment sensor	Detects the temperature and humidity levels inside the MFP	NA	Yes

Failure detection

The DC controller can detect motor and fan failures as described below.

Drum motor failure detection

The DC controller determines the drum motor failure and notifies the formatter of an error status when it encounters the following conditions.



NOTE The drum motor failure detection operates in the same manner for each color separately.

- **Drum motor start-up abnormality.** The interval of the drum motor speed detection signal does not reach the specified interval after 1.5 seconds of the drum motor drive start.
- **Drum motor rotation abnormality.** The interval of the drum motor speed detection signal stays at an irregular interval for two seconds and longer after it has reached the specified interval.

Fuser motor failure detection

The DC controller determines the fuser motor failure and notifies the formatter of an error status when it encounters the following conditions.

- **Fuser motor start-up abnormality.** The interval of the fuser motor speed detection signal does not reach the specified interval after 1.5 seconds of the fuser motor drive start.
- **Fuser motor rotation abnormality.** The interval of the fuser motor speed detection signal stays at an irregular interval for two seconds and longer after it has reached the specified interval.

ETB motor failure detection

The DC controller determines the ETB motor failure and notifies the formatter of an error status when it encounters the following conditions.

- **ETB motor start-up abnormality.** The interval of the ETB motor speed detection signal does not reach the specified interval after 1.5 seconds of the ETB motor drive start.
- **ETB motor rotation abnormality.** The interval of the ETB motor speed detection signal stays at an irregular interval for two seconds and longer after it has reached the specified interval.

Rear exhaust fan failure detection

The DC controller detects a rear exhaust fan failure and notifies the formatter of an error status when the rear exhaust fan lock detection signal is input for ten seconds continuously.

Cartridge fan failure detection

The DC controller detects a cartridge fan failure and notifies the formatter of an error status when the cartridge fan lock detection signal is input for ten seconds continuously.

Delivery fan failure detection

The DC controller detects a temporary locked status when the delivery fan lock detection signal is input for 0.5 seconds continuously after 0.1 seconds of delivery fan drive start. The DC controller starts the drive delivery fan for four seconds at the time of temporary locked status determination. If the delivery fan lock detection signal is input for four seconds, it detects a delivery fan failure and notifies the formatter of an error status.

Power supply fan failure detection

The DC controller detects a power supply fan failure and notifies the formatter of an error status when the power supply fan lock detection signal is input for ten seconds continuously.

Scanner fan failure detection

The DC controller detects a scanner fan failure and notifies the formatter of an error status when the scanner fan lock detection signal is input.

ADF fan failure detection

The DC controller detects a ADF fan failure and notifies the formatter of an error status when the ADF fan lock detection signal is input.

Control fans #1 and #2 failure detection

The DC controller detects a control fan failure and notifies the formatter of an error status when the control fan lock detection signal.

Sub power supply fan failure detection

The DC controller detects a sub power supply fan failure and notifies the formatter of an error status when the sub power supply fan lock detection signal is input.

ETB fan failure detection

The DC controller detects an ETB fan failure and notifies the formatter of an error status when the ETB fan lock detection signal is input.

Other fan failures can also be detected.

Low-voltage power supply

The low voltage power supply unit generates DC power and controls the fuser. The low voltage power supply unit consists of the following circuits:

- **Fuser control circuit.** Controls the fuser heater temperature in the fuser.
- **Low-voltage power supply circuit.** Generates the DC power required in the MFP.

[Figure 5-7 Low-voltage power supply circuits on page 161](#) shows each circuit of the low voltage power supply unit.

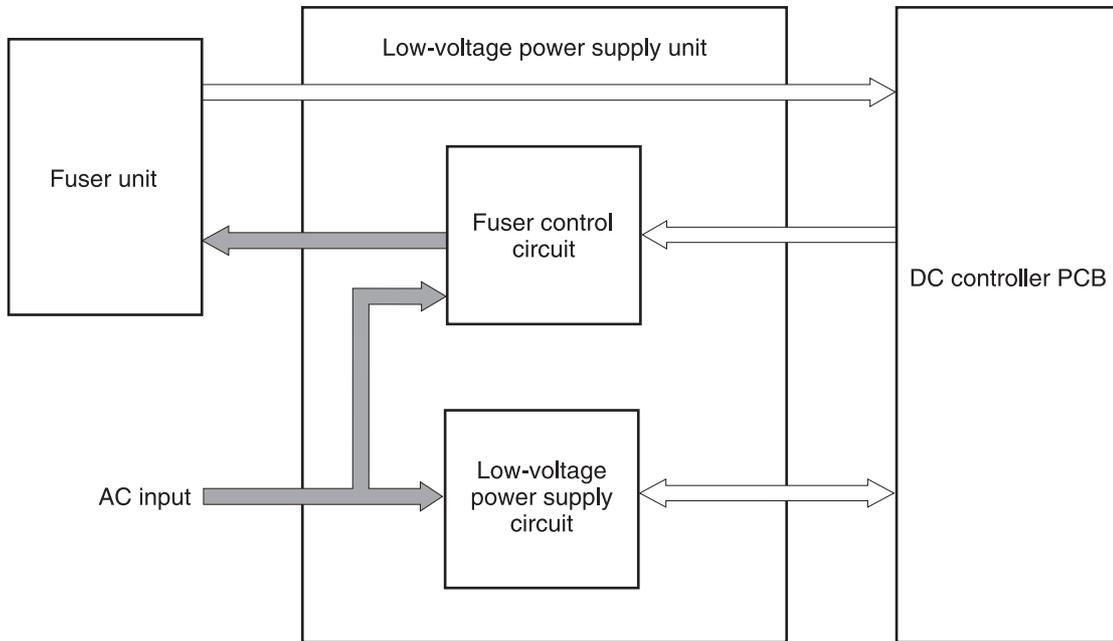


Figure 5-7 Low-voltage power supply circuits

Fuser control circuit

This MFP uses a ceramic heating method to heat the fuser. [Figure 5-8 Fuser power supply circuit on page 161](#) shows the configuration of the fuser power supply.

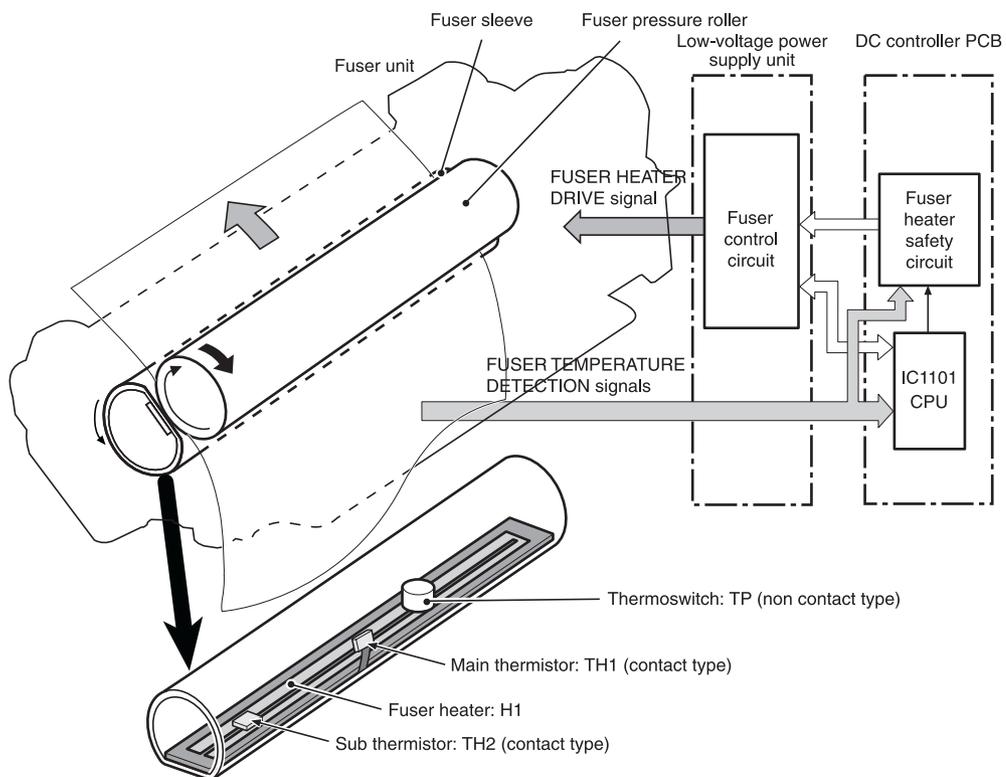


Figure 5-8 Fuser power supply circuit

The fuser power supply system has three main components:

- **Fuser heater.** A ceramic heater heats the fuser sleeve. The heater has a U-shaped heating element on its surface.
- **Thermistors.** Two thermistors are in the fuser sleeve: one in the center, and the other at the end. Each thermistor monitors the temperature in the fuser sleeve.
 - **Main thermistor.** The main thermistor controls print temperature and between-sheets temperature. It contacts the inside surface of the fuser sleeve at the center and detects the fuser sleeve temperature.
 - **Sub thermistor.** The sub thermistor detects the one-sided temperature rise of the fuser heater, the initial rotation temperature control, and the start-up temperature control. It contacts the one side of the fuser heater and detects the fuser heater temperature.
- **Thermoswitch.** The thermoswitch prevents the fuser heater temperature from rising abnormally high. It is located above the center of the fuser sleeve. If the fuser heater temperature rises abnormally high, the contact is broken to cut off the power supply to the heater.

These temperature controls are performed by the fuser control circuit and the fuser heater safety circuit according to the commands from the CPU in the DC controller.

Table 5-3 Fuser temperatures

Media	Temperature	Engine speed
Any	Auto	Auto
Plain	Auto	Auto
Preprinted	~ 195°C (383°F)	Full
Letterhead	~ 195°C (383°F)	Full
Overhead transparencies	~ 180°C (356°F)	1/3
Prepunched	~ 195°C (383°F)	Full
Labels	~ 180°C (356°F)	1/2
Bond	~ 195°C (383°F)	Full
Recycled	~ 195°C (383°F)	Full
Color	~ 195°C (383°F)	Full
Light	~ 175°C (347°F)	Full
Intermediate	~ 180°C (356°F)	1/2
Heavy	~ 180°C (356°F)	1/2
Extra heavy	~ 170°C (338°F)	1/2
Cardstock	~ 170°C (338°F)	1/2
Rough	~ 180°C (356°F)	1/2
Glossy	~ 180°C (356°F)	1/2
Heavy glossy	~ 165°C (329°F)	1/3
Extra heavy glossy	~ 180°C (356°F)	1/3

Table 5-3 Fuser temperatures (continued)

Media	Temperature	Engine speed
Tough paper	~ 180°C (356°F)	1/3
Envelopes	~ 180°C (356°F)	1/2

Low-voltage power supply circuit

The low-voltage power supply circuit converts AC power from the wall receptacle into DC power to cover the DC loads.

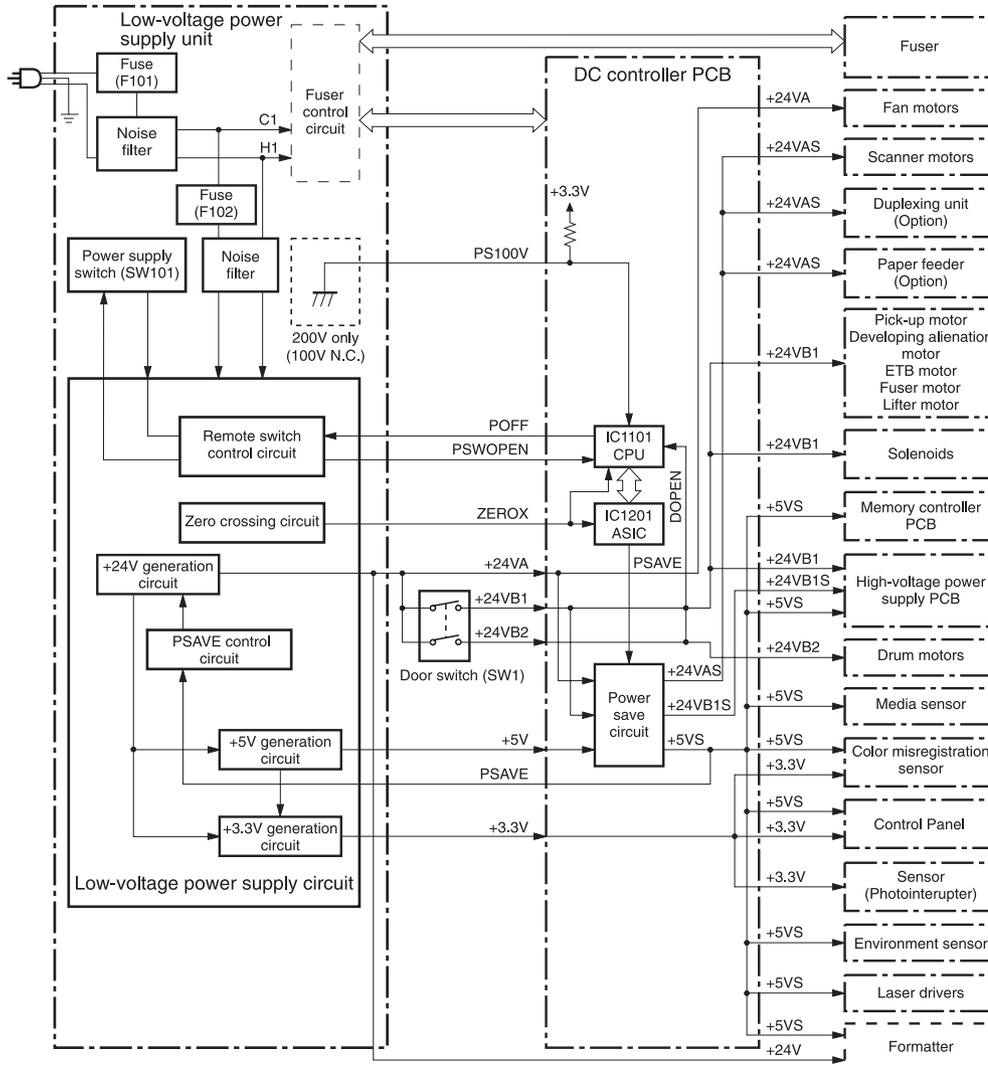


Figure 5-9 Low-voltage power supply circuit

The AC power is supplied to the low-voltage power supply circuit by turning on the power switch (SW101). The AC power is then converted into +24V, +5V and +3.3V to serve the DC power load requirements.

Protective functions

Two fuses, FU101 and FU102, protect against overcurrent and overvoltage to prevent failures in the power supply circuit. If there is a supply error, such as a short-circuit or overvoltage, the low-voltage system automatically cuts off the output voltage. The fuses blow and cut off the AC power, once AC overcurrent flows into the AC line.

If DC voltage is not being supplied from the low-voltage power supply circuit, turn off the power switch (SW101). Do not turn the power on again until the root cause is found. If the cause is not at the load side, the protective function may still work.



NOTE If the low-voltage power supply is shut down for protection, turn the power off (by switching off or unplugging the MFP) and leave the MFP off for approximately three minutes. Then turn the MFP on.

Safety

For safety, the +24V is divided into two: +24VA and +24VB (+24VB1 and +24VB2). The +24VA is supplied from the DC controller, whereas +24VB stops when the door switch (SW1) is cut off. The high-voltage power supply PCB and motors are supplied with the +24VB. They stop when the front cover is opened. This is to protect users and service technicians from injury. The +24VB also functions as the DOOR OPEN DETECTION signal (DOPEN). The CPU determines that the door is open when the +24VB supply stops.

Sleep mode

Sleep mode reduces power consumption during periods of inactivity. When the DC controller receives a Sleep command from the formatter, the controller stops the supply of +24V and +5V power by operating the power-save circuit. At the same time, it sends a POWER SAVE MODE signal (PSAVE) to the low-voltage power supply circuit. The low-voltage power supply circuit implements PSAVE upon receiving the /PSAVE signal. The MFP returns to the WAIT period once it receives a command from the formatter ending Sleep mode.

Power supply recognition

The low-voltage power supply circuit recognizes the voltage specification (100V or 200V) that the MFP uses and the CPU switches the temperature control firmware for the fuser accordingly. The CPU monitors the 100V POWER SUPPLY DETECTION signal (PS100V). When the MFP is connected to the 100V power source, the temperature control firmware is switched for the 100V specification. In the same way, when the MFP is connected to the 200V power source, it is switched for the 200V specification.

Heater temperature control

The heater temperature control detects the surface temperature of the fuser sleeve and controls the current flowing to the induction heating coil. The heater temperature control circuit is shown in [Figure 5-10 Heater temperature control circuit on page 165](#).

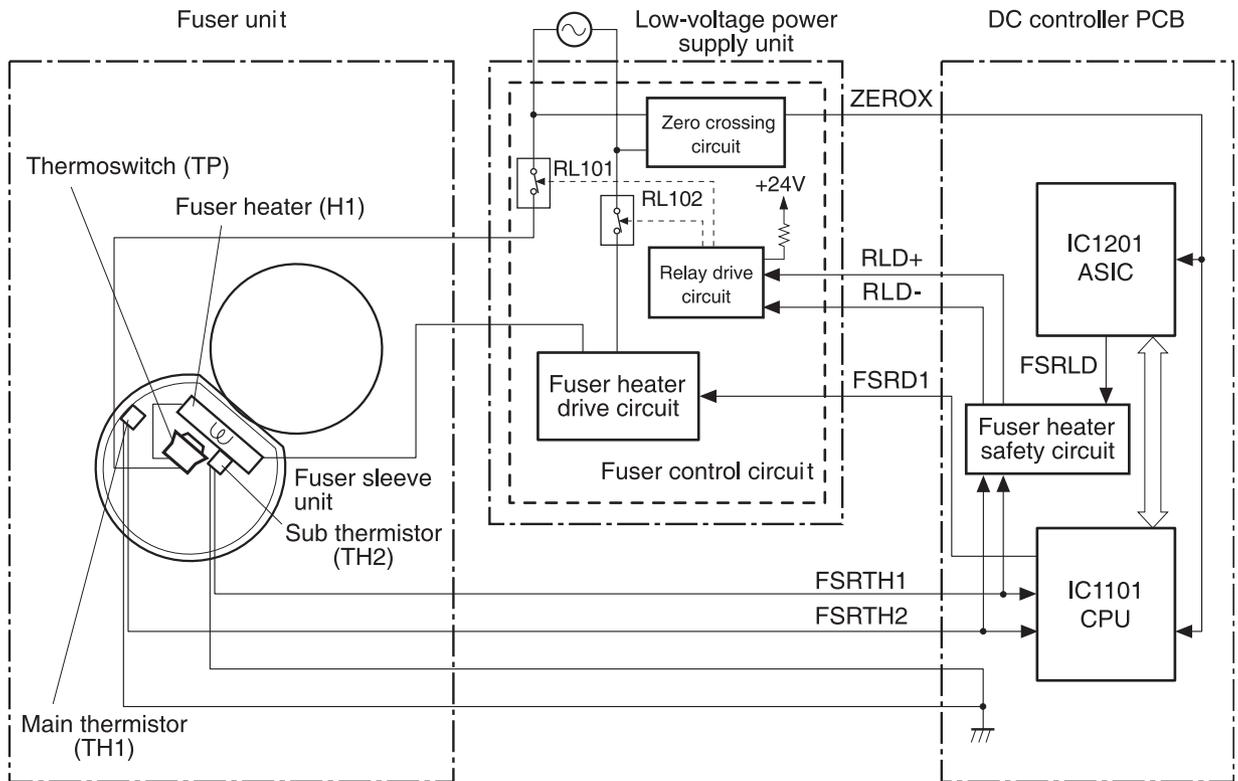


Figure 5-10 Heater temperature control circuit

The fuser heater temperature is monitored by two thermistors: the main thermistor (TH1) and the sub thermistor (TH2). The main thermistor controls the print temperature and the between-sheets temperature. The sub thermistor detects the one-sided temperature rise of the fuser heater, and controls the initial rotation temperature and the start-up temperature.

The CPU (IC1101) on the DC controller monitors the voltage of the fuser heater temperature signals. The CPU sends the fuser heater drive signal (FSRD1) according to the voltage level. The fuser heater control circuit controls the fuser temperature so the heater remains at the target temperature.

The fuser temperature control is divided into the following four sequences.



NOTE During standby, the fuser temperature is maintained at about 76.7°C (170°F) to accommodate a first-print time of less than 15 seconds.

Initial rotation temperature control

This control melts the grease inside the fuser sleeve and lubricates the sleeve when the power is turned on to prevent sleeve damage. If the sub thermistor detects the temperature of below 50°C (122°F) at power-on, the CPU turns on the fuser heater for a prescribed time period before it drives the fuser motor.

Start-up temperature control

This control determines the start-up power provided to the fuser heater according to the temperature detected by the sub thermistor at heater energization. If the heater is energized within 30 seconds after the previous print completion, the heater control starts at this temperature point.

Print temperature control

This control maintains the temperature of the fuser sleeve at its targeted temperature during the printing operation. The CPU gradually raises the targeted temperature in one printing process. This prevents the fuser temperature from falling while the media goes through the fuser roller. The targeted temperature also varies according to the number of prints when continuous printing. The targeted temperature varies depending on the media types.

Between-sheets temperature control

This control maintains the temperature of the fuser heater below its normally targeted temperature during continuous printing. This prevents the excessive temperature rise of the fuser pressure roller while uncovering the paper portion of between-sheets with low-speed mode. The targeted temperature varies according to the between-sheets intervals and the media types.

Temperature protective function

This function detects an abnormal temperature rise of the fuser and interrupts power supply to the fuser heater. The following three protective components prevent an abnormal temperature rise of the fuser heater.

- CPU
- Fuser heater safety circuit
- Thermoswitch

Protective function by the CPU

The CPU always monitors the output voltage of the main and sub thermistors (FSRTH1, FSRTH2). If the voltage of the FSRTH1 is approximately 0.9V and lower (equivalent to 230°C (446°F) and higher), or the voltage of the FSRTH2 is approximately 0.46V and higher (equivalent to 285°C (545°F) and higher), the CPU detects a fuser failure and then performs the following sequence:

1. The CPU sets the fuser heater drive signal (FSRD1) to inactive and turns the heater off.
2. The CPU sets the relay drive signal (FSRLD) to stop through the ASIC.
3. The fuser heater safety circuit sets the main thermistor relay drive signal (RLD-) to inactive.
4. The fuser heater safety circuit sets the sub thermistor relay drive signal (RLD+) to inactive.
5. The relay drive circuit releases the relays (RL101 and RL102) to interrupt power supply to the fuser heater.

Protective function by the fuser heater safety circuit

The fuser heater safety circuit monitors the output voltage of the main and sub thermistors (FSRTH1, FSRTH2). If the voltage of the FSRTH1 is approximately 0.8V and lower (equivalent to 240°C (464°F) and higher), or the voltage of the FSRTH2 is approximately 0.41V and higher (equivalent to 293°C (559°F) and higher), the circuit detects a fuser failure and performs the following sequence:

1. The fuser heater safety circuit makes the main thermistor relay drive signal (RLD-) inactive.
2. The fuser heater safety circuit makes the sub thermistor relay drive signal (RLD+) inactive.
3. The relay drive circuit releases the relays (RL101 and RL102) to interrupt power supply to the fuser heater.

Protective function by the thermoswitch

When the temperature of the fuser heater rises abnormally high and the detected temperature of the thermoswitch (TP) exceeds approximately 250°C (482°F), the thermoswitch is disconnected and the power supply to the fuser heater is immediately cut off.



NOTE The actual temperature of the fuser heater is about 30° higher than the thermoswitch, as the thermoswitch is not contact with the fuser heater.

Temperature failure detection

The CPU determines the fuser failure, stops the MFP engine, and notifies the formatter of an fuser failure when it encounters the following conditions:

Start-up failure (warm-up failure)

The CPU determines a start-up failure:

- If the detected temperature of the main thermistor does not reach 185°C (365°F) within 30 seconds of heater energization during the wait period.
- If the heater does not enter the **Ready** mode within 30 seconds of heater energization during the initial rotation period.

Abnormal low temperature of main thermistor (no conduction)

The CPU presumes the main thermistor has no conduction:

- If the detected temperature of the main thermistor is kept 40°C (104°F) or lower for four seconds continuously, from heater energization until the heater is turned off during the wait period.
- If the detected temperature of the main thermistor is kept 70°C (158°F) or lower for four seconds continuously, from initial rotation start until the media reaches the fuser during the initial rotation period.
- If the detected temperature of the main thermistor is kept 130°C (266°F) or lower for 0.5 seconds continuously, from when the media reaches the fuser until the heater is turned off during the print period.

Abnormal high temperature of main thermistor

The CPU presumes an abnormal high temperature of the main thermistor if the detected temperature of the main thermistor is kept 230°C (446°F) and higher for 0.1 seconds continuously.

Abnormal low temperature of sub thermistor (no conduction)

The CPU presumes the sub thermistor has no conduction:

- If the detected temperature of the sub thermistor is kept 60°C (140°F) or lower for four seconds continuously, from heater energization until the heater is turned off during the wait period.
- If the detected temperature of the main thermistor is kept 90°C (194°F) or lower for 2.5 seconds continuously, from initial rotation start until the media reaches the fuser during the initial rotation period.

- If the detected temperature of the main thermistor is kept 120°C (248°F) or lower for 0.5 seconds continuously, from when the media reaches the fuser until the heater is turned off during the print period.
- If the detected temperature of sub thermistor is kept 50°C (122°F) or lower for 0.5 seconds continuously during the standby period.

Abnormal high temperature of sub thermistor

The CPU determines the abnormal high temperature of sub thermistor if the detected temperature of the sub thermistor is kept 285°C (545°F) and higher for 0.1 seconds continuously.

Drive circuit abnormality

The CPU determines the drive circuit abnormality if the ZERO CROSSING signal (ZEROX) is not detected for the specified time period.

High-voltage power supply

The high-voltage power supply PCB produces the voltage biases that are applied to the primary charging roller, developing cylinder, developing blade, attraction roller, and transfer roller. There are two types of biases: DC positive bias and DC negative bias. The high-voltage power supply PCB is controlled by the DC controller.

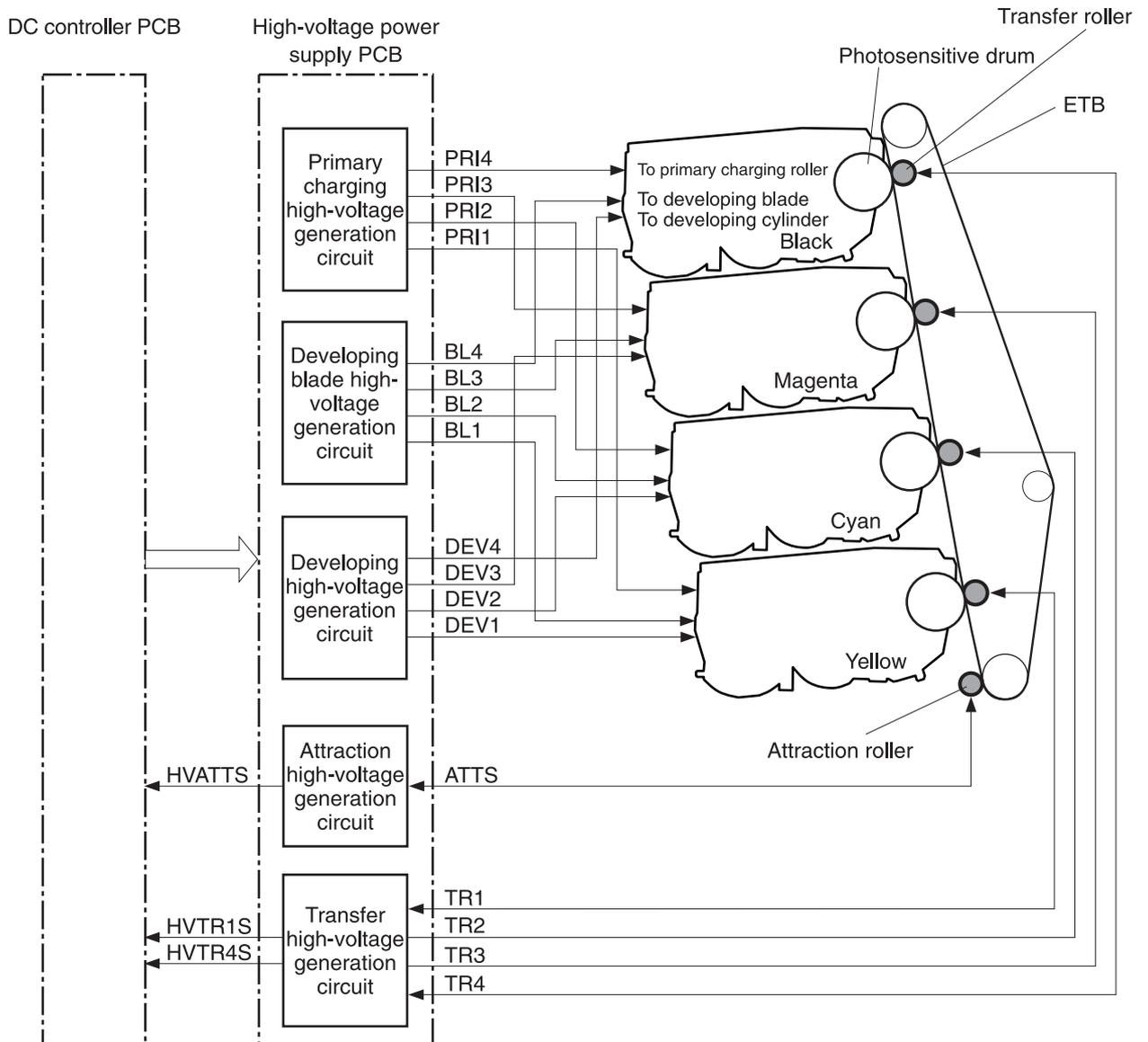


Figure 5-11 High-voltage power supply block diagram

Generation of biases

Generation of primary charging bias: The primary charging bias is the DC negative bias that is generated to apply negative potential to the photosensitive drum in preparation for image formation. This bias is generated for each color (Y, C, M, K) in the primary charging high-voltage power supply circuit. The high-voltage power supply PCB applies the primary charging bias (PRI1, PRI2, PRI3, PRI4) to the primary charging rollers in each cartridge at the specified timing. The value of the primary charging bias varies in response to commands from the DC controller.

