Troubleshooting Manual

M452nw
M452dn
M452dw

M477fnw
M477fdn
M477fdw

For printer part removal and part number information, see the Repair Manual.
HP Color LaserJet Pro M452 and HP Color LaserJet Pro MFP M477

Troubleshooting Manual
Conventions used in this guide

☀️ **TIP:** Helpful hints or shortcuts.

📝 **NOTE:** Information that explains a concept or how to complete a task.

🌟 **Reinstallation tip:** Reinstallation helpful hints, shortcuts, or considerations.

🔒 **IMPORTANT:** Information that help the user to avoid potential printer error conditions.

⚠️ **CAUTION:** Procedures that the user must follow to avoid losing data or damaging the printer.

⚠️ **WARNING!** Procedures that the user must follow to avoid personal injury, catastrophic loss of data, or extensive damage to the printer.
For additional service and support information

HP service personnel, go to the Service Access Work Bench (SAW) at http://h41302.www4.hp.com/km/saw/home.do.

Channel partners, go to HP Channel Services Network (CNS) at https://h30125.www3.hp.com/hpcsn.

At these locations, find information on the following topics:

- Install and configure
- Printer specifications
- Up-to-date control panel message (CPMD) troubleshooting
- Solutions for printer issues and emerging issues
- Remove and replace part instructions and videos
- Service advisories
- Warranty and regulatory information

To access HP PartSurfer information from any mobile device, go to http://partsurfermobile.hp.com/ or scan the Quick Response (QR) code below.
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1 Theory of operation

- For additional service and support
- Basic operation
- Formatter-control system
- Engine-control system
- Engine laser/scanner system
- Engine pickup, feed, and delivery system
- Input accessories
- Scanning and image capture system
- Document feeder system
- Fax functions and operation (fax models only)
For additional service and support

HP service personnel, go to the Service Access Work Bench (SAW) at http://h41302.www4.hp.com/km/saw/home.do.

Channel partners, go to HP Channel Services Network (CSN) at https://h30125.www3.hp.com/hpcsn.

- To access HP PartSurfer information from any mobile device, go to http://partsurfermobile.hp.com/ or scan the Quick Response (QR) code below.

- Install and configure
- Printer specifications
- Up-to-date control panel message (CPMD) troubleshooting
- Solutions for printer issues and emerging issues
- Remove and replace part instructions and videos
- Service advisories
- Warranty and regulatory information
Basic operation

The printer routes all high-level processes through the formatter, which stores font information, processes the print image, and communicates with the host computer.

The basic printer operation comprises the following systems:

- Engine control system
- Laser scanner system
- Image-formation system
- Pickup, feed, and delivery system
- Accessory (optional paper feeder)
- Integrated scanner system (M477 models only)

Figure 1-1 Relationship between the main printer systems
## Sequence of operation

The DC controller PCA controls the operating sequence, as described in the following table.

<table>
<thead>
<tr>
<th>Period</th>
<th>Duration</th>
<th>Description</th>
</tr>
</thead>
</table>
| Waiting            | From the time the power is turned on, the door is closed, or when the printer exits sleep mode until the printer is ready for printing. | • Heats the fuser roller in the fuser  
• Pressurizes the fuser film  
• Detects the toner cartridges  
• Separates all of the developing rollers from the photosensitive drums in the toner cartridges  
• Rotates and stops each motor  
• Cleans the intermediate transfer belt (ITB) and secondary transfer roller  
• Detects cable breakage on the thermistor  
• Rotates and stops each fan  
• Detects any residual paper in the engine |
| Standby            | From the end of the waiting sequence, the last rotation until the formatter receives a print command, or until the printer is turned off. | • Is in the Ready state  
• Enters Sleep mode if the formatter sends the sleep command  
• The printer calibrates if it is time for an automatic calibration |
| Initial rotation   | From the time the formatter receives a print command until the paper enters the paper path. | • Rotates each motor  
• Rotates each fan  
• Activates the high-voltage power supply  
• Prepares the laser/scanner unit  
• Warms the fuser to the correct temperature |
<table>
<thead>
<tr>
<th>Period</th>
<th>Duration</th>
<th>Description</th>
</tr>
</thead>
</table>
| Printing         | From the time the first sheet of paper enters the paper path until the last sheet has passed through the fuser. | • Forms the image on the photosensitive drums  
                   |                                                            | • Transfers the toner to the paper  
                   |                                                            | • Fuses the toner image onto the paper                                      |
| Last rotation    | From the time the last sheet of paper exits the fuser until the motors stop rotating. | • Moves the last printed sheet into the output bin  
                   |                                                            | • Stops each motor  
                   |                                                            | • Stops the high-voltage power supply  
                   |                                                            | • Stops the laser/scanner unit  
                   |                                                            | • Turns the fuser heater off  
                   |                                                            | • Cleans the ITB and secondary transfer roller  
                   |                                                            | • If another print command is received, the printer enters the initial rotation period when the last rotation is complete. |
Formatter-control system

The formatter performs the following functions:

- Controlling the sleep delay function
- Receiving and processing print data from the various printer inputs
- Monitoring control-panel functions and relaying printer status information (through the control panel and the bidirectional input/output)
- Developing and coordinating data placement and timing with the DC controller PCA
- Stores font information
- Communicates with the host computer through the network or the bidirectional interface

The formatter receives a print job from the network or bidirectional interface and separates it into image information and instructions that control the printing process. The DC controller PCA synchronizes the image formation system with the paper input and output systems, and then signals the formatter to send the print image data.

Sleep delay

When the printer is in sleep delay mode, the control-panel backlight is turned off, but the printer retains all printer settings, downloaded fonts, and macros. The default setting is a 15-minute idle time. The setting can be changed or turned off from the control panel menus.

The printer exits sleep delay mode and enters the warm-up cycle when any of the following occurs.

- A print job, valid data, or a PML or PJL command is received at the serial port.
- The control panel is touched (button press or touchscreen touch depending on model).
- A document is loaded in the document feeder or the scanner lid is opened (M477 only).
- A tray is opened.

💡 TIP: Error messages override the sleep delay message. The printer enters sleep mode at the appropriate time, but the error message continues to appear.

Auto On / Auto Off mode

2-line control panels

1. On the product control panel, press the OK button.
2. Open the following menus:
   - System Setup
   - Energy Settings
   - Sleep/Auto Off After
3. Use the arrow keys to select the time for the Sleep/Auto Off delay, and then press the OK button.
**Touchscreen control panels**

1. From the Home screen on the product control panel, touch the Setup button.

2. Open the following menus:
   - System Setup
   - Energy Settings
   - Sleep/Auto Off After

3. Select the time for the Sleep/Auto Off delay.

**Printer job language (PJL)**

PJL is an integral part of printer configuration, in addition to the standard PCL and PostScript (PS). With standard cabling, the printer can use PJL to perform a variety of functions.

- **Dynamic I/O switching:** The printer can be configured with a host on each I/O by using dynamic I/O switching. Even when the printer is offline, it can receive data from more than one I/O simultaneously, until the I/O buffer is full.

- **Context-sensitive switching:** The printer can 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 printer in landscape mode, the subsequent print jobs print in landscape only if they are formatted for landscape printing.

**Printer management language (PML)**

PML allows remote configuration of the printer and status monitoring through the input/output (I/O) ports.

**Control panel**

The formatter sends and receives printer status and command data to and from the control panel.
Walk-up USB

NOTE: Touchscreen models only.

This printer features printing from a USB flash drive. This printer supports printing the following types of files from the USB flash drive.

- .pdf
- .jpg
- .prn and .PRN
- .cht and .CHT
- .pxl
- .pcl and .PCL
- .ps and .PS
- .doc and .docx
- .ppt and .pptx

When a USB flash drive is inserted into the front of the printer, the control panel will display the USB Flash Drive menu. The files present on the USB flash drive can be accessed from the control panel.

Any files in a supported format on the USB flash drive can be printed directly from the printer control panel. Pages also can be scanned and saved to the USB flash drive from the control panel.

Wireless

NOTE: Wireless models only.

Wireless products contain a wireless card to enable 802.11b/g/n wireless communication.

Low end data model (LEDM) overview

The low-end data model (LEDM) provides one consistent data representation method and defines the dynamic and capabilities tickets shared between clients and devices, as well as the access protocol, event, security, and discovery methods.

Advanced control language (ACL) overview

The advanced control language (ACL) is a language that supports printer control and firmware downloads in printers that support both PJL/PCL and host-based printing. Each sequence of ACL commands must be preceded by a unified exit command (UEL) and an @PJL ENTER LANGUAGE=ACL command. The ACL sequence is always followed by a UEL. Any number of commands can be placed between the UELs. The only exception to these rules is the download command. If a firmware download is done, the download command must be the last command in the sequence. It will not be followed by a UEL.

The firmware searches for the UEL sequence when parsing commands. However, while downloading binary data such as host-based code or NVRAM data the firmware suspends UEL parsing. To handle hosts that
“disappear” during binary sequences, the firmware times out all ACL command sessions. If a timeout occurs during a non-download command sequence, it is treated as the receipt of a UEL. If a timeout occurs during firmware download, the printer resets.

### NFC

<table>
<thead>
<tr>
<th>NOTE:</th>
<th>Wireless models only.</th>
</tr>
</thead>
</table>

This printer supports near field communication (NFC) capabilities. NFC enables an easy one-to-one HP WiFi Direct print connection using a simple device-to-device touch. Mobile device users can quickly connect to the printer and print documents and images from a mobile device, such as a smartphone or tablet, by touching the device to the NFC icon on the printer.

### CPU

The formatter incorporates a 1200 MHz processor.

### Input/output (I/O)

The following sections discuss the input and output features of the printer.

### USB

The printer includes a universal serial bus (USB) 2.0 connection.

### USB hosts

The printer includes USB hosts for USB flash drive and wireless communication control.

### 10/100/1000 networking

The printer includes a 10/100/1000 network (ethernet) connection.

### Fax

<table>
<thead>
<tr>
<th>NOTE:</th>
<th>M477 models only.</th>
</tr>
</thead>
</table>

The printer includes a fax phone line connection.

### Memory

If the printer encounters a problem when managing available memory, a clearable warning message appears on the control panel.

### Firmware

The formatter stores the printer firmware. A remote firmware upgrade process is used to overwrite and upgrade the firmware.

### Nonvolatile random access memory (NVRAM)

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

**NOR:** Stores microprocessor control programs and internal character sets (fonts).

**NAND:** Stores fax memory (M477 models only) and driver installation software.

Random access memory

The M452n model comes with 128 MB of memory installed. All other models come with 256 MB of memory installed. The formatter has 256 MB NAND Flash.

**HP Memory Enhancement technology (MEt)**

The HP Memory Enhancement technology (MEt) effectively doubles the standard memory through a variety of font- and data-compression methods.

**NOTE:** The MEt is available only in PCL mode; it is not functional when printing in PS mode.
Engine-control system

The engine-control system receives commands from the formatter and interacts with the other main systems to coordinate all printer functions. The engine-control system consists of the following components:

- DC controller
- Low-voltage power supply
- High-voltage power supply
- Fuser control

The formatter receives a print job from the bidirectional interface and separates it into image information and instructions that control the printing process. The DC controller PCA synchronizes the image-formation system with the paper input and output systems, and then signals the formatter to send the print-image data.

Figure 1-2 Engine-control system

Engine-control unit

The engine-control unit includes the DC controller and the high-voltage power supply.
Figure 1-3 Engine-control unit

- Secondary transfer roller
- Cartridge (Y/M/C/K)
- ITB assembly
- High-voltage power supply
- Fan
- Motor
- Solenoid
- Switch
- Photointerrupter
- Sensor
- LED
- DC controller
- Control panel
- Formatter
- Laser scanner assembly
- AC input
- Low-voltage power supply
- Fuser
The DC controller controls the operation of the printer and its components. The DC controller starts the printer operation when the printer power is turned on and the power supply sends DC voltage to the DC controller. After the printer enters the standby period, the DC controller sends out various signals to operate motors, solenoids, and other printer components based on the print command and image data that the host computer sends.

**Table 1-2 Printer electrical components**

<table>
<thead>
<tr>
<th>Component type</th>
<th>Abbreviation</th>
<th>Component name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>M1</td>
<td>Pickup motor</td>
</tr>
<tr>
<td></td>
<td>M2</td>
<td>Drum motor</td>
</tr>
<tr>
<td></td>
<td>M3</td>
<td>Developer motor</td>
</tr>
<tr>
<td></td>
<td>M4</td>
<td>Fuser motor</td>
</tr>
<tr>
<td></td>
<td>M10</td>
<td>Scanner motor</td>
</tr>
<tr>
<td>Fan</td>
<td>FM1</td>
<td>Power supply fan</td>
</tr>
<tr>
<td></td>
<td>FM2</td>
<td>Cartridge fan</td>
</tr>
<tr>
<td>Clutch</td>
<td>CL1</td>
<td>Duplex re-pickup clutch</td>
</tr>
<tr>
<td>Solenoid</td>
<td>SL1</td>
<td>Tray 1 (MP) pickup solenoid</td>
</tr>
<tr>
<td></td>
<td>SL2</td>
<td>Developer alienation solenoid (K)</td>
</tr>
<tr>
<td></td>
<td>SL3</td>
<td>Cassette (Tray 2) pickup solenoid</td>
</tr>
<tr>
<td></td>
<td>SL4</td>
<td>Developer alienation solenoid (YMC)</td>
</tr>
<tr>
<td></td>
<td>SL5</td>
<td>Lifter solenoid</td>
</tr>
<tr>
<td></td>
<td>SL10</td>
<td>Duplex switchback solenoid</td>
</tr>
<tr>
<td></td>
<td>SL30</td>
<td>T1 brush alienation solenoid</td>
</tr>
<tr>
<td>Switch</td>
<td>SW1</td>
<td>Front door switch</td>
</tr>
<tr>
<td></td>
<td>SW2</td>
<td>Developer alienation detection switch (YMC)</td>
</tr>
<tr>
<td></td>
<td>SW3</td>
<td>Developer alienation detection switch (K)</td>
</tr>
<tr>
<td></td>
<td>SW4</td>
<td>T1 brush alienation detection switch</td>
</tr>
<tr>
<td></td>
<td>SW5</td>
<td>Fuser pressure release detection switch</td>
</tr>
<tr>
<td></td>
<td>SW6</td>
<td>Cassette detection switch</td>
</tr>
<tr>
<td></td>
<td>SW601</td>
<td>Power switch</td>
</tr>
<tr>
<td>Photointerrupter</td>
<td>SR1</td>
<td>Registration sensor</td>
</tr>
<tr>
<td></td>
<td>SR2</td>
<td>Loop sensor</td>
</tr>
<tr>
<td></td>
<td>SR3</td>
<td>Fuser output sensor</td>
</tr>
<tr>
<td></td>
<td>SR4</td>
<td>Output bin media-full sensor</td>
</tr>
<tr>
<td></td>
<td>SR5</td>
<td>Cassette (Tray 2) media out sensor</td>
</tr>
<tr>
<td></td>
<td>SR6</td>
<td>Tray 1(MP) media out sensor</td>
</tr>
</tbody>
</table>
### Table 1-2 Printer electrical components (continued)

<table>
<thead>
<tr>
<th>Component type</th>
<th>Abbreviation</th>
<th>Component name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SR7</td>
<td>Cassette (Tray 2) media surface sensor</td>
</tr>
<tr>
<td></td>
<td>SR8</td>
<td>Lifter sensor</td>
</tr>
<tr>
<td></td>
<td>SR21</td>
<td>Duplex switchback sensor(^1)</td>
</tr>
<tr>
<td></td>
<td>SR22</td>
<td>Duplex re-pickup sensor(^1)</td>
</tr>
<tr>
<td>Sensor</td>
<td></td>
<td>Registration density sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environment sensor</td>
</tr>
</tbody>
</table>

\(^1\) Duplex models only

---

**High-voltage power supply**

The DC controller controls the high-voltage power supply to generate high-voltage biases. The high-voltage power supply generates the high-voltage biases that are applied to the following components:

- Primary charging roller (in the toner cartridges)
- Developer roller (in the toner cartridges)
- Primary transfer brush
- Secondary transfer roller
- ITB cleaning brush
- Static charge eliminator
Figure 1-4 High-voltage power supply

[Diagram of high-voltage power supply system with labels for various components such as engine controller, DC controller, high-voltage power supply, T2 bias circuit, static charge eliminator bias circuit, ITB cleaning brush bias circuit, T1 bias and developing bias circuit (YMC), T1 bias and developing bias circuit (K), and T2 roller, Y, M, C, K cartridges, and T1 brush.]
Motors

The printer has five motors for the paper-feed and image-formation.

**NOTE:** The DC controller determines the following motor failures.

- Drum motor (ITB motor start-up failure)
- Drum motor (ITB motor rotation failure)
- Fuser motor (fuser motor start-up failure)
- Fuser motor (fuser motor rotation failure)
- Developer motor (developer alienation motor failure)

### Table 1-3 Motors^1^

<table>
<thead>
<tr>
<th>Component name</th>
<th>Components driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 Pickup motor</td>
<td>• Tray 1 (MP) tray pickup roller</td>
</tr>
<tr>
<td></td>
<td>• Tray 1 (MP) tray feed roller</td>
</tr>
<tr>
<td></td>
<td>• Cassette (Tray 2) pickup roller</td>
</tr>
<tr>
<td></td>
<td>• Cassette (Tray 2) feed roller</td>
</tr>
<tr>
<td></td>
<td>• Registration roller</td>
</tr>
<tr>
<td></td>
<td>• Duplex feed roller^2</td>
</tr>
<tr>
<td></td>
<td>• Duplex re-pickup roller^2</td>
</tr>
<tr>
<td></td>
<td>• Lift up of cassette (Tray 2)</td>
</tr>
<tr>
<td>M2 Drum motor</td>
<td>• Photosensitive drum</td>
</tr>
<tr>
<td></td>
<td>• Intermediate transfer belt (ITB)</td>
</tr>
<tr>
<td>M3 Developer motor</td>
<td>• Developer roller</td>
</tr>
<tr>
<td></td>
<td>• Contact/alienation of developer roller</td>
</tr>
<tr>
<td>M4 Fuser motor</td>
<td>• Fuser roller</td>
</tr>
<tr>
<td></td>
<td>• Output roller</td>
</tr>
<tr>
<td></td>
<td>• Duplex switchback roller^2</td>
</tr>
<tr>
<td></td>
<td>• Pressure/release of pressure film</td>
</tr>
<tr>
<td></td>
<td>• Fuser film</td>
</tr>
<tr>
<td>M10 Laser/scanner motor</td>
<td>Laser/scanner mirror</td>
</tr>
</tbody>
</table>

^1^ Because the integrated scanner assembly on the M477 models is a whole unit replacement, those motors are not included on this list.

^2^ Duplex models only
The printer has two fans for preventing the temperature from rising in the printer and for cooling the printed pages.

**NOTE:** The DC controller determines the following fan failures.

- Power supply fan (fan motor 1 failure)
- Cartridge fan (fan motor 2 failure)

<table>
<thead>
<tr>
<th>Component name</th>
<th>Cooling area</th>
<th>Type</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM1</td>
<td>Power supply fan</td>
<td>Intake</td>
<td>Variable (full/middle/half)</td>
</tr>
<tr>
<td></td>
<td>Around the low-voltage power supply unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM2</td>
<td>Cartridge fan</td>
<td>Intake</td>
<td>Variable (full/half)</td>
</tr>
<tr>
<td></td>
<td>Around the toner cartridges and fuser</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1-4 Fans
Low-voltage power supply

The low-voltage power-supply (LVPS) converts the AC power from the wall receptacle into the DC voltage that the printer components use.

Figure 1-5 Low-voltage power-supply circuit

Table 1-5 Low-voltage power supply voltages

<table>
<thead>
<tr>
<th>Main DC voltage</th>
<th>Sub-voltage</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>+24V</td>
<td>+24VA</td>
<td>Stopped during active off or inactive off</td>
</tr>
<tr>
<td>+3.3V</td>
<td>+3.3VA</td>
<td>Constant supply</td>
</tr>
<tr>
<td></td>
<td>+3.3VB</td>
<td>Stopped during active off or inactive off</td>
</tr>
<tr>
<td></td>
<td>+3.3VC</td>
<td>Stopped during inactive off</td>
</tr>
</tbody>
</table>

Over-current/over-voltage protection

The over-current/over-voltage protection automatically stops supplying the DC voltage to the printer components whenever it detects excessive current or abnormal voltage. The low-voltage power supply has a protective function against over-current and over-voltage to prevent failures in the power supply circuit. In addition, the low-voltage power supply has two fuses (FU1101/FU1102) to protect against over-current. If over-current flows into the AC line, the fuse blows to stop the AC power.
⚠️ **CAUTION:** If DC voltage is not being supplied from the low-voltage power supply, the protective function might be running. In this case, turn the printer off and unplug the power cord from the wall receptacle. Do not turn the power switch on until the root cause is found and corrected.

⚠️ **WARNING!** For personal safety, the printer interrupts +24V power when the power switch is turned off. The remote switch control circuit turns the printer power on or off so that AC power flows even when the power switch is turned off. Unplug the printer power cord from the wall receptacle before disassembling the printer.

<table>
<thead>
<tr>
<th>Table 1-6 LVPS functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Failure detection functions</strong></td>
</tr>
<tr>
<td>Sleep mode</td>
</tr>
<tr>
<td>Power-supply voltage detection</td>
</tr>
<tr>
<td>Automatic power off</td>
</tr>
<tr>
<td>Automatic power on/off</td>
</tr>
<tr>
<td>Active off</td>
</tr>
<tr>
<td>Inactive off</td>
</tr>
<tr>
<td>Network mode</td>
</tr>
<tr>
<td>Power-switch illumination</td>
</tr>
<tr>
<td>Low-voltage power supply failure detection</td>
</tr>
<tr>
<td>Power-save mode</td>
</tr>
</tbody>
</table>
**Fuser control**

The fuser heater control circuit and the fuser safety circuit control the fuser temperature according to the commands from the DC controller. The printer uses an on-demand fusing method.

**Figure 1-6** Fuser control

![Diagram of fuser control](image)

**Table 1-7 Fuser control functions**

<table>
<thead>
<tr>
<th>Component name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>H120/H240</td>
<td>Fuser heater</td>
</tr>
<tr>
<td></td>
<td>Heats the fuser roller</td>
</tr>
<tr>
<td>TH801</td>
<td>Main thermistor</td>
</tr>
<tr>
<td></td>
<td>Detects the center temperature of the fuser heater (contact type)</td>
</tr>
<tr>
<td>TH802</td>
<td>Sub thermistor 1</td>
</tr>
<tr>
<td></td>
<td>Detects the right temperature of the fuser heater (contact type)</td>
</tr>
<tr>
<td>TH803</td>
<td>Sub thermistor 2</td>
</tr>
<tr>
<td></td>
<td>Detects the left temperature of the fuser heater (contact type)</td>
</tr>
<tr>
<td>FU1</td>
<td>Temperature fuse</td>
</tr>
<tr>
<td></td>
<td>Prevents an abnormal temperature rise of fuser heater</td>
</tr>
</tbody>
</table>
**Fuser heater protection**

The fuser heater protective function detects an excessive temperature rise of the fuser and interrupts power supply to the fuser heater.
The following three protective components prevent the fuser heater from excessive rising temperature.

- DC controller
- Fuser heater safety circuit
- Temperature fuse

**DC controller**

The DC controller monitors the detected temperature of the thermistor. The DC controller deactivates the FUSER HEATER CONTROL signal and turns off the relays (RL1101/RL1102) to interrupt power supply to the fuser heater when it detects an excessive temperature.

**Fuser heater safety circuit**

The fuser heater safety circuit monitors the detected temperature of the thermistor. The fuser heater safety circuit turns off the relays (RL1101/RL1102) to interrupt power supply to the fuser heater when it detects an excessive temperature.

**Temperature fuse**

The temperature fuse opens and relays (RL1101/RL1102) are turned off to interrupt power supply to the fuser heater when the temperature of the temperature fuse in the pressure film is abnormally high.

**Fuser control functions**

The printer has the following fuser control functions.

<table>
<thead>
<tr>
<th>Fuser control functions</th>
<th>Supported feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuser temperature control</td>
<td>Yes</td>
</tr>
<tr>
<td>Fuser failure detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Frequency detection circuit failure detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Fuser pressure release mechanism failure detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Fuser type discrepancy detection</td>
<td>No</td>
</tr>
<tr>
<td>Fuser type identification detection</td>
<td>No</td>
</tr>
<tr>
<td>Fuser presence detection</td>
<td>No</td>
</tr>
<tr>
<td>Fuser life detection</td>
<td>No</td>
</tr>
<tr>
<td>Relay failure detection</td>
<td>No</td>
</tr>
<tr>
<td>Pressure roller cleaning</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Engine laser/scanner system

**NOTE:** The laser scanner assembly of this printer has the laser shutter mechanism. For personal safety, the laser shutter interrupts the laser optical path of laser scanner assembly when the following cover/door is opened.

- Front door

The formatter sends video signals to the DC controller, which controls the laser scanner. When the laser scanner system receives those signals, it converts them to latent images on the photosensitive drums.

The laser/scanner system consists of the following components.

**NOTE:** The printer has one laser scanner assembly for yellow, magenta, cyan and black.

- Laser assembly
- Scanner motor
- Beam-detect (BD) sensor
- Scanner mirror

**Figure 1-8 Laser/scanner system**
Laser/scanner failure detection

The DC controller detects the following laser scanner failure conditions and notifies the formatter:

- Scanner motor start-up failure
- Scanner motor rotational failure
Image-formation system

The DC controller controls the image-formation system according to commands from the formatter. The DC controller controls the internal components of the image-formation system to form the toner image on the photosensitive drum surface. The toner image is then transferred to the print media and fused to the page.

Following are the main components of the image-formation system:

- Toner cartridges
- Intermediate Transfer Belt (ITB)
- Secondary transfer (T2) roller
- Fuser
- Laser scanner assembly
- High-voltage power supply (HVPS)

**Figure 1-9** Image-formation system block diagram

The DC controller rotates the following motors to drive each component.

- Drum motor
- Photosensitive drum
- Primary charging roller (follows the photosensitive drum)\textsuperscript{1}
- ITB drive roller
- ITB (follows the ITB drive roller)
- T2 roller (follows the ITB)

- Developer motor
  - Developer roller\textsuperscript{1}
  - Contact/alienation of developing roller

- Fuser motor
  - Fuser roller
  - Fuser film (follows the fuser roller)
  - Pressure film (follows the fuser roller)

\textsuperscript{1}The primary charging roller and developer roller are in the toner cartridges.
Figure 1-10 Image-formation drive system

Table 1-9 Image-formation drive system

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Component name</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2</td>
<td>Drum motor</td>
</tr>
<tr>
<td>M3</td>
<td>Developer motor</td>
</tr>
<tr>
<td>M4</td>
<td>Fuser motor</td>
</tr>
</tbody>
</table>
Figure 1-11 Image-formation switch and sensor system

Table 1-10 Image-formation switch and sensor system

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Component name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW2</td>
<td>Developer alienation detection switch (YMC)</td>
</tr>
<tr>
<td>SW3</td>
<td>Developer alienation detection switch (K)</td>
</tr>
<tr>
<td>SW4</td>
<td>T1 brush alienation detection switch</td>
</tr>
<tr>
<td></td>
<td>Registration density (RD) sensor</td>
</tr>
<tr>
<td></td>
<td>Environment sensor</td>
</tr>
</tbody>
</table>

Image-formation process

The image-formation process consists of eight steps divided into five functional blocks.
Table 1-11 Image formation process

<table>
<thead>
<tr>
<th>Functional block</th>
<th>Steps</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latent image formation</td>
<td>1. Primary charging</td>
<td>An invisible latent image forms on the surface of the photosensitive drums.</td>
</tr>
<tr>
<td></td>
<td>2. Laser-beam exposure</td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td>3. Development</td>
<td>Toner adheres to the electrostatic latent image by color on each photosensitive drum.</td>
</tr>
<tr>
<td>Transfer</td>
<td>4. Primary transfer</td>
<td>The toner image transfers to the ITB and then to the paper.</td>
</tr>
<tr>
<td></td>
<td>5. Secondary transfer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Separation</td>
<td></td>
</tr>
<tr>
<td>Fusing</td>
<td>7. Fusing</td>
<td>The toner fuses to the paper to make a permanent image.</td>
</tr>
<tr>
<td>Drum cleaning</td>
<td>8. Drum cleaning</td>
<td>Residual toner is removed from the photosensitive drums.</td>
</tr>
</tbody>
</table>

**Step 1: Primary charging**

The primary-charging roller contacts the photosensitive drum and charges the drum with negative potential.
Figure 1-13 Primary charging

Primary charging roller

Photosensitive drum

Primary charging bias
Step 2: Laser-beam exposure

The laser beam strikes the surface of the photosensitive drum in the areas where the image will form. The negative charge neutralizes in those areas, which are then ready to accept toner.

Figure 1-14 Laser-beam exposure

Step 3: Development

Toner acquires a negative charge as the developing cylinder contacts the developing blade. Because the negatively charged surface of the photosensitive drums have been neutralized where they have been struck by the laser beam, the toner adheres to those areas on the drums. The latent image becomes visible on the surface of each drum.

Figure 1-15 Development
Step 4: Primary transfer

The positively charged primary-transfer brushes contact the ITB, giving the ITB a positive charge. The ITB attracts the negatively charged toner from the surface of each photosensitive drum, and the complete toner image transfers onto the ITB.

**Figure 1-16** Primary transfer

---

Step 5: Secondary transfer

The paper acquires a positive charge from the secondary-transfer roller, and attracts the negatively charged toner from the surface of the ITB. The complete toner image transfers onto the paper.

**Figure 1-17** Secondary transfer
Step 6: Separation

The stiffness of the paper causes it to separate from the ITB as the ITB bends. The static-charge eliminator removes excess charge from the paper for stable paper feeding and print quality.

Figure 1-18 Separation

Step 7: Fusing

To create the permanent image, the paper passes through heated, pressurized rollers to melt the toner onto the page.

Figure 1-19 Fusing

Step 8: Drum cleaning

The cleaning blade scrapes the residual toner off the surface of the photosensitive drum, and toner is deposited in the toner collection portion of the cartridge.
Figure 1-20 Drum cleaning
Cleaning blade
Photosensitive drum
Residual toner collection box
**Toner cartridges**

The printer has four toner cartridges, one for each color: yellow, magenta, cyan and black.

**Design**

Each toner cartridge is filled with toner and consists of the following components:

- Photosensitive drum
- Developer
- Primary-charging roller
- Memory chip

![Toner cartridge block diagram](image)

The printer has the following toner cartridge control functions.

**Table 1-12 Toner cartridge control functions**

<table>
<thead>
<tr>
<th>Function</th>
<th>Supported feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toner cartridge presence detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Toner level detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Toner cartridge life detection</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Table 1-12  Toner cartridge control functions (continued)

<table>
<thead>
<tr>
<th>Function</th>
<th>Supported feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toner cartridge mis-installation detection</td>
<td>No</td>
</tr>
<tr>
<td>Developer alienation control</td>
<td>Yes</td>
</tr>
<tr>
<td>Developer alienation motor failure detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Drum discharge mechanism</td>
<td>No</td>
</tr>
</tbody>
</table>

HP Cartridges with JetIntelligence

HP Cartridges with JetIntelligence support two features for managing toner cartridges.

- The HP Cartridge Policy feature allows customers to specify the use of only genuine HP toner cartridges in the printer.
- The anti-theft feature enables locking a cartridge to a specific printer or fleet of printers.

HP Cartridge Policy

The genuine HP Cartridge Policy feature allows a customer to specify that only genuine HP supplies can be used in a printer. If anything but a genuine HP supply is installed, the printer will not print. This feature is disabled by default, and can be enabled or disabled from the control panel, the HP Embedded Web Server (EWS), or HP Web Jetadmin.

If a genuine HP cartridge has passed the low state and is installed in a printer that has this feature enabled, the printer will display an **Unauthorized Cartridge** message on the control panel and will not print.

If a non-HP toner cartridge is used in a printer with this feature enabled, the message **Unauthorized Cartridge** appears on the control-panel display and the printer will not print.

**NOTE:** If a customer suspects they have a counterfeit cartridge, they should report it by going to [www.hp.com/go/anticounterfeit](http://www.hp.com/go/anticounterfeit) and selecting **Report now**.

Anti-theft or cartridge protection

The toner cartridge anti-theft feature allows a customer to configure the printer to automatically lock toner cartridges to a specific printer or fleet of printers when they are installed. A locked toner cartridge will work only in the specified printer or fleet of printers. This feature prevents toner cartridges from being stolen and used in another printer, or from being moved from an authorized printer to an unauthorized printer. This feature is disabled by default. Cartridge protection to a single printer can be enabled or disabled from the control panel or the HP Embedded Web Server (EWS). Cartridge protection for a printer fleet can be enabled only by using HP Web Jetadmin.

When the anti-theft feature is enabled, the toner cartridge in a printer will only work in the specified printer or fleet of printers. If a locked toner cartridge is moved to another printer, the cartridge will not print and the message **Protected Cartridge** appears on the control-panel display.

**NOTE:** When a toner cartridge is locked to a specific printer or fleet of printers, it cannot be unlocked. This is a permanent operation.
**Memory chip**

The memory chip is non-volatile memory that stores information about the usage of the toner cartridge and helps protect the customer from counterfeit cartridges. This chip is also used to detect the presence of a cartridge within the printer or when a cartridge is installed in the wrong slot. The printer reads and writes the data in the memory chip.

**Toner seal**

The toner cartridge seal is opened automatically when the toner cartridge is installed into the printer.

**Toner cartridge life detection**

The DC controller detects the cartridge life by monitoring the total operating time and remaining toner level of the toner cartridge. The DC controller determines a cartridge end of life and notifies the formatter when total operating time of the cartridge reaches a specified time or the cartridge runs out of toner.

**Developing unit engagement and disengagement control**

The printer can print in full-color mode or in black-only mode. To print in black-only mode, the printer disengages the developing rollers in the cyan, magenta, and yellow toner cartridges, which maximizes the life of the cartridges.

The developing-roller engagement and disengagement control operates as follows: When the printer is turned on and when each print job is completed, all four of the developing units are disengaged from the photosensitive drums. When development is not needed, a special cam mechanism on the developer roller stops the rotation separate from the developer disengagement cam, providing even more life for the cartridge.

- The drive of the developer disengagement motor rotates the developer disengagement cam.
- As the cam rotates, the developing unit engages with or separates from the photosensitive drum.

When the print mode is full color, the developing units engage with the drums. When the print mode is black-only, only the black developing unit engages with the drum.

The DC controller determines a developer disengagement motor failure and notifies the formatter when it does not detect a specified signal from the developer disengagement sensor during the developing unit engagement and disengagement operation.
Intermediate transfer belt (ITB) unit

The ITB unit accepts the toner images from the photosensitive drums and transfers the completed image to the paper. The ITB unit has the following main components:

- Intermediate transfer belt (ITB)
- ITB-drive roller
- T1 brushes

The drum motor (M2) drives the ITB drive roller, which rotates the ITB.

Secondary transfer roller functions

The secondary transfer roller transfers the image from the ITB onto the paper.

The printer has the following secondary transfer roller functions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Supported feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary transfer roller cleaning mechanism</td>
<td>Yes</td>
</tr>
<tr>
<td>Function</td>
<td>Supported feature</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Secondary transfer roller presence detection</td>
<td>No</td>
</tr>
<tr>
<td>Secondary transfer roller life detection</td>
<td>No</td>
</tr>
<tr>
<td>Secondary transfer roller alienation control</td>
<td>No</td>
</tr>
</tbody>
</table>
Color self calibration

The printer calibrates itself to maintain proper print-quality. The calibration corrects color-misregistration and color-density variation due to environmental changes or internal variation in the printer.

The printer has the following calibration functions.

