LaserWriter Printers
Volume II

Service Guide

LaserWriter Pro 600/630,
LaserWriter Select 300/310,
Personal LaserWriter 300

September 1993

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General Information

LaserWriter Pro 600/630

LaserWriter Select 300/310

Personal LaserWriter 300

Introduction

The *Apple Service Guide for LaserWriter Printers*, Volume 2, is designed to help Apple-certified technicians troubleshoot and repair Apple laser printers at the customer's site. This guide includes service information for the LaserWriter Pro 600/630, LaserWriter Select 300/310, and Personal LaserWriter 300 printers.

The *Apple Service Guide for LaserWriter Printers* presents information from the *Service Source* CD and other Service publications in a booklet format that is easy to use and easy to carry. The guide includes *only* information that experienced technicians need to service LaserWriter printers quickly and reliably at the customer's site.

Using the Guide

The *Apple Service Guide for LaserWriter Printers* contains safety information and four tab sections:

Tab 1: General Information
Tab 2: LaserWriter Pro 600/630
Tab 3: LaserWriter Select 300/310
Tab 4: Personal LaserWriter 300

Safety: This section includes safety warnings, practices, and procedures. You should be completely familiar with all the safety information before using this guide. Please read this section.

Tab 1 – General Information: This tab section contains general printer connection information, port pinouts, and generic troubleshooting tips that apply to more than one of the printer families covered in this guide.

Tabs 2–4: The three LaserWriter printer tab sections contain information specific to particular LaserWriter printer models:

- Exploded-view drawings of the LaserWriter printers
- Alphabetical parts lists with part numbers
- System specifications
- Troubleshooting information, flowcharts, and tables

Important **When ordering a replacement module or spare part, be sure to check the part number given in this guide against the current information in the AppleOrder™ system, on the AppleLink® network, or in the Apple Service Price Pages. Remember that this Apple Service Guide is not updated on a regular basis.**

Safety

▲ Warning The LaserWriter printers operate at high voltages. To prevent serious injury, always switch off the printer and unplug the AC power cord before servicing the printer.

▲ Warning Never disconnect the beam-detect cabling or laser shutter when the printer is switched on. The reflected laser beam, although invisible, can permanently damage your eyes.

▲ Warning The fuser assembly becomes very hot during printer operation. Before servicing the fuser assembly, switch off the printer for at least 5 minutes to allow the fuser assembly to cool.

▲ Warning Electrostatic discharge (ESD) can cause severe damage to sensitive microcircuits. LaserWriter I/O boards contain CMOS components, among the most sensitive chips in use today. CMOS chips, ROMs, and SIMMs are very susceptible to ESD and skin acid damage. To prevent damage to these components, handle them only by the edges.

▲ Warning Make sure that you are not grounded when

- You are working on plugged-in equipment
- You are performing live adjustments

▲ Warning The LaserWriter printers are heavy. When lifting or moving the printers, be careful not to strain your back.

LaserWriter Safety Rules

1. **Remove all jewelry before performing repairs on a LaserWriter printer.** Removing these conductors reduces the possibility of electric shock.
2. **Before servicing a LaserWriter, turn off the power and disconnect the AC power cord.** Certain parts of the printer are hot (electrified) when the printer is under power. Never work on a LaserWriter printer under power except when making live adjustments.
3. **Do not touch the following modules when the LaserWriter is powered on and the covers are removed:**

    - The high-voltage power supply
    - The DC power supply
    - The power supply block
    - The high-voltage contact assembly
    - The power supply unit

Toner Safety

Toner is a nontoxic substance composed of plastic, iron, and a small amount of pigment. Skin and clothing are best cleaned by removing as much toner as possible with a dry tissue, then washing with cold water. Hot water causes toner to jell and permanently fuse into clothing. Toner attacks vinyl materials, so avoid contact with vinyl.

Laser Safety

When servicing the optical system of the LaserWriter, be careful not to place screwdrivers or other shiny objects in the path of the laser beam. The reflected laser beam, though invisible, can permanently damage your eyes.

Never remove the cover of a laser/scanner assembly, whether the printer is powered on or not.

Because the laser beam is invisible, the labels shown in the following figure are attached to the insides of covers where there is danger of exposure to laser radiation.

危険- 開くと不可視のレーザ放射を受けます。
直接放射や散乱放射に目や皮膚を さらさ れないこと。

DANGER- INVISIBLE LASER RADIATION WHEN OPEN.
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

CLASS 3B
780mm
5mWmax

PELOGRO! RADIACIÓNLASÉRICA INVISIBLE CUANDO ABERTO.
EVITE EXPOSICIÓN DE OJOS O PIFL A RADIACION DIRECTA O DISPERSA.

GEFAHR- UNSICHTBARE LASERSTRAHLUNG IN OFFENEM ZUSTAND.
AUSSETZUNG VON AUGEN ODER HAUT ZU DIREKTER ODER STREUSTRAHLUNG VERMEIDEN.

DANGER- EMISSION DE RADIATION LASER INVISIBLE QUAND L'APPAREIL EST OUVERT.
EVITER TOUTE EXPOSITION DE LA PEAU OU DES YEUX AUX RADIATIONS DIRECTES OU INDIRECTES.

VAARA- NÄKYMÄTÖNTA LASERSÄTEILYÄ KANNEN OLLESSA AUKI.
VARO,ETTÄ SILMÄT JA IHO EIVÄT JOUDU ALTTIIKSI SÄTEIYLLE.

FARE- USYNLIG LASERUTSTRALING I ÅPEN POSISJION.
PASS PÅ AT OYNE OG HUD IKKE BLIR UTSATT FOR DIREKTE ELLER SPREDT STRÅLING.

VAARA- NÄKYMÄTON LASER SÄFEILY AVATTAESSA.
FARA SILMA TAI IHO KOSKETUSTA SUORAAN TAI EPASUORASTI SÄFEILY KENTÄN KANSSA.

ADVARSEL- USYNLIG LASERSTRÅLING VED ÅBNING UNDGÅ AT UNDGÅ AT UDSATTE ØJNE ELLER HUD FOR DIREKTE ELLER STREDT STRÅLING.

DANGER - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION - INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ATTENTION - RAYONNEMENT LASER INVISIBLE EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.
VORSICHT - UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
ATTENZIONE - RADIAZIONE LASER INVISIBLE IN CASO DI APERTURA. EVITARE L'ESPOSIZIONE AL FASCIO.
PRECAUCION - RADIACION LASER INVISIBLE CUANDO SE ABRE. EVITAR EXPONERSE AL RAYO.
VARO! - AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING! - OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.
ADVARSEL! - USYNLIG LASER STRÅLING, NÅR DENNE ER ÅBEN. UNDGÅ BESTRÅLING.
ADVARSEL - USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN.
R55-8169
注 - この カバーの内側とよぶ 見レーザ が 放 射 されています。レーザーにとれないようにしてください。

DANGER - Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.
CAUTION - INVISIBLE LASER RADIATION WHEN OPEN.
AVOID EXPOSURE TO BEAM.
ATTENTION - RAYONNEMENT LASER INVISIBLE EN CAS D'OUVERTURE.
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VARNING! - OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD.
BETRAKTA EJ STRÅLEN.
ADVARSEL! - USYNLIG LASER STRÅLING, NÅR DENNE ER ÅBEN.
UNDGÅ BESTRÅLING.
ADVARSEL - USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES.
UNNGÅ EKSPONERING FOR STRÅLEN.
注 - この カバーの内側とよぶ 見レーザ が 放 射 されています。
レーザーにとれないようにしてください。
K-4

Laser/Scanner Warning Labels

ESD Prevention Rules

Follow these steps to reduce the risk of electrostatic discharge (ESD) damage to equipment:

1. Before working on any device containing a printed circuit, ground yourself and your equipment to an earth or building ground. Use a grounded conductive workbench mat and a grounding wriststrap, and ground your equipment to the mat.