Generation of developing bias: The developing bias is the DC negative bias that is generated to adhere toner to an electrostatic latent image formed on the photosensitive drum. This bias is generated for each color. The high-voltage power supply PCB applies the developing biases (DEV1, DEV2, DEV3, DEV4) to the developing cylinders in each cartridge at the specified timing. The value of the developing bias varies in response to commands from the DC controller.

The developing voltage (bias) causes the toner to adhere to the electrostatic image that the laser/ scanner assembly created on the photosensitive drum. Two types of developing biases are used: the developing DC negative bias and the developing AC bias. The high-voltage circuit on the power supply generates both biases. These biases are superimposed on one another and then applied to the primary charging roller, which transfers the biases to the drum. The biased developing cylinder picks up toner particles and deposits them onto the electrostatic image on the photosensitive drum. The image is now visible on the drum.

Generation of developing blade bias: The developing blade bias (BL) is the DC negative bias that is generated to charge the toner. This bias is generated for each color in the developing blade high-voltage power supply circuit in the high-voltage power supply PCB. The high-voltage power supply PCB applies the developing blade biases (BL1, BL2, BL3, BL4) to the developing blade in each cartridge at specified timing. The value of the developing blade bias varies in response to the command from the DC controller.

Generation of attraction bias: The attraction bias is generated to attract paper to the ETB and to transfer toner onto the paper efficiently. Both DC positive and DC negative biases are generated when attracting paper and cleaning the ETB. The high-voltage power supply PCB applies the attraction biases (ATTS) to the attraction roller in the ETB unit at the specified timing. The value of the attraction bias varies in response to the command from the DC controller. The DC controller changes the value of the attraction bias and regulates it in constant current control in response to the ATTRACTION CURRENT VALUE RETURN signal (HVATTS) sent from the high-voltage power supply PCB. The following are the printing sequences.

- **Attraction charging bias:** This bias charges the paper positively or negatively and makes the negatively charged toner transfer easily.
- **Between-sheets bias:** This bias prevents the residual toner on the ETB from adhering to the attraction roller in the between-sheets during continuous printing.
- **Cleaning bias:** This bias prevents the residual toner on the ETB from adhering to the attraction roller during ETB cleaning.

Generation of transfer bias: The transfer bias is generated to transfer toner onto the paper. Both DC positive and DC negative biases are generated in the transfer high-voltage power supply circuit in the high-voltage power supply PCB. The DC positive bias is generated when transferring toner, and the DC negative bias is generated when cleaning the ETB. The high-voltage power supply PCB applies the transfer biases (TR1, TR2, TR3, TR4) to the transfer roller in the ETB unit according to the print sequences. The value of the transfer bias varies in response to the command from the DC controller. The DC controller changes the value of the transfer bias and regulates it in constant current control in response to the TRANSFER CURRENT VALUE RETURN signals (HVTR1S, HVTR4S) and the HVATTS signal sent from the high-voltage power supply PCB. The following are the printing sequences.

- **Print bias:** This bias transfers toner on the photosensitive drum surface onto the paper during printing. The transfer roller is applied with the DC positive bias.
- **Between-sheets bias:** This bias prevents the residual toner on the ETB from adhering to the attraction roller in the between-sheets during continuous printing.
- **Cleaning bias:** This bias cleans the ETB by returning any toner remaining on the ETB surface to the photosensitive drum. The transfer rollers in the yellow and magenta cartridges (first and third colors) are applied with DC negative bias. The rollers in cyan and black cartridges (second and fourth colors) are applied with DC positive bias.

Sub power supply assembly

The sub power assembly provides power to the ADF and the image scanner. It is connected to the low-voltage power supply and the DC controller.

Video interface control

The video interface allows communication between the formatter and the DC controller. The formatter always monitors the status of the MFP by using the video interface. It sends the VIDEO signals to the DC controller through the video interface when the MFP is ready to print. The DC controller turns the laser on or off based on the signals it receives.

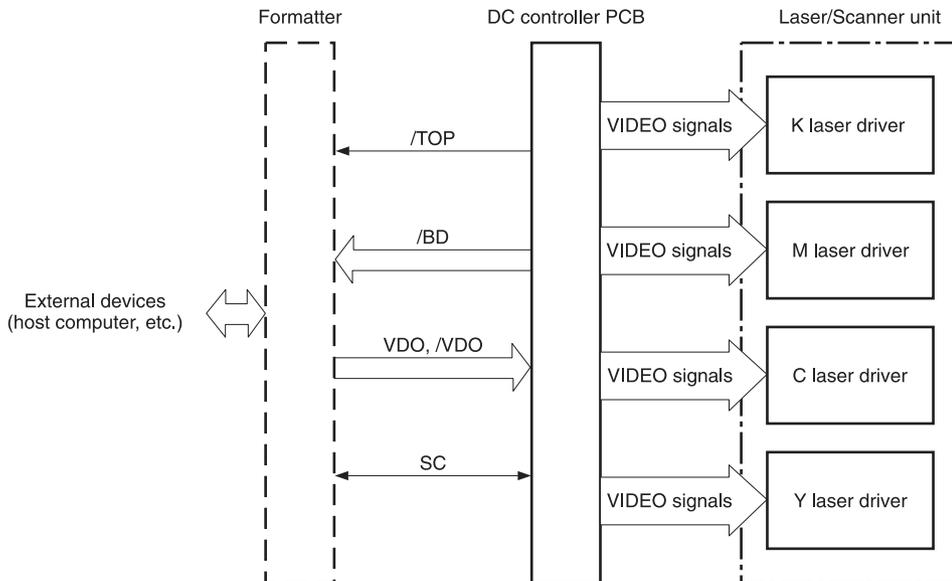


Figure 5-12 Video interface control

The VIDEO INTERFACE signal is exchanged during printing operations, as described below.

1. When the MFP engine is ready to print, the DC controller notifies the formatter using the STATUS COMMAND signal (SC).
2. The formatter sends a print command as a SC signal to the DC controller when the MFP engine and the data for one page are ready.
3. The DC controller drives the scanner motor and sends the HORIZONTAL SYNCHRONOUS signals to the formatter after receiving the print command.
4. The printer engine starts a pickup operation. When the paper arrives at the top of page sensor (SR12), the DC controller sends the VERTICAL SYNCHRONOUS signal (/TOP) to the formatter.
5. The formatter sends VIDEO signals in synchronization with the HORIZONTAL SYNCHRONOUS signals to the DC controller upon a reception of the /TOP signal.
6. The DC controller controls each color's laser driver circuit and turns the laser on and off according to the VIDEO signals. This forms an electrostatic latent image on the photosensitive drums of each color.

7. The latent images on the photosensitive drums are developed by toner and transferred onto paper in this order: Y (yellow), C (cyan), M (magenta), and K (black).
8. The toner is fused to the paper in the fuser and the paper is delivered to the delivery tray. Printing continues if the DC controller receives another print command from the formatter during the printing operation.

Laser/scanner system

The laser/scanner system forms the latent electrostatic image on the photosensitive drum according to video signals sent from the formatter. The main components of each laser/scanner assembly are the laser driver, scanner motor, mirrors, and focusing lenses. Each color has its own laser/scanner assembly unit, which is controlled by the DC controller.

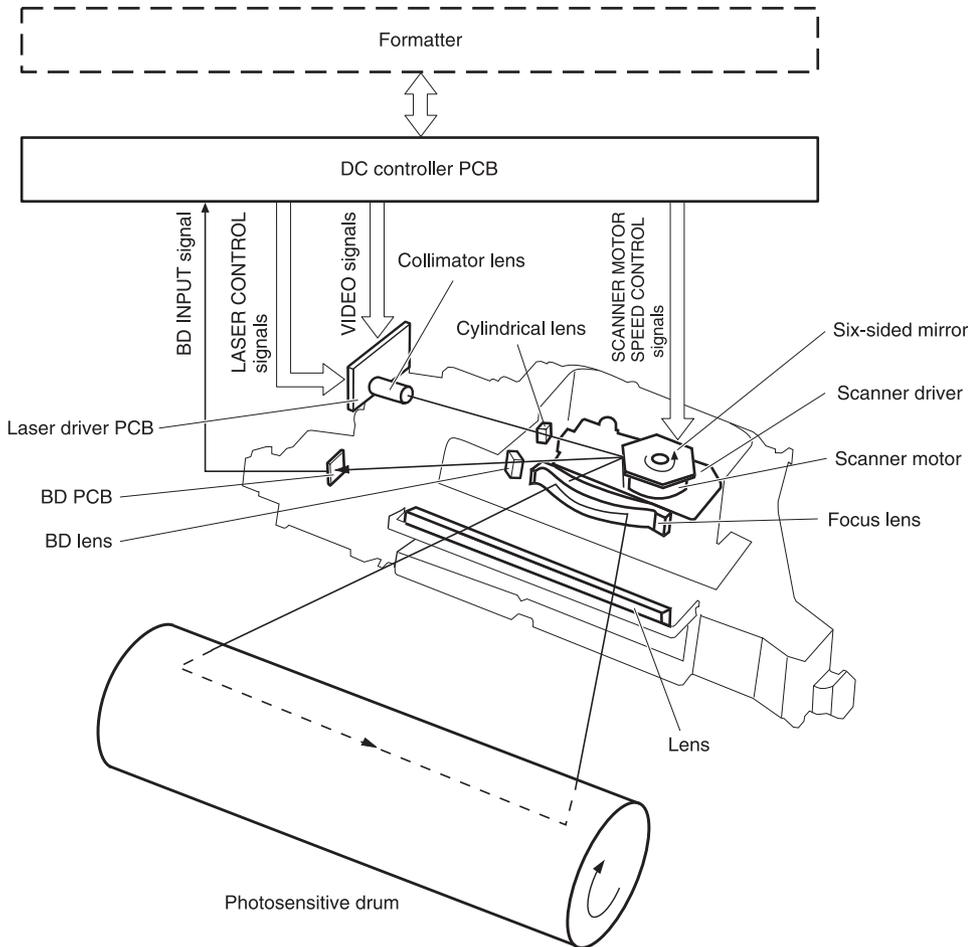


Figure 5-13 Laser/scanner assembly

The laser/scanner system uses two laser diodes in one scanning operation to write two lines simultaneously for high-speed laser scanning. The process is summarized below:

1. After receiving the print command from the formatter, the DC controller activates the scanner motor to rotate the six-faced scanner mirror.
2. When the scanner motor starts to rotate, the DC controller allows the laser to emit light and maintains the scanner motor rotation at a constant speed.
3. When the scanner motor reaches its specified speed, the formatter sends video signals to the laser driver PCB through the DC controller. The laser driver emits two laser diodes according to these signals.
4. The laser beams pass through the collimator lens and the cylindrical lens, and enter the six-faced mirror that is rotating at a constant speed.

5. The laser beams are reflected by the six-faced mirror, pass through the focusing lens and the reflecting mirror that is in front of the six-faced mirror, and focus the photosensitive drum.
6. While the six-faced mirror rotates at a constant speed, the laser beams on the photosensitive drum scan the drum.
7. As the photosensitive drum rotates and the laser beams scan on the photosensitive drum, both at a constant speed, a latent image is formed the drum.

Laser control

The laser control circuit allows the laser driver IC to turn the laser diodes LD1 and LD2 on and off according to the image data signals sent by the DC controller.

The DC controller sends video signals (VDODAT11, /VDODAT11, VDODAT12, and /VDODAT12) and laser control signals (LDCTRL10, LDCTRL11, and LDCTRL12) to the logic circuit on the laser driver IC. The laser driver IC controls the laser according to the combination of the laser control signals.

[Figure 5-14 Laser control circuit block diagram on page 175](#) illustrates the laser control system.

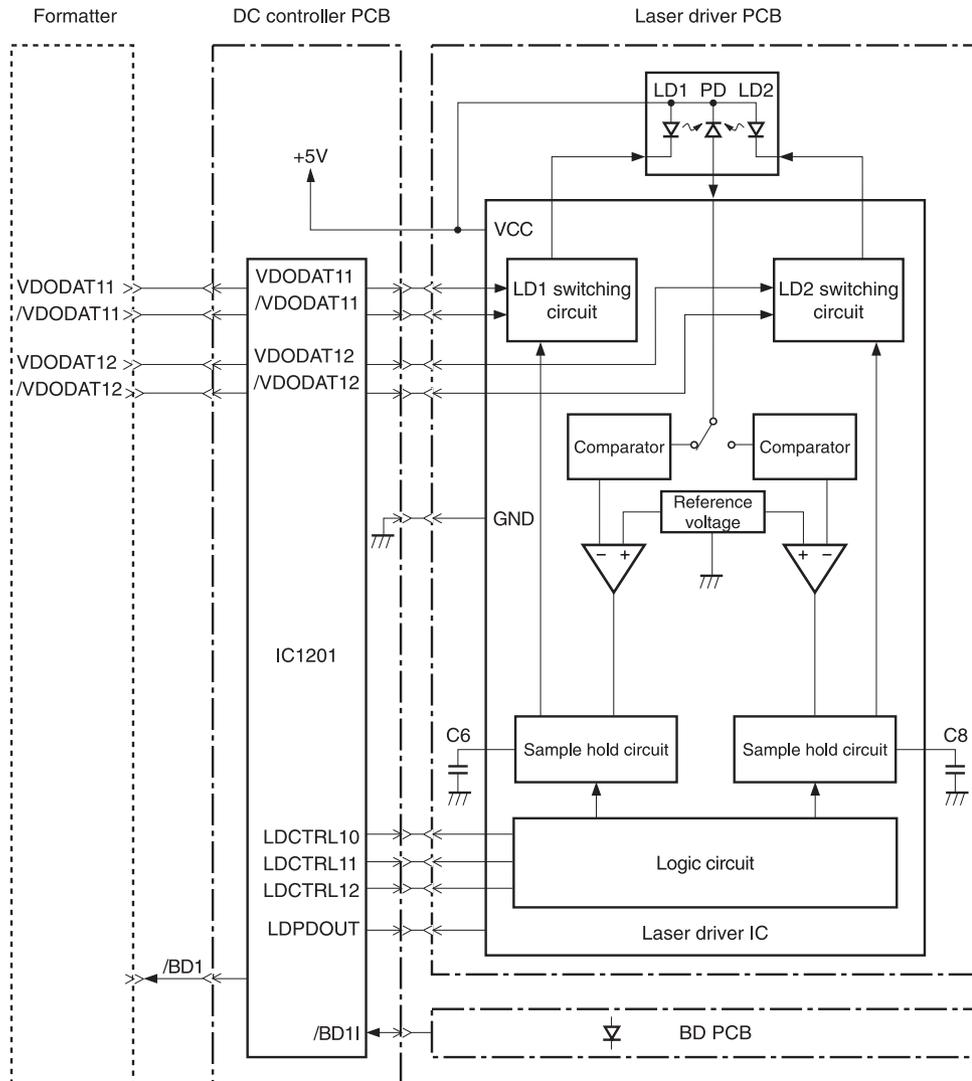


Figure 5-14 Laser control circuit block diagram

The laser control circuit manages the following control and detection functions:

- Laser emission control. Allows the laser diodes to turn on and off according to the video signals sent by the formatter.
- Automatic power control (APC). Allows the laser diodes to emit light at a constant intensity.
- Horizontal synchronous control. Aligns the starting position in the horizontal direction.
- Image masking control. Regulates laser beam emission in non-image area except during the unblanking interval.
- Failure detection. Detects failures in the laser diodes.

Scanner control

The scanner motor control rotates the scanner motor in order to strike the laser beam at the correct position on the photosensitive drum.

The DC controller divides the oscillation frequency of the oscillator (X1201) and generates the reference clock signal. It compares the intervals between the reference clock signal and the BD input signal (/BD1I) with the frequency comparator, and monitors the rotational count of the scanner motor. The DC controller controls rotational speed by sending an acceleration signal (/SCNACC1) or deceleration signal (/SCNDEC1) to the scanner motor driver based on the detected rotational speed. [Figure 5-15 Scanner motor circuit diagram on page 176](#) illustrates the scanner motor control system.

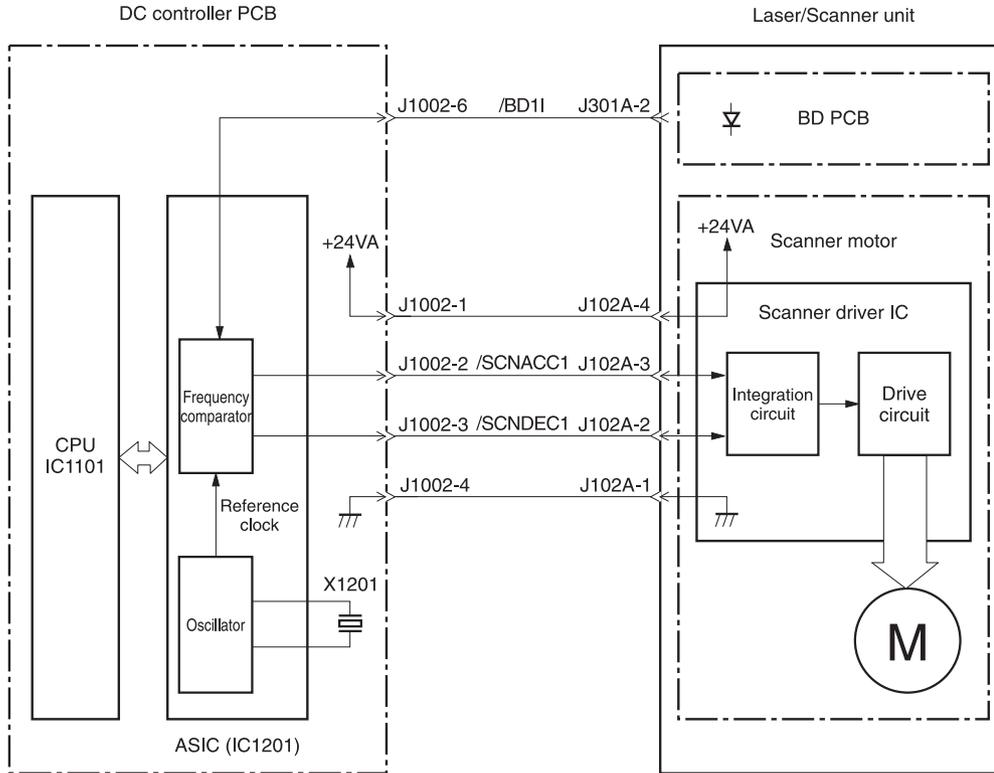


Figure 5-15 Scanner motor circuit diagram

The scanner motor control circuit manages the following control and detection functions:

- Speed control. Maintains the rotational speed of the scanner motor at a constant speed.
- Phase control. Prevents color misregistration by eliminating rotational variations in each color's scanner motor and adjusts the phase of the scanner motor.
- Failure detection. Monitors the frequency comparator in the ASIC and determines whether the scanner motor is rotating at its specified rotational count.

Image formation system

The image formation system is the central hub of the MFP. It also forms the toner image on the media.

The image formation system consists of four cartridges, the ETB, and the fuser, which are controlled by the DC controller. [Figure 5-16 Image formation system on page 177](#) shows the image formation system.

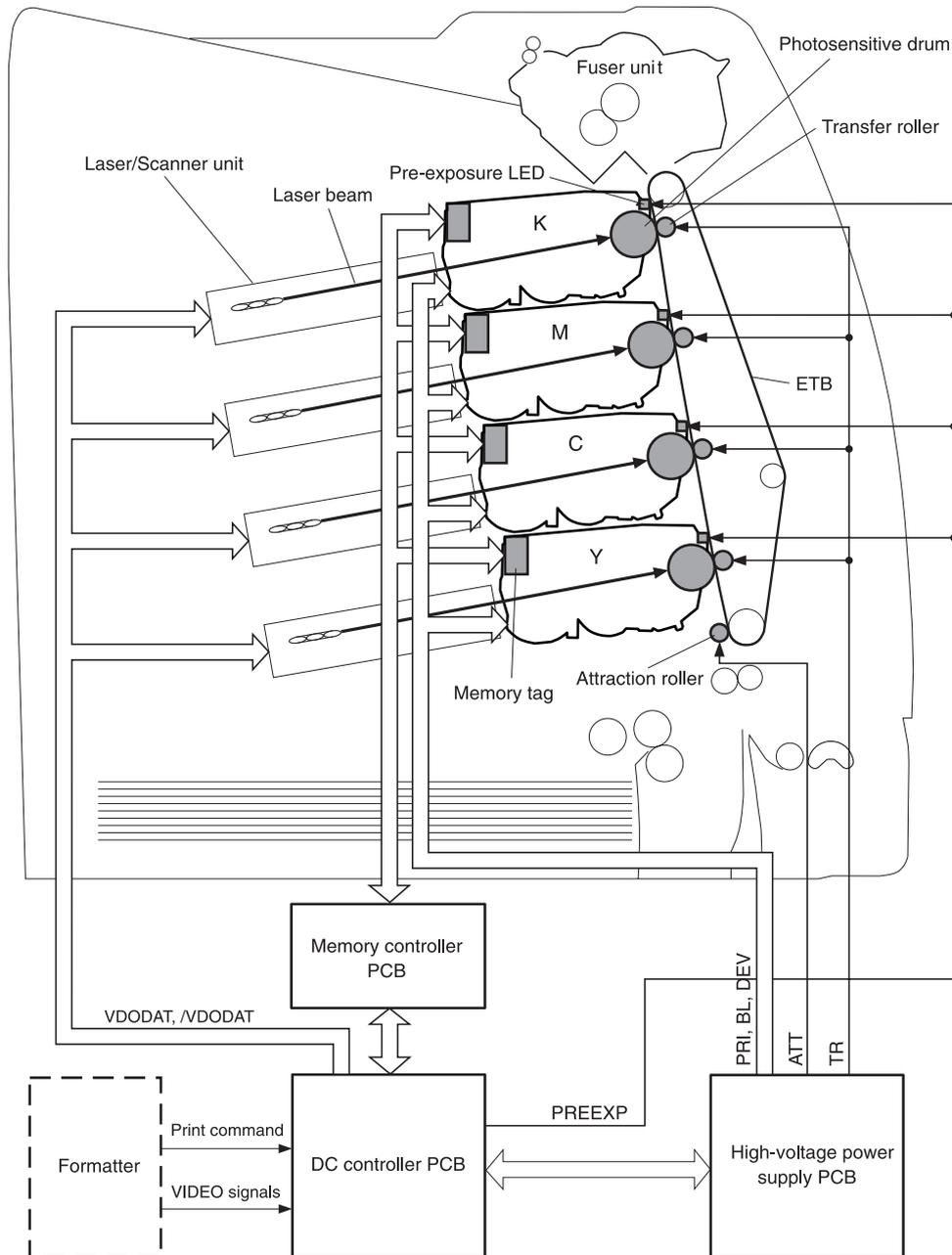


Figure 5-16 Image formation system

Image formation process

The image formation process consists of nine steps divided among five functional blocks:

1. **Electrostatic latent image formation block.** Forms an electrostatic latent image on the photosensitive drum.

Step 1: Pre-exposure

Step 2: Primary charging

Step 3: Laser beam exposure

2. **Development block.** Makes the electrostatic latent image on the photosensitive drum surface visible by applying toner.

Step 4: Development

3. **Transfer block.** Transfers toner image on the photosensitive drum onto the media.

Step 5: Attraction

Step 6: Transfer



NOTE Toner is transferred onto a sheet of media in the order of yellow (Y), cyan (C), magenta (M), and black (K) in one printing operation.

Step 7: Separation

4. **Fusing block.** Fuses the toner image on the media.

Step 8: Fusing

5. **Cleaning block.** Cleans the residual toner on the photosensitive drum.

Step 9: Drum cleaning

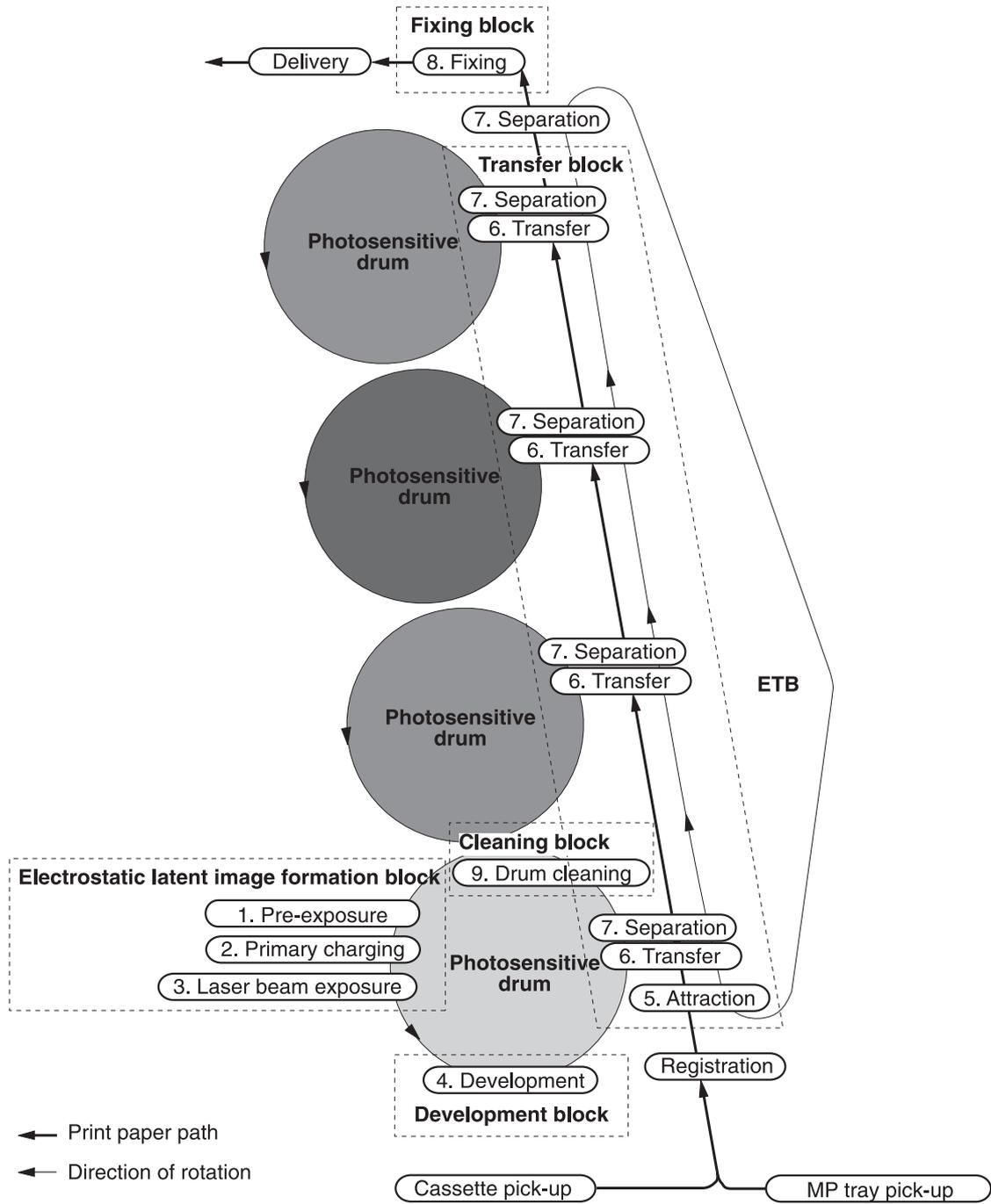


Figure 5-17 Image formation process

Electrostatic latent image formation block

The image formation process begins in the electrostatic latent image formation block. This block consists of three steps that results in forming an electrostatic latent image on the photosensitive drum:

- Pre-exposure
- Primary charging
- Laser beam exposure

When the last step in this block is complete, areas of the drum surface that have not been exposed to the laser beam retain a negative charge. The areas that have been exposed to the laser are neutralized. This neutralized image is called an electrostatic latent image because it is invisible to the eye.

