7

LaserJet 5 Error Map

The LaserJet 5/5M/5N printer has error messages that are similar to the LaserJet 4/4M/4+/4M+. Use the following table to look up the LJ5 error and take the recommended action. If the recommendation is to see another error, for example See 00 POWERSAVE, look up the recommendation for that error in the Printer Message Troubleshooting section (Tables 7-1 and 7-2).

Note   The LaserJet 5 printer's `Go` key replaces both the `Online` and `Continue` keys previously used to resolve some of the temporary errors in the LaserJet 4 and 4 Plus printers.

Note   For any LaserJet 5 error message preceded with a number from 20 through 81, look up the equivalently-numbered message in Table 7-1 and proceed as directed.

Message on LJ 5/5M/5N	Recommendations
CLEARING MEMORY	See 07 RESET
CLOSE PRINTER COVER	See 12 PRINTER OPEN
CONTINUOUS TEST, PRESS JOB CANCEL KEY	See 04 SELF TEST
DATA RECEIVED	The received data is waiting for a form feed. (Takes the place of the `Form Feed` indicator on the LJ4.)
ENGINE TEST	See 15 ENGINE TEST
FACTORY DEFAULTS BEING RESTORED	See 09 MENU RESET
INCOMPATIBLE ENVELOPE FEEDER INSTALLED	Indicates that an envelope feeder has been installed that is not compatible with the LJ5. Press `GO` to clear the error. The feeder will not appear in any control panel or PJL messages.

Message on LJ 5/5M/5N	Recommendations
`INCOMPATIBLE TRAY 3 INSTALLED`	Indicates that a lower cassette has been installed that is not compatible with the LJ5. Press `GO` to clear the error. The tray will not appear in any control panel or PJL messages.
`INITIALIZING` (powerup only)	See `05 SELF TEST`
`INSTALL TONER CARTRIDGE`	See `14 EP CART`
`INSTALL TRAY 2`	See `PC INSTALL`
`INSUFFICIENT MEMORY, JOB CLEARED`	See `W3 JOB ABORTED`
`INSUFFICIENT MEMORY, PRINTING AT 300 DPI`	See W4/7 JOB 300/[page protect size]
`MANUALLY FEED [envelope size]`	See `ME FEED [envelope size]`
`MANUALLY FEED [paper size]`	See `MF FEED [paper size]`
`MEMORY LOW, PAGE SIMPLIFIED`	See `W1 IMAGE ADAPT`
`MEMORY SETTINGS CHANGED`	See `WM MEM CNFIG N/A` or `WM CHK MEM CNFIG`
`OFFLINE`	See `00 OFFLINE`
`[personality] MEMORY FULL, STORED DATA LOST`	See `WM [Personality] MEM FULL`
`PLEASE WAIT`	This message is displayed whenever the device is in the process of flushing the pipeline so it can go offline or into the menus. (Takes the place of the flashing `Online` indicator.)
`POWERSAVE ON`	See `00 POWERSAVE`
`PRINTING CONFIGURATION PAGE`	See `05 SELF TEST` / `06 PRINTING TEST`
`PRINTING DEMO PAGE`	See `06 DEMO PAGE`
`PRINTING FLASH PAGE`	This message is displayed while a flash file system page is being formatted and printed. Upon successful completion, the device returns to an online and ready state.
`PRINTING FONT LIST`	See `06 TYPEFACE LIST`
`PROCESSING JOB`	This message is displayed whenever the device is actively processing a user's job. (Takes the place of the flashing Ready indicator.)
`READY`	See `00 READY`
`REMOVE DUPLEX JAM`	See `13 DUPLEX JAM`

Message on LJ 5/5M/5N	Recommendations
`REMOVE PAPER JAM`	See `13 PAPER JAM`
`REQUESTED LANGUAGE NOT AVAILABLE`	See `W2 INVALID PERS`
`RESETTING ACTIVE I/O`	See `07 RESET`
`RESETTING ALL I/O`	See `07 RESET`
`RESTORING FACTORY SETTINGS`	See `08 COLD RESET`
`TONER LOW`	See `16 TONER LOW`
`TRAY 2/3 EMPTY`	Indicates Tray 2 or 3 has run out of paper and has not been selected as the current job's paper source. If the problem persists, check for a binding sensor flag or replace the appropriate sensor.
`TRAY x LOAD [paper or envelope size]`	See `xx LOAD [paper or envelope size]`
`WARMING UP`	See `02 WARMING UP`
`x LOAD [envelope size]` x=Tray 1 or Envelope Feeder	See `xx LOAD [paper or envelope size]`

7

Troubleshooting

Pre-Troubleshooting Procedures

Preliminary Operating Checks

Prior to troubleshooting a specific printer problem, you should ensure that:

- The printer is being maintained on a regular basis as described in Chapter 4.
- The customer is using acceptable media as specified in the User's Manual.
- The printer is installed on a solid, level surface.
- The line voltage does not vary more than 10% from the nominal rated value as specified on the Power Rating Label.
- The operating environment for the printer and paper is within the temperature and humidity specifications listed in Chapter 1 of this manual.
- The printer is never exposed to ammonia fumes such as those produced by diazo copiers, or office cleaning materials.
- The printer is not exposed to direct sunlight.
- Non-HP components (such as refilled toner cartridges, font cartridges, and memory boards) are removed from the printer.

Printer Message Troubleshooting

Printer Message Summary Table

Table 7-1 is a list of all status, attendance, error, and service messages affecting the printers. The table also identifies the action required to correct the situation identified by the message. When the action requires removal and replacement of an assembly or PCA, refer to the applicable section of Chapter 6 for instructions. For general location of components, refer to *Troubleshooting Aids* at the end of this chapter.

Table 7-1   Printer Messages

Message	Symptoms and Recommendations
Blank Display	Refer to the "Blank Display" Table 7-3.
00 READY	Proceed; printer is ready to use.
00 POWERSAVE POWERSAVE ON	Printer is in Power Save Mode. Press any key to take printer out of Power Save mode. Receipt of data or an error condition will also take printer out of Power Save mode. The job will print when the fuser is warmed up (may take up to 45 seconds).
00 OFFLINE	Printer is off line and not able to receive data. Press On Line*.
02 WARMING UP	Wait until printer signals ready.
05 SELF TEST	The non-printing portion of Self Test is in progress. Wait for the printer to display the 00 READY message.
06 PRINTING TEST PRINTING CONFIGURATION PAGE	Self Test printing. Wait for the printer to display the 00 READY message.
06 TYPE PRINTOUT	Printing sample characters from available typefaces. Wait for the printer to display the 00 READY message. (Note: the format is different for PCL and PostScript.)
06 TYPEFACE LIST PRINTING FONT LIST	Printing a Typeface List. (Note that PCL/Postscript formats are different.)
06 DEMO PAGE PRINTING DEMO PAGE	Printing a Demonstration Page. (Note that PCL/Postscript formats are different.)
06 CONFIG PAGE	Printing a Configuration Page. Appears only with PostScript installed in the printer.

*Press Go on the LJ5.

Table 7-1 Printer Messages (continued)

Message	Symptoms and Recommendations
`07 RESET` `RESETTING [xxx]`	Returns all printer settings to Printing Menu settings, and clears buffered pages, temporary soft fonts, and macros. Wait for the printer to display the `00 READY` message. See the *Reset Menu* section in Chapter 3 for more details.
`08 NVRAM_INIT`	Printer is initializing non-volatile RAM. This allows other personalities to access non-volatile RAM.

`08 COLD RESET`
 	
`RESTORING FACTORY`
`SETTINGS`
	Returns both Configuration and Printing Menu selections to the factory settings. Ensure that the Configuration Menu settings are correct before placing the printer on-line. Wait for the printer to display the `00 READY` message. See the *Reset Menu* section in Chapter 3 for more details.

`RESET=MENU`
`09 MENU RESET`
`09 RESET ACTIVE I/O`
`09 RESET ALL I/O`
`FACTORY DEFAULTS`
`BEING RESTORED`
	Follows a Control Panel `Reset` selection. The printer returns all Printing, PCL, PS, and Job Menu items to the factory settings. Clears buffered page data, temporary soft fonts, and temporary macros. See Chapter 3 for more details.

`10 RESET TO SAVE`	The Printing, PCL, PS, and Config Menus were changed while data, temporary fonts, or temporary macros were present in printer memory, or while the printer was in the middle of a job. Press `Continue` * or `On Line` *. Your changes remain recorded in the menu but do not become active until the printer is reset, or the job boundary is detected.
`12 PRINTER OPEN` `CLOSE PRINTER COVER`	Close the Top Cover Assembly. If the problem continues, refer to the "`12 PRINTER OPEN` Message" section.

`13 PAPER JAM`
 	
`REMOVE PAPER JAM`
	Open printer and clear any paper within the printer. Press `Continue` * or `On Line` * to reprint the page. If the problem persists, refer to "`13 PAPER JAM` Message" section.

`13 DUPLEX JAM` `REMOVE DUPLEX JAM`	Check for any paper in the Duplexer area. If problem persists, refer to the Duplex Section (Appendix A).

`14 NO EP CART`
 	
`INSTALL TONER`
`CARTRIDGE`
	Ensure that the Toner Cartridge is installed correctly (fully seated into the printer). Try a new Toner Cartridge. If the problem continues, refer to the "`14 NO EP CART` Message" section.

`15 ENGINE TEST`	This message is displayed during the execution of a print engine self-test. When this test is complete, the printer returns to the ready state, but remains off line.
`16 TONER LOW`	The toner cartridge is almost empty. Replace the Toner Cartridge. Although you can continue to print for a short while, make sure that the print quality does not degrade past the acceptable level. If the problem continues, refer to "`16 TONER LOW`" Message" section.

*Press `Go` on the LJ5.

Table 7-1   Printer Messages (continued)

Message	Symptoms and Recommendations
18 AUX IO INIT	This message is displayed when the MIO (AUX IO) card is in the process of initializing. During initialization the MIO is not active, but since the printer supports I/O switching, the printer remains on line and this becomes a status message. Display clears automatically (this may take up to a minute, depending upon the card).
18 AUX IO NT RDY	The MIO (AUX IO) card is not ready. See the user's manual for the MIO card. The serial and Bi-Tronics parallel ports continue to operate normally. To clear the display, you must remove the card, and power-cycle the printer. The `Continue`* key does not clear the display.
18 MIO INIT	The MIO card is initializing. This is a status message. During initialization the MIO is not active, but since the printer supports I/O switching, the printer remains on line. Displays clears automatically (may take up to a minute, depending on the card).
18 MIO NOT READY	The MIO card is not ready or not connected to a working network. The serial and Bi-Tronics parallel ports will continue to operate normally. To clear the display, switch the printer OFF, remove the card and switch printer ON. `Continue`* will not clear the display. See MIO documentation for troubleshooting.
20 MEM OVERFLOW 20 INSUFFICIENT MEMORY	Indicates a memory overflow. Too much data is being sent to the printer and the printer has run out of memory. Pressing the `Continue`* key causes the printer to print only the information it received. If the error persists, it may be necessary to *simplify* the print job (such as fewer fonts and less graphics information), or have the customer purchase additional memory.
21 PRINT OVERRUN 21 PAGE TOO COMPLEX	Indicates that the information being sent to the printer is too complex for the printer (the formatting capabilities of the printer cannot keep up with the formatting instructions being sent to it by the computer). If the error persists, it may be necessary to *simplify* the job (reduce the number of characters, number of fonts used, number of pixels addressed, cursor repositions, or reduce addressing the same pixel location multiple times). This problem can also be resolved by adding at least one additional memory PCA, and setting PAGEPROTECT=[LTR, LGL, or A4], if applicable.

*Press `Go` on the LJ5.

Table 7-1   Printer Messages (continued)

Message	Symptoms and Recommendations

`22 ERROR`
 	
`22 SERIAL I/O ERROR`
 	
`22 PARALLEL I/O ERROR`
 	
`22 HP MIO ERROR`
	For serial/Bi-Tronics parallel configuration, the computer and printer are not communicating because of improper signal protocols. This is an I/O buffer overrun error.
	
	Parallel configuration: may mean a loose cable connection. Serial configuration: wrong pacing option may be selected. (If you are using an RS232 serial connection, the HP LaserJet printer uses XON/XOFF and DTR signal protocols rather than ENC/ACK protocol.) Press Continue * to clear the error message (data is lost).

`40 ERROR`
 	
`40 BAD SERIAL DATA FORMAT`
 	
`40 HP MIO ERROR`
	The printer encountered an error while transferring data from the computer. For serial I/O configuration, the error may have occurred because you turned ON or OFF your computer while the printer was on line, or your printer's baud rate or parity was not the same as the computer's. For network MIO cards, this means there was an abnormal connection break. Make sure the printer is set at the same baud rate as the computer. Press Continue * to clear the error message. For network MIO cards, see the user's manual for your card.

`41.[X] ERROR`
`41.x PRINTER ERROR`
`x=1, 2, 4 ,5`
	A temporary error occurred while printing. Press the Continue * key to clear the error. If the error persists, refer to `41.X ERROR` Message."

`41.3 ERROR` `41.3 UNEXPECTED PAPER SIZE`	The paper size selection knob or MP paper size does not match the installed paper or more than one sheet of paper was picked up.
`50 SERVICE` `50 FUSER ERROR`	Power OFF the printer for a minimum of 10 minutes. If the problem continues, refer to the "`50 SERVICE` error" section.

`51 ERROR`
 	
`51 PRINTER ERROR`
	Indicates loss of laser beam for over 2 seconds. Press Continue * to clear this error. If the error persists, refer to the "`51 ERROR` Message" section.

`52 ERROR`
 	
`52 PRINTER ERROR`
	Indicates scanner motor is unable to maintain the proper speed. Press Continue* to clear this error. If the error persists, refer to the "`52 ERROR` Scanner Malfunction" section.

*Press Go on the LJ5.

Table 7-1   Printer Messages (continued)

Message	Symptoms and Recommendations
`53.XY.ZZ ERROR`	An error occurred during configuration and validation of SIMM memory: **X Hardware Type:** 0:ROM 1:RAM 2:Flash **Y Hardware Device:** 0: Internal Memory 1: SIMM Slot 1 2: SIMM Slot 2 3: SIMM Slot 3 4: SIMM Slot 4 **ZZ Error Number**: 0: Unsupported Memory 1: Unrecognized Memory 2: Unsupported Memory Size 3: Failed RAM Test 4: Exceeded Maximum RAM Size 5: Exceeded Maximum ROM Size 6: Invalid SIMM Speed 7: SIMM Reporting Information Incorrectly 8: SIMM RAM Parity Error **LaserJet 4/4m only** 9: SIMM ROM Needs To Be Mapped To An Unsupported Address 10:SIMM Address Conflict 11:PDC XROM out of bounds 12:Could not make a temporary mapping Replace the SIMM device that caused the error. Pressing `Continue` * allows you to continue but the SIMM device that caused the error is not configured. If the SIMM device has more than one bank of memory, the good banks are configured.