Table 1-14 Calibration functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Supported feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color-plane registration correction control</td>
<td>Yes</td>
</tr>
<tr>
<td>Environment correction control</td>
<td>Yes</td>
</tr>
<tr>
<td>Image density control (DMAX)</td>
<td>Yes</td>
</tr>
<tr>
<td>Image halftone control (DHALF)</td>
<td>Yes</td>
</tr>
<tr>
<td>Registration density sensor failure detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Color sensor control</td>
<td>No</td>
</tr>
<tr>
<td>Gray axis control (GAS)</td>
<td>No</td>
</tr>
<tr>
<td>Environment sensor failure detection</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Engine pickup, feed, and delivery system

The DC controller controls the pickup, feed, and delivery system according to commands from the formatter. The pickup, feed, and delivery system uses a series of rollers to move the paper through the printer.

The pickup, feed, and delivery system consists of the following three functional blocks. The DC controller controls each block to pick up, feed and deliver the paper.

- **Pickup-and-feed-block**: Controls the movement of the paper from each pickup source to the fuser inlet
- **Fuser-and-delivery-block**: Controls the movement of the paper from the fuser to the delivery destination
- **Duplex block**: Controls the movement of the paper from the duplex switchback unit to the duplex re-pickup unit (duplex models only)

**Figure 1-23** Engine pickup, feed, and delivery system

- Simplex paper path
- Duplex paper path

Photo sensors and switches

The following figure shows the sensors and switches for the pickup, feed, and delivery system.
Figure 1-24  Photo sensors and switches

Table 1-15  Photo sensors and switches

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Component</th>
<th>Replacement part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1</td>
<td>Registration sensor</td>
<td></td>
</tr>
<tr>
<td>SR2</td>
<td>Loop sensor</td>
<td></td>
</tr>
<tr>
<td>SR3</td>
<td>Fuser output sensor</td>
<td></td>
</tr>
<tr>
<td>SR4</td>
<td>Output bin media-full sensor</td>
<td></td>
</tr>
<tr>
<td>SR5</td>
<td>Cassette (Tray 2) media out sensor</td>
<td></td>
</tr>
<tr>
<td>SR6</td>
<td>Tray 1 (MP) tray media out sensor</td>
<td></td>
</tr>
<tr>
<td>SR7</td>
<td>Cassette (Tray 2) media surface sensor</td>
<td></td>
</tr>
<tr>
<td>SR8</td>
<td>Lifter sensor</td>
<td></td>
</tr>
<tr>
<td>SR21</td>
<td>Duplex switchback sensor(^1)</td>
<td></td>
</tr>
<tr>
<td>SR22</td>
<td>Duplex re-pickup sensor(^1)</td>
<td></td>
</tr>
<tr>
<td>SW6</td>
<td>Cassette (Tray 2) detection switch</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Duplex models only
Motors, clutches, and solenoids

The following figure shows the motors, clutches, and solenoids for the pickup, feed, and delivery system.

Figure 1-25 Motors, clutches, and solenoids

Table 1-16 Motors, clutches, and solenoids

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Component</th>
<th>Replacement part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Pickup motor</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>Drum motor</td>
<td></td>
</tr>
<tr>
<td>M4</td>
<td>Fuser motor</td>
<td></td>
</tr>
<tr>
<td>CL1</td>
<td>Duplex re-pickup clutch</td>
<td></td>
</tr>
<tr>
<td>SL1</td>
<td>Tray 1 (MP) tray pickup solenoid</td>
<td></td>
</tr>
<tr>
<td>SL3</td>
<td>Cassette (Tray 2) pickup solenoid</td>
<td></td>
</tr>
<tr>
<td>SL5</td>
<td>Lifter solenoid</td>
<td></td>
</tr>
<tr>
<td>SL10</td>
<td>Duplex switchback solenoid</td>
<td></td>
</tr>
</tbody>
</table>

1 Duplex models only
Feed speed control

The DC controller adjusts the feed speed to improve the print quality depending on the paper type. The paper is fed at a specified speed according to the print mode designated by the formatter.

<table>
<thead>
<tr>
<th>Print mode</th>
<th>Feed speed</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Normal media 1</td>
<td>1/1</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>Normal media 2</td>
<td>1/1</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>Heavy media 1</td>
<td>1/2</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>Heavy media 2</td>
<td>1/2</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>Heavy media 3</td>
<td>1/2</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>Light media 1</td>
<td>1/1</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>Light media 2</td>
<td>1/1</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>Light media 3</td>
<td>1/1</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>Glossy media 1</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Glossy media 2</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Glossy media 3</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Glossy film</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Photo media 1</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Photo media 2</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Photo media 3</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Envelope 1</td>
<td>1/2</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>Envelope 2</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Envelope 3</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>OHT</td>
<td>1/3</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Label</td>
<td>1/2</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>Designated media 1</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Designated media 2</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Designated media 3</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

Pickup and feed delivery features

The printer has the following pickup, feed and delivery functions:
### Table 1-18 Print mode and feed speed

<table>
<thead>
<tr>
<th>Function</th>
<th>Supported feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassette (Tray 2) media size detection</td>
<td>No</td>
</tr>
<tr>
<td>Cassette (Tray 2) presence detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Cassette (Tray 2) media surface detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Cassette (Tray 2) media presence detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Cassette (Tray 2) media level detection</td>
<td>No</td>
</tr>
<tr>
<td>Cassette (Tray 2) lift-up control</td>
<td>Yes</td>
</tr>
<tr>
<td>Cassette (Tray 2) lift-down control</td>
<td>No</td>
</tr>
<tr>
<td>Cassette (Tray 2) multiple-feed prevention mechanism</td>
<td>Yes</td>
</tr>
<tr>
<td>Tray 1 (MP) tray media presence detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Tray 1 (MP) tray media width detection</td>
<td>No</td>
</tr>
<tr>
<td>Tray 1 (MP) tray last-media detection</td>
<td>No</td>
</tr>
<tr>
<td>Skew-feed prevention mechanism</td>
<td>Yes</td>
</tr>
<tr>
<td>Feed speed control</td>
<td>Yes</td>
</tr>
<tr>
<td>Loop control</td>
<td>Yes</td>
</tr>
<tr>
<td>Media detection</td>
<td>No</td>
</tr>
<tr>
<td>OHT detection</td>
<td>No</td>
</tr>
<tr>
<td>Image leading edge positioning</td>
<td>Yes</td>
</tr>
<tr>
<td>Media length detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Media width detection</td>
<td>No</td>
</tr>
<tr>
<td>Pressure roller pressure release control</td>
<td>Yes</td>
</tr>
<tr>
<td>Output bin media-full detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Automatic delivery</td>
<td>Yes</td>
</tr>
<tr>
<td>Duplex switchback control</td>
<td>Yes</td>
</tr>
<tr>
<td>Duplex feed control</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1

**Tray 1 (multipurpose)/Tray 2 (base printer)**

The sequence of steps for the cassette tray pickup operation is the following:

After receiving a print command from the formatter, the DC controller rotates the pickup motor, which causes the lifting mechanism to lift the paper stack against the pick roller, at which time the cassette pickup roller, cassette feed roller, and cassette separation roller rotate to feed the sheet.

**Duplexing unit**
The duplexing unit reverses the paper and feeds it through the paper path to print the second side.

**Duplexing reverse and duplex feed control**

The duplexing reverse procedure pulls the paper into the duplexing unit after it exits the fuser. The duplexing feed procedure moves the paper through the duplexer so it can enter the printer paper path to print the second side of the page.

1. After the first side has printed, the duplexing flapper solenoid opens, which creates a paper path into the duplexing-reverse unit.
2. After the paper has fully entered the duplexing-reverse unit, the duplexing-reverse motor reverses and directs the paper into the duplexing-feed unit.
3. The duplexing re-pickup motor and duplexing feed motor move the paper into the duplexing repickup unit.
4. To align the paper with the toner image on the ITB, the duplexing re-pickup motor stops and the paper pauses.
5. The paper re-enters the paper path, and the second side prints.

**Duplex pickup operation**

The printer has the following two duplex-media-feed modes depending on the paper sizes:

- **One-sheet mode:** Prints one sheet that is printed on two sides in one duplex print operation.
- **Two-sheet mode:** Prints two sheets that are printed on two sides in one duplex print operation.

**Jam detection/prevention**

The printer uses the following sensors to detect the presence of paper and to check whether paper is being fed correctly or has jammed:

- Registration sensor (SR1)
- Loop sensor (SR2)
- Fuser output sensor (SR3)
- Loop sensor (PS1)
- Output bin media-full sensor (SR4)
- Duplex switchback sensor (SR21)\(^1\)
- Duplex re-pickup sensor (SR22)\(^1\)

\(^1\)Duplex models only.
The printer determines that a jam has occurred if one of these sensors detects paper at an inappropriate time. The DC controller stops the print operation and notifies the formatter.

The printer detects the following jams:

- No pick jam 1
- No pick jam 2
- Pickup stay jam 1
- Fuser delivery delay jam 1
- Fuser delivery stay jam 1
- Residual paper jam 1
- Residual paper jam 4
- Door open jam 1
- Fuser wrap jam 1
- Fuser wrap jam 2
- Duplex switchback jam 1\(^1\)
- Duplex re-pickup jam 1\(^1\)
- Duplex re-pickup jam 2\(^1\)
- Delivery delay jam 1\(^1\)

\(^1\)Duplex models only.
Input accessories

NOTE: An optional 550-sheet paper feeder is available for this printer.

Tray 3

The 550-sheet paper feeder is installed under the printer. It picks up paper and feeds it into the printer.

Figure 1-27  550-sheet paper feeder

Tray 3 paper feeder controller

The paper feeder controller controls the operational sequence of the paper feeder.
Tray 3 paper feeder controller

The 550-sheet paper feeder has one motor for lifting the tray and feeding paper.

### Tray 3 paper feeder electrical components

<table>
<thead>
<tr>
<th>Component type</th>
<th>Abbreviation</th>
<th>Component name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>M9</td>
<td>Pickup motor</td>
</tr>
<tr>
<td>Clutch</td>
<td>SL20</td>
<td>Cassette (Tray 3) pickup solenoid</td>
</tr>
<tr>
<td></td>
<td>SL21</td>
<td>Lifter solenoid</td>
</tr>
<tr>
<td>Switch</td>
<td>SW31</td>
<td>Cassette (Tray 3) detection switch</td>
</tr>
<tr>
<td>Photointerrupter</td>
<td>SR31</td>
<td>Feed sensor</td>
</tr>
<tr>
<td></td>
<td>SR32</td>
<td>Cassette (Tray 3) media surface sensor</td>
</tr>
<tr>
<td></td>
<td>SR33</td>
<td>Lifter sensor</td>
</tr>
<tr>
<td></td>
<td>SR34</td>
<td>Cassette (Tray 3) media out sensor</td>
</tr>
</tbody>
</table>

### Tray 3 motor control

The 550-sheet paper feeder has one motor for lifting the tray and feeding paper.

<table>
<thead>
<tr>
<th>Component</th>
<th>Drives</th>
<th>Failure detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>M9</td>
<td>Pickup motor</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Cassette (Tray 3) pickup roller</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cassette (Tray 3) feed roller</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feed roller (550-sheet paper feeder)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lifter drive assembly</td>
<td></td>
</tr>
</tbody>
</table>

### Tray 3 paper pickup

The 550-sheet paper feeder picks up one sheet from the paper-feeder tray and feeds it to the printer.
Figure 1-29 Paper pickup and feed operation (550-sheet paper feeder)

Table 1-21 Pickup feed components (1x550-sheet paper feeder)

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>M9</td>
<td>Pickup motor</td>
</tr>
<tr>
<td>SL20</td>
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</tr>
<tr>
<td>SL21</td>
<td>Lifter solenoid</td>
</tr>
<tr>
<td>SR31</td>
<td>Feed sensor</td>
</tr>
<tr>
<td>SR32</td>
<td>Cassette (Tray 3) media surface sensor</td>
</tr>
<tr>
<td>SR33</td>
<td>Lifter sensor</td>
</tr>
<tr>
<td>SR34</td>
<td>Cassette (Tray 3) media output sensor</td>
</tr>
<tr>
<td>SW31</td>
<td>Cassette (Tray 3) detection switch</td>
</tr>
</tbody>
</table>

Tray 3 pickup and feed functions

The paper feeder has the following pickup and feed functions:

- Cassette (Tray 3) lift-up control
- Cassette (Tray 3) presence detection
- Cassette (Tray 3) media stack surface detection
- Cassette (Tray 3) media out detection
- Multiple-feed prevention
- Automatic delivery

Tray 3 jam detection

The paper feeder uses the following sensors to detect the presence of paper and to check whether paper is being fed correctly or has jammed:
Feed sensor (SR31)

**Figure 1-30 Jam detection sensors (Tray 3)**

The printer determines that a jam has occurred if one of these sensors detects paper at an inappropriate time. The DC controller stops the print operation and notifies the formatter.

The printer detects the following paper feeder jams:

- No pick jam 1
- No pick jam 2
- Pickup stay jam 1
- Fuser delivery delay jam 1
- Fuser delivery stay jam 1
- Residual paper jam 1
The flatbed image scanner captures an electronic image of the document on the glass. The scanner does this by illuminating the document with LEDs (red, green, and blue) and capturing the image in the image sensor to create an electronic format of the document. The flatbed scanner consists of three main elements.

- **CIS scanner**
  
  The CIS (contact image sensor) scanner captures an image using the product’s optical path. Red, green, and blue LEDs sequentially illuminate a small strip of the document (often called a raster line), and the optical system captures each color in a single row of CCD sensors that cover the entire page width. Because only one color is captured for each line per exposure, the three colors are recombined electronically to create the full color image. For monochromatic scans or copies, all three LEDs are illuminated to create a white light for the scan so the raster line can be captured in one exposure.

- **Mechanical drive system**
  
  The drive system moves the CIS scanner along the document length to create the image. In this printer, the drive system consists of a small DC motor with an optical encoder, a drive belt, and a guide rod. The speed of the drive system is proportional to the scan resolution (300 ppi is much faster than 1200 ppi) and also proportional to the type of scan (color scans are slower than monochromatic scans).

- **Image processing system (formatter)**
  
  The formatter processes the scanner data into either a copy or a scan to the computer. For copies, the image data is sent directly to the printer without being transmitted to the computer. Depending on user selections for the copy settings, the formatter enhances the scanner data significantly before sending it to the printer. Image data is captured at 300 ppi for copies and is user selectable for scans to the computer. Each pixel is represented by 8 bits for each of the three colors (256 levels for each color), for a total of 24 bits per pixel (24-bit color).
Document feeder system

**NOTE:** This section is for the M477 printer only.

Document feeder simplex operation

The document feeder will not function when the document feeder cover is open. The paper path is incomplete if the document feeder cover is lifted from the glass.

When the printer duplexes from the document feeder, the paper moves through one time, because the document feeder has a contact image sensor (CIS) scanner for side two which is scanned simultaneously with side one.

The standard operation of the document feeder consists of the standby (paper loading) mode, pick, feed, and lift steps:

- **Standby (paper-loading) mode**
  
  In standby mode, the lift plate is in the down position. When a document is loaded into the input tray, the paper-present sensor detects its presence.

  When a copy/scan is initiated, the document feeder motor engages the gear train and raises the lift plate until the document makes contact with the pick roller. The document feeder then begins the pick, feed, and lower sequence.

- **Pick**

  The pick roller rotates and moves one or more sheets forward into the document feeder where the sheets engage with the separation roller. The separation roller contacts the document feeder separation pad, which separates multiple sheets into a single sheet.

- **Feed**

  The single sheet continues through the document feeder paper path (aided by the pre-scan rollers) until the leading edge of the page activates the top-of-form sensor. Activation of this sensor initiates the scan process, and the scanner acquires the image as the document moves over the document feeder glass. The post-scan rollers then eject the sheet into the output area. The pick and feed steps are repeated as long as paper is detected by the paper-present sensor.

- **Home**

  When the form sensor detects the trailing edge of the last page, the last sheet is ejected and the motor turns on a sequence that rests the separation floor back down in standby mode, which allows it to detect when more media is loaded.
Fax functions and operation (fax models only)

The following sections describe the printer fax capabilities.

Computer and network security features

The printer can send and receive fax data over telephone lines that conform to public switch telephone network (PSTN) standards. The secure fax protocols make it impossible for computer viruses to be transferred from the telephone line to a computer or network.

The following printer features prevent virus transmission:

- No direct connection exists between the fax line and any devices that are connected to the USB or Ethernet ports.
- The internal firmware cannot be modified through the fax connection.
- All fax communications go through the fax subsystem, which does not use Internet data-exchange protocols.

PSTN operation

The PSTN operates through a central office (CO) that generates a constant voltage on the TIP and RING wires (48 V, usually). A device goes on-hook by connecting impedance (such as 600 ohms for the U.S.) across the TIP and RING so that a line current can flow. The CO can detect this current and can send impulses like dial tones. The printer generates more signaling tones, such as dialing digits, to tell the CO how to connect the call. The printer can also detect tones, such as a busy tone from the CO, that tell it how to behave.

When the call is finally connected, the CO behaves like a piece of wire connecting the sender and receiver. This is the period during which all of the fax signaling and data transfer occurs. When a call is completed, the circuit opens again and the line-current flow ceases, removing the CO connection from both the sender and the receiver.

On most phone systems, the TIP and RING signals appear on pins 3 and 4 of the RJ-11 modular jack (the one on the fax card, as defined in the common 6 wire RJ standard). These two signals do not have to be polarized because all of the equipment works with either TIP or RING on one pin and the other signal on the other pin. This means that cables of either polarity can interconnect and still work.

These basic functions of PSTN operation are assumed in the design of the fax subsystem. The printer generates and detects the signaling tones, currents, and data signals that are required to transmit and receive faxes using the PSTN.

Receive faxes when you hear fax tones

In general, incoming faxes to the printer are automatically received. However, if other devices are connected to the same phone line, the printer might not be set to answer automatically.

If the printer is connected to a phone line that receives both fax and phone calls, and you hear fax tones when you answer the extension phone, receive the fax in one of two ways:

- If you are near the printer, press Start Fax on the control panel.
- Press 1-2-3 in sequence on the extension phone keypad, listen for fax transmission sounds, and then hang up.
NOTE: In order for the 1-2-3 sequence to work, the extension phone setting must be set to On in the Fax Setup menu.

Distinctive ring function

Distinctive ring is a service that a telephone company provides. The distinctive ring service allows three phone numbers to be assigned to one phone line. Each phone number has a distinctive ring. The first phone number has a single ring, the second phone number has a double ring, and the third phone number has a triple ring.

NOTE: The printer has not been tested with all of the distinctive-ring services that telephone companies provide in all countries/regions. HP does not guarantee that the distinctive-ring function will operate correctly in all countries/regions. Contact the local phone service provider for assistance.

Set up the distinctive ring function

1. Open the Setup menu.
2. Open the Fax Menu menu.
3. Select the Basic Setup menu.
4. Select the Distinctive Ring setting.
5. Use the arrow buttons to select one of the following options:
   - All Rings (default setting)
   - Single
   - Double
   - Triple
   - Double and Triple

Fax by using voice over IP (VOIP) services

Voice over IP (VoIP) services provide normal telephone service, including long distance service through a broadband Internet connection. These services use packets to break up the voice signal on a telephone line and transmit it digitally to the receiver, where the packets are reassembled. The VoIP services are often not compatible with fax machines. The VoIP provider must state that the service supports fax over IP services.

Because the installation process varies, the VoIP service provider will have to assist in installing the printer fax component.

Although a fax might work on a VoIP network, it can fail when the following events occur:

- Internet traffic becomes heavy and packets are lost.
- Latency (the time it takes for a packet to travel from its point of origin to its point of destination) becomes excessive.

If you experience problems using the fax feature on a VoIP network, ensure that all of the printer cables and settings are correct. Configuring the Fax Speed setting to Medium(V.17) or Slow(V.29) can also improve your ability to send a fax over a VoIP network.

If you continue to have problems faxing, contact your VoIP provider.
The fax subsystem

The formatter, fax card, firmware, and software all contribute to the fax functionality. The designs of the formatter and fax card, along with parameters in the firmware, determine the majority of the regulatory requirements for telephony on the printer.

The fax subsystem is designed to support V.34 fax transmission, low speeds (such as V.17 fax), and older fax machines.

Fax card in the fax subsystem

Two versions of the fax card are used in the printer. One is used in the North American, South American, and Asian countries/regions. The other is used primarily in European countries/regions.

The fax card contains the modem chipset (DSP and CODEC) that controls the basic fax functions of tone generation and detection, along with channel control for fax transmissions. The CODEC and its associated circuitry act as the third-generation silicon data access arrangement (DAA) to comply with worldwide regulatory requirements.

The only difference between the two versions is that each version is compliant with the 2/4-wire phone jack system from the respective country/region.

Safety isolation

The most important function of the fax card is the safety isolation between the high-voltage, transient-prone environment of the telephone network (TNV [telephone network voltage]) and the low-voltage analog and digital circuitry of the formatter (SELV [secondary extra-low voltage]). This safety isolation provides both customer safety and printer reliability in the telecom environment.

Any signals that cross the isolation barrier do so magnetically. The breakdown voltage rating of barrier-critical components is greater than 5 kV.

Safety-protection circuitry

In addition to the safety barrier, the fax card protects against over-voltage and over-current events.

Telephone over-voltage events can be either differential mode or common mode. The event can be transient in nature (a lightning-induced surge or ESD) or continuous (a power line crossed with a phone line). The fax card protection circuitry provides margin against combinations of over-voltage and overcurrent events.

Common mode protection is provided by the selection of high-voltage-barrier critical components (transformer and relay). The safety barrier of the fax card PCB traces and the clearance between the fax card and surrounding components also contribute to common mode protection.

A voltage suppressor (a crowbar-type thyristor) provides differential protection. This device becomes low impedance at approximately 300 V differential, and crowbars to a low voltage. A series thermal switch works in conjunction with the crowbar for continuous telephone line events, such as crossed power lines.

All communications cross the isolation barrier magnetically. The breakdown voltage rating of barrier-critical components is greater than 5 kV.

Data path

TIP and RING are the two-wire paths for all signals from the telephone network. All signaling and data information comes across them, including fax tones and fax data.
The telephone network uses DC current to determine the hook state of the telephone, so line current must be present during a call. The silicon DAA provides a DC holding circuit to keep the line current constant during a fax call.

The silicon DAA converts the analog signal to a digital signal for DSP processing, and also converts the digital signal to an analog signal for transmitting data through a telephone line.

The magnetically coupled signals that cross the isolation barrier go through either a transformer or a relay.

The DSP in the fax card communicates with the ASIC in the formatter using the high-speed serial interface.

**Hook state**

Another magnetically coupled signal is the control signal that disconnects the downstream telephone devices (such as a phone or answering machine). A control signal originating on the DSP can change the relay state, causing the auxiliary jack (downstream jack) to be disconnected from the telephone circuit.

The printer takes control of calls that it recognizes as fax calls. If the printer does not directly pick up the call, it monitors incoming calls for the fax tone or for the user to direct it to receive a fax. This idle mode is also called eavesdropping. This mode is active when the printer is on-hook but current exists in the downstream phone line because another device is off-hook. During eavesdropping, the receive circuit is enabled but has a different gain from the current that is generated during normal fax transmissions.

The printer does not take control of the line unless it detects a fax tone or the user causes it to connect manually. This feature allows the user to make voice calls from a phone that is connected to the printer without being cut off if a fax is not being received.

**Downstream device detection**

The line voltage monitoring module of the silicon DAA can detect the line state as well as the downstream device. It tells DSP via DIB that an active device (telephone, modem, or answering machine) is connected to the auxiliary port on the printer (the right side of the dual RJ-11 jack). The DSP uses the signal to ensure that the printer does not go off-hook (and disconnects a downstream call) until it has been authorized to do so (by a manual fax start or the detection of the appropriate tones).

**Hook switch control**

In the silicon DAA the CODEC controls the hook switch directly. The CODEC is activated when it receives commands from the DSP. When the circuit is drawing DC current from the central office it is considered off-hook. When no DC current flows the state is considered on-hook.

**Ring detect**

Ring detect is performed by the line voltage monitoring module of the silicon DAA, and is a combination of voltage levels and cadence (time on and time off). Both must be present to detect a valid ring. The CODEC works with DSP as well as the firmware to determine if an incoming signal is an answerable ring.

**Line current control**

The DC current from the CO needs to have a path to flow from TIP to RING. The DC impedance emulation line modulator and DC terminations modules in the silicon DAA act as a DC holding circuit, and work with the firmware to achieve the voltage-current characteristic between TIP and RING. The impedance (the current-voltage characteristic) changes corresponding to certain special events, such as pulse dialing or when the printer goes on-hook.
Billing or metering tone filters

Switzerland and Germany provide high-frequency AC signals on the phone line in order to bill customers.

A filter in a special fax cable (for certain countries/regions), can filter these signals. Because these billing signals are not used in the U.S., these filters are not present in the U.S. fax cable.

To obtain a special fax cable, contact your local telephone service provider.

Fax page storage in flash memory

Fax pages are the electronic images of the document page. They can be created in any of three ways: scanned to be sent to another fax machine, generated to be sent by the computer, or received from a fax machine to be printed.

The printer stores all fax pages in flash memory automatically. After these pages are written into flash memory, they are stored until the pages are sent to another fax machine, printed on the printer, transmitted to the computer, or erased by the user.

These pages are stored in flash memory, which is the nonvolatile memory that can be repeatedly read from, written to, and erased. The printer has 8 MB of flash memory, of which 7.5 MB is available for fax storage. The remaining 0.5 MB is used for the file system and reclamation. Adding RAM does not affect the fax page storage because the printer does not use RAM for storing fax pages.

Stored fax pages

The user can reprint stored fax receive pages in case of errors. For a fax send, the printer will resend the fax in case of errors. The printer will resend stored fax pages after a busy signal, communication error, no answer, or power failure. Other fax devices store fax pages in either normal RAM or short-term RAM. Normal RAM immediately loses its data when power is lost, while short-term RAM loses its data about 60 minutes after power failure. Flash memory maintains its data for years without any applied power.

Advantages of flash memory storage

Fax pages that are stored in flash memory are persistent. They are not lost as a result of a power failure, no matter how long the power is off. Users can reprint faxes in case the print cartridge runs out of toner or the printer experiences other errors while printing faxes.

The printer also has scan-ahead functionality that makes use of flash memory. Scan-ahead automatically scans pages into flash memory before a fax job is sent. This allows the sender to pick up the original document immediately after it is scanned, eliminating the need to wait until the fax transmission is complete.

Because fax pages are stored in flash memory rather than RAM, more RAM is available to handle larger and more complicated copy and print jobs.
2 Solve problems

- For additional service and support
- Troubleshooting process
- Tools for troubleshooting
- Solve image quality problems
- Clean the printer
- Solve paper-handling problems
- Prevent paper jams
- Clear paper jams
- Solve performance problems
- Solve connectivity problems
- Service mode functions
- Solve fax problems (fax models only)
- Solve email problems
- Update the firmware
For additional service and support

HP service personnel, go to the Service Access Work Bench (SAW) at http://h41302.www4.hp.com/km/saw/home.do.

Channel partners, go to HP Channel Services Network (CSN) at https://h30125.www3.hp.com/hpcsn.

At these locations, find information on the following topics:

● Install and configure
● Printer specifications
● Up-to-date control panel message (CPMD) troubleshooting
● Solutions for printer issues and emerging issues
● Remove and replace part instructions and videos
● Service advisories
● Warranty and regulatory information

To access HP PartSurfer information from any mobile device, go to http://partsurfermobile.hp.com/ or scan the Quick Response (QR) code below.
Troubleshooting process

Solve problems checklist

If the printer is not correctly functioning, complete the steps (in the order given) in the following checklist. If the printer fails a checklist step, follow the corresponding troubleshooting suggestions for that step. If a checklist step resolves the problem, skip the remaining checklist items.

1. Make sure that the printer is set up correctly.
   a. Press the power button to turn on the printer or to deactivate the Auto-Off mode.
   b. Check the power-cable connections.
   c. Make sure that the line voltage is correct for the printer power configuration. See the label that is on the printer for voltage requirements. If you are using a power strip and its voltage is not within specifications, plug the printer directly into the wall. If it is already plugged into the wall, try a different outlet.

2. Check the cable connections.
   a. Check the cable connection between the printer and the computer. Make sure that the connection is secure.
   b. Make sure that the cable itself is not faulty, by using a different cable if possible.
   c. Check the network connection: Make sure that the network light is lit. The network light is next to the network port on the back of the printer.

      If the printer remains unable to connect to the network, uninstall and then reinstall the printer. If the error persists, contact a network administrator.

3. Check to see if any messages appear on the control panel.

4. Make sure that the paper you are using meets specifications.

5. Make sure that the paper is loaded correctly in the input tray.

6. Make sure that the printer software is installed correctly.

7. Verify that you have installed the printer driver for this printer, and that you are selecting this printer from the list of available printers.

8. Print a configuration page.
   a. **2-line control panels:** On the printer control panel, press the OK button.
      
      **Touchscreen control panels:** From the Home screen on the printer control panel, touch the Setup button.
   
   b. Open the Reports menu.
   
   c. Select Configuration Report.
After printing the configuration page, check the following:

a. If the page does not print, verify that the input tray contains paper and that the paper is properly loaded.

b. Make sure that each toner cartridge is installed correctly.

c. If the page jams in the printer, clear the jam.

d. If the print quality is unacceptable, complete the following steps:
   - Verify that the print settings are correct for the paper you are using.
   - Solve print-quality problems.

9. Print a small document from a different program that has printed in the past. If this solution works, then the problem is with the program you are using. If this solution does not work (the document does not print), complete these steps:

a. Try printing the job from another computer that has the printer software installed.

b. Check the cable connection. Direct the printer to the correct port, or reinstall the software, selecting the connection type you are using.

Print the menu map

To more easily navigate individual settings, print a report of the complete printer menus.

1. **2-line control panels**: On the printer control panel, press the OK button.
   
   **Touchscreen control panels**: From the Home screen on the printer control panel, touch the Setup button.

2. Open the Reports menu.

3. Select Menu Structure.

Print a configuration page

Print a configuration page to test the printer.

1. **2-line control panels**: On the printer control panel, press the OK button.
   
   **Touchscreen control panels**: From the Home screen on the printer control panel, touch the Setup button.

2. Open the Reports menu.

Print the service page (includes the event log)

Printing the service page provides a list of printer settings that might be helpful in the troubleshooting process, as well as the event log, which stores the last 10 error events that the printer experienced.

1. **2-line control panels:** On the printer control panel, press the **OK** button.

   **Touchscreen control panels:** From the Home screen on the printer control panel, touch the **Setup** button.

2. Open the **Reports** menu.

3. Select the **Service Page** option to print the report.

The event log is located in the lower right-hand corner of the service page.

Determine the problem source

When the printer malfunctions or encounters an unexpected situation, the printer control panel alerts the user to the situation. This section contains a pre-troubleshooting checklist and a troubleshooting flow chart to filter out many possible causes of the problem. Use the pre-troubleshooting checklist to gather information about the problem from the customer. Use the troubleshooting flowchart to help diagnose the root cause of the problem. The remainder of this chapter provides steps for correcting problems.

- Use the pre-troubleshooting check list to gather information about the problem from the customer. See [Pre-troubleshooting checklist on page 63](#).

- Use the troubleshooting flowchart to pinpoint the root cause of hardware malfunctions. The flowchart provides guides to the section of this chapter that contain steps to correct the malfunction. See [Troubleshooting flowchart on page 64](#).

Before beginning any troubleshooting procedure, check the following issues:

- Are supply items within their rated life?

- Does the configuration page reveal any configuration errors?

**NOTE:** The customer is responsible for checking supplies and for using supplies that are in good condition.

Pre-troubleshooting checklist

The following table includes basic questions to ask the customer to quickly help define the problem(s).
<table>
<thead>
<tr>
<th>General topic</th>
<th>Questions</th>
</tr>
</thead>
</table>
| Environment   | ● Is the printer installed on a solid, level surface (+/- 1°)?  
● Is the power-supply voltage within ± 10 volts of the specified power source?  
● Is the power-supply plug inserted in the printer and the outlet?  
● Is the operating environment within the specified parameters?  
● Is the printer exposed to ammonia gas, such as that produced by diazo copiers or office cleaning materials?  
  **NOTE:** Diazo copiers produce ammonia gas as part of the copying processes. Ammonia gas (from cleaning supplies or a diazo copier) can have an adverse effect on some printer components (for example, the toner cartridge or cartridges OPC).  
● Is the printer exposed to direct sunlight? |
| Media         | ● Does the customer use only supported media?  
● Is the media in good condition (no curls, folds, or distortion)?  
● Is the media stored correctly and within environmental limits? |
| Input trays   | ● Is the amount of media in the tray within specifications?  
● Is the media correctly placed in the tray?  
● Are the paper guides aligned with the stack?  
● Is the tray (or trays) correctly installed in the printer? |
| Toner cartridge | ● Is the toner cartridge (or cartridges) installed correctly? |
| Transfer unit and fuser | ● Are the transfer unit and fuser installed correctly?  
  **NOTE:** For printers with an intermediate transfer belt (ITB), is the ITB installed correctly and fully seated. If a replacement ITB was installed, was all of the packing materials removed? |
| Covers        | ● Is the toner cartridge door closed? |
| Condensation  | ● Does condensation occur following a temperature change (particularly in winter following cold storage)? If so, wipe affected parts dry or leave the printer on for 10 to 20 minutes.  
● Was a toner cartridge (or cartridges) opened soon after being moved from a cold to a warm room? If so, allow the toner cartridge (or cartridges) to sit at room temperature for 1 to 2 hours. |
| Miscellaneous | ● Check for and remove any non-HP components (toner cartridges, memory modules, and EIO cards) from the printer.  
● Remove the printer from the network and ensure that the failure is associated with the printer before beginning troubleshooting.  
● For any color print-quality issues, calibrate the printer. |

**Troubleshooting flowchart**

This flowchart highlights the general processes to follow to quickly isolate and solve printer hardware problems.
Each row depicts a major troubleshooting step. Follow a “yes” answer to a question to proceed to the next major step. A “no” answer indicates that more testing is needed. Go to the appropriate section in this chapter, and follow the instructions there. After completing the instructions, go to the next major step in this troubleshooting flowchart.

Table 2-1 Troubleshooting flowchart

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Power on</td>
<td>Is the printer on and does a readable message display?</td>
<td>Yes</td>
<td>No → Follow the power-on troubleshooting checks. See Power subsystem on page 65.</td>
</tr>
<tr>
<td>2. Control panel messages</td>
<td>Does the message Ready display on the control panel?</td>
<td>Yes</td>
<td>No → After the control panel display is functional, see step 2.</td>
</tr>
<tr>
<td>3. Event log</td>
<td>Open the Troubleshooting menu and print an event log to see the history of errors with this printer. Does the event log print?</td>
<td>Yes</td>
<td>No → If the event log does not print, check for error messages. If paper jams inside the printer, see the jams section of the printer service manual. If error messages display on the control panel when trying to print an event log, see the control panel message section of the printer troubleshooting service manual. After successfully printing and evaluating the event log, see step 4.</td>
</tr>
<tr>
<td>4. Information pages</td>
<td>Open the Reports menu and print the configuration pages to verify that all the accessories are installed. Are all the accessories installed?</td>
<td>Yes</td>
<td>No → If accessories that are installed are not listed on the configuration page, remove the accessory and reinstall it. After evaluating the configuration pages, see step 5.</td>
</tr>
<tr>
<td>5. Print quality</td>
<td>Does the print quality meet the customer’s requirements?</td>
<td>Yes</td>
<td>No → Compare the images with the sample defects in the image defect tables. See the images defects table in the printer repair service manual. After the print quality is acceptable, see step 6.</td>
</tr>
<tr>
<td>6. Interface</td>
<td>Can the customer print successfully from the host computer?</td>
<td>Yes, This is the end of the troubleshooting process.</td>
<td>No → Verify that all I/O cables are connected correctly and that a valid IP address is listed on the HP Jetdirect configuration page. If error messages display on the control panel when trying to print an event log, see the control-panel message section of the printer troubleshooting service manual. When the customer can print from the host computer, this is the end of the troubleshooting process.</td>
</tr>
</tbody>
</table>

Power subsystem

Power-on checks

The basic printer functions should start up when the printer is connected into an electrical outlet and the power switch is pushed to the on position. If the printer does not start, use the information in this section to isolate and solve the problem.