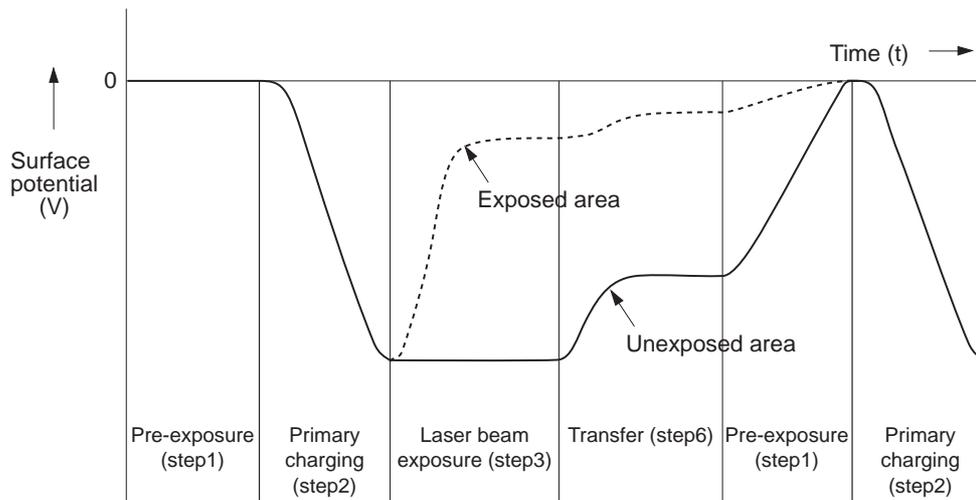


Figure 5-18 Electrostatic latent image formation block

Step 1: Pre-exposure

To prepare for primary charging, light from the pre-exposure LED strikes the photosensitive drum surface. This eliminates any residual charge on the drum surface to avoid density unevenness.

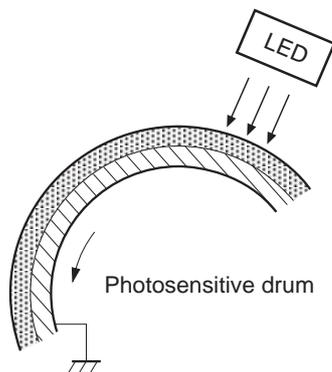


Figure 5-19 Pre-exposure

Step 2: Primary charging

To prepare for latent image formation, the surface of the photosensitive drum is charged with a uniform negative potential.

The charging method of this MFP is to charge directly to the photosensitive drum surface from the primary charging roller, which is interlocked with the drum. The primary charging roller is made of a conductive rubber. To charge the drum surface negatively, the DC bias is applied to the primary charging roller.

Step 3: Laser beam exposure

In this step, the latent image is formed on the photosensitive drum by the laser beam. As the laser beam scans on the negatively charged photosensitive drum, the potential on the exposed area is neutralized and the negative potential is removed from the drum surface. This area forms an electrostatic latent image.

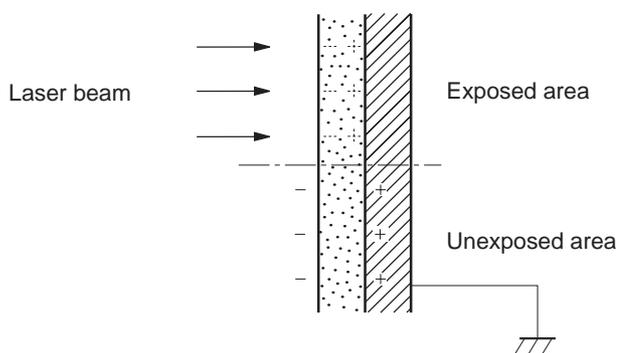


Figure 5-20 Laser beam exposure

Development block

The second part of the image formation process is the development block, where toner is transferred onto the electrostatic latent image on the surface of the photosensitive drum to create a visible image. This MFP uses a contact development method that keeps the developing cylinder in contact with the drum, pushing the toner against the drum surface for development. The toner is non-magnetic and consists of resins.

Step 4: Development

In this step, the toner adheres to the electrostatic latent image on the photosensitive drum surface. The toner (developing material) has an insulating property and is charged with a negative potential by the friction force with the rotating developing cylinder and the developing blade surface. This negatively charged toner contacts with the photosensitive drum, after the potential is adjusted to be uniform. As the area of the drum surface where the laser beam exposed has higher potential than the developing cylinder, the toner charged with almost the same potential with the developing cylinder adheres to this area. This phenomenon is called contact development and it visualizes the electrostatic latent image on the drum surface.

Transfer block

The third part of the image formation process is the transfer block, in which the toner image is transferred from the photosensitive drum to the media. This block consists of three steps:

- Attraction
- Transfer
- Separation

Step 5: Attraction

To feed the media vertically, it is necessary to push the media against the ETB. The picked up media is fed as it is pushed against the ETB by the attraction roller. The positive DC bias is applied to the attraction roller, which charges the media positively to make the negatively charged toner easier to transfer onto the media during the transfer operation.

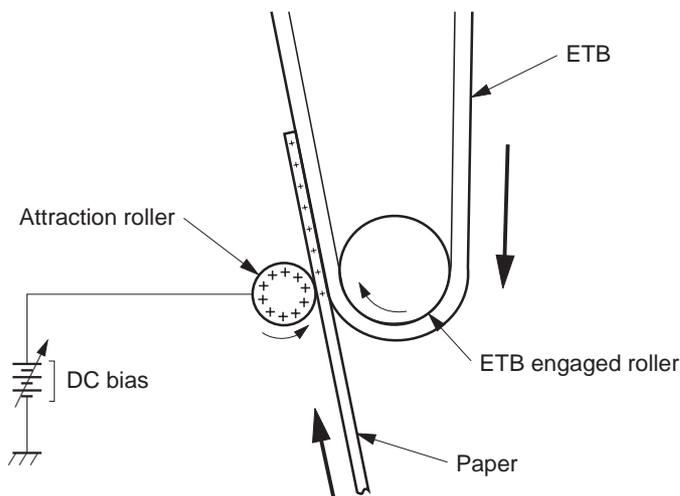


Figure 5-21 Attaching the media to the ETB

Step 6: Transfer

A positive bias is applied to the transfer charging roller, which is directly opposite the photosensitive drum. As the ETB passes the transfer charging roller, it picks up a positive charge. The negatively charged toner on the photosensitive drum is transferred to the positively charged print media. [Figure 5-22 Toner transfer on page 183](#) illustrates this step. This process is repeated for each color as the ETB carries the media from the bottom cartridge to the top (C, Y, M, K).

In full-color printing, as four colors of toner are piled up on the media, the holding force of the toner weakens as the transfer process progresses. To counteract this effect, the DC controller increases the positive DC bias that is applied to the transfer charging roller for each successive color.

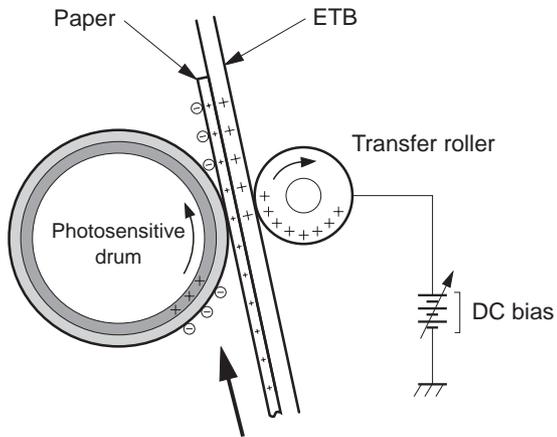


Figure 5-22 Toner transfer

Step 7: Separation

The elasticity of media separates the media from the photosensitive drum and the ETB.

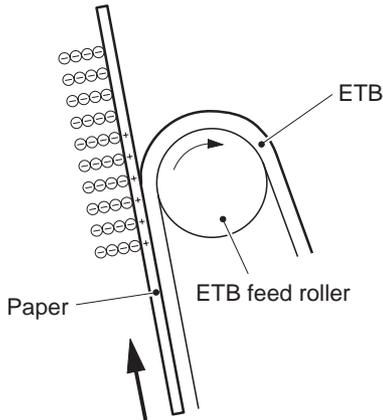


Figure 5-23 Separation

Fusing block

The fourth part of the image formation process is the fusing block, in which the toner image is fused to the media, making a permanent image that cannot be smeared. This block consists of one step: fusing.

Step 8: Fusing

This MFP uses the ceramic heater with lower heat capacity to fuse the toner to the media. This method warms up quickly and does not require the power supply during standby period, resulting in shortened wait time and reduced power consumption.

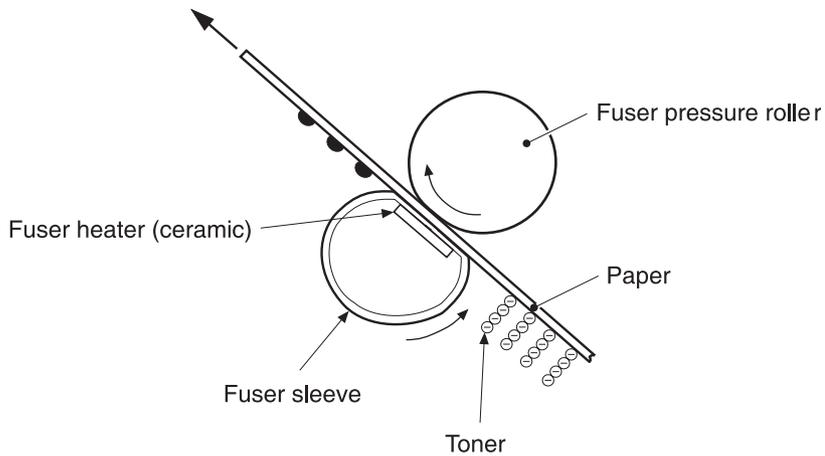


Figure 5-24 Fusing

Cleaning block

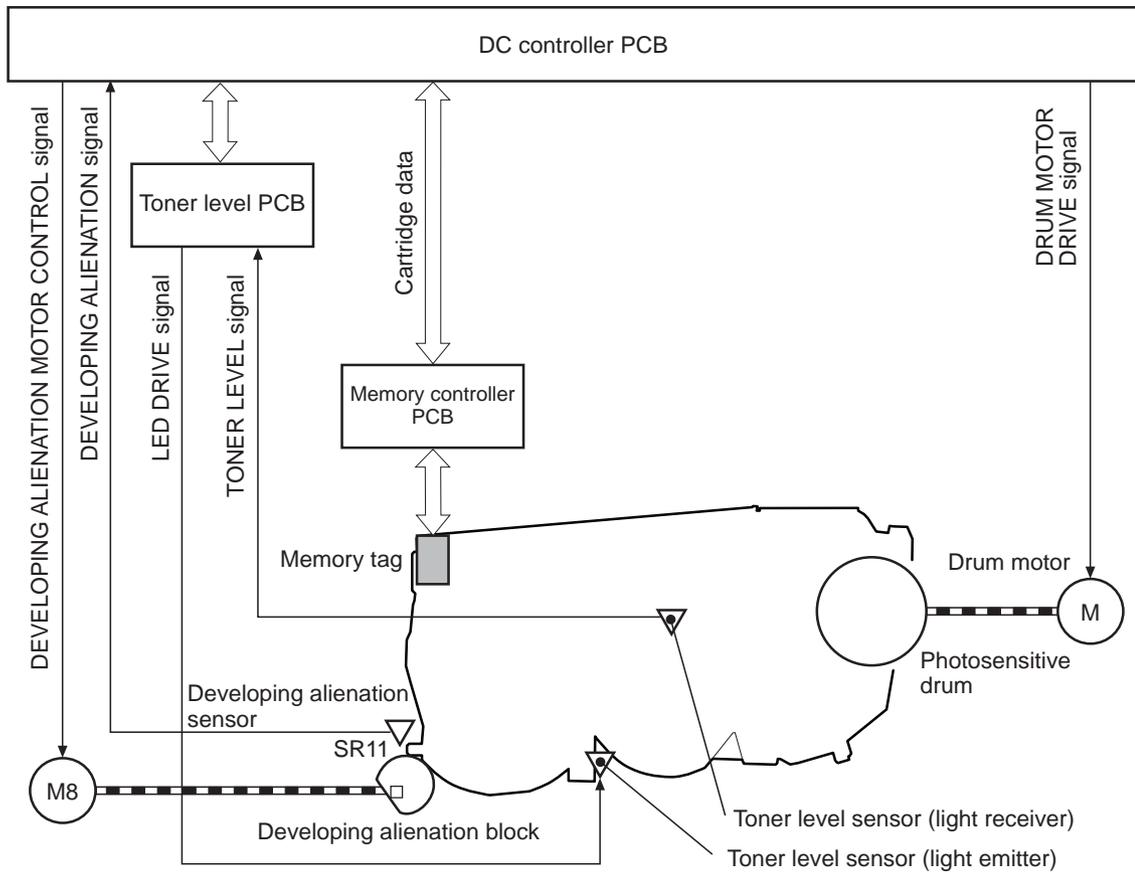
The fifth and final part of the image formation process is the cleaning block, in which the photosensitive drums are cleaned, preparing them for the next print. In the transfer block, not all of the toner is transferred from the photosensitive drum onto the media, but some remains on the drum surface. This remaining toner is called residual toner or waste toner. The cleaning block cleans the photosensitive drum surface to keep a clear image in the next print.

Step 9: Drum cleaning

The cleaning blade scrapes off the leftover toner on the drum surface. The residual (waste) toner is collected in the waste toner container by the waste toner feed plate.

Print cartridges

The MFP has four different print cartridges, one for each color. However, they share the same structure, shown in [Figure 5-25 Print cartridge on page 185](#).



Developing alienation motor

Figure 5-25 Print cartridge

The following are the physical components inside the print cartridge:

- Photosensitive drum
- Primary charging roller
- Developing cylinder
- Toner charging roller
- Stirrers
- Waste-toner transfer plate

The photosensitive drum rotation drives the primary charging roller. All other components are driven by the drum motor.

The developing disengaging motor drives the developing disengaging block, which causes the developing cylinder to engage with or disengage from the photosensitive drum.

The DC controller uses an LED and a photo diode to monitor the level of toner inside the cartridge. It stores this information on a memory tag that is built into each cartridge.

Memory tag

The memory tag is a nonvolatile memory that is built into the print cartridge. It stores information about the amount of toner in the cartridge and estimates the remaining life. [Figure 5-26 Memory tag on page 186](#) illustrates how the memory tag operates.

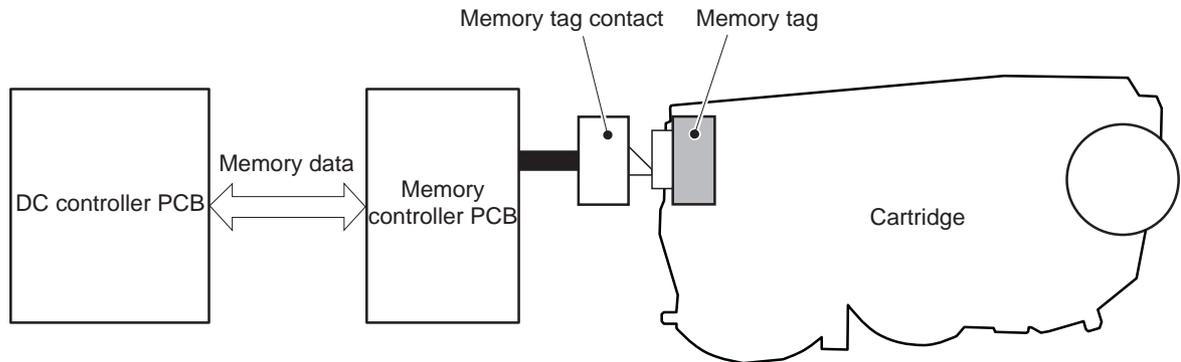


Figure 5-26 Memory tag

The DC controller reads information from the memory tag whenever the MFP is turned on, whenever the top cover is closed, and whenever it receives a read command from the formatter.

The DC controller writes information to the memory tag at specified times during a print operation, whenever it receives a write command from the formatter, and after print completion.

If the DC controller is unable to either read to or write from the memory tag four times in a row, the DC controller alerts the formatter of a memory tag abnormality.

Cartridge presence detection

The MFP detects the presence of print cartridges when the power is turned on or the door is closed. There are two procedures to the cartridge presence detection:

- Memory tag detection
- Photosensitive drum detection

Memory tag detection

The DC controller reads the data in the memory tag and determines the cartridge presence. If the reading fails, the DC controller goes to the next procedure, photosensitive drum detection.

Photosensitive drum detection

The DC controller measures the torque of the photosensitive drum. The DC controller stops the drum motor after driving it for the prescribed period of time. If the motor stops rotating within the specified period after the stoppage command is sent, the DC controller detects the cartridge presence based on the large load torque. If it takes more than the prescribed period of time for the motor to stop, the DC controller detects the cartridge absence based on the small load torque.

When the DC controller detects the cartridge absence, it stops the engine and notifies the formatter. [Figure 5-27 Photosensitive drum detection on page 187](#) illustrates the drum detection procedure.

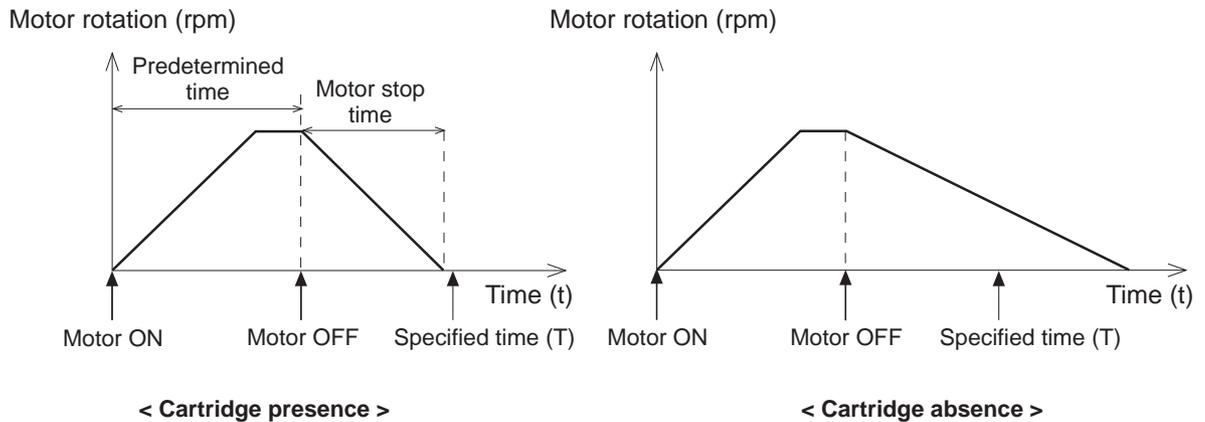


Figure 5-27 Photosensitive drum detection

Developing cylinder disengaging control

The developing cylinder is engaged or disengaged when the DC controller drives the developing alienation motor. When the developing motor rotates clockwise by a command from the DC controller during power on, printing operation stopped, cleaning cartridges, and monochrome print, the developing alienation cam rotates. Accordingly, the rear bottom of the cartridge is raised and the developing cylinder is disengaged from the photosensitive drum with a principle of leverage. The developing alienation sensor (SR11) detects the position of the developing alienation block.



NOTE Only the developing cylinders in the color cartridges (C, Y, M) are disengaged in monochrome print, and all of the developing cylinders in any other case.

If the cam stays at its home position for the prescribed period of time or longer during the developing cylinder disengagement operation, or it does not return to the home position within the prescribed period of time after alienation is completed, the DC controller detects the developing alienation motor abnormality, stops the printer engine, and notifies the formatter of the developing alienation motor abnormality.

ETB (electrostatic transfer/transport belt)

The ETB feeds the media through the MFP and helps transfer toner onto the media. [Figure 5-28 ETB on page 188](#) illustrates the ETB.

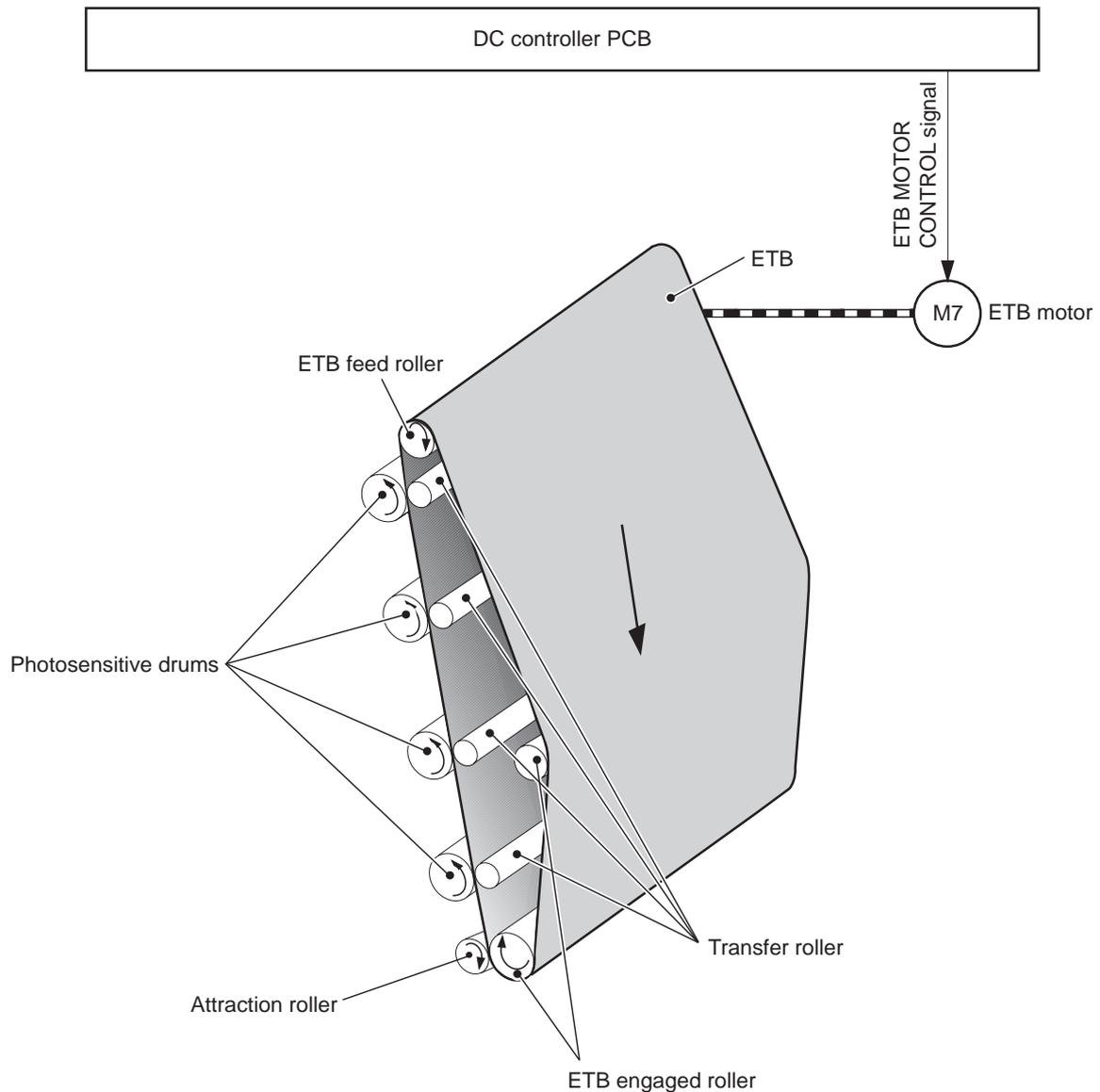


Figure 5-28 ETB

The following are the components of the ETB:

- ETB belt
- ETB feed roller
- ETB engaged roller
- Attraction roller
- Transfer roller

The ETB motor drives the ETB feed roller, causing the belt to rotate. All other rollers are driven by the belt rotation.

During the printing operation, the picked up media is conveyed between the ETB and the photosensitive drum. Simultaneously the toner image is transferred onto the media. The ETB is also

used for the color misregistration and image stabilization control. The pattern image for the color misregistration or image density determination is transferred onto the ETB.

The ETB also controls the following:

- Transfer roller (Y, C, M) engagement/disengagement detection
- Transfer roller alienation
- ETB cleaning

Transfer roller (Y, C, M) engagement/disengagement detection

When the power is turned on, the DC controller applies biases to the transfers roller for yellow and black, and detects the value of current flow through the ETB according to the current return signals. The DC controller obtains information on the transfer roller (Y, M, C) engagement and disengagement. Accordingly, the DC controller executes the transfer roller engage or disengage control depending on the situation and engages the transfer rollers (Y, M, C).

Transfer roller engagement/disengagement control

This control disengages the transfer rollers (Y, M, C) from the photosensitive drums so that only black toner is transferred onto the ETB during monochrome printing. The ETB motor (M7) performs this control by driving the ETB alienation solenoid (SL3) while the motor is rotating according to a command from the DC controller.

The following is the operational sequence of the transfer roller engagement/disengagement control.

1. The transfer roller engaging/disengaging cam inside the ETB holds up the transfer roller holder that contains the Y, M, and C transfer rollers. This brings the ETB into contact with the photosensitive drums.
2. When a monochrome print starts, the DC controller turns on the ETB alienation solenoid (SL3) to rotate the transfer roller engaging/disengaging cam.
3. The rotation of the transfer roller engaging/disengaging cam pushes the Y, M, and C transfer rollers down, disengaging the ETB from the photosensitive drums.

When allowing the ETB to engage back with the photosensitive drums, the DC controller turns on the ETB alienation solenoid (SL3) again. The transfer roller engaging/disengaging cam rotates and pushes the transfer roller holder. Accordingly, the transfer rollers push the ETB into contact with the photosensitive drums.