*Press `Go` on the LJ5.

Note   Refer to the "Product Family Compatibility Matrix" in Chapter 1, or for the LaserJet 5, Appendix B to verify correct memory for the printer.

Table 7-1 Printer Messages (continued)

Message	Symptoms and Recommendations
`55 ERROR` `55 PRINTER ERROR`	Indicates a communications problem between the DC Controller PCA and the Formatter PCA. Pressing **Continue** * clears the error and resumes printing. Perform the Test Print operation to verify DC Controller functionality. If the message persists, check for any cable damage, and check the DC voltages, or replace the DC Controller.

`57 SERVICE`
 	
`57 MOTOR FAILURE`
 	
`57.1 SERVICE`
	This message indicates that a main motor failure occurred. Power cycle the printer. If the error persists, first check the connections at the main motor and DC Controller, then replace the main motor to clear the error. See "`57` (or `57.1`) `SERVICE` message.

`58 SERVICE`
`58 FAN MOTOR FAILURE`
`57.2 SERVICE`
	This errors indicates the DC Controller detects an exhaust fan failure in either the printer or the optional duplexer. See the "`58` (or `57.2`) `SERVICE`" section for more information.

`61.[x] SERVICE` `X=0 - 4`	Printer encountered a parity error when accessing the RAM memory SIMM in slot "X". If X=0, the faulty SIMM slot was not detected. Turn OFF the printer, then back ON. (Data stored in printer is lost.) If the error is still present, Turn OFF the printer and verify that the indicated SIMM is correctly installed. Turn ON the printer . If the error is still present, turn OFF the printer, and remove the SIMM board. Turn ON the printer. If the error message does not appear, the problem is on the SIMM board; if the error still appears, the problem is in the printer's internal memory.
`62.[x] SERVICE` `x=0 - 5`	Printer identified a problem while checking its memory. "X" refers to the device the printer was checking when it encountered the error. 0: Internal Memory 1-4: SIMM Slot 5: Cartridge If the printer contains a SIMM memory board, turn OFF the printer. (Data stored in printer is lost.) Verify that the SIMM is installed correctly, and turn ON the printer. If the error is still present, turn OFF the printer, and remove the SIMM board. Turn ON the printer. If the error message does not appear, the problem is on the SIMM board.

`63 SERVICE`
 	
`63 NEEDS SERVICE`
	The printer found a problem in its internal RAM memory. Switch OFF the printer, and then switch ON. (You lose any data stored in the printer.) If the problem persists, replace the Formatter PCA.

*Press **Go** on the LJ5.

Table 7-1   Printer Messages (continued)

Message	Symptoms and Recommendations
64 SERVICE 64 PRINTER ERROR 65 SERVICE 67 SERVICE	The printer identified an internal service error. If this error appears, turn the printer OFF, and then back ON. If the problem persists, replace the Formatter PCA.
68 ERROR 68 NVRAM ERROR	The printer detected an error in the nonvolatile memory (NVRAM). Press `Continue` *, then check your Control Panel settings. If the problem persists, replace the Formatter PCA.
68 SERVICE 68 NVRAM FULL	The printer's nonvolatile memory is full because new feature sets were installed. Power the printer OFF, then back ON. If the problem persists reinitialize the NVRAM by pressing the `Item` ** key while powering on the printer. Reset the page count, cold reset paper size, display language, and all other applicable control panel settings.
70 SERVICE HP LJ 4+/4M+ Only	A firmware SIMM problem was identified. Remove or replace the firmware SIMM.
71 SERVICE HP LJ 4+/4M+ Only	A firmware SIMM problem was identified. Remove or replace the firmware SIMM.
79 SERVICE [xxxx]	An internal controller error has occurred. Power the printer OFF, then back ON. If this error persists, replace the Formatter PCA. Remove third party memory, if installed. May also be caused by driver or application incompatibilities, or defective toner cartridge.
80 SERVICE [xxxx]	The formatter PCA has been informed of an irrecoverable error by the MIO card. Power cycle the printer. If the error persists, replace the MIO card.
81 SERVICE [xxx]	Formatter manufacturing error. Cold Reset the printer. If the problem persists, replace the Formatter PCA.
EE LOAD [envelope size] ENVELOPE FEEDER [envelope size]	The printer received a request for an envelope size that is not loaded currently in the optional envelope feeder, or the feeder is empty. *Envelope size* may be: COM10, MONARCH, or DL, C5, B5, or ENVELOPE. Load the correct envelope size into the tray, or press `Continue` * to use the size of media installed in the feeder.
FE CARTRIDGE	An accessory cartridge was removed or replaced while the printer was on line. (This message appears even if the cartridge was not used.) Power cycle the printer to clear this message. Ensure that the printer is off line when the cartridge is removed or installed. If a font cartridge is not recognized, verify that it is installed correctly.
FI INSERT CART	An accessory cartridge was removed while the printer was in an error state. To clear this message, insert the cartridge, clear any error conditions, then remove the cartridge.

*Press `Go` on the LJ5.   **Press `Job Cancel` on the LJ5.

Table 7-1   Printer Messages (continued)

Message	Symptoms and Recommendations
FR REMOVE CART	An accessory cartridge was installed while the printer was in an error state. To clear this message, remove the cartridge, clear the pending error condition, then install the cartridge.
ME FEED [envelope size] MANUALLY FEED [envelope size]	This message is displayed when there is a request for a manually fed envelope. *envelope size* may be: COM10, MONARCH, DL, C5, B5, or ENVELOPE. Insert the appropriate envelope size into the MP tray (Tray 1), and press On Line * to print.
MF FEED [paper size] MANUALLY FEED [paper size]	This message is displayed when there is a request for manually fed media. *Paper size* may be: LETTER, LEGAL, EXEC, or A4. Insert the appropriate media size into the MP tray, and press On Line * to print, or press Continue * to feed from the Paper Cassette (Tray 2).
PC INSTALL INSTALL TRAY 2	The printer currently has the Lower Cassette or duplexer selected as the paper source, and has detected that the Paper Cassette (Tray 2), which serves as a paper guide for the Lower Cassette, is not installed. Install (reseat) the Paper Cassette.
xx LOAD [paper size or envelope size] TRAY x LOAD [size] ENVELOPE FEEDER [envelope size]	The printer received a request for a paper or envelope size not available in the printer. The xx is MP (Multi-Purpose), PC (Paper Cassette), or LC (Lower cassette). *Paper size* may be: LETTER, LEGAL, EXEC, or A4; for MP tray, *envelope sizes* may be COM10, MONARCH, DL, C5, or B5. Load the correct paper tray and/or media, or press Continue * to use the media in the installed tray(s). The printer continues automatically. If the problem persists, refer to page 7-13.

*Press Go on the LJ5.

Clearable Warnings

A clearable warning indicates a transient condition in the printer. The printer continues on line while the message is displayed in place of `00 READY`. A clearable warning appears each time the printer alters resolution or page protection (this causes reconfiguration of memory), or aborts a job due to an invalid or uninstalled personality, or insufficient memory. Clear the message by pressing `Shift` + `Continue` (or `Go` for the LaserJet 5).

Table 7-2   Clearable Warning Messages

Message Displayed	Meaning

`W1 IMAGE ADAPT`
 	
`MEMORY LOW, PAGE`
`SIMPLIFIED`
	The printer received a graphics print file that was too complex to print at the requested resolution. The printer automatically processed the file in the highest resolution possible with the memory installed. Add additional memory to print the file at full resolution. Check the printout for loss of data or print quality.

`W2 INVALID PERS`
 	
`REQUESTED LANGUAGE`
`NOT AVAILABLE`
	The job was not printed because the requested personality, such as PostScript, was not installed. Install the language in which the files are sent, together with enough memory to support that language.

`W3 JOB ABORTED`
`INSUFFICIENT MEMORY`
`JOB CLEARED`
	The printer was forced to abort the print job because there was not enough installed memory to support the printer language used.

`W4 JOB 300/OFF`
`W5 JOB 300/LTR`
`W6 JOB 300/A4`
`W7 JOB 300/LGL`
	The job was printed at 300 dpi with page protection set as specified in the message. To print the job as requested, install additional memory.

`W8 JOB 600/OFF`
`W9 JOB 600/LTR`
`W0 JOB 600/A4`
	The job was printed at 600 dpi with page protection set as specified in the message. To print the job as requested, install additional memory.

`WM MEM CNFIG N/A`
 	
`MEMORY SETTINGS`
`CHANGED`
	The printer did not have enough memory when switched on to support the previous settings for I/O buffering and /or Resource Saving, probably because you removed a memory SIMM, added a new personality SIMM, or added the optional duplex unit.

`WM CHK MEM CNFIG`
 	
`MEMORY SETTINGS`
`CHANGED`
	I/O Buffering and /or Resource Saving settings were altered when the printer was switched on because the printer did not have enough memory. This usually occurs after memory has been removed from the printer. (You can check settings by printing a self test.)

`WM [personality]`
`MEM FULL`
 	
`[personality]`
`MEMORY FULL`
	The Resource Saving memory area for the specified personality is full. Press **CONTINUE*** to continue printing (some data will be lost). The current job will print, but some resources (downloaded fonts, etc.) may not be saved. If this error occurs frequently, you may need to adjust Resource Saving settings.

*Press **Go** on the LJ5.

Printer Message Troubleshooting Procedures

When the following procedures require removing and replacing an assembly or PCA, refer to the applicable section in Chapter 6 for instructions.

Blank Display

Table 7-3   Blank Display

Checks	Action
Is the power on?	1. Check the ON/OFF switch and verify the power is plugged in. 2. Press a Control Panel key to verify problem still exists.
Is the fan working?	1. If the fan is working, check the cabling to the Control Panel. If the cabling is good, replace the Formatter first, then the Control Panel. 2. If the fan is NOT working, measure the DC voltage levels (refer to Table 7-39). If the voltage levels are good from the power supply to the DC Controller and the fan is not working, replace the DC Controller. If the voltage levels are not present at TB1, replace the DC Power Supply.

MP/PC/LC (Tray 1/2/3) LOAD Message

The conditions that result in `MP/PC/LC LOAD` or (`TRAY 1/2/3`) messages are:

- The absence of any input tray.
- The absence of media in either tray.
- The tray size switches may be defective and not recognize the presence of the paper tray. The tray is sensed as the tray-identifier tabs contact one or more of the three tray identifier microswitches.
- The Universal Tray paper size dial setting does not match the installed paper.

The `MP/PC/LC LOAD` message is also generated when the user or software requests a paper size other than that installed.

The Paper Sensing Arms are located in the paper input areas of the printer. During normal operation, the Paper Sensing Arm flags rest on the media installed in the paper tray. The Sensing Arm flags are attached to shafts. The opposite end of the shaft is a photointerrupter that rotates through the sensors on the Paper Control PCA. These sensors are:

- PS4 Paper out-MP tray.
- PS2 Paper out-PC tray.
- PS6 Paper out-Lower Cassette.
- PS7 Paper out-Envelope Feeder.

The presence of paper in the paper tray is sensed by the paper sensor arm. When paper is in the cassette, the sensor arm rests on top of the paper in the tray. At this point, the sensors are not blocked. When the tray is empty, the arm swings through its travel. The photointerrupter attached to the paper sensor arm shaft rotates and blocks the sensor diode.

Table 7-4 "MP/PC/LC (Tray 1/2/3) LOAD" Message Checks

Checks	Action
Is media present in the tray(s).	Install media.
Are the proper trays fully inserted in the printer?	Reseat the cassettes. Make sure each cassette is fully seated into the printer. Ensure that the Universal Paper tray selector knob setting matches the installed paper.
Does the Control Panel's or application's Paper size setting match the tray being used?	Correct the setting to match tray.
Is the expected tray size being recognized by the printer?	Ensure that the image is sized correctly (formatted) for the paper size selected. Proceed to the following cassette size switches functional check. Check switches 603/4/5 if feeding from the PC tray (Tray 1). Check switches 851/2/3 if feeding from the Lower Cassette. see Figures 7-14 and 7-15 for locations.)
Are any of the tray identifier tabs broken on either PC (Tray 1) or LC (Tray 2) paper tray?	Inspect the tray for damage. If damaged, replace the tray.

Cassette Size Switches (SW603, SW604, SW605) Functional Check

Before beginning this test, remove the Lower Cassette Base and the Envelope Feeder. Also, PS2 (PC or Tray 2 Paper Out sensor) must be engaged for this test to be performed reliably. Push PS2 up towards the rear of the printer with your hand.

1. Power ON the printer with the PC tray removed. Wait for the PC LOAD XXX message. Set PAPER=LETTER in the Printing Menu using the Control Panel.

2. With PS2 engaged, press and hold the lower and upper paper size switches (refer to Table 7-5). The display should read 00 READY. If the display does not change, the switches are defective. Inspect the switch activating mechanism and/or replace the Paper Control PCA.

3. Repeat the test, this time setting the paper size to legal (PAPER=LEGAL) and pressing the top two switches. If the printer responds with 00 READY, all three switches have been tested and verified.

N o t e   The LaserJet 5 printer will require you to set the paper size, followed by a self test to generate the equivalent TRAY 2 LOAD message. Use the Job Cancel key between tests to cancel the Self Test printout.
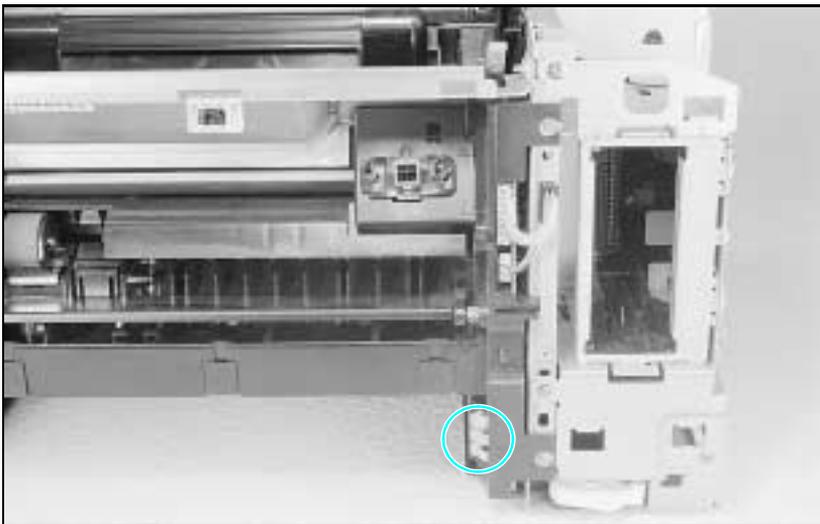

Figure 7-1   PC Tray Size Sensing Microswitches Location

Table 7-5   Switch Logic for Cassette Size

Cassette	Cassette Size Sensing Switch		
	SW603/851 Upper	SW604/852 Middle	SW605/853 Lower
Legal	ON	ON	OFF
Letter	ON	OFF	ON
A4	OFF	OFF	ON
Executive	OFF	ON	ON
No Cassette	OFF	OFF	OFF

Paper Size Sensing Lower Cassette

The operator must set the appropriate paper size for the Lower Cassette using a dial which, in turn, activates switches on the cassette base. This setting is sent to the DC Controller on the serial data bus (SLI). The printer posts a `41.3 SERVICE` error if the media is different from that selected with the switch.