If the control panel display remains blank, random patterns display, or asterisks remain on the control panel display, perform power-on checks to find the cause of the problem.
Power-on troubleshooting overview

During normal operation, a cooling fan begins to spin briefly after the printer power is turned on. Place a hand over the fan intake vents located on the right-side cover. When the fan is correctly operating, air passing into the printer is felt. Lean close to the printer to hear the fan operating. If the fan is operating, the dc side of the power supply is functioning.

After the fan is operating, the main motor turns on (unless the top cover is open, a jam condition is sensed, or the paper-path sensors are damaged). Visually and audibly determine that the main motor is turned on.

If the fan and main motor are operating correctly, the next troubleshooting step is to isolate print engine, formatter, and control panel problems. Perform an engine test. If the formatter is damaged, it might interfere with the engine test. If the engine-test page does not print, try removing the formatter, and then performing the engine test again. If the engine test is then successful, the problem is almost certainly with the formatter, the control panel, or the cable that connects them.

Perform an engine test

▲ With the printer on and in the Ready state, open and then close the front door four times (for a simplex print out on both simplex and duplex models) or five times (for a duplex print on duplex models). The printer prints the engine test page.

![Figure 2-1 Engine test page](image)

Troubleshooting power on problems

1. Verify that power is available to the printer. If the printer is plugged into a surge protector or uninterruptible power supply (UPS), remove it, and then plug the printer directly into a known operating wall receptacle (make sure that the wall receptacle provides the correct voltage and current for the printer).

   Unplug any other devices on the same circuit that the printer is using.

2. Try another known operating wall receptacle and a different power cord.

3. Listen for startup noises (fans and motors) and illuminated lights on the control panel.
**NOTE:** Operational fans, motors, and control-panel lights indicate the following:

- AC power is present at the printer.
- The low-voltage power supply (LVPS) is providing either or both 24 Vdc and 5 Vdc voltages.
- The DC controller microprocessor is functioning.

4. If startup noises are not heard, check the following:

   a. Turn the printer off, and then remove the power from the formatter.
   
   b. Turn the printer on, and then listen for startup noises. If normal startup noises are heard, go to step 5.

   **NOTE:** The control panel will be blank with the formatter removed.

   c. If normal startup noises and lights are still not present, replace the LVPS.

   d. If after replacing the LVPS normal startup noises are still not heard, replace the DC controller.

   **NOTE:** If the error persists after replacing these assemblies, escalate the problem to the Global Business Unit (GBU).

5. Try printing an engine test page.

   **NOTE:** The test page can only use Tray 2 as the paper source, so make sure that paper is loaded in Tray 2.

   ▲ With the printer on and in the Ready state, open and then close the front door four times (for a simplex print out on both simplex and duplex models) or five times (for a duplex print on duplex models). The printer prints the engine test page.

   ![Figure 2-2 Engine test page](image)

   If the engine test page prints, the print engine is operating normally (a failed engine test print page does not necessarily indicate that the print engine or DC controller is defective).

   **NOTE:** If the engine test page does not print, turn the printer off, remove the power from the formatter, and then try the engine test again. If the page prints, the problem might be the formatter.
A blank control panel display can be caused by one or more of the following:

- No power to the printer.
- Power supply has tripped (over-current/over-voltage/temperature issue).
- Formatter not fully seated.

💡 **TIP:** The two LEDs on the formatter indicate that the printer is functioning correctly.

HP recommends fully troubleshooting the formatter and control panel before replacing either assembly. Use the link LED (green) to troubleshoot formatter and control panel errors to avoid unnecessarily replacing these assemblies. See the LED diagnostics section in this manual.

- Faulty component installed on the formatter (for example, memory DIMM or disk drive).
- Control panel connector not fully seated.
- Faulty formatter.
- Faulty DC controller.
- Faulty control panel.

**Troubleshooting a blank control panel**

1. Verify that power is available to the printer. If the printer is plugged into a surge protector or uninterruptible power supply (UPS), remove it, and then plug the printer directly into a known operating wall receptacle (make sure that the wall receptacle provides the correct voltage and current for the printer).
2. Make sure that the power switch is in the on position.
3. Make sure that the fan runs briefly, which indicates that the power supply is operational.
4. Make sure that the control-panel display wire harness is connected.
5. Make sure that the formatter is seated and operating correctly. Turn off the printer and remove the formatter. Reinstall the formatter, make sure the power switch is in the on position, and then verify that the network LED (amber) is blinking and that the link LED (green) is illuminated.
6. Remove any external solutions, and then try to turn the printer on again.
7. If the control panel display is blank, but the main cooling fan runs briefly after the printer power is turned on, try printing an engine-test page to determine whether the problem is with the control-panel display, formatter, or other printer assemblies.

⚠ With the printer on and in the Ready state, open and then close the front door four times (for a simplex print out on both simplex and duplex models) or five times (for a duplex print on duplex models). The printer will print the engine test page.
If the engine test page prints, the print engine is operating normally (a failed engine test print page does not necessarily indicate that the print engine or DC controller is defective).

▲ Use the control-panel diagnostics to test the control panel. See the Control panel checks section below. If the error persists, proceed to the next step.

8. If the print engine appears to be correctly operating (the engine test page successfully printed) and the control panel is still blank, replace the low-voltage power supply (LVPS).

9. If after replacing the LVPS normal startup noises and lights are still not present, replace the DC controller.

NOTE: If the error persists after replacing these assemblies, escalate the problem to the Global Business Unit (GBU).

Control panel checks

The printer includes diagnostic tests for the control panel. This mode allows for troubleshooting issues with the LEDs (2-line control panels), display, and the buttons.

1. Open the secondary service menu.

   2-line control panels (M452nw/dn models)
   a. From the printer control panel, press the OK button.
   b. Press and hold the left arrow button.
   c. Press the Cancel button.
   d. Press the OK button to reopen the Setup menu.
   e. Scroll to the 2ndary Service menu, and then press the OK button.
**Touchscreen control panels (M452dw and M477 models)**

a. From the Home screen on the printer control panel, touch the Setup button.

b. Touch the space between the Home and Help buttons.

c. Touch the Back button.

d. Touch the Setup button.

e. Scroll to and touch the 2ndary Service menu.

2. Select one of the following tests:

   - **LED test**: Test the LED lights on 2-line control panels. The touchscreen control panels do not have any LEDs.
   - **Display Test**: Test the control panel display.
   - **Button Test**: Test the control panel buttons.
Tools for troubleshooting

The section describes the tools that can help solve problems with the printer.

Individual component diagnostics

Tools for troubleshooting: LED diagnostics

LED, engine, and individual diagnostics can identify and troubleshoot printer problems.

Network port LEDs

The formatter has two network port LEDs. When the printer is connected to a properly working network through a network cable, the amber LED indicates network activity, and the green LED indicates the link status.

A blinking amber LED indicates network traffic. If the green LED is off, a link has failed. For link failures, check all of the network cable connections. In addition, you can try to manually configure the network card link speed setting by using the printer control-panel.

1. **2-line control panels**: On the printer control panel, press the **OK** button.

   Touchscreen control panels: From the Home screen on the printer control panel, touch the **Setup** button.

2. Open the following menus:

   - **Network Setup**
   - **Link Speed**

3. Select the appropriate link speed.
Two-line control panel LEDs

The state of the Ready light and Attention light on the printer signal the printer status. The following table outlines the possible control-panel light states.

<table>
<thead>
<tr>
<th>Printer state</th>
<th>Ready light state</th>
<th>Attention light state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initializing</td>
<td>Blinking</td>
<td>Blinking</td>
</tr>
<tr>
<td>Ready</td>
<td>On</td>
<td>Off</td>
</tr>
<tr>
<td>Receiving data/processing job or cancelling job</td>
<td>Blinking</td>
<td>Off</td>
</tr>
<tr>
<td>Error message</td>
<td>Off</td>
<td>Blinking</td>
</tr>
<tr>
<td>Fatal error (49 or 79 error)(^1)</td>
<td>On</td>
<td>On</td>
</tr>
</tbody>
</table>

\(^1\) The printer restarts after one of these errors occurs.

Tools for troubleshooting: Engine diagnostics

The printer contains extensive internal engine diagnostics that help in troubleshooting print quality, paper path, noise, assembly, and timing issues.

Engine test

To verify that the printer engine is functioning, print an engine test page. The test page should have a series of lines that are parallel to the short end of the page. The test page can use only Tray 2 as the paper source, so make sure that paper is loaded in Tray 2.

\(^\Delta\) With the printer on and in the Ready state, open and then close the front door four times (for a simplex print out on both simplex and duplex models) or five times (for a duplex print on duplex models). The printer prints the engine test page.

Figure 2-4 Engine test page
Diagrams

Use the diagrams in this section to identify printer components.

Diagrams: Block diagrams

Sensors and switches (printer base)

Figure 2-5  Sensors and switches (printer base)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1</td>
<td>Registration sensor</td>
<td>SR7</td>
<td>Tray media surface sensor</td>
</tr>
<tr>
<td>SR2</td>
<td>Loop sensor</td>
<td>SR8</td>
<td>Lifter sensor</td>
</tr>
<tr>
<td>SR3</td>
<td>Fuser output sensor</td>
<td>SR21</td>
<td>Duplex switchback sensor (duplex models only)</td>
</tr>
<tr>
<td>SR4</td>
<td>Output bin media-full sensor</td>
<td>SR22</td>
<td>Duplex re-pickup sensor (duplex models only)</td>
</tr>
<tr>
<td>SR5</td>
<td>Tray media out sensor</td>
<td>SW6</td>
<td>Tray detection switch</td>
</tr>
<tr>
<td>SR6</td>
<td>Tray 1 media out sensor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 2-6 Sensors and switches (550-sheet paper feeder)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR31</td>
<td>Feed sensor</td>
<td>SR34</td>
<td>Tray media output sensor</td>
</tr>
<tr>
<td>SR32</td>
<td>Tray media surface sensor</td>
<td>SW31</td>
<td>Tray detection switch</td>
</tr>
<tr>
<td>SR33</td>
<td>Lifter sensor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chapter 2 Solve problems
Diagrams: Printed circuit assembly (PCA) connector locations

- Diagrams: Formatter connections
- Diagrams: Engine controller PCA connections
- Diagrams: 550-sheet paper feeder controller PCA connections

Diagrams: Formatter connections

Figure 2-7  Formatter connections—M452nw/dn models

Table 2-2  Formatter connections—M452nw/dn models

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1/J5</td>
<td>Power</td>
<td>J15</td>
<td>JTAG (debug only)</td>
</tr>
<tr>
<td>J6</td>
<td>SPI (debug only)</td>
<td>J18</td>
<td>Control panel (2-line)</td>
</tr>
<tr>
<td>J7</td>
<td>Trace (debug only)</td>
<td>J36</td>
<td>Engine</td>
</tr>
<tr>
<td>J8</td>
<td>Wireless radio</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2-3 Formatter connections—M452dw model

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1/J5</td>
<td>Power</td>
<td>J10/J14/J27/J35</td>
<td>Control panel (touchscreen)</td>
</tr>
<tr>
<td>J6</td>
<td>SPI (debug only)</td>
<td>J15</td>
<td>JTAG (debug only)</td>
</tr>
<tr>
<td>J7</td>
<td>Trace (debug only)</td>
<td>J17</td>
<td>NFC</td>
</tr>
<tr>
<td>J8</td>
<td>Wireless radio</td>
<td>J36</td>
<td>Engine</td>
</tr>
<tr>
<td>J9</td>
<td>Walk-up USB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2-4 Formatter connections—M477 models

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1/J5</td>
<td>Power</td>
<td>J15</td>
<td>JTAG (debug only)</td>
</tr>
<tr>
<td>J6</td>
<td>SPI (debug only)</td>
<td>J17</td>
<td>NFC</td>
</tr>
<tr>
<td>J7</td>
<td>Trace (debug only)</td>
<td>J19</td>
<td>Flatbed scanner</td>
</tr>
<tr>
<td>J8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J9</td>
<td></td>
<td>J1/J5</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2-8 Formatter connections—M452dw model

Figure 2-9 Formatter connections—M477 models
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J8</td>
<td>Wireless radio</td>
<td>J20/J22</td>
<td>Document feeder</td>
</tr>
<tr>
<td>J9</td>
<td>Walk-up USB</td>
<td>J21/J23</td>
<td>E-duplex scanner</td>
</tr>
<tr>
<td>J10/J14/J27/J35</td>
<td>Control panel (touchscreen)</td>
<td>J36</td>
<td>Engine</td>
</tr>
<tr>
<td>J12</td>
<td>Fax</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diagrams: Engine controller PCA connections

Each of the connections on the Engine controller PCA is indicated in the following figure.

**Figure 2-10** Engine controller PCA connectors

![Engine controller PCA connectors diagram]

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J100</td>
<td>Formatter</td>
<td>J119</td>
<td>Power supply switch</td>
</tr>
<tr>
<td>J102</td>
<td>Registration sensor</td>
<td>J120</td>
<td>Memory chip</td>
</tr>
<tr>
<td>J103</td>
<td>Tray media out sensor</td>
<td>J121</td>
<td>Environment sensor</td>
</tr>
<tr>
<td></td>
<td>Lifter sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tray media surface sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J104</td>
<td>Low-voltage power supply</td>
<td>J122</td>
<td>Paper feeder</td>
</tr>
<tr>
<td>J105</td>
<td>Low-voltage power supply</td>
<td>J123</td>
<td>Cyan/black laser assembly</td>
</tr>
<tr>
<td>J106</td>
<td>Intermediate transfer belt (ITB)</td>
<td>J124</td>
<td>Fuser</td>
</tr>
<tr>
<td>J107</td>
<td>Output bin media-full sensor</td>
<td>J125</td>
<td>Fuser</td>
</tr>
<tr>
<td>J108</td>
<td>Loop sensor</td>
<td>J126</td>
<td>Fuser</td>
</tr>
<tr>
<td></td>
<td>Fuser output sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J109</td>
<td>Fuser power supply</td>
<td>J127</td>
<td>Fuser</td>
</tr>
<tr>
<td>J110</td>
<td>Yellow/magenta laser assembly</td>
<td>J128</td>
<td>Duplex re-pickup clutch (duplex models only)</td>
</tr>
<tr>
<td>J111</td>
<td>Scanner motor</td>
<td>J129</td>
<td>Fuser</td>
</tr>
<tr>
<td>J112</td>
<td>Fuser pressure release detection switch</td>
<td>J130</td>
<td>Not used</td>
</tr>
<tr>
<td>J113</td>
<td>Driver PCA</td>
<td>J131</td>
<td>Not used</td>
</tr>
<tr>
<td>J114</td>
<td>Tray 1 media out sensor</td>
<td>J132</td>
<td>Formatter</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------</td>
<td>-------</td>
<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td>J116</td>
<td>Low-voltage power supply</td>
<td>J134</td>
<td>Duplex re-pickup sensor (duplex models only)</td>
</tr>
<tr>
<td>J117</td>
<td>Front door switch</td>
<td>J140</td>
<td>Lifter solenoid</td>
</tr>
<tr>
<td>J118</td>
<td>Registration density sensor</td>
<td>J144</td>
<td>Tray detection switch</td>
</tr>
</tbody>
</table>
Each of the connections on the 550-sheet paper feeder controller PCA is indicated in the following figure.

**Table 2-6 550-sheet paper feeder controller PCA connectors**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J750</td>
<td>Engine controller PCA</td>
<td>J754</td>
<td>Tray pickup solenoid</td>
</tr>
<tr>
<td>J751</td>
<td>Not used</td>
<td>J755</td>
<td>Tray media surface sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lifter sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tray media out sensor</td>
</tr>
<tr>
<td>J752</td>
<td>Pickup motor</td>
<td>J756</td>
<td>Feed sensor</td>
</tr>
<tr>
<td>J753</td>
<td>Lifter solenoid</td>
<td>J757</td>
<td>Tray detection switch</td>
</tr>
</tbody>
</table>
## Diagrams: External plug and port locations

1. **Power cord receptacle**
2. **Fax ports (M477 models only)**
3. **USB port for job storage**
4. **USB port for direct connection to a computer**
5. **Ethernet port**
Diagrams: Locations of major components

Major components (printer base)

Figure 2-12  Major components (printer base)

Table 2-7  Major components (printer base)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switchback drive assembly (duplex models only)</td>
<td>6</td>
<td>Registration assembly</td>
</tr>
<tr>
<td>2</td>
<td>Secondary transfer assembly</td>
<td>7</td>
<td>Fuser</td>
</tr>
<tr>
<td>3</td>
<td>Re-pickup assembly (duplex models only)</td>
<td>8</td>
<td>Lifter drive assembly</td>
</tr>
<tr>
<td>4</td>
<td>Registration density sensor</td>
<td>9</td>
<td>Intermediate transfer belt (ITB)</td>
</tr>
<tr>
<td>5</td>
<td>Tray pickup assembly</td>
<td>10</td>
<td>Laser scanner</td>
</tr>
</tbody>
</table>
Motors (printer base)

Figure 2-13 Motors (printer base)

Table 2-8 Motors (printer base)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fuser motor</td>
<td>3</td>
<td>Developer motor</td>
</tr>
<tr>
<td>2</td>
<td>Drum motor</td>
<td>4</td>
<td>Pickup motor</td>
</tr>
</tbody>
</table>

Fans (printer base)

Figure 2-14 Fans (printer base)

Table 2-9 Fans (printer base)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cartridge fan</td>
<td>2</td>
<td>Power supply fan</td>
</tr>
</tbody>
</table>
Rollers and power switch (printer base)

Figure 2-15 Rollers and power switch (printer base)

Table 2-10 Rollers and power switch (printer base)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Secondary transfer roller</td>
<td>5</td>
<td>Tray 1 pickup roller</td>
</tr>
<tr>
<td>2</td>
<td>Power supply switch</td>
<td>6</td>
<td>Separation roller</td>
</tr>
<tr>
<td>3</td>
<td>Pickup roller</td>
<td>7</td>
<td>Feed roller</td>
</tr>
<tr>
<td>4</td>
<td>Tray 1 separation pad</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PCAs (printer base)

Figure 2-16  PCAs (printer base)

Table 2-11  PCAs (printer base)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Driver PCA</td>
<td>6</td>
<td>Wireless PCA (M477fnw/fdw models)</td>
</tr>
<tr>
<td>2</td>
<td>Low-voltage power supply</td>
<td>7</td>
<td>Wireless PCA (M452nw/dw models)</td>
</tr>
<tr>
<td>3</td>
<td>Memory PCA</td>
<td>8</td>
<td>Formatter PCA</td>
</tr>
<tr>
<td>4</td>
<td>Environment sensor</td>
<td>9</td>
<td>Fax PCA (M477 models only)</td>
</tr>
<tr>
<td>5</td>
<td>Engine controller PCA</td>
<td>10</td>
<td>Fuser power supply</td>
</tr>
</tbody>
</table>
Major components (550-sheet paper feeder)

**Figure 2-17** Major components (550-sheet paper feeder)

![Diagram](image)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tray pickup assembly</td>
</tr>
<tr>
<td>2</td>
<td>Lifter drive assembly</td>
</tr>
<tr>
<td>3</td>
<td>Paper feed assembly</td>
</tr>
</tbody>
</table>

Table 2-12 Major components (550-sheet paper feeder)

PCA (550-sheet paper feeder)

**Figure 2-18** PCA (550-sheet paper feeder)

![Diagram](image)

Table 2-13 PCA (550-sheet paper feeder)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paper feeder controller PCA</td>
</tr>
</tbody>
</table>
Motors and rollers (550-sheet paper feeder)

**Figure 2-19** Motors and rollers (550-sheet paper feeder)

![Diagram of motors and rollers]

**Table 2-14** Motors and rollers (550-sheet paper feeder)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pickup motor</td>
<td>3</td>
<td>Separation roller</td>
</tr>
<tr>
<td>2</td>
<td>Pickup roller</td>
<td>4</td>
<td>Feed roller</td>
</tr>
</tbody>
</table>
## General Timing Chart

Timing chart two consecutive prints on LTR paper (Full color 1/1 speed mode)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Print command</td>
</tr>
<tr>
<td>2</td>
<td>Pickup solenoid</td>
</tr>
<tr>
<td>3</td>
<td>Registration sensor</td>
</tr>
<tr>
<td>4</td>
<td>Fuser output sensor</td>
</tr>
<tr>
<td>5</td>
<td>TOP sensor signal</td>
</tr>
<tr>
<td>6</td>
<td>Scanner motor</td>
</tr>
<tr>
<td>7</td>
<td>Drum motor</td>
</tr>
<tr>
<td>8</td>
<td>Drum motor</td>
</tr>
<tr>
<td>9</td>
<td>Developer motor</td>
</tr>
<tr>
<td>10</td>
<td>Fuser motor</td>
</tr>
<tr>
<td>11</td>
<td>Fuser heater</td>
</tr>
</tbody>
</table>
| 12   | Charging bias and developing bias (Y)
| 13   | Charging bias and developing bias (M) |
| 14   | Charging bias and developing bias (C) |
| 15   | Charging bias and developing bias (K) |
| 16   | Cartridge fan |
| 17   | Power supply fan |

Chapter 2   Solve problems
Diagrams: Circuit diagrams

Figure 2-21 General circuit diagram (printer base)
Advanced configuration with HP Embedded Web Server (EWS) and HP Device Toolbox (Windows)

Use the HP Embedded Web Server to manage printing functions from your computer instead of the printer control panel.

- View printer status information
- Determine the remaining life for all supplies and order new ones
- View and change tray configurations (paper types and sizes)
- View and print internal pages
- View and change network configuration

The HP Embedded Web Server works when the printer is connected to an IP-based network. The HP Embedded Web Server does not support IPX-based printer connections. You do not have to have Internet access to open and use the HP Embedded Web Server.

When the printer is connected to the network, the HP Embedded Web Server is automatically available.

**NOTE:** HP Device Toolbox is available only if you performed a full installation when you installed the printer. Depending on how the printer is connected, some features might not be available.

**NOTE:** The HP Embedded Web Server is not accessible beyond the network firewall.

Open the HP Embedded Web Server (EWS) from the Start menu

1. Click the Start button, and then click the Programs item.
2. Click your HP printer group, and then click the HP Device Toolbox item.

Open the HP Embedded Web Server (EWS) from a Web browser

1. **2-line control panels:** On the printer control panel, press the OK button. Open the Network Setup menu, and then select Show IP Address to display the IP address or host name.

   **Touchscreen control panels:** From the Home screen on the printer control panel, touch the Connection Information button, and then touch the Network Connected button or the Network Wi-Fi ON button to display the IP address or host name.

2. Open a Web browser, and in the address line, type the IP address or host name exactly as it displays on the printer control panel. Press the Enter key on the computer keyboard. The EWS opens.

   ![https://10.10.XXXX](https://10.10.XXXX/)

   **NOTE:** If the Web browser displays a There is a problem with this website’s security certificate message when attempting to open the EWS, click Continue to this website (not recommended).

Choosing Continue to this website (not recommended) will not harm the computer while navigating within the EWS for the HP printer.
<table>
<thead>
<tr>
<th>Tab or section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home tab</strong></td>
<td>Provides printer, status, and configuration information.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Device Status</strong>: Shows the printer status and shows the approximate percent life remaining of HP supplies.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Supplies Status</strong>: Shows the approximate percent life remaining of HP supplies. Actual supply life remaining can vary. Consider having a replacement supply available to install when print quality is no longer acceptable. The supply does not need to be replaced unless the print quality is no longer acceptable.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Device Configuration</strong>: Shows the information found on the printer configuration page.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Network Summary</strong>: Shows the information found on the printer network configuration page.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Reports</strong>: Print the configuration and supplies status pages that the printer generates.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Event Log</strong>: Shows a list of all printer events and errors.</td>
</tr>
<tr>
<td><strong>System tab</strong></td>
<td>Provides the ability to configure the printer from your computer.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Device Information</strong>: Provides basic printer and company information.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Paper Setup</strong>: Change the default paper-handling settings for the printer.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Print Quality</strong>: Change the default print-quality settings for the printer.</td>
</tr>
<tr>
<td></td>
<td>● <strong>EcoSMART Console</strong>: Change the default times for entering Sleep mode or Auto Power Down mode. Configure which events cause the printer to wake.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Paper Types</strong>: Configure print modes that correspond to the paper types that the printer accepts.</td>
</tr>
<tr>
<td></td>
<td>● <strong>System Setup</strong>: Change the system defaults for the printer.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Service</strong>: Perform the cleaning procedure on the printer.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Save and Restore</strong>: Save the current settings for the printer to a file on the computer. Use this file to load the same settings onto another printer or to restore these settings to this printer at a later time.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Administration</strong>: Set or change the printer password. Enable or disable printer features.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE</strong>: The System tab can be password-protected. If this printer is on a network, always consult with the administrator before changing settings on this tab.</td>
</tr>
<tr>
<td><strong>Print tab</strong></td>
<td>Provides the ability to change default print settings from your computer.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Printing</strong>: Change the default print settings, such as number of copies and paper orientation. These are the same options that are available on the control panel.</td>
</tr>
<tr>
<td></td>
<td>● <strong>PCL5c</strong>: View and change the PCL5c settings.</td>
</tr>
<tr>
<td></td>
<td>● <strong>PostScript</strong>: Turn off or on the Print PS Errors feature.</td>
</tr>
<tr>
<td><strong>Fax tab</strong></td>
<td>(Fax models only)</td>
</tr>
<tr>
<td></td>
<td>● <strong>Receive Options</strong>: Configure how the printer handles incoming faxes.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Phone Book</strong>: Add or delete entries in the fax phone book.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Junk Fax List</strong>: Set fax numbers to block from sending faxes to the printer.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Fax Activity Log</strong>: Review recent fax activity for the printer.</td>
</tr>
<tr>
<td>Tab or section</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Scan tab</strong> (MFP models only)</td>
<td>Configure the <strong>Scan to Network Folder</strong> and <strong>Scan to E-mail</strong> features.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Network Folder Setup</strong>: Configure folders on the network to which the printer can save a scanned file.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Scan to E-mail Setup</strong>: Begin the process to set up the <strong>Scan to E-mail</strong> feature.</td>
</tr>
<tr>
<td></td>
<td>● <strong>Outgoing E-mail Profiles</strong>: Set an email address that will appear as the “from” address for all emails sent from the printer. Configure the SMTP Server information.</td>
</tr>
<tr>
<td></td>
<td>● <strong>E-mail Address Book</strong>: Add or delete entries in the email address book.</td>
</tr>
<tr>
<td></td>
<td>● <strong>E-mail Options</strong>: Configure a default subject line and body text. Configure default scan settings for emails.</td>
</tr>
<tr>
<td><strong>Networking tab</strong> (Network-connected printers only)</td>
<td>Network administrators can use this tab to control network-related settings for the printer when it is connected to an IP-based network. It also allows the network administrator to set up Wireless Direct functionality. This tab does not appear if the printer is directly connected to a computer.</td>
</tr>
<tr>
<td><strong>HP Web Services tab</strong></td>
<td>Use this tab to set up and use various Web tools with the printer.</td>
</tr>
</tbody>
</table>
Control panel menus

2-line control-panel view (M452nw and M452dn models)

1 2-line control panel display
   This screen displays menus and printer information.

2 OK button
   Press the OK button for the following actions:
   ● Open the control-panel menus.
   ● Open a submenu displayed on the control-panel display.
   ● Select a menu item.
   ● Clear some errors.
   ● Begin a print job in response to a control-panel prompt (for example, when the message Press [OK] to continue appears on the control-panel display).

3 Right arrow button
   Use this button to navigate through the menus or to increase a value that appears on the display.

4 Cancel button
   Press this button to cancel a print job or to exit the control panel menus.

5 Wireless button (wireless models only)
   Use this button to navigate the open the Wireless menu and wireless status information.

6 Back arrow button
   Use this button for the following actions:
   ● Exit the control-panel menus.
   ● Scroll back to a previous menu in a submenu list.
   ● Scroll back to a previous menu item in a submenu list (without saving changes to the menu item).

7 Left arrow button
   Use this button to navigate through the menus or to decrease a value that appears on the display.

8 Ready LED
   The Ready light is on when the printer is ready to print. It blinks when the printer is receiving print data, or when the printer is in sleep mode.

9 Attention LED
   The Attention light blinks when the printer requires user attention.
**Touchscreen control-panel view (M452dw model)**

<table>
<thead>
<tr>
<th>1</th>
<th>Touchscreen</th>
<th>The display provides access to menus, help animations, and printer information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Home page screen indicator</td>
<td>The display indicates which Home screen the control panel is currently displaying.</td>
</tr>
<tr>
<td>3</td>
<td>Help ? button</td>
<td>Touch this button to open the control-panel help system.</td>
</tr>
<tr>
<td>4</td>
<td>Home button</td>
<td>Touch this button to navigate to the Home screen.</td>
</tr>
<tr>
<td>5</td>
<td>Back button</td>
<td>Touch this button to return to the previous screen.</td>
</tr>
</tbody>
</table>

**NOTE:** While the control panel does not have a standard Cancel button, during many printer processes a Cancel button appears on the touchscreen. This permits users to cancel a process before the printer completes it.
Home screen layout

The Home screen provides access to the printer features and indicates the current status of the printer.

Return to the Home screen at any time by touching the Home button on the printer control panel.

NOTE: The features that appear on the Home screen can vary, depending on the printer configuration.

1. **Reset button**
   Touch this button to reset any temporary job settings to the default printer settings.

2. **Connection Information button**
   Touch this button to open the Connection Information menu, which provides network information. The button appears as either a wired network icon or a wireless network icon, depending on the type of network to which the printer is connected.

3. **Setup button**
   Touch this button to open the Setup menu.

4. **Apps button**
   Touch this button to open the Apps menu to print directly from select Web applications.

5. **Supplies button**
   Touch this button to view information about supplies status.

6. **USB button**
   Touch this button to open the USB Flash Drive menu.

7. **Printer status**
   This screen area provides information about the overall printer status.

8. **Jobs button**
   Touch this button to open the stored jobs feature.
### Touchscreen control-panel view (M477 models)

![Touchscreen control-panel view](image)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Touchscreen</td>
<td>Provides access to menus, help animations, and printer information.</td>
</tr>
<tr>
<td>2</td>
<td>Home page screen indicator</td>
<td>The display indicates which Home screen the control panel is currently displaying.</td>
</tr>
<tr>
<td>3</td>
<td>Help button</td>
<td>Provides access to the control-panel help system</td>
</tr>
<tr>
<td>4</td>
<td>Home button</td>
<td>Provides access to the Home screen</td>
</tr>
<tr>
<td>5</td>
<td>Back button</td>
<td>Returns to the previous screen</td>
</tr>
</tbody>
</table>

**NOTE:** While the control panel does not have a standard Cancel button, during many printer processes a Cancel button appears on the touchscreen. This permits users to cancel a process before the printer completes it.
Home screen layout

The Home screen provides access to the printer features and indicates the current status of the printer.

Return to the Home screen at any time by touching the Home button on the printer control panel.

**NOTE:** The features that appear on the Home screen can vary, depending on the printer configuration.

1. **Reset button**
   - Touch this button to reset any temporary job settings to the default printer settings.

2. **Connection Information button**
   - Touch this button to open the Connection Information menu, which provides network information. The button appears as either a wired network icon or a wireless network icon, depending on the type of network to which the printer is connected.

3. **Setup button**
   - Touch this button to open the Setup menu.

4. **Apps button**
   - Touch this button to open the Apps menu to print directly from select Web applications.

5. **Supplies button**
   - Touch this button to view information about supplies status.

6. **USB button**
   - Touch this button to open the USB Flash Drive menu.

7. **Fax button**
   - Touch this button to open the fax features.

8. **Scan button**
   - Touch this button to open the scan features:
     - Scan to USB Drive
     - Scan to Network Folder
     - Scan to E-mail

9. **Jobs button**
   - Touch this button to open the stored jobs feature.

10. **Copy button**
    - Touch this button to open the copy feature.

11. **Printer status**
    - This screen area provides information about the overall printer status.

Setup menu

To open this menu, either press the OK button (2-line control panels) or touch the Setup button (touchscreen control panels). The following sub menus are available:
HP Web Services

- Reports
- Self Diagnostics (M452dw and M477 models only)
- Fax Setup (M477 models only)
- System Setup
- Service
- Network Setup
- Quick Forms

HP Web Services menu

Table 2-15 HP Web Services menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Web Services</td>
<td>Use Enable Web Services to set up Web Services on the printer.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> You must be connected to a network to enable HP Web Services.</td>
</tr>
<tr>
<td>Proxy Settings</td>
<td>The Proxy Settings sub-menu includes the following:</td>
</tr>
<tr>
<td></td>
<td>• Proxy Server</td>
</tr>
<tr>
<td></td>
<td>• Proxy Port</td>
</tr>
<tr>
<td></td>
<td>• Username</td>
</tr>
<tr>
<td></td>
<td>• Password</td>
</tr>
</tbody>
</table>

Chapter 2   Solve problems
## Reports menu

### Table 2-16 Reports menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo Page</td>
<td>Prints a page that demonstrates print quality.</td>
</tr>
<tr>
<td>Fax Reports (M477 models only)</td>
<td>• Fax Confirmation: Sets whether the printer prints a confirmation report after a successful fax job.</td>
</tr>
<tr>
<td></td>
<td>• Include First Page: Sets whether the printer includes a thumbnail image of the first page of the fax on the report.</td>
</tr>
<tr>
<td></td>
<td>• Fax Error Report: Sets whether the printer prints a report after a failed fax job.</td>
</tr>
<tr>
<td></td>
<td>• Print Last Call Report: Prints a detailed report of the last fax operation, either sent or received.</td>
</tr>
<tr>
<td></td>
<td>• Fax Activity Log:</td>
</tr>
<tr>
<td></td>
<td>• Print Log Now: Prints a list of the faxes that have been sent from or received by this printer.</td>
</tr>
<tr>
<td></td>
<td>• Auto Log Print: Automatically prints a report after every fax job.</td>
</tr>
<tr>
<td></td>
<td>• Print Phone Book: Prints a list of the speed dials that have been set up for this printer.</td>
</tr>
<tr>
<td></td>
<td>• Print Junk Fax List: Prints a list of phone numbers that are blocked from sending faxes to this printer.</td>
</tr>
<tr>
<td></td>
<td>• Print All Fax Reports: Prints all fax-related reports.</td>
</tr>
<tr>
<td>Menu Structure</td>
<td>Prints a control-panel menu layout map.</td>
</tr>
<tr>
<td>Configuration Report</td>
<td>Prints a list of the printer settings.</td>
</tr>
<tr>
<td>Supplies Status</td>
<td>Prints the toner cartridge status. Includes the following information:</td>
</tr>
<tr>
<td></td>
<td>• Approximate pages remaining</td>
</tr>
<tr>
<td></td>
<td>• Supply level</td>
</tr>
<tr>
<td></td>
<td>• Serial number</td>
</tr>
<tr>
<td></td>
<td>• Number of pages printed</td>
</tr>
<tr>
<td></td>
<td>• First install date</td>
</tr>
<tr>
<td></td>
<td>• Last used date</td>
</tr>
<tr>
<td>Network Summary</td>
<td>Displays status for:</td>
</tr>
<tr>
<td></td>
<td>• Network hardware configuration</td>
</tr>
<tr>
<td></td>
<td>• Enabled features</td>
</tr>
<tr>
<td></td>
<td>• TCP/IP and SNMP information</td>
</tr>
<tr>
<td></td>
<td>• Network statistics</td>
</tr>
<tr>
<td></td>
<td>• Wireless network configuration (wireless models only)</td>
</tr>
<tr>
<td>Usage Page</td>
<td>Displays the number of pages printed, faxed, copied, and scanned by the printer. (Specific items reported are model dependent.)</td>
</tr>
<tr>
<td>PCL Font List</td>
<td>Prints a list of all installed PCL 5 fonts.</td>
</tr>
<tr>
<td>Menu item</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PS Font List</td>
<td>Prints a list of all installed PS fonts.</td>
</tr>
<tr>
<td>PCL6 Font List</td>
<td>Prints a list of all installed PCL 6 fonts.</td>
</tr>
<tr>
<td>Color Usage Log</td>
<td>Prints information about the color supply usage.</td>
</tr>
<tr>
<td>Service Page</td>
<td>Prints the service page. The service page includes information about supported paper types, copy settings, and other settings that are not included on the configuration page. It also includes the event log.</td>
</tr>
<tr>
<td>Diagnostic Page</td>
<td>Prints diagnostic information about calibration and color quality.</td>
</tr>
<tr>
<td>Print Quality Page</td>
<td>Prints a page that helps solve problems with print quality.</td>
</tr>
<tr>
<td>Default Info Page</td>
<td>Prints a page that shows the default settings for the LaserJet Update feature.</td>
</tr>
</tbody>
</table>
### Self Diagnostics menu

**NOTE:** Not available for the 2-line control panel.

<table>
<thead>
<tr>
<th>Table 2-17 Self Diagnostics menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Menu item</strong></td>
</tr>
<tr>
<td>Run Network Test (if connected to a wired network)</td>
</tr>
<tr>
<td>Run Wireless Test (if connected to a wireless network — wireless models only)</td>
</tr>
<tr>
<td>Run Fax Test</td>
</tr>
</tbody>
</table>

### Fax Setup menu (M477 models)

In the following table, items that have an asterisk (*) indicate the factory default setting.