▲ Warning

Make sure that you are not grounded when

- **You are working on plugged-in equipment**
- **You are performing live adjustments**

2. Do not touch anybody who is working on integrated circuits. You could "zap" the equipment through the technician—even if the technician is grounded.

3. Use static-shielding bags for boards and chips during storage, transportation, and handling. Leave all Apple replacement modules in their ESD-safe packaging until you need them.

4. Handle all ICs by the body, not the leads. Also, do not touch the edge connectors or exposed circuitry on boards or cards.

5. Do not wear polyester clothing or bring plastic, vinyl, or styrofoam into the work environment. The electrostatic field around these nonconductors cannot be removed.

6. Never place components on any metal surface. Use antistatic, conductive, or foam rubber mats.

7. If possible, keep the humidity in the service area between 70% and 90%, and use an ion generator. Charge levels are reduced (but not eliminated) in high-humidity environments and in areas where an ion generator is routinely used.

8. If an ESD pad/workstation (see Setting Up an ESD-Safe Workstation) is not available, touch bare metal on the power supply to discharge electrostatic charges.

Setting Up an ESD-Safe Workstation

You need the following materials to set up an ESD-safe workstation:

- Conductive workbench mat, with grounding cord
- Wriststrap, with built-in 1-megohm resistor and ground cord
- Equipment grounding cord, with alligator clips
- Ground/polarity tester

Setup Procedure

1. Remove all ESD hazards from the area. Nonconductive materials (see rule 5 under ESD Prevention Rules) cannot be grounded. Such materials retain charges for hours and even days.

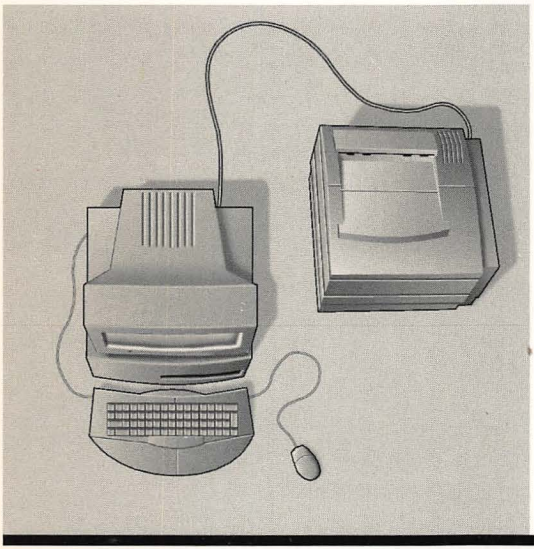
2. Use a ground/polarity tester to verify proper grounding of the power outlet. If the outlet is wired incorrectly, most testers show a light pattern that matches a code given on the tester. If the tester does not verify proper grounding, move to another outlet that is safe.

3. Connect the grounding cord of the workbench mat to ground.

4. Use a wriststrap grounding cord. Fasten it to the workbench mat and to the wriststrap. The wriststrap should touch your skin. You need the continuous grounding provided by a grounding wriststrap.

5. Finally, ground the equipment you are working on. Use alligator clips and a grounding cord to attach any metal part of the device you are working on to the grounded workbench mat.

General Information



Connecting the Printer to a Computer

You will find it useful to connect the printer to a computer in order to test the printer, especially the operation of the I/O board.

Following are instructions on how to connect the printer to a Macintosh computer using a peripheral-8 or LocalTalk cable and to an MS-DOS computer using a 36-pin Centronics cable.

Note For information on how to install the appropriate printer software, refer to the printer's user manual.

Connecting via a Peripheral-8 Cable

The LaserWriter Pro 600/630, LaserWriter Select 300/310, and Personal LaserWriter 300 printers can be connected to a Macintosh computer by attaching a peripheral-8 cable to the mini DIN-8 port on the printer.

1. Switch off the printer and the Macintosh computer.
2. Attach one end of the peripheral-8 cable to the printer port or modem port on the Macintosh computer.

Note If you plug the printer cable into the printer port, you must make sure that AppleTalk is inactive in the Macintosh Chooser desk accessory.

3. Attach the other end of the cable to the mini DIN-8 port on the back of the printer.

Note **LaserWriter Select 310 only:** Do not connect the LaserWriter Select 310 to both a Macintosh and an IBM PC or compatible computer at the same time. Although this does not harm the printer, you cannot use the Macintosh (serial) port while the PC (parallel) port is connected, or vice versa.

Connecting via LocalTalk Cables (LaserWriter Pro 600/630 only)

The LaserWriter Pro 600/630 printers can be connected to a Macintosh computer by attaching a LocalTalk cable to the mini DIN-8 port on the printer.

1. Switch off the LaserWriter Pro and the Macintosh computer.
2. Connect a LocalTalk connector box to the mini DIN-8 port on the LaserWriter Pro (see Figure 1).
3. Connect a LocalTalk connector box to the printer port on the Macintosh computer (see Figure 1).
4. Connect the two connector boxes with a LocalTalk cable (see Figure 1).

5. Switch on the LaserWriter Pro and wait for the startup test page.
6. Click the LaserWriter icon to select the device type and select the LaserWriter name when it appears.
7. Choose Print Directory from the File menu.
   - If a printout of the directory is produced, the printer and network are functioning properly.
   - If a printout of the directory is not produced, refer to the appropriate troubleshooting flowcharts or table in the LaserWriter Pro tab section.

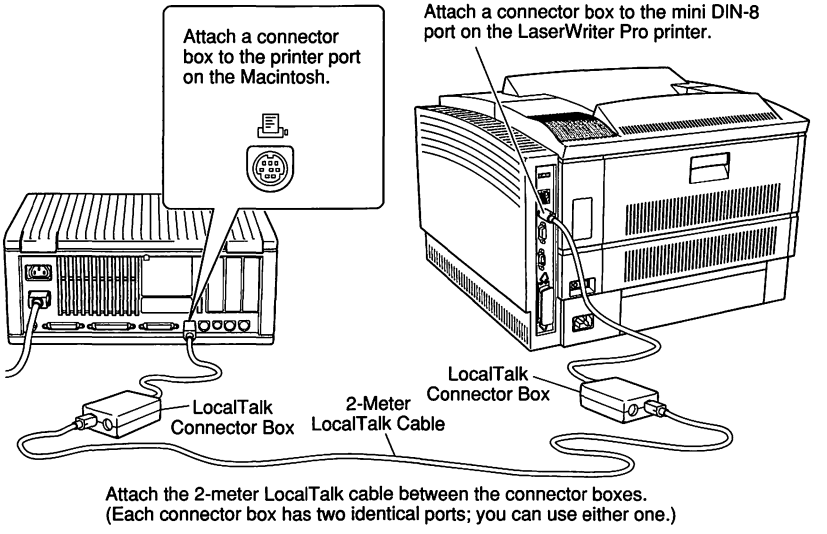


Figure 1 LocalTalk Connection

Connecting via a Centronics Parallel Cable (LaserWriter Pro 600/630 and LaserWriter Select 310 only)

The LaserWriter Pro 600/630 and LaserWriter Select 310 printers offer a Centronics parallel port for connection to MS-DOS computers. This connection requires a cable with a 36-pin Centronics-type connector on one end and an appropriate connector on the other end for the specific MS-DOS computer. (Most IBM PCs and compatible computers require a 25-pin connector.)