To verify proper operation of the LC (Tray 3) switches, lock out the MP (Tray 1) and PC (Tray 2) trays (in the Config Menu) and perform the same test with Lower Cassette switches as was done for the PC tray (Tray 2) switches.

PC Empty Sensor (PS2) Functional Check

1 Power on the printer with the PC tray (Tray 2) empty.

2 After the `05 SELF TEST` and the `02 WARMING UP` cycles, the `PC LOAD LETTER` (or `A4`) or `TRAY 2 EMPTY` message appears.

3 Add paper to the PC tray and re-install the tray.

4 The display should read `02 WARMING UP`, then `00 READY`. If the `PC LOAD` or `TRAY 2 EMPTY` message persists, replace PS2.

PS4 Check (MP Tray Empty Sensor)

1 With the printer powered ON and `00 READY` displayed, select the Config Menu from the Control Panel.

2 Configure the MP Tray (Tray 1) as a cassette (`MP TRAY=CASS or TRAY 1=CASSETTE`).

3 Lock out the remaining paper trays (`LOCK= PC LC or LOCK TRAY= 2 3`).

4 Remove any paper from the MP Tray (Tray 1). The printer should display an `MP LOAD [paper size]` message. For the LaserJet 5 printer, run a Self Test to generate the `TRAY 1 LOAD` message.

5 Insert paper into the MP Tray (Tray 1). If the `MP LOAD (TRAY 1 LOAD)` message persists (or if the load message never occurred), PS4 or the sensor flag is defective.

12 Printer Open Message

The `12 PRINTER OPEN` (or `CLOSE PRINTER COVER`) display tells the operator to close the printer's top cover. The DC Controller detects the Printer Open condition through the position of SW601, which is located on the Paper Feed Assembly PCA . A tab underneath the top cover Door engages SW601 through a slot in the Top Cover Assembly.

In addition to signaling that the top cover is open, SW601 enables the +24B VDC which controls the high voltage for the printing processes, and the AC Voltage for the Fuser Assembly.

Table 7-6   12 PRINTER OPEN Checks

Checks	Action
Is the Top Cover Assembly open?	Ensure the Top Cover Assembly is firmly closed, and that the protrusion that engages the switch actuator is not broken.
With the top cover open, check that the switch actuator does engage the switch.	Use a slim object to manually engage SW601. Listen for a definite "click" as the switch is engaged (see Figures 7-2 and 7-14).
Has the Paper Control PCA on the Paper Feed Assembly been replaced?	SW601 has an actuator that can be deleted during reassembly. Ensure that this actuator is installed correctly.
Is the DC Controller PCA defective?	Measure the 24 VDC on J201, pins 8 and 9 on the DC Controller (see Figures 7-16 and 7-17 for locations). If this 24 volts toggles as SW601 is activated, replace the DC Controller. If it does not, replace the Paper Control PCA or the cable. Also check J201-6 (DOPEN). This voltage should be 5 VDC when the printer is open, and 0 when the printer is closed. If not, replace the DC Controller PCA.

SW601 Functional Check

1 Open the Top Cover Assembly.

2 The message `12 PRINTER OPEN` (**or** `CLOSE PRINTER COVER`) should appear.

3 Close the top cover. The `02 WARMING UP` message should appear.

4 If the messages do not occur, check the switch actuator (see Figure 7-2, callout 1) on the top cover, and check that the plunger that covers the switch is in place (see also Figure 7-14 for switch locations).
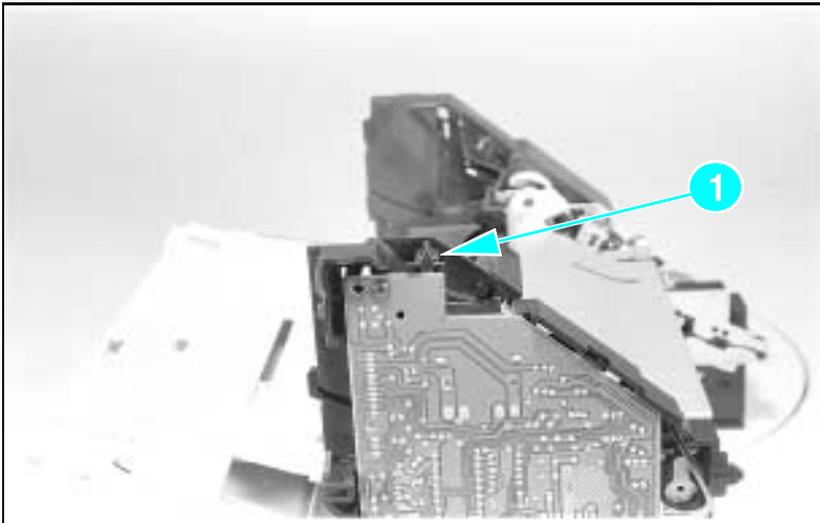
5 Replace the Paper Control PCA.

Figure 7-2   Location of the Top Cover Closed (SW601) Actuator

13 PAPER JAM Message

Paper jams occur when paper fails to arrive at or clear the paper path sensors in the allotted time. Paper movement is monitored primarily by two paper sensors. These are described below and illustrated in Figure 7-3).

1 PS1, the Input/Registration Sensor, located in the Paper Feed Assembly.
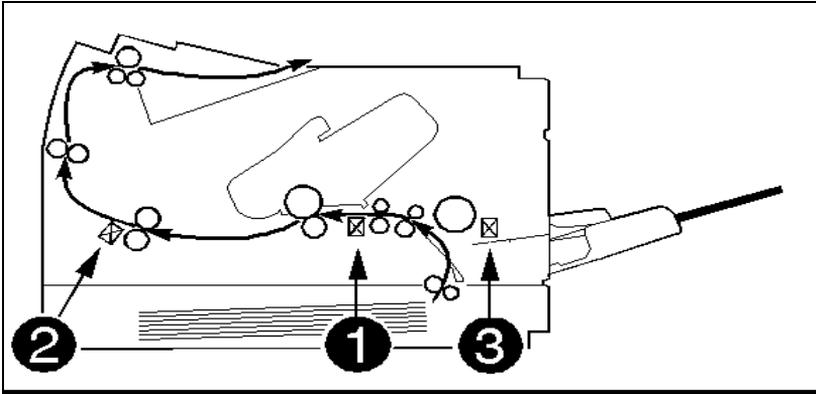2 PS3, Exit Sensor, monitors paper in the Fuser Assembly.

Figure 7-3   PS1 and PS3 (Paper Path Sensors) & PS5 Paper End Sensor

When troubleshooting paper jams, the door associated with the sensor must be opened and closed to clear the jam message. For instance, if PS3 (Exit Sensor) detected the paper jam, and the jam was cleared through a method other than opening the rear door, the message remains in the display until the rear door is opened and closed. Likewise, the top cover must be opened before a jam detected by PS1 is cleared.

The DC Controller monitors these sensors, and detects both the leading and trailing edge of the paper to verify that the paper clears the sensors in the allotted time. If the paper does not arrive at, or clear the sensors in the allotted time, the DC Controller senses a paper jam. The paper jam information is transferred to the Formatter PCA, which displays the `13 PAPER JAM` message.

Note also that if PS5 (MP Tray or Tray 1) Paper End Sensor on the Sensor PCA is bad (Figure 7-3, item 3), a paper jam will be reported when paper is fed from the MP Tray (or Tray 1).

Table 7-7   Paper Jam Troubleshooting Checklist

Jam Location	Checks and Action Required
Input Area Jams (Sensed by PS1.)	1. Check that the Transfer Roller is fully seated and shows no sign of wear. 2. Check that the Toner Cartridge is fully seated. 3. Check that the cassettes are not overfull and the media is loaded correctly. 4. Ensure that the media meets specs. (media is not too smooth or rough), and it has been stored properly. 5. Ensure that the paper tray is fully seated (especially if printing from the Lower Cassette). 6. Ensure that the spring force of the Lower Cassette is set correctly.
Registration Area Jams (Sensed by PS1.)	1. If paper is damaged at the Registration Sensor (PS1), check that the Transfer Charge Roller is properly seated.
Lower Cassette Paper Jams (Sensed by PS1.)	1. The LC Tray (Tray 3) is not fully seated into the printer. Seat the LC Tray firmly into the printer. 2. The Lower Cassette feed pressure (spring force) adjustment is incorrect. Set the spring force as shown in Chapter 3.
Fuser Assembly Jams (Sensed by PS3.)	1. Check that the Fuser Pressure Roller Levers are down (LJ4 and 4 Plus Only). 2. Check that the Exit Sensor Arm (PS3) is free throughout its travel and that the Exit Sensor Arm is installed correctly.
False Paper Jams Paper Jam occurs when the last sheet of paper is fed from the tray.	1. PS1, PS3, or PS5 are damaged or mechanically broken. 2. The sensor wires are damaged or disconnected. 3. The rear door is open. 4. Paper out sensors in the paper tray or envelope feeder may be defective, or the sensor flags may be broken or missing. PS2 is the sensor for the PC Tray (Tray 2), PS4 is the sensor for the MP Tray (Tray 1), PS6 is the sensor for the LC Tray (Tray 3), and PS7 is the sensor for the Envelope Feeder.

PS1 (Input/Registration Sensor) Check

1 Power ON the printer *with the top cover open*. Wait for the `12 PRINTER OPEN` (or `CLOSE PRINTER COVER`) message.

2 Engage PS1 by taping it down.

  a For the LaserJet 5, install the toner cartridge.

3 Close the top cover. The `02 WARMING UP` message should display.

4 After the fuser warms up, the main motor should turn on.

5 The `13 PAPER JAM` message appears if the sensor is working correctly.

6 If the `13 PAPER JAM` message does not appear, check that PS1 was fully engaged, then replace PS1.

7 Remove the tape from PS1, install the Toner Cartridge and close the top cover.

8 The display should change from `02 WARMING UP` to `00 READY`. If the `13 PAPER JAM` message persists, replace PS1.
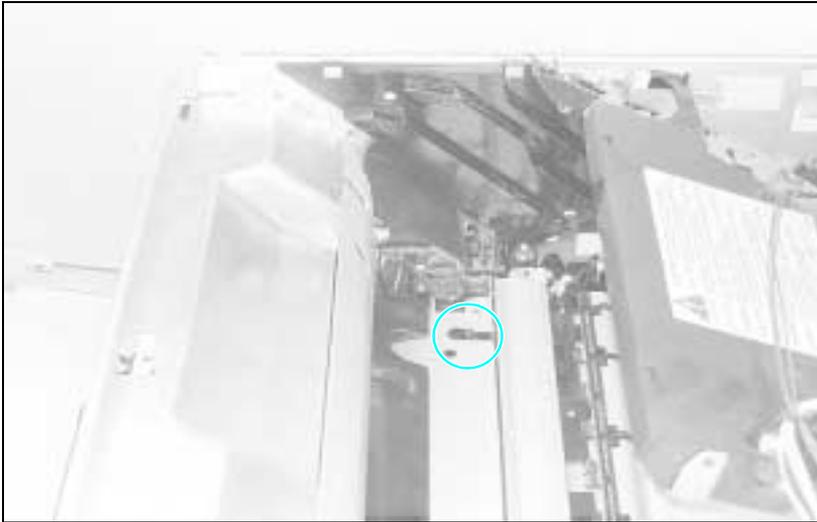

Figure 7-4   PS1 Input/Registration Sensor

PS3 (Exit Sensor) Check

1 Open the rear door (cover) of the printer.

2 The display should read 13 PAPER JAM (or REMOVE PAPER JAM) immediately after the door is opened.

3 Close the rear cover. The display should change from 02 WARMING UP to 00 READY.

    a If the 00 READY message does not appear, check that the rear door is not damaged, and the the door closes and latches properly.

    b If the PAPER JAM message does not appear, replace PS3.

Pickup Motor Functional Test (M2)

There is not a good method with which to access the test points around the Pickup Motor (M2) circuit. Therefore, when troubleshooting Pickup Motor failures, perform the following in the order listed (see Figures 7-11 and 7-12 for component location).

1 Reseat J601 and J602 on the Paper Control PCA.

2 Reseat J201 on the DC Controller. Reseat J703 on the Sensor PCA.

3 Verify that the Paper Control PCA and the Sensor PCA are firmly seated into one another.

4 Replace the Pickup Motor.

5 Replace the Paper Control PCA.

6 Replace the Sensor PCA.

Lower Cassette Functional Check

When troubleshooting a Lower Cassette failure, always prove the failure by removing the Lower Cassette from the printer. Next, test the printer's ability to move and print media satisfactorily without the Lower Cassette installed.

The Lower Cassette is a field-serviceable item. The procedures for removing and replacing the Lower Cassette components are in Chapter 6. Replacement parts for the Lower Cassette Assembly are listed in Chapter 8.

After the failure has been associated with the Lower Cassette Assembly, perform the following in the order given. Test the repair after each replacement.

1 Reseat all connectors in Lower Cassette.
2 Replace the Lower Cassette Pickup Motor.
3 Replace the Paper Control PCA.
4 Replace the DC Controller.

14 NO EP CART Message

The printer detects the presence of the Toner Cartridge and the level of toner present in the cartridge through the condition of the ANTIN signal. The ANTIN signal becomes part of the serial data stream used to communicate with the DC Controller (see Figure 7-5 for cartridge components). Troubleshoot the `14 NO EP CART` (or INSTALL TONER CARTRIDGE) message as follows:

1 Reseat the Toner Cartridge. Try a new or known good Toner Cartridge.
2 Check the High Voltage Contacts for damage. If the contacts are dirty or damaged, clean the contacts after the repair.
3 Replace the High Voltage Power Supply.
4 Check and reseat the HVPS cable.
5 Replace the DC Controller.