<table>
<thead>
<tr>
<th>Table 2-18 Fax Setup menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Menu item</strong></td>
</tr>
<tr>
<td>Fax Setup Utility</td>
</tr>
<tr>
<td>Basic Setup</td>
</tr>
<tr>
<td>Fax Header</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Answer Mode</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Rings to Answer</td>
</tr>
</tbody>
</table>
Table 2-18 Fax Setup menu (continued)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Setup</td>
<td>Distinctive Ring</td>
<td>All Rings*</td>
<td>If you have distinctive ring phone service, use this item to configure how the printer responds to incoming calls.</td>
</tr>
<tr>
<td>(continued)</td>
<td></td>
<td>Single</td>
<td>● <strong>All Rings</strong>: The printer answers any calls that come through the telephone line.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Double</td>
<td>● <strong>Single</strong>: The printer answers any calls that produce a single-ring pattern.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Triple</td>
<td>● <strong>Double</strong>: The printer answers any calls that produce a double-ring pattern.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Double and Triple</td>
<td>● <strong>Triple</strong>: The printer answers any calls that produce a triple-ring pattern.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● <strong>Double and Triple</strong>: The printer answers any calls that produce a double-ring or triple-ring pattern.</td>
</tr>
<tr>
<td></td>
<td>Dial Prefix</td>
<td>On</td>
<td>Specifies a prefix number that must be dialed when sending faxes from the printer. If this feature is turned on, the printer prompts you for the number and then it automatically includes that number every time a fax is sent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off*</td>
<td></td>
</tr>
<tr>
<td>Advanced Setup</td>
<td>Fax Resolution</td>
<td>Standard</td>
<td>Sets the resolution for sent documents. Higher resolution images have more dots per inch (dpi), so they show more detail. Lower resolution images have fewer dots per inch and show less detail, but the file size is smaller and the fax takes less time to transmit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fine*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superfine</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Photo</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lighter/Darker</td>
<td></td>
<td>Sets the darkness for outgoing faxes.</td>
</tr>
<tr>
<td></td>
<td>Fit to Page</td>
<td>On*</td>
<td>Shrinks incoming faxes that are larger than the paper size set for the tray.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glass Size</td>
<td>Letter</td>
<td>Sets the default paper size for documents being scanned from the flatbed scanner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOTE:</td>
<td></td>
<td>The default setting is determined by the choice of location during the initial printer setup.</td>
</tr>
<tr>
<td></td>
<td>Dialing Mode</td>
<td>Tone*</td>
<td>Sets whether the printer should use tone or pulse dialing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Redial if Busy</td>
<td>On*</td>
<td>Sets whether the printer should attempt to redial if the line is busy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Redial if No Answer</td>
<td>On</td>
<td>Sets whether the printer should attempt to redial if the recipient fax number does not answer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Redial if Comm. Error</td>
<td>On*</td>
<td>Sets whether the printer should attempt to redial the recipient fax number if a communication error occurs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detect Dial Tone</td>
<td>On</td>
<td>Sets whether the printer should check for a dial tone before sending a fax.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off*</td>
<td></td>
</tr>
<tr>
<td>Menu item</td>
<td>Sub-menu item</td>
<td>Sub-menu item</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Advanced Setup</td>
<td>Billing Codes</td>
<td>On</td>
<td>Enables the use of billing codes when set to On. A prompt appears for the billing code for an outgoing fax.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension Phone</td>
<td>On*</td>
<td>When this feature is enabled, the 1-2-3 buttons on the extension phone can be pressed to cause the printer to answer an incoming fax call.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stamp Faxes</td>
<td>On</td>
<td>Sets the printer to print the date, time, sender’s phone number, and page number on each page of incoming faxes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Private Receive</td>
<td>On</td>
<td>Setting Private Receive to On requires you to set a printer password. After setting the password, the following options are set:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● Private Receive is turned on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● All old faxes are deleted from memory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● Fax Forwarding is set to Off and is not allowed to be changed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● All incoming faxes are stored in memory.</td>
</tr>
<tr>
<td></td>
<td>Confirm Fax Number</td>
<td>On</td>
<td>Confirm a fax number by entering it a second time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allow Fax Reprint</td>
<td>On*</td>
<td>Sets whether incoming faxes are stored in memory for reprinting later.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax/Tel Ring Time</td>
<td>20</td>
<td>Sets the time, in seconds, after which the printer should stop sounding the Fax/Tel audible ring to notify the user of an incoming voice call.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Print Duplex</td>
<td>On</td>
<td>Enables or disables the two-sided printing feature for multiple-page faxes (duplex models only).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax Speed</td>
<td>Fast(V.34)</td>
<td>Sets the allowed fax communication speed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium(V.17)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slow(V.29)</td>
<td></td>
</tr>
</tbody>
</table>
## System Setup menu

In the following table, items that have an asterisk (*) indicate the factory default setting.

### Table 2-19 System Setup menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>(List of available control-panel display languages.)</td>
<td></td>
<td>Sets the language in which the control panel displays messages and printer reports.</td>
</tr>
<tr>
<td>Paper Setup</td>
<td>Default Paper Size</td>
<td>Letter</td>
<td>Sets the size for printing internal reports, faxes, or any print job that does not specify a size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A4</td>
<td>Note: The default setting is determined by the choice of location during the initial printer setup.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Legal</td>
<td></td>
</tr>
<tr>
<td>Default Paper Type</td>
<td>Lists available paper types.</td>
<td></td>
<td>Sets the type for printing internal reports, faxes, or any print job that does not specify a type.</td>
</tr>
<tr>
<td>Tray 1</td>
<td>Paper Type</td>
<td>Paper Size</td>
<td>Configures the size and type for the tray.</td>
</tr>
<tr>
<td>Tray 2</td>
<td>Paper Type</td>
<td>Paper Size</td>
<td>Configures the size and type for the tray.</td>
</tr>
<tr>
<td>Paper Out Action</td>
<td>Wait forever*</td>
<td></td>
<td>Determines how the printer reacts when a print job requires a paper size or type that is unavailable or when the tray is empty.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cancel</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Override</td>
<td></td>
</tr>
<tr>
<td>Print Quality</td>
<td>Color Calibration</td>
<td>Calibrate Now</td>
<td>Performs a full calibration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power-On Calibration</td>
<td></td>
</tr>
<tr>
<td>Adjust Alignment</td>
<td>Print Test Page</td>
<td></td>
<td>Shifts the margin alignment to center the image on the page from top to bottom, and left to right. You can also align the image that is printed on the front with the image that is printed on the back. Allows for one-sided and two-sided printing alignment.</td>
</tr>
</tbody>
</table>

**NOTE:** The default setting is determined by the choice of location during the initial printer setup.

**Print Test Page:** Prints a test page that shows the current registration settings.
<table>
<thead>
<tr>
<th>Menu item (continued)</th>
<th>Sub-menu item (continued)</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Print Quality**     | **Adjust Alignment**      | **Adjust Tray 1** | • X1 Shift: Registration of the image on the paper from side to side, as the paper lies in the tray. For duplex models, this side is the second side (back) of the paper.  
• X2 Shift: Registration of the image on the paper from side to side, as the paper lies in the tray, for the first side (front) of a duplexed page. This item appears only on duplex models (M452dn/dw and M477fdn/fdw).  
**NOTE:** Set X1 Shift first.  
• Y Shift: Registration of the image on the paper from top to bottom as the paper lies in the tray. |
|                       |                           | **Adjust Tray 2** | • X1 Shift: Registration of the image on the paper from side to side, as the paper lies in the tray, for the first side (front) of a duplexed page. This item appears only on duplex models (M452dn/dw and M477fdn/fdw).  
**NOTE:** Set X1 Shift first.  
• Y Shift: Registration of the image on the paper from top to bottom as the paper lies in the tray. |
| **Energy Settings**   | **Sleep/Auto Off After**  | **Off**        | Specifies the amount of idle time before the printer enters sleep mode.  
• 1 Minute  
• 15 Minutes*  
• 30 Minutes  
• 1 Hour  
• 2 Hours |
|                       | **Shut Down After**       | **Never**      | Set the amount of elapsed time before the printer turns itself off.  
• 30 Minutes  
• 1 Hour  
• 2 Hours  
• 4 Hours  
• 8 Hours  
• 24 Hours |
| **Delay Shut Down**   | **No Delay**              | **Select whether or not the printer delays shutting down after the user presses the power button.**  
• No Delay: The printer shuts down immediately.  
• When Ports Are Active: The printer waits until there is no I/O port activity before shutting down.
### Table 2-19  System Setup menu (continued)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
</table>
| Supply Settings| Black Cartridge| Very Low Setting | **Stop**: The printer stops printing until you replace the print cartridge.  
**Prompt**: The printer stops printing and prompts you to replace the print cartridge. You can acknowledge the prompt and continue printing.  
**Continue**: The printer alerts you that the print cartridge is very low, but it continues printing. |
|                |               | Low Threshold | Enter a percentage for the low threshold setting. |
| Color Cartridges| Very Low Setting | Stop | **Stop**: The printer stops printing until you replace the print cartridge.  
**Prompt**: The printer stops printing and prompts you to replace the print cartridge. You can acknowledge the prompt and continue printing.  
**Continue**: The printer alerts you that the print cartridge is very low, but it continues printing.  
**Print Black**: When a color print cartridge becomes very low, the printer prints in black only to prevent fax interruptions. When you choose to replace the very low print cartridge, color printing resumes automatically.  
**NOTE**: Prompt is the default setting, but if you install the fax wizard on your first incoming fax, the setting switches automatically to Print Black. |
|                | Low Threshold | Set a low threshold percentage setting for the following colors:  
- Cyan  
- Magenta  
- Yellow |
| Store Usage Data | Off | Select where to store the printer's usage data, either on the supplies or not on the supplies. |
| Cartridge Policy | Authorized HP | Use the Cartridge Policy feature to allow only genuine HP cartridges to be used with this printer. When someone attempts to install a cartridge that is not a genuine HP cartridge, the printer control panel displays a message informing that the cartridge is unauthorized, and it displays information explaining how to proceed. |
### Table 2-19  System Setup menu (continued)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Settings</td>
<td>Cartridge Protection</td>
<td>Protect Cartridges</td>
<td>Use the Cartridge Protection feature to permanently associate toner cartridges with a specific printer so they cannot be used in other printers. When someone attempts to transfer a protected cartridge from the original printer into another printer, that printer will not print. The printer control panel displays a message informing that the cartridge is protected, and it displays information explaining how to proceed. After selecting Protect Cartridges, when the printer prompts to confirm, select Continue to enable the feature. NOTE: After enabling cartridge protection for the printer, all subsequent toner cartridges installed in the printer are automatically and permanently protected. To avoid protecting a new cartridge, disable the feature before installing the new cartridge. To disable the feature, select Cancel rather than Continue in this step.</td>
</tr>
<tr>
<td>Volume Settings</td>
<td>Alarm Volume</td>
<td>Off</td>
<td>Set the volume levels for the printer.</td>
</tr>
<tr>
<td></td>
<td>Ring Volume</td>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Key-Press Volume</td>
<td>Medium*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phone Line Volume</td>
<td>Loud</td>
<td></td>
</tr>
<tr>
<td>Time/Date</td>
<td>12 Hour</td>
<td></td>
<td>Set the time and date setting for the printer.</td>
</tr>
<tr>
<td></td>
<td>24 Hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>Product Security</td>
<td>On</td>
<td>Set the printer-security feature. If you select the On setting, you must set a password.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>USB Flash Drive</td>
<td>On*</td>
<td>Enable, or disable, the USB flash drive.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disable Fax (M477 models only)</td>
<td>Yes</td>
<td>Enable, or disable, faxing to and from the printer.</td>
</tr>
<tr>
<td></td>
<td>No*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manage Stored Jobs</td>
<td>Job Storage</td>
<td>Automatic*</td>
<td>Automatically enables the job storage feature when a dedicated USB 2.0 storage device with at least 16 GB free space is installed in the rear host USB port. Off: Disables the job storage feature.</td>
</tr>
<tr>
<td>Sort Stored Jobs</td>
<td>Sort by Name*</td>
<td>Sorts stored jobs alphabetically by job name.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sort by Date</td>
<td>Sorts stored jobs chronologically by date.</td>
<td></td>
</tr>
<tr>
<td>Retain Temp Jobs</td>
<td>Do Not Retain*</td>
<td>Deletes temporary stored jobs when the printer reboots.</td>
<td></td>
</tr>
<tr>
<td>Retain Temp Jobs After Reboot</td>
<td>Personal Jobs Only</td>
<td>Retains only personal temporary stored jobs when the printer reboots.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All Temporary Jobs</td>
<td>Retains all temporary stored jobs when the printer reboots.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2-19 System Setup menu (continued)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>Manage Stored Jobs</td>
<td>Delete Temporary Jobs After</td>
<td>Specifies the amount of time temporary jobs are held before they are deleted.</td>
</tr>
<tr>
<td>(continued)</td>
<td>(continued)</td>
<td></td>
<td><em>Off</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 Minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Weeks</td>
</tr>
<tr>
<td>Delete Standard</td>
<td></td>
<td></td>
<td>Specifies the amount of time standard jobs are held before they are deleted.</td>
</tr>
<tr>
<td>Jobs After</td>
<td></td>
<td></td>
<td><em>Off</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 Minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Weeks</td>
</tr>
<tr>
<td>Scan to Network</td>
<td>On*</td>
<td></td>
<td>Enable, or disable, the printer’s scan to folder capability.</td>
</tr>
<tr>
<td>Folder (M477 models only)</td>
<td></td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td>Scan to E-mail</td>
<td>On*</td>
<td></td>
<td>Enable, or disable, the printer’s scan to email feature.</td>
</tr>
<tr>
<td>(M477 models only)</td>
<td></td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td>Color Copy</td>
<td>On*</td>
<td></td>
<td>Enable, or disable, the printer’s color copying feature.</td>
</tr>
<tr>
<td>(M477 models only)</td>
<td></td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td>Inactivity Timer</td>
<td></td>
<td></td>
<td>Set the amount of time that passes before a given menu or item will close due to printer inactivity.</td>
</tr>
<tr>
<td>Courier Font</td>
<td>Regular*</td>
<td></td>
<td>Set Courier font values.</td>
</tr>
<tr>
<td></td>
<td>Dark</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Service menu

In the following table, items that have an asterisk (*) indicate the factory default setting.

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax Service</td>
<td>Clear Saved Faxes</td>
<td></td>
<td>Clears all faxes in memory.</td>
</tr>
<tr>
<td>Run Fax Test</td>
<td></td>
<td></td>
<td>Performs a fax test to verify that the phone cord is connected to the correct outlet and that there is a signal on the phone line. A fax test report is printed indicating the results.</td>
</tr>
<tr>
<td>Print T.30 Trace</td>
<td>Now</td>
<td>Never*</td>
<td>Prints or schedules a report that is used to troubleshoot fax transmission issues.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If Error</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>At End of Call</td>
<td></td>
</tr>
<tr>
<td>Error Correction</td>
<td>On*</td>
<td>Off</td>
<td>The error correction mode allows the sending device to re-transmit data if it detects an error signal.</td>
</tr>
<tr>
<td>Fax Service Log</td>
<td>(fax models only)</td>
<td></td>
<td>The fax service log prints out the last 40 entries in the fax log.</td>
</tr>
<tr>
<td>Cleaning Page</td>
<td></td>
<td></td>
<td>Cleans the printer when specks or other marks appear on printed output. The cleaning process removes dust and excess toner from the paper path.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When selected, the printer prompts you to load plain Letter or A4 paper in Tray 1. Touch the OK button to begin the cleaning process. Wait until the process completes. Discard the page that prints.</td>
</tr>
<tr>
<td>USB Speed</td>
<td>High*</td>
<td>Full</td>
<td>Sets the USB speed for the USB connection to the computer. For the printer to actually operate at high speed, it must have high speed enabled and be connected to an EHCI host controller that is also operating at high speed. This menu item does not reflect the current operating speed of the printer.</td>
</tr>
<tr>
<td>Less Paper Curl</td>
<td>On</td>
<td>Off*</td>
<td>When printed pages are consistently curled, this option sets the printer to a mode that reduces curl.</td>
</tr>
<tr>
<td>Archive Print</td>
<td>On</td>
<td>Off*</td>
<td>When printing pages that will be stored for a long time, this option sets the printer to a mode that reduces toner smearing and dusting.</td>
</tr>
<tr>
<td>Firmware Datecode</td>
<td></td>
<td></td>
<td>Displays the current firmware datecode.</td>
</tr>
<tr>
<td>Restore Defaults</td>
<td></td>
<td></td>
<td>Sets all settings to the factory default values.</td>
</tr>
<tr>
<td>Signature Check</td>
<td>Cancel if Invalid*</td>
<td></td>
<td>Validates HP firmware downloads.</td>
</tr>
<tr>
<td></td>
<td>Prompt if Invalid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menu item</td>
<td>Sub-menu item</td>
<td>Sub-menu item</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------</td>
<td>-------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>LaserJet Update</td>
<td>Check for Updates Now</td>
<td>Install Now</td>
<td>Check for printer firmware updates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remind Me Later</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skip this Update</td>
<td></td>
</tr>
<tr>
<td>Manage Updates</td>
<td>Allow Downgrade</td>
<td></td>
<td>Manage how the printer handles firmware updates.</td>
</tr>
<tr>
<td></td>
<td>Check Automatically</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prompt Before Install</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allow Updates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMTP Comm. Report</td>
<td></td>
<td></td>
<td>The SMTP Communication Report contains the SMTP communication to and from the printer from the last Scan to E-mail job.</td>
</tr>
</tbody>
</table>
### Network Setup menu

In the following table, items that have an asterisk (*) indicate the factory default setting.

<table>
<thead>
<tr>
<th>Table 2-21 Network Setup menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Menu item</strong></td>
</tr>
<tr>
<td>Wireless Menu (wireless models only)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Google Cloud Print</td>
</tr>
<tr>
<td>Proxy Settings</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Wi-Fi Direct</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Wi-Fi Direct Name</td>
</tr>
<tr>
<td>Connection Method</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Wi-Fi Direct Password</td>
</tr>
<tr>
<td>IPv4 Config Method</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Auto Crossover</td>
</tr>
<tr>
<td>Network Services</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Table 2-21  Network Setup menu (continued)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link Speed</td>
<td>Automatic*</td>
<td>Sets the link speed manually if needed.</td>
</tr>
<tr>
<td></td>
<td>10T Full</td>
<td>After setting the link speed, the printer automatically restarts.</td>
</tr>
<tr>
<td></td>
<td>10T Half</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100TX Full</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100TX Half</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1000T Full</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Product Security</td>
<td>Enable printer security. If turned on, the printer prompts you to set a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>password. After it is set, the password will be needed to change printer</td>
</tr>
<tr>
<td></td>
<td>HTTPS Enforcement</td>
<td>An encrypted communication and secure identification of a network web server</td>
</tr>
<tr>
<td></td>
<td>Firewall</td>
<td>Enable, disable, or reset the printer firewall.</td>
</tr>
<tr>
<td></td>
<td>Access Control List</td>
<td>Enable, disable, or reset the network access control list.</td>
</tr>
<tr>
<td></td>
<td>802.1x (wireless models only)</td>
<td>Enable or disable the 802.1x wireless authentication protocol.</td>
</tr>
<tr>
<td></td>
<td>Reset All Security</td>
<td>Reset the security settings to the factory-set default values.</td>
</tr>
<tr>
<td>Restore Defaults</td>
<td></td>
<td>Resets all network configurations to their factory defaults.</td>
</tr>
</tbody>
</table>

Quick Forms menu

Table 2-22  Quick Forms menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notebook Paper</td>
<td>Narrow Rule</td>
<td>Prints pages that have preprinted</td>
</tr>
<tr>
<td></td>
<td>Wide Rule</td>
<td>lines.</td>
</tr>
<tr>
<td></td>
<td>Child Rule</td>
<td></td>
</tr>
<tr>
<td>Graph Paper</td>
<td>1/8 inch</td>
<td>Prints pages that have preprinted</td>
</tr>
<tr>
<td></td>
<td>5 mm</td>
<td>graph lines.</td>
</tr>
<tr>
<td>Checklist</td>
<td>1-Column</td>
<td>Prints pages that have preprinted</td>
</tr>
<tr>
<td></td>
<td>2-Column</td>
<td>lines with check boxes.</td>
</tr>
<tr>
<td>Music Paper</td>
<td>Portrait</td>
<td>Prints pages that have preprinted</td>
</tr>
<tr>
<td></td>
<td>Landscape</td>
<td>lines for writing music.</td>
</tr>
</tbody>
</table>
Function specific menus

The printer features function-specific menus for copying, faxing, scanning, and using a USB flash drive. To open these menus, touch the button for that function on the control panel.

USB menu

Open this menu by touching the USB button (touchscreen control panels). The following file types are supported:

- .PDF
- .JPG
- .PRN
- .CHT
- .DOC
- .XLS
- .PDF
- .PXL
- .DOCX
- .XLSX
- .PCL
- .PS
- .PPT
- .PPTX

Table 2-23 USB menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print Documents</td>
<td>Prints documents stored on the USB flash drive. Use the arrow buttons to scroll through the documents. Touch the names of documents to print. Touch the summary screen to change settings such as the number of copies, the paper size, or the paper type. Touch the Print button to print the documents.</td>
</tr>
<tr>
<td>View and Print Photos</td>
<td>Previews photos on the USB flash drive. Use the arrow buttons to scroll through the photos. Touch the preview image for each photo to print. Adjust the settings and save the changes as the new default settings. To print the photos, touch the Print button.</td>
</tr>
<tr>
<td>Scan to USB Drive</td>
<td>Scans a document and stores it as a .PDF file or JPEG image on the USB flash drive.</td>
</tr>
</tbody>
</table>

Fax Menu (M477 models only)

To open this menu, touch the Fax button, and then touch the Fax Menu button.

Table 2-24 Fax Menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax Reports</td>
<td>Fax Confirmation</td>
<td>On Every Fax</td>
<td>Sets whether the printer prints a confirmation report after a successful fax job.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Send Fax Only</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Receive Fax Only</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Never*</td>
<td></td>
</tr>
<tr>
<td>Include First Page</td>
<td>On*</td>
<td>Off</td>
<td>Sets whether the printer includes a thumbnail image of the first page of the fax on the report.</td>
</tr>
<tr>
<td>Menu item</td>
<td>Sub-menu item</td>
<td>Sub-menu item</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Fax Reports</td>
<td>Fax Error Report</td>
<td>On Every Error *</td>
<td>Sets whether the printer prints a report after a failed fax job.</td>
</tr>
<tr>
<td>(continued)</td>
<td></td>
<td>On Send Error</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Receive Error</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Never</td>
<td></td>
</tr>
<tr>
<td>Print Last Call Report</td>
<td></td>
<td></td>
<td>Prints a detailed report of the last fax operation, either sent or received.</td>
</tr>
<tr>
<td>Fax Activity Log</td>
<td>Print Log Now</td>
<td></td>
<td>Print Log Now: Prints a list of the faxes that have been sent from or received by this printer.</td>
</tr>
<tr>
<td></td>
<td>Auto Log Print</td>
<td></td>
<td>Auto Log Print: Automatically prints a report after every fax job.</td>
</tr>
<tr>
<td>Print Phone Book</td>
<td></td>
<td></td>
<td>Prints a list of the speed dials that have been set up for this printer.</td>
</tr>
<tr>
<td>Print Junk Fax list</td>
<td></td>
<td></td>
<td>Prints a list of phone numbers that are blocked from sending faxes to this printer.</td>
</tr>
<tr>
<td>Print All Fax Reports</td>
<td></td>
<td></td>
<td>Prints all fax-related reports.</td>
</tr>
<tr>
<td>Send Options</td>
<td>Send Fax Later</td>
<td></td>
<td>Allows a fax to be sent at a later time and date.</td>
</tr>
<tr>
<td></td>
<td>Broadcast Fax</td>
<td></td>
<td>Sends a fax to multiple recipients.</td>
</tr>
<tr>
<td></td>
<td>Fax Job Status</td>
<td></td>
<td>Displays pending fax jobs, and allows you to cancel pending fax jobs.</td>
</tr>
<tr>
<td>Fax Resolution</td>
<td>Standard</td>
<td></td>
<td>Sets the resolution for sent documents. Higher resolution images have more dots per inch (dpi), so they show more detail. Lower resolution images have fewer dots per inch and show less detail, but the file size is smaller.</td>
</tr>
<tr>
<td></td>
<td>Fine *</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Superfine</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Photo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive Options</td>
<td>Block Junk Faxes</td>
<td>Add Number</td>
<td>Modifies the junk fax list. The junk fax list can contain up to 30 numbers. When the printer receives a call from one of the junk fax numbers, it deletes the incoming fax. It also logs the junk fax in the activity log along with job-accounting information.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delete Number</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delete All Numbers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Print Junk Fax list</td>
<td></td>
</tr>
<tr>
<td>Menu item</td>
<td>Sub-menu item</td>
<td>Sub-menu item</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Receive Options</td>
<td></td>
<td></td>
<td><strong>Reprint Faxes</strong> Prints the received faxes stored in available memory. This item is available only if you have turned on the Allow Fax Reprint feature in the Fax Setup menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Forward Fax</strong> On</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Polling Receive</strong></td>
</tr>
<tr>
<td>Phone Book Setup</td>
<td></td>
<td></td>
<td><strong>Individual Setup</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Group Setup</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Delete Entry</strong> Deletes a specific phone book entry.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Delete All Entries</strong> Deletes all entries in the phone book.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Print Report Now</strong> Prints a list of all the individual and group dial entries in the phone book.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Change Defaults</strong></td>
</tr>
</tbody>
</table>

**Copy menu (M477 models only)**

To open this menu, touch the Copy button, and then touch the Settings button.

**NOTE:** Settings that have been changed with this menu expire 2 minutes after the last copy completes.

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID Copy</td>
<td></td>
<td></td>
<td>Copies both sides of identification cards, or other small-size documents, onto the same side of one sheet of paper.</td>
</tr>
<tr>
<td><strong>NOTE:</strong> This item is available from the main Copy screen. You do not need to touch the Settings button to access it.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Copies</td>
<td>(1–99)</td>
<td></td>
<td>Specifies the number of copies.</td>
</tr>
<tr>
<td>Menu item</td>
<td>Sub-menu item</td>
<td>Sub-menu item</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------</td>
<td>---------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Reduce/Enlarge</td>
<td>Original=100%</td>
<td></td>
<td>Specifies the size of the copy.</td>
</tr>
<tr>
<td></td>
<td>Legal to Letter=78%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Legal to A4=83%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A4 to Letter=94%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Letter to A4=97%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Page=91%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fit to Page</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Pages per Sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 Pages per Sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Custom: 25 to 400%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighter/Darker</td>
<td></td>
<td></td>
<td>Specifies the contrast of the copy.</td>
</tr>
<tr>
<td>Optimize</td>
<td>Describe Original</td>
<td>Auto Select*</td>
<td>Specifies the type of content in the original document, so the copy is the best match for the original.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mixed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Picture</td>
<td></td>
</tr>
<tr>
<td>Paper</td>
<td>Letter</td>
<td></td>
<td>Specifies the paper size.</td>
</tr>
<tr>
<td></td>
<td>Legal</td>
<td></td>
<td><strong>NOTE:</strong> The default paper size setting is determined by the choice of location during the initial printer setup.</td>
</tr>
<tr>
<td></td>
<td>A4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-Page Copy</td>
<td>Off*</td>
<td></td>
<td>When this feature is on, the printer prompts you to load another page onto the scanner glass or to indicate that the job is complete.</td>
</tr>
<tr>
<td></td>
<td>On</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collation</td>
<td>On*</td>
<td></td>
<td>Specifies whether to collate copy jobs.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tray Select</td>
<td>Auto Select</td>
<td></td>
<td>Specifies the tray to be used for the copy job.</td>
</tr>
<tr>
<td></td>
<td>Tray 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tray 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-Sided</td>
<td>1-Sided to 1-Sided</td>
<td></td>
<td>Specifies whether originals are one-sided or two-sided and whether copies should be one-sided or two-sided.</td>
</tr>
<tr>
<td></td>
<td>1-Sided to 2-Sided</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Sided to 2-Sided</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Sided to 1-Sided</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2-25 Copy menu (continued)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft Mode</td>
<td>Off*</td>
<td>On</td>
<td>Specifies whether to use draft-quality printing for copies.</td>
</tr>
<tr>
<td>Image Adjustment</td>
<td>Lightness</td>
<td>Contrast</td>
<td>Adjusts the image quality settings for copies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sharpen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Background Removal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Color Balance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grayness</td>
<td></td>
</tr>
<tr>
<td>Set as New Defaults</td>
<td></td>
<td></td>
<td>Saves any changes you have made to this menu as the new defaults.</td>
</tr>
<tr>
<td>Restore Defaults</td>
<td></td>
<td></td>
<td>Restores the factory defaults for this menu.</td>
</tr>
</tbody>
</table>

Scan menu (M477 models only)

Table 2-26 Scan menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan to USB Drive</td>
<td>Scans a document and stores it as a .PDF file or .JPEG image on the USB flash drive.</td>
</tr>
<tr>
<td>Scan to Network Folder</td>
<td>Scans a document to a network folder.</td>
</tr>
<tr>
<td>Scan to E-mail</td>
<td>Scans a document and sends as an email attachment.</td>
</tr>
</tbody>
</table>

Apps

Use the Apps menu to install HP Web Services applications.

Jobs

Use the Jobs menu to manage stored jobs. Requires a USB 2.0 storage device with at least 16 GB free space to be installed in the rear host USB port.

Supplies Status

Use the Supplies Status menu to print a supplies status page. Press Report.
Control panel message document (CPMD)

Control-panel message types

The control-panel messages and event code entries indicate the current printer status or situations that might require action.

**NOTE:** Event log errors do not appear on the control-panel display. Open the event log to view or print the event log errors.

A control-panel message displays temporarily and might require the user to acknowledge the message by touching the OK button to resume printing or by touching the Cancel button to cancel the job. With certain messages, the job might not finish printing or the print quality might be affected. If the message is related to printing and the auto-continue feature is on, the printer will attempt to resume printing after the message has appeared for 10 seconds without acknowledgement.

For some messages, restarting the printer might fix the problem. If a critical error persists, the printer might require service.

Control-panel messages and event log entries

**NOTE:** Some of the messages in the following sections only appear in the event log.

**TIP:** Some control-panel messages and event log entries refer to a specific printer sensor or switch in the recommended action to solve the problem. See the diagrams in the clear jams section of this manual for sensor and switch locations.

### 30.XX Error Messages

<table>
<thead>
<tr>
<th>Control panel message</th>
<th>Description</th>
<th>Recommended action</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.XXXX Scanner Error</td>
<td>The flatbed or ADF scanner is failing to initialize for the following reasons:</td>
<td>1. Verify that the product has the most recent firmware from hp.com.</td>
</tr>
<tr>
<td></td>
<td>● 30.0013 = Scanner failed to find home</td>
<td>2. Verify that the (flat flexible cables (FFC’s) are seated correctly on the formatter board.</td>
</tr>
<tr>
<td></td>
<td>● 30.0016 = Scan sensor communication error</td>
<td>3. If the error persists, replace the Scanner/ADF Assembly (HP Part #: CF377–60104).</td>
</tr>
<tr>
<td></td>
<td>● 30.0017 = Scan motor exceeded max position error</td>
<td>4. If the error persists, escalate to Level 3 so that Technical Marketing has visibility to the problem.</td>
</tr>
<tr>
<td></td>
<td>● 30.0023 = ADF scanner calibration error</td>
<td></td>
</tr>
</tbody>
</table>

### 49.XX.YY Error Messages

**49 Error, Turn off then on**

**Description**

The product has experienced an internal embedded software error. Under most conditions, the product automatically restarts.
Recommended action

1. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.

2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.

3. If the error persists, disconnect any network or USB cables and power cycle. If the product returns to Ready, check the FW version and update if a newer version is available.

4. If the error persists, print a Service Page from the Reports menu. Also, print an Error Report from the 2ndary Service Menu. On the Service Page, look at the xxxx portion of the 49.xxxx errors listed:
   - If the numbers are all or mostly different, then power quality is a possible problem; try a different wall socket.
   - If the xxxx portion of 49.xxxx contain repeats of the same numbers or groups of numbers, then check the 2ndary Service Error Report printed earlier for indications of a failure in a particular area. The report may indicate whether the error is caused by a network problem or a problem with the job.

5. If the error persists, replace the product.

   **NOTE:** If the 49 Error is caused by the network or a specific file, do not replace the product; it will not resolve the issue. Instead, attempt to isolate the issue in a way that demonstrates the error is caused by something in the environment.

6. If the error persists after product replacement, escalate to Level 3 so that Technical Marketing has visibility to the problem.

50.XX fuser errors

50.XX Fuser Error, Turn off then on

**Description**

The product has experienced an internal fuser hardware error:

- **50.00** = Generic Fuser error
- **50.10** = Low Fuser temperature error
- **50.11** = High sub thermistor area 3 fuser error
- **50.12** = Low sub thermistor area 3 fuser error
- **50.20** = Slow fuser error
- **50.30** = High fuser temperature error
- **50.40** = Fuser drive circuit error
- **50.70** = Fuser open error
- **50.80** = Low sub thermistor fuser error
- **50.90** = High sub thermistor fuser error

**Recommended action**

1. Reset the product:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.

2. If you are using a surge protector:
   a. Power off the product.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.

3. If the error persists, replace the Fusing Assembly:
   - Fusing Assembly, 110 VAC, simplex models (HP Part #: RM2–6431–000CN)
   - Fusing Assembly, 220 VAC, simplex models (HP Part #: RM2–6436–000CN)
   - Fusing Assembly, 110 VAC, duplex models (HP Part #: RM2–6418–000CN)
   - Fusing Assembly, 220 VAC, duplex models (HP Part #: RM2–6435–000CN)

4. If the error persists, replace the product.

**51.XX and 52 Laser/Scanner Errors**

**52 Scanner Error, Turn off then on**

**Description**

An error with the laser/scanner assembly has occurred in the product.