Note Do not connect the LaserWriter Select 310 printer to both a Macintosh and an IBM PC or compatible computer at the same time. Although this does not harm the printer, you cannot use the Macintosh (serial) port while the PC (parallel) port is connected, or vice versa.

Before you can attach the cable, you must remove the plastic static-protection cover from the printer's parallel port.

Note Do not remove the plastic cover from the parallel port unless you need to attach a parallel cable to the port. The cover protects the printer from possible damage by static electricity.

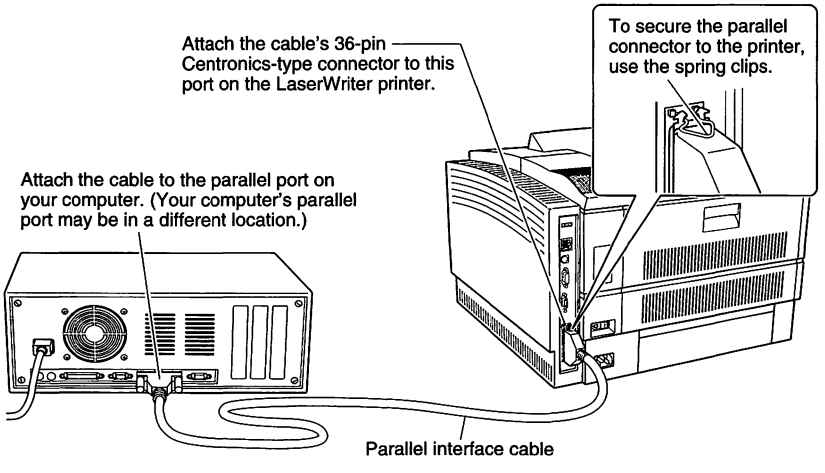


Figure 2 Centronics Parallel Port Connection

The pin numbers shown in Figure 3 are for the connectors attached to the ends of the LaserWriter peripheral cables, as viewed from the front of the connector.

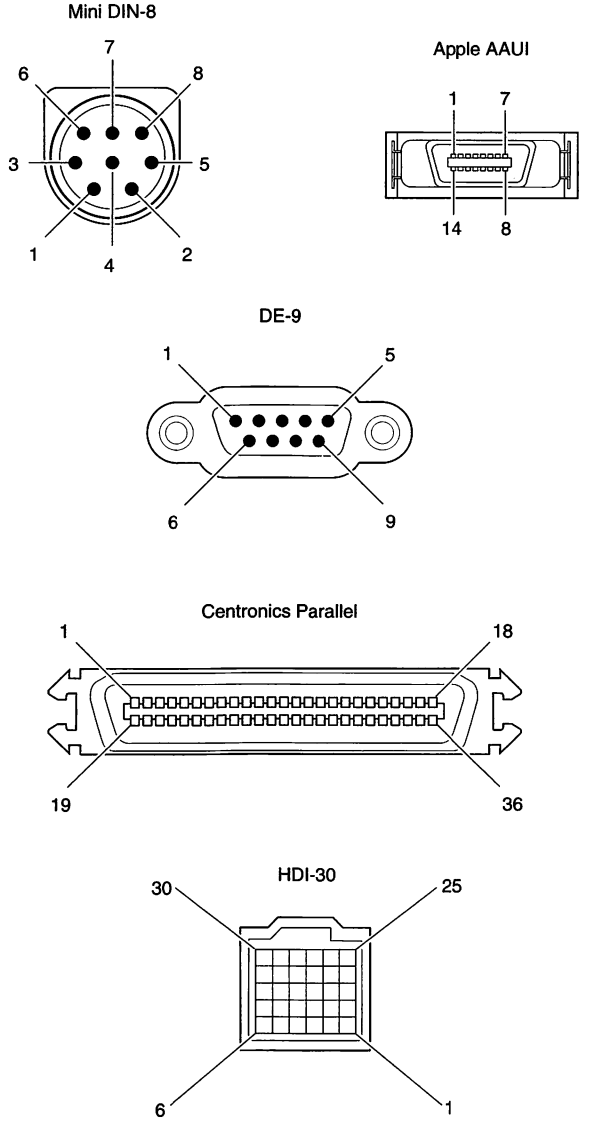


Figure 3 Cable Connectors

Printer Connectors

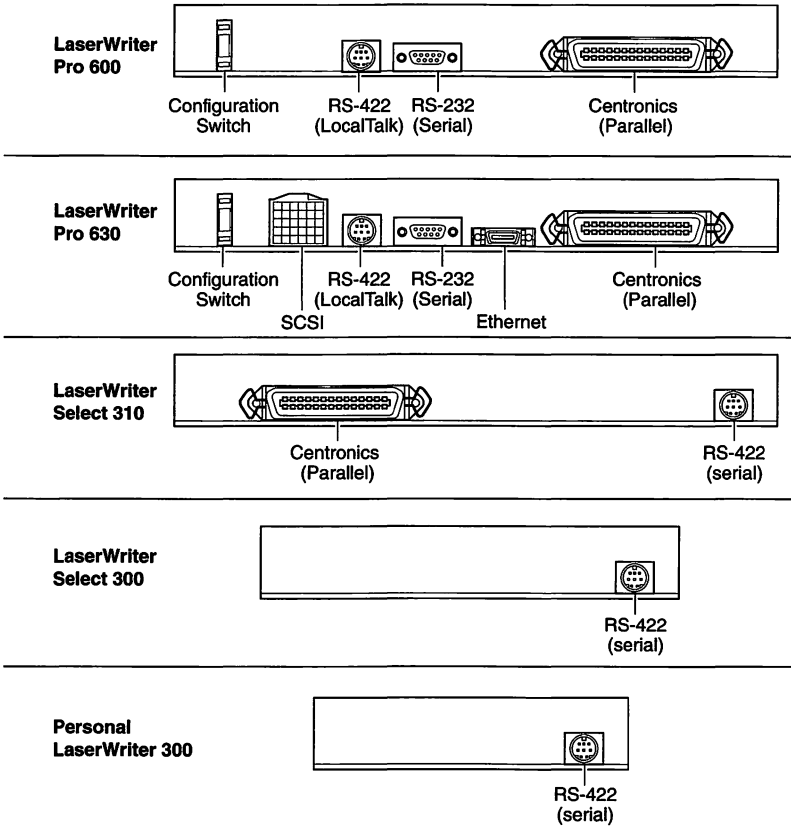


Figure 4 External Connectors on the Printers

LaserWriter Pro 600/630 Pinouts – RS-422		
Pin	**Signal Name**	**Signal Description**
1	HSKo	Handshake out
2	HSKi	Handshake in
3	TxD-	Transmit Data -
4	GND	Signal Ground
5	RxD-	Receive Data -
6	TxD+	Transmit Data +
7	GPi	General-Purpose input
8	RxD+	Receive Data +
Connector type: mini DIN-8 male		

LaserWriter Pro 600/630 Pinouts – RS-232		
Pin	**Signal Name**	**Signal Description**
1	DCD	Data Carrier Detect
2•	RxD	Receive Data
3•	TxD	Transmit Data
4	DTR	Data Terminal Ready
5•	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	Ring	Ring Indicator
• The LaserWriter Pro needs only 2, 3, and 5, but a connected device may require the others. For example, to exchange information with an MS-DOS computer using the DSR/DTR handshake, pins 6 (DSR) and 4 (DTR) on the RS-232 port of the LaserWriter Pro must be connected to their counterparts on the MS-DOS computer.		