16 Toner Low Message

The `TONER LOW` message results as the level of toner in the cartridge cavity falls past the minimum level. The level is sensed by a mechanism similar to an antenna, which detects the AC Developer Bias Voltage applied to the developer mixture. If the `TONER LOW` message cannot be cleared by shaking or replacing the Toner Cartridge, perform the steps listed for troubleshooting the `14 NO EP CART` message.
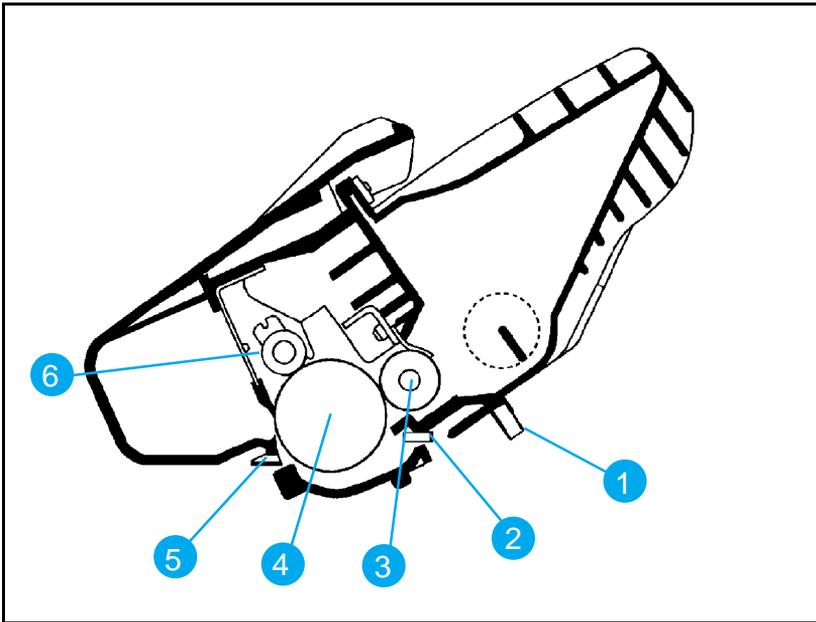
Figure 7-5   **Toner Cartridge Components**

Table 7-8   Toner Cartridge Components

Callout	Assembly
1	Toner Low Voltage Contact
2	Developer Roller High Voltage Contact
3	Developer Roller
4	Photoconductive Drum
5	Charge Roller High Voltage Contact
6	Charge Roller

41.X ERROR Message

A `41.X ERROR` (misprint) indicates that a *temporary* malfunction has occurred with the print engine (NOT a Formatter error). Occasional occurrences of this message can be expected. However, persistent `41 ERROR` messages indicate a problem requiring attention.

The `41.X ERROR` is usually accompanied by a blank, or partially printed page. Pressing the `Continue` (or `Go`) key re-prints the page, and continues the print job.

A `41 ERROR` occurs due to the following conditions:

- Incorrect Universal Tray Switch setting. Set the Universal Tray and the Lower Cassette Tray paper size as shown in Chapter 3.
- Wrong size paper in tray. Check that the Universal Tray, and/or the Lower Cassette settings match the installed paper.
- An unstable or temporary loss of the Beam Detect pulse. This problem normally is accompanied by a partially printed page, often with thin horizontal black lines, deformed characters, or solid black areas. Loss of the Beam Detect pulse for more than 2 seconds results in a `51 ERROR` condition.
- Paper reaching the Input Paper Sensor (PS1) before it is expected. This is accompanied by a blank page. This normally is due to paper feed problems.

  Proceed as directed in the following table.

Table 7-9   41.X ERROR Checks

Error Message	Recommended Action
`41.1 ERROR` Noisy Vertical Sync (VS)	Reseat all connectors on the DC Controller, the Laser Drive PCA, the Scanner Connector and the Beam Detect Connector.
`41.2 ERROR` Beam Detect (BD) weak or unstable.	Reseat all connectors on the DC Controller. Also check the Laser Scanning Assembly connections.
`41.3 ERROR` Paper Multifeed	1. Incorrect size selection on the cassette. 2. One of the cassettes is overfull. Remove the extra paper from the overfull cassette. 3. Check the paper for edge damage. Improperly cut edges can lock together causing multi-feeds. 4. Check that the pickup rollers and separation pad are not worn. Replace the rollers and pad as a set if necessary. Ensure that the corners of the paper are tucked in the tray's retainers. 5. Check the paper tension adjustment on the optional Lower Cassette, if attached. Refer to procedure in Chapter 3.
`41.4 ERROR` Vertical Sync Late (VS) Signal	Reseat the DC Controller and Formatter PCA Connections.
`41.5 ERROR` Undetermined Cause	Reseat the DC Controller and Formatter PCA connections.

See Figures 7-11 through 7-17 for connector locations.

50 SERVICE Error - Fuser Malfunction

Warning   The Fuser Assembly is HOT. Allow the assembly
time to cool before servicing.

The purpose of the fusing system is to maintain a constant
temperature on the fuser roller. A high intensity fusing lamp,
located inside the fuser roller, provides the high temperature
required for the fusing process. While the printer is in standby
mode, a temperature of approximately 172° C is maintained on
the fuser roller. While the printer is in printing mode, a
temperature of around 183° C is maintained.

The main components of the Fuser Assembly are the fusing lamp
and its associated fusing and pressure rollers, a thermistor,
thermoprotector, and the AC controller/safety circuitry in the AC
Power Supply. The fusing lamp is a specially designed 460 watt
(220V), or 500 watt (115V) halogen lamp that operates at line
voltage. The thermistor is a resistor whose value changes with
temperature. At room temperature the resistance value of the
thermistor should be between 180k ohms and 280k ohms.The
thermoprotector is a switch designed for over-temperature
protection, and opens when the temperature reaches 230° C. The
thermoprotector will not reset when the fuser cools. It may be
necessary to replace the thermoprotector or fuser assembly if the
thermoprotector opens.

The following conditions result in a fusing error:

1 Unable to maintain a temperature above approximately
  180° C.
2 A temperature above 230° C.
3 A condition wherein a temperature of 165° C is NOT reached
  within 90 seconds after power-up.

Note   If a `50 SERVICE` error message is displayed, turn
the printer OFF for at least 10 minutes. Failure
to wait the full 10 minutes before turning the
printer ON results in a continuation of the error
message and the shutting off of the fuser lamp
current during this time, though the source of the
error may have already been resolved.

Table 7-10 50 SERVICE Fuser Malfunction Checks

Checks	Action
Is the Fuser Assembly correctly seated?	Reseat the Fuser Assembly. Allow adequate time for the error message to clear (10 minutes) and turn the printer ON.
Is the Fuser Bulb/ Thermoswitch open?	The fuser bulb and thermoswitch are wired in series. To check if one or the other is defective, perform the following: 1. Remove the Fuser Assembly from the printer. 2. Use an ohmmeter and measure the continuity between pins (see Figure 7-6, callout 1). It should read about 2 ohms (about 4 ohms for the 220 volt fuser). If an open condition is detected, either the fusing bulb or the thermoswitch is defective. Replace the defective component (refer to Chapter 6) or replace the complete Fuser Assembly.
Is the Thermistor defective?	1. Remove the Fuser Assembly and let it cool to room temperature. 2. Use an ohmmeter and measure the resistance between pins (see Figure 7-6, callout 2) It should read about 220 K ohms +/- 40 K ohms at ambient room temperature. If the thermistor is either open or shorted, replace the thermistor (refer to Chapter 6) or the complete Fuser Assembly.

Does the error persist?	1. Verify all cabling is correct.
	
	2. Replace the following components in the order given:
	    Power Supply Assembly
	    DC Controller PCA

See Figure 7-11 for Fuser Assembly location and Chapter 6 for removal and replacement, as necessary.

Note   The 50 SERVICE error message can be cleared immediately by shorting the C202 leads on the HP LaserJet 4/4M (or the C205 leads on the HP LaserJet 4 Plus/4M Plus/5/5M/5N) on the DC Controller. Remove the Formatter PCA to access the DC Controller as shown in Chapter 6.
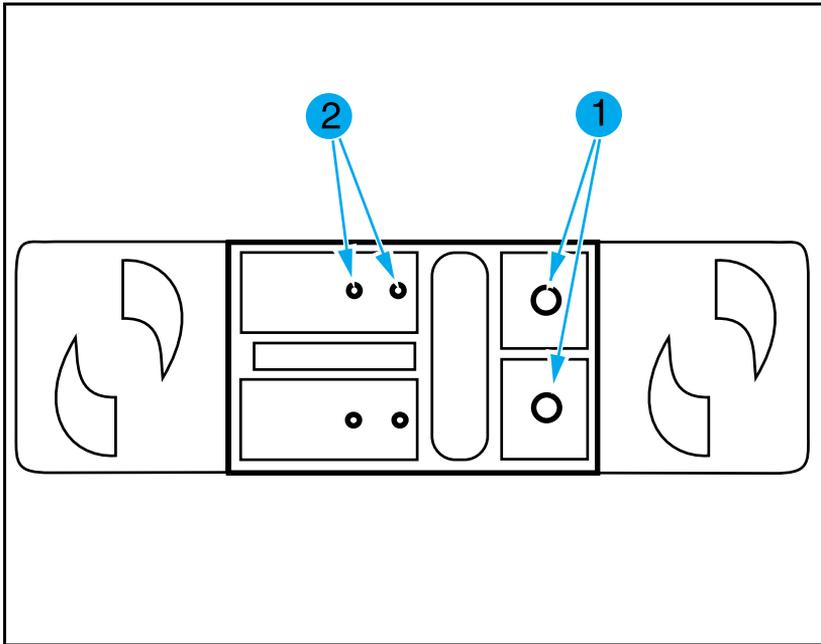
Figure 7-6   Fuser Assembly Connector

51 ERROR Message

The `51 ERROR`, and the `41.2 ERROR` are caused by Beam Detect
failures. If the beam detect signal is lost for more than 2 seconds
the error is posted as a `51 ERROR`. The `41.2 ERROR` can be cleared
by pressing **Continue** (or **Go**). The `51 ERROR` may be cleared by
power cycling the printer.

Table 7-11   51 ERROR Beam Detect Checks

Checks	Action
1. Are all connectors on the DC Controller properly seated?	Inspect connectors and wiring. Reseat or replace cables if necessary.
2. Is the Laser/Scanner Assembly Defective?	A defective Laser/Scanner Assembly can cause a `51 ERROR` by spinning the scanning mirror at the wrong speed. Replace the Laser/Scanner Assembly.
3. Is the DC Controller Defective?	Replace the DC Controller.
4. Has the printer been moved from a cold to a warm room?	Allow the printer to stand 6 hours until any condensation has dissipated.

52 ERROR Scanner Malfunction

The scanner motor is a flat, brushless, DC motor. Motor operation is completely controlled by the DC Controller.

The scanner motor is enabled when the printer is powered-up (during the printer's power-on self test), or whenever the PRINT command is received by the Formatter PCA. The scanner motor makes a distinctive sound when starting. The sound can be described as a "variable pitch whirring" sound. Listen for the sound of the scanner motor when troubleshooting the `52 ERROR`.

Laser/Scanner Assembly Functional Checks

Initiate a Self Test. As the test begins, listen for the sound of the scanner motor. If the motor cannot be heard, perform the following in the order given:

1 Check the Laser/Scanner and the Power Supply cables. Replace if necessary.
2 Replace the Laser/Scanner Assembly.
3 Replace the DC Controller.

57 (or 57.1) SERVICE Message (Main Motor Failure)

The `57 SERVICE` indicates that the DC Controller PCA detected a general motor failure. The Main Motor drives all moving components in the printing process. The Main Motor is a 4-phase, DC servo motor controlled by the DC Controller PCA.

The formatter detects a Main Motor failure when:

- The Main Motor does not come up to speed within one second of receiving drive voltage.
- The Main Motor deviates from the correct speed for one second after reaching the correct speed.

Main Motor Functional Checks

- Inspect the gear train for debris that would block the free operation of the gears.
- Check the gears in the Toner Cartridge for wear and binding.
- Reseat J211 (or J214 on the HP LaserJet 4 Plus/4M Plus) on the DC Controller PCA, and the main connector on the Main Motor Assembly. Refer to Figures 7-16 and 7-17 for the DC Controller PCA connector locations.
- If the problem persists, check that the +24B Voltage is present on the DC Controller. If the voltage is not present, replace the DC Controller. If the voltage is present, and the motor does not rotate, replace the Main Motor Assembly (see Figure 7-11 for location).

58 (or 57.2) SERVICE (Fan Failure)

The `58 SERVICE` indicates that the DC Controller detected a failure in the Exhaust Fan (FM1) in the printer or the optional duplexer. When troubleshooting this problem, perform the following steps in the order given.

1 Check that the fan is mounted correctly in its shroud.
2 Check that the fan blades are not blocked.
3 Check that the Cooling Fan connector is firmly seated on the DC Controller (see Figure 7-16 or Figure 7-17 for location).

If the above checks are satisfactory, replace the fan.

N o t e	Verify the direction of air flow. Air should blow out of the printer.

Image Defect Summary

The quality of the printer's output is subject to the judgment of the user. This section of the manual helps you define print quality defects, and understand what factors affect print quality.

The print samples shown in the following figures illustrate some print quality defects. Keep copies of print quality defects encountered in the field with an explanation of their causes for future reference.

The image defects listed below are covered in the following tables. (For major assembly, connector, and switch locations, see Figures 7-11 through 7-18 later in this chapter.)

- Black Pages.
- Any Faint Print Condition
- Faulty Registration
- Vertical White Streaks.
- Right-hand Image Missing.
- Small Print Voids
- Random Horizontal Black Lines
- Repetitive Defects.
- Smeared Print/Improper Fusing.
- Distorted Print.
- Black Pages with Horizontal White Strips.
- Image Skew.
- Improperly Sized Image.
- Vertical Dark Streaks.
- Large Print Voids.
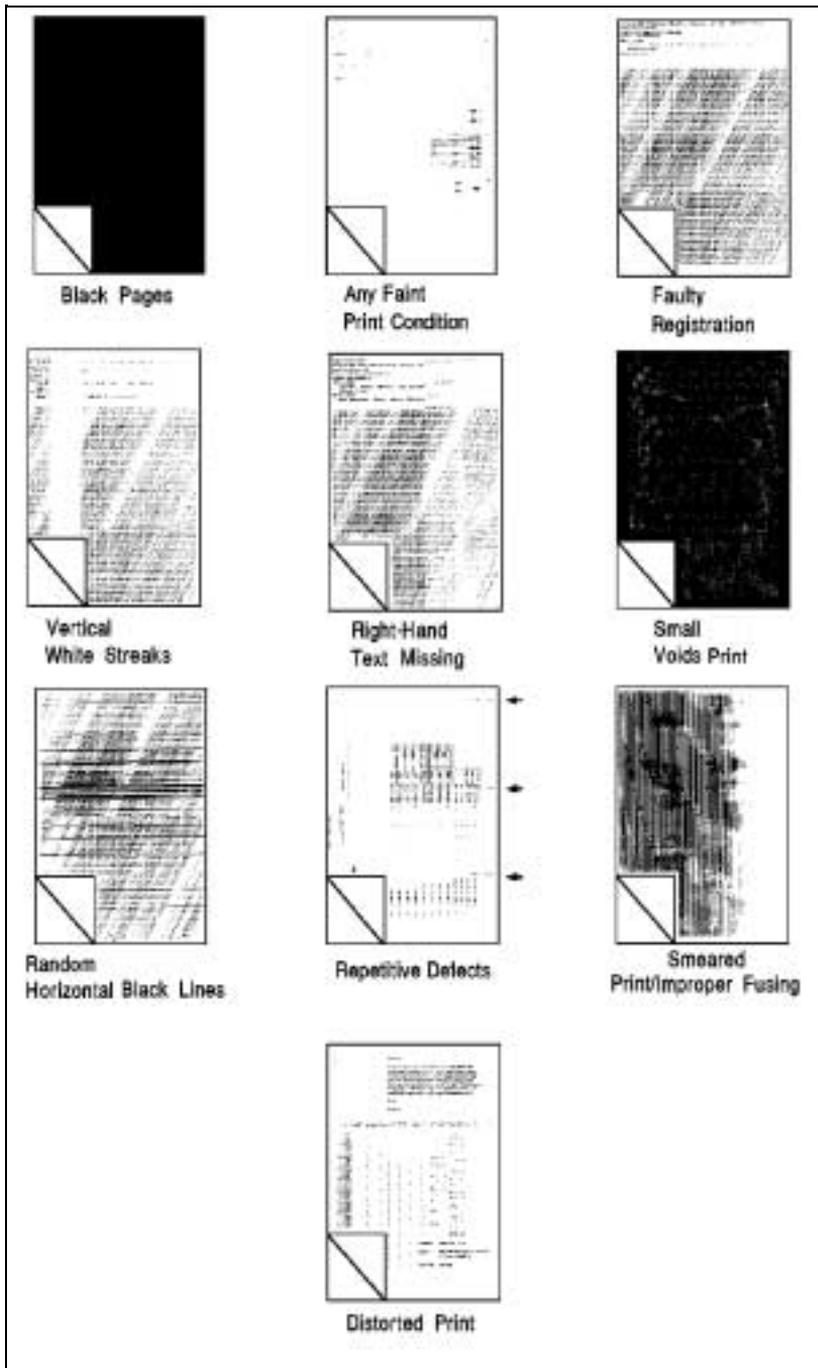- Background Scatter.
- White or Blank Pages.