**Recommended action**

1. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.

2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.

3. If the error persists, replace the product.
**51.XX Laser Error, Turn off then on**

Description

An error with the laser/scanner assembly has occurred in the product.

- **51.00** = Laser error
- **51.20** = Black laser scanner error
- **51.21** = Cyan laser scanner error
- **51.22** = Magenta laser scanner error
- **51.23** = Yellow laser scanner error
- **51.30** = Laser error

Recommended action

1. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.
2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.
3. If the error persists, replace the product.

**54.XX Error Messages**

**54.XX Error, Turn off then on**

Description

The product has experienced an error with one of the internal sensors.

- **54.15** = Yellow toner level sensor error
- **54.16** = Magenta toner level sensor error
- **54.17** = Cyan toner level sensor error
- **54.18** = Black toner level sensor error
- **54.19** = TOP sensor scanner error
- **54.1C** = Density or CPRS sensor dirty

Recommended action

1. Reset the printer:
a. Turn off the power by using the power switch, and then wait at least 30 seconds.

b. Turn on the power and wait for the product to initialize.

2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.

3. Reseat sensor connections on the DC Controller.

4. If the error persists, replace the Density Detect Sensor Assembly (HP Part #: RM2–7399–000CN).

5. If the error persists, replace the product.

55.XXXX Error Messages

55.XXXX Error, Turn off then on

Description
The product has experienced an error with one of the internal sensors.

- **55.0** = DC controller communication error
- **55.0601** = DC controller NVRAM data error
- **55.0602** = DC controller NVRAM access error
- **55.1** = DC controller memory error
- **55.3** = Engine communication error

Recommended action

1. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.

2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.

3. If the error persists, replace the Engine Controller PCB Assembly:

   **NOTE:** For these products, the DC Controller and HVPS are integrated in to the Engine Controller PCB Assembly. There are not separate part numbers for the HVPS or DCC.
4. If the error persists, replace the product.

57.XX Error Messages

57 Fan Error, Turn off then on

Description
The product has experienced an error with its internal fan.

- 57.01 = Fan 1 error

Recommended action
1. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.
2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.
3. If the error persists, replace the internal cooling fan (HP Part #: RK2–6270–000CN).
4. If the error persists, replace the product.

58.XX Error Messages

58.XX Error, Turn off then on

Description
The product has experienced an error with the low voltage power supply.

- 58.04 = Low voltage power supply malfunction

Recommended action
1. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.
2. If you are using a surge protector:
a. Power off the printer.

b. Remove the surge protector.

c. Plug the product directly into the wall socket and turn the product power on.

3. Check the voltage label on the back of the product. If the product is rated 220V and is plugged into a 110V outlet, this error might occur. In most cases, no damage is caused to the product. If a power transformer is used to convert 220V power to 110V, verify that the transformer power rating is sufficient to operate the product.

4. If the error persists, replace the Low Voltage Power Supply:

<table>
<thead>
<tr>
<th>Low voltage power supply PCB assembly - Input voltage</th>
<th>RM2–7913–000CN</th>
</tr>
</thead>
<tbody>
<tr>
<td>110VAC-127VAC</td>
<td>RM2–7913–000CN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low voltage power supply PCB assembly - Input voltage</th>
<th>RM2–7914–000CN</th>
</tr>
</thead>
<tbody>
<tr>
<td>220VAC-240VAC</td>
<td>RM2–7914–000CN</td>
</tr>
</tbody>
</table>

5. If the error persists, replace the product.

59.XX Error Messages

59.XX Error, Turn off then on

Description
The product has experienced an error with one of the internal motors.

- **59.30** = Fuser motor startup error
- **59.40** = Fuser motor rotation error
- **59.70** = Black developer motor startup error
- **59.71** = Cyan developer motor startup error
- **59.72** = Magenta developer motor startup error
- **59.73** = Yellow developer motor startup error
- **59.80** = Black developer motor rotation error
- **59.81** = Cyan developer motor rotation error
- **59.82** = Magenta developer motor rotation error
- **59.83** = Yellow developer motor rotation error
- **59.90** = ITB motor start error
- **59.A0** = ITB motor rotation error
- **59.C0** = Developer motor rotation error
- **59.F0** = Transfer alienation failure

Recommended action
1. Reset the printer:
a. Turn off the power by using the power switch, and then wait at least 30 seconds.
b. Turn on the power and wait for the product to initialize.

2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.

3. If the error persists, replace the appropriate motor:

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Motor Description</th>
<th>HP Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>59.30, 59.40</td>
<td>Fuser Motor Assembly</td>
<td>RM2–7348–000CN</td>
</tr>
<tr>
<td>59.70, 59.71, 59.72, 59.73, 59.80, 59.80, 59.82, 59.83</td>
<td>Developing Motor Assembly</td>
<td>RM2–7344–000CN</td>
</tr>
<tr>
<td>59.C0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59.90, 59.A0, 59.F0</td>
<td>Drum Motor Assembly</td>
<td>RM2–7342–000CN</td>
</tr>
</tbody>
</table>

79 Errors

79 Error, Turn off then on

Description
The product has experienced an internal firmware error. Under most conditions, the product automatically restarts.

Recommended action
1. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.
2. If you are using a surge protector:
   a. Power off the printer.
   b. Remove the surge protector.
   c. Plug the product directly into the wall socket and turn the product power on.
3. If the error is intermittent, attempt to isolate the issue to something specific in the customers environment.

NOTE: If the 79 Error is caused by the network or a specific file, do not replace the product; it will not resolve the issue. Instead, attempt to isolate the issue in a way that demonstrates the error is caused by something in the environment.

4. If the error is persistent, replace the Formatter PCA.
5. If the error persists, replace the product.

6. If the error persists after product replacement, escalate to Level 3 so that Technical Marketing has visibility to the problem.

**Alpha Error Messages**

**<COLOR> cartridge is low.**

**Description**
The indicated toner cartridge is nearing the end of its useful life.

**Recommended action**
Printing can continue, but consider having a replacement supply on hand.

**<COLOR> cartridge is very low.**

**Description**
The indicated toner cartridge is at the end of its useful life. A customer configurable option on this product is "Prompt to Remind Me in 100 pages, 200 pages, 300 pages, 400 pages, or never." This option is provided as a customer convenience and is not an indication these pages will have acceptable print quality.

**Recommended action**
To ensure optimal print quality, HP recommends replacing the toner cartridge at this point. You can continue printing until you notice a decrease in print quality. Actual cartridge life might vary. Once an HP supply has reached Very Low, HP's Premium Protection Warranty on that supply has ended. All print defects or cartridge failures incurred when an HP supply is used in Continue at very low mode will not be considered to be defects in materials or workmanship in the supply under the HP Print Cartridge Warranty Statement.

**Cleaning.**

**Description**
The product periodically performs a cleaning procedure to maintain the best print quality.

**Recommended action**
Wait for the cleaning process to finish.

**Device error. Press [OK] to continue.**

**Description**
Paper has been delayed as it moves through the product.

**Recommended action**
Press the **OK** button to clear the message.

To avoid this problem, try the following solutions:
1. Adjust the paper guides in the tray. Ensure the front paper guide is pushing the paper against the back edge of the tray.

2. Use paper that meets HP specifications. Store paper unopened in its original packaging.

3. Use the product in an area that meets the environmental specifications for this product.

**Device is busy. Try again later.**

**Description**

The product is currently in use.

**Recommended action**

1. Wait for the product to finish the current job, or to finish initializing.

2. Turn the product off, then on, to see whether it comes to a Ready state.

3. Restore the device to the factory default settings. ([Setup Menu -> Service Menu -> Restore Defaults](#))

4. If the issue persists, upgrade to the latest firmware version.

**Document feeder jam. Clear and reload.**

**Description**

Paper is jammed in the document feeder tray or a sensor has incorrectly detected media in the document feeder paper path.

**Recommended action**

1. Remove the paper from the document feeder. If the paper rips, use a thick piece of paper (such as a business card) to clean the paper path.

2. Reset the printer:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.

3. If the error persists, replace the Scanner/ADF Assembly (HP Part #: CF377-60114).

**Document feeder mispick. Reload.**

**Description**

The product did not pick up the paper in the document feeder.

**Recommended action**

1. Remove the paper from the document feeder tray, and then reload it.

2. Verify there are no staples or paper clips on the stack of originals. Verify the originals are straightened out from previous folds or curl.

3. Check the pick rollers and separation pad for damage or wear. Replace if necessary.

---

<table>
<thead>
<tr>
<th>Part Description</th>
<th>HP Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENWW</td>
<td></td>
</tr>
</tbody>
</table>
4. If the control panel displays **Document Feeder Loaded** when the originals are not in the input tray of the document feeder, the sensor on the document feeder might be malfunctioning. Replace the Scanner/ADF Assembly (HP Part #: CF377-60114).

**Engine cable connection issue. Contact HP service. Press [OK] to continue.**

**Description**
The print engine cable diagnostics did not pass due to a cable issue.

**Recommended action**
Press **OK** to continue to use the device for scanning and faxing, but printing will not be functional.

Either replace the product or send to HP service.

**Fax is busy. Canceled send.**

**Description**
The fax line to which you were sending a fax was busy. The product has canceled sending the fax.

**Recommended action**
1. Call the recipient to ensure that the fax machine is on and ready.
2. Verify that the fax number is correct.
3. Verify that the **Redial if Busy** option is enabled.
4. Open the **Service** menu, and then touch the **Fax Service** button. Touch the **Run Fax Test** button. This test verifies that the phone cord is connected to the correct port and that the phone line has a signal. The product prints a report with the results.
5. Additional fax sending/receiving troubleshooting can be found in this document: [HP LaserJet Pro - Solve problems sending or receiving faxes (includes fax error messages)](c03491494) (in English) available in Service Access Workbench (SAW) or Channel Service Network (CSN).

**Fax line surge.**

**Description**
The product experienced current on the fax line over 125 mA for more than 15 seconds.

**Recommended action**
Increase the default surge value of 125 mA to 145 mA:

1. Enter the Secondary Service Menu.
2. Select Fax Settings.
4. Key in the number 141 and press OK.
5. Change the default value of 178 to 186 and press OK.
6. Power cycle the printer to make the change effective.

Fax receive error.

Description
An error occurred while trying to receive a fax.

Recommended action
1. Ask the sender to resend the fax.
2. To verify that the telephone cord is securely connected, disconnect and reconnect the telephone cord.
3. Verify that you are using the telephone cord that came with the product.
4. Open the Service menu, and touch the Fax Service button. Touch the Run Fax Test button. This test verifies that the phone cord is connected to the correct port and that the phone line has a signal. The product prints a report with the results.
5. Decrease the fax speed. Ask the sender to resend the fax.
6. Turn off error-correction mode. Ask the sender to resend the fax.

NOTE: Turning off error-correction mode might reduce the quality of the fax image.
7. Connect the product to a different phone line.
8. Additional fax sending/receiving troubleshooting can be found in this document: HP LaserJet Pro - Solve problems sending or receiving faxes (includes fax error messages) (c03491494) (in English) available in Service Access Workbench (SAW) or Channel Service Network (CSN).

Fax Send error.

Description
An error occurred while trying to send a fax.

Recommended action
1. Resend the fax.
2. Try faxing to another fax number.
3. To verify that the telephone cord is securely connected, disconnect and reconnect the telephone cord. Check that the telephone cord is securely connected by unplugging and replugging the cord.
4. Verify that you are using the telephone cord that came with the product.
5. Open the Service menu, and touch the Fax Service button. Touch the Run Fax Test button. This test verifies that the phone cord is connected to the correct port and that the phone line has a signal. The product prints a report with the results.
6. Connect the product to a different phone line.
7. Set the fax resolution to Standard instead of the default of Fine.

8. Additional fax sending/receiving troubleshooting can be found in this document: HP LaserJet Pro - Solve problems sending or receiving faxes (includes fax error messages) (c03491494) (in English) available in Service Access Workbench (SAW) or Channel Service Network (CSN).

Fax storage is full. Canceling the fax send/receive.

Description
The amount of available memory for storing faxes is insufficient to store an incoming fax.

Recommended action
1. If you are using the Private Receive feature, print all received faxes to regain some memory.
2. If the issue persists, clear faxes from memory:
   a. Open the Service menu.
   b. Touch the Fax Service button.
   c. Touch the Clear Saved Faxes menu item.

Front door open.

Description
The products front door is open.

Recommended action
Close the door.

Genuine HP supply installed.

Description
A genuine HP supply was just installed.

Recommended action
No action necessary.

Genuine HP supplies installed.

Description
More than one genuine HP supply was just installed.

Recommended action
No action necessary.

Install <COLOR> cartridge.

Description
The indicated toner cartridge is missing or not seated correctly.
Recommended action
Remove and reinstall the indicated supply.

Install supplies.
Description
More than one toner cartridge is missing or not seated correctly.

**NOTE:** Check the Status of each supply on the Supplies Status page using the product’s Embedded Web Server (EWS) to identify the specific cartridges.

Recommended action
Remove and reinstall all the supplies.

Jam in output bin. Open rear door and clear jam.
Description
A paper jam occurred in the output bin area of the printer.

Recommended action
1. Follow the instructions on the control panel to clear the jammed media.
2. If the issue persists:
   a. Use paper that meets HP specifications. Store paper unopened in its original packaging.
   b. Use the product in an area that meets the environmental specifications for this product.

Jam in print paper path. Open rear door and clear jam.
Description
A paper jam occurred while printing.

Recommended action
1. Follow the instructions on the control panel to clear the jammed media.
2. If the issue persists:
   a. Adjust the paper guides in the tray. Ensure the front paper guide is pushing the paper against the back edge of the tray.
   b. Use paper that meets HP specifications. Store paper unopened in its original packaging.
   c. Use the product in an area that meets the environmental specifications for this product.

Jam in print paper path. Open tray 2 and rear door.
Description
A paper jam occurred while printing.
Recommended action

1. Follow the instructions on the control panel to clear the jammed media.

2. If the issue persists:
   a. Adjust the paper guides in the tray. Ensure the front paper guide is pushing the paper against the back edge of the tray.
   b. Use paper that meets HP specifications. Store paper unopened in its original packaging.
   c. Use the product in an area that meets the environmental specifications for this product.

3. If the issue persists, check the pick-up rollers for wear or damage and replace if necessary.

Jam in Tray 1. Clear jam and then press [OK].

Description
A paper jam occurred while printing from the Tray 1 slot.

Recommended action

1. Follow the instructions on the control panel to clear the jammed media.

2. If the issue persists:
   a. Adjust the side paper guides in the tray 1 slot. Allow the printer to pull the media in when inserted in the Tray 1 slot.
   b. Use paper that meets HP specifications. Store paper unopened in its original packaging.
   c. Use the product in an area that meets the environmental specifications for this product.

3. If the issue persists, check the pick-up rollers for wear or damage and replace if necessary.

Jam in Tray 2. Clear jam and then press [OK].

Description
A paper jam occurred while printing from Tray 2.

Recommended action

1. Follow the instructions on the control panel to clear the jammed media.

2. If the issue persists:
   a. Adjust the paper guides in the tray. Ensure the front paper guide is pushing the paper against the back edge of the tray.
   b. Use paper that meets HP specifications. Store paper unopened in its original packaging.
   c. Use the product in an area that meets the environmental specifications for this product.

3. If the issue persists, check the pick-up rollers for wear or damage and replace if necessary.
**Jam in Tray 3, Clear jam and then press OK**

**Description**

The product has detected a jam in Tray 3.

**Recommended action**

1. Clear the jam from the area indicated on the product control panel, and then follow the control panel instructions.
2. Make sure the paper guides in the tray are adjusted correctly for the size of paper.
3. If the jam persists, replace the Tray 3 Assembly (HP Part #: CF404–67902).

**Load paper**

**Description**

The tray is empty.

**Recommended action**

Load paper in the tray.

**Load tray <#> Press [OK] for available media**

**Description**

The indicated tray is empty.

**Recommended action**

Load paper into the tray to continue printing. Press the OK button to select a different tray.

**Load tray <#>. Press [OK] to continue.**

**Description**

The indicated tray is empty.

**Recommended action**

Load paper into the tray and press OK to continue printing.

**Load tray <#> <TYPE>, <SIZE>. Press [OK] to continue.**

**Description**

The tray is not configured for the paper type and size that the print job is requesting.

**Recommended action**

Load the correct paper into the indicated tray and press OK to continue printing.

**Load tray <#>. Plain, <SIZE> / Cleaning mode. Press [OK] to start.**

**Description**

The product is ready to process the cleaning operation.
**Recommended action**

Load the indicated tray with plain paper in the size indicated, and then press the OK button.

**Manual Duplex. Load Tray <#>. Press [OK] to continue.**

**Description**
The first side of a manual duplex job has printed, and the page needs to be loaded to process the second side.

**Recommended action**
Load the page in the indicated tray with the side to be printed face up, and the top of the page away from you, and then press the OK button.

**Memory is low. Press [OK] to continue.**

**Description**
The product memory is almost full.

**Recommended action**
Press the OK button to finish the job, or touch the Cancel button to cancel the job. Break the job into smaller jobs that contain fewer pages.

**Misprint. Press [OK] to continue.**

**Description**
Paper has been delayed as it moves through the product.

**Recommended action**
Press the OK button to clear the message.

To avoid this problem, try the following solutions:

1. Adjust the paper guides in the tray. Ensure the front paper guide is pushing the paper against the back edge of the tray.

2. Use paper that meets HP specifications. Store paper unopened in its original packaging.

3. Use the product in an area that meets the environmental specifications for this product.

**NFC cable connection issue. Contact HP service. Press [OK] to continue.**

**Description**
The Near Field Communication (NFC) cable diagnostics did not pass due to a cable issue.

**Recommended action**
Press OK to continue to use the device, but NFC will not be functional.

Either replace the product or send to HP service.
No dial tone.

Description

The product could not detect a dial tone.

Recommended action

1. Check for a dial tone on the phone line by touching the Start Fax button.
2. Unplug the telephone cord from both the product and the wall. Reconnect the cord at both ends ensuring you are using the FAX port on the back of the printer. Looking at the back of the printer, the FAX port is towards the middle. DO NOT connect the fax line to the port with the telephone icon.
3. Verify that you are using the telephone cord that came with the product.
4. Open the Service menu, and touch the Fax Service button. Touch the Run Fax Test button. This test verifies that the phone cord is connected to the correct port and that the phone line has a signal. The product prints a report with the results.
5. Additional fax sending/receiving troubleshooting can be found in this document: HP LaserJet Pro - Solve problems sending or receiving faxes (includes fax error messages) (c03491494) (in English) available in Service Access Workbench (SAW) or Channel Service Network (CSN).

No fax detected.

Description

The product answered the incoming call but did not detect that a fax machine was calling.

Recommended action

1. Open the Service menu, and touch the Fax Service button. Touch the Run Fax Test button. This test verifies that the phone cord is connected to the correct port and that the phone line has a signal. The product prints a report with the results.
2. Additional fax sending/receiving troubleshooting can be found in this document: HP LaserJet Pro - Solve problems sending or receiving faxes (includes fax error messages) (c03491494) (in English) available in Service Access Workbench (SAW) or Channel Service Network (CSN).

Non-HP supply installed.

Description

A non-HP supply has been installed.

Recommended action

No action necessary.

⚠️ NOTE:  If customer believes they purchased a new genuine HP supply, direct them to www.hp.com/go/anticounterfeit to verify

⚠️ NOTE:  Service or repairs that are required as a result of using unsupported supplies is not covered under HP warranty.
Print failure, press [OK]. If error repeats, turn off then on.

Description
The product cannot process the page.

Recommended action
Press the OK button to continue printing the job, but output might be affected.
If the error persists, turn the power off and then on. Resend the print job.

Protected <COLOR> cartridge.

Description
A previously protected cartridge was installed in a printer other than the one that initiated the cartridge protection.

Recommended action
The cartridge can only be used in the product or fleet of products that initially protected it using Cartridge Protection.
Install a new or unprotected supply.

Protected supplies.

Description
More than one previously protected cartridge was installed in a printer other than the one that initiated the cartridge protection.

NOTE: Check the Status of each supply on the Supplies Status page using the product’s Embedded Web Server (EWS) to identify the specific cartridges.

Recommended action
The cartridges can only be used in the product or fleet of products that initially protected it using Cartridge Protection.
Install new or unprotected supplies.

Rear door open.

Description
The products rear door is open.

Recommended action
Close the door.

Replace <COLOR>.

Description
The indicated toner cartridge is at the end of its useful life, and the product is customer-configured to stop printing when it reaches the very low state.
Recommended action

Replace the indicated cartridge or change the Very Low Setting for the supply to something other than Stop.

**NOTE:** To ensure optimal print quality, HP recommends replacing the toner cartridge at this point. You can continue printing (if Very Low Setting is set to something other than Stop) until you notice a decrease in print quality. Actual cartridge life might vary. Once an HP supply has reached Very Low, HP's Premium Protection Warranty on that supply has ended. All print defects or cartridge failures incurred when an HP supply is used in Continue at very low mode will not be considered to be defects in materials or workmanship in the supply under the HP Print Cartridge Warranty Statement.

Replace supplies.

**Description**

More than one toner cartridge is at the end of its useful life, and the product is customer-configured to stop printing when it reaches the very low state.

**NOTE:** Check the Status of each supply on the Supplies Status page using the product’s Embedded Web Server (EWS) to identify the specific cartridges.

**Recommended action**

Replace the cartridges or change the Very Low Setting for each supply to something other than Stop.

**NOTE:** To ensure optimal print quality, HP recommends replacing the toner cartridge at this point. You can continue printing (if Very Low Setting is set to something other than Stop) until you notice a decrease in print quality. Actual cartridge life might vary. Once an HP supply has reached Very Low, HP's Premium Protection Warranty on that supply has ended. All print defects or cartridge failures incurred when an HP supply is used in Continue at very low mode will not be considered to be defects in materials or workmanship in the supply under the HP Print Cartridge Warranty Statement.

Supplies are in the wrong positions.

**Description**

More than one toner cartridge is installed in the incorrect slot.

**Recommended action**

Ensure that each toner cartridge is installed in the correct slot. From front to back, the toner cartridges are installed in this order: black, cyan, magenta, and yellow.

Supplies low.

**Description**

More than one toner cartridge is nearing the end of its useful life.

**Recommended action**

Check the supply level gauges on the control panel, or print a supplies status page to determine which toner cartridges are low.

Printing will continue until a Very Low message displays. Consider having replacement supplies on hand.
Supply memory error.

Description
There is an error with one of the installed cartridges. ‘X’ indicates the color of the cartridge.

(X=0: Black, X=1: Cyan, X=2: Magenta, X=3: Yellow)

- 10.000X (Event Code) — cartridge memory error
- 10.010X (Event Code) — cartridge memory error
- 10.020X (Event Code) — cartridge memory error
- 10.030X (Event Code) — cartridge memory error
- 10.100X (Event Code) — cartridge memory chip is missing

Recommended action
1. Reset the product:
   a. Turn off the power by using the power switch, and then wait at least 30 seconds.
   b. Turn on the power and wait for the product to initialize.
2. If the error persists, check the event-log messages to identify the specific cartridge at fault.
3. Verify the indicated cartridge is HP Genuine.
4. If the error persists, replace the cartridge.
5. If the error persists, replace the product.

The product is unable to calibrate. Close the lid and remove paper from the document feeder.

Description
The scanner is unable to calibrate because either the lid is open or there is paper blocking the scan head.

Recommended action
1. Remove any paper from the scanner glass or the ADF and close the lid.
2. If the error persists, replace the Scanner/ADF Assembly (HP Part #: CF377-60104).

Unauthorized <COLOR> cartridge.

Description
The administrator has configured this product to use only genuine HP supplies. The product has determined there is a supply not meeting this criteria.

Recommended action
Change the Cartridge Policy to Off or replace the cartridge to continue printing.

NOTE: If customer believes they purchased a new genuine HP supply, direct them to www.hp.com/go/anticounterfeit to verify
NOTE: Service or repairs that are required as a result of using unsupported supplies is not covered under HP warranty.

Unauthorized supplies.

Description
The administrator has configured this product to use only genuine HP supplies. The product has determined there is more than one supply not meeting this criteria

NOTE: Check the Status of each supply on the Supplies Status page using the product’s Embedded Web Server (EWS) to identify the specific cartridges.

Recommended action
Change the Cartridge Policy to Off or replace the cartridge to continue printing.

NOTE: If customer believes they purchased a new genuine HP supply, direct them to www.hp.com/go/anticounterfeit to verify

NOTE: Service or repairs that are required as a result of using unsupported supplies is not covered under HP warranty.

Unexpected size in Tray <#>. Load <SIZE>. Press [OK] to continue.

Description
The product has detected paper in the indicated tray that does not match the configuration for the tray.

Recommended action
Load the correct paper into the tray, or configure the tray for the size that you have loaded and press OK to continue printing.

Used or counterfeit <COLOR> cartridge in use.

Description
The indicated cartridge is used or counterfeit.

Recommended action
No action necessary.

NOTE: If customer believes they purchased a new genuine HP supply, direct them to www.hp.com/go/anticounterfeit to verify

NOTE: Service or repairs that are required as a result of using unsupported supplies is not covered under HP warranty.

Used or counterfeit supplies in use.

Description
More than one used or counterfeit cartridge is in use.

NOTE: Check the Status of each supply on the Supplies Status page using the product’s Embedded Web Server (EWS) to identify the specific cartridges.
Recommended action

No action necessary.

NOTE: If customer believes they purchased a new genuine HP supply, direct them to www.hp.com/go/anticounterfeit to verify.

NOTE: Service or repairs that are required as a result of using unsupported supplies is not covered under HP warranty.

Used or counterfeit <COLOR> cartridge is installed. Press [OK] to continue.

Description

The indicated cartridge is used or counterfeit.

Recommended action

Replace the indicated cartridge with a new genuine HP supply or press OK to continue using the installed cartridge.

Used or counterfeit supplies installed. Press [OK] to continue.

Description

More than one cartridge is used or counterfeit.

NOTE: Check the Status of each supply on the Supplies Status page using the product's Embedded Web Server (EWS) to identify the specific cartridges.

Recommended action

Replace the cartridges with new genuine HP supplies or press OK to continue using the installed cartridges.


Description

The wireless cable diagnostics did not pass due to a cable issue.

Recommended action

Press OK to continue to use the device, but wireless printing will not be functional.

Either replace the product or send to HP service.

Wrong cartridge in <COLOR> slot.

Description

The indicated toner cartridge is installed in the incorrect slot.

Recommended action

Ensure that each toner cartridge is installed in the correct slot. From front to back, the toner cartridges are installed in this order: black, cyan, magenta, and yellow.
Tools for troubleshooting: Event log messages

See the control-panel message and event-log entries section of this manual for event-log entry descriptions and solutions. The event log shows the last 50 events in descending order.

Print an error log

Print the error log from the secondary service menu

1. Open the secondary service menu.
   
   2-line control panels (M452nw/dn models)
   
   a. From the printer control panel, press the OK button.
   
   b. Press and hold the Back button.
   
   c. Press the Cancel button.
   
   d. Press the OK button to reopen the Setup menu.
   
   e. Scroll to the 2ndary Service menu, and then press the OK button.

   Touchscreen control panels (M452dw and M477 models)
   
   a. From the Home screen on the printer control panel, touch the Setup button.
   
   b. Touch the space between the Home and Help buttons.
   
   c. Touch the Back button.
   
   d. Touch the Setup button.
   
   e. Scroll to and touch the 2ndary Service menu.

2. Open the Service Reports menu.

3. Select the Error Log item.

View the event log

You can use HP Device Toolbox and the HP Embedded Web Server (EWS) to view the event log from a computer.

NOTE: This tool is available only if a full installation was performed when the printer software was installed.

1. Open the HP EWS through one of the following methods:

   From the Start menu
   
   a. Click the Start button, and then click the Programs item.
   
   b. Click the HP printer group, and then click the HP Device Toolbox item.
From a Web browser

Open a Web browser, and in the address line, type the IP address or host name exactly as it displays on the product control panel. Press the Enter key on the computer keyboard. The EWS opens.

https://10.10.XXXX/

**NOTE:** If the Web browser displays a There is a problem with this website's security certificate message when attempting to open the EWS, click Continue to this website (not recommended).

Choosing Continue to this website (not recommended) will not harm the computer while navigating within the EWS for the HP printer.

2. Click the Home tab, and then click the Event Log item. The event log shows a list of all printer events and errors.

**Event-log messages**

The following product events do not produce a message that appears on the control panel. Instead, they are recorded in the event log. To print the event log, open the secondary service menu, select Service Reports, and then select Error Report.

**Table 2-27 Event-log messages (X=0: black cartridge, X=1: cyan cartridge, X=2: magenta cartridge, X=3: yellow cartridge)**

<table>
<thead>
<tr>
<th>Event code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.000X</td>
<td>Cartridge memory error</td>
</tr>
<tr>
<td>10.010X</td>
<td>Cartridge memory error</td>
</tr>
<tr>
<td>10.020X</td>
<td>Cartridge memory error</td>
</tr>
<tr>
<td>10.030X</td>
<td>Cartridge memory error</td>
</tr>
<tr>
<td>10.100X</td>
<td>Cartridge memory chip is missing</td>
</tr>
<tr>
<td>10.300X</td>
<td>Unauthorized cartridge</td>
</tr>
<tr>
<td>10.310X</td>
<td>Non-HP supply in use</td>
</tr>
<tr>
<td>10.330X</td>
<td>Used or counterfeit cartridge in use</td>
</tr>
<tr>
<td>10.350X</td>
<td>Incompatible supply</td>
</tr>
<tr>
<td>10.400X</td>
<td>All installed cartridges are genuine HP</td>
</tr>
<tr>
<td>10.410X</td>
<td>Unsupported supply</td>
</tr>
<tr>
<td>10.570X</td>
<td>Protected cartridge</td>
</tr>
<tr>
<td>10.700X</td>
<td>Printing past very low</td>
</tr>
<tr>
<td>10.7100</td>
<td>Printing black only</td>
</tr>
<tr>
<td>10.8100</td>
<td>Not printing black only</td>
</tr>
<tr>
<td>Event code</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>13.XXXYY</td>
<td>Paper jam</td>
</tr>
<tr>
<td>• XX = 02</td>
<td>Input Media Source 1 Area</td>
</tr>
<tr>
<td>• XX = 03</td>
<td>Input Media Source 2 Area</td>
</tr>
<tr>
<td>• XX = 08</td>
<td>Registration Area - Drum Area</td>
</tr>
<tr>
<td>• XX = 09</td>
<td>Drum Area - Fuser Area</td>
</tr>
<tr>
<td>• XX = 10</td>
<td>Fuser Area - Paper Output Area</td>
</tr>
<tr>
<td>• XX = 11</td>
<td>Paper Output Area 1</td>
</tr>
<tr>
<td>• XX = 13</td>
<td>Duplex Reversing Area</td>
</tr>
<tr>
<td>• XX = 14</td>
<td>Duplex Feeding Area</td>
</tr>
<tr>
<td>• YY = 04</td>
<td>Media input delay jam 1. This jam occurs when the paper from input source 1 or 2 does not reach the registration sensor in designated amount of time from the start of paper pick-up.</td>
</tr>
<tr>
<td>• YY = 05</td>
<td>Media input delay jam 2. This jam occurs when the paper from input source 1 does not reach the PSTOP sensor in designated amount of time from the start of paper pickup from Tray 1.</td>
</tr>
<tr>
<td>• YY = 08</td>
<td>Media input stay jam 1. This jam occurs when media longer than specified is detected at the registration sensor.</td>
</tr>
<tr>
<td>• YY = 12</td>
<td>Fuser delivery delay jam 1. This jam occurs when the paper does not reach the output sensor in designated amount of time.</td>
</tr>
<tr>
<td>• YY = 16</td>
<td>Fuser delivery stay jam 1. This jam occurs when the page still exists at the output sensor after a designated amount of time after the paper reached the sensor.</td>
</tr>
<tr>
<td>• YY = 20</td>
<td>Residual Media in Paper path jam 1. This jam occurs when it is determined that auto-flash cannot be conducted for residual media, at power ON or door close.</td>
</tr>
<tr>
<td>• YY = 21</td>
<td>Residual Media in Paper path jam 2. This jam occurs when media left in the duplex switchback area is detected during duplex printing.</td>
</tr>
<tr>
<td>• YY = 23</td>
<td>Residual Media in Paper path jam 4. This jam occurs when residual media is detected after completion of the pre rotation sequence, or after completion of the post rotation sequence.</td>
</tr>
<tr>
<td>• YY = 24</td>
<td>Door open jam 1. This jam occurs when a door is opened during printing.</td>
</tr>
<tr>
<td>• YY = 28</td>
<td>Wrap jam 1. This jam occurs when the paper disappears from the output sensor before a designated amount of time after the paper reached the output sensor (It is determined that the paper is being wrapped around the fuser roller).</td>
</tr>
<tr>
<td>• YY = 36</td>
<td>Duplex re-feed jam 1. This jam occurs when the paper does not reach the registration sensor in designated amount of time from switchback of the paper at switchback position in duplex printing.</td>
</tr>
<tr>
<td>• YY = 44</td>
<td>Delivery Delay Jam 1. When the paper does not reach the output sensor after output before a designated amount of time.</td>
</tr>
<tr>
<td>• YY = 48</td>
<td>Delivery Stay Jam 1. This jam occurs when media stays on the paper delivery sensor even after a lapse of predefined time after it reached the sensor.</td>
</tr>
<tr>
<td>13.1200</td>
<td>External device paper jam (13.12XX)</td>
</tr>
<tr>
<td>19.0000</td>
<td>Fax modem reset and power cycle</td>
</tr>
<tr>
<td>20.0000</td>
<td>Memory out in print</td>
</tr>
<tr>
<td>Event code</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>20.0001</td>
<td>Memory out in copy</td>
</tr>
<tr>
<td>20.0002</td>
<td>Memory out in scan</td>
</tr>
<tr>
<td>20.0003</td>
<td>Memory out in photo</td>
</tr>
<tr>
<td>20.0004</td>
<td>Memory out in fax</td>
</tr>
<tr>
<td>20.0005</td>
<td>Memory out in fax flash</td>
</tr>
<tr>
<td>20.0006</td>
<td>Memory out in scan calibration</td>
</tr>
<tr>
<td>21.0000</td>
<td>Page punt</td>
</tr>
<tr>
<td>25.0000</td>
<td>SMTP error</td>
</tr>
<tr>
<td>31.1301</td>
<td>Document Feeder Mispick</td>
</tr>
<tr>
<td>31.1302</td>
<td>Document Feeder Jam</td>
</tr>
<tr>
<td>41.2000</td>
<td>Beam detect malfunction</td>
</tr>
<tr>
<td>41.3000</td>
<td>Unexpected size</td>
</tr>
<tr>
<td>49.&lt;line #&gt;</td>
<td>Firmware asserts</td>
</tr>
<tr>
<td>50.0000</td>
<td>Fuser error</td>
</tr>
<tr>
<td>50.1000</td>
<td>Low fuser temperature error</td>
</tr>
<tr>
<td>50.1100</td>
<td>High subthermistor area 3 fuser error</td>
</tr>
<tr>
<td>50.1200</td>
<td>Low subthermistor area 3 fuser error</td>
</tr>
<tr>
<td>50.2000</td>
<td>Slow fuser error</td>
</tr>
<tr>
<td>50.3000</td>
<td>High fuser temperature error</td>
</tr>
<tr>
<td>50.4000</td>
<td>Fuser drive circuit error</td>
</tr>
<tr>
<td>50.7000</td>
<td>Fuser open error</td>
</tr>
<tr>
<td>50.8000</td>
<td>Low subthermistor fuser error</td>
</tr>
<tr>
<td>50.9000</td>
<td>High subthermistor fuser error</td>
</tr>
<tr>
<td>51.0000</td>
<td>Beam detect or laser error</td>
</tr>
<tr>
<td>51.2000</td>
<td>Black scanner laser error (inline devices only)</td>
</tr>
<tr>
<td>51.2100</td>
<td>Cyan scanner laser error (inline devices only)</td>
</tr>
<tr>
<td>51.2200</td>
<td>Magenta scanner laser error (inline devices only)</td>
</tr>
<tr>
<td>51.2300</td>
<td>Yellow scanner laser error (inline devices only)</td>
</tr>
<tr>
<td>52.0000</td>
<td>Scanner error</td>
</tr>
<tr>
<td>54.0100</td>
<td>Environmental sensor error</td>
</tr>
<tr>
<td>54.0600</td>
<td>Density sensor error</td>
</tr>
<tr>
<td>54.0700</td>
<td>Yellow drum phase control sensor error</td>
</tr>
<tr>
<td>54.0800</td>
<td>Magenta drum phase control sensor error</td>
</tr>
</tbody>
</table>
Table 2-27  Event-log messages (X=0: black cartridge, X=1: cyan cartridge, X=2: magenta cartridge, X=3: yellow cartridge) (continued)