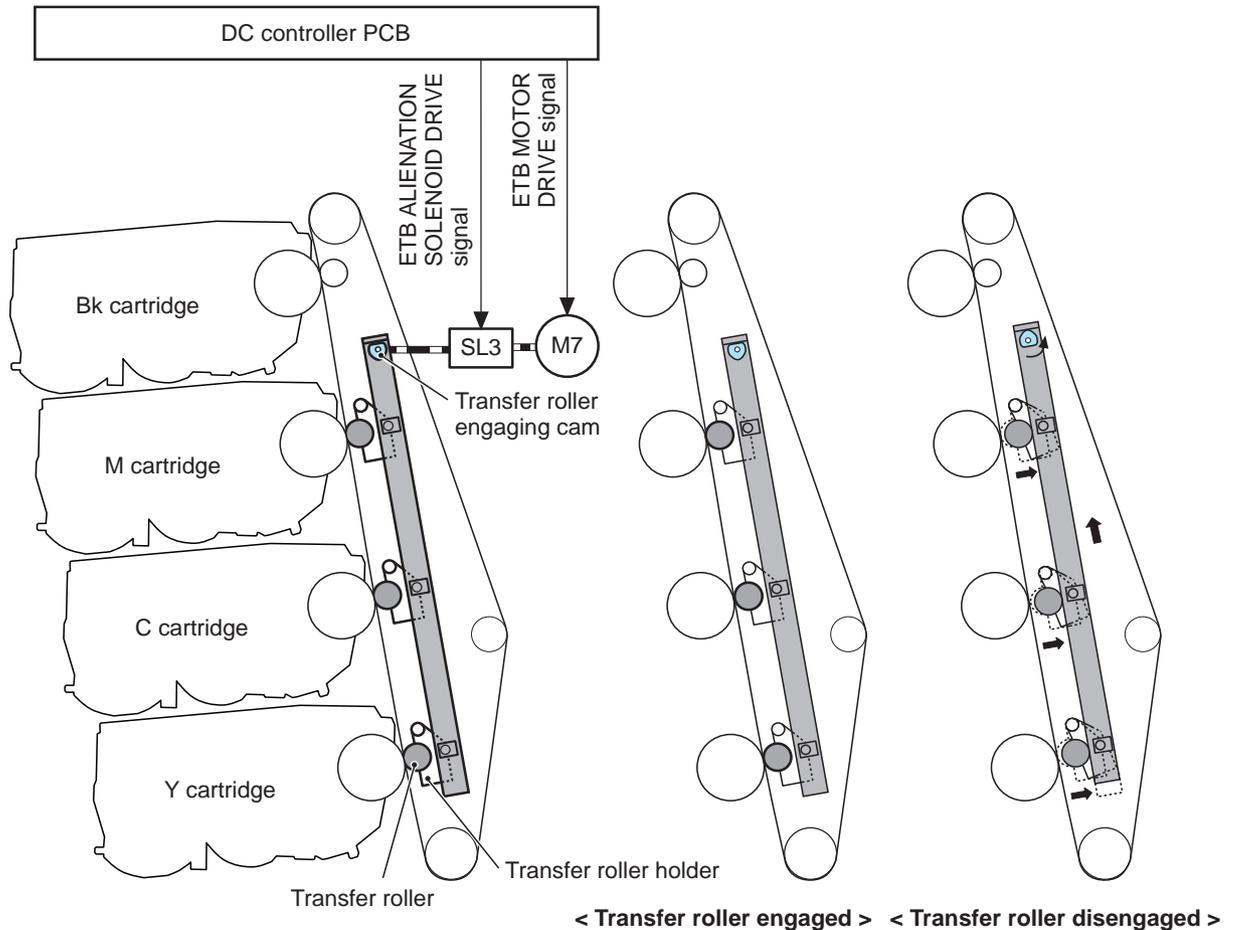


Figure 5-29 Transfer roller engagement/disengagement control



NOTE The Y, M, and C photosensitive drums opposite the transfer rollers stop rotating when the rollers are disengaged.

Calibration and cleaning

The MFP automatically calibrates and cleans itself at various times to maintain the best print quality. You can also force the MFP to calibrate by selecting **QUICK CALIBRATE NOW** or **CALIBRATE NOW** from the **PRINT QUALITY** menu. For information about calibrating the MFP, see [Table 5-4 Calibration timing and duration on page 191](#) or [Table 5-5 Cleaning timing and duration on page 191](#) for more information.

While the MFP is calibrating or cleaning, it pauses printing. For most calibrations and cleaning, the MFP does not interrupt a print job, but waits for the job to complete before calibrating or cleaning. [Table 5-4 Calibration timing and duration on page 191](#) shows when the MFP calibrates, the duration of the calibration, and the type of calibration that occurs. [Table 5-5 Cleaning timing and duration on page 191](#) shows when the MFP cleans and the duration of the cleaning. The sections that follow discuss calibration and cleaning in more detail.

Table 5-4 Calibration timing and duration

Calibration occurrence	Duration	Type of calibration
When you turn the MFP on.	75 seconds for calibration, but because of other initialization activities, the MFP takes a total of 2 minutes to be ready for printing	DMAX, DHALF
When you install one or more print cartridges that have not previously been installed in the MFP.	150 seconds (2 minutes, 30 seconds)	DMAX, DHALF, color-plane registration (CPR)
When 50 pages have been printed since installing a print cartridge. The MFP will finish printing the current job before calibrating.	75 seconds	DMAX, DHALF
When 1,000 pages have printed since the last calibration. The MFP will finish printing the current job before calibrating.	75 seconds	DMAX, DHALF
When eight hours have passed since the last calibration, but not while the MFP is in Sleep mode. Typically, this calibration occurs during the first job or any control panel interaction after an overnight idle period.	75 seconds	DMAX, DHALF
When you request calibration from the control panel (QUICK CALIBRATE NOW and CALIBRATE NOW).	280 seconds (4 minutes, 40 seconds)	DMAX, DHALF, CPR, drum phase

Table 5-5 Cleaning timing and duration

Cleaning occurrence	Duration	Type of cleaning
When the MFP continuously prints (with no idle period or spin down) for 51 pages.	either 5 seconds or 21 seconds (5 seconds is the most common)	primary and toner charging rollers
At intervals of 90 and 140 pages. The MFP will finish printing the current job before cleaning.	16 seconds	ETB

ETB cleaning

During this step, all toner particles that remain on the ETB are returned to the photosensitive drums in each print cartridge. [Figure 5-30 ETB cleaning on page 192](#) illustrates this step.

This control is performed by the DC controller under the following conditions:

- The power is turned on
- During operation of the color misregistration corrective control
- During operation of the image stabilization control
- The door is closed

- After completion in every prescribed number of printings
- During pickup operation specified by universal size

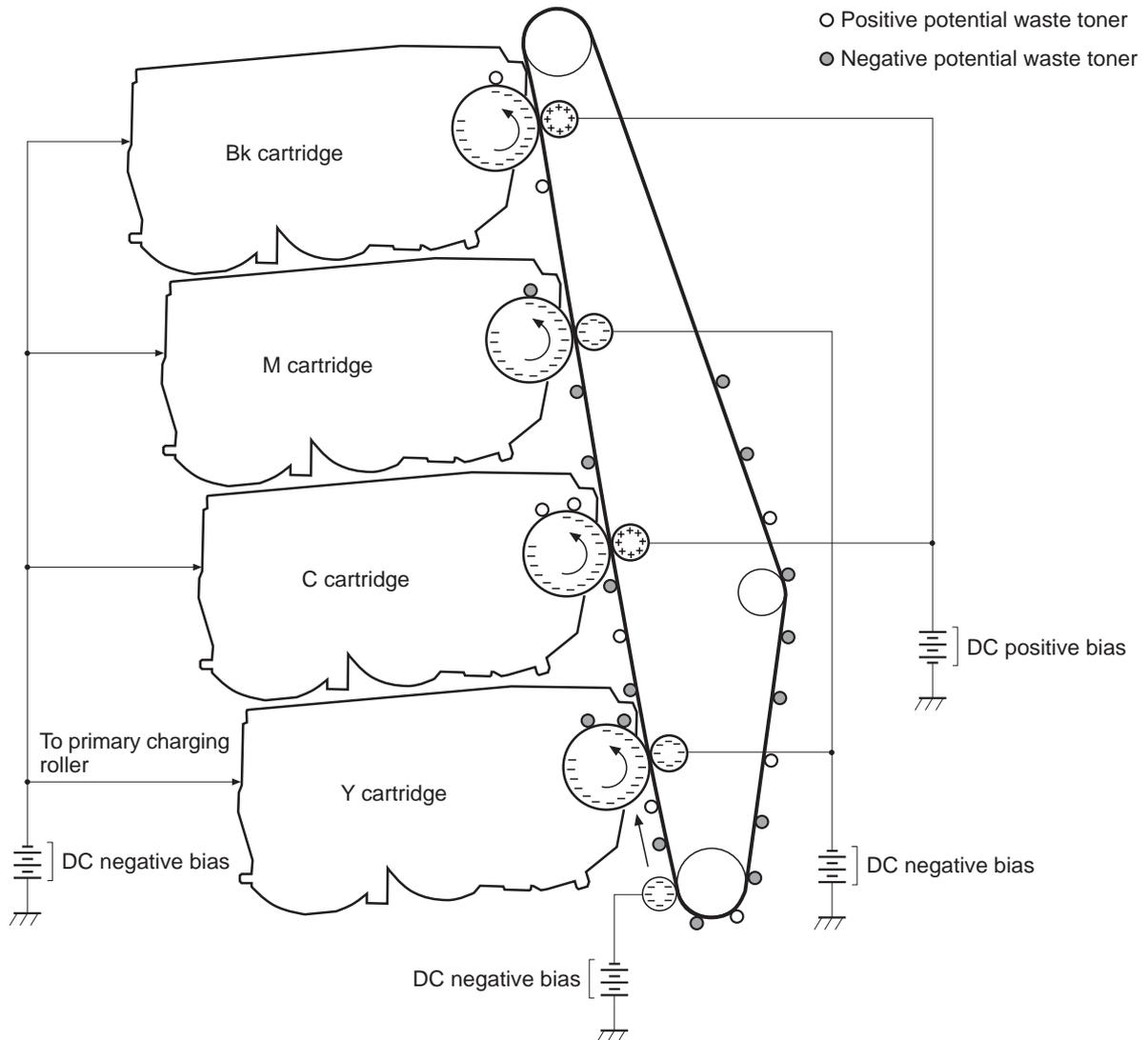


Figure 5-30 ETB cleaning

The DC controller applies negative bias to the photosensitive drum and both negative and positive biases to each of the four color transfer rollers. This brings a potential difference between the photosensitive drum and the ETB, so that both positive and negative charged residual toner on the ETB is returned to the photosensitive drum at once. The developing cylinder is disengaged from the photosensitive drum during the cleaning operation to prevent toner in the toner container from transferring onto the ETB.

Color misregistration corrective control

This control corrects a color misregistration caused by the variation inherent in the laser/scanner unit and each cartridge. The color misregistration corrective control corrects the horizontal scanning magnification, the horizontal scanning start position, and the vertical scanning start position.

The DC controller controls the color misregistration unit under the following conditions:

- At power on or door close after cartridge replacement
- After job completion in every specified number of printings
- At a command from the formatter

The following is the operational sequence of the color misregistration corrective control:

1. The DC controller forms two pattern images for color misregistration detection with four colors on the ETB when the color misregistration corrective control starts. The two pattern images are the same pattern, one formed on the left side and the other on the right side.
2. The DC controller measures the position of each pattern image and calculates the misregistration amount of each color by controlling the color misregistration unit.
3. The calculated misregistration information of each color is sent to the formatter.
4. The formatter controls each color's video signals according to this information and optimizes the main-scanning start position, the main-scanning scale, and the sub-scanning start position.

The color misregistration in sub-scanning direction is corrected at printer engine side by the DC controller controlling the speed of the scanner motor.



NOTE Horizontal magnification is the size of the image in the horizontal direction. Every color has its own photosensitive drum in each cartridge in this MFP. The positions of each drum differ and the laser beam lengths vary because of the variations among the cartridges, so the horizontal scanning area depends on the color. This causes a color misregistration at the edge of image.

Color misregistration detection

In this MFP, the positions of each color's misregistration pattern images formed on the ETB are detected to measure the misregistration amount. The DC controller controls the color misregistration unit during the foregoing color misregistration corrective control. The color misregistration unit is placed under the ETB and consists of two detection sensors, each one having a light emitter (LED) and a light receiver (PD).

The following is the operational sequence of the color misregistration detection.

1. The DC controller allows the LED to emit light by sending the LED DRIVE signal when the color misregistration detection starts.
2. The ETB reflects the light from the LED and the PD in the color misregistration sensor receives the light. This reflected light intensity differs depending on whether the light is reflected from the area of toner.
3. The light receiver converts the received light intensity into voltage and sends it in the form of the color misregistration signal to the DC controller.
4. The DC controller detects the positions of the pattern images according to the timing of the color misregistration signal.

[Figure 5-31 Color misregistration detection on page 194](#) illustrates this process.

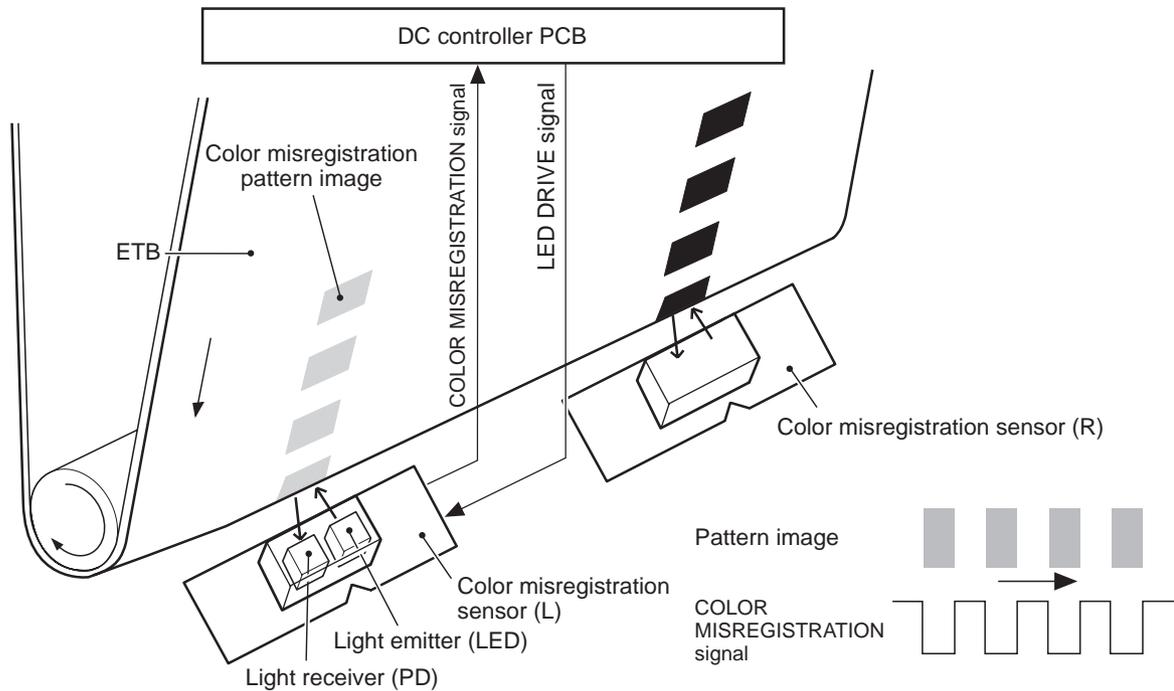


Figure 5-31 Color misregistration detection

The DC controller notifies the formatter of each error when the following errors are found during the color misregistration detection. The initial value is reset to the new color misregistration correction value whenever an error occurs.

- Color misregistration sensor abnormality warning: The light receiver does not receive light at all.
- Color misregistration measurement out of range warning: The measurement value is out of specified range.

Image stabilization control

This controls the variation of the image density caused by an environmental change or deterioration of the photosensitive drum, toner, etc.

There are three types of image stabilization control. These controls operate when necessary.

- **Environmental change control.** The environment condition sensor controls the bias according to the environment conditions.
- **Image density control (D-max).** The color misregistration sensor (PS12) calibrates the bias value when the image density is at max.
- **Image halftone control (D-half).** The color misregistration sensor (PS12) calibrates the halftone data in the formatter.

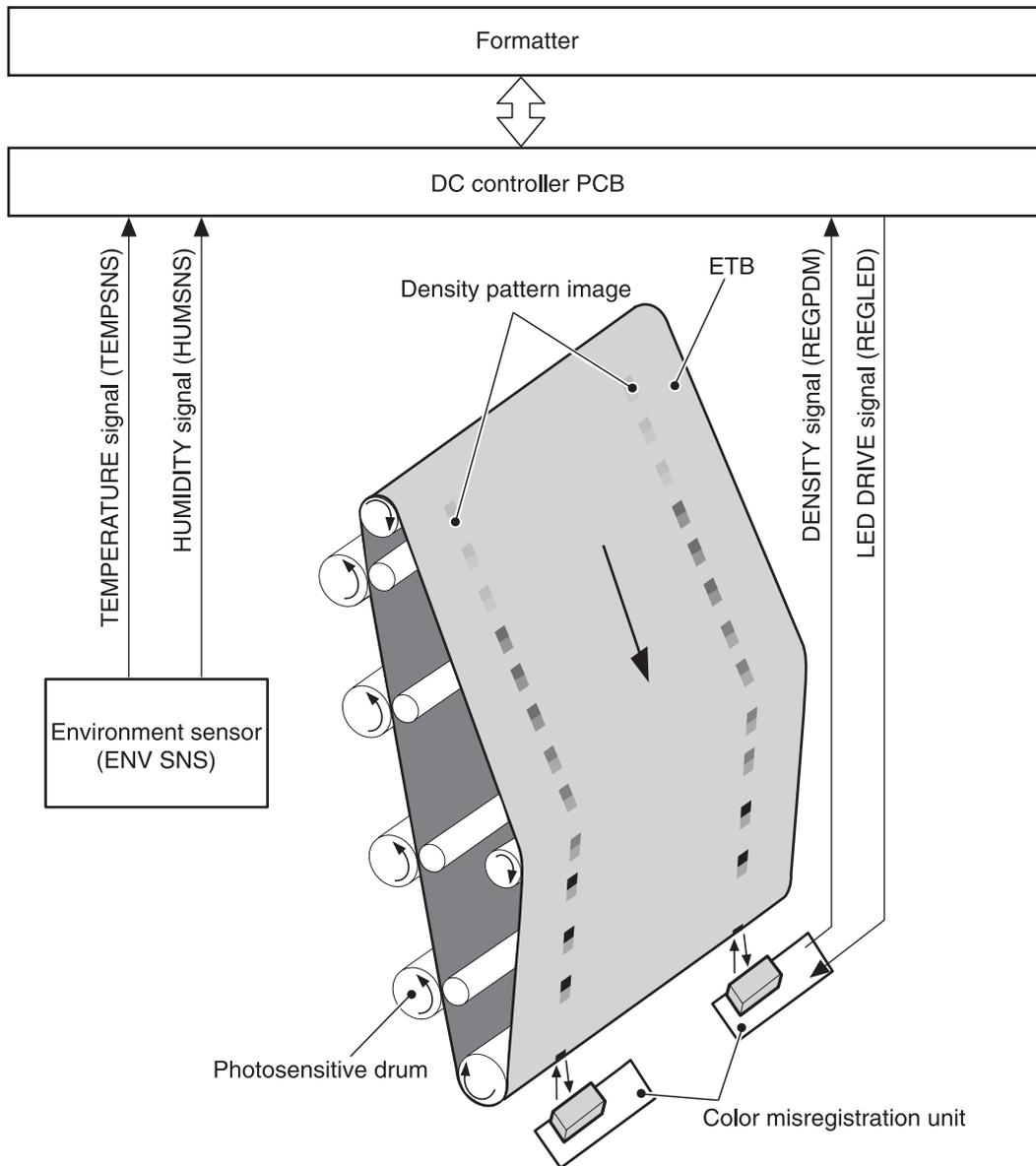


Figure 5-32 Image stabilization control

Environmental change control

This control calibrates each bias to obtain the best image possible according to environmental changes.

The environmental sensor detects the temperature and the humidity. The sensor sends this information to the DC controller in the form of the temperature detection signal (TEMPSNS) and the humidity detection signal (HUMSNS).

The DC controller monitors the environmental conditions of the MFP based on these two signals.

The DC controller controls the following biases to prevent image defects when it detects an environmental change:

- Developing bias
- Primary transfer bias
- Secondary transfer bias

If the environment sensor detects a temperature of below -30°C (22°F) or over 80°C (176°F), the DC controller determines this is an "environment sensor abnormality" and sends an error message to the formatter.

Image density calibration control (DMAX)

This control stabilizes image density by calibrating the values of the developing bias whenever one of the following events occurs:

- The detected temperature of the sub thermistor is below 50°C (122°F) when the MFP is turned on.
- The door is closed after a print cartridge or ETB is replaced.
- A set number of pages is printed.
- The specified value of environmental conditions has changed since the last image density corrective control.
- The formatter sends an operation command.

Image halftone calibration control (DHALF)

This control measures halftone density output from the formatter and returns the measurements to the formatter so it can perform halftone calibration. Image density calibration must always be performed before image halftone calibration.

Image halftone calibration control consists of three steps:

1. The DC controller forms density patterns on the photosensitive drum in each color using the optimum developing bias determined during image density calibration.
2. These density patterns are transferred to the ETB, and the color-registration detection unit measures the image density of these patterns. Image data is returned to the formatter.
3. The formatter uses the image data to perform a halftone calibration to obtain an ideal halftone image.

Image density detection

Each of the image stabilization controls uses the color registration unit at the top of the ETB to measure image density. The image density detection is performed by the DC controller, which controls the color misregistration unit during the D-half control. The color misregistration unit is placed under the ETB and consists of two detection sensors, each having one light emitter (LED) and one light receiver (PD). [Figure 5-33 Image density detection on page 197](#) illustrates this process.

The following is the operational sequence of the image density control:

1. The DC controller allows the LED to emit light by sending the LED drive signal. The image density detection control starts.
2. The density pattern images on the ETB reflect the light from the LED and the PD in the sensor receives the light. This reflected light intensity differs depending on the toner density.
3. The light receiver converts the received light intensity into voltage and sends it as a toner density signal to the DC controller.
4. The DC controller converts the toner density signal (analog) into a density value (digital) and stores it.

The DC controller notifies the formatter of each error when the following errors are found during the image density detection. When it fails to detect image density, it zeros the density data and notifies the formatter.

- Image density sensor abnormality warning: detected ETB surface density is improper.
- Failed image density detection warning: detected density is improper.

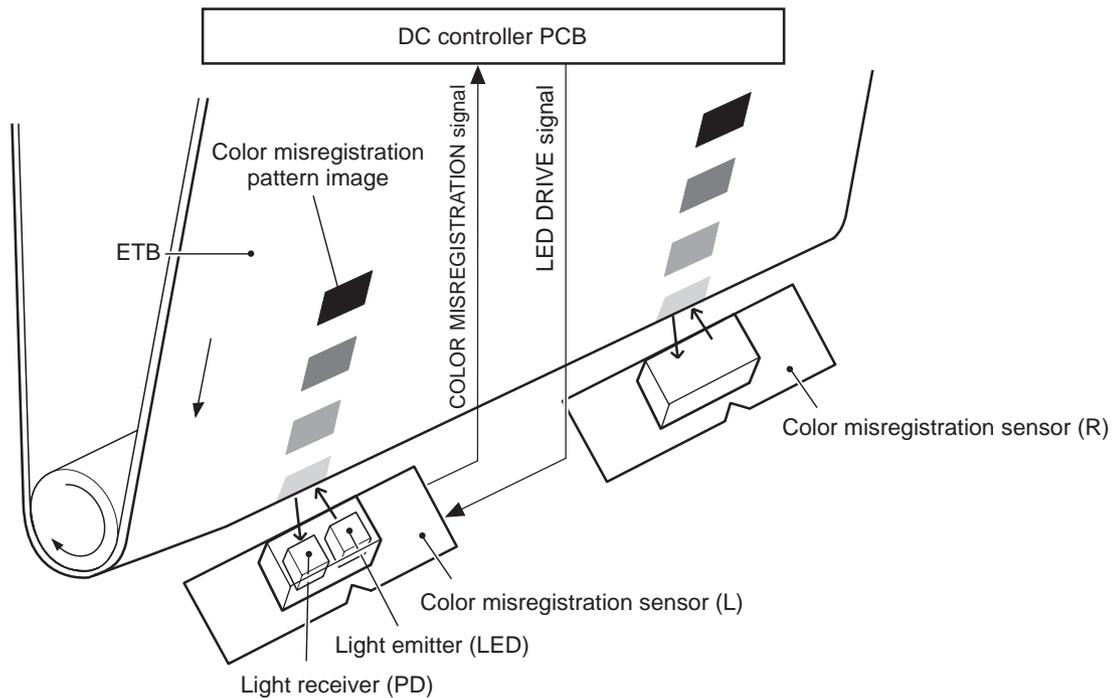


Figure 5-33 Image density detection

Pickup/feed system

The pickup/feed system consists of various feed rollers that pick up and feed media. This MFP has four pickup sources: the MP tray, tray 2, and the two trays of the 2 X 500-sheet paper feeder. The primary delivery source is the face-down tray. The IPTU and stapler/stacker or 3-bin mailbox can also be used for output.

The multipurpose tray paper sensor (SR4) detects the media presence in the multipurpose tray, and the cassette paper sensor (SR9) detects the media presence in the cassette. The paper stack surface sensor (SR10) in the cassette monitors the pickup position of the media stack surface. When the SR10 detects that the pickup position lowers to a certain level, the DC controller lifts the lifting plate up to maintain the media stack surface at a specified height. [Figure 5-34 Pickup/feed system \(1 of 2\) on page 199](#) illustrates this system.

The media size in the cassette and presence of the cassette installed in the MFP are detected by the cassette paper size detection switch (CSIZE SW). The cassette paper size detection switch consists of three switches.

The DC controller controls ten motors: pickup motor, ETB motor, four drum motors, fuser motor, fuser pressure release motor, reversing motor, and lifter motor. There are three solenoids: cassette pickup solenoid, MP tray pickup solenoid, and duplexing solenoid, for the pickup operation.

There are five photo interrupters: top of page sensor, fuser paper sensor, paper loop sensor 1, paper loop sensor 2, and paper reversing sensor, on the paper transport path to detect media arrival and passage. If the media does not reach or pass these sensors within the specified period of time, the microcomputer (CPU) on the DC controller determines the paper jam and notifies the formatter.

[Figure 5-34 Pickup/feed system \(1 of 2\) on page 199](#) and [Figure 5-35 Pickup/feed system \(2 of 2\) on page 201](#) illustrate this system.