Black Pages

Any Faint
Print Condition

Faulty
Registration

Vertical
White Streaks

Right-Hand
Text Missing

Small
Voids Print

Random
Horizontal Black Lines

Repetitive Defects

Smeared
Print/Improper Fusing

Distorted Print

Figure 7-7   Image Defect Summary
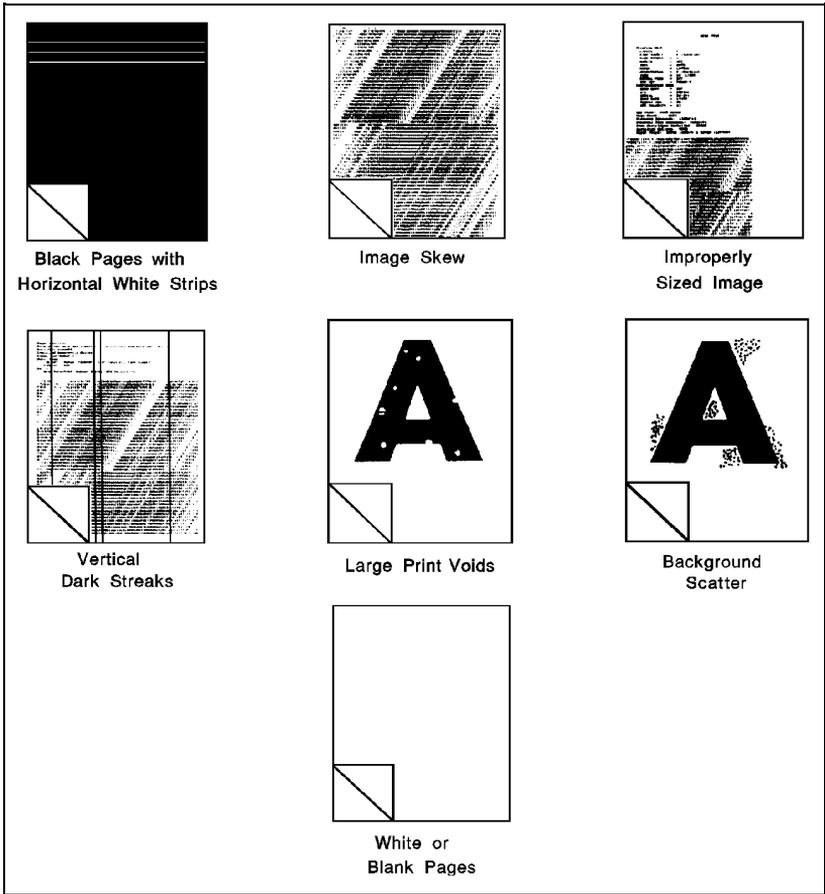
Figure 7-8 Image Defect Summary

Table 7-12   Black Pages

Possible Cause	Action
The HVPS connections are dirty.	Clean the HVPS terminals (see Figure 7-18 for layout).
The HVPS is installed improperly. If the HVPS has been removed and replaced, it may not be seated properly.	Remove the HVPS, and check the connectors for damage. Reseat the HVPS, being certain to fully seat the connectors.
Bad Primary Charging Roller.	Replace the Toner Cartridge.
The HVPS is defective.	Replace the HVPS.
DC Controller PCA. The laser drive circuitry is damaged so that the laser is always on.	Replace the DC Controller PCA, followed by the Formatter PCA if required.

Table 7-13   Any Faint Print Condition

Possible Cause	Action
Printer set to Economode.	Change driver and/or Control Panel settings to `ECONOMODE=OFF`.
Toner Cartridge.	Replace the Toner Cartridge.
Print density set improperly. The higher the print density setting, the more toner transferred to the drum.	Set the print density to a darker level. Replace the high voltage power supply if this has no effect.
The paper finish, conductivity, or moisture content may not be suitable for the electro-photographic printing process.	Try a known good source of paper from a freshly opened package. Refer to the HP LaserJet Family Paper Specifications Guide for media specifications.
The transfer roller may be defective.	Replace or reseat the roller.
Weak or no developer bias. If inadequate, or no developer bias is produced, toner is not attracted to the image written on the drum.	Adjust the print density setting as shown in Chapter 3.

Table 7-14   Faulty Registration

Possible Cause	Action
Paper. The surface of the paper may be too smooth for the pickup roller to move the paper through the paper path.	Change paper. Try a brand of paper known to be good.
Worn Pickup Roller and Separation Pad.	If the Paper Pickup Roller, or the Separation Pad are sufficiently worn, the leading edge of the paper may not reach the registration assembly in time. Replace the Pickup Roller and Separation Pad together.
PS1 faulty. If the Input/Registration sensor (PS1) is broken, it can not sense the presence of paper at the registration point.	Replace the Input/Registration Sensor.
Drive Gears. If any gear within the gear drive train becomes excessively worn or dirty, erratic paper movement results, causing image misregistration.	Examine the gears along the paper path for wear and contamination. Clean and inspect the gears. Replace any broken or defective gears.
Paper Tray. The paper tray may be preventing the paper from moving through the printer.	Verify that the tray is loaded correctly. Verify that the paper tray is seated fully into the printer. If possible, exchange tray with another printer to see if the problem is associated with the tray. Note the HP LaserJet 4/4M tray is NOT interchangeable with the HP LaserJet 4 Plus/4M Plus tray. The LJ5 paper trays are not compatible with the LJ4 or LJ4+. Replace the paper tray.
DC Controller replaced.	If the DC Controller was replaced, adjust VR202 as shown in Chapter 6.
Paper Input Assembly replaced.	The HP LaserJet 4/4M Paper Input Assembly is NOT compatible with the HP LaserJet 4 Plus/4M Plus. The LJ5 Paper Input Assembly is not compatible with the LJ4 or LJ4+ Input Assemblies. Installing a non-compatible Input Assembly results in paper input registration problems.

Table 7-15   Right-Hand Image Missing

Possible Cause	Action
No toner available for print.	Shake/replace the EP Toner Cartridge.
Laser shutter may be blocking the beam	Ensure that the mechanism that lifts the shutter is functional, for example, the shutter doesn't stick in its travel, and is lifted evenly.

Table 7-16   Small Print Voids

Possible Cause	Action
Small voids on black, or near-black printed images may be caused by imbedded toner on the electro-photographic drum. Cartridges that are run for long periods of time in high temperature and humidity conditions may develop this problem.	Replace the EP Toner Cartridge. If the printer is installed in a hot or humid location, tell the customer to move the printer to a better location.

Table 7-17   Random Horizontal Black Lines

Possible Cause	Action
Laser/Scanning Assembly misaligned or damaged.	Replace the Laser/Scanner Assembly.
DC Controller PCA	Replace the DC Controller PCA.

Table 7-18   Vertical White Streaks

Possible Cause	Action
1.No toner is available for print, or the toner level is low.	Shake the EP Toner Cartridge, replace the cartridge if the problem persists.
2.The lenses within the Laser/Scanning Assembly may be contaminated, blocking (or diffusing) the laser light.	Replace the Laser/Scanning Assembly.

Table 7-19   Repetitive Defects

Possible Cause	Action
Toner Cartridge. The circumference of the photoconductive drum is 3.75 inches (94mm). The circumference of the developer roller is 2 inches (51mm). If a defect appears in the print image at these intervals, assume the defect is associated with the Toner Cartridge.	Replace the Toner Cartridge.
Fuser Assembly. The Fuser Roller's circumference is approximately 2.5 inches (63mm) for the LJ4, and 3-1/8 (79mm) for the LJ4+/5. If a defect appears at this interval, assume the defect is associated with the Fuser Assembly.	Clean the Fuser Assembly rollers. Replace the assembly if necessary.
Dirty Roller. Any dirty roller along the paper path may result in a pattern of repetitive print image defects.	Examine and clean rollers along the paper path.

For further information on interval dimensions, refer to the Repetitive Defect Ruler, Figure 7-19.

Table 7-20   Smeared Print/Improper Fusing

Possible Cause	Action
Fuser levers not in place. (All LJ4, some LJ4+, N/A on LJ5)	The Fuser Assembly has shipping levers that must be lowered during the setup process. See Chapter 3 for instruction on how to lower the fusing levers.
Media. The media may not be acceptable for laser printing. Heavy paper stock is a common cause of smeared print and improper fusing.	Verify that the media meets specifications as shown in the HP LaserJet Family Paper Specifications Guide.
Dirty Fuser Assembly. The print smears if the Fuser Assembly is dirty.	Replace the Fuser Assembly and clean the printer.
Bent Static Teeth. If the static teeth are defective, the print could smear prior to the paper entering the Fuser Assembly.	If the teeth are bent or defective, replace the Static Teeth Assembly.
Worn Gears. If the drum and paper are not moving at the same speed the characters may smudge.	Replace the Toner Cartridge.
Foreign object in paper path. Something is smearing the unfused toner image on the surface of the paper.	Remove any foreign material. Try a new Toner Cartridge.
Orange Packing Spacers not removed. Some HP LaserJet 4 only.	Remove Orange Packing Spacers.

Table 7-21   Distorted Print

Possible Cause	Action
Paper Path. If the paper does not move at a uniform speed, the print image will be affected. Characters that are either too tall or too short (in the direction of paper motion), are usually a result of drive mechanism problem.	Examine the paper transport rollers along the paper path for wear. Replace if excessive wear exists. Inspect and replace the Toner Cartridge, Drive Gear Assembly, Main Motor, or Fuser Assembly as necessary.
Laser/Scanning Assembly. Wavy, irregular-shaped characters, or irregular line margins in the scan direction of printing are usually a result of a defective Laser/Scanning Assembly.	Replace the Laser/Scanning Assembly.

Table 7-22   Black Pages with Horizontal White Strips

Possible Cause	Action
Laser/Scanning Assembly or DC Controller PCA.	Replace the Laser/Scanning Assembly followed by the DC Controller PCA, if necessary (see Figure 7-12 for locations).

Table 7-23   Image Skew

Possible Cause	Action
Input/Registration Sensor (PS1). The Paper Pickup Roller positions the leading edge of the paper at the Input/Registration Sensor (PS1). If this sensor is defective it may not sense the presence of the paper reliably (on time).	Replace the Input/Registration Sensor. Skew tolerance for the printer is 1.5mm over 260mm page length.
Drive Gears. If any gear within the gear drive train becomes excessively worn, or is excessively dirty, erratic paper movement would result, leading to image misregistration.	Closely examine the gears along the paper path for wear and contamination. Clean and inspect the gears. Replace any defective gear.
Paper Tray. The paper tray may be preventing the paper from freely moving through the printer.	Verify that the tray is loaded correctly. Verify that the paper tray is seated fully into the printer. Switch trays to verify that the problem follows the tray. Replace the paper tray.
Paper. The surface of the paper may be too smooth for the pickup roller to move the paper through the paper path.	Change paper. Try paper known to be good.
Paper too heavy?	See *Paper Specifications* in Chapter 2.

Table 7-24   Improperly Sized Image

Possible Cause	Action
PC tray Microswitches. The paper tray microswitches indicate the paper size of the installed tray. This information is used to format the print image to the size of the paper installed in the tray. If the paper tray microswitches are defective, the image is formatted incorrectly.	Perform the "Cassette Size Switches (SW603, SW604, SW605) Functional Check" on page 7-15. Ensure that the correct envelope size is selected if appropriate.
PS 5 is defective. PS 5 senses the trailing edge of the media being fed from the MP tray.	If improperly sized images result from printing from the MP tray, check that PS 5 is functioning correctly mechanically and electrically. This feature allows odd-sized media to be printed with the MP tray. Troubleshoot PS 5 as shown in the following procedure.
MP Paper Size is not set correctly.	Use the MP Paper Size Button on the Front Panel to correctly configure paper size for the MP Tray.

PS5 Check (MP Tray Paper End Sensor) Functional Test

1 Make a test sheet by cutting a notch in the trailing edge of a sheet of paper as shown in Figure 7-9.
2 Perform the set up procedures listed for the PS4 check (MP Tray Empty Sensor) on page 7-17, and put the test sheet into the MP tray when the display reads XX LOAD LEGAL.
3 The self test print should stop 2 to 5 mm above the notch (see Figure 7-9).
4 Print that extends into cut out area indicates that the sensor PS5 is not free in its travel or is defective. Ensure that the sensor lever is free throughout its entire range of travel. If not, replace the lever or the sensor itself.

Figure 7-9   PS5 Test Sheet

Table 7-25   Vertical Dark Streaks

Possible Cause	Action
Dirty Primary Charge roller.	Change the Toner Cartridge.
Bad Toner Cartridge.	Replace the Toner Cartridge.
Incompatible media. During media manufacture, inks, or other finishing processes may interfere with the electro-photographic or fusing process.	Change type of media.