LaserWriter Pro 600/630 Pinouts – HDI-30 SCSI Connector (Pins 1-15)		
Pin	**Signal Name**	**Signal Description**
1	SCSI-Mode/	SCSI disk mode enable signal
2	Data0/	Data bit 0
3	GND	Signal ground
4	Data1/	Data bit 1
5*	Termpwr	+5 volts termination power
6	Data2/	Data bit 2
7	Data3/	Data bit 3
8	GND	Signal ground
9	ACK/	Acknowledge
10	GND	Signal ground
11	Data4/	Data bit 4
12	GND	Signal ground
13	GND	Signal ground
14	Data5/	Dat bit 5
15	GND	Signal ground
* Termination power is not provided on the PowerBook 100.		

LaserWriter Pro 600/630 Pinouts – HDI-30 SCSI Connector (Pins 16-30)		
Pin	**Signal Name**	**Signal Description**
16	Data6/	Dat bit 6
17	GND	Signal ground
18	Data7/	Dat bit 7
19	PARITY/	Data parity
20	GND	Signal ground
21	REQ/	Request
22	GND	Signal ground
23	BUSY/	Busy
24	GND	Signal ground
25	ATN/	Attention
26	C/D/	Control/data
27	RST/	Reset
28	MSG/	Message
29	SEL/	Select
30	I/O/	Input/output
Connector: 30-pin high-density interconnect (HDI-30)		

LaserWriter Pro 630 Pinouts – Ethernet		
Pin	**Signal Name**	**Signal Description**
1	FN Pwr	+12 volts @ 175 mA or +5 volts @ 420 mA
2	DI-A	Data In circuit A
3	DI-B	Data In circuit B
4	VCC	Voltage common
5	CI-A	Control In circuit A
6	CI-B	Control In circuit B
7	+5V	+5 volts (from host)
8	+5V	Secondary +5 volts (from host)
9	DO-A	Data Out circuit A
10	DO-B	Data Out circuit B
11	VCC	Secondary voltage common
12	NC	Reserved
13	NC	Reserved
14	FN Pwr	Secondary +12 volts or +5 volts
Shell	Protective Gnd	Protective ground
Connector type: Custom 14-pin .05-inch spaced ribbon		

LaserWriter Pro 600/630 and Select 310 Pinouts – Parallel Port	
Pin	**Signal Description**
1	Data strobe
2	Data 1
3	Data bit 7
4	Data parity
5	Signal ground
6	Request
7	Signal ground
8	Busy
9	Signal ground
10	Attention
11	Control/data
12	Reset
13	Message
14	Select
15	Input/output
16	Signal ground
17	Chassis ground
18	No connection
19-30	Signal ground
31	Prime
32	Fault
33-36	No connection
Connector type: TRW CINCH 57-30360 or equivalent	

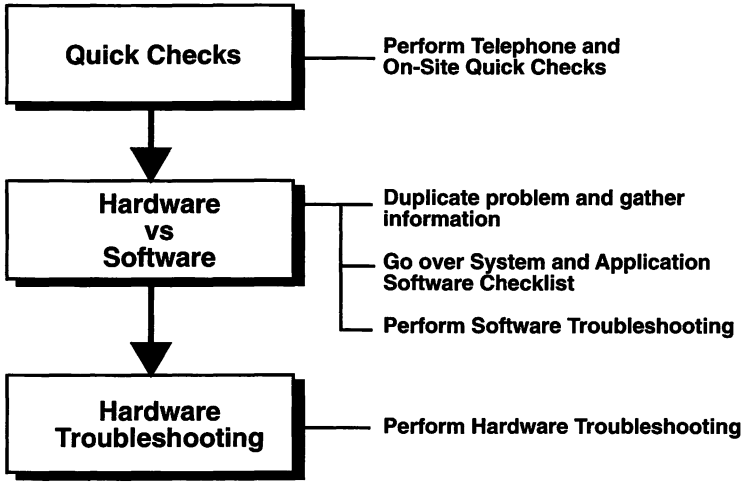
LaserWriter Select 310 Pinouts – RS-232		
Pin	**Signal Name**	**Signal Description**
1	DTR	Data Terminal Ready (output)
2	DSR	Data Set Ready (input)
3	TxD-	Transmitted Data -
4	SG	Signal Ground
5	RxD-	Received Data -
6	SG	Signal Ground
7	NC	No Connection
8	NC	No Connection
Shield	PG	Protective Ground

LaserWriter Pro 600/630 Switch Settings			
Switch Position	**Port Name**	**Type of Connection**	**Mode**
0	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript PostScript PostScript PostScript
1	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript HP PCL 4 PostScript HP PCL 4
2	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript PostScript PostScript PostScript
3	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript * PostScript HP PCL 4
4	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript PostScript PostScript PostScript
5	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript PostScript PostScript PostScript
6	8-pin/RS-422 RS-232 Ethernet Parallel	Serial Serial EtherTalk Centronics	PostScript PostScript PostScript PostScript
7	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript PostScript PostScript PostScript
8	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript HP PCL 4 PostScript HP PCL 4
9	8-pin/RS-422 RS-232 Ethernet Parallel	LocalTalk Serial EtherTalk Centronics	PostScript PostScript PostScript PostScript

* Not arbitrated for input

Troubleshooting Tips

The following diagram illustrates the overall approach you should use when troubleshooting an Apple LaserWriter printer. You will find information about each action in this section.



Telephone and On-Site Quick Checks

- ✓ Check the power source and power connection.
- ✓ Check all cables and cable connections.
- ✓ Confirm that the toner cartridge is installed and has toner.
- ✓ Confirm that the paper cassette is installed and has paper.
- ✓ Confirm that the LaserWriter access door is closed.
- ✓ Check the status lights.
- ✓ Check the print density adjustment.
- ✓ Check the switch settings, if applicable.
- ✓ Confirm whether the printer produces a user test page. (The LaserWriter Pro 600/630 printers generate a user test page 2 to 3 minutes after you switch on the printer, unless the function has been turned off with the LaserWriter Utility. The Personal LaserWriter 300 and LaserWriter Select 300/310 printers do not produce a user test page.)

Information Gathering

If quick checks do not identify the problem, try duplicating the problem and gather as much information as possible, including the following:

- A description of the problem (no power, unable to print from the computer, print quality bad, paper jam)
- The operating condition and environment when the problem occurs (model of computer and LaserWriter; whether printer is networked; LaserWriter Driver version; system software and version; application software and version)
- Exactly what the customer is doing when the problem occurs
- What has been changed or added to the system if the problem only appeared recently
- What the customer has done to fix the problem and the results
- Whether the problem is continuous or intermittent
- Whether the LaserWriter can print a user test page (if applicable)

Problem Identification

Using the information obtained from the customer or from on-site observation, identify whether the problem resides in one of the following functional areas—software, hardware, or network environment.

Network Environment

The problem is most likely a network problem if any of the following conditions exists:

- Two or more users on the network experience the same symptoms.
- The printer successfully prints both a user test page and a service test page (if applicable), and the computer and software are known-good.
- Users experience "poor performance" symptoms (for example, the printer takes longer to print than before).
- The printer or other network devices have been moved from one location to another.

Note To troubleshoot and repair network problems, refer to the *Networking and Communications Apple Service Guide*.

Software Environment

The problem is most likely a software problem if any of the following conditions exists:

- The printer successfully prints both a user test page and a service test page, but does not print when connected to a computer (provided the computer and network hardware components are known-good).
- The user is attempting to print using pre-release, public-domain, or untested software (applications, fonts or drivers).
- The same problem occurs when the software is used with other known-good LaserWriter printers.