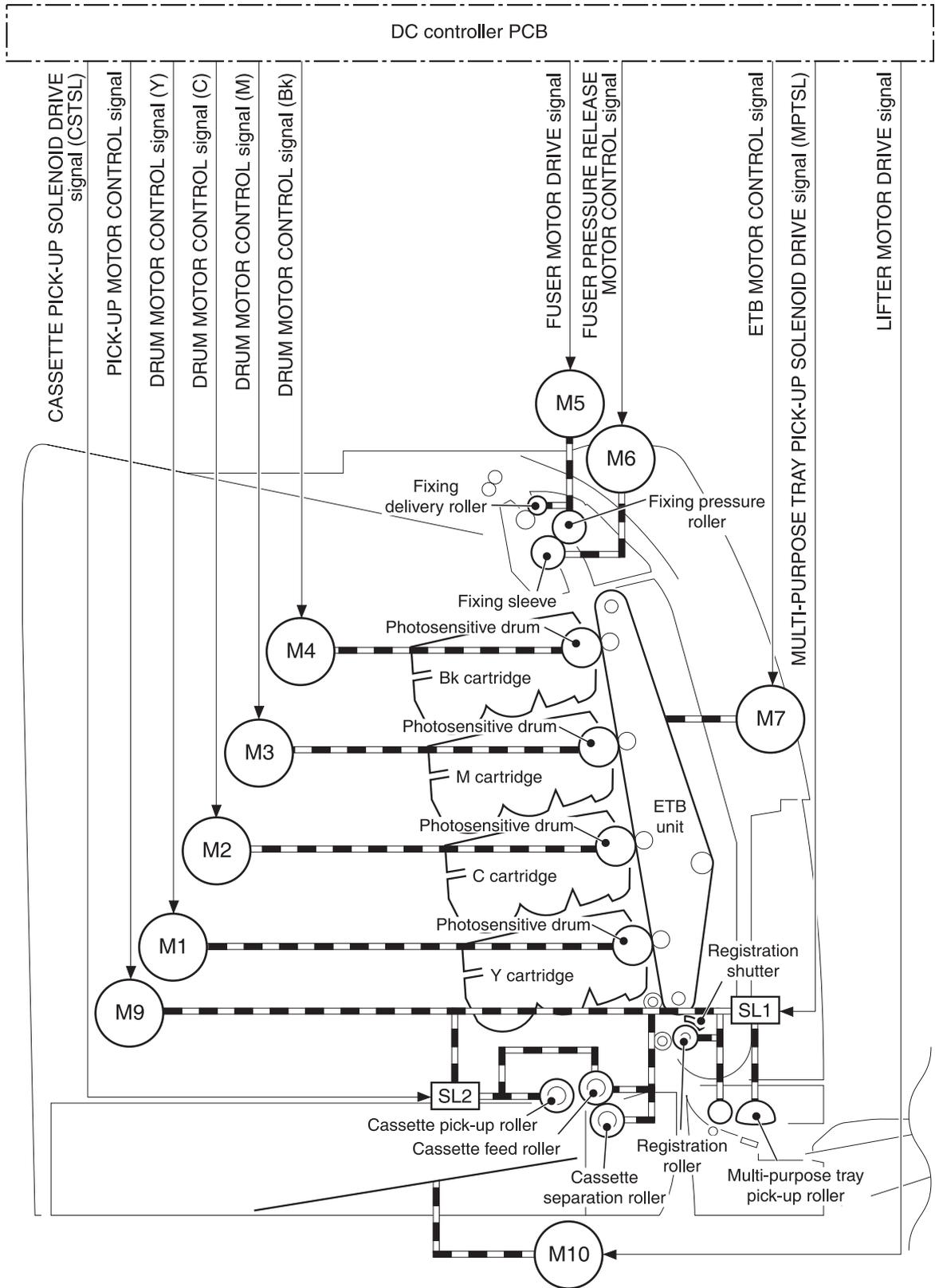


Figure 5-34 Pickup/feed system (1 of 2)

The pickup/feed system consists of the following motors and solenoids:

- M1: Yellow (Y) drum motor
- M2: Cyan (C) drum motor
- M3: Magenta (M) drum motor
- M4: Black (K) drum motor
- M5: Fuser motor
- M6: Fuser pressure release motor
- M7: ETB motor
- M9: Pickup motor
- M10: Lifter motor
- M8001: Reversing motor
- SL1: Multipurpose tray pickup solenoid
- SL2: Cassette pickup solenoid
- SL8001: Duplexing solenoid

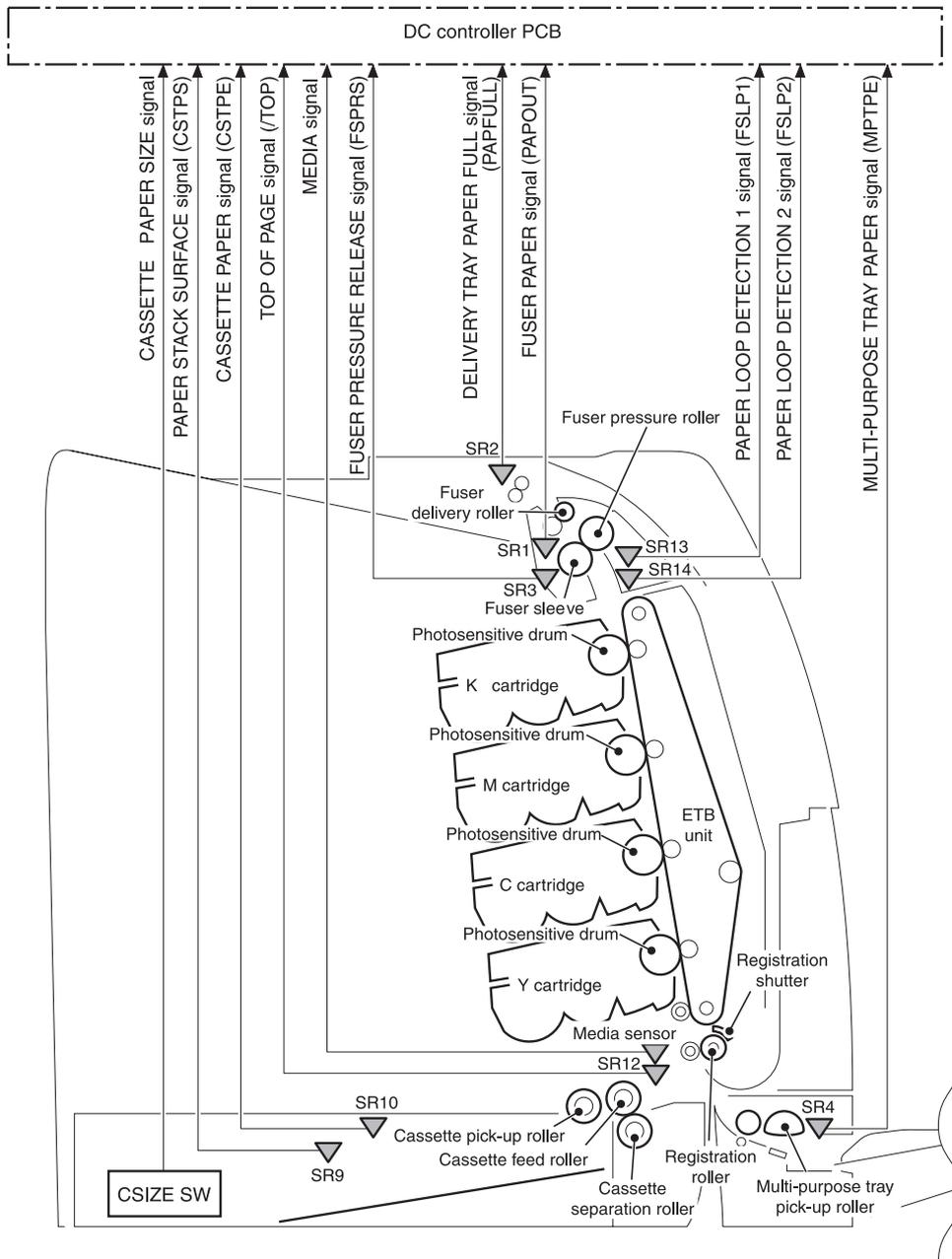


Figure 5-35 Pickup/feed system (2 of 2)

The pickup/feed system consists of the following sensors and switches:

- SR1: Fuser paper sensor
- SR2: Delivery tray paper full sensor
- SR3: Fuser pressure release sensor
- SR4: Multipurpose tray paper sensor
- SR9: Cassette paper sensor
- SR10: Paper stack surface sensor

- SR12: Top of page sensor
- SR13: Paper loop sensor 1
- SR14: Paper loop sensor 2
- SR8001: Paper reversing sensor
- Media sensor
- CNT0: Cassette paper size detection switch
- CNT1: Cassette paper size detection switch
- CNT2: Cassette paper size detection switch

[Figure 5-36 Pickup/feed system on page 202](#) illustrates the pickup/feed system, which can be divided into three units:

- **Pickup/feed unit.** From the point the media is picked from the tray until it reaches the fuser.
- **Fuser/delivery unit.** From the fuser to the face-down tray or other output device.
- **Duplex feed unit.** From the duplexing reverse inlet unit to the registration roller.

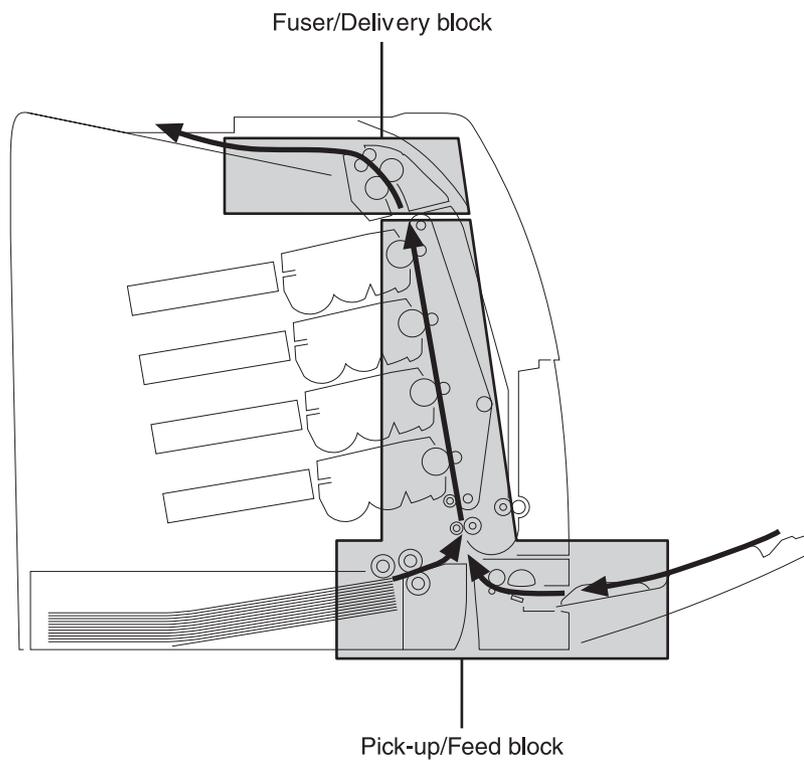


Figure 5-36 Pickup/feed system

Pickup/feed unit

The pickup/feed block is structured with two blocks. One is the pickup block, which picks up media from the cassette or the multipurpose tray into the MFP one by one. The other one is the feed block, which feeds the picked-up media to the fuser. The following sequence of events occurs:

1. The DC controller rotates the pickup motor (M9), drum motors (M1, M2, M3, M4), ETB motor (M7), and fuser motor (M5) after receiving a print command from the formatter.
2. The feed roller and the registration roller rotate as the pickup motor starts to rotate. The cassette separation roller also begins to rotate. However, the separation roller does not rotate.
3. Media is picked from the cassette. The cassette pickup solenoid (SL2) is turned on after a specified time after 'scanner ready'. This rotates the cassette pickup roller and cassette feed roller to pick up media in the cassette.

Media is picked from the MP tray. The MP pickup solenoid (SL1) is turned on after a specified time after 'scanner ready'. This rotates the MP tray pickup roller to pick up media in the tray.

4. Any multiple-fed media is removed by the cassette paper separation roller (paper separation pad for the MP tray) and a single sheet is fed to the registration roller.
5. The skew of the media is corrected by the registration shutter. The media is then fed at its prescribed speed. The formatter specifies the feed speed depending on the media type.
6. Toner is transferred to the media on the ETB, and the media is fed to the fuser/delivery block.

Cassette detection and cassette media size detection

The MFP can sense whether a cassette is installed correctly, and it can sense the size of the media in the cassette. Paper-size detection switches at the back of the cassette send this information to the DC controller. The DC controller determines which size is loaded by reading various switches. See [Table 5-6 Paper tray media size detection on page 203](#).

Table 5-6 Paper tray media size detection

Paper size	Paper-size detection switch		
	CNT0	CNT1	CNT2
A4	on	off	off
B5	on	on	off
A5	off	on	off
Letter	on	off	on
Legal	off	on	on
Executive	off	off	on
Custom	on	on	on
No paper tray	off	off	off

Although the cassette determines the media size by reading the switches, the user could select a different size from what is loaded, creating an error in media-size detection.

The paper leading-edge sensor detects when the leading edge and the trailing edge of a sheet pass it. By measuring the time between the passing of the leading edge and trailing edge, the sensor can determine the actual size of the sheet. If this measured size differs from the size specified by the formatter or the switch combination, the DC controller determines a mismatch. The sheet is ejected from the MFP, and the MFP stops.

Cassette pickup operation

This MFP uses the pickup arm method for high-speed media pickup. The pickup arm presses the pickup roller down on the media stack to feed the media one by one. The pickup roller is attached to the pickup arm and it is normally held at the original position by the pickup arm. When the pickup solenoid (SL2) is turned on, the pickup cam rotates and lowers the pickup roller onto the media.

The following is the operational sequence of the cassette pickup mechanism.

1. When the DC controller turns the cassette pickup solenoid (SL2) on during the cassette pickup operation, the driving force of the pickup motor (M9) causes the cassette pickup roller and the pickup cam to rotate.
2. As the pickup cam rotates, the pickup arm goes down and the rotating cassette pickup roller touches the media surface. The media in the cassette is fed into the MFP one sheet at a time.
3. The pickup cam rotation allows the pickup arm to go up and the cassette pickup roller disengages from the media surface.
4. The cassette pickup roller stops rotating.

Figure 5-37 Cassette pickup on page 204 illustrates this process.

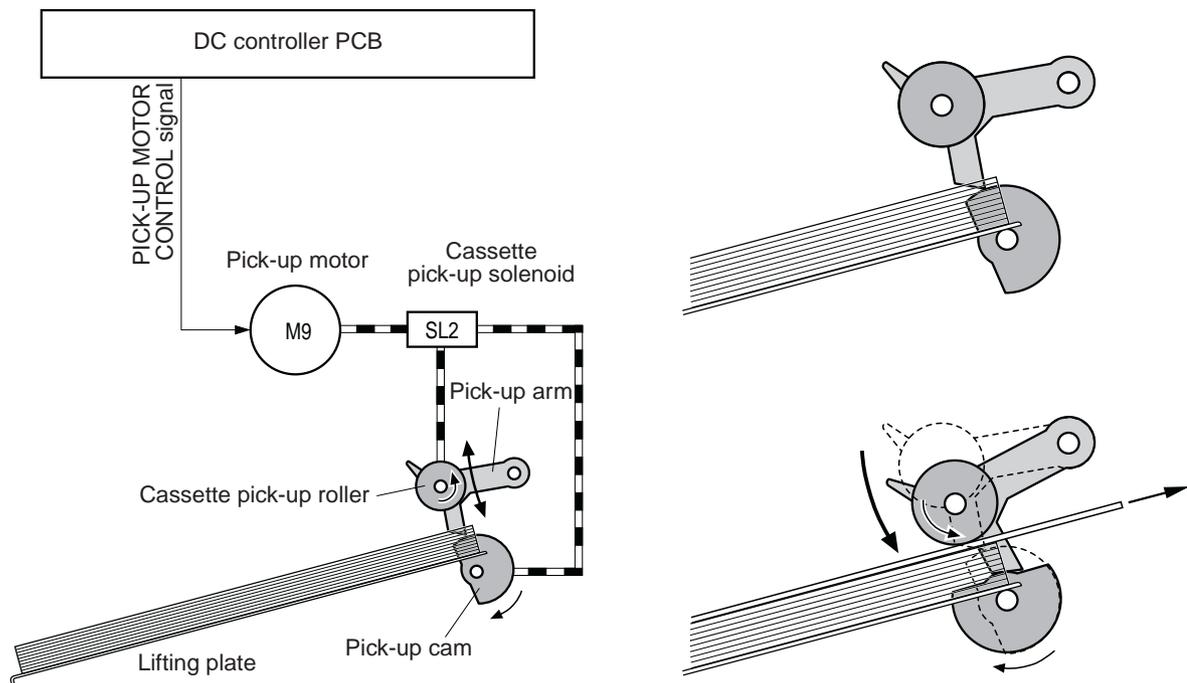


Figure 5-37 Cassette pickup

Media lifting operation

This operation maintains the position of the media stack surface at a specified height for a stable pickup operation. The DC controller rotates the lifter motor (M10) and raises the lifting plate on which

the media stack is loaded. The DC controller monitors the cassette paper sensor (SR9) and the media stack surface sensor (SR10) when the MFP is turned on, the cassette is installed, and during the printing operation.

The media lifting operation is divided into two procedures:

- Initial lift
- Lifting during printing

Initial lift

The initial lift begins when the cassette is installed in the MFP and the lifting plate remains in the bottom of the cassette. The DC controller continues driving the M10 until the SR10 detects media. The SR10 lifts the stack surface up to the pickup position under the following conditions:

- The SR9 and SR10 detect no media when the power is turned on.
- The SR10 detects no media when the cassette is installed.

The DC controller stops this operation when the SR10 detects media before the SR9 detects media.

Lift-up during printing

The lifting during printing starts when the stack level reaches a specified level according to the pickup operation. The DC controller drives the M10 when the SR10 detects no media during the printing operation. The SR10 then lifts the stack surface up to the pickup position. [Figure 5-38 Media lifting on page 206](#) illustrates this process.



NOTE The paper lifting operation is also available for the 2 X 500-sheet paper feeders. The initial lift for the cassette and paper feeders does not occur at the same time because of the DC power supply limit. The operation starts from the bottom paper feeder and moves upwards.

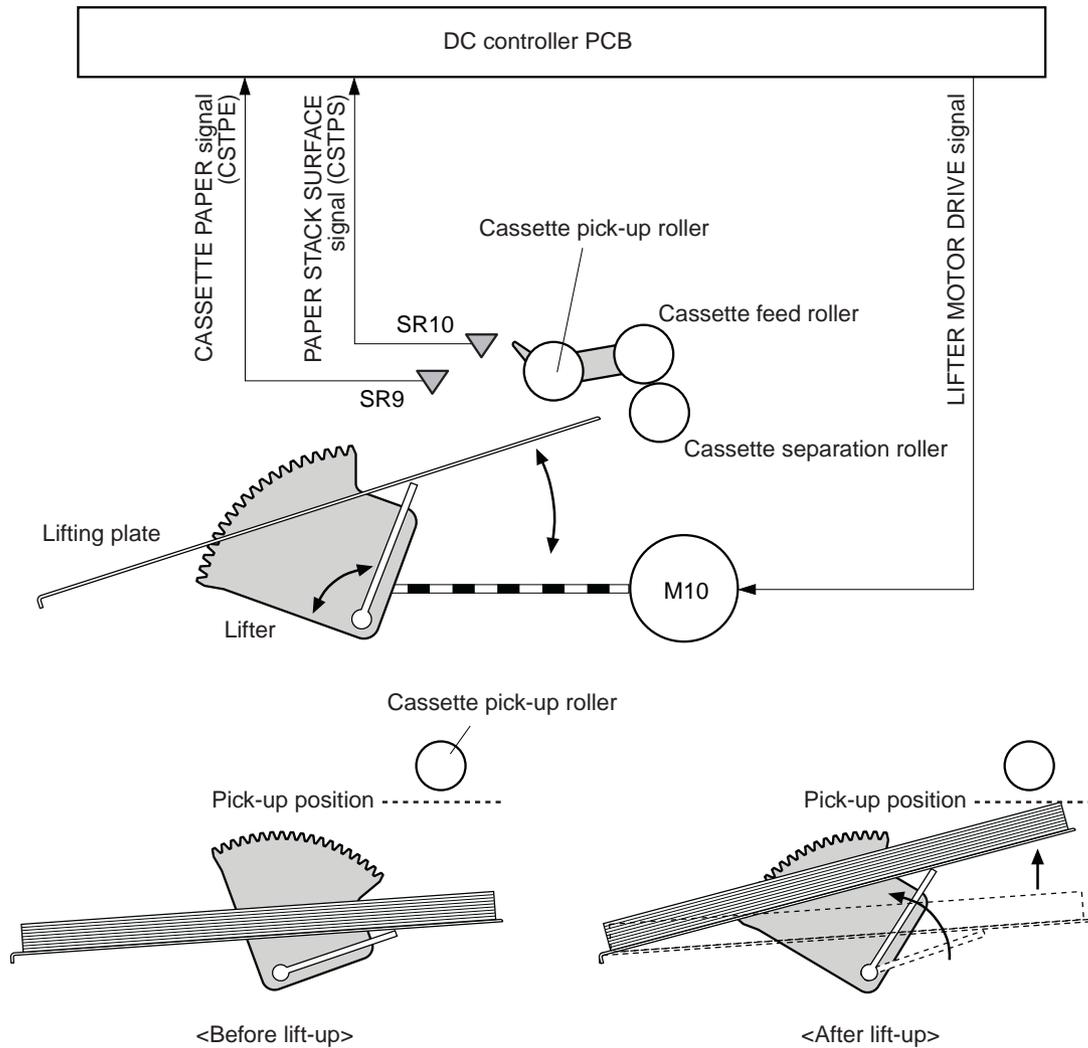


Figure 5-38 Media lifting

Multiple-feed prevention

This MFP uses the paper separation roller method to prevent multiple feeds. The cassette paper separation roller rotates in the same direction as the cassette feed roller. The paper separation roller is imparted with a rotational force, transmitted through the torque limiter. If a multiple feed occurs, the second paper is pushed back to the cassette and only one sheet is fed into the MFP.

Normally, the cassette paper separation roller is imparted with a rotational force in the same direction to the cassette feed roller. However, since the paper separation roller touches the feed roller, driving torque from the feed roller brings the torque limiter functions. The torque limiter shuts the rotational force from the separation roller. The paper separation roller follows the rotational direction of the feed roller, in the opposite direction. When the paper is not multiple-fed, the driving force from the feed roller transmits through the single paper and allows the paper separation roller to rotate in the opposite direction.

During a multi-feed, the rotational force of the cassette feed roller transmitted to the cassette paper separation roller becomes weak because of the low friction between the sheets. The torque limiter does not function and the paper separation roller rotates in the direction of the drive gear, causing

the multiple-fed media to be separated and pushed back to the cassette. [Figure 5-39 Media lifting on page 207](#) illustrates this process.

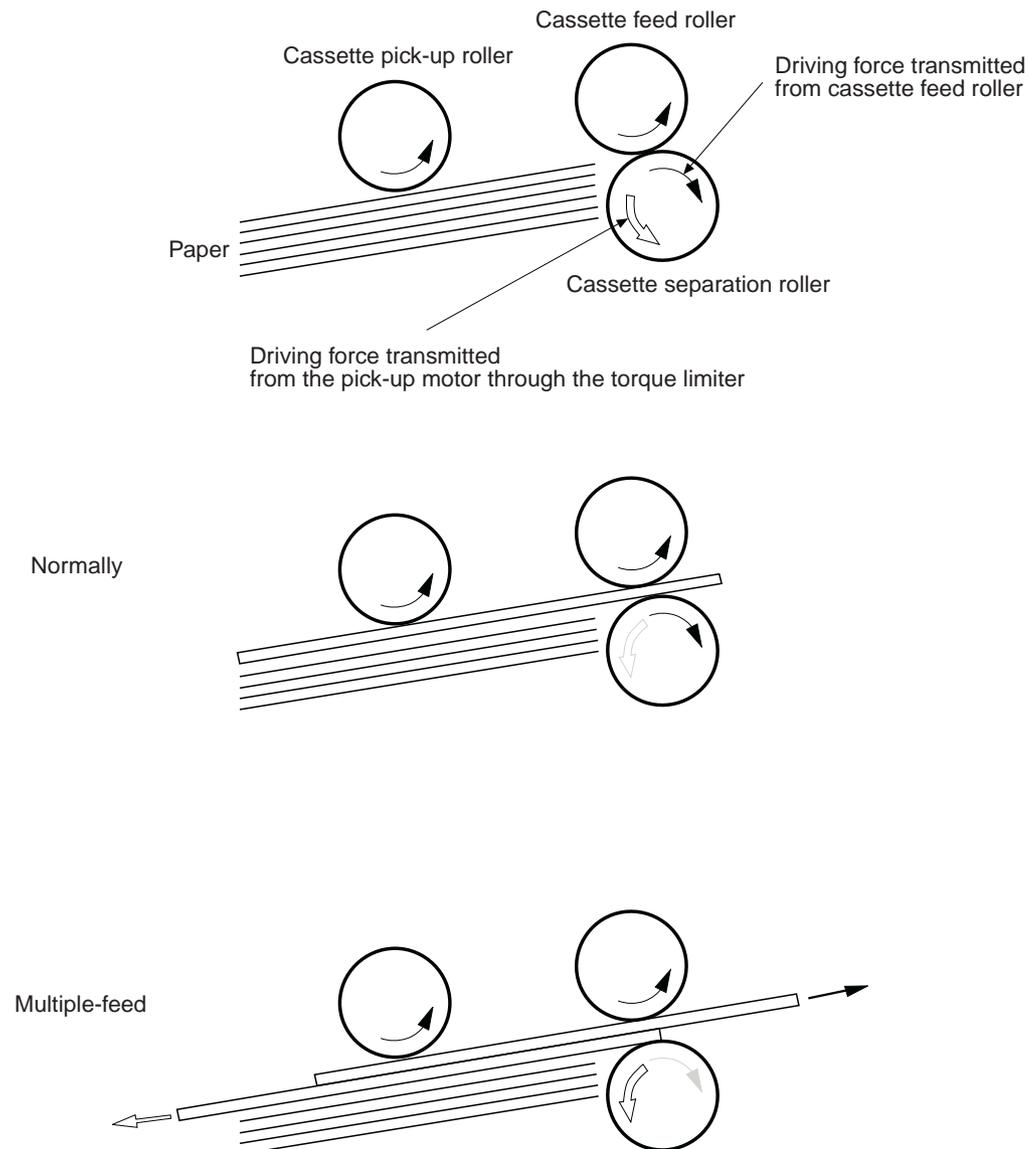


Figure 5-39 Media lifting

Skew correction

The skew correction mechanism compensates for the skew of feeding media. This MFP uses the registration shutter method to avoid decreasing throughput.

1. When the media is fed to the registration roller, the leading edge of the media hits the registration shutter to compensate for the skew feeding.
2. The media is warped as the feed roller keeps pushing the media with the condition that the media hit the registration shutter.
3. The stiffness of the media being warped lifts up the registration shutter and the media goes through the shutter. The skew-feed is corrected without decreasing throughput.

Figure 5-40 Skew correction on page 208 illustrates this process.

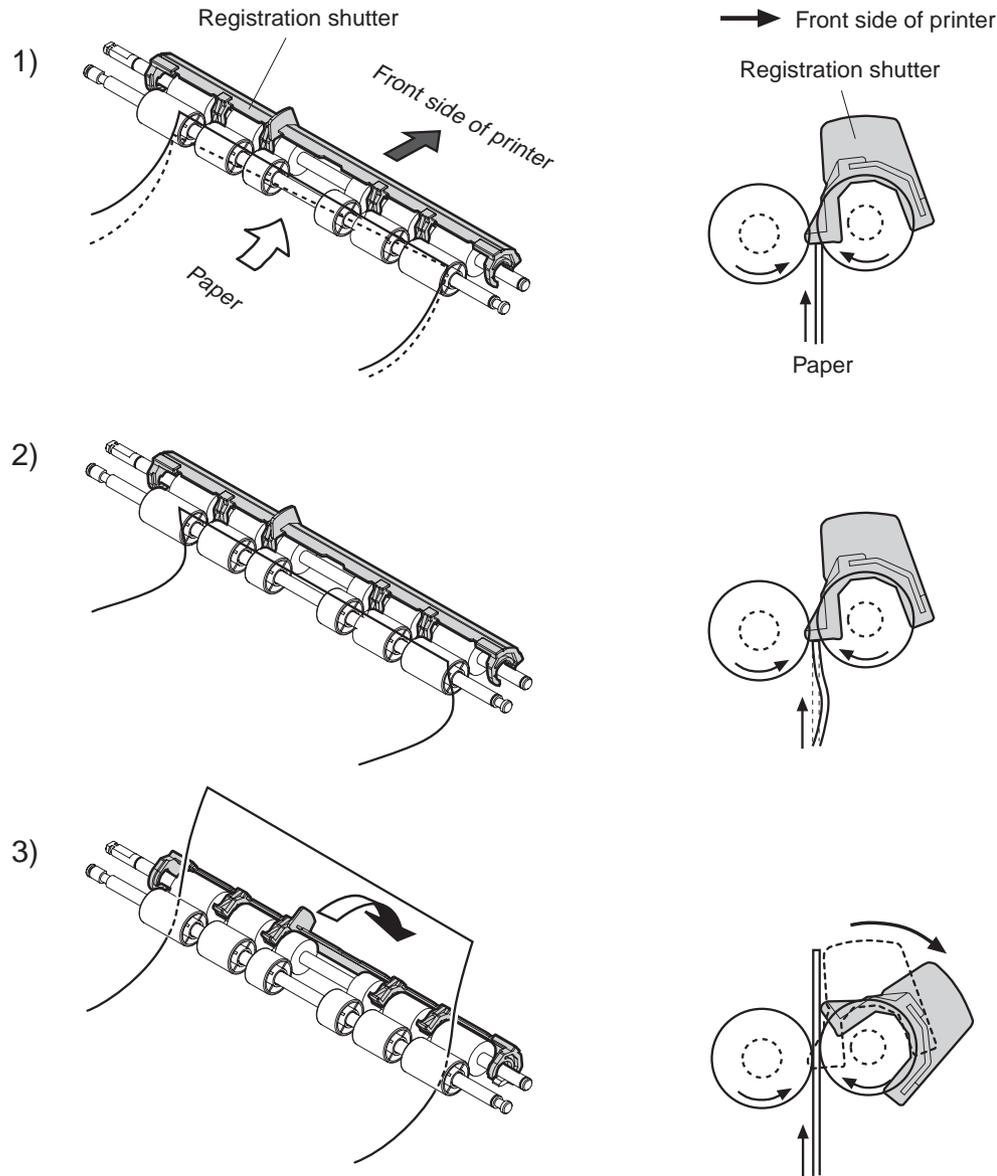


Figure 5-40 Skew correction

Media detection

This MFP detects the media types to select the optimum print mode automatically. The DC controller controls the media sensor during the printing operation for this detection. The media sensor contains a light emitter (LED) and a light receiver. The light from the emitter is reflected off the media surface or transmitted through the media. Each light is received at the light receiver.