Table 7-26   Large Print Voids

Possible Cause	Action
Defective laser shutter.	Check the laser shutter for free operation when inserting the EP Toner Cartridge.
EP Cartridge Support damaged, improperly positioned, or missing.	Refer to item 4 in Figure 8-4a. Guide must be installed properly above the EP Cartridge, between the laser shutter opening and the fuser stop plate.
Bad transparencies. Transparencies exhibit this problem if they are not designed for proper toner adhesion.	Use Hewlett-Packard-approved transparencies (refer to the *HP LaserJet Family Paper Specifications Guide)*.
Bad paper lot. The surface of the paper may be too smooth for proper toner adhesion.	Try a known good paper from a reliable source (refer to the *HP LaserJet Family Paper Specifications Guide*).
Poor fusing. Toner may not be fused properly to the media.	Try a known good paper from a reliable source (refer to the *HP LaserJet Family Paper Specifications Guide*).
Print image fusing may not occur correctly.	Replace Fuser Assembly (see Figure 7-11 for location).
Wet paper. The paper may be damp.	Try a new batch of paper. Store the paper in a dry area.
Transfer roller is dirty.	Replace the transfer roller.

Table 7-27   Background Scatter

Possible Cause	Action
Defective Toner Cartridge. The Toner Cartridge may be internally damaged.	Replace the Toner Cartridge.
Bad paper lot. The paper moisture content, conductivity, or surface finish may be incompatible with the electro-photographic process.	Try a different paper lot (see the *HP LaserJet Family Paper Specifications Guide*) for paper specifications.
Print density set incorrectly. If the print density is set incorrectly, background scatter can result, particularly with envelopes.	Adjust the print density.
Inside of printer dirty. If toner dust leaked out of the EP Toner Cartridge, this problem can occur.	Clean the inside of the printer.

Table 7-28   White or Blank Pages

Possible Cause	Action
Defective laser shutter.	Check the laser shutter for free operation when inserting the EP Toner Cartridge.
EP Cartridge Support damaged, improperly positioned, or missing.	Refer to item 4 in Figure 8-4a. Guide must be installed properly above the EP Cartridge, between the laser shutter opening and the fuser stop plate.
Toner Cartridge. No toner is available for print.	Remove sealing tape or replace the Toner Cartridge.
No Transfer Roller voltage. Without transfer charge roller voltage, toner cannot be attracted from the surface of the drum to the paper.	Perform the "Half Self Test Functional Check" which follows to check all other electro-photographic processes.
No Developing Bias. With no Developing Bias charge, toner is not attracted to the drum.	Refer to "High Voltage System Checks."
No drum ground path. With no ground path the drum cannot discharge. The negative charge on the drum repels toner, and leaves a white page.	Refer to "High Voltage System Checks."
Bad Laser Scanning Cable Assembly. Low-level signals exchanged between the Laser/Scanning Assembly, and the DC Controller may be affecting laser output.	Replace the Laser/Scanning Cable Assembly.

Image Formation Troubleshooting

Half Self-Test Functional Check

The electro-photographic process can be subdivided into the following stages:

- Cleaning (Physical and Electrostatic).
- Conditioning (Primary Charge Roller).
- Writing (Laser Modulation).
- Development (Formation of the Toner Image).
- Transfer (Charge to transfer the image to paper).

The purpose of the Half Self Test Check is to determine which process is malfunctioning. Perform the test as follows:

1 Initiate an `05 SELF TEST`.
2 Open or switch OFF the printer after the paper advances halfway through the printer (the leading edge of the paper should advance at least past the Transfer Charge roller).
3 Remove the Toner Cartridge.
4 Open the Toner Cartridge's drum shield to view the drum's surface.

If a dark and distinct toner image is present on the drum's surface, assume that the first four functions of the electro-photographic process are functioning, and troubleshoot the failure as a transfer problem. If NO image is present on the photoconductive drum, perform the checks shown on the following pages.

- The Drum Rotation Functional Check.
- High voltage Power Supply Check.

Drum Rotation Functional Check

The photoconductive drum, located in the Toner Cartridge, must rotate for the print process to work. The photoconductive drum receives its drive from the Main Motor gear train. To verify whether the drum is rotating:

1 Open the printer's Top Cover Assembly.
2 Remove the Toner Cartridge. Open the Toner Cartridge's drum shield (cover) to view the photoconductive drum.
3 Mark the gear with a felt-tipped marker. Note the position of the mark.
4 Install the EP Toner Cartridge, and close the Top Cover. The 1-second startup sequence should rotate the drum enough to move the mark. Open the printer, and inspect the drum. Verify that the mark moved.

If the mark did not move, inspect the gear train to ensure that it is meshing with the Toner Cartridge gears. If the drive gears appear functional, and the drum does not move, replace the Toner Cartridge.

Note   This test is especially important if refilled Toner Cartridges were used.

High Voltage Power Supply Assembly

The High Voltage Power Supply Assembly provides the necessary voltages for the printer's electro-photographic processes. The +24B VDC supply is used to power the High Voltage Power Supply Assembly. A summary of the major components of the high voltage system, is given in the table below (see Figure 7-18 for High Voltage PCA layout).

Table 7-29   High Voltage System Checks

Checks	Action
Are the connectors for the Primary Charge roller, Drum Ground, Developing Bias, Toner Level Sensor damaged, corroded, dirty, or missing? Also check the Toner Cartridge.	Visually inspect each item. If any are damaged, correct as necessary. Replace the High Voltage Power Supply if the connection is not repairable. Check that all wires are connected to their respective terminals.
Are the HVPS connections bent or broken?	Clean the terminals with alcohol only.

Interface Troubleshooting

This section provides an overview of the printer interface requirements. Refer to Chapter 3 for detailed information about the printer interfaces and configuration.

Communications Check

Note   Communication problems are normally the customer's responsibility. Time spent attempting to resolve these problems may not be covered by the product's Hewlett-Packard warranty.

The Customer Service Center (CSC) is available to the customer to help them through these problems. The CSC telephone number is: (208) 323-2551.

If the printer is not connected to an MS-DOS-based host, proceed to the Communications Checks table in this section.

Test Message

After the printer is installed, verify communications between the printer and the IBM-compatible computer. Enter the following at the DOS prompt:

```
C:\DIR>LPT1   Enter
```

The printer should print a directory listing of the C:\ directory. If the Communications Check fails, proceed as follows.

AUTOEXEC.BAT Standard Configurations

Parallel DOS Commands

If the previous check did not produce the desired result, ensure that the AUTOEXEC.BAT file contains the following statements for parallel interface communications:

```
MODE LPT1:,,P
```

For MS-DOS version 4.0 and above, enter:

```
MODE LPT1:,,B
```

Note   This example assumes that you are using parallel printer port LPT1. If you are using LPT2 or LPT3, replace LPT1 in the example with the appropriate printer port.

If the problem persists, proceed to Table 7-30 "Communications Checks."

Serial MS-DOS Commands

Most IBM compatible computers default to a parallel printer port. To ensure that information is sent to your serial printer port, type the following MS-DOS commands at your MS-DOS prompt, or include them in your AUTOEXEC.BAT file.

```
MODE COM1:9600,N,8,1,P
```

```
MODE LPT1:=COM1
```

For MS-DOS version 4.0, or above, enter:

```
MODE COM1:9600,N,8,1,B
```

```
MODE LPT1:=COM1
```

Note   These examples assume that you are using serial printer port COM1. If you are using COM2 or COM3, replace COM1 with the appropriate printer port.

If the problem persists, proceed with the following checks in Table 7-30.

Communications Checks

Table 7-30   Communications Checks

Checks	Action
Is your computer configured to the parameters described in the configuration instructions?	These parameters are required to communicate with the printer. Verify your computer's communications port configuration matches these parameters. Note: If these parameters are not set properly, they may yield a `40, 20,` or `22 ERROR` on the printer's Control Panel.
For Serial Communications only	
Does the printer's baud rate match that of the computer's communications port?	Run the printer's Self Test to verify the baud rate setting. At the computer, verify that the baud rate is set correctly in any configuration files. Note: A baud rate problem may cause a `40 ERROR`.
Are you using the correct cable for communications between the computer and the printer?	See the cable wiring in Chapter 3. Hint: On an RS-232 cable, pins 2 and 3 may need to be reversed at the printer-end of the cable.
Are you using the correct RS-232-C protocol?	During the communications "handshake," the printer transmits both the XON/XOFF signal, and the DTR signal. The DTR (Data Terminal Ready) signal may be either negative going, or positive going. DTR polarity is set at the printer's Control Panel. The XON may be set to normal (only transmitted when data is needed), or Robust XON (transmitted every second). This feature is configurable from the Control Panel. DTR is available at pin 20, and XOFF is transmitted from pin 2 of the printer.

Table 7-30   Communications Checks (continued)

Checks	Action
If using a serial interface, is the cable longer than 50 feet (15 meters)?	The maximum recommended cable length for RS-232 serial communications is 50 feet. Use RS-422 for the HP LaserJet 4/4M printer, or move the printer closer to the host.
If using a Centronics parallel cable, is it over 10 feet (3 meters) long?	Use a serial interface connection, or move the printer closer to the host.
Do all the current Control Panel Configuration Menu items match the host system's parameters?	Make appropriate changes. If host system changes are made, be sure to reboot the system, or otherwise ensure the changes are in effect.
Does the printer have a bad interface port?	If possible, try a different printer interface than the one with the problem. Reconfigure the printer and host.
Does the host have a bad interface port?	If possible, try a different host system port, and reconfigure both the host and printer appropriately.

If the host system and printer still are not communicating, and steps 1 through 9 have been completed, replace the Formatter PCA and the MIO card, and reconfigure the printer. If the problem persists, a protocol analyzer may be needed to find the source of the problem.

Caution   HP LaserJet printers are not designed to work with mechanical switch-box products without proper surge protection. These devices generate high transient voltages that cause permanent damage to the Formatter PCA. This circumstance is not covered by the Hewlett-Packard warranty.

MIO Troubleshooting

The Self Test Printout and explanation shown on the following pages contain valuable information regarding the current status of the MIO. Before attempting to troubleshoot a network problem or notifying your network consultant of a problem, always obtain a Self Test Printout.

Troubleshooting Hints

The JetDirect Card Status Block (see Figure 7-10, status block 2) indicates the functionality of the JetDirect Card. An I/O NOT READY STATUS indicates a problem. A 2-digit error code follows the message. Use the HP JetDirect Network Interface Configuration Guide (P/N J2552-90001) for detailed explanations of errors and suggested corrective action.

NETWORK STATISTICS, status block 3, indicates network activity. Bad packets, framing errors, unsendable packet and collisions should be minimal. If unusually high numbers of these statistics occur, please advise the network administrator.

The various Network Operating Systems supported by these printers are indicated in status blocks 4, 5, 6, and 7. When the status is READY, the printer has successfully connected to the host network server and is awaiting data. Other messages indicate the printer is either still trying to successfully connect to the network or a configuration problem has been encountered. Refer to the HP JetDirect Network Interface Configuration Guide (P/N J2552-90001) for detailed explanations of these messages.

Explanation of Self Test Printout

1 Multiple Environment Information. General information about your JetDirect MIO.

2 JetDirect Card Status. I/O CARD READY indicates the interface is correctly configured and capable of communicating. I/O CARD NOT READY indicates there is a problem with the interface, configuration, or server.

3 Network Statistics. A list of network statistics is generated by the JetDirect MIO. All statistic counters are reset to zero when the printer is turned OFF.

Supported Network Operating Systems

4 Novell Status Information

5 Apple Ether Talk/Local Talk Status Information

6 HP-UX, Solaris and Sun/OS (TCP/IP) Status Information

7 Lan Server/Lan Manager/Windows for Workgroups/Windows NT Status Information
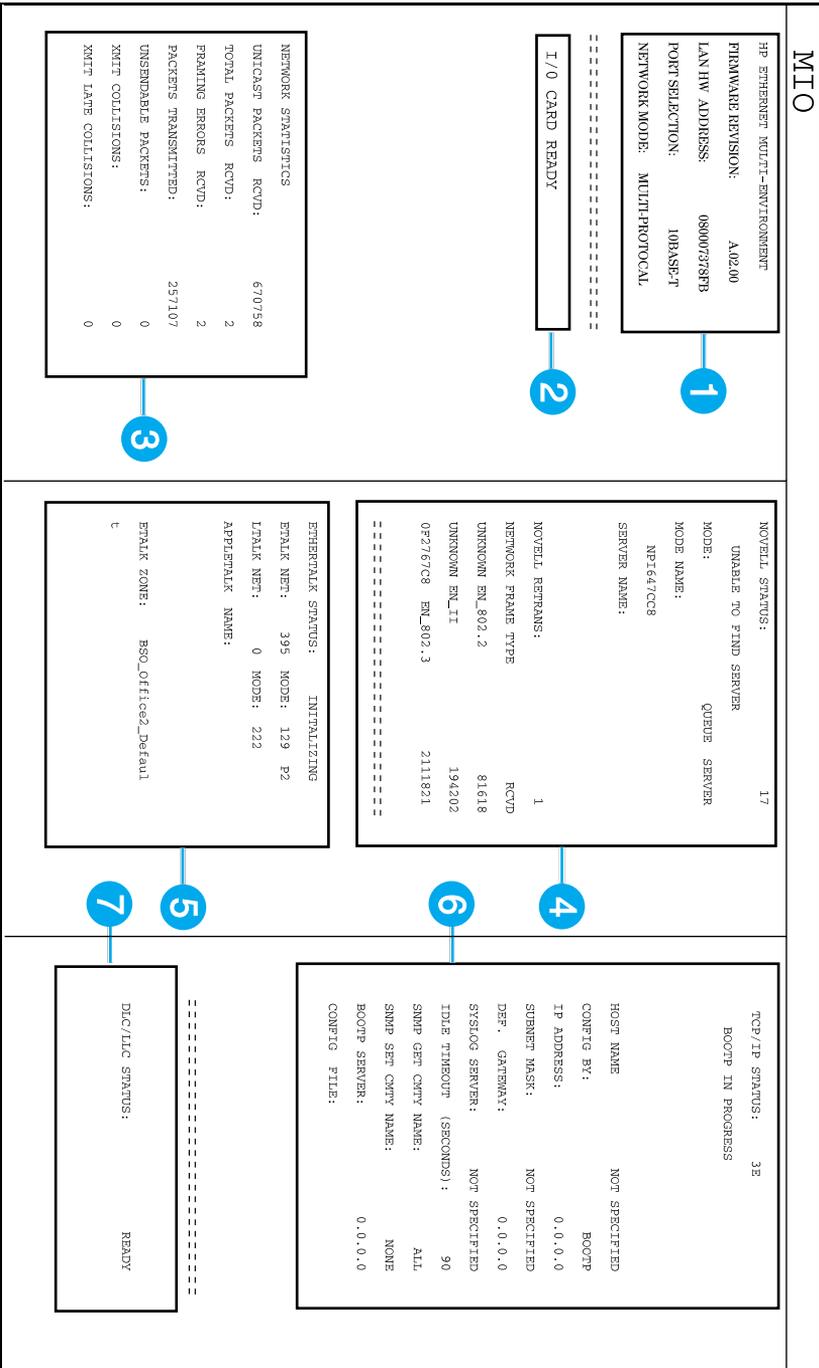
MIO