Hardware Environment

The problem is most likely a hardware problem if any of the following conditions exists:

- The printer is unable to print a user or service test page (if applicable).
- The printer shows obvious, physical signs of damage.
- The printer emits unusual noises or smells.
- The printer indicates a paper jam or paper-out condition.
- The print quality of the test print is not acceptable.
- The printer has no power.

Software Troubleshooting

If you suspect a software problem, follow these steps:

1. Check the LaserWriter switch settings (if applicable).
2. Check the cables and cable connections.
3. Verify that the LaserWriter driver software is installed in the System Folder using the Installer, and that the version number is current.
4. Open the Apple menu and select the Chooser.
5. Click the appropriate LaserWriter icon and verify that the printer is selected.
6. Open the File menu and choose Print Directory or Print Window.
7. If a printout of the directory is produced, the printer and network are functioning properly. Perform software checks as directed in the System and Application Software Checklist section that follows.
8. If a printout of the directory is not produced, perform software checks as directed in the System and Application Software Checklist section that follows. If this approach does not fix the problem, your customer probably has a hardware problem. Refer to the appropriate troubleshooting flowcharts and tables later in this manual.

System and Application Software Checklist

When troubleshooting systems and application software, perform the following checks:

✓ **Confirm whether the problem is peculiar to one application (try replicating the problem using another application). If the application is at fault, try the following:**

Problem	Solutions
The message "Application is busy or missing" appears	1. Make sure application is installed on drive. 2. Launch application rather than document. If application launches, it is not corrupted.
Program incompatible with system software	1. Contact vendor about program update. 2. Remove program from system.
Program corrupted	1. System crashes can corrupt the program and the system software. Trash the program. 2. Reinstall the program and system software from original, locked disks.

✓ **Confirm whether the problem is with system software (try booting from a floppy) or with multiple System Folders (use Find File under the Apple menu).**

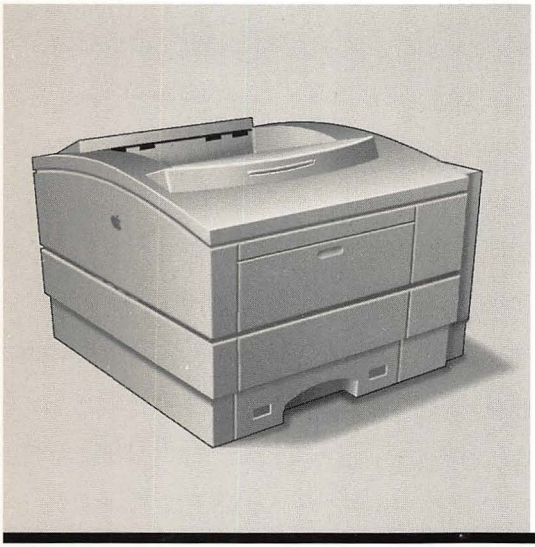
Problem	Solutions
Multiple system folders	– Remove all system folders except folder with the Macintosh icon on it.
Corrupted system software	– Trash the old system software. Use Installer on original, locked system software disks to install new system software.

Important **When replacing corrupted system software, avoid introducing new problems—always use the Installer on the original system software disks. If you remove the System folder before running the Installer, you will need to replace any custom enhancements, such as fonts, sounds, etc., from the previous system folder on your customer's system. Make copies of your customer's fonts and desk accessories before running the Installer.**

Hardware Troubleshooting

If you suspect you have a printer hardware problem, refer to the troubleshooting flowcharts and tables in the appropriate printer tab section in this manual.

LaserWriter Pro 600/630



Exploded View—Main Printer

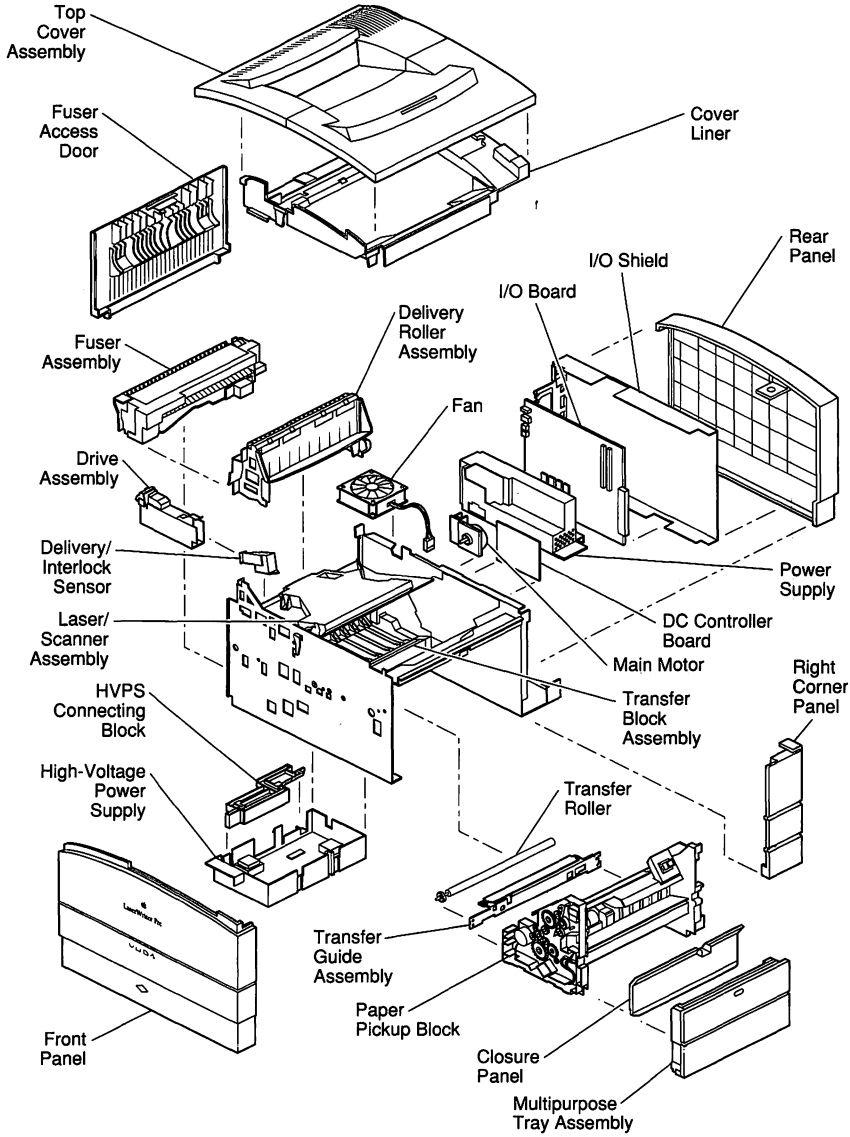


Figure 1 LaserWriter Pro 600/630 Exploded View

A4 cassette 922-0384
Cable cover 922-0273
Cassette guide (left) 922-0245
Cassette guide (right) 922-0249
Cassette stop cover 922-0222
Cleaning brush 922-0240
Closure panel 922-0253
Controller board connectors shield 922-0259
Cover liner 922-0229
DC controller board 661-0807
DC controller mount 922-0257
Delivery/interlock sensor 922-0299
Delivery roller assembly 922-0292
  Delivery assembly piece parts kit 076-0675
  Delivery frame 922-0293
  Drive belt 922-0209
  Drive belt end plate 922-0294
  Lower delivery roller 922-0296
  Upper delivery guide 922-0298
  Upper delivery roller 922-0297
  Upper passive delivery roller 922-0295
Engine interface cable 922-0213
Engine spring kit 076-0678
Drive assembly 922-0274
Fan 922-0202
Fan duct A 922-0254
Fan duct B 922-0255
Fan shield 922-0256
Feeder guide 922-0265
Foot 922-0247
Fuser access door 922-0233
Front panel 922-0231
Fuser assembly (110/115) 661-0805
Fuser assembly (220/240) 661-0806
  Delivery sensing lever 922-0308
  Fuser cable cover 922-0306
  Fuser cable guide 922-0315
  Fuser connector cable 922-0314
  Fuser cover cap (left) 922-0305
  Fuser cover (left) 922-0309
  Fuser cover (right) 922-0304
  Fuser heating bulb (110/115 V) 922-0310
  Fuser heating bulb (220/240 V) 922-0311