NOTE The light receiver can detect even a slight difference in the light intensity because the high-density pixels are integrated in a very small area.

The DC controller turns the media sensor on when the picked-up media passes through the registration roller. Then it detects the roughness of the media surface, transmitted light intensity, and thickness according to the patterns (luminance distribution within specified area) of the detected light

by the receiver. Accordingly, the DC controller identifies the media type: either plain paper, thin paper, thick paper, gloss paper, gloss film, or overhead transparency, and notifies the formatter. [Figure 5-41 Media detection on page 209](#) illustrates this process.

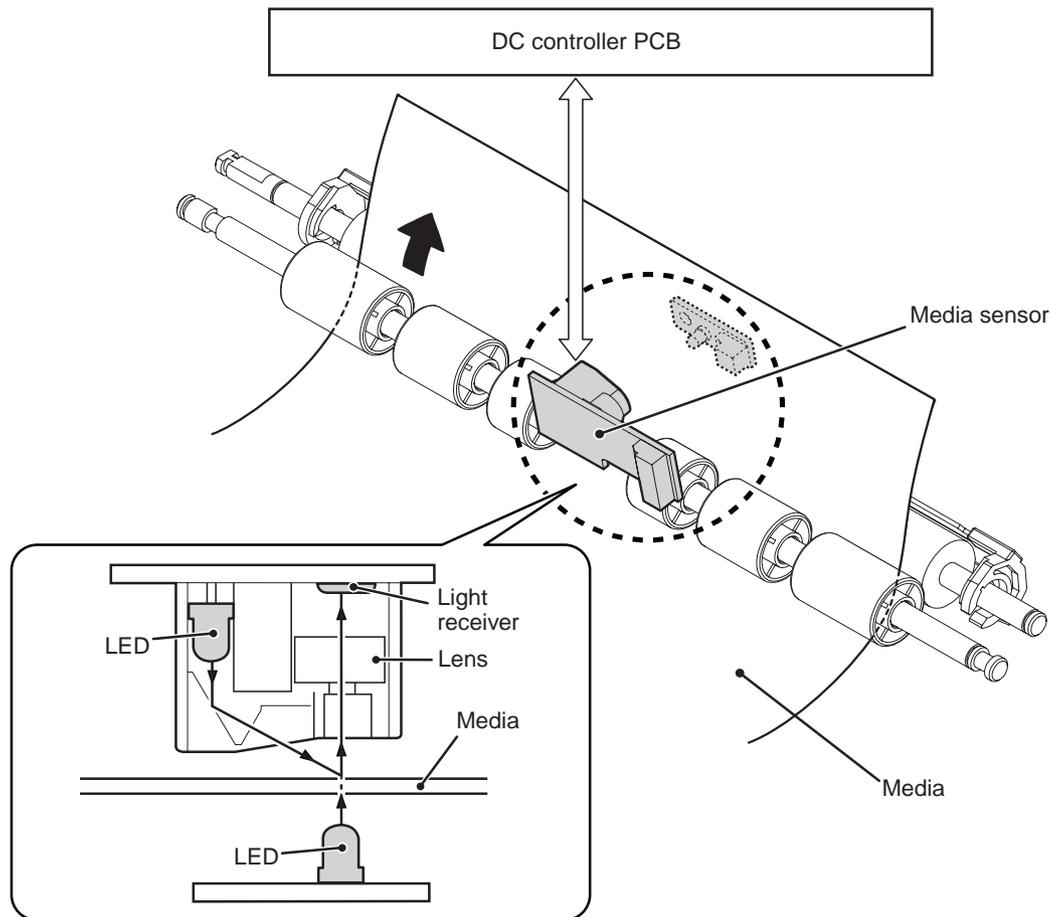


Figure 5-41 Media detection

The DC controller switches the media feeding speed according to the detected media type when the detected media type does not match the selected print mode.

If the DC controller fails to communicate with the media sensor during the media detection, it detects a media sensor failure and outputs a media sensor abnormality warning to the formatter.

Feed speed control

The type of media in the paper path dictates the speed at which it is fed. The DC controller can change the feed speed according to type of media. [Table 5-7 Paper size detection switch settings on page 209](#) shows the relationship between media type and feed speed.

Table 5-7 Paper size detection switch settings

Print mode	Media type	Feed speed
Normal	Plain paper	Normal speed
Normal gloss	Plain paper	1/2 speed
Rough	Rough paper	1/2 speed

Table 5-7 Paper size detection switch settings (continued)

Print mode	Media type	Feed speed
Thin	Plain paper	Normal speed
Thin rough	Rough paper	1/2 speed
Envelope	Envelope	1/2 speed
Label	Label	1/2 speed
Thick 1	Thick card/postcard	1/2 speed
Thick 2	Thick paper	1/3 speed
Gloss 1	Gloss paper	1/2 speed
Gloss 2 and 3	Gloss paper	1/3 speed
Overhead transparency	OHT film	1/3 speed
Gloss film	Gloss film	1/3 speed
Automatic	Plain paper, thin paper, thick paper, gloss paper, gloss film, overhead transparency	N/A

The DC controller performs the following controls depending on the specified print mode.

- **OHT mode.** If plain paper, other than OHT is detected, the DC controller determines a media misprint. The DC controller lets the printing operation continue under the OHT mode only when it detects the OHT. The same applies to the following sheets in a continuous printing. When the DC controller outputs the wrong media, it notifies the formatter, cuts off the secondary transfer bias, delivers the media, and then stops the printer engine.
- **Automatic mode.** When automatic mode is selected, the MFP starts the printing operation in the normal mode. If plain paper, thin paper, thick paper, gloss paper, gloss film, or OHT is detected, the DC controller switches the print mode to the appropriate mode and executes the printing operation. In continuous printing, the print mode will not change from the one selected for the first sheet. However, if the DC controller detects media different from the first page, it outputs a media misprint.
- **All other print modes.** If media other than OHT is detected, the DC controller continues the printing operation with the selected print mode. It outputs a media misprint only when it detects OHT. The same applies to the following sheets in the continuous printing.

Fusing and delivery block

The fuser/delivery unit is structured with two blocks. One is the fuser block that fuses toner on the media. The other is the delivery block, which delivers the fused media to the face-down tray or output device. The following is the operational sequence of the fuser/delivery unit.

1. The media with toner transferred on the ETB is fed to the fuser.
2. The paper warp is adjusted with the fuser motor speed control. The feeding speed differs between the ETB and the fuser, as different motors are used to drive them. This control keeps the media with a specified warp to prevent image defects and media transport defects.

3. The fusing sleeve and the fusing pressure roller fuse the toner onto the media. The media is then delivered from the fuser.
4. The image fusing media sensor (SR1) detects the media delivered from the fuser, and then delivers the media to the face-down tray or other output device.



NOTE If the face-down tray is full of media, the delivery tray paper-full sensor (SR2) detects that it is full. The DC controller determines the face-down tray media is full, notifies the formatter, delivers the media currently printing from the MFP, and stops the printer engine. When the stack of media on the face-down tray is removed, the SR2 detects the media absence and the printing operation resumes.

Loop control

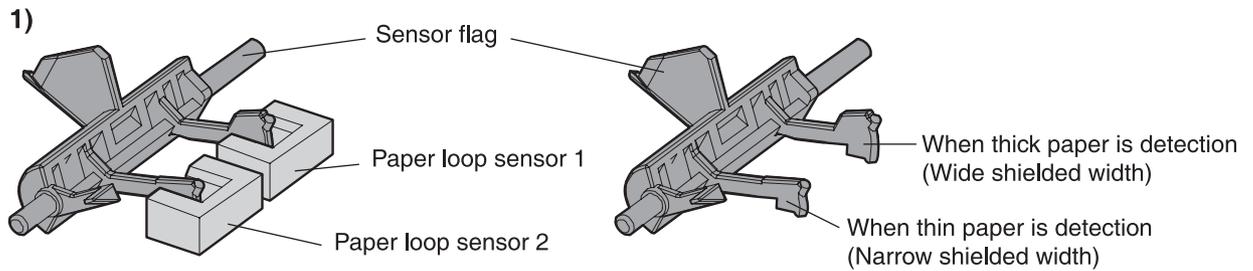
The media is delivered from the ETB to the fusing pressure roller maintaining the specified warp for the media type, to prevent image and media transport defects.

The feeding speed of the fusing pressure roller and the ETB are not exactly the same. The following problems might occur when the media is fed into the fuser.

- If the rotational speed of the fusing pressure roller is slower than that of the ETB, the media warp increases and an image defect or media crease might occur.
- If the rotational speed of the fusing pressure roller is faster than that of the ETB, the media warp decreases and a color misregistration in the sub-scanning direction occurs as the fusing pressure roller pulls the media.

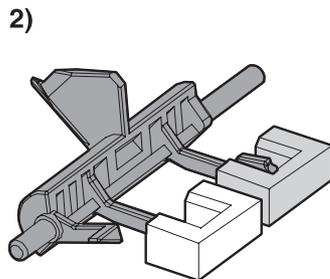
To resolve these issues, two sensors are used depending on the media type specified by the formatter. The sensors bifurcate the warp amount for thick paper and thin paper. The DC controller monitors the paper loop sensor 1 (SR13) and the paper loop sensor 2 (SR14) to maintain the paper warp at specified amount by changing the rotational speed of the fusing pressure roller.

[Figure 5-42 Loop control on page 212](#) illustrates this process.



Home position

Slow down the rotation of fuser pressure roller

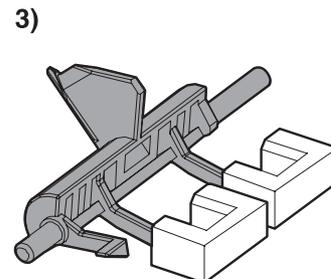


(At thick paper feeding)

Slow down the rotation of fuser pressure roller

(At thin paper feeding)

Speed up the rotation of fuser pressure roller



Speed up the rotation of fuser pressure roller

Figure 5-42 Loop control

Fusing pressure release mechanism

This mechanism automatically releases the fusing pressure to improve media removal and prevent fusing pressure roller deformation.

The DC controller rotates the cam driven by the fuser pressure release motor (M6) at the prescribed timing. The lifting plate is pushed down and the fusing pressure roller is released. The fusing pressure is released under the following conditions:

- When a paper jam occurs
- When the power is turned off
- When Sleep mode is ON/OFF

[Figure 5-43 Fusing pressure release on page 213](#) illustrates this process.

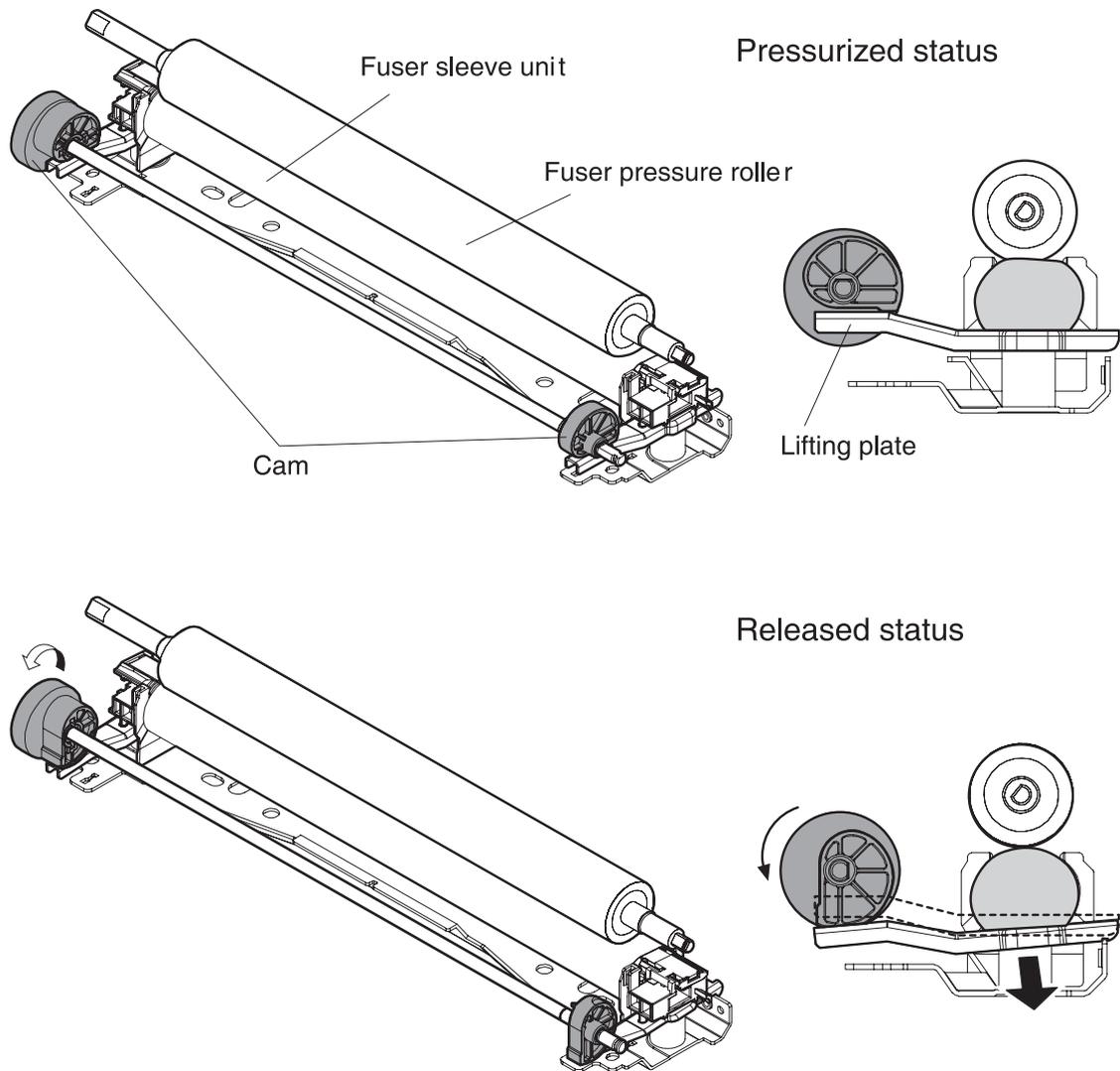


Figure 5-43 Fusing pressure release

Duplex feed unit

This MFP is equipped with an integrated duplexing unit. The duplexing reverse/duplexing feed unit is structured into two blocks.

One is the duplexing reverse block, that reverses paper in preparation for duplex printing. The second is the duplexing feed block, which delivers the reversed paper to the registration roller.

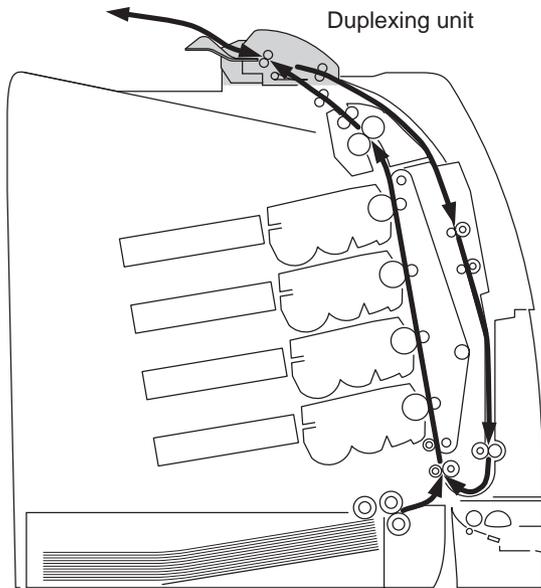


Figure 5-44 Duplex feed unit

The duplexing driver PCB controls the duplexing unit. An 8-bit microcomputer in the duplexing driver PCB controls the sequences of the duplexing unit and serial communication with the DC controller.

The DC controller sends a command to the duplexing driver PCB at the necessary time. The duplexing driver PCB drives each load, such as motors and solenoids, depending on these commands. The duplexing driver PCB relays the status information of the duplexing unit to the DC controller.

The MFP supplies +24VDC to the duplexing unit. The +3.3VDC is generated by +24V DC in the duplexing driver PCB, which works for the component devices such as sensors and ICs. [Figure 5-45 Duplexing driver PCB signal flow on page 214](#) shows the signal flow in the duplexing driver PCB.

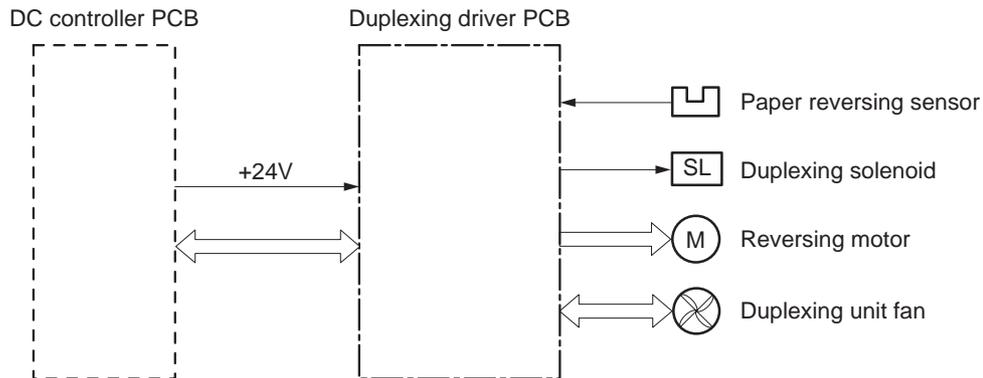


Figure 5-45 Duplexing driver PCB signal flow

Duplexing reverse/duplexing feed operation

The media fed to the duplexing unit goes to the opposite direction and proceeds hitting along the right plate by the oblique roller. This corrects the paper skew and the media is fed into the MFP. The operational sequence of the duplexing feed is described in [Figure 5-46 Duplexing feed on page 215](#).

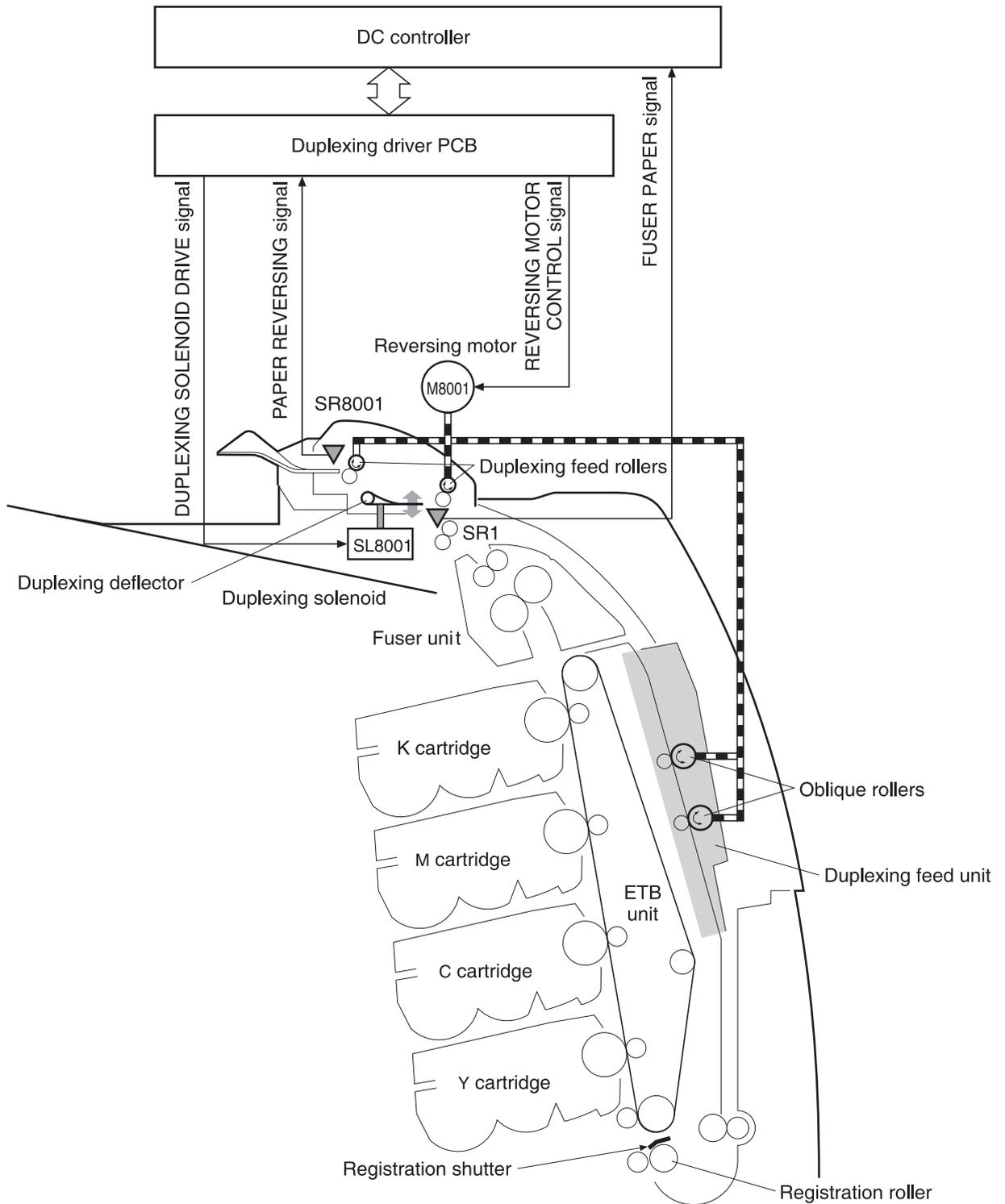


Figure 5-46 Duplexing feed

1. Media that has been printed on one side passes through the fuser.
2. The DC controller sends the reversing command to the duplexing driver at the specified time after the top of page sensor (SR12) detects the leading edge of paper. The prescribed time is when the media arrives at the fuser.

3. When the duplexing driver receives the reversing command, it turns on the duplexing solenoid (SL8001) to move the duplexing deflector. The duplexing driver also rotates the reversing motor (M8001) clockwise to feed the media to the duplexing unit.
4. The DC controller sends the duplexing pickup command to the duplexing driver after the prescribed time from when the fuser paper sensor (SR1) detected the trailing edge of paper. The prescribed time is when the media passes through the duplexing deflector.
5. The duplexing driver rotates the reversing motor (M8001) counter clockwise (CCW) to reverse the media and feed it to the duplexing feed unit when it receives the duplexing pickup command.
6. The media is fed while hitting its edge to the right guide by the oblique rollers in the duplexing feed unit. Consequently, the paper skew is corrected and the starting position of the image in main-scanning is determined.

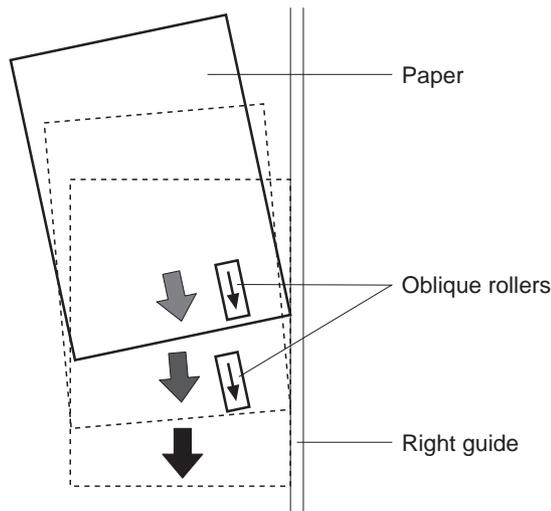


Figure 5-47 Paper skew correction

7. The paper skew is again corrected by the registration shutter. Then the media is printed on the other side and fed to the face-down tray or other output device.

The MFP can use the following three duplexing modes depending on the paper size and the print mode. The formatter specifies each duplexing print operation. However, it cannot specify the operation other than the printable size (LTR, legal, executive, A4, B5-JIS) and the print mode (normal, thick paper, thin paper, gloss paper, gloss film) for the duplexing print.

1. **Single sheet mode.** Duplexing of one sheet at a time (all paper sizes).
2. **Dual sheet mode.** Duplexing of two sheets moving at once (all paper sizes print except legal).
3. **Alternating complex mode.** Duplexing of three sheets moving at once (all paper sizes print except legal).

Jam detection

The MFP uses the following sensors to detect the presence of media and to check whether media is being fed correctly or has jammed:

- Top-of-page sensor (SR12)
- Fuser paper sensor (SR1)

- Delivery tray paper-full sensor (SR2)
- Reversing paper sensor (SR8001)

The microprocessor on the DC controller checks for jams by timing the media as it moves past these sensors. If the media does not pass the sensor in a specific period of time, the transport process is stopped (the motors are turned off and the rollers no longer rotate) and a jam message displays on the product control panel display.

Pickup delay jam

If the top-of-page sensor (SR12) does not detect the leading edge of the media within a specific period of time after the media is picked up, the microprocessor on the DC controller PCB determines that a pickup jam has occurred.



NOTE The MFP attempts to pick up the media several times before determining that a pickup jam exists. The number of pickup attempts depends on the source (for example, four attempts occur if tray 1 is the source).

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Pickup stationary jam

If the top-of-page sensor (SR12) continues to detect the leading edge of the media after a specific period of time has elapsed, the microprocessor on the DC controller PCB determines that a pickup stationary jam has occurred.

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Delivery delay jam

If the fuser paper sensor (SR1) does not detect the leading edge of the media within a specific period of time after the top-of-page sensor detects the media, the microprocessor on the DC controller PCB determines that a delivery delay jam has occurred.

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Door open jam

If the upper right cover, ETB cover, tray 1, IPTU door, or the 2 x 500-sheet paper deck door is opened during printing, the microprocessor on the DC controller PCB determines that a door open jam has occurred.

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message appears on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Residual paper jam

If the fuser paper sensor (SR1) detects paper during the WAIT or INTR period, or if the top-of-page sensor or fuser paper sensor detect paper during the automatic delivery period, the microprocessor on the DC controller PCB determines that a residual paper jam has occurred.

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Reversing unit jam 1

If the paper reversing sensor (SR8001) does not detect the leading edge of the media within a specified period after the duplexing driver receives a reversing command from the MFP, the microprocessor on the DC controller PCB determines that a reversing unit jam 1 has occurred.

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Reversing unit jam 2

If the paper reversing sensor (SR8001) continues to detect media for a specified period after it initially detects the media, the microprocessor on the DC controller PCB determines that a reversing unit jam 2 has occurred.

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message appears on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Duplexing pickup unit jam 1

If the top-of-page sensor (SR12) fails to detect the leading edge of media within the specified period after the duplexing driver receives a duplexing pickup command from the MFP, the microprocessor on the DC controller PCB determines that a duplexing pickup unit jam 1 has occurred.

The transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Automatic delivery function

Any residual paper within the MFP is automatically delivered when the power is turned on or when printing starts. If the top-of-page sensor (SR12) detects paper during the WAIT period, the DC controller PCB detects that residual paper is present, notifies the formatter, and stops printing. The controller drives the motors and delivers the residual paper to the MFP when it receives an automatic delivery command from the formatter.

Scanner system

The scanner system adds copying and sending functions to the standard MFP printing function. The scanner assembly consists of an automatic document feeder (ADF) and a flatbed scanner glass surface.

Original documents that are fed through the ADF are delivered to the ADF output bin, which is underneath the ADF input tray. Printed copies are delivered to the output device that is attached to the print engine.

The scanner unit has built-in duplexing capability for scanning two-sided documents.

[Figure 5-48 ADF mechanical structure on page 219](#) shows a cross-section of the ADF.