HP ETHERNET MULTI-ENVIRONMENT
FIRMWARE REVISION: A.02.00
LAN HW ADDRESS: 08007378FB
PORT SELECTION: 10BASE-T
NETWORK MODE: MULTI-PROTOCAL

I/O CARD READY

NETWORK STATISTICS
UNICAST PACKETS RCVD: 670758
TOTAL PACKETS RCVD: 2
FRAMING ERRORS RCVD: 2
PACKETS TRANSMITTED: 2571107
UNSENDABLE PACKETS: 0
XMIT COLLISIONS: 0
XMIT LATE COLLISIONS: 0

NOVELL STATUS: 17
MODE: UNABLE TO FIND SERVER
MODE NAME: QUEUE   SERVER
      NPI647CC8
SERVER NAME:
0F2767C8 EN_802.3   2111821
UNKNOWN EN_II   194202
UNKNOWN EN_802.2   81618
NETWORK FRAME TYPE   RCVD
NOVELL RETRANS: 1

ETHERTALK STATUS: INITIALIZING
ETALK NET: 395 MODE: 129 P2
LTALK NET: 0 MODE: 222
APPLETALK   NAME:
ETALK ZONE: BSQ_Office2_Defaul
      t

TCP/IP STATUS: 3E
BOOTP IN PROGRESS
HOST NAME   NOT SPECIFIED
CONFIG BY: BOOTP
IP ADDRESS: 0.0.0.0
SUBNET MASK: NOT SPECIFIED
DEF. GATEWAY: 0.0.0.0
SYSLOG SERVER: NOT SPECIFIED
IDLE TIMEOUT (SECONDS):   90
SNMP GET CMTY NAME: ALL
SNMP SET CMTY NAME: NONE
BOOTP SERVER: 0.0.0.0
CONFIG FILE:

DLC/LLC STATUS: READY

Figure 7-10   MIO Staus Information on the Self Test Printout

Troubleshooting Aids

Component Locations

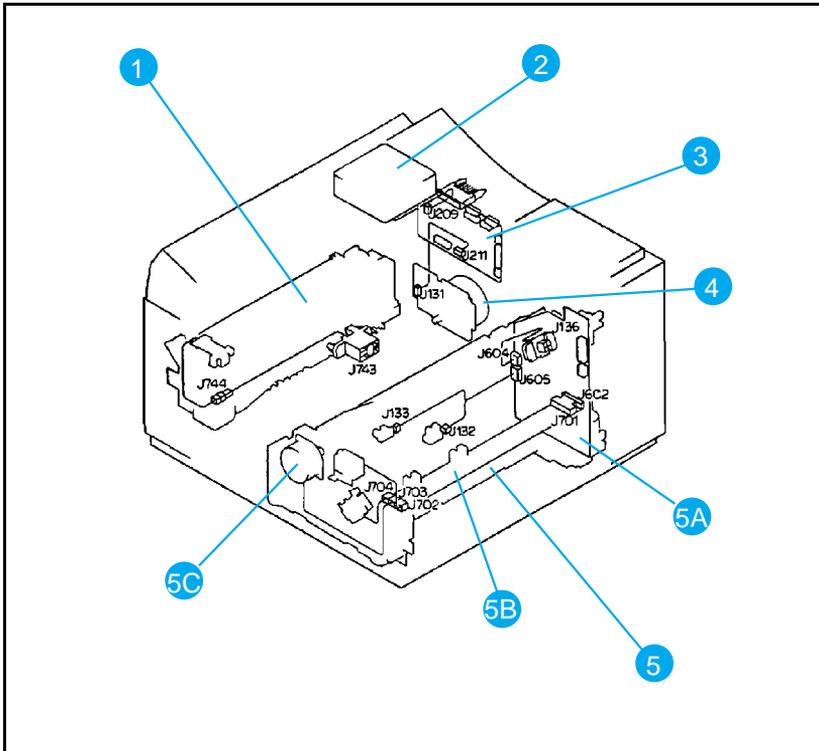The following illustrations help you quickly find the parts discussed in this chapter.

Figure 7-11   Major Assembly and Connector Locations

Table 7-31

Number	Part	Number	Part
1	Fuser Assembly	5	Paper Feed Assembly
2	Cooling Fan	5A	Paper Control PCA
3	DC Controller PCA	5B	Sensor PCA
4	Main Motor Assembly	5C	Paper Pickup Motor (M2)
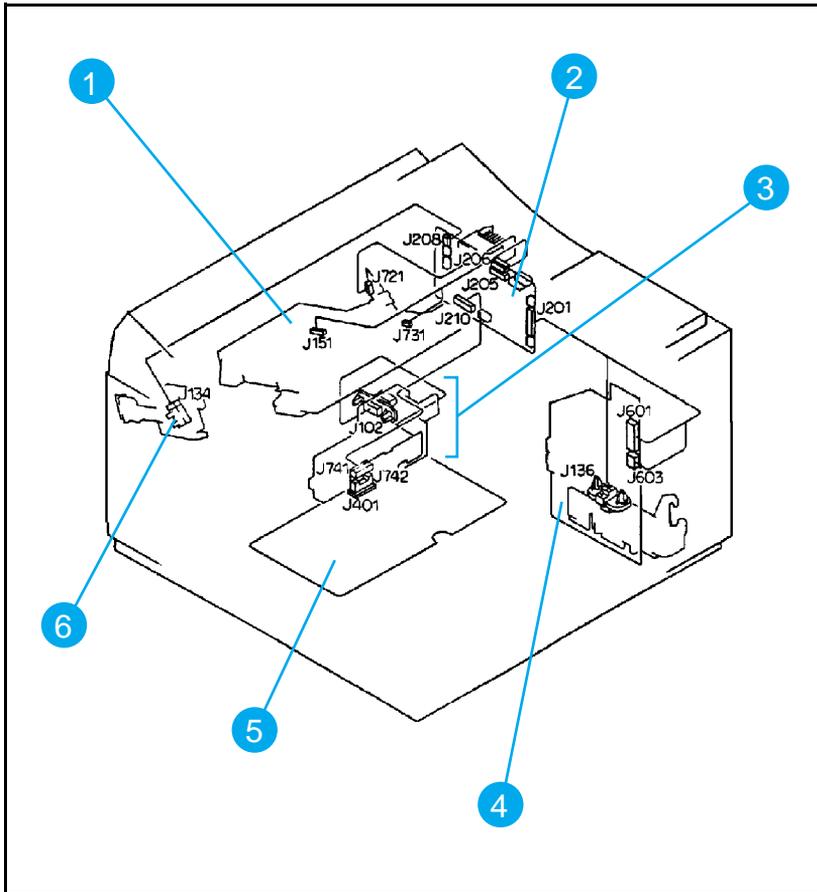
Figure 7-12   Major Assembly and Connector Locations (2 of 3)

Table 7-32

Number	Part
1	Laser/Scanner Assembly
2	DC Controller PCA
3	Interconnect PCA Assembly
4	Paper Control PCA
5	High Voltage Power Supply PCA
6	Exit Sensor Assembly
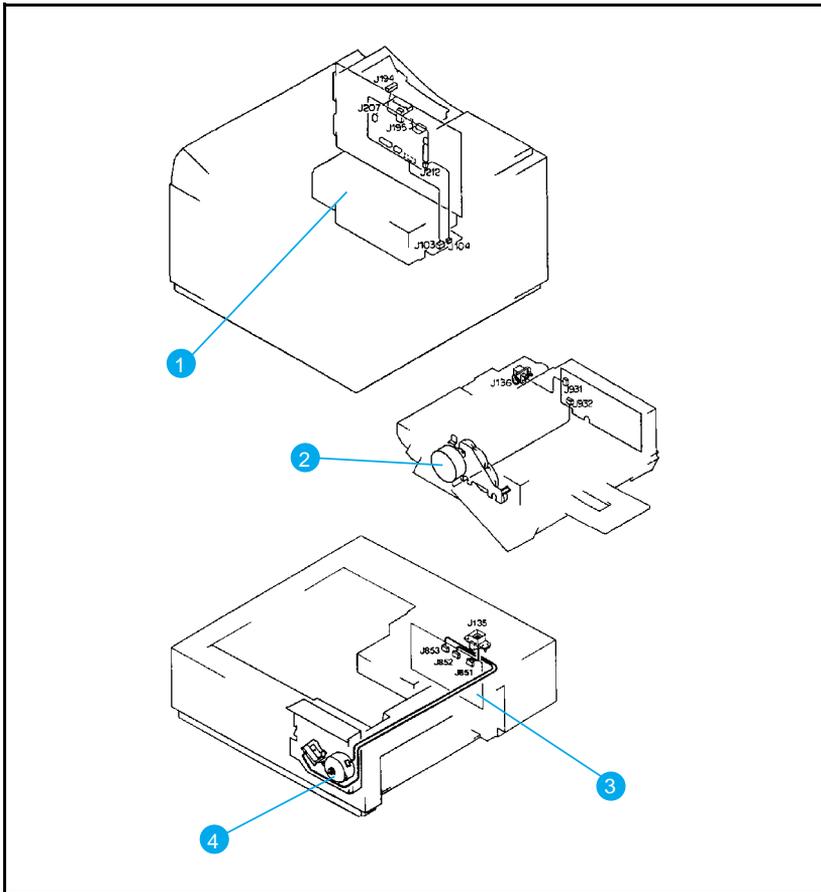
Figure 7-13   Major Assembly and Connector Locations (3 of 3)

Table 7-33

Number	Part
1	Power Supply Assembly
2	Envelope Feeder Main Motor (M4)
3	Lower Cassette Drive PCA
4	Lower Cassette Main Motor (M3)
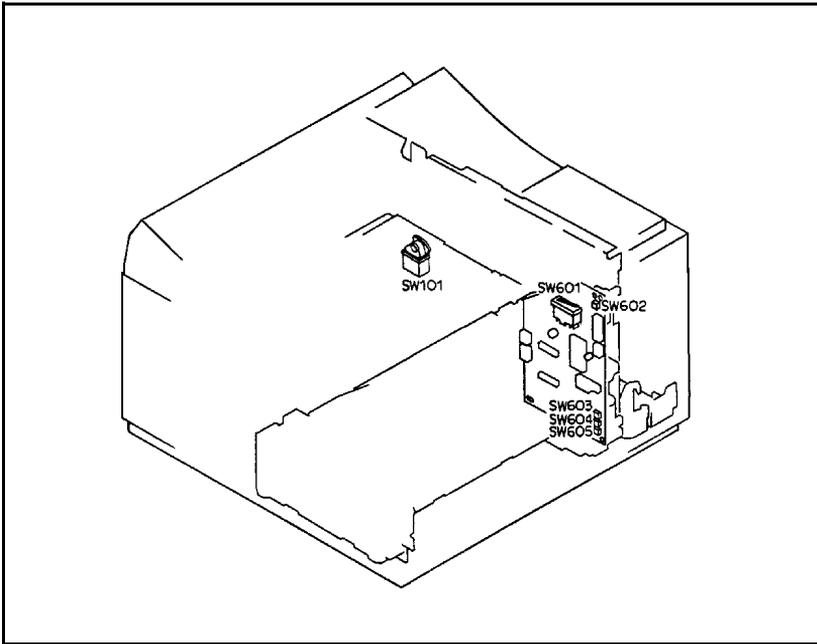
Figure 7-14   Switch Locations

Table 7-34

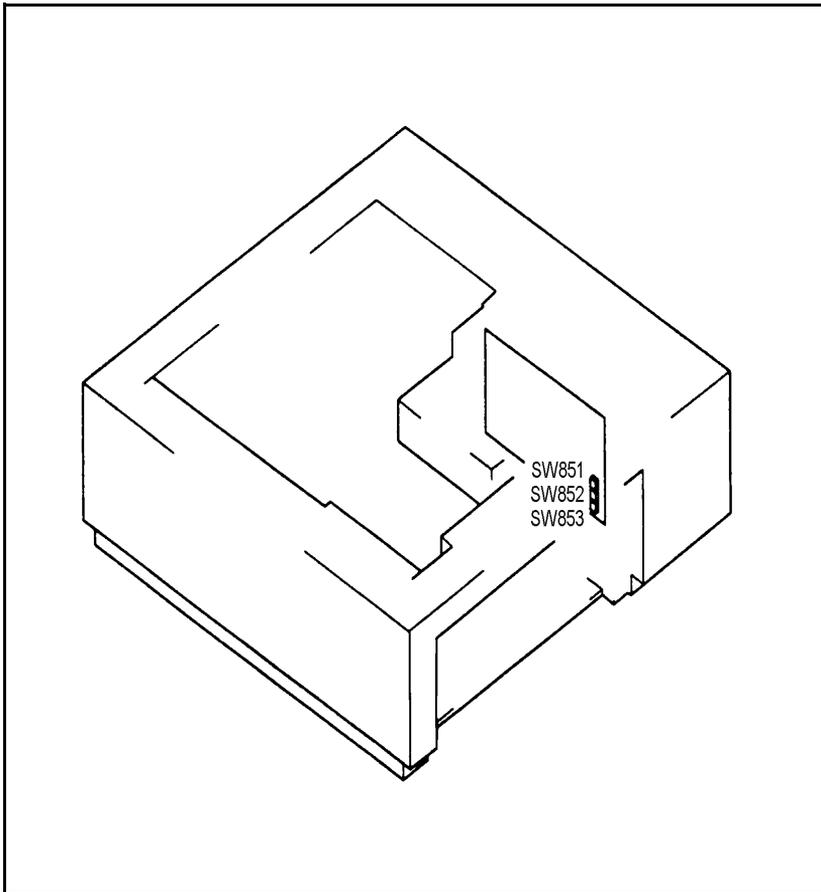| Number	Part
SW101	AC Input ON/OFF Switch (Power Supply Assembly)
SW 601	Top Cover Open Sensing Switch
SW602	TEST PRINT Switch
SW603	PC (Tray 2) Tray Size Switches
SW604	
SW605	