Exploded View—Envelope Feeder

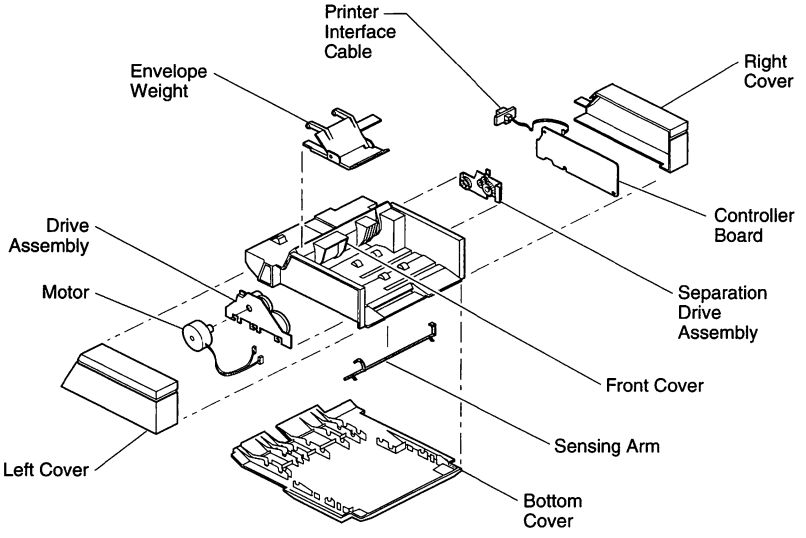


Figure 2 LaserWriter Pro Envelope Feeder Exploded View

Envelope Feeder Parts List

Note The LaserWriter Pro envelope feeder is for use with the LaserWriter Pro 600 and 630 models only.

Bottom cover	922-0123
Bushing/ring/spring kit	076-0663
Cable clamp	922-0142
Controller board	661-0797
Drive assembly	922-0141
Envelope weight	922-0127
Envelope weight arm	922-0128
Feed roller, secondary	922-0134
Feeder frame	922-0122
Ferrite core	922-0148
Front cover	922-0130
Gear kit	076-0662
Guide plate	922-0131
Guide plate ground	922-0132
Guide plate grounding cable	922-0133
Left cover	922-0129
Motor	922-0121
Passive roller shaft	922-0138
Pickup roller shaft, forward	922-0146
Pickup roller shaft, rear	922-0145
Pressure block	922-0136
Primary feed shaft	922-0147
Printer interface cable	922-0139
Right cover	922-0124
Roller/pin kit	076-0664
Screw kit	076-0665
Sensing arm	922-0137
Separation assembly	922-0144
Separation assembly coupling	922-0135
Separation assembly shaft	922-0140
Separation drive assembly	
Separation drive plate	922-0143
Sizing guide	922-0125
Tray extension	922-0126

Exploded View—Sheet Feeder

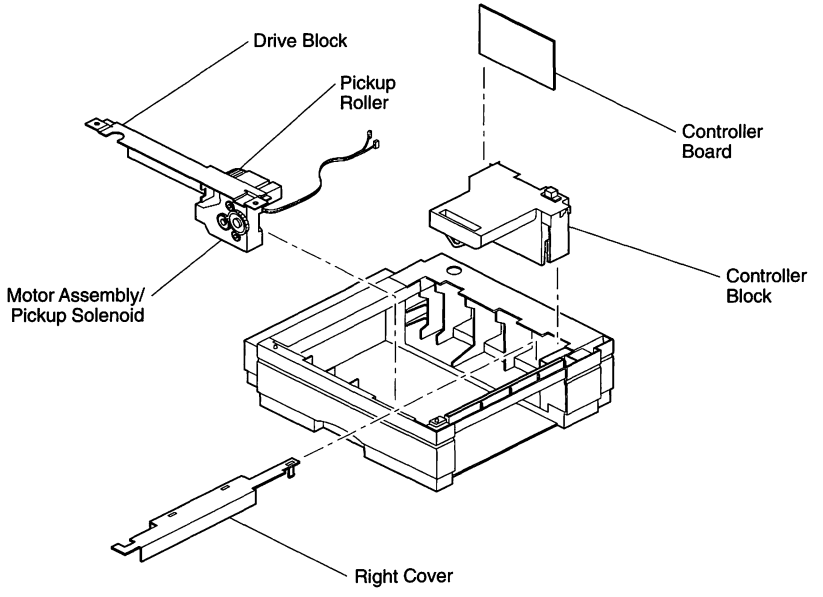


Figure 3 LaserWriter Pro Sheet Feeder Exploded View

Sheet Feeder Parts List

Note The LaserWriter Pro sheet feeder is for use with the LaserWriter Pro 600 and 630 models only.

500 sheet cassette	922-0179
Base pan	922-0159
Base pan foot	922-0160
Bushing/spring/washer kit	076-0668
Cassette size actuator	922-0163
Cassette size actuator cover	922-0162
Controller block	922-0161
Controller block cover	922-0155
Controller board	661-0798
Drive block	922-0483
Drive block mount	922-0169
Drive block plate	922-0168
Feeder roller	922-0170
Feeder roller housing	922-0165
Feeder shaft	922-0172
Guide rail	922-0167
Motor assembly	922-0149
Paper weight	922-0177
Passive roller housing	922-0166
Passive roller mount	922-0175
Pendulum	922-0176
Pickup cam	922-0171
Pickup roller	922-0178
Pickup shaft	922-0173
Pickup solenoid	922-0174
Front panel	922-0157
Front panel support rod	922-0158
Gear kit	076-0666
I/O shield bracket	922-0260
Left frame	922-0153
Left panel	922-0164
Rear panel	922-0151
Rear panel grounding plate	922-0156
Right cover	922-0154
Right frame	922-0152
Screw/ring kit	076-0667

RAM SIMM Configuration Guidelines:

Socket 1 can hold a SIMM with one or two DRAM banks.
Socket 2 can hold a SIMM with one DRAM bank. Socket 2 may never contain a two-bank SIMM.
Socket 2 may be loaded with a single-bank SIMM only if socket 1 contains a single-bank SIMM.