<table>
<thead>
<tr>
<th>Event code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.0900</td>
<td>Cyan drum phase control sensor error</td>
</tr>
<tr>
<td>54.1000</td>
<td>Black drum phase control sensor error</td>
</tr>
<tr>
<td>54.1100</td>
<td>Black density out of range</td>
</tr>
<tr>
<td>54.1101</td>
<td>Cyan density out of range</td>
</tr>
<tr>
<td>54.1102</td>
<td>Magenta density out of range</td>
</tr>
<tr>
<td>54.1103</td>
<td>Yellow density out of range</td>
</tr>
<tr>
<td>54.1200</td>
<td>Black density measurement abnormality</td>
</tr>
<tr>
<td>54.1201</td>
<td>Cyan density measurement abnormality</td>
</tr>
<tr>
<td>54.1202</td>
<td>Magenta density measurement abnormality</td>
</tr>
<tr>
<td>54.1203</td>
<td>Yellow density measurement abnormality</td>
</tr>
<tr>
<td>54.1400</td>
<td>Color plane registration sensor error (inline devices only)</td>
</tr>
<tr>
<td>54.1599</td>
<td>Black CPR pattern can't be read</td>
</tr>
<tr>
<td>54.1501</td>
<td>Cyan CPR pattern can't be read</td>
</tr>
<tr>
<td>54.1502</td>
<td>Magenta CPR pattern can't be read</td>
</tr>
<tr>
<td>54.1503</td>
<td>Yellow CPR pattern can't be read</td>
</tr>
<tr>
<td>54.1500</td>
<td>Yellow toner level sensor error</td>
</tr>
<tr>
<td>54.1600</td>
<td>Magenta toner level sensor error</td>
</tr>
<tr>
<td>54.1700</td>
<td>Cyan toner level sensor error</td>
</tr>
<tr>
<td>54.1800</td>
<td>Black toner level sensor error</td>
</tr>
<tr>
<td>54.1900</td>
<td>Bad TOP sensor</td>
</tr>
<tr>
<td>54.2000</td>
<td>Carousel rotation error</td>
</tr>
<tr>
<td>54.2100</td>
<td>BD error</td>
</tr>
<tr>
<td>54.2500</td>
<td>TOP sensor error</td>
</tr>
<tr>
<td>54.2800</td>
<td>Density sensor or CPR contamination warning (54.1C)</td>
</tr>
<tr>
<td>55.0000</td>
<td>Engine internal communication error</td>
</tr>
<tr>
<td>55.0005</td>
<td>Hardware memory error</td>
</tr>
<tr>
<td>55.0601</td>
<td>DC controller NVRAM data error</td>
</tr>
<tr>
<td>55.0602</td>
<td>DC controller NVRAM access error</td>
</tr>
<tr>
<td>55.1000</td>
<td>DC controller memory error</td>
</tr>
<tr>
<td>55.3000</td>
<td>Engine/formatter communication error</td>
</tr>
<tr>
<td>55.4000</td>
<td>Engine communication timeout error</td>
</tr>
<tr>
<td>55.9028</td>
<td>DC controller NVRAM restore</td>
</tr>
<tr>
<td>56.0100</td>
<td>Illegal input</td>
</tr>
<tr>
<td>Event code</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>57.0000</td>
<td>Fan motor error</td>
</tr>
<tr>
<td>57.0100</td>
<td>Fan motor error</td>
</tr>
<tr>
<td>57.0200</td>
<td>Fan error</td>
</tr>
<tr>
<td>57.0600</td>
<td>Fan motor error</td>
</tr>
<tr>
<td>58.0400</td>
<td>Low voltage power supply error</td>
</tr>
<tr>
<td>59.0160</td>
<td>Main motor rotation error (59.A0)</td>
</tr>
<tr>
<td>59.0192</td>
<td>Developer motor rotation error (59.C0)</td>
</tr>
<tr>
<td>59.0240</td>
<td>Transfer alienation failure (59.F0)</td>
</tr>
<tr>
<td>59.3000</td>
<td>Fuser motor startup error</td>
</tr>
<tr>
<td>59.4000</td>
<td>Fuser motor error</td>
</tr>
<tr>
<td>59.5000</td>
<td>Image drum motor startup error- black</td>
</tr>
<tr>
<td>59.5100</td>
<td>Image drum motor startup error- cyan</td>
</tr>
<tr>
<td>59.5200</td>
<td>Image drum motor startup error- magenta</td>
</tr>
<tr>
<td>59.5300</td>
<td>Image drum motor startup error- yellow</td>
</tr>
<tr>
<td>59.6000</td>
<td>Image drum motor rotation error- black</td>
</tr>
<tr>
<td>59.6100</td>
<td>Image drum motor rotation error- cyan</td>
</tr>
<tr>
<td>59.6200</td>
<td>Image drum motor rotation error- magenta</td>
</tr>
<tr>
<td>59.6300</td>
<td>Image drum motor rotation error- yellow</td>
</tr>
<tr>
<td>59.7000</td>
<td>Black developer motor startup error</td>
</tr>
<tr>
<td>59.7300</td>
<td>Yellow developer motor startup error</td>
</tr>
<tr>
<td>59.8000</td>
<td>Black developer motor rotation error</td>
</tr>
<tr>
<td>59.8300</td>
<td>Yellow developer motor rotation error</td>
</tr>
<tr>
<td>59.9000</td>
<td>ETB motor start error</td>
</tr>
<tr>
<td>59.9900</td>
<td>T2 Clutch error</td>
</tr>
<tr>
<td>65.1200</td>
<td>External device operation error (65.12XX)</td>
</tr>
<tr>
<td>66.1200</td>
<td>External device critical error (66.12XX)</td>
</tr>
<tr>
<td>66.0015</td>
<td>External device communication error</td>
</tr>
<tr>
<td>79.0000</td>
<td>79 service, firmware exception</td>
</tr>
<tr>
<td>79.0001</td>
<td>79 service, firmware ASIC fault</td>
</tr>
<tr>
<td>90.1101</td>
<td>The cable from the print engine to the formatter is not connected</td>
</tr>
<tr>
<td>90.1201</td>
<td>The cable from the fax card to the formatter is not connected</td>
</tr>
<tr>
<td>90.1301</td>
<td>The cable from the ADF to the formatter is not connected</td>
</tr>
<tr>
<td>90.1401</td>
<td>The cable from the NFC card to the formatter is not connected</td>
</tr>
</tbody>
</table>
**Table 2-27 Event-log messages (X=0: black cartridge, X=1: cyan cartridge, X=2: magenta cartridge, X=3: yellow cartridge) (continued)**

<table>
<thead>
<tr>
<th>Event code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.1501</td>
<td>The cable from the Wireless card to the formatter is not connected</td>
</tr>
<tr>
<td>90.1601</td>
<td>The cable from the flatbed scanner to the formatter is not connected</td>
</tr>
<tr>
<td>95.0001</td>
<td>A thermal event has occurred</td>
</tr>
<tr>
<td>99.0028</td>
<td>Download error - bad signature accepted</td>
</tr>
<tr>
<td>99.0029</td>
<td>Download error - bad signature canceled</td>
</tr>
</tbody>
</table>

**Table 2-28 Fax event log codes**

<table>
<thead>
<tr>
<th>Event code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0016</td>
<td>Receive fax directory missing</td>
</tr>
<tr>
<td>20.0032</td>
<td>Send fax directory missing</td>
</tr>
<tr>
<td>20.0080</td>
<td>Flash log corrupted</td>
</tr>
<tr>
<td>20.0096</td>
<td>Flash init due to firmware upgrade</td>
</tr>
<tr>
<td>20.3001</td>
<td>Fax Hardware non-functional</td>
</tr>
<tr>
<td>20.4001</td>
<td>Fax Line surge #1 event was detected and the call aborted</td>
</tr>
<tr>
<td>20.4002</td>
<td>Fax Line surge #2 event was detected and the call aborted</td>
</tr>
<tr>
<td>20.5000</td>
<td>Fax Diagnostics Test Pass</td>
</tr>
<tr>
<td>20.5001</td>
<td>Fax Diagnostics Test Failed in Active line test</td>
</tr>
<tr>
<td>20.5002</td>
<td>Fax Diagnostics test Failed in Port test</td>
</tr>
<tr>
<td>20.5003</td>
<td>Fax Diagnostics test Failed in Line Current test</td>
</tr>
<tr>
<td>20.5004</td>
<td>Fax Diagnostics test Failed in Dialtone test</td>
</tr>
<tr>
<td>20.5005</td>
<td>Fax Diagnostics test Failed in Parallel phone offhook test</td>
</tr>
</tbody>
</table>
Solve image quality problems

Often print-quality problems can be resolved easily by making sure that the printer is well-maintained, using paper that meets HP specifications, or running a cleaning page.

Improve print quality

If the printer is having print-quality problems, try the following solutions in the order presented to resolve the issue.

If the printer is having scan, fax, or copy quality problems, try the following solutions and also see “Improve scan quality,” “Improve fax quality,” or “Improve copy quality” for further solutions.

- Print from a different software program
- Check the paper-type setting for the print job
- Check toner-cartridge status
- Print and interpret the print quality page
- Clean the printer
- Visually inspect the toner cartridge
- Check paper and the printing environment
- Calibrate the printer to align the colors
- Check other print job settings
- Try a different print driver

Print from a different software program

Try printing from a different software program. If the page prints correctly, the problem is with the software program from which you were printing.

Check the paper-type setting for the print job

Check the paper type setting when printing from a software program and the printed pages have smears, fuzzy or dark print, curled paper, scattered dots of toner, loose toner, or small areas of missing toner.

Check the paper type setting (Windows)

1. From the software program, select the Print option.
2. Select the printer, and then click the Properties or Preferences button.
3. Click the Paper/Quality tab.
4. From the Paper Type drop-down list, click the More... option.
5. Expand the list of Type is: options.
6. Expand the category of paper types that best describes your paper.
7. Select the option for the type of paper you are using, and click the OK button.

8. Click the OK button to close the Document Properties dialog box. In the Print dialog box, click the OK button to print the job.

Check the paper type setting (Mac OS X)

1. Click the File menu, and then click the Print option.

2. In the Printer menu, select the printer.

3. By default, the print driver displays theCopies & Pages menu. Open the menus drop-down list, and then click the Finishing menu.

4. Select a type from the Media Type drop-down list.

5. Click the Print button.

Check toner-cartridge status

Follow these steps to check the estimated life remaining in the toner cartridges and if applicable, the status of other replaceable maintenance parts.

Step one: Print the supplies status page (2-line control panels)

1. On the printer control panel, press the OK button.

2. Scroll to the Reports menu, and then press the OK button.

3. Scroll to the Supplies Status menu, and then press the OK button.

4. Scroll to the Print Supplies status page item, and then press the OK button.

Step one: Print the supplies status page (touchscreen control panels)

1. From the Home screen on the printer control panel, navigate to and touch the Setup button.

2. Touch the Reports button.

3. Touch the Supplies Status item to print the supplies status page.

4. To print a report of the status of all supply items, including the genuine HP part number for reordering the supply, select Manage Supplies, and then select Print Supplies Status.

Step two: Check supplies status

1. Look at the supplies status report to check the percent of life remaining for the toner cartridges and if applicable, the status of other replaceable maintenance parts.

Print quality problems can occur when using a toner cartridge that is at its estimated end of life. The supplies status page indicates when a supply level is very low. After an HP supply has reached the very low threshold, HP’s premium protection warranty on that supply has ended.

The toner cartridge does not need to be replaced now unless the print quality is no longer acceptable. Consider having a replacement available to install when print quality is no longer acceptable.
If you determine that you need to replace a toner cartridge or other replaceable maintenance parts, the supplies status page lists the genuine HP part numbers.

2. Check to see if you are using a genuine HP cartridge.

A genuine HP toner cartridge has the words “HP” or “Hewlett-Packard” on it, or has the HP logo on it. For more information on identifying HP cartridges go to www.hp.com/go/learnaboutsupplies.

Print and interpret the print quality page

1. 2-line control panels: On the printer control panel, press the OK button.

   Touchscreen control panels: From the Home screen, touch the Setup button.

2. Open the Reports menu.

3. Select the Print Quality Page item.

This page contains five bands of color, which are divided into four groups as indicated in the following illustration. By examining each group, you can isolate the problem to a particular toner cartridge.

![Print quality page](image)

<table>
<thead>
<tr>
<th>Section</th>
<th>Toner cartridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yellow</td>
</tr>
<tr>
<td>2</td>
<td>Cyan</td>
</tr>
<tr>
<td>3</td>
<td>Black</td>
</tr>
<tr>
<td>4</td>
<td>Magenta</td>
</tr>
</tbody>
</table>

- If dots or streaks appear in only one of the groups, replace the toner cartridge that correlates with that group.
- If dots appear in more than one group, print a cleaning page. If this does not solve the problem, determine if the dots are always the same color; for example, if magenta dots appear in all five color bands. If the dots are all the same color, replace that toner cartridge.
- If streaks appear in multiple color bands, contact HP. A component other than the toner cartridge is probably causing the problem.

Clean the printer

Print a cleaning page

See Print a cleaning page on page 160 for instructions on how to print a cleaning page.
Clean the scanner glass strip and platen

See Clean the scanner glass strip and platen on page 160 for instructions on how to clean the scanner glass and white plastic backing.

Visually inspect the toner cartridge

Follow these steps to inspect each toner cartridge.

1. Remove the toner cartridge from the printer.
2. Check the memory chip for damage.
3. Examine the surface of the green imaging drum.

⚠️ CAUTION: Do not touch the imaging drum. Fingerprints on the imaging drum can cause print-quality problems.

4. If you see any scratches, fingerprints, or other damage on the imaging drum, replace the toner cartridge.
5. Reinstall the toner cartridge, and print a few pages to see if the problem has resolved.

Check paper and the printing environment

Step one: Use paper that meets HP specifications

Some print-quality problems arise from using paper that does not meet HP specifications.

- Always use a paper type and weight that this printer supports.
- Use paper that is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, staples, and curled or bent edges.
- Use paper that has not been previously printed on.
- Use paper that does not contain metallic material, such as glitter.
- Use paper that is designed for use in laser printers. Do not use paper that is designed only for use in Inkjet printers.
- Use paper that is not too rough. Using smoother paper generally results in better print quality.

Step two: Check the environment

The environment can directly affect print quality and is a common cause for print-quality or paper-feeding issues. Try the following solutions:

- Move the printer away from drafty locations, such as open windows or doors, or air-conditioning vents.
- Make sure the printer is not exposed to temperatures or humidity outside of printer specifications.
- Do not place the printer in a confined space, such as a cabinet.
- Place the printer on a sturdy, level surface.
- Remove anything that is blocking the vents on the printer. The printer requires good air flow on all sides, including the top.
- Protect the printer from airborne debris, dust, steam, grease, or other elements that can leave residue inside the printer.

**Calibrate the printer to align the colors**

Calibration is a function that optimizes print quality.

Follow these steps to resolve print-quality problems such as misaligned color, colored shadows, blurry graphics, or other print-quality issues.

**2-line control panels**

1. On the printer control panel, press the OK button.

2. Open the following menus:

   - System Setup
   - Print Quality
   - Color Calibration
   - Calibrate Now

3. Press the OK button to start the calibration process.

   A **Calibrating** message will display on the printer control panel. The calibration process takes a few minutes to complete. Do not turn the printer off until the calibration process has finished.

4. Wait while the printer calibrates, and then try printing again.

**Touchscreen control panels**

1. On the printer control panel, touch the Setup button.

2. Open the following menus:

   - System Setup
   - Print Quality
   - Color Calibration
   - Calibrate Now

3. A **Calibrating** message will display on the printer control panel. The calibration process takes a few minutes to complete. Do not turn the printer off until the calibration process has finished.

4. Wait while the printer calibrates, and then try printing again.

**Check other print job settings**

When printing from a software program, follow these steps to try to resolve the issue by adjusting other print-driver settings.

**Check the EconoMode settings**

HP does not recommend the full-time use of EconoMode. If EconoMode is used full-time, the toner supply might outlast the mechanical parts in the toner cartridge. If print quality begins to degrade and is no longer acceptable, consider replacing the toner cartridge.
Follow these steps if the entire page is too dark or too light.

1. From the software program, select the Print option.
2. Select the printer, and then click the Properties or Preferences button.
3. Click the Paper/Quality tab, and locate the Print Quality area.
4. If the entire page is too dark, use these settings:
   - Select the 600 dpi option.
   - Select the EconoMode check box to enable it.
If the entire page is too light, use these settings:
   - Select the FastRes 1200 option.
   - Clear the EconoMode check box to disable it.
5. Click the OK button to close the Document Properties dialog box. In the Print dialog, click the OK button to print the job.

Adjust color settings (Windows)

Follow these steps if colors on the printed page do not match colors on the computer screen, or if the colors on the printed page are not satisfactory.

Change the color theme

1. From the software program, select the Print option.
2. Select the printer, and then click the Properties or Preferences button.
3. Click the Color tab.
4. Select the HP EasyColor check box to clear it.
5. Select a color theme from the Color Themes drop-down list.
   - Default (sRGB): This theme sets the printer to print RGB data in raw device mode. When using this theme, manage color in the software program or in the operating system for correct rendering.
   - Vivid (sRGB): The printer increases the color saturation in the midtones. Use this theme when printing business graphics.
   - Photo (sRGB): The printer interprets RGB color as if it were printed as a photograph using a digital mini lab. The printer renders deeper, more saturated colors differently than with the Default (sRGB) theme. Use this theme when printing photos.
- **Photo (Adobe RGB 1998):** Use this theme with printing digital photos that use the AdobeRGB color space rather than sRGB. Turn off color management in the software program when using this theme.
- **None:** No color theme is used.

6. Click the **OK** button to close the **Document Properties** dialog box. In the **Print** dialog box, click the **OK** button to print the job.

### Change the color options

1. From the software program, select the **Print** option.
2. Select the printer, and then click the **Properties** or **Preferences** button.
3. Click the **Color** tab.
4. Click the **Automatic** or **Manual** setting.
   - **Automatic** setting: Select this setting for most color print jobs.
   - **Manual** setting: Select this setting to adjust the color settings independently from other settings. Click the **Settings** button to open the manual color-adjustment window.

   **NOTE:** Changing color settings manually can impact output. HP recommends that only color graphics experts change these settings.

5. Click the **Print in Grayscale** selection box to print a color document in black and shades of gray. Use this option to print color documents for photocopying or faxing. Also use this option to print draft copies or to save color toner.

6. Click the **OK** button to close the **Document Properties** dialog box. In the **Print** dialog box, click the **OK** button to print the job.

### Try a different print driver

Try a different print driver when printing from a software program and the printed pages have unexpected lines in graphics, missing text, missing graphics, incorrect formatting, or substituted fonts.


<table>
<thead>
<tr>
<th>HP PCL 6 driver</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>•</strong> Provided as the default driver on the printer CD. This driver is automatically installed unless you select a different one.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>•</strong> Recommended for all Windows environments</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>•</strong> Provides the overall best speed, print quality, and printer-feature support for most users</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>•</strong> Developed to align with the Windows Graphic Device Interface (GDI) for the best speed in Windows environments</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>•</strong> Might not be fully compatible with third-party and custom software programs that are based on PCL 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Print quality troubleshooting guide**

**Repetitive defects ruler**

When troubleshooting the source of some print image defects, one solution is to identify if it is a repetitive defect (does the print quality defect appear multiple times on the printed page?). If this is the case, use a ruler to measure occurrences of repetitive image defects to help solve image-quality problems. For more information, see Use a ruler to measure between repetitive defects on page 156.

Use a ruler to measure occurrences of repetitive image defects to help solve image-quality problems. Place the ruler next to the first occurrence of the defect on the page. Find the distance between identical defects and use the table below to identify the component that is causing the defect.

**NOTE:** Do not use solvents or oils to clean rollers. Instead, rub the roller with a lint-free cloth. If dirt is difficult to remove, rub the roller with a lint-free cloth that has been dampened with water.

<table>
<thead>
<tr>
<th>Distance between identical defects</th>
<th>Component</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.6 mm (0.89 in)</td>
<td>Developer roller</td>
<td>Appears in the form of dropouts.</td>
</tr>
<tr>
<td>23.6 mm (0.93 in)</td>
<td>Primary charging roller</td>
<td>Appears in the form of dropouts.</td>
</tr>
<tr>
<td>29.6 mm (1.17 in)</td>
<td>RS roller</td>
<td></td>
</tr>
<tr>
<td>35.0 mm (1.38 in)</td>
<td>Intermediate transfer belt (ITB)</td>
<td>assist roller</td>
</tr>
<tr>
<td>Distance between identical defects</td>
<td>Component</td>
<td>Notes</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td>50.0 mm (1.97 in)</td>
<td>Secondary transfer roller</td>
<td>Appears in the form of dropouts or dirt on the back of the page.</td>
</tr>
<tr>
<td>50.0 mm (1.97 in)</td>
<td>Large assist roller</td>
<td></td>
</tr>
<tr>
<td>57.0 mm (2.24 in)</td>
<td>Fuser rollers (3)</td>
<td>Appears in the form of dirt (front or back of page) or loose toner.</td>
</tr>
<tr>
<td>63.0 mm (2.48 in)</td>
<td>Photosensitive drum</td>
<td>Appears in the form of dirt or dropouts.</td>
</tr>
<tr>
<td>63.0 mm (2.48 in)</td>
<td>Tension roller</td>
<td></td>
</tr>
<tr>
<td>75.0 mm (2.95 in)</td>
<td>Scale</td>
<td></td>
</tr>
<tr>
<td>78.0 mm (3.07 in)</td>
<td>Cartridge station</td>
<td></td>
</tr>
<tr>
<td>78.0 mm (3.07 in)</td>
<td>Intermediate transfer belt (ITB) drive roller</td>
<td></td>
</tr>
<tr>
<td>712.0 mm (28.03 in)</td>
<td>Intermediate transfer belt (ITB) length</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The primary charging roller, photosensitive drum, and developer roller cannot be cleaned. If any of these rollers are indicated, replace the toner cartridge.

**Use a ruler to measure between repetitive defects**

The figures in this section shows color repetitive defect pages. However, the process for measuring repetitive defects is valid for mono pages.

1. Identify a repetitive defect on the page.

**TIP:** Print a cleaning page to see if that resolves the defect.

The example pages below show the following types of repetitive defects.

**NOTE:** These are examples only, other types of repetitive defects might appear on a page.

- Lines (callout 1)
- Smudges (callout 2)
- Dots or spots (callout 3)
Figure 2-23 Examples of repetitive defects
2. Position a metric ruler on the page with the "zero" ruler mark at one occurrence of the defect (callout 1).

Figure 2-24 Place the ruler on the page

3. Locate the next occurrence of the defect (callout 1).

Figure 2-25 Locate the next repetitive defect
4. Measure the distance (in millimeters) between the two occurrences (callout 1), and then use Table 2-29 Repetitive image defects on page 155 to determine the defective assembly.

**TIP:** Always measure from and to the same point on the defects. For example, if the ruler is "zeroed" at the top edge of a defect, measure to the top edge of the next occurrence of that defect.

Figure 2-26 Determine the defective assembly
Clean the printer

Over time, particles of toner and paper accumulate inside the printer. This can cause print-quality problems during printing. Cleaning the printer eliminates or reduces these problems.

Clean the paper path and toner-cartridge areas every time that the toner cartridge is changed or whenever print-quality problems occur. As much as possible, keep the printer free from dust and debris.

To clean the printer exterior, use a soft, water-moistened cloth.

Print a cleaning page

2-line control panels

1. From the printer control panel, press the OK button.
2. Open the Service menu.
3. Use the arrow keys to select the Cleaning mode option, and then press the OK button.

The printer prints the first side and then prompts you to remove the page from the output bin and reload it in Tray 1, keeping the same orientation. Wait until the process is complete. Discard the page that prints.

Touchscreen control panels

1. From the Home screen on the printer control panel, touch the Setup button.
2. Touch the Service menu.
3. Touch the Cleaning Page button.
4. Load plain letter or A4 paper when you are prompted.
5. Touch the OK button to begin the cleaning process.

The printer prints the first side and then prompts you to remove the page from the output bin and reload it in Tray 1, keeping the same orientation. Wait until the process is complete. Discard the page that prints.

Clean the scanner glass strip and platen

Over time, specks of debris might collect on the scanner glass and white plastic backing, which can affect performance. Use the following procedure to clean the scanner glass and white plastic backing.

1. Use the power switch to turn off the printer, and then unplug the power cable from the electrical socket.
2. Open the scanner lid.
3. Clean the scanner glass (callout 1) and the white plastic backing (callout 2) with a soft cloth or sponge that has been moistened with nonabrasive glass cleaner.

![Scanner Glass and Plastic Backing](image)

**CAUTION:** Do not use abrasives, acetone, benzene, ammonia, ethyl alcohol, or carbon tetrachloride on any part of the printer; these can damage the printer. Do not place liquids directly on the glass or platen. They might seep and damage the printer.

**TIP:** See this English-language video for a demonstration of how to identify and clean debris that causes streaks on copies: [www.youtube.com/watch?v=CGn7FJvH8sE](http://www.youtube.com/watch?v=CGn7FJvH8sE).

4. Dry the glass and white plastic backing with a chamois or a cellulose sponge to prevent spotting.

5. Connect the printer, and then use the power switch to turn on the printer.

### Clean the pickup and separation rollers

1. Turn off the printer, unplug the power cable from the printer, and then remove the rollers.

2. Dab a lint-free cloth in isopropyl alcohol, and then scrub the roller.

**WARNING!** Alcohol is flammable. Keep the alcohol and cloth away from an open flame. Before you close the printer and connect the power cable, allow the alcohol to dry completely.

**NOTE:** In certain areas of California (USA), air pollution control regulations restrict the use of liquid isopropyl alcohol (IPA) as a cleaning agent. In those areas of California, please disregard the previous recommendations and use a dry, lint free cloth, moistened with water, to clean the pickup roller.

3. Use a dry, lint free cloth, to wipe the rollers and remove loose dirt.
Clean the pickup rollers and separation pad in the document feeder

1. Open the document-feeder access cover.

2. Use a moist, lint-free cloth to wipe both pickup rollers and the separation pad to remove dirt.

   **CAUTION:** Do not use abrasives, acetone, benzene, ammonia, ethyl alcohol, or carbon tetrachloride on any part of the printer; these can damage the printer.

3. Close the document feeder access cover.
Clean 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 touch screen. Do not pour or spray water directly onto the touchscreen.
## Solve paper-handling problems

### Printer feeds incorrect page size

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The correct size paper is not loaded in the tray.</td>
<td>Load the correct size paper in the tray.</td>
</tr>
<tr>
<td>The correct size paper is not selected in the software program or</td>
<td>Confirm that the settings in the software program and printer driver are correct, because the</td>
</tr>
<tr>
<td>printer driver.</td>
<td>software program settings override the printer driver and control panel settings, and the printer</td>
</tr>
<tr>
<td></td>
<td>driver settings override the control panel settings.</td>
</tr>
<tr>
<td>The correct size paper for the tray is not selected in the printer</td>
<td>From the control panel, select the correct size paper for the tray.</td>
</tr>
<tr>
<td>control panel.</td>
<td></td>
</tr>
<tr>
<td>The paper size is not configured correctly for the tray.</td>
<td>Print a configuration page or use the control panel to determine the paper size for which the tray</td>
</tr>
<tr>
<td></td>
<td>is configured.</td>
</tr>
<tr>
<td>The guides in the tray are not against the paper.</td>
<td>Verify that the paper guides are touching the paper, but not so tightly that the paper is buckled.</td>
</tr>
</tbody>
</table>

### Printer pulls from incorrect tray

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are using a driver for a different printer.</td>
<td>Use a driver for this printer.</td>
</tr>
<tr>
<td>The specified tray is empty.</td>
<td>Load paper in the specified tray.</td>
</tr>
<tr>
<td>The paper size is not configured correctly for the input tray.</td>
<td>Print a configuration page or use the control panel to determine the paper size for which the tray</td>
</tr>
<tr>
<td></td>
<td>is configured.</td>
</tr>
<tr>
<td>The guides in the tray are not against the paper.</td>
<td>Verify that the guides are touching the paper.</td>
</tr>
</tbody>
</table>

### Printer will not duplex or duplexes incorrectly

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are trying to duplex on unsupported paper.</td>
<td>Verify that the paper is supported for duplex printing.</td>
</tr>
<tr>
<td>The printer driver is not set up for duplex printing.</td>
<td>Set up the printer driver to enable duplex printing.</td>
</tr>
<tr>
<td>The first page is printing on the back of preprinted forms or letterhead.</td>
<td>Load preprinted forms and letterhead in Tray 1 with the letterhead or printed side down, with the top of the page leading into the printer. For Tray 2 and 3, load the paper printed side up with the top of the page toward the right of the printer.</td>
</tr>
</tbody>
</table>
## Printer will not duplex (print 2-sided jobs) or duplexes incorrectly

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The printer model does not support automatic 2-sided printing.</td>
<td>The printer model does not support automatic 2-sided printing.</td>
</tr>
<tr>
<td>The printer configuration is not set for duplexing.</td>
<td>In Windows, run the automatic configuration feature:</td>
</tr>
<tr>
<td></td>
<td>1. Click the <strong>Start</strong> button, point to <strong>Settings</strong>, and then click <strong>Printers</strong> (for Windows 2000) or <strong>Printers and Faxes</strong> (for Windows XP).</td>
</tr>
<tr>
<td></td>
<td>2. Right-click the HP printer icon, and then click <strong>Properties</strong> or <strong>Printing Preferences</strong>.</td>
</tr>
<tr>
<td></td>
<td>3. Click the <strong>Device Settings</strong> tab.</td>
</tr>
<tr>
<td></td>
<td>4. Under <strong>Installable Options</strong>, click <strong>Update Now</strong> in the <strong>Automatic Configuration</strong> list.</td>
</tr>
</tbody>
</table>

## Paper does not feed from Tray 2

### Paper does not feed from Tray 2 or 3

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The correct size paper is not loaded.</td>
<td>Load the correct size paper.</td>
</tr>
<tr>
<td>The input tray is empty.</td>
<td>Load paper in the input tray.</td>
</tr>
<tr>
<td>The correct paper type for the input tray is not selected in the printer control panel.</td>
<td>From the printer control panel, select the correct paper type for the input tray. Trays configured for a paper type with a specific weight range will not match a print job that specifies an exact weight, even if the specified weight is within the weight range.</td>
</tr>
<tr>
<td>Paper from a previous jam has not been completely removed.</td>
<td>Open the printer and remove any paper in the paper path. Closely inspect the fuser area for jams.</td>
</tr>
<tr>
<td>None of the optional trays appear as input tray options.</td>
<td>The optional trays only display as available if they are installed. Verify that any optional trays are correctly installed. Verify that the printer driver has been configured to recognize the optional trays.</td>
</tr>
<tr>
<td>An optional tray is incorrectly installed.</td>
<td>Print a configuration page to confirm that the optional tray is installed. If not, verify that the tray is correctly attached to the printer.</td>
</tr>
<tr>
<td>The paper size is not configured correctly for the input tray.</td>
<td>Print a configuration page or use the control panel to determine the paper size for which the tray is configured.</td>
</tr>
<tr>
<td>The guides in the tray are not against the paper.</td>
<td>Verify that the guides are touching the paper.</td>
</tr>
</tbody>
</table>

## Output is curled or wrinkled

### Output is curled or wrinkled

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper does not meet the specifications for this printer.</td>
<td>Use only paper that meets the HP paper specifications for this printer.</td>
</tr>
</tbody>
</table>
Output is curled or wrinkled

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper is damaged or in poor condition.</td>
<td>Remove paper from the input tray and load paper that is in good condition.</td>
</tr>
<tr>
<td>Printer is operating in an excessively humid environment.</td>
<td>Verify that the printing environment is within humidity specifications.</td>
</tr>
<tr>
<td>You are printing large, solid-filled areas.</td>
<td>Large, solid-filled areas can cause excessive curl. Try using a different pattern.</td>
</tr>
<tr>
<td>Paper used was not stored correctly and might have absorbed moisture.</td>
<td>Remove paper and replace it with paper from a fresh, unopened package.</td>
</tr>
<tr>
<td>Paper has poorly cut edges.</td>
<td>Remove paper, flex it, rotate it 180 degrees or turn it over, and then reload it into the input tray. Do not fan paper. If the problem persists, replace the paper.</td>
</tr>
<tr>
<td>The specific paper type was not configured for the tray or selected in the software.</td>
<td>Configure the software for the paper (see the software documentation). Configure the tray for the paper.</td>
</tr>
<tr>
<td>The paper has previously been used for a print job.</td>
<td>Do not re-use paper.</td>
</tr>
</tbody>
</table>

Printer does not pick up paper or misfeeds

The printer does not pick up paper

If the printer does not pick up paper from the tray, try these solutions.

1. Open the printer and remove any jammed sheets of paper.
2. Load the tray with the correct size of paper for the job.
3. Make sure the paper size and type are set correctly on the printer control panel.
4. Make sure the paper guides in the tray are adjusted correctly for the size of paper. Adjust the guides to the appropriate indentation in the tray.
5. Check the printer control panel to see if the printer is waiting for an acknowledgment to the feed the paper manually prompt. Load paper, and continue.
6. The pickup, feed, or separation rollers might be contaminated. Clean the rollers with a lint-free cloth dampened with warm water.

The printer picks up multiple sheets of paper

If the printer picks up multiple sheets of paper from the tray, try these solutions.

1. Remove the stack of paper from the tray and flex it, rotate it 180 degrees, and flip it over. Do not fan the paper. Return the stack of paper to the tray.
2. Use only paper that meets HP specifications for this printer.
3. Use paper that is not wrinkled, folded, or damaged. If necessary, use paper from a different package.
4. Make sure the tray is not overfilled. If it is, remove the entire stack of paper from the tray, straighten the stack, and then return some of the paper to the tray.
5. Make sure the paper guides in the tray are adjusted correctly for the size of paper. Adjust the guides to the appropriate indentation in the tray.

6. Make sure the printing environment is within recommended specifications.

The document feeder jams, skews, or picks up multiple sheets of paper (M477 models)

- The original might have something on it, such as staples or self-adhesive notes, that must be removed.
- Check that all rollers are in place and that the roller-access cover inside the document feeder is closed.
- Make sure that the top document-feeder cover is closed.
- The pages might not be placed correctly. Straighten the pages and adjust the paper guides to center the stack.
- The paper guides must be touching the sides of the paper stack to work correctly. Make sure that the paper stack is straight and the guides are against the paper stack.
- The document feeder input tray or output bin might contain more than the maximum number of pages. Make sure the paper stack fits below the guides in the input tray, and remove pages from the output bin.
- Verify that there are no pieces of paper, staples, paper clips, or other debris in the paper path.
- Clean the document-feeder rollers and the separation pad. Use compressed air or a clean, lint-free cloth moistened with warm water. If misfeeds still occur, replace the rollers.