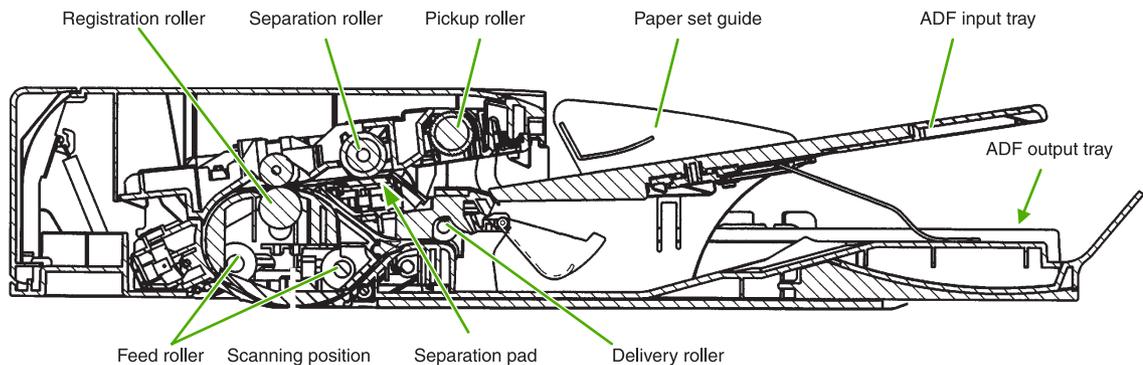


Figure 5-48 ADF mechanical structure

Electrical system

The scanner assembly electrical system consists of the following components:

- Charged coupled device (CCD) PCB
- Inverter PCB
- Scanner PCB
- ADF PCB
- ADF LED PCB

The scanner assembly is connected to the print engine formatter through a flat, flexible cable.

[Figure 5-49 Scanner assembly electrical structure on page 220](#) shows the scanner assembly electrical structure.

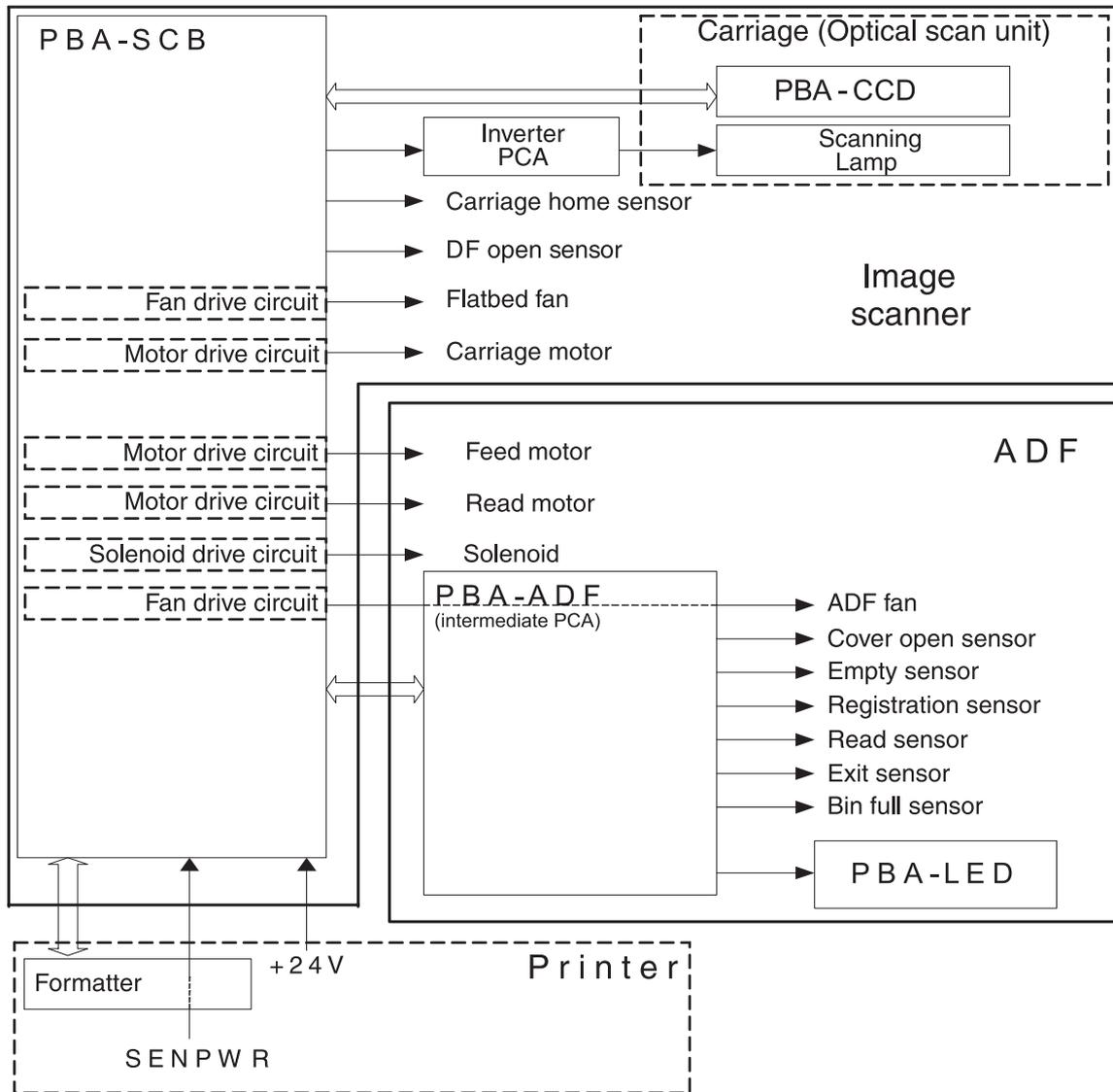


Figure 5-49 Scanner assembly electrical structure

Motors and fans

The scanner assembly has five motors and two fans. Three of the motors are stepping motors, which drive the components inside the scanner assembly. The remaining two motors are DC motors, which drive the two fans.

Name	Purpose	Type	Rotation	Failure detection
Carriage motor	Drives the carriage unit	Stepping motor	Varies	No
Feed motor	Drives the pickup, separation, and registration rollers	Stepping motor	Varies	No
Read motor	Drives the feed and delivery rollers	Stepping motor	Counterclockwise	No

Name	Purpose	Type	Rotation	Failure detection
Flatbed fan	Cools the scanner lamp and the CCD	DC motor	Clockwise	Yes
ADF fan	Cools the motors	DC motor	Clockwise	Yes

Optical assembly

The optical assembly contains the scan carriage and the scanner glass. The scan carriage contains the lamp, five mirrors, a lens, and the CCD.

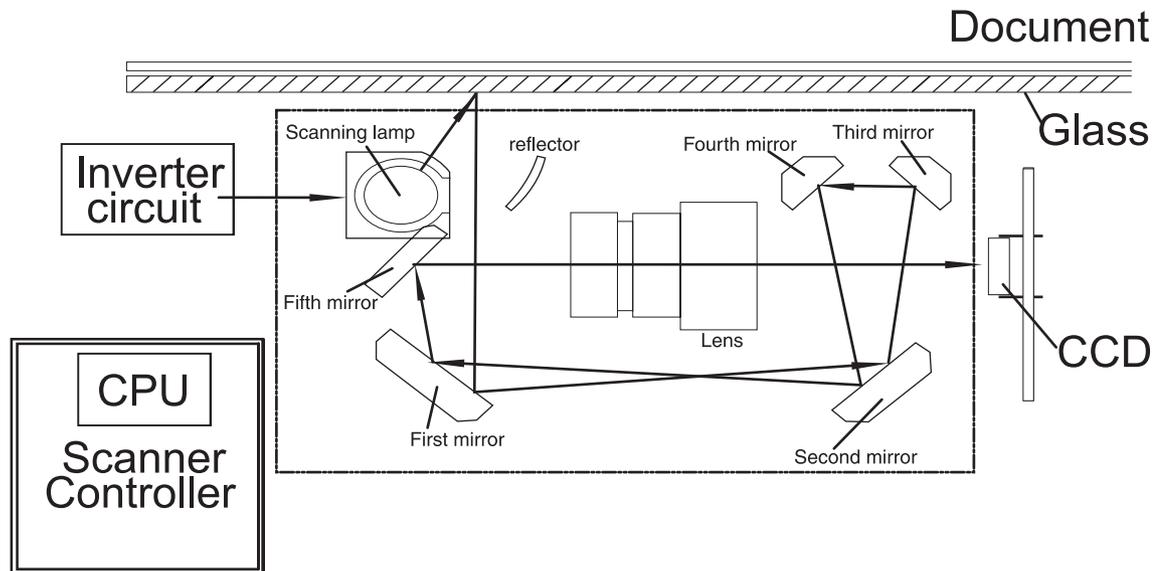


Figure 5-50 Scan carriage components

The scanner lamp illuminates a small strip of the document (called the raster line). The mirrors direct the light through the lens to the CCD. The CCD senses and records the light, creating an analog representation of the raster line. If the ADF is being used, the document then advances in the ADF to the next raster line. If the flatbed is being used, the carriage advances to the next raster line. This advancing and collection process continues to the end of the sheet.

The image data is collected on the scanner controller PCB, where it is processed and sent to the formatter.

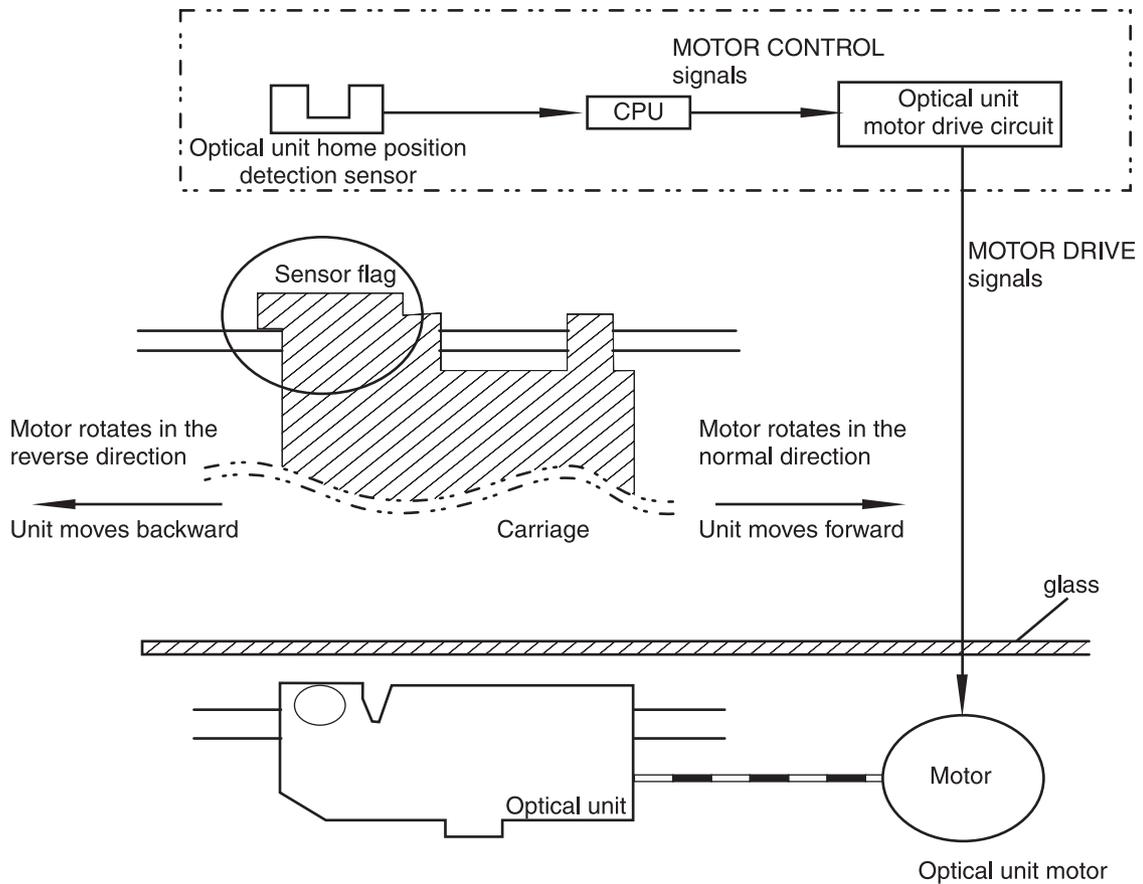


Figure 5-51 Scan carriage movement

ADF feed system

Pages from the original document enter the ADF from the ADF input tray. A separation roller and separation pad work together to separate the top sheet from the stack. The page passes through a set of registration rollers and two sets of feed rollers that advance the page. A set of delivery rollers delivers the page to the ADF output bin. A bin-full sensor detects when the ADF output bin is full, and stops the feed mechanism until the bin is emptied.

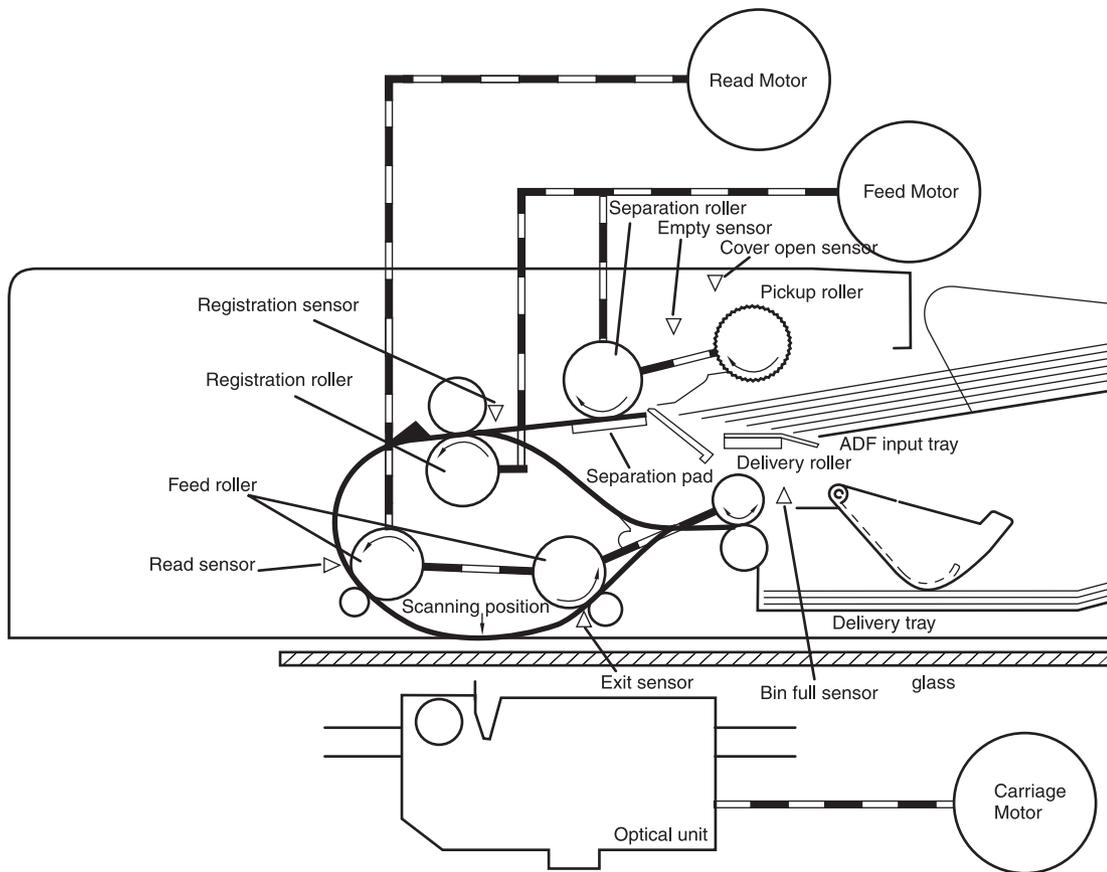


Figure 5-52 ADF paper path and sensors

ADF jam detection

When the sensors inside the ADF detect a jam, the feed and read motors immediately stop and send a signal to the scanner controller PCB, which notifies the formatter. An **ADF Paper Jam** message displays on the product control panel display.

To clear a jam, open the jam access cover and remove the media. If no sensors detect media after the jam access cover is closed, the jam message is cleared from the product control panel display.

Residual media jam

During the initialization sequence or after the ADF jam cover has been opened and closed, the registration sensor, read sensor, and exit sensor are checked for residual media jams. If a sensor detects the presence of media, the scanner controller PCB detects a residual media jam.

ADF pickup jam

If the leading edge of the media did not reach the registration sensor within a specific period of time, the scanner controller PCB determines that an ADF pickup jam has occurred.

ADF jam

Jams can occur in three places inside the ADF: at the registration sensor, read sensor, and exit sensor.

Registration sensor jam

If the registration sensor does not detect the trailing edge of the media after the leading edge reaches the scan ready position, the scanner controller PCB determines that an ADF paper jam has occurred.

Also, when the scanner duplexer is being used, if the registration sensor does not detect the leading edge of the media after a specific period of time after media enters the duplexer, the scanner controller PCB determines that a jam has occurred.

Read sensor jam

If the read sensor does not detect the leading edge of the media within a specific period of time, or if the read sensor does not detect the trailing edge of the media within a specific period of time after it detects the leading edge, the scanner controller PCB determines that a jam has occurred.

Exit sensor jam

If the exit sensor does not detect the leading edge of the media within a specific period of time after the leading edge reaches the read sensor, or if the exit sensor does not detect the trailing edge of the media within a specific period of time after the read sensor detects the trailing edge, the scanner controller PCB determines that a jam has occurred.

ADF cover-open jam

If the ADF jam access cover is opened while media is feeding through the ADF, a jam occurs.

ADF open jam

If the ADF is opened while media is feeding through the ADF, a jam occurs.

2 X 500-sheet paper feeder

The MFP includes a 500-sheet paper tray (tray 2) and a larger paper deck that contains two 500-sheet feeders (trays 3 and 4). The paper path is shown below.

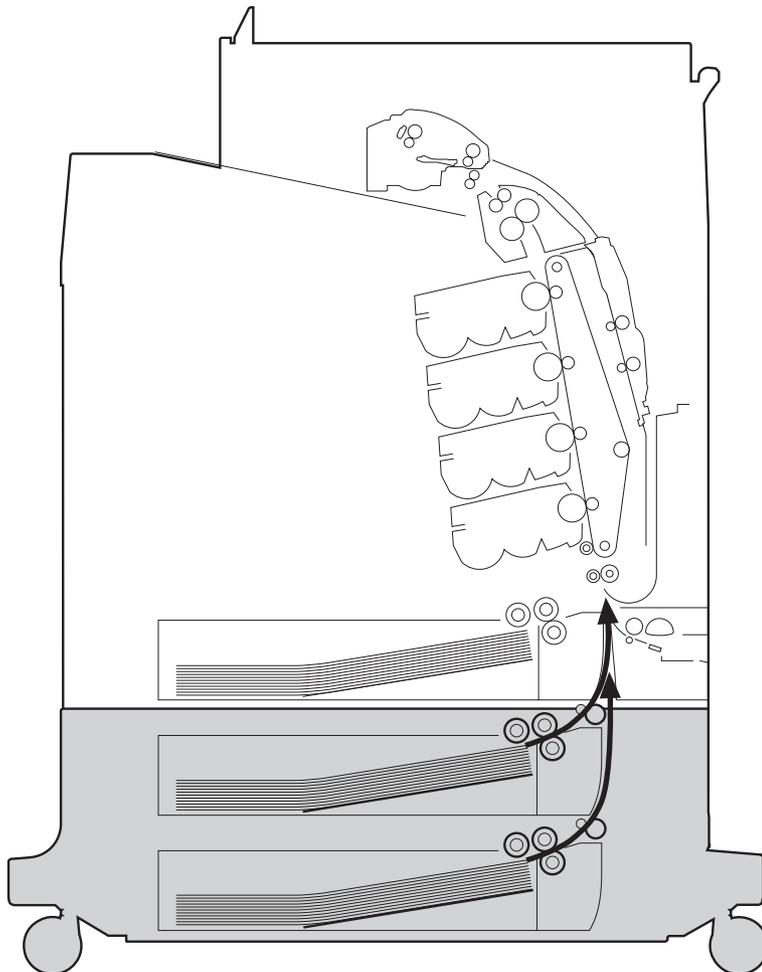


Figure 5-53 2 X 500-sheet feeder paper path

The paper feeder driver PCB controls the 2 X 500-sheet feeder operation sequences. The microprocessor in the paper feeder driver controls the 2 X 500-sheet feeder sequences and the communication with the DC controller PCB.

The paper feeder driver drives the solenoid in response to the pickup command. The paper feeder driver also reports the paper feeder status to the DC controller PCB.

The MFP delivers a charge of +24 V to the paper feeder, which then generates +3.3 V for the integrated circuits.

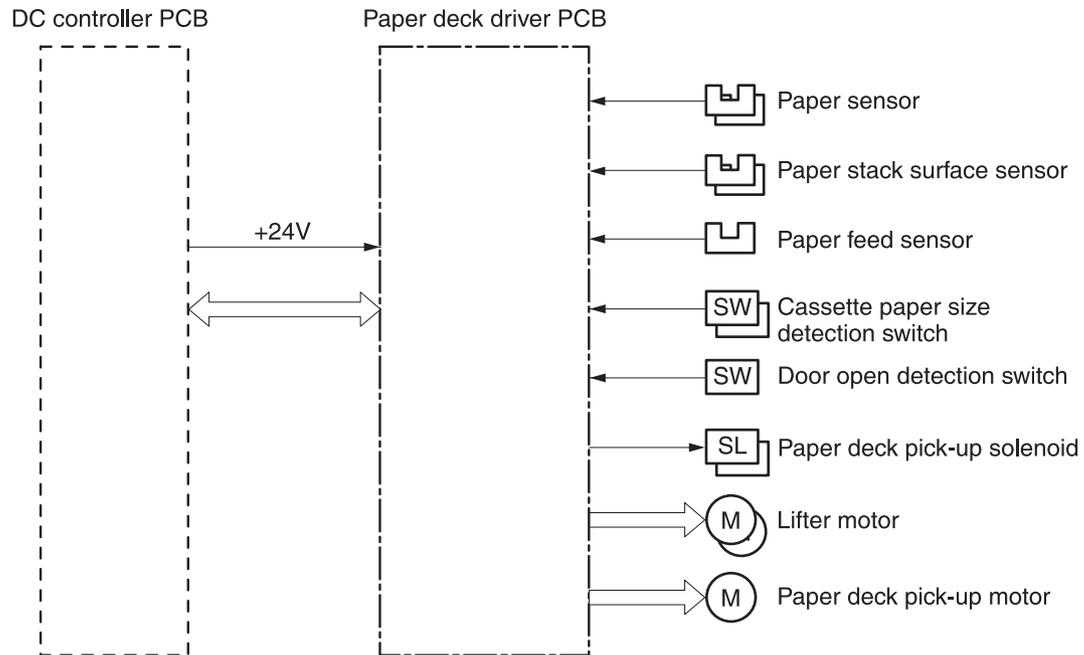


Figure 5-54 2 X 500-sheet feeder I/O block diagram

Pickup and feed operations

The paper pickup and feeding processes for the 2 X 500-sheet feeder are identical to the processes used for tray 2. See [Figure 5-54 2 X 500-sheet feeder I/O block diagram on page 226](#). The [Figure 5-55 2 X 500-sheet feeder pickup and feed diagram on page 227](#) identifies the components of the 2 X 500-sheet feeder.

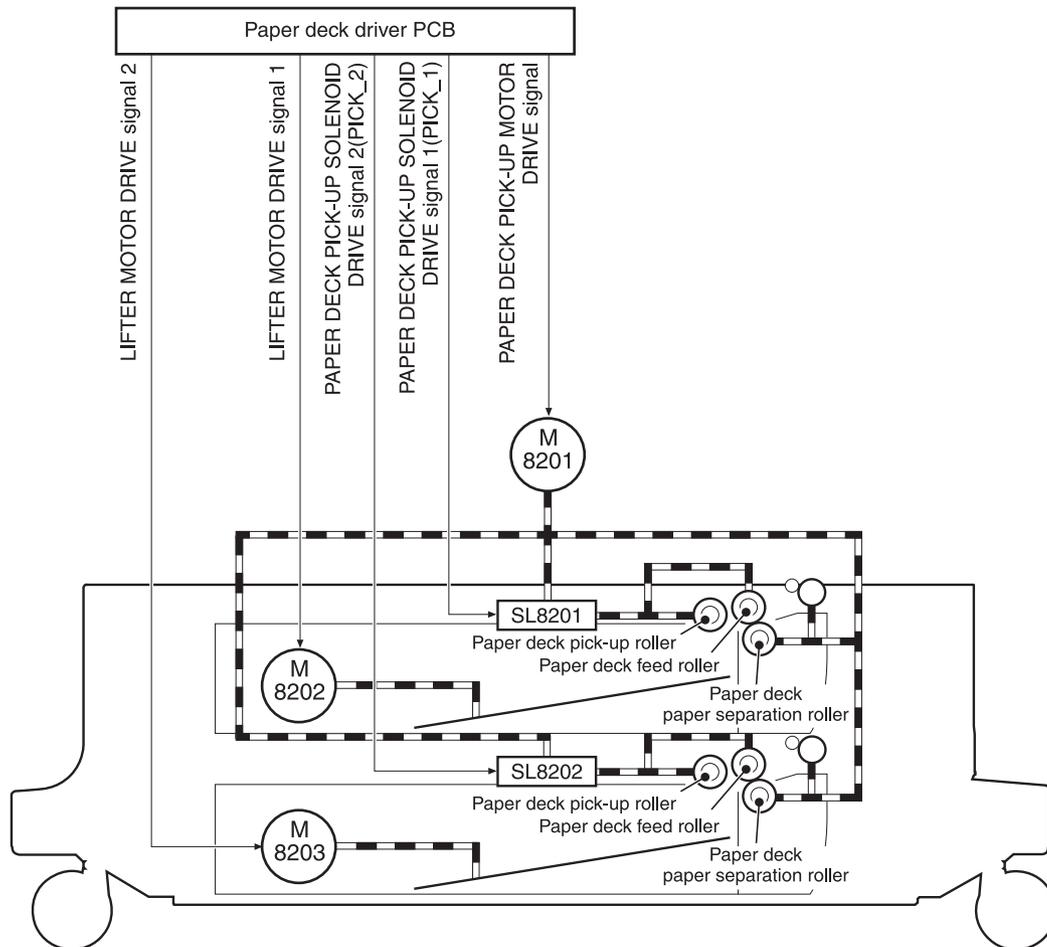


Figure 5-55 2 X 500-sheet feeder pickup and feed diagram

1. The DC controller receives a print command from the formatter and sends a pickup command to the paper feeder driver.
2. The paper feeder driver rotates the pickup motor (M8101) in the paper feeder, and the feed roller and the paper feeder separation roller start to rotate.
3. The DC controller sends the paper feeder pickup start command to the paper deck driver PCB after the scanner is ready.
4. The paper deck driver PCB then rotates the paper deck pickup motor (M8201) clockwise to rotate the paper deck feed roller.
5. The paper deck driver PCB turns on the paper feeder pickup solenoids (SL8201 and SL8202) to rotate the paper deck pickup roller and the paper feeder feed roller. At the same time, the PCB lowers the paper feeder pickup roller. As the pickup roller lowers, it contacts the media surface and media in the cassette is fed into the MFP.
6. The separation roller eliminates extra sheets, and a single piece of media enters the feed path.
7. If the paper stack level goes down to the specified level according to the pickup operation, the paper lifting operation is performed.



NOTE Paper-size detection, multiple-feed prevention, and jam detection for the 2 X 500-sheet feeder function in the same manner as the rest of the MFP.

NOTE Paper lifting operation for the 2 X 500-sheet feeder is the same as that of tray 2, except that the paper feeder driver PCB controls this operation instead of the DC controller.

2 X 500-sheet jam detection

The paper feed sensor (SR8201) detects abnormal feed operation in the 500-sheet paper feeder. These jams can occur:

- **Paper deck pickup delay jam:** If the paper feed sensor (SR8201) does not detect the leading edge of the media within a specified period after the paper is picked up, the microprocessor on the DC controller PCB determines that a pickup jam has occurred.
- **Paper deck pickup stationary jam:** If the paper feed sensor (SR8201) continues to detect paper after a specific period of time has elapsed, the microprocessor on the DC controller PCB determines that a paper deck pickup stationary jam has occurred.