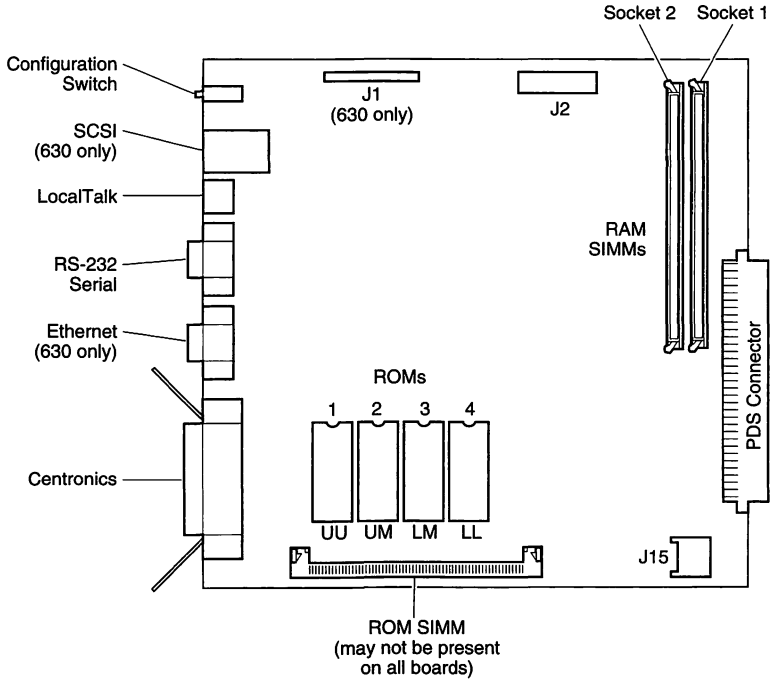


Figure 4 LaserWriter Pro 600 and 630 I/O Board

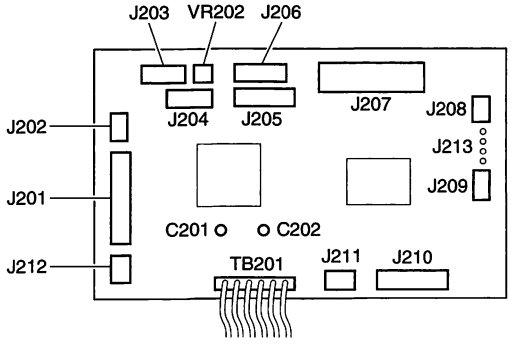


Figure 5 LaserWriter Pro 600 and 630 DC Controller Board

Specifications

Print Engine Specifications	
Marking Engine	Canon LBP engine
Printing Method	Electrophotography using single-component microfine toner
Optical System	Semiconductor laser and a rotating six-faced prism scanning mirror
Print Resolution	600 dpi* (300 dpi when PhotoGrade is enabled) *The LaserWriter Pro 600 and 630 require 8 MB of RAM in order to print in PhotoGrade or to print at 600 dpi.
Print Capacities and Materials	Standard Cassette (250 sheets): A4, B5, legal, letter, or executive plain paper (16–24 lb.) Cassettes available: letter, A4, or universal Multipurpose Tray (100 sheets) Plain paper from 7.16 in. by 10.1 in. to 8.5 in. by 14 in. (16–32 lb.), envelopes, and fuser-compatible labels and film Lower Cassette (500 sheets) A4, B5, legal, letter, or executive plain paper (16–24 lb.) Cassette available: universal Envelope Feeder (75 envelopes) COM-10, DC, Monarch, C5, B5 (recommended envelope); from 3.54 in. by 7.44 in. to 7.0 in. by 10.0 in. (Do not use envelopes with clasps, snaps, windows, or synthetic materials. Envelopes with peel-off adhesive strips or double sealable flaps must use fuser-compatible adhesive.)
Speed	8 pages per minute (letter or A4) 6 envelopes per minute (optional envelope feeder)
Dimensions	Height: 11.61 in. (295 mm) Width: 16.69 in. (424 mm) Depth: 16.37 in. (416 mm) Weight: 40.7 lb. (18.5 kg)
Operating Requirements	50–90.5° F (10–32.5° C) 20–80% relative humidity
Power Requirements	U.S./Japan: 100–115 VAC, 50–60 Hz Europe/Australia: 220–240 VAC, 50 Hz
Macintosh Requirement	System Software 6.0.5 or later
External Hard Drives	LaserWriter Pro 630 only— Up to 7 drives

I/O Board Specifications	
Processor	Motorola 68030 (25 MHz)
RAM	8 MB, expandable to 32 MB
ROM	2 MB standard
Expansion	40-pin processor direct slot (PDS)
Pinouts	LocalTalk, RS-232, Centronics, SCSI (630 only), Ethernet (630 only)
Settings	Use configuration switch or the LaserWriter Utility to set communication protocols. The setting of the configuration switch affects the configuration of all the pinouts. See the user's guide for switch settings.
Imaging Languages Supported	QuickDraw, PostScript Level 2, and HP PCL 4

Printer Diagnostic

The LaserWriter Pro has self-diagnostic capability built into the I/O board. When the printer is in diagnostic mode, the LEDs are displayed in special diagnostic sequences.

Note In diagnostic mode, the normal functioning of the LEDs is suspended. The LED configuration has no correlation with Ready, Low-Toner, Paper Out, or Paper Jam status.

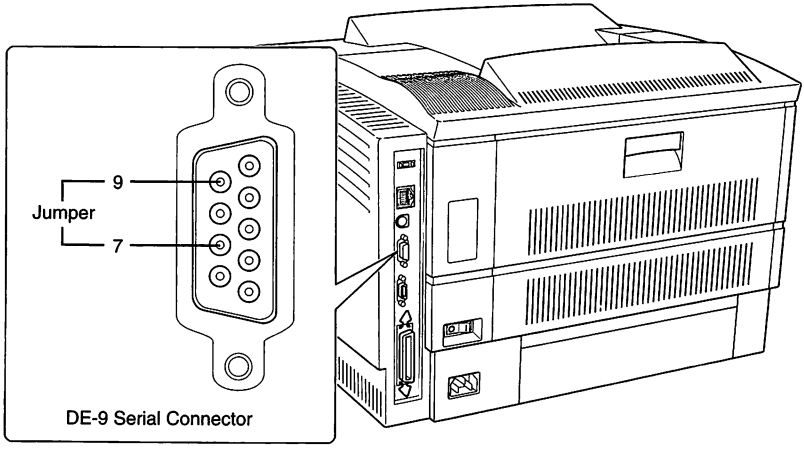


Figure 6 DE-9 Serial Connector

To put the LaserWriter Pro into diagnostic mode, follow these steps:

1. Switch off the printer.
2. Install a cassette tray and toner cartridge.
3. Jumper pins 7 and 9 on the I/O board DE-9 connector, as shown in Figure 6.
4. Switch on the printer.

At this point, the LEDs should flash during startup for about 15 seconds and then fix on the "diagnostic executing" (see Figure 7) configuration for about two minutes.

Note If the "diagnostic executing" LEDs persist longer than two or three minutes, an unknown error exists.

If no error is found, all LEDs come on and two pages print. See Figure 7 to interpret the diagnostic LEDs.