Paper does not feed automatically

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual feed is selected in the software program.</td>
<td>Load Tray 2 with paper, or, if the paper is loaded, press the OK button.</td>
</tr>
<tr>
<td>The correct size paper is not loaded.</td>
<td>Load the correct size paper.</td>
</tr>
<tr>
<td>The input tray is empty.</td>
<td>Load paper into the input tray.</td>
</tr>
<tr>
<td>Paper from a previous jam has not been completely removed.</td>
<td>Open the printer and remove any paper in the paper path.</td>
</tr>
<tr>
<td>The paper size is not configured correctly for the input tray.</td>
<td>Print a configuration page or use the control panel to determine the paper size for which the tray is configured.</td>
</tr>
<tr>
<td>The guides in the tray are not against the paper.</td>
<td>Verify that the rear and width paper guides are touching the paper.</td>
</tr>
</tbody>
</table>
Prevent paper jams

To reduce the number of paper jams, try these solutions.

- Use only paper that meets HP specifications for this printer.
- Use paper that is not wrinkled, folded, or damaged. If necessary, use paper from a different package.
- Use paper that has not previously been printed or copied on.
- Make sure the tray is not overfilled. If it is, remove the entire stack of paper from the tray, straighten the stack, and then return some of the paper to the tray.
- Make sure the paper guides in the tray are adjusted correctly for the size of paper. Adjust the guides so they are touching the paper stack without bending it.
- Make sure that the tray is fully inserted in the printer.
- When printing on heavy, embossed, or perforated paper, use the manual feed feature and feed sheets one at a time.
- Make sure the printing environment is within recommended specifications.
- Follow these steps to verify that the tray is configured for the correct paper size and type on the printer control panel. Adjust paper settings if necessary.
  a. **2-line control panels**: On the product control panel, press the OK button.
  
  **Touchscreen control panels**: On the printer control panel, press or touch the Setup button.
  b. Open the System Setup menu.
  c. Open the Paper setup menu.
  d. Select the tray from the list.
  e. Select Paper Type and then select the type of paper that is in the tray.
  f. Select Paper Size and then select the size of paper that is in the tray.
Clear paper jams

Introduction

The following information includes instructions for clearing paper jams from the printer.

- Experiencing frequent or recurring paper jams?
- Paper jam locations
- Clear paper jams in the document feeder (M477 models only)
- Clear paper jams in Tray 1
- Clear paper jams in Tray 2
- Clear paper jams in the rear door and the fuser area (simplex models)
- Clear paper jams in the output bin
- Clear paper jams in the duplexer (duplex models)

Experiencing frequent or recurring paper jams?

Follow these steps to solve problems with frequent paper jams. If the first step does not resolve the problem continue with the next step until you have resolved the problem.

1. If paper has jammed in the printer, clear the jam and then print a configuration page to test the printer.

2. Check that the tray is configured for the correct paper size and type on the printer control panel. Adjust paper settings if necessary.
   a. 2-line control panels: On the product control panel, press the OK button.
   b. Touchscreen control panels: On the printer control panel, press or touch the Setup button.
   c. Open the System Setup menu.
   d. Open the Paper setup menu.
   e. Select Paper Type and then select the type of paper that is in the tray.
   f. Select Paper Size and then select the size of paper that is in the tray.

3. Turn the printer off, wait 30 seconds, and then turn it on again.

4. Print a cleaning page to remove excess toner from inside the printer.
   a. 2-line control panels: On the product control panel, press the OK button.
   b. Touchscreen control panels: On the printer control panel, press or touch the Setup button.
   c. Open the Service menu.
   d. Select Cleaning Page.
d. Load plain letter or A4 paper when you are prompted.

e. Touch the OK button to begin the cleaning process.

The printer prints the first side and then prompts you to remove the page from the output bin and reload it in Tray 1, keeping the same orientation. Wait until the process is complete. Discard the page that prints.

5. Print a configuration page to test the printer.

a. 2-line control panels: On the product control panel, press the OK button.

   Touchscreen control panels: On the printer control panel, press or touch the Setup button.

b. Open the Reports menu.

c. Select Configuration Report.

If none of these steps resolves the problem, the printer might need service. Contact HP customer support.

**Paper jam locations**

<table>
<thead>
<tr>
<th></th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Output bin</td>
</tr>
<tr>
<td>2</td>
<td>Tray 1</td>
</tr>
<tr>
<td>3</td>
<td>Tray 2</td>
</tr>
<tr>
<td>4</td>
<td>Rear door (nw model only)</td>
</tr>
<tr>
<td>5</td>
<td>Duplexer (duplex models only)</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Document feeder</td>
</tr>
<tr>
<td>2</td>
<td>Output bin</td>
</tr>
<tr>
<td>3</td>
<td>Tray 1</td>
</tr>
<tr>
<td>4</td>
<td>Tray 2</td>
</tr>
<tr>
<td>5</td>
<td>Rear door and fuser area</td>
</tr>
<tr>
<td>6</td>
<td>Duplexer (duplex models only)</td>
</tr>
</tbody>
</table>
Clear paper jams in the document feeder (M477 models only)

The following information describes how to clear paper jams in the document feeder. When a jam occurs, the control panel displays an animation that assists in clearing the jam.

1. Open the document-feeder cover.

2. Remove any jammed paper.

3. Close the scanner lid.
4. Lift the document feeder input tray to provide better access to the document feeder output bin, and then remove any jammed paper from the output area.

5. Open the scanner lid. If paper is jammed behind the white plastic backing, gently pull it out.

6. Lower the scanner lid.

NOTE: To avoid jams, make sure the guides in the document-feeder input tray are adjusted tightly against the document. Remove all staples and paper clips from original documents.
NOTE: Original documents that are printed on heavy, glossy paper can jam more frequently than originals that are printed on plain paper.

Clear paper jams in Tray 1

When a jam occurs, the control panel displays an animation that assists in clearing the jam.

NOTE: If the sheet tears, remove all fragments before resuming printing.

1. If you can see the jammed sheet in Tray 1, remove the jammed sheet by pulling it straight out.

2. If you cannot see the jammed sheet, close Tray 1, and then remove Tray 2.
3. At the left side of the Tray 2 cavity, press the tab to lower the tray plate, and then remove any paper. Remove the jammed sheet by gently pulling it straight out.

4. Push the tray plate back up into place.
5. Reinstall Tray 2.

6. Reopen Tray 1 and load paper into the tray.
Clear paper jams in Tray 2

Use the following procedure to check for a paper jam in Tray 2. When a jam occurs, the control panel displays an animation that assists in clearing the jam.

1. Pull the tray completely out of the printer.

2. Remove any jammed or damaged sheets of paper.

3. Reinsert and close Tray 2.
Clear paper jams in the rear door and the fuser area (simplex models)

Use the following procedure to check for paper inside the rear door. When a jam occurs, the control panel displays an animation that assists in clearing the jam.

⚠️ **CAUTION:** The fuser is located above the rear door, and it is hot. Do not attempt to reach into the area above the rear door until the fuser is cool.

1. Open the rear door.
2. Gently pull out any jammed paper from the rollers in the rear door area.

3. Close the rear door.
Clear paper jams in the output bin

Use the following procedure to clear jams in the output bin. When a jam occurs, the control panel displays an animation that assists in clearing the jam.

1. If paper is visible in the output bin, grasp the leading edge and remove it.
Clear paper jams in the duplexer (duplex models)

Use the following procedure to check for paper in the duplexer. When a jam occurs, the control panel displays an animation that assists in clearing the jam.

1. At the rear of the printer, open the duplexer.

2. Remove any jammed or damaged sheets of paper.

   **CAUTION:** The fuser is located above the rear door, and it is hot. Do not attempt to reach into the area above the rear door until the fuser is cool.

3. Close the duplexer.
## Solve performance problems

### Table 2-30 Solve performance problems

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages print but are totally blank.</td>
<td>The document might contain blank pages.</td>
<td>Check the original document to see if content is present on all of the pages.</td>
</tr>
<tr>
<td></td>
<td>The printer might be malfunctioning.</td>
<td>To check the printer, print a configuration page.</td>
</tr>
<tr>
<td>Pages print very slowly.</td>
<td>Heavier paper types can slow the print job.</td>
<td>Print on a different type of paper.</td>
</tr>
<tr>
<td></td>
<td>Complex pages can print slowly.</td>
<td>Proper fusing might require a slower print speed to ensure the best print quality.</td>
</tr>
<tr>
<td></td>
<td>Large batches, narrow paper, and special paper such as gloss, transparency, cardstock, and HP Tough Paper can slow the print job.</td>
<td>Print in smaller batches, on a different type of paper, or on a different size of paper.</td>
</tr>
<tr>
<td>Pages did not print.</td>
<td>The printer might not be pulling paper correctly.</td>
<td>Make sure paper is loaded in the tray correctly.</td>
</tr>
<tr>
<td></td>
<td>The paper is jamming in the printer.</td>
<td>Clear the jam.</td>
</tr>
<tr>
<td></td>
<td>The USB cable might be defective or incorrectly connected.</td>
<td>● Disconnect the USB cable at both ends and reconnect it.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Try printing a job that has printed in the past.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Try using a different USB cable.</td>
</tr>
<tr>
<td></td>
<td>Other devices are running on the host computer.</td>
<td>The printer might not share a USB port. If an external hard drive or network switchbox is connected to the same port as the printer, the other device might be interfering with the printer. To connect and use the printer, disconnect the other device or use two USB ports on the host computer.</td>
</tr>
</tbody>
</table>
Solve connectivity problems

Solve USB connection problems

If you have connected the printer directly to a computer, check the cable.

- Verify that the cable is connected to the computer and to the printer.
- Verify that the cable is not longer than 5 m (16.4 ft). Try using a shorter cable.
- Verify that the cable is working correctly by connecting it to another printer. Replace the cable if necessary.

Solve wired network problems

Introduction

Check the following items to verify that the printer is communicating with the network. Before beginning, print a configuration page from the printer control panel and locate the printer IP address that is listed on this page.

- Poor physical connection
- The computer is using the incorrect IP address for the printer
- The computer is unable to communicate with the printer
- The printer is using incorrect link and duplex settings for the network
- New software programs might be causing compatibility problems
- The computer or workstation might be set up incorrectly
- The printer is disabled, or other network settings are incorrect

**NOTE:** HP does not support peer-to-peer networking, as the feature is a function of Microsoft operating systems and not of the HP print drivers. For more information, go to Microsoft at [www.microsoft.com](http://www.microsoft.com).

Poor physical connection

1. Verify that the printer is attached to the correct network port using a cable of the correct length.
2. Verify that cable connections are secure.
3. Look at the network port connection on the back of the printer, and verify that the amber activity light and the green link-status light are lit.
4. If the problem continues, try a different cable or port on the hub.

The computer is using the incorrect IP address for the printer

1. Open the printer properties and click the Ports tab. Verify that the current IP address for the printer is selected. The printer IP address is listed on the printer configuration page.
2. If you installed the printer using the HP standard TCP/IP port, select the box labeled *Always print to this printer, even if its IP address changes.*
3. If you installed the printer using a Microsoft standard TCP/IP port, use the hostname instead of the IP address.

4. If the IP address is correct, delete the printer and then add it again.

**The computer is unable to communicate with the printer**

1. Test network communication by pinging the network.
   a. Open a command-line prompt on your computer.
      - For Windows, click **Start**, click **Run**, type `cmd`, and then press **Enter**.
      - For OS X, go to **Applications**, then **Utilities**, and open **Terminal**.
   b. Type `ping` followed by the IP address for your printer.
   c. If the window displays round-trip times, the network is working.

2. If the ping command failed, verify that the network hubs are on, and then verify that the network settings, the printer, and the computer are all configured for the same network.

**The printer is using incorrect link and duplex settings for the network**

HP recommends leaving these settings in automatic mode (the default setting). If you change these settings, you must also change them for your network.

**New software programs might be causing compatibility problems**

Verify that any new software programs are correctly installed and that they use the correct print driver.

**The computer or workstation might be set up incorrectly**

1. Check the network drivers, print drivers, and the network redirection settings.
2. Verify that the operating system is configured correctly.

**The printer is disabled, or other network settings are incorrect**

1. Review the configuration page to check the status of the network protocol. Enable it if necessary.
2. Reconfigure the network settings if necessary.

**Solve wireless network problems**

**Introduction**

Use the troubleshooting information to help resolve issues.

> **NOTE:** To determine whether HP NFC and HP wireless direct printing are enabled on your printer, print a configuration page from the printer control panel. If a page titled Wireless is included, HP Jetdirect 2800w NFC & Wireless Direct Accessory printing is enabled on the printer.

- Wireless connectivity checklist
- The printer does not print after the wireless configuration completes
● The printer does not print, and the computer has a third-party firewall installed
● The wireless connection does not work after moving the wireless router or printer
● Cannot connect more computers to the wireless printer
● The wireless printer loses communication when connected to a VPN
● The network does not appear in the wireless networks list
● The wireless network is not functioning
● Perform a wireless network diagnostic test
● Reduce interference on a wireless network

**Wireless connectivity checklist**

- Verify that the network cable is not connected.
- Verify that the printer and the wireless router are turned on and have power. Also make sure that the wireless radio in the printer is turned on.
- Verify that the service set identifier (SSID) is correct. Print a configuration page to determine the SSID. If you are not sure the SSID is correct, run the wireless setup again.
- With secured networks, verify that the security information is correct. If the security information is incorrect, run the wireless setup again.
- If the wireless network is working correctly, try accessing other computers on the wireless network. If the network has Internet access, try connecting to the Internet over a wireless connection.
- Verify that the encryption method (AES or TKIP) is the same for the printer as it is for the wireless access point (on networks using WPA security).
- Verify that the printer is within the range of the wireless network. For most networks, the printer must be within 30 m (100 ft) of the wireless access point (wireless router).
- Verify that obstacles do not block the wireless signal. Remove any large metal objects between the access point and the printer. Make sure poles, walls, or support columns containing metal or concrete do not separate the printer and wireless access point.
- Verify that the printer is located away from electronic devices that might interfere with the wireless signal. Many devices can interfere with the wireless signal including motors, cordless phones, security system cameras, other wireless networks, and some Bluetooth devices.
- Verify that the print driver is installed on the computer.
- Verify that you have selected the correct printer port.
- Verify that the computer and printer connect to the same wireless network.
- For OS X, verify that the wireless router supports Bonjour.

**The printer does not print after the wireless configuration completes**

1. Make sure that the printer is turned on and in the ready state.
2. Turn off any third-party firewalls on your computer.
3. Make sure that the wireless network is working correctly.
4. Make sure that your computer is working correctly. If necessary, restart the computer.
5. Verify that you can open the HP Embedded Web Server from a computer on the network.

**The printer does not print, and the computer has a third-party firewall installed**

1. Update the firewall with the most recent update available from the manufacturer.
2. If programs request firewall access when you install the printer or try to print, make sure you allow the programs to run.
3. Temporarily turn off the firewall, and then install the wireless printer on the computer. Enable the firewall when you have completed the wireless installation.

**The wireless connection does not work after moving the wireless router or printer**

1. Make sure that the router or printer connects to the same network that your computer connects to.
2. Print a configuration page.
3. Compare the service set identifier (SSID) on the configuration page to the SSID in the printer configuration for the computer.
4. If the numbers are not the same, the devices are not connecting to the same network. Reconfigure the wireless setup for the printer.

**Cannot connect more computers to the wireless printer**

1. Make sure that the other computers are within the wireless range and that no obstacles block the signal. For most networks, the wireless range is within 30 m (100 ft) of the wireless access point.
2. Make sure that the printer is turned on and in the ready state.
3. Turn off any third-party firewalls on your computer.
4. Make sure that the wireless network is working correctly.
5. Make sure that your computer is working correctly. If necessary, restart the computer.

**The wireless printer loses communication when connected to a VPN**

- Typically, you cannot connect to a VPN and other networks at the same time.

**The network does not appear in the wireless networks list**

- Make sure the wireless router is turned on and has power.
- The network might be hidden. However, you can still connect to a hidden network.

**The wireless network is not functioning**

1. Make sure that the network cable is not connected.
2. To verify if the network has lost communication, try connecting other devices to the network.
3. Test network communication by pinging the network.
a. Open a command-line prompt on your computer.
   - For Windows, click **Start**, click **Run**, type `cmd`, and then press **Enter**.
   - For OS X, go to **Applications**, then **Utilities**, and open **Terminal**.

b. Type `ping` followed by the router IP address.

c. If the window displays round-trip times, the network is working.

4. Make sure that the router or printer connects to the same network that the computer connects to.
   a. Print a configuration page.
   b. Compare the service set identifier (SSID) on the configuration report to the SSID in the printer configuration for the computer.
   c. If the numbers are not the same, the devices are not connecting to the same network. Reconfigure the wireless setup for the printer.

**Perform a wireless network diagnostic test**

From the printer control panel, you can run a diagnostic test that provides information about the wireless network settings.

1. From the Home screen on the printer control panel, touch the **Setup** button.

2. Open the **Self Diagnostics** menu.

3. Touch the **Run Wireless Test** button to start the test. The printer prints a test page that shows test results.

**Reduce interference on a wireless network**

The following tips can reduce interference in a wireless network:

- Keep the wireless devices away from large metal objects, such as filing cabinets, and other electromagnetic devices, such as microwaves and cordless telephones. These objects can disrupt radio signals.

- Keep the wireless devices away from large masonry structures and other building structures. These objects can absorb radio waves and lower signal strength.

- Position the wireless router in a central location in line of sight with the wireless printers on the network.
Service mode functions

Service menu

The Service menu is used to adjust print settings, restore factory default settings, and clean the print paper path.

2-line control panels
1. From the printer control panel, press the OK button.
2. Open the Service menu.

Touchscreen control panels
1. From the Home screen on the printer control panel, touch the Setup button.
2. Touch the Service button.

The following menu items appear in the Service menu:

<table>
<thead>
<tr>
<th>Table 2-31 Service menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Menu item</strong></td>
</tr>
<tr>
<td>Fax Service (fax models only)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Cleaning Page</td>
</tr>
<tr>
<td>USB Speed</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Less Paper Curl</td>
</tr>
<tr>
<td>Archive Print</td>
</tr>
<tr>
<td>Firmware Datecode</td>
</tr>
<tr>
<td>Restore Defaults</td>
</tr>
<tr>
<td>Signature Check</td>
</tr>
</tbody>
</table>
Table 2-31 Service menu (continued)

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LaserJet Update</td>
<td>Check for Updates Now</td>
<td>This item provides the means to manually update the firmware or to set up automatic firmware updates.</td>
</tr>
<tr>
<td></td>
<td>Manage Updates</td>
<td></td>
</tr>
<tr>
<td>SMTP Comm. Report</td>
<td></td>
<td>This report provides information regarding the printer communication with an SMTP server for the last Scan to E-Mail job.</td>
</tr>
</tbody>
</table>

Secondary service menu

Use the secondary service menu to print service-related reports and to run special tests. Customers do not have access to this menu.

2-line control panels (M452nw/dn models)

1. From the printer control panel, press the OK button.
2. Press and hold the Left button.
3. Press the Cancel button.
4. Press the OK button to reopen the Setup menu.
5. Scroll to the 2ndary Service menu, and then press the OK button.

Touchscreen control panel (M452dw and M477 models)

1. From the Home screen on the printer control panel, touch the Setup button.
2. Touch the space between the Home and Help buttons.
3. Touch the Back button.
4. Touch the Setup button.
5. Scroll to and touch the 2ndary Service menu.

The following menu items appear in the secondary service menu:

Table 2-32 Secondary service menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Sub-menu item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Settings</td>
<td>Self-managed</td>
<td>This item optimizes open security settings with a proactive configuration for a self-managed environment.</td>
</tr>
<tr>
<td></td>
<td>IT-managed</td>
<td>This item optimizes centralized administration of a group of printers with enhanced security settings in an information technology (IT) administrator managed environment.</td>
</tr>
<tr>
<td>Location</td>
<td>A list of available locations displays</td>
<td>This item sets certain printer parameters that are dependent on the location, such as the default paper size and the symbol set.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scroll to the appropriate location and select Yes to set the location. The printer automatically restarts after you change the location.</td>
</tr>
<tr>
<td>Menu item</td>
<td>Sub-menu item</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Line Frequency</td>
<td></td>
<td>This item allows the refresh rate of the touchscreen control panel to be changed between 50 and 60 Hz.</td>
</tr>
<tr>
<td>LED test</td>
<td></td>
<td><strong>2-line control panels</strong>: This test verifies that the LEDs on the control-panel display function correctly.</td>
</tr>
<tr>
<td></td>
<td>(2-line control panels only)</td>
<td>At the beginning of the test, each of the LEDs turns on one-at-a-time. Press the OK button to continue to the next LED.</td>
</tr>
<tr>
<td>Display test</td>
<td></td>
<td><strong>2-line control panels</strong>: This test begins by testing the pixels on each line. Then, each of the 255 characters is displayed in groups of 16. Press the OK button to continue to the next group of 16 characters. You can cancel the test at any time by touching the Cancel button.</td>
</tr>
<tr>
<td></td>
<td>Touchscreen control panels: The test sets the display colors. Touch the OK button to confirm each setting.</td>
<td></td>
</tr>
<tr>
<td>Button test</td>
<td></td>
<td>This test verifies that the control-panel buttons function correctly. The display prompts you to touch each button.</td>
</tr>
<tr>
<td>CP FW Version</td>
<td></td>
<td>This item displays the current control panel firmware version.</td>
</tr>
<tr>
<td>NAND Reset</td>
<td></td>
<td>This item resets the NAND memory.</td>
</tr>
<tr>
<td>Permanent Config.</td>
<td>Allow</td>
<td>This item is used only by authorized third-party vendors for custom printer setup. When Allow is selected, the printer is set as a non-HP printer.</td>
</tr>
<tr>
<td></td>
<td>Prevent</td>
<td>CAUTION: Do not select the Allow option unless requested to do so by an authorized third-party vendor.</td>
</tr>
<tr>
<td>Service Reports</td>
<td>Cont. Self-Test</td>
<td>This item prints a continuous configuration page.</td>
</tr>
<tr>
<td></td>
<td>Error report</td>
<td>This item prints an error report that contains the last 5 instances of 49.xx.yy or 79.xx.yy errors.</td>
</tr>
<tr>
<td></td>
<td>DS Fax</td>
<td></td>
</tr>
<tr>
<td>Color Cal.</td>
<td>Adjust color</td>
<td>This item adjusts density settings for contrast, highlights, midtones, and shadows. Adjust each color individually.</td>
</tr>
<tr>
<td></td>
<td>Timing</td>
<td>This item specifies how frequently the printer should automatically perform a color calibration. The default setting is 48 hours. You can turn automatic calibration off.</td>
</tr>
<tr>
<td>Scan Calibration</td>
<td></td>
<td>This item calibrates the scanner assembly.</td>
</tr>
<tr>
<td>Clean Belt</td>
<td></td>
<td>This item runs additional belt-cleaning cycles.</td>
</tr>
<tr>
<td>Speed</td>
<td></td>
<td>Use this item to toggle between high and low.</td>
</tr>
<tr>
<td>802.11n</td>
<td></td>
<td>This item enables or disables the wireless 802.11n functionality.</td>
</tr>
<tr>
<td>(Wireless models only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Printer resets

Restore the factory-set defaults

Restoring the factory-set defaults returns all of the printer and network settings to the factory defaults. It will not reset the page count, tray size, or language. To restore the printer to the factory-default settings, follow these steps.

⚠️ **CAUTION:** Restoring the factory-set defaults returns all of the settings to the factory defaults, and it also deletes any pages that are stored in the memory.

1. **2-line control panels:** On the printer control panel, press the OK button.

   **Touchscreen control panels:** From the Home screen on the printer control panel, touch the Setup button.

2. Open the Service menu.

3. Select the Restore Defaults option, and then press or touch the OK button.

   The printer automatically restarts.

NVRAM initialization

⚠️ **CAUTION:** Be sure to print a configuration page before performing an NVRAM initialization.

An NVRAM initialization erases all data stored in the unprotected NVRAM sections. Performing an NVRAM initialization resets the following settings and information:

- All menu settings are reset to factory default values.
- All localization settings, including language and country/region, are reset.

After performing an NVRAM initialization, reconfigure any computers that print to this printer so that the computers can recognize the printer.

1. Turn the printer off.

2. **2-line control panels:** Press and hold the right-arrow button and the Cancel button simultaneously. Keep the buttons depressed as you turn the printer on.

   **Touchscreen control panels:** Turn the printer on, and then, as soon as the HP logo appears, press the lower right quadrant of the control panel.

3. When the Permanent Storage Init. message appears on the display, release the buttons (2-line control panels) or touchscreen.

   The NVRAM initialization starts.

4. When the printer has finished the NVRAM initialization, it returns to the Ready state.

Super NVRAM initialization

⚠️ **WARNING!** A super NVRAM initialization resets the printer page count and removes the formatter association to the printer serial number. The lack of formatter association to the printer serial number might affect the printer’s warranty entitlement. Also, the printer will not be allowed to connect to the HP cloud.
A super NVRAM initialization restores the printer to the “generic printer mode” in which it arrived from the factory. This means that you will have to reset the language and country/region settings when the printer starts after the initialization. A super NVRAM initialization erases all data stored in the protected and unprotected NVRAM sections.

1. Turn the printer off.

2. 2-line control panels: Press and hold the left-arrow button and the Cancel button simultaneously. Keep the buttons depressed as you turn the printer on.

   Touchscreen control panels: Turn the printer on, and then, as soon as the HP logo appears, press the lower left quadrant of the control panel.

3. When the Permanent Storage Init. message appears on the display, release the buttons (2-line control panels) or touchscreen.

   The super NVRAM initialization starts.

4. When the super NVRAM initialization has been completed, the printer enters the generic printer mode.
Solve fax problems (fax models only)

Checklist for solving fax problems

- Several possible fixes are available. After each recommended action, retry faxing to see if the problem is resolved.
- For best results during fax problem solving, make sure the line from the printer is connected directly to the wall phone port. Disconnect all other devices that are connected to the printer.

1. Verify that the telephone cord is connected to the correct port on the back of the printer.
2. Check the phone line by using the fax test:
   a. From the Home screen on the printer control panel, touch the Setup button, and then touch the Service menu.
   b. Select the Self Diagnostics menu.
   c. Select the Run Fax Test option. The printer prints a fax test report.
      The report contains the following possible results:
      - **Pass**: The report contains all of the current fax settings for review.
      - **Fail**: The report indicates the nature of the error and contains suggestions for how to resolve the issue.
3. Verify that the printer firmware is current:
   a. Print a configuration page from the control panel Reports menu to obtain the current firmware date code.
      1. Click the Support & Drivers link.
      2. Click the Download drivers and software (and firmware) link option.
      3. In the For product box, enter the printer model number, and then click the Go button.
      4. Click the link for your operating system.
      5. Scroll to the Firmware section of the table.
         - If the listed version matches the version on the configuration page, you have the most current version.
         - If the versions are different, download the firmware upgrade file and upgrade the firmware on the printer following the on-screen instructions.
         - **NOTE**: The printer must be connected to a computer with internet access to upgrade firmware.
   4. Resend the fax.
5. Verify that the fax was set up when the printer software was installed.
   From the computer, in the HP program folder, run the Fax Setup Utility.
5. Verify that the telephone service supports analog fax.
   - If using ISDN or digital PBX, contact your service provider for information about configuring to an analog fax line.
   - If using a VoIP service, change the Fax Speed setting to Slow V.29 from the control panel. Ask if your service provider supports fax and for the recommended fax modem speed. Some companies might require an adapter.
   - If you are using a DSL service, make sure that a filter is included on the phone-line connection to the printer. Contact the DSL service provider, or purchase a DSL filter if you do not have one. If a DSL filter is installed, try another filter because filters can be defective.

6. If the error persists, find more detailed problem-solving solutions in the sections that follow this one.

Perform a fax diagnostic test

From the printer control panel, you can run a diagnostic test that provides information about the printer fax settings.

1. From the Home screen on the printer control panel, touch the Setup button.
2. Open the following menus:
   - Service
   - Fax Service
3. Touch the Run Fax Test button to start the test. The printer prints a test page that shows test results.

Solve general fax problems

- Faxes are sending slowly
- Print quality of a photo is poor or prints as a gray box.
- Fax quality is poor
- You touched the Cancel button to cancel a fax, but the fax was still sent
- No fax address book button displays
- Not able to locate the fax settings in HP Web Jetadmin
- The header is appended to the top of the page when the overlay option is enabled
- A mix of names and numbers is in the recipients box
- A one-page fax prints as two pages
- A document stops in the document feeder in the middle of faxing
- The volume for sounds coming from the fax accessory is too high or too low
- Use fax over VoIP networks

Faxes are sending slowly

The printer is experiencing poor phone line quality.
● Retry sending the fax when the line conditions have improved.
● Check with the phone service provider that the line supports fax.
● Turn off the Error Correction setting.
   a. From the Home screen on the printer control panel, touch the Setup button.
   b. Open the Service menu.
   c. Open the Fax Service menu.
   d. Open the Error Correction menu.
   e. Select the Off setting.

   **NOTE:** This can reduce image quality.

● Use white paper for the original. Do not use colors such as gray, yellow, or pink.
● Increase the Fax Speed setting.
   a. From the Home screen on the printer control panel, touch the Setup button.
   b. Open the Fax Setup menu.
   c. Open the Advanced Setup menu.
   d. Open the Fax Speed menu.
   e. Select the correct setting.

● Divide large fax jobs into smaller sections, and then fax them individually.
● Change the fax settings on the control panel to a lower resolution.
   a. From the Home screen on the printer control panel, touch the Setup button.
   b. Open the Fax Setup menu.
   c. Open the Advanced Setup menu.
   d. Open the Fax Resolution menu.
   e. Select the correct setting.

**Print quality of a photo is poor or prints as a gray box.**

You are using the wrong page-content setting or the wrong resolution setting.

Try setting the Optimize Text/Picture option to the Photo setting.

**Fax quality is poor**

Fax is blurry or light.

● Increase fax resolution when sending faxes. Resolution does not affect received faxes.
a. From the Home screen on the printer control panel, touch the Setup button.

b. Open the Fax Setup menu.

c. Open the Advanced Setup menu.

d. Open the Fax Resolution menu.

e. Select the correct setting.

NOTE: Increasing resolution slows transmission speed.

- Turn on the Error Correction setting from the control panel.
  a. From the Home screen on the printer control panel, touch the Setup button.
  b. Open the Service menu.
  c. Open the Fax Service menu.
  d. Open the Error Correction menu.
  e. Select the On setting.

- Check the toner cartridges and replace if necessary.
- Ask the sender to darken the contrast setting on the sending fax machine, and then resend the fax.

You touched the Cancel button to cancel a fax, but the fax was still sent

If the job is too far along in the sending process, you cannot cancel the job.

This is normal operation.

No fax address book button displays

The fax address book feature has not been enabled.

Use the HP MFP Digital Sending Software Configuration utility to enable the fax address book feature.

Not able to locate the fax settings in HP Web Jetadmin

Fax settings in HP Web Jetadmin are located under the status page drop-down menu.

Select Digital Sending and Fax from the drop-down menu.

The header is appended to the top of the page when the overlay option is enabled

For all forwarded faxes, the printer appends the overlay header to the top of a page.

This is normal operation.

A mix of names and numbers is in the recipients box

Names and numbers can both display, depending on where they are from. The fax address book lists names, and all other databases list numbers.

This is normal operation.
A one-page fax prints as two pages

The fax header is being appended to the top of the fax, pushing text to a second page.

To print a one page fax on one page, set the overlay header to overlay mode, or adjust the fit-to-page setting.

A document stops in the document feeder in the middle of faxing

A jam is in the document feeder.

Clear the jam, and send the fax again.

The volume for sounds coming from the fax accessory is too high or too low

The volume setting needs to be adjusted.

Adjust the volume in the Fax Send Settings menu and the Fax Receive Settings menu.

Use fax over VoIP networks

VoIP technology converts the analog phone signal into digital bits. These are then assembled into packets which travel on the Internet. The packets are converted and transmitted back to analog signals at or near the destination.

Transmission of information on the Internet is digital instead of analog. Therefore, there are different constraints on the fax transmission that might require different fax settings than the analog Public Switched Telephone Network (PSTN). Fax is very dependent upon timing and signal quality, so a fax transmission is more sensitive to a VoIP environment.

The following are suggested changes in settings for the printer when it is connected to a VoIP service:

- Begin with the fax speed set to Medium (V.17). This might be helpful in environments where a new VoIP network is in use.
- If numerous errors or retries occur with the fax speed set to Fast, set it to Medium (V.17).
- If errors and retries persist, set the fax speed to Slow (V.29) because some VoIP systems cannot handle the higher signal rates associated with fax.
- In rare cases, if errors persist, turn off ECM on the printer. The image quality might decrease. Ensure that the image quality is acceptable with ECM off before using this setting.
- If the preceding setting changes have not improved the VoIP fax reliability, contact your VoIP provider for help.

Solve problems receiving faxes

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The fax does not respond.</td>
<td>The fax has a dedicated phone line.</td>
<td>• Set the Answer Mode option to the Automatic setting from the control panel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. From the Home screen on the printer control panel, touch the Setup button.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Open the Fax Setup menu.</td>
</tr>
</tbody>
</table>
Table 2-33 Solve problems receiving faxes (continued)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
</table>
| c. An answering machine is connected to the printer. | | c. Open the **Basic Setup** menu.  
d. Open the **Answer Mode** menu.  
e. Select the **Automatic** setting.  
| a. From the Home screen on the printer control panel, touch the **Setup** button.  
b. Open the **Fax Setup** menu.  
c. Open the **Basic Setup** menu.  
d. Open the **Answer Mode** menu.  
e. Select the **TAM** setting.  
If the **TAM** setting is unavailable, set the **Answer Mode** option to the **Automatic** setting.  
| • Set the **Answer Mode** option to the **TAM** setting and connect the answering machine to the "telephone" port.  
a. From the Home screen on the printer control panel, touch the **Setup** button.  
b. Open the **Fax Setup** menu.  
c. Open the **Basic Setup** menu.  
d. Open the **Answer Mode** menu.  
e. Select the **TAM** setting.  
| • Set the **Rings to Answer** setting to at least one ring more than the number of rings for which the answering machine is set.  
a. From the Home screen on the printer control panel, touch the **Setup** button.  
b. Open the **Fax Setup** menu.  
c. Open the **Basic Setup** menu.  
d. Open the **Rings to Answer** menu.  
e. Select the correct setting.  
| • Connect the answering machine to the "telephone" port.  
| • If the printer has a telephone handset connected, set the **Answer Mode** option to the **Fax/Tel** setting to route calls to the correct device. When detecting a voice call, the printer generates a ring tone that alerts you to pick up the telephone handset.  
a. From the Home screen on the printer control panel, touch the **Setup** button.  
b. Open the **Fax Setup** menu.  
c. Open the **Basic Setup** menu.  
d. Open the **Answer Mode** menu.  
e. Select the **Fax/Tel** setting.  