For other jams, see [Jam detection on page 216](#).

Output devices

This section describes the theory of operation for these components:

- [IPTU](#)
- [3-bin mailbox](#)
- [Stapler/stacker](#)

IPTU

The IPTU (intermediate paper transfer unit) is installed at the face-down delivery area of the MFP. Its function is to transfer paper to the installed output device, such as the stapler/stacker and the 3-bin mailbox. The standard face-down tray should be removed when installing the IPTU. Paper flow is illustrated in [Figure 5-56 IPTU paper path on page 229](#).

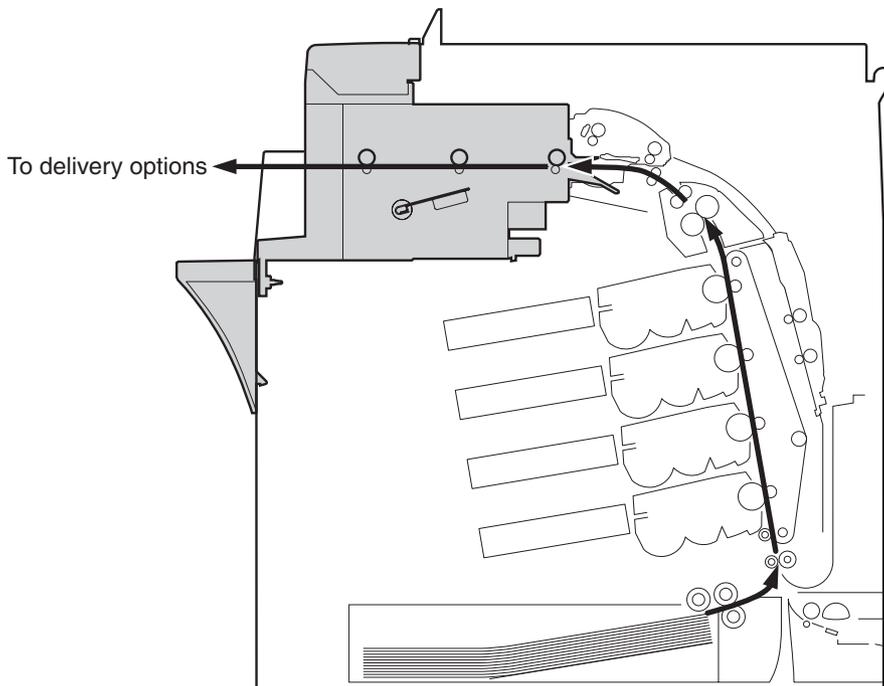


Figure 5-56 IPTU paper path

The IPTU is controlled by the intermediate paper transfer driver PCB (IPTD PCB). The IPTD PCB controls the IPTU sequencing and communicates with the DC controller. The DC controller sends commands to the IPTD PCB at appropriate points in the printing process and the IPTD PCB drives motors in response to these commands. The IPTD PCB submits status information to the DC controller.

The MFP supplies +24VDC to the IPTU. The +3.3V for IC is generated by +24V in the IPTD PCB. [Figure 5-57 IPTU PCB flow on page 230](#) shows the signal flow in the IPTD PCB.

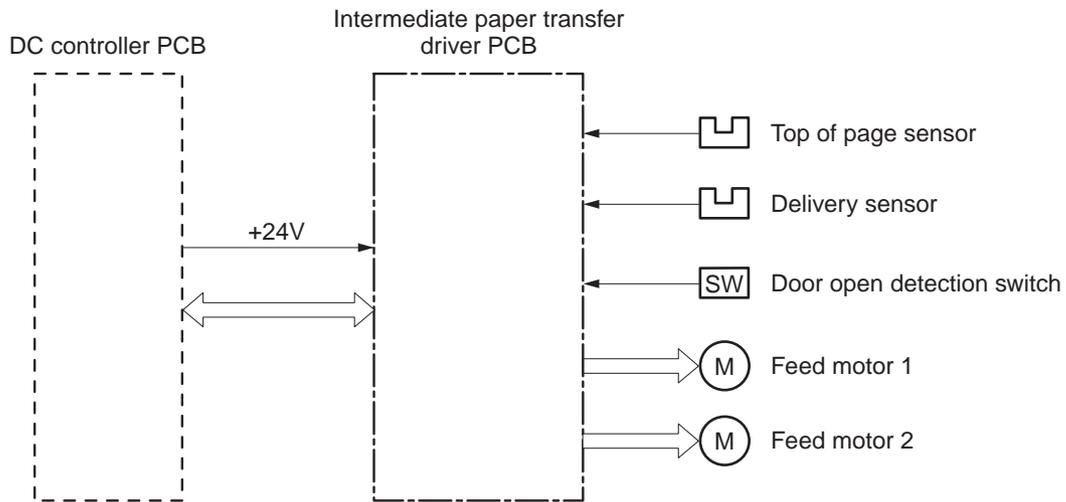


Figure 5-57 IPTU PCB flow

IPTU transfer operation

The IPTU delivers the fused paper to the output device in the operation shown in [Figure 5-58 IPTU transfer operation on page 231](#).

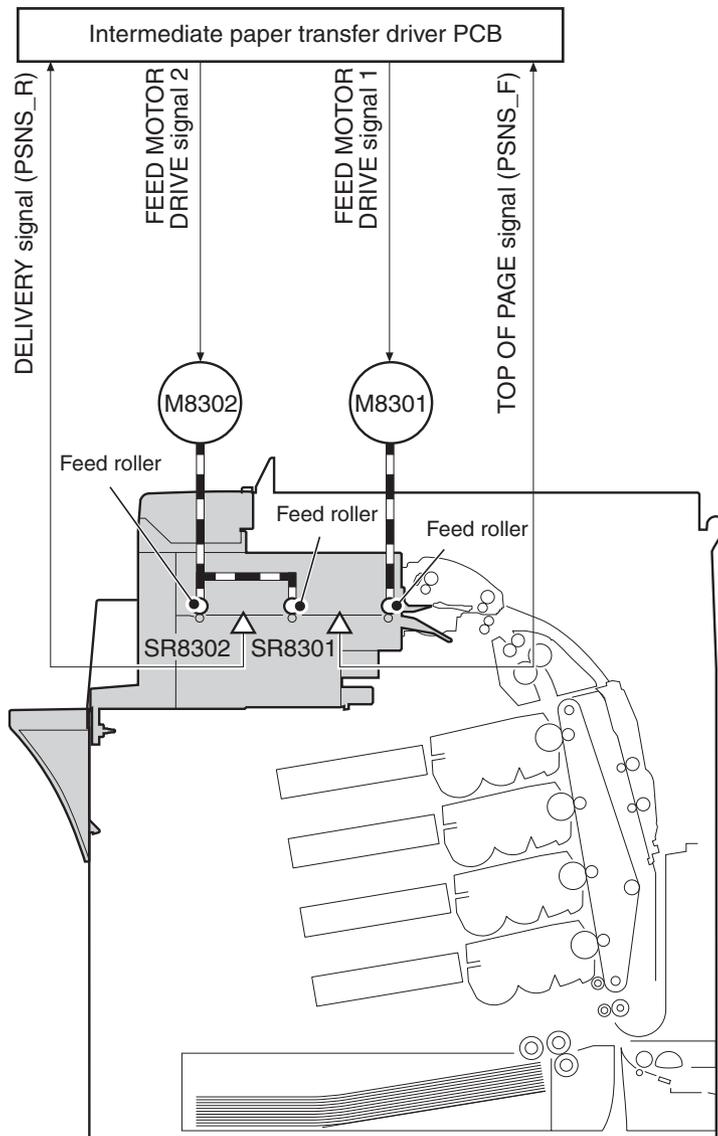


Figure 5-58 IPTU transfer operation

1. The paper, which has completed the fusing operation, is transferred to the IPTU.
2. The DC controller sends the drive start command to the IPTD when the fusing paper sensor (SR1) detects the leading edge of the paper.
3. The IPTD turns feed motor 1 (M8301) and feed motor 2 (M8302) ON to rotate the feed rollers upon receiving the drive start command.
4. The feed rollers deliver the paper to the output device.

IPTU jam detection

The IPTU is equipped with paper detection sensors to detect the presence of paper and to determine operational status:

- Top of page sensor (SR8301)
- Delivery sensor (SR8302)

The CPU on the IPTD PCB determines a paper jam by checking whether paper is present at the sensors at the checking timing. The checking timing is stored in the memory of the CPU. If the CPU determines a jam, it stops the intermediate paper transfer operation and notifies the MFP of the jam.

Pickup delay jam

The CPU determines a pickup delay jam when the top-of-page sensor (SR8301) does not detect the paper within the specified period after the cassette pickup solenoid (SL2) or the MP tray pickup solenoid (SL1) is turned ON.

Pickup stationary jam

The CPU determines a pickup stationary jam when the top-of-page sensor (SR8301) does not detect the trailing edge of the paper within the specified period after the top-of-page sensor (SR8301) detects the leading edge.

Delivery delay jam

The CPU determines a delivery delay jam when the delivery sensor (SR8302) does not detect the leading edge of the paper within the specified period after the top-of-page sensor (SR8301) detects the trailing edge.

Delivery stationary jam

The CPU determines a delivery stationary jam when the delivery sensor (SR8302) does not detect the trailing edge of the paper within the specified period after the top-of-page sensor (SR8301) detects the trailing edge.

3-bin mailbox

When the 3-bin mailbox (MBM) is installed, it receives printed media from the print engine and delivers it to one of its three bins. The 3-bin mailbox has the following components:

- One feed motor that drives the rollers
- Two solenoids that operate the inlet deflector and the bin deflector
- Six sensors that detect the presence of print media and the stack height in the output bins
- One switch that determines whether the 3-bin mailbox is attached to the MFP correctly
- One fan that cools components inside the 3-bin mailbox

The 3-bin mailbox has three operating modes: stacker mode, mailbox mode, and function separator mode.

The MBM driver PCB controls all functions in the 3-bin mailbox. To deliver media to the different bins, the inlet deflector and the bin deflector change position as required.

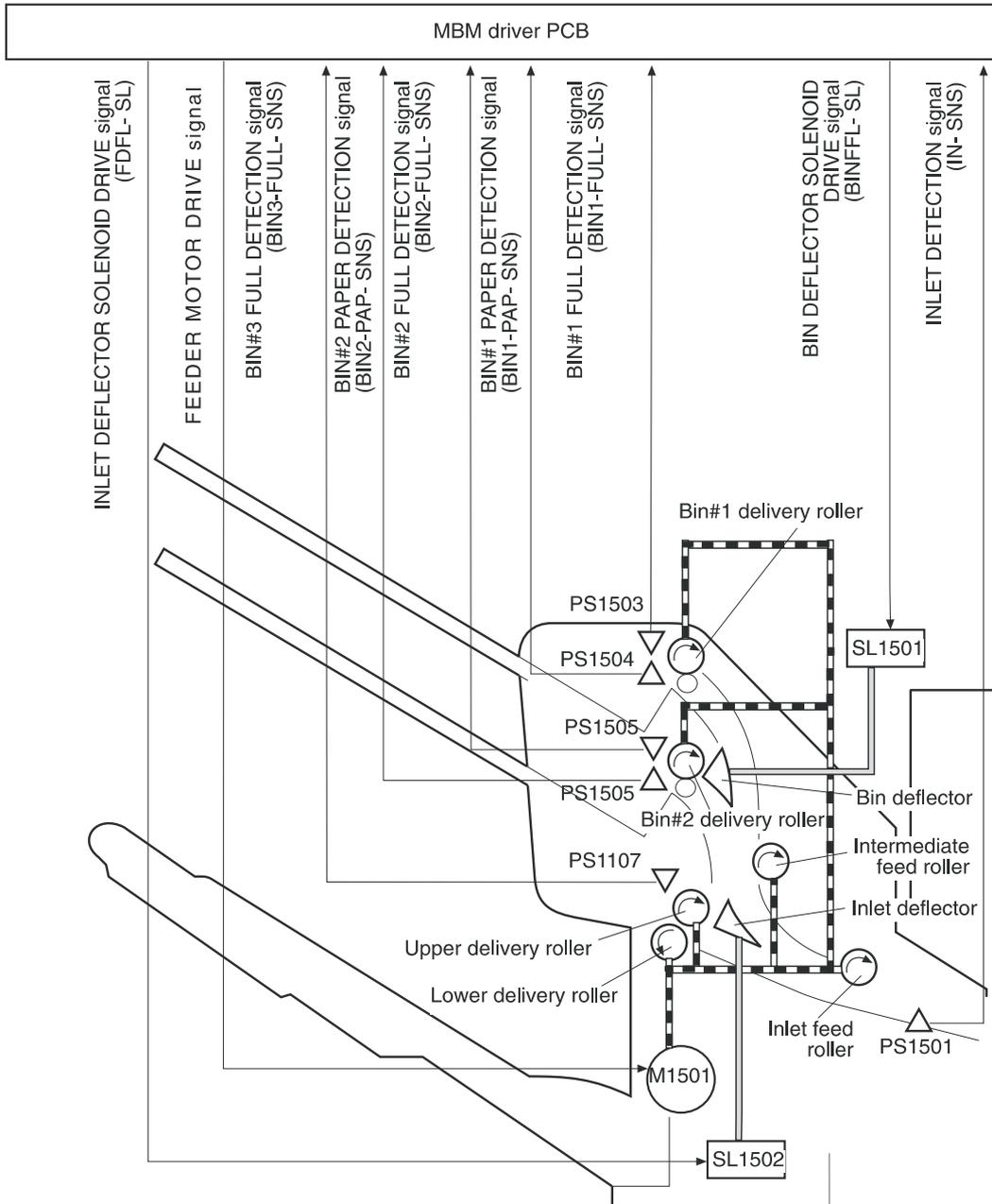


Figure 5-59 3-bin mailbox operation

Stacker mode

When configured for stacker mode, the 3-bin mailbox fills the bottom output bin (bin 3) first and then fills the next highest bin.

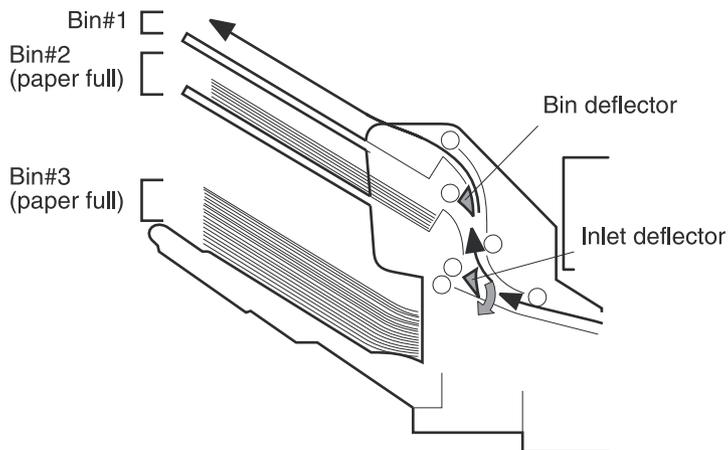


Figure 5-60 Media flow when using the stacker mode

Mailbox mode

When configured for mailbox mode, the 3-bin mailbox stacks print media in each bin as determined by the print job specifications. For example, one user might have all jobs delivered to the bottom bin, and another user might have all jobs delivered to the top bin.

Function separator mode

When configured for function separator mode, the 3-bin mailbox delivers print media to each bin as specified by the job type. For example, all copy jobs might be delivered to the top bin, and all faxes might be delivered to the middle bin.

3-bin mailbox jam detection

The 3-bin mailbox uses the inlet sensor (PS1501) to detect jams. The microprocessor on the MBM driver PCB determines a jam situation if the sensor indicates that media is present at an unexpected time or that media is not present at the expected time. The microprocessor on the MBM driver PCB notifies the formatter that a jam has occurred.

When a jam is detected, the transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Feed delay jam

If the inlet sensor (PS1501) does not detect the leading edge of the media within a specific time period after receiving a delivery notice command, the microprocessor on the MBM driver PCB determines that a feed delay jam has occurred. The time interval is longer for face-up delivery than for face-down delivery.

Feed stationary jam

If the inlet sensor (PS1501) does not detect the trailing edge of the media within a specific time period after it detects the leading edge, the microprocessor on the MBM driver PCB determines that a feed stationary jam has occurred.

Residual media jam

If the inlet sensor (PS1501) detects the presence of media during the initial WAIT period, the microprocessor on the MBM driver PCB determines that a residual media jam has occurred.

Stapler/stacker

When the stapler/stacker is installed, it receives print media from the print engine and delivers it to the stapler or stacks it in the output bin. The stapler/stacker has the following components:

- Four motors that operate the paddle, the jogger, the feed mechanism, and the stapler unit
- One clamp solenoid
- Nine sensors that detect the media position and guide positions
- One switch that detects when the stapler door is open

The stapler/stacker has two operating modes: staple mode and stacker mode.

The stapler/stacker driver PCB controls all functions in the stapler/stacker.

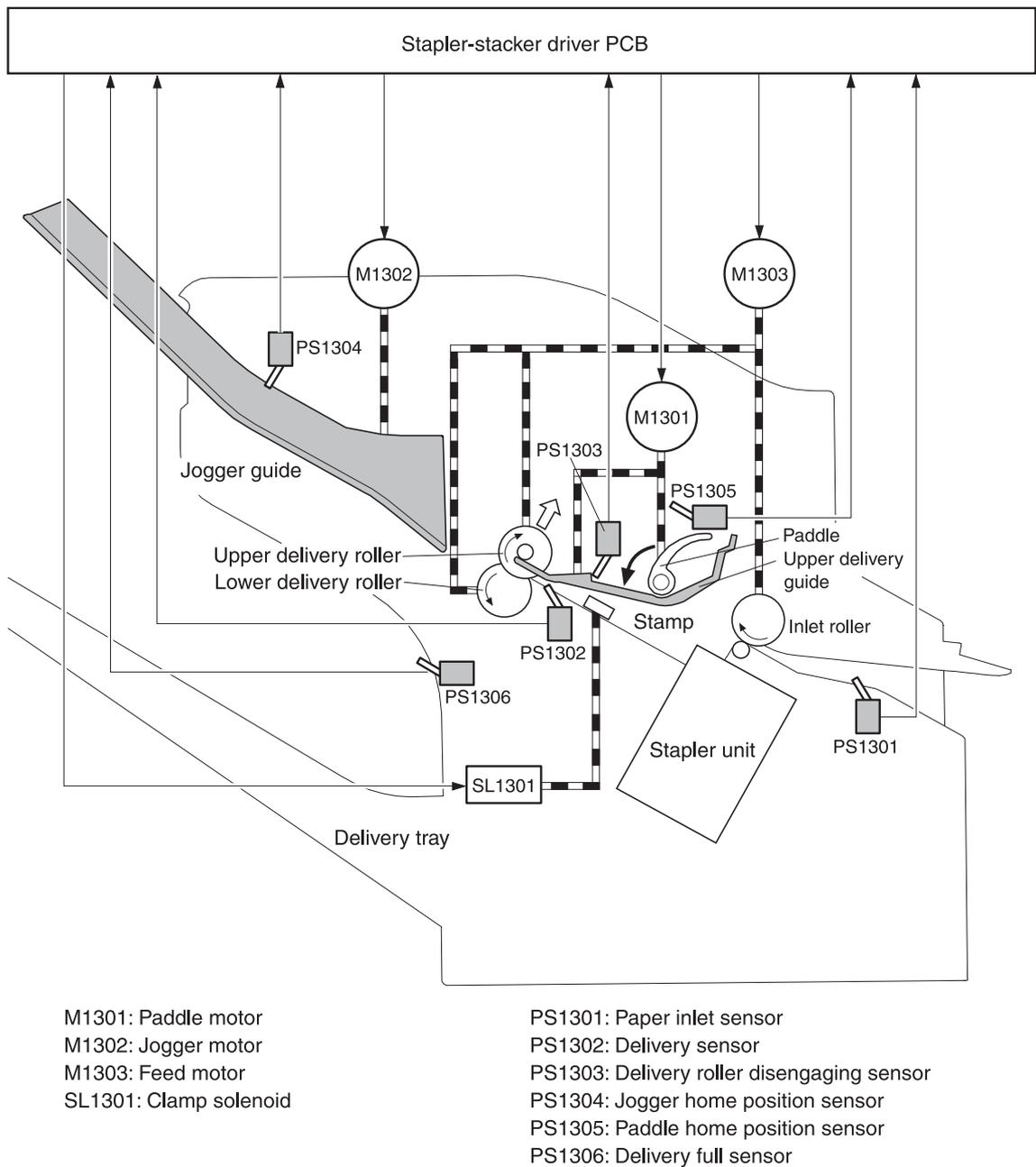


Figure 5-61 Stapler/stacker operation

Staple mode

When the print job specifications require stapling, the pages of the document are gathered inside the unit. A jogger aligns the pages horizontally, and a paddle aligns the pages vertically. When all pages of a job are gathered, a clamp compresses the stack and a staple is attached.

After the document is stapled, the jogger guides spread apart to release the stack, and the stapled document falls into the stacker bin.

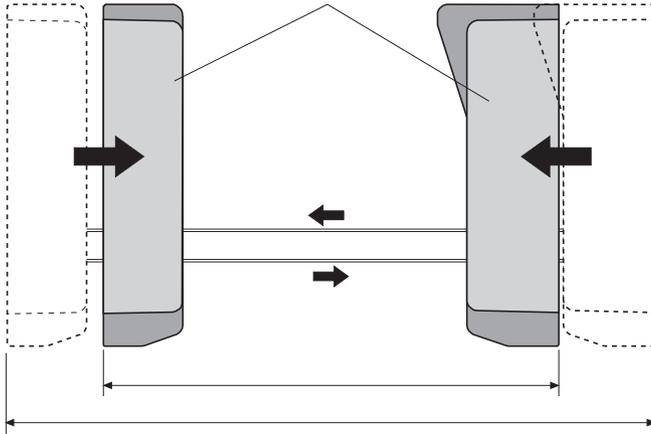


Figure 5-62 Jogger operation (top view)

Stacker mode

The stacker mode collates multiple-page print jobs without stapling them.

When the print job requires no stapling, the pages of the document are gathered inside the unit. A jogger aligns the pages horizontally, and a paddle aligns the pages vertically. When all pages of a job are gathered, the jogger guides spread apart, releasing the stack, and the document falls into the stacker bin without being stapled.

Staple jam detection

The stapler/stacker uses the inlet sensor (PS1301) and the delivery sensor (PS1302) to detect jams. The microprocessor on the stapler/stacker driver PCB determines a jam situation if the sensor indicates that paper is present at an unexpected time or that paper is not present at the expected time. The microprocessor on the stapler/stacker driver PCB notifies the formatter that a jam has occurred.

When a jam is detected, the transport process stops and a **13.%1\$2:02X.%2\$1:X%3\$1:X FUSER JAM** message displays on the product control panel display. For more information about jam messages, see [Resolving control panel messages on page 488](#).

Feed delay jam

If the inlet sensor (PS1301) does not detect the leading edge of the media within a specific time period after receiving a delivery notice command, the microprocessor on the MBM driver PCB determines that a feed delay jam has occurred.

Feed stationary jam

If the inlet sensor (PS1301) does not detect the trailing edge of the media within a specific time period after it detects the leading edge, the microprocessor on the MBM driver PCB determines that a feed stationary jam has occurred.

Delivery stationary jam

If the delivery sensor (PS1302) does not detect the trailing edge of the media within a specific time period after the feed motor has begun rotating, the microprocessor on the MBM driver PCB determines that a delivery stationary jam has occurred.

Residual media jam

If the inlet sensor (PS1301) detects the presence of media during the initial WAIT period, the microprocessor on the MBM driver PCB determines that a residual media jam has occurred.

Stapler unit

The stapler unit holds the staple cartridge and the staple motor. The staple cartridge contains up to 10,000 staples. The stapler unit also has three sensors that detect the presence of staples and staple jams.

- The staple home position sensor (PHOI1) detects when the stapler is in the correct position. If the stapler is in the incorrect position, the staple/stacker driver PCB notifies the formatter that a staple jam has occurred.
- The staple ready sensor (PHOI2) detects when the stapler is self-primed after a new staple cartridge is installed. If the sensor determines that the self-priming function was unsuccessful, the staple/stacker driver PCB notifies the formatter that a staple jam has occurred.
- The staple presence sensor (PHOI3) detects the number of staples in the staple cartridge. When the number of staples in the cartridge is 20 or fewer, the stapler/stacker driver PCB notifies the formatter. A **STAPLER LOW ON STAPLES** message displays on the product control panel display.

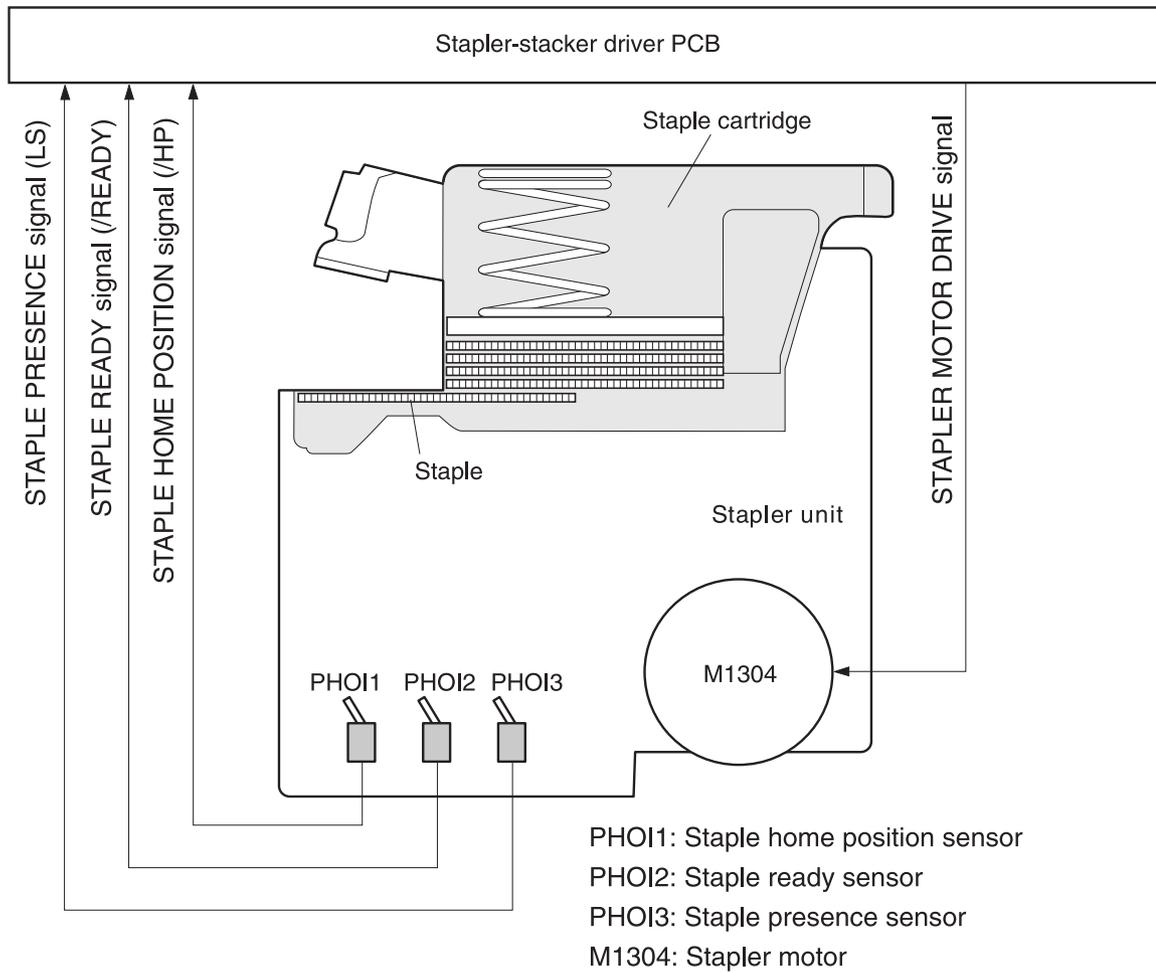


Figure 5-63 Stapler unit operation