Figure 7-15   Optional 500 Sheet Lower Cassette

Table 7-35

Number	Part
SW851	Optional 500 Sheet Paper Feeder Paper Tray (Tray 3) Size Switches
SW852	
SW853	
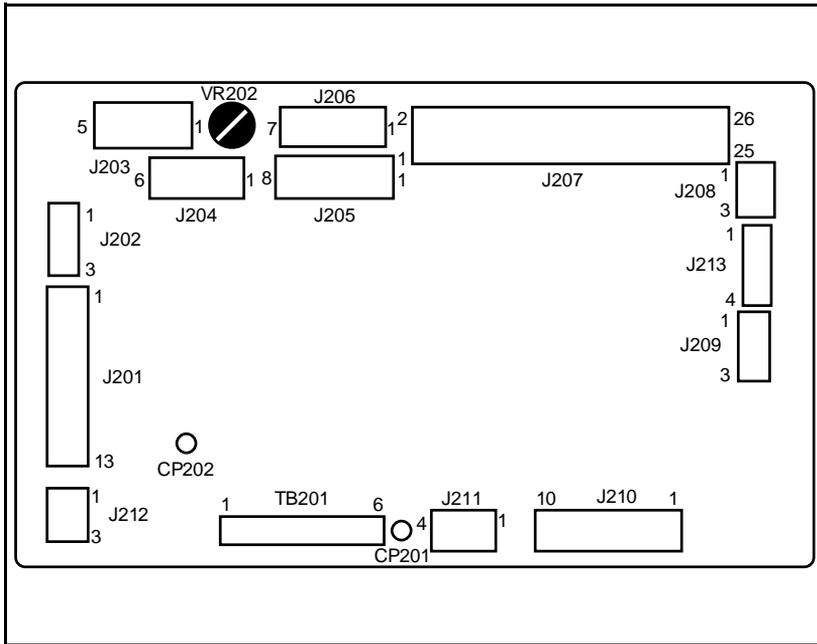
Figure 7-16   DC Controller PCA Layout—LaserJet 4/4M

Table 7-36

Number	Part
J201	Paper Control PCA
J205	Scanner/Beam Detect
J206	Laser Drive PCA
J207	Formatter PCA
J208	Deliver/Exit Sensor PS3
J210	Interconnect PCA
J209	Cooling Fan
J211	Main Motor
J212	Power Supply/Fuser Drive
VR202	Registration Adjustment
TB201	DC Voltages (from Power Supply)
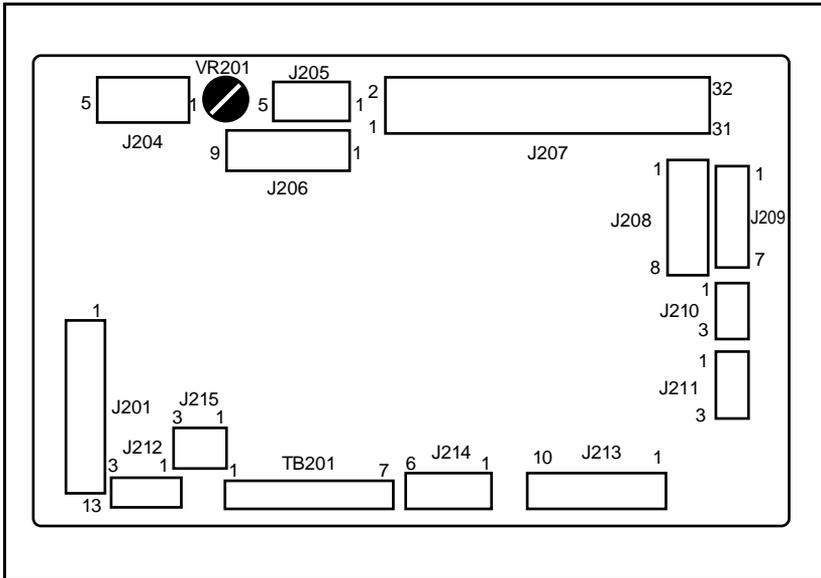
Figure 7-17   DC Controller PCA Layout —LaserJet 4 Plus/5

Table 7-37

Number	Part
J201	Paper Control PCA
J208	Scanner/Beam Detect
J209	Laser Drive PCA
J207	Formatter PCA
J210	Deliver/Exit Sensor PS3
J213	Interconnect PCA
J211	Cooling Fan
J214	Main Motor
J215	Power Supply/Fuser Drive
VR201	Registration Adjustment
TB201	DC Voltages (from Power Supply)
J206	Control Panel
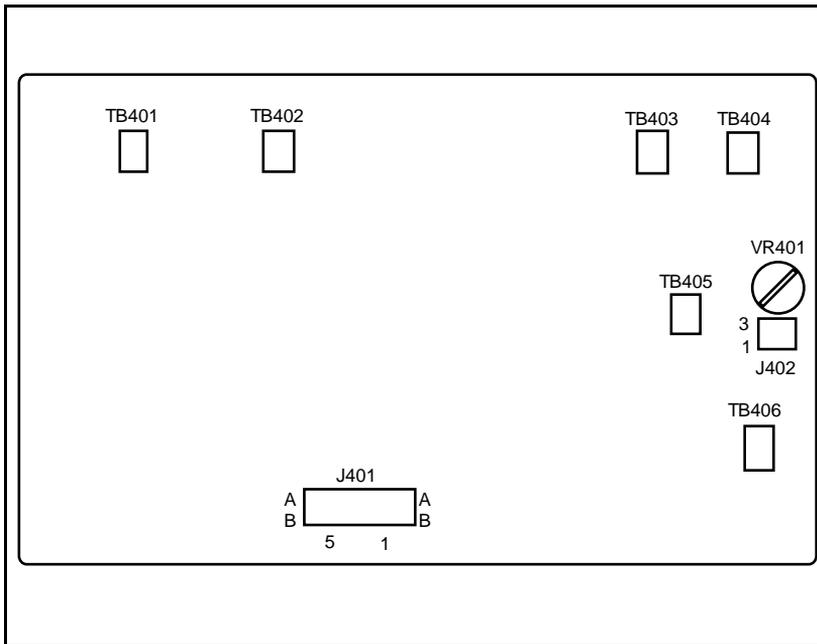
Figure 7-18   High Voltage PCA Layout

Table 7-38

Number	Part
J401	High Voltage PS Connection To DC Controller PCA via Interconnect PCA
TB401	Transfer Roller Contact
TB402	Drum Ground Contact
TB403	Toner Low/EP Toner Cartridge-in-Place Contact
TB404	GND
TB405	Developer Roller Contact
TB406	Charge Roller Contact
VR401	Factory Adjustment Only

Repetitive Defect Template

Repetitive print defects usually are associated with a specific roller within the printer, or the Toner Cartridge. The following templates are provided to help quickly isolate the cause of repetitive print defects. Align the first occurrence of the defect with the top of the "ruler", and measure to the next occurrence of the defect to determine the roller in question. When you are certain that your defect pattern matches the pattern of the template, replace the indicated roller.
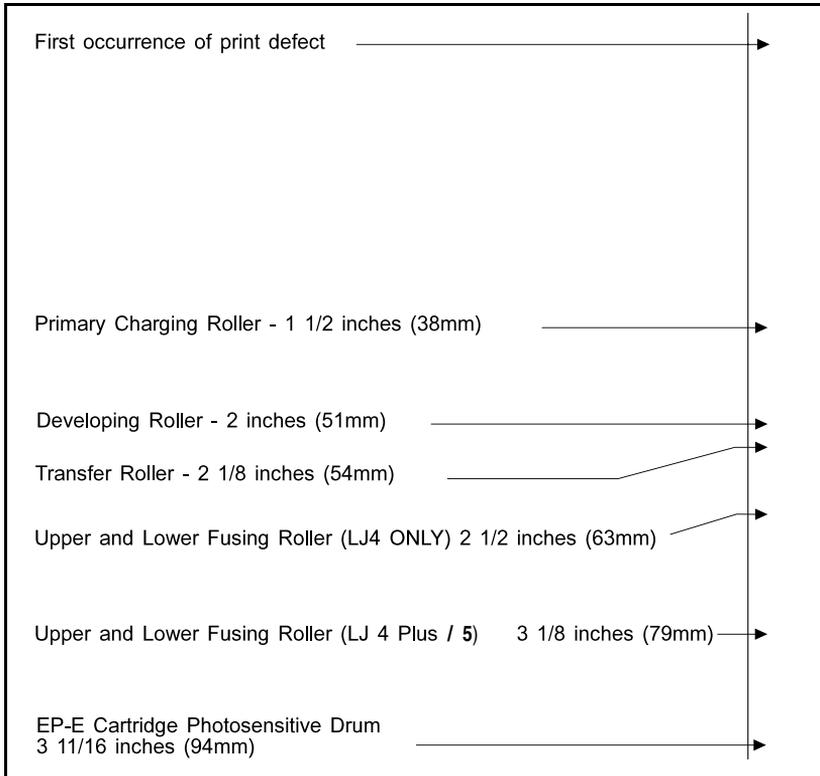
First occurrence of print defect

Primary Charging Roller - 1 1/2 inches (38mm)

Developing Roller - 2 inches (51mm)

Transfer Roller - 2 1/8 inches (54mm)

Upper and Lower Fusing Roller (LJ4 ONLY) 2 1/2 inches (63mm)

Upper and Lower Fusing Roller (LJ 4 Plus **/ 5**)   3 1/8 inches (79mm)

EP-E Cartridge Photosensitive Drum
3 11/16 inches (94mm)

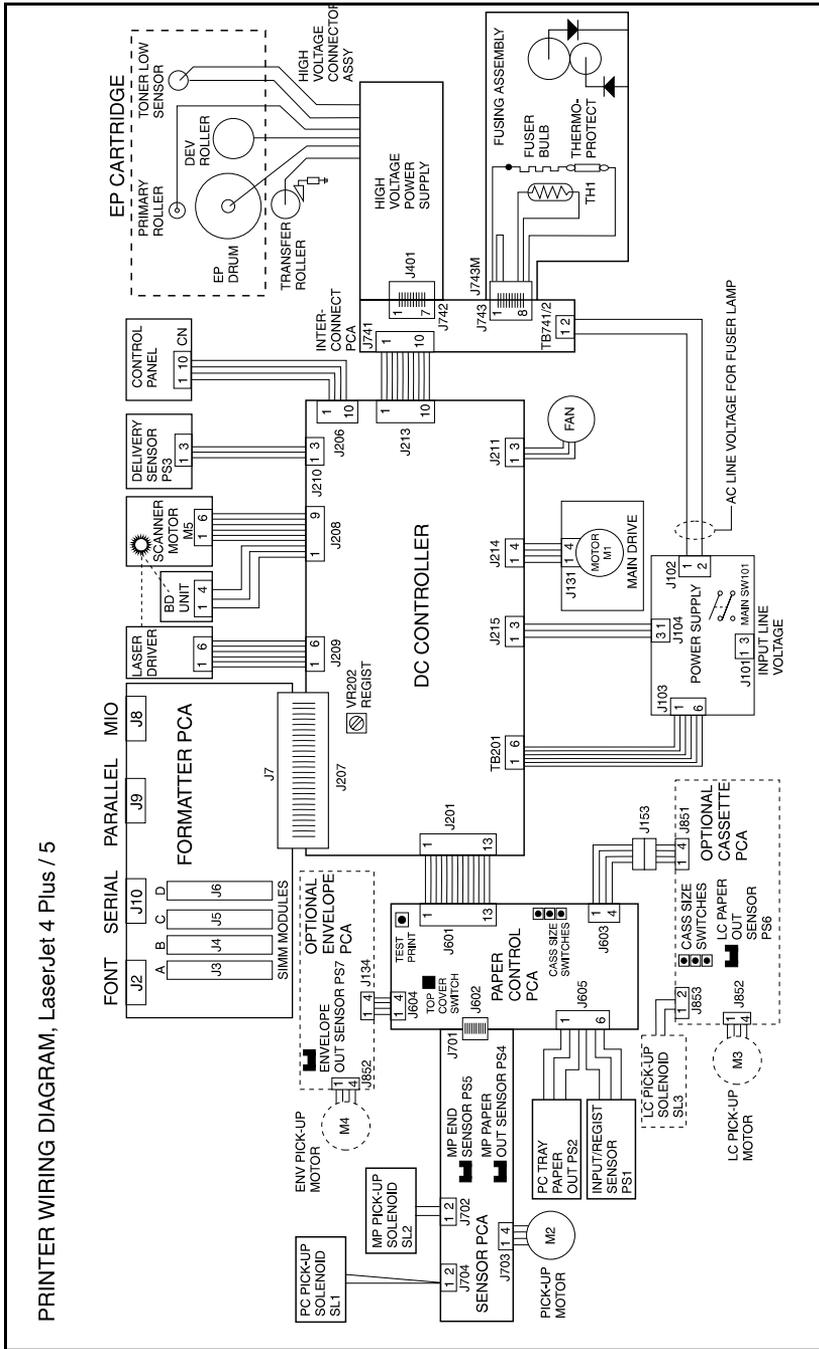**Figure 7-19   Repetitive Defect Ruler**

Figure 7-20   Main Wiring Diagram (LJ 4+/5 only)

Voltage Test Points

The operating voltages of the printer can be verified by:

1 Listening for the exhaust fan. A rotating fan indicates that the +5 VDC and +24A VDC voltages are present. (The fan runs on +24A VDC. The +5 VDC enables the +24A VDC.)
2 Listen for the Main Motor. If the Main Motor runs, the +24B VDC is enabled, therefore +24A VDC must be present.

Measuring the DC Voltage Levels

The DC voltage levels can be measured directly on the DC Controller TB 201. TB 201 connects the DC Controller with the Power Supply. (See the Main Wiring Diagram, and Figure 7-16 or 7-17, the DC Controller PCA Layout in the previous section.) Remove the Formatter cage to access the DC Controller. The voltages on TB201 are as follows:

Table 7-39   TB 201 Voltages

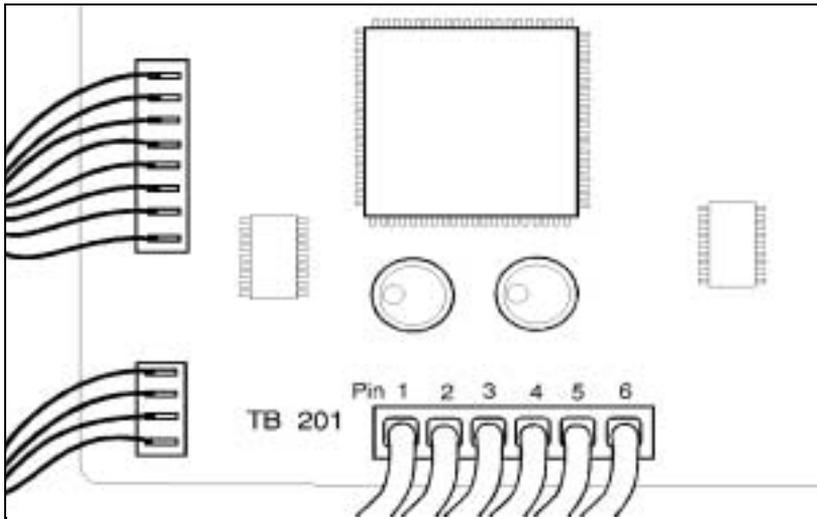| Voltage	Color	Pin Number
+5 VDC	Brown	1, 2
+24 VDC	Red	3
Ground	Blue	4, 5, 6

Figure 7-21   **TB 201 Voltages**