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A handset is connected to the printer.</td>
<td>● Make sure the phone is hung up.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Change the Answer Mode option to match the printer setup.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. From the Home screen on the printer control panel, touch the Setup button.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Open the Fax Setup menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Open the Basic Setup menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Open the Answer Mode menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Select the setting that matches the printer setup.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set the Answer Mode option to the Fax/Tel setting to automatically receive faxes. The Fax/Tel setting automatically detects whether the incoming transmission is a fax or a voice call and routes the call to the appropriate device.</td>
<td></td>
</tr>
<tr>
<td>The Answer Mode setting is set to the Manual setting.</td>
<td>● Touch the Start Fax button on the printer control panel.</td>
<td></td>
</tr>
<tr>
<td>Voice mail is available on the fax line.</td>
<td>● Add a distinctive ring service to your telephone line and change the Distinctive Ring setting on the printer to match the ring pattern supplied by the telephone company. Contact your telephone company for information.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. From the Home screen on the printer control panel, touch the Setup button.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Open the Fax Setup menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Open the Basic Setup menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Open the Distinctive Ring menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Select the correct setting.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Buy a dedicated line for faxing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Set the Answer Mode option to the Manual setting.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. From the Home screen on the printer control panel, touch the Setup button.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Open the Fax Setup menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Open the Basic Setup menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Open the Answer Mode menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Select the Manual setting.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** You must be present to receive faxes.
<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
</table>
| The printer is connected to a DSL phone service. | - Check the installation and features. A DSL modem requires a high-pass filter on the phone line connection to the printer. Contact your DSL service provider for a filter or buy a filter.  
- Verify that the filter is connected.  
- Replace the existing filter to make sure that it is not defective. | |
| The printer uses a fax over IP or VoIP phone service. | - Set the Fax Speed option to the Slow(V.29) or Medium(V.17) setting.  
  a. From the Home screen on the printer control panel, touch the Setup button.  
  b. Open the Fax Setup menu.  
  c. Open the Advanced Setup menu.  
  d. Open the Fax Speed menu.  
  e. Select the correct setting.  
- Contact your service provider to make sure that fax is supported and for a recommended fax speed setting. Some companies might require an adapter. | |
| Sender receives a busy signal | A handset is connected to the printer. | - Make sure the phone is hung up.  
- Change the Answer Mode option to match the printer setup.  
  a. From the Home screen on the printer control panel, touch the Setup button.  
  b. Open the Fax Setup menu.  
  c. Open the Basic Setup menu.  
  d. Open the Answer Mode menu.  
  e. Select the setting that matches the printer setup.  
  Set the Answer Mode option to the Fax/Tel setting to automatically receive faxes. The Fax/Tel setting automatically detects whether the incoming transmission is a fax or a voice call and routes the call to the appropriate device. | |
| A phone line splitter is being used. | - If you are using a phone line splitter, remove the splitter and set up the phone as a downstream phone.  
- Make sure the phone is hung up.  
- Make sure the phone is not being used for a voice call when faxing. | |
### Table 2-33 Solve problems receiving faxes (continued)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No dial tone</td>
<td>A phone line splitter is being used.</td>
<td>If using a phone line splitter, remove the phone line splitter and set up the phone as a downstream phone.</td>
</tr>
<tr>
<td></td>
<td>The phone cable is not connected correctly to the printer.</td>
<td>Verify that the telephone cord is plugged into the correct port on the back of the printer.</td>
</tr>
</tbody>
</table>
| Printer rings once, but does not answer | An answering machine or voice messaging service is sharing the phone line with the printer. | - **Answering machine**: Set the Answer Mode option to the TAM setting and connect the answering machine to the “telephone” port.  
  - **Voice mail**: Add a distinctive ring service to your telephone line and change the Distinctive Ring setting on the printer to match the ring pattern supplied by the telephone company. Contact your telephone company for information. |
|                               | The Distinctive Ring setting is incorrectly set. | 1. From the Home screen on the printer control panel, touch the Setup button.  
  2. Open the Fax Setup menu.  
  3. Open the Basic Setup menu.  
  4. Open the Distinctive Ring menu.  
  5. Select the correct setting. |
|                               | The sender number is blocked, and the printer is ringing once before blocking the fax job. | This is normal printer behavior. |
| Printer continues to ring, but does not answer | The Answer Mode setting is set to the Manual setting. | Touch the Start Fax button on the printer control panel. |
|                               | The Rings to Answer setting is incorrectly set. | 1. From the Home screen on the printer control panel, touch the Setup button.  
  2. Open the Fax Setup menu.  
  3. Open the Basic Setup menu.  
  4. Open the Rings to Answer menu.  
  5. Select the correct setting. |
|                               | The Distinctive Ring setting is incorrectly set. | 1. From the Home screen on the printer control panel, touch the Setup button.  
  2. Open the Fax Setup menu.  
  3. Open the Basic Setup menu.  
  4. Open the Distinctive Ring menu.  
  5. Select the correct setting. |
| Printer does not ring, no fax received | The phone cable is not connected correctly to the printer. | Verify that the telephone cord is plugged into the correct port on the back of the printer. |
### Table 2-33 Solve problems receiving faxes (continued)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printer answers, but fax does not print</td>
<td>The Private Receive feature is on</td>
<td>• When the Private Receive feature is activated, received faxes are stored in memory. A password is required to print the stored faxes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enter the password to print the fax. If you do not know the password, contact the printer administrator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>NOTE:</strong> Memory errors might occur if the faxes are not printed. The printer will not answer if the memory is full.</td>
</tr>
<tr>
<td>The Private Receive option is enabled.</td>
<td>When the Private Receive feature is activated, received faxes are stored in memory. A password is required to print the stored faxes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enter the password to print the fax. If you do not know the password, contact the printer administrator.</td>
</tr>
<tr>
<td>The printer is out of paper.</td>
<td></td>
<td>This is normal printer behavior.</td>
</tr>
<tr>
<td>Header information prints on top of the fax information</td>
<td>For all forwarded faxes, the printer appends the overlay header to the top of a page.</td>
<td></td>
</tr>
</tbody>
</table>

### Solve problems sending faxes

### Table 2-34 Solve problems sending faxes

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax does not send</td>
<td>The Send Fax Later option is enabled and scheduled to send the fax at a later time.</td>
<td>This is normal printer behavior.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change the redial settings to prompt the printer to try to resend the fax automatically.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. From the Home screen on the printer control panel, touch the Setup button.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Open the Fax Setup menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Open the Advanced Setup menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Open the following items:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Redial if Busy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Redial if No Answer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Redial if Comm. Error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Select the correct setting for each option.</td>
</tr>
<tr>
<td>Outgoing fax calls keep dialing.</td>
<td>The redial settings are all inactive, causing the printer to try dialing once and then stop if it encounters a busy signal, no answer, or an error.</td>
<td>This is normal printer behavior. To prevent the fax from resending, set the Redial if Busy option to 0, set the Redial if No Answer option to 0, and set the Redial if Comm. Error option to 0.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The fax number is too long.</td>
</tr>
</tbody>
</table>
Table 2-34  Solve problems sending faxes (continued)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax stops while sending</td>
<td>The receiving fax machine might be</td>
<td>Try sending to another fax machine.</td>
</tr>
<tr>
<td></td>
<td>malfunctioning.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The phone line might not be working.</td>
<td>Disconnect the printer from the phone jack, and connect a phone. Try to make a phone call to verify that the phone line is working.</td>
</tr>
<tr>
<td></td>
<td>The phone line might be noisy or poor quality.</td>
<td>Try using a slower fax speed to improve the reliability of transmission.</td>
</tr>
<tr>
<td></td>
<td>A call-waiting feature might be active.</td>
<td>Verify that the fax telephone line does not have an activated call-waiting feature. A call-waiting notice can interrupt a fax call in progress, which causes a communication error.</td>
</tr>
<tr>
<td>Sent faxes are not arriving at the receiving fax machine</td>
<td>The receiving fax machine is turned off or has an error condition, such as being out of paper.</td>
<td>Ask the recipient to make sure that the fax machine is turned on and ready to receive faxes.</td>
</tr>
<tr>
<td></td>
<td>The receiving machine is blocking the sending machine number.</td>
<td>Ask the recipient to make sure that the receiving fax machine is not blocking the sending machine fax number.</td>
</tr>
</tbody>
</table>

Fax error messages on the control panel

The No Fax Detected message displays

NOTE:  This error does not always refer to a missed fax. If a voice call is made to a fax number by mistake and the caller hangs up, the No Fax Detected message displays on the control panel.

- Ask the sender to resend the fax.
- Make sure that the telephone cord from the printer is connected to the wall telephone jack.
- Try a different phone cord.
- Connect the printer phone cord to a jack for another phone line.
- Make sure the telephone line and phone wall jack are active by connecting a telephone and checking for a dial tone.
- Make sure that the telephone cord is connected to the “line” port on the printer.
- Check the phone line by running a fax test from the control panel.
- If the error persists, contact HP. See www.hp.com/support/colorljM452, www.hp.com/support/colorljM477MFP or the support flyer that came in the printer box.

The Communication error message appears

- Ask the sender to send the fax again or send at a later time when line conditions have improved.
- Disconnect the printer telephone cord from the wall, connect a telephone to the phone jack on the wall, and try making a call. Plug the printer phone cord into a jack for another phone line.
- Try a different phone cord.
- Set the Fax Speed option to the Slow(V.29) or Medium(V.17) setting.
  a. From the Home screen on the printer control panel, touch the Setup button.
  b. Open the Fax Setup menu.
  c. Open the Advanced Setup menu.
  d. Open the Fax Speed menu.
  e. Select the correct setting.

- Turn off the Error Correction feature to prevent automatic error correction.

  **NOTE:** Turning off the Error Correction feature can reduce image quality.

  a. From the Home screen on the printer control panel, touch the Setup button.
  b. Open the Service menu.
  c. Open the Fax Service menu.
  d. Open the Error Correction Mode menu.
  e. Select the Off setting.

- Print the Fax Activity Log report from the control panel to determine if the error occurs with a specific fax number.
  a. Touch the Fax button, and then touch the Fax Menu button.
  b. Open the Fax Reports menu.
  c. Open the Fax Activity Log menu.
  d. Select the Print Log Now option.

- If the error persists, contact HP. See www.hp.com/support/colorljM452, www.hp.com/support/colorljM477MFP or the support flyer that came in the printer box.

**No Dial Tone**

- Make sure that the telephone cord is connected to the correct port on the printer.
- Make sure that the telephone cord from the printer is connected directly to the wall telephone jack.
- Check for a dial tone on the phone line by using the Start Fax button.
- Disconnect the printer telephone cord from the wall, connect a telephone to the phone jack on the wall, and try making a voice call.
- Disconnect the telephone cord from both the printer and the wall and reconnect the cord.
- Make sure that you are using the telephone cord that came with the printer.
- Connect the printer phone cord to a jack for another phone line.
- Check the phone line by using the Run Fax Test option from the Service menu on the control panel.
a. From the Home screen on the printer control panel, touch the Setup button.

b. Open the Service menu.

c. Open the Fax Service menu.

d. Select the Run Fax Test item.

**The Fax is busy message appears**

- Try sending the fax again.
- Call the recipient to ensure that the fax machine is on and ready.
- Check that you are dialing the correct fax number.
- Check for a dial tone on the phone line by using the Start Fax button.
- Make sure that the phone line is working by disconnecting the printer, connecting a telephone to the phone line, and making a voice call.
- Connect the printer phone cord to a jack for another phone line, and try sending the fax again.
- Try a different phone cord.
- Send the fax at a later time.
- If the error persists, contact HP. See [www.hp.com/support/colorljM452](http://www.hp.com/support/colorljM452), [www.hp.com/support/colorljM477MFP](http://www.hp.com/support/colorljM477MFP) or the support flyer that came in the printer box.

**The No fax answer message appears**

- Try to resend the fax.
- Call the recipient to ensure that the fax machine is on and ready.
- Check that you are dialing the correct fax number.
- Disconnect the printer telephone cord from the wall, connect a telephone to the phone jack on the wall, and try making a voice call.
- Connect the printer phone cord to a jack for another phone line.
- Try a different phone cord.
- Make sure that the phone cord from the wall telephone jack is connected to the line port.
- Check the phone line by using the Run Fax Test option from the Service menu on the control panel.
  
  a. From the Home screen on the printer control panel, touch the Setup button.
  
  b. Open the Service menu.
  
  c. Open the Fax Service menu.
  
  d. Select the Run Fax Test item.
- If the error persists, contact HP. See [www.hp.com/support/colorljM452](http://www.hp.com/support/colorljM452), [www.hp.com/support/colorljM477MFP](http://www.hp.com/support/colorljM477MFP) or the support flyer that came in the printer box.
Document feeder paper jam

- Verify that the paper meets printer size requirements. The printer does not support pages longer than 381 mm (15 in) for faxing.
- Copy or print the original to letter, A4, or legal size paper, and then resend the fax.

The Fax storage is full message appears

- Turn the printer off then on.
- Delete stored faxes from memory.
  a. From the Home screen on the printer control panel, touch the Setup button.
  b. Open the Service menu.
  c. Open the Fax Service menu.
  d. Select the Clear Saved Faxes item.
- Divide the large fax job into smaller sections, and then fax them individually.

Scanner error

- Verify that the paper meets printer size requirements. The printer does not support pages longer than 381 mm (15 in) for faxing.
- Copy or print the original onto letter, A4, or legal size paper and then resend the fax.

The control panel displays a Ready message with no attempt to send the fax

- Check the fax activity log for errors.
  a. Touch the Fax button, and then touch the Fax Menu button.
  b. Open the Fax Reports menu.
  c. Open the Fax Activity Log menu.
  d. Select the Print Log Now option.
- If a phone is connected to the printer, make sure that the phone is hung up.
- Disconnect all other lines between the fax and the printer.
- Connect the printer directly into the wall telephone jack and resend the fax.

The control panel displays the message “Storing page 1” and does not progress beyond that message

- Delete stored faxes from memory.
  a. From the Home screen on the printer control panel, touch the Setup button.
  b. Open the Service menu.
c. Open the Fax Service menu.

d. Select the Clear Saved Faxes item.

**Faxes can be received, but not sent**

Send fax and nothing happens.

1. Check for a dial tone on the phone line by using the Start Fax button.

2. Turn the printer off then on.

3. Use the control panel or the HP Fax Setup Wizard to configure the fax time, date, and fax header information.
   
a. From the Home screen on the printer control panel, touch the Setup button.

b. Open the Fax Setup menu.

c. Open the Basic Setup menu.

d. Open the Fax Header menu.

e. Enter the correct settings.

4. Verify that any extension phones on the line are hung up.

5. If using a DSL service, make sure that the phone line connection to the printer includes a high-pass filter.

**Printer is password protected**

If a network administrator has set a printer password, then you must obtain the password in order to use the printer fax features.

**Unable to use fax functions from the control panel**

- The printer might be password protected. Use the HP Embedded Web Server, HP Toolbox software, or the control panel to set a password.

- If you do not know the password for the printer, contact your system administrator.

- Verify with the system administrator that the fax functionality has not been disabled.

**Unable to use speed dials**

- Make sure that the fax number is valid.

- If an outside line requires a prefix, turn on the Dial Prefix option or include the prefix in the speed dial number.
   
a. From the Home screen on the printer control panel, touch the Setup button.

b. Open the Fax Setup menu.

c. Open the Basic Setup menu.

d. Open the Dial Prefix menu.

e. Select the On setting.
Unable to use group dials

- Make sure that the fax number is valid.
- If an outside line requires a prefix, turn on the Dial Prefix option or include the prefix in the speed dial number.
  a. From the Home screen on the printer control panel, touch the Setup button.
  b. Open the Fax Setup menu.
  c. Open the Basic Setup menu.
  d. Open the Dial Prefix menu.
  e. Select the On setting.
- Set up all entries in the group with speed dial entries.
  a. Open an unused speed dial entry.
  b. Enter the fax number for the speed dial.
  c. Touch the OK button to save the speed dial.

Receive a recorded error message from the phone company when trying to send a fax

- Make sure you dial the fax number correctly, and make sure that the phone service is not blocked. For example, some phone services might prevent long distance calling.
- If an outside line requires a prefix, turn on the Dial Prefix option or include the prefix in the speed dial number.
  a. From the Home screen on the printer control panel, touch the Setup button.
  b. Open the Fax Setup menu.
  c. Open the Basic Setup menu.
  d. Open the Dial Prefix menu.
  e. Select the On setting.

**NOTE:** To send a fax without a prefix, when the Dial Prefix option is turned on, send the fax manually.
- Send a fax to an international number
  a. If a prefix is required, manually dial the telephone number with the prefix.
  b. Enter the country/region code before dialing the phone number.
  c. Wait for pauses as you hear the tones on the phone.
  d. Send the fax manually from the control panel.
Unable to send a fax when a phone is connected to the printer

- Make sure that the telephone is hung up.
- Make sure that the telephone is not being used for a voice call when faxing.
- Disconnect the phone from the line, and then try sending the fax.

Troubleshoot fax codes and trace reports

View and interpret fax error codes

Use fax error codes from the fax activity log to solve problems with the printer fax features.

<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>232</td>
<td>Possible causes include the following:</td>
<td>1. Resend the fax at a different time when telephone line conditions have improved.</td>
</tr>
<tr>
<td></td>
<td>● A communication failure has occurred between the two machines.</td>
<td>2. If the error persists, and error correction is in use for the fax session, disable the Error Correction setting.</td>
</tr>
<tr>
<td></td>
<td>● The user at the remote machine might have pressed the Stop or Cancel button.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● The power at the remote machine has been interrupted, or deliberately turned off causing the fax session to be interrupted.</td>
<td></td>
</tr>
<tr>
<td>282</td>
<td>Possible causes include the following:</td>
<td>Have the sender verify that the sending machine is working correctly, and then request that the sender resend the fax.</td>
</tr>
<tr>
<td></td>
<td>● The printer has not received any data at the start of a page during reception in error correction mode, but the modem has not detected a remote disconnect.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● The remote machine is probably transmitting sync frames instead of data and has either jammed or broken.</td>
<td></td>
</tr>
<tr>
<td>321</td>
<td>There was a communication error with the receiving fax machine due to poor telephone line conditions.</td>
<td>Resend the fax at a different time when telephone line conditions have improved.</td>
</tr>
<tr>
<td>344-348</td>
<td>Possible causes include the following:</td>
<td>1. Resend the fax at a different time when telephone line conditions have improved.</td>
</tr>
<tr>
<td></td>
<td>● The remote machine has failed to respond to a fax command from the local machine due to the connection being interrupted.</td>
<td>2. If the error persists, and error correction is in use for the fax session, disable the Error Correction setting.</td>
</tr>
<tr>
<td></td>
<td>● The user at the remote machine might have pressed the Stop or Cancel button.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● In rare instances, incompatibility between the two machines can cause the remote machine to simply terminate the call.</td>
<td></td>
</tr>
<tr>
<td>381</td>
<td>Possible causes include the following:</td>
<td>1. Resend the fax at a different time when telephone line conditions have improved.</td>
</tr>
<tr>
<td></td>
<td>● The remote machine has failed to respond to a fax command from the local machine due to the connection being interrupted.</td>
<td>2. If the error persists, and error correction is in use for the fax session, disable the Error Correction setting.</td>
</tr>
<tr>
<td></td>
<td>● The user at the remote machine might have pressed the Stop button.</td>
<td></td>
</tr>
</tbody>
</table>
**Fax trace report**

A fax T.30 trace report has information that can help resolve fax transmission problems. If you call HP for help in resolving these problems, print a T.30 trace report before you call.

1. From the Home screen on the printer control panel, touch the Setup button.
2. Touch the Service menu.
3. Touch the Fax Service menu.
4. Touch the Print T.30 Trace button, and then touch the Now button.

**NOTE:** This procedure prints a report for the last fax job, successful or not. To generate a report for each unsuccessful fax job, select the If Error setting. To generate a report for each fax job, select the At End of Call setting.

**Fax logs and reports**

Use the following instructions to print fax logs and reports:

**Print all fax reports**

Use this procedure to print all of the following reports at one time:

- Last Call Report
- Fax Activity Log
- Phone Book Report
- Junk Fax List
- Billing Report (when Billing Codes are turned on)
- Configuration Report
- Usage Page

1. From the Home screen on the printer control panel, touch the Fax button.
2. Touch the Fax Menu button.
3. Touch the Fax Reports button.
4. Touch the Print All Fax Reports button.

**Print individual fax reports**

1. From the Home screen on the printer control panel, touch the Fax button.
2. Touch the Fax Menu button.
3. Touch the Fax Reports button.
4. Touch the name of the report that you want to print.
Set the fax error report

A fax error report is a brief report that indicates the printer experienced a fax job error. You can set it to print after the following events:

- Every fax error (the factory-set default)
- Send fax error
- Receive fax error
- Never

NOTE: With this option, you will have no indication that a fax failed to be transmitted unless you print a fax activity log.

1. From the Home screen on the printer control panel, touch the Fax button.
2. Touch the Fax Menu button.
3. Touch the Fax Reports button.
4. Touch the Fax Error Report button, and then touch the printing option that you want to use.

Set the fax-error-correction mode

Usually, the printer monitors the signals on the telephone line while it is sending or receiving a fax. If the printer detects an error during the transmission and the error-correction setting is On, the printer can request that the portion of the fax be resent. The factory-set default for error correction is On.

You should turn off error correction only if you are having trouble sending or receiving a fax, and you are willing to accept the errors in the transmission. Turning off the setting might be useful when you are trying to send a fax overseas or receive one from overseas, or if you are using a satellite telephone connection.

1. From the Home screen on the printer control panel, touch the Setup button.
2. Touch the Service menu.
3. Touch the Fax Service menu.
4. Touch the Error Correction button, and then touch the On button.

Change the fax speed

The fax-speed setting is the modem protocol that the printer uses to send faxes. It is the worldwide standard for full-duplex modems that send and receive data across telephone lines at up to 33,600 bits per second (bps). The factory-set default for the fax-speed setting is Fast V.34.

You should change the setting only if you are having trouble sending a fax to or receiving a fax from a particular device. Decreasing the fax speed might be useful when you are trying to send a fax overseas, or receive one from overseas, or if you are using a satellite telephone connection.

1. From the Home screen on the printer control panel, touch the Setup button.
2. Touch the Fax Setup menu.
3. Touch the Advanced Setup menu.
4. Scroll to and touch the Fax Speed button, and then touch the speed setting that you want to use.
Use fax on a DSL, PBX, or ISDN system

HP printers are designed specifically for use with traditional analog phone services. They are not designed to work on DSL, PBX, ISDN lines, or VoIP services, but they work with the proper setup and equipment.

**NOTE:** HP recommends discussing DSL, PBX, ISDN, and VoIP setup options with the service provider.

The HP LaserJet printer is an analog device that is not compatible with all digital phone environments (unless a digital-to-analog converter is used). HP does not guarantee that the printer will be compatible with digital environments or digital-to-analog converters.

**DSL**

A digital subscriber line (DSL) uses digital technology over standard copper telephone wires. This printer is not directly compatible with those digital signals. However, if the configuration is specified during DSL setup, the signal can be separated so that some of the bandwidth is used to transmit an analog signal (for voice and fax) while the remaining bandwidth is used to transmit digital data.

**NOTE:** Not all faxes are compatible with DSL services. HP does not guarantee that the printer will be compatible with all DSL service lines or providers.

A typical DSL modem employs a filter to separate the higher frequency DSL modem communication from lower frequency analog phone and fax modem communication. It is often necessary to use a filter with analog phones and analog fax products that are connected to a telephone line used by a DSL modem. The DSL service provider usually provides this filter. Contact the DSL provider for more information or for assistance.

**PBX**

The printer is an analog device that is not compatible in all digital phone environments. Digital-to-analog filters or converters might be needed for faxing functionality. If faxing issues occur in a PBX environment, it might be necessary to contact the PBX provider for assistance. HP does not guarantee that the printer will be compatible with digital environments or digital-to-analog converters.

Contact the PBX provider for more information and for assistance.

**ISDN**

The printer is an analog device that is not compatible in all digital phone environments. Digital-to-analog filters or converters might be needed for faxing functionality. If faxing issues occur in an ISDN environment, it might be necessary to contact the ISDN provider for assistance. HP does not guarantee that the printer will be compatible with ISDN digital environments or digital-to-analog converters.
Solve email problems

If Scan to E-mail problems occur, try these solutions:

- Make sure this feature has been set up. If this feature has not been set up, use the setup wizard in the HP Device Toolbox (Windows) or HP Utility for Mac OS X software to set it up.
- Make sure the Scan to Email feature is enabled. If it has been disabled, enable the feature through the HP Device Toolbox (Windows) or HP Utility for Mac OS X software.
- Make sure that the printer is connected to a computer or to a network.

Cannot connect to the email server

- Make sure the SMTP or LDAP server name is correct. Check this setting with your system administrator or Internet Service Provider.
- If the printer cannot establish a secure connection to the SMTP or LDAP server, try without the secure connection or try a different server or port. Check this setting with your system administrator or Internet Service Provider.
- If the SMTP or LDAP server requires authentication, make sure a valid user name and password are used.
- If the SMTP or LDAP server uses an authentication method that is not supported, try a different server. Check this setting with your system administrator or Internet Service Provider.

Validate the SMTP gateway (Windows)

1. Open an MS-DOS command prompt: click Start, click Run, type cmd, and then press the Enter key.
2. In the command prompt window, type telnet followed by the SMTP gateway address and then the number 25, which is the port over which the printer is communicating. For example, type telnet 123.123.123.123 25 where "123.123.123.123" represents the SMTP gateway address.
3. Press the Enter key. If the SMTP gateway address is not valid, the response contains the message Could not open connection to the host on port 25: Connect Failed.
4. If the SMTP gateway address is not valid, contact the network administrator.

Validate the LDAP gateway (Windows)

1. Open Windows Explorer. In the address bar, type LDAP:// immediately followed by the LDAP gateway address. For example, type LDAP://12.12.12.12 where "12.12.12.12" represents the LDAP gateway address.
2. Press the Enter key. If the LDAP gateway address is valid, the Find People dialog box opens.
3. If the LDAP gateway address is not valid, contact the network administrator.
Update the firmware

HP offers periodic printer updates, new Web Services apps, and new features to existing Web Services apps. Follow these steps to update the firmware for a single printer. When you update the firmware, Web Service apps will update automatically.

There are two supported methods to perform a firmware update on this printer. Use only one of the following methods to update the printer firmware.

Method one: Update the firmware using the control panel

Use these steps to load the firmware from the control panel (for network-connected printers only), and/or set the printer to automatically load future firmware updates. For USB-connected printers, use method two.

1. Make sure the printer is connected to a wired (Ethernet) or wireless network with an active Internet connection.

   **NOTE:** The printer must be connected to the internet to update the firmware via a network connection.

2. From the Home screen on the printer control panel, open the Setup menu.
   - For touchscreen control panels, touch the Setup button.
   - For standard control panels, press the left or right arrow button.

3. Scroll to and open the Service menu, and then open the LaserJet Update menu.

   **NOTE:** If the LaserJet Update option is not listed, use method two.

4. Check for updates.
   - For touchscreen control panels, touch Check for Updates Now.
   - For standard control panels, select Check for Update.

   **NOTE:** The printer automatically checks for an update, and if a newer version is detected, the update process automatically starts.

5. Set the printer to automatically update the firmware when updates become available.

   From the Home screen on the printer control panel, open the Setup menu.
   - For touchscreen control panels, touch the Setup button.
   - For standard control panels, press the left or right arrow button.

   Scroll to and open the Service menu, open the LaserJet Update menu, and then select the Manage Updates menu.

   Set the printer to automatically update the firmware.
   - For touchscreen control panels, set the Allow Updates option to YES, and then set the Check automatically option to ON.
   - For standard control panels, set the Allow Updates option to YES, and then set the Automatic Check option to ON.
Method two: Update the firmware using the Firmware Update Utility

Use these steps to manually download and install the Firmware Update Utility from HP.com.

**NOTE:** This method is the only firmware update option available for printers connected to the computer via a USB cable. It also works for printers connected to a network.

1. Go to [www.hp.com/go/support](http://www.hp.com/go/support), click the **Drivers & Software** link, type the printer name in the search field, press the **ENTER** button, and then select the printer from the list of search results.

2. Select the operating system.

3. Under the **Firmware** section, locate the **Firmware Update Utility**.

4. Click **Download**, click **Run**, and then click **Run** again.

5. When the utility launches, select the printer from the drop-down list, and then click **Send Firmware**.

**NOTE:** To print a configuration page to verify the installed firmware version before or after the update process, click **Print Config**.

6. Follow the on-screen instructions to complete the installation, and then click the **Exit** button to close the utility.
A  Certificates of volatility

- Certificates of volatility
Certificates of volatility

Figure A-1 Certificate of volatility M452 (1 of 2)

Hewlett-Packard Certificate of Volatility

| Model: HP Color LaserJet M452 | Part Number: CF388A=M452nw CF389A=M452dn CF394A=M452dw | Address: Hewlett Packard Company 11311 Chinden Blvd Boise, ID 83714 |

Volatile Memory

Does the device contain volatile memory (Memory whose contents are lost when power is removed)?

☑ Yes ☐ No

If Yes please describe the type, size, function, and steps to clear the memory below:

<table>
<thead>
<tr>
<th>Type (SRAM, DRAM, etc):</th>
<th>Size: 128MB</th>
<th>User Modifiable: Yes ☑ No ☐</th>
<th>Function: Used for temporary storage during the processing of jobs and for applications running on the OS.</th>
<th>Steps to clear memory: When the printer is powered OFF, the memory is erased.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type (SRAM, DRAM, etc):</td>
<td>Size: 256MB</td>
<td>User Modifiable: Yes ☑ No ☐</td>
<td>Function: Used for temporary storage during the processing of jobs and for applications running on the OS.</td>
<td>Steps to clear memory: When the printer is powered OFF, the memory is erased.</td>
</tr>
</tbody>
</table>

Non-Volatile Memory

Does the device contain non-volatile memory (Memory whose contents are retained when power is removed)?

☑ Yes ☐ No

If Yes please describe the type, size, function, and steps to clear the memory below:

<table>
<thead>
<tr>
<th>Type (Flash, EEPROM, etc):</th>
<th>Size: 2GB</th>
<th>User Modifiable: Yes ☑ No ☐</th>
<th>Function: Device Firmware</th>
<th>Steps to clear memory:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type (Flash, EEPROM, etc):</td>
<td>Size:</td>
<td>User Modifiable: Yes ☑ No ☐</td>
<td>Function:</td>
<td>Steps to clear memory:</td>
</tr>
<tr>
<td>Type (Flash, EEPROM, etc):</td>
<td>Size:</td>
<td>User Modifiable: Yes ☑ No ☐</td>
<td>Function:</td>
<td>Steps to clear memory:</td>
</tr>
</tbody>
</table>

Mass Storage

Does the device contain mass storage memory (Hard Disk Drive, Tape Backup)?

☑ Yes ☐ No

If Yes please describe the type, size, function, and steps to clear the memory below:

<table>
<thead>
<tr>
<th>Type (HDD, Tape, etc):</th>
<th>Size:</th>
<th>User Modifiable: Yes ☑ No ☐</th>
<th>Function:</th>
<th>Steps to clear memory:</th>
</tr>
</thead>
</table>

USB

Does the item accept USB input and if so, for what purpose (i.e. Print Jobs, device firmware updates, scan upload)?

☑ Yes ☐ No

If Yes please describe below:

The front USB host can accept print jobs, scan uploads, photos and can be used to upload printer firmware.

Can any data other than scan upload be sent to the USB device)?

☑ Yes ☐ No

If Yes please describe below:

Rear USB host when configured will accept stored jobs, encrypted files stored and deleted by user.

RF/RID

Does the item use RF or RFID for receive or transmit of any data including remote diagnostics. (e.g. Cellular phone, Bluetooth)?

☑ Yes ☐ No

If Yes please describe below:

Purpose: Wireless Information string

Frequency: 13.56 MHz

Bandwidth: 106-848kbps

Modulation: 7-30% ASK

Effective Radiate Power (ERP): Not an internal radiator.

Load modulation as passive tag emulation.

Specifications:
### Figure A-2 Certificate of volatility M452 (2 of 2)

<table>
<thead>
<tr>
<th>Other Transmission Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the device employ any other methods of non-wired access to transmit or receive any data whatsoever (e.g. anything other than standard hard wired TCP/IP, direct USB, or parallel connections)?</td>
</tr>
<tr>
<td>If Yes please describe below:</td>
</tr>
<tr>
<td><strong>Purpose:</strong></td>
</tr>
<tr>
<td><strong>Frequency:</strong></td>
</tr>
<tr>
<td><strong>Bandwidth:</strong></td>
</tr>
<tr>
<td><strong>Modulation:</strong></td>
</tr>
<tr>
<td><strong>Specifications:</strong></td>
</tr>
<tr>
<td><strong>Effective Radiate Power (ERP):</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever?</td>
</tr>
<tr>
<td>If Yes please describe below:</td>
</tr>
<tr>
<td><strong>Purpose:</strong></td>
</tr>
<tr>
<td><strong>Specifications:</strong></td>
</tr>
</tbody>
</table>
### Hewlett-Packard Certificate of Volatility

**Model:** HP Color LaserJet MFP M477  
**Part Number:** CF377A=M477nw  
**CF378A=M477dn  
**CF379A=M477dw  
**Address:** Hewlett Packard Company  
11311 Chinden Blvd  
Boise, ID 83714

#### Volatile Memory

Does the device contain volatile memory (Memory whose contents are lost when power is removed)?  
☑ Yes ☐ No  
If Yes please describe the type, size, function, and steps to clear the memory below

<table>
<thead>
<tr>
<th>Type (SRAM, DRAM, etc):</th>
<th>Size:</th>
<th>User Modifiable:</th>
<th>Function:</th>
<th>Steps to clear memory:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>128MB</td>
<td>☑ Yes ☐ No</td>
<td>Used for temporary storage during the processing of jobs and for applications running on the OS.</td>
<td>When the printer is powered OFF, the memory is erased.</td>
</tr>
<tr>
<td></td>
<td>256MB</td>
<td>☑ Yes ☐ No</td>
<td>Used for temporary storage during the processing of jobs and for applications running on the OS.</td>
<td>When the printer is powered OFF, the memory is erased.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Non-Volatile Memory

Does the device contain non-volatile memory (Memory whose contents are retained when power is removed)?  
☑ Yes ☐ No  
If Yes please describe the type, size, function, and steps to clear the memory below

<table>
<thead>
<tr>
<th>Type (Flash, EEPROM, etc):</th>
<th>Size:</th>
<th>User Modifiable:</th>
<th>Function:</th>
<th>Steps to clear memory:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2GB</td>
<td>☑ Yes ☐ No</td>
<td>Device FW, Fax system</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Mass Storage

Does the device contain mass storage memory (Hard Disk Drive, Tape Backup)?  
☑ Yes ☐ No  
If Yes please describe the type, size, function, and steps to clear the memory below

<table>
<thead>
<tr>
<th>Type (HDD, Tape, etc):</th>
<th>Size:</th>
<th>User Modifiable:</th>
<th>Function:</th>
<th>Steps to clear memory:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>☑ Yes ☐ No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### USB

Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)?  
☑ Yes ☐ No  
If Yes please describe below

The front USB host can accept print jobs, scan uploads, photos and can be used to upload printer firmware.

Can any data other than scan upload be sent to the USB device)?  
☑ Yes ☐ No  
If Yes please describe below

Rear USB host when configured will accept stored jobs, encrypted files stored and deleted by user.

#### RF/RFID

Does the item use RF or RFID for receive or transmit of any data including remote diagnostics. (e.g. Cellular phone, Bluetooth)?  
☑ Yes ☐ No  
If Yes please describe below

Purpose: Wireless Information string

<table>
<thead>
<tr>
<th>Frequency: 13.56</th>
<th>Bandwidth: 106-848kbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulation: 7-30%ASK</td>
<td>Effective Radiate Power (ERP): Not an intentional radiator. Load modulation as passive tag emulation.</td>
</tr>
</tbody>
</table>
### Other Transmission Capabilities

Does the device employ any other methods of non-wired access to transmit or receive any data whatsoever (e.g. anything other than standard hard wired TCP/IP, direct USB, or parallel connections)?  ☑ Yes ☐ No If Yes please describe below:

<table>
<thead>
<tr>
<th>Purpose: Wireless Network Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency: 2.4GHz</td>
</tr>
<tr>
<td>Modulation:</td>
</tr>
<tr>
<td>Specifications: 802.11 n/a/b/g</td>
</tr>
</tbody>
</table>

### Other Capabilities

Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever?  ☑ Yes ☐ No If Yes please describe below:

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