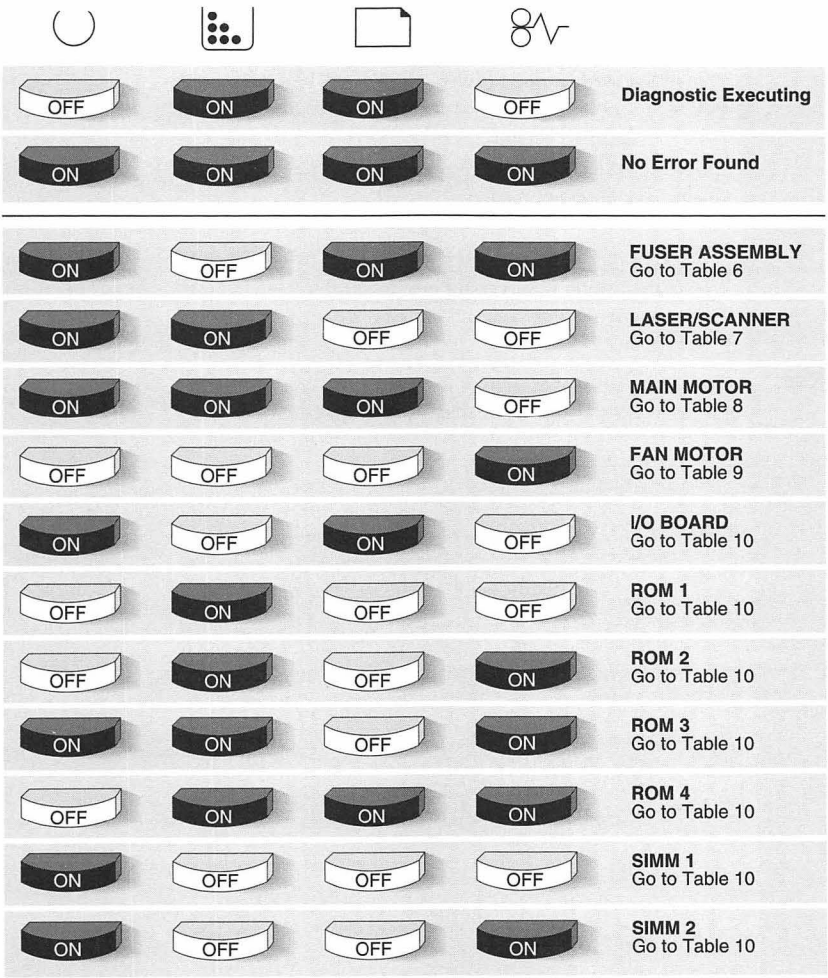


Figure 7 Diagnostic LEDs

If the diagnostic LEDs indicate a fault, go to the appropriate troubleshooting table under "Troubleshooting the LaserWriter Pro 600/630."

▲Caution **Remember to remove the jumper after reading the LED configuration.**

Test and Configuration Pages

An operational LaserWriter Pro can print three special pages. Each page indicates information that can isolate problems and/or identify the configuration of the printer. These three pages are

- Startup test page
- Service test page
- Configuration page

The printer generates a startup test page two to three minutes after you switch on the printer. Successful printing of this page indicates that the I/O board is operational.

Note The startup test page may not print due to software disabling. Use the LaserWriter Utility to enable the startup test page.

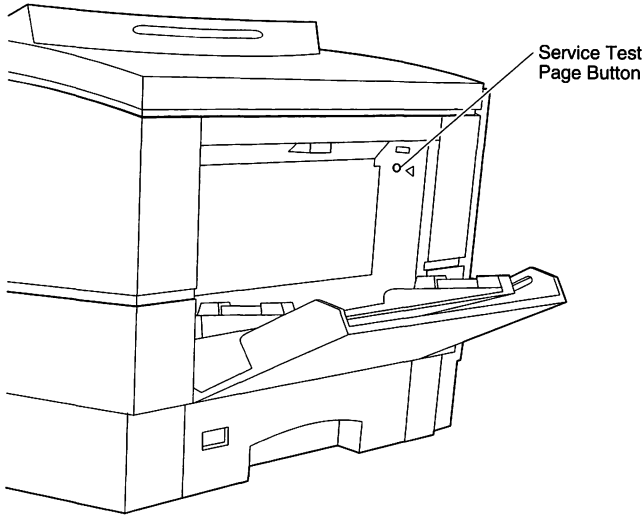


Figure 8 Service Test Page Button

The printer generates a service test page when you press the service test page button. (See Figure 8.) To access the service test page button, open the multipurpose tray. The button is located in the upper right corner of the opening. The button is small and difficult to see against the black plastic. Use a paper clip or similar tool to press the button. Successful printing of this page indicates that the printer engine is operational.

The printer generates a configuration page when you issue the "Print Configuration Page" command with the LaserWriter Utility.

The configuration page provides the following valuable information:

- Network address settings
- Amount and allocation of RAM memory and readout of EEROM integrity
- Switch configurations
- HP LaserJet emulator version
- Startup page setting (on or off)
- LaserWriter serial number
- Timeout settings
- System administrator password
- SCSI ID (LaserWriter Pro 630 only)
- Halftone screen settings
- Default margin offsets

If possible, always print a configuration page before calling Apple Technical Assistance Center.

Before you begin troubleshooting, check the printer setup and operating conditions described in the following section, Pre-Power-On Checklist. If the problem persists, refer to the flowchart later in this troubleshooting section.

The flowchart directs you to perform various tasks and refer you to specific troubleshooting tables. Perform each step in the troubleshooting tables in order, and refer as necessary to the wiring diagram that follows the tables.

Retry the printer each time you change its physical state—such as when you replace a component—until the problem is resolved. If you replace a module and find that the problem remains, reinstall the original module before proceeding.

When the printer is repaired, perform the necessary preventive maintenance before returning it to the customer. Make sure you are familiar with all procedures described in the "Safety" section in the front of this guide before performing any live electrical checks.

Pre-Power-On Checklist

Check the following items before proceeding with the troubleshooting flowchart or tables:

- Line voltage is OK (U.S.: 115 VAC ± 10%; Int'l.: 220 VAC ± 10%).
- Printer is installed on a solid, level surface.
- Room temperature is 50–90° F (10–32.5° C).
- Humidity is 20–80%.
- Printer is not located in a hot or humid area, near open flames, or in a dusty location.
- Printer is not exposed to ammonia gas.
- Printer is not in direct sunlight.
- Printer is installed in a well-ventilated area.
- Cables and connectors are OK.
- Toner cartridge is installed and has toner.
- Paper cassette is properly loaded with paper.
- Paper is within specifications.
- Top cover and fuser door are closed.
- Fuser roller levers are in a down position.

Troubleshooting Tips

This section contains important information regarding the LaserWriter Pro. Read through this section before troubleshooting the printer. The procedures in this section are referenced from the troubleshooting tables.

Multimeter Probes

The connectors within the LaserWriter Pro are very small and require sharp needle-point probes to make good contact. Do not use probes that do not make proper contact.

Note To see whether a set of probes works properly, test resistance at connector J210 on the DC controller board in the following manner (the cable must be connected to the board):

Set your multimeter to resistance and insert the probes at pins 1 and 10. If the reading indicates continuity, then the probes are making good contact. If the reading indicates infinite resistance, then the probes do not make contact and should not be used with the LaserWriter Pro.

Forcing a Feed Cycle

If you want to print from anything other than the standard 250-sheet cassette tray, you must be connected to a CPU and select the feed option that you want (see Maintaining I/O Connectivity later in this section). It is not possible to print a service test page from any source other than the standard cassette.

Interrupting a Print Cycle

Interrupting a print cycle and inspecting the photosensitive drum can help isolate the cause of print quality problems. To inspect the drum, run a print and wait until the paper clears the synchronization pause at the registration paper sensor. Open the toner access door, remove the toner cartridge, and pull back the shield to inspect the drum.

If the image on the surface of the drum exhibits the same problem as the printed page, the fault exists at some point before the drum, probably somewhere in the imaging system.

If the image on the drum is OK, the fault exists at some point after the drum, probably in the fuser assembly, transfer block, or high-voltage power supply.

Maintaining I/O Connectivity

When you remove the I/O shield, you disrupt the connection between the I/O board and the DC controller board, thus preventing the printer engine from communicating with an external computer. When it is necessary to maintain this connection during troubleshooting (for example, to force a feed cycle from the multipurpose tray or to change settings with the LaserWriter Utility), you must remove the printer interface cable and temporarily install a Quadra 900/950 floppy drive 20-pin cable between connectors A and B, as shown in Figure 9. This cable has the extra length needed for the I/O shield to rest flat on the work surface. Do not disconnect power supply cable J15, the I/O-CPU cabling, or the AC power cable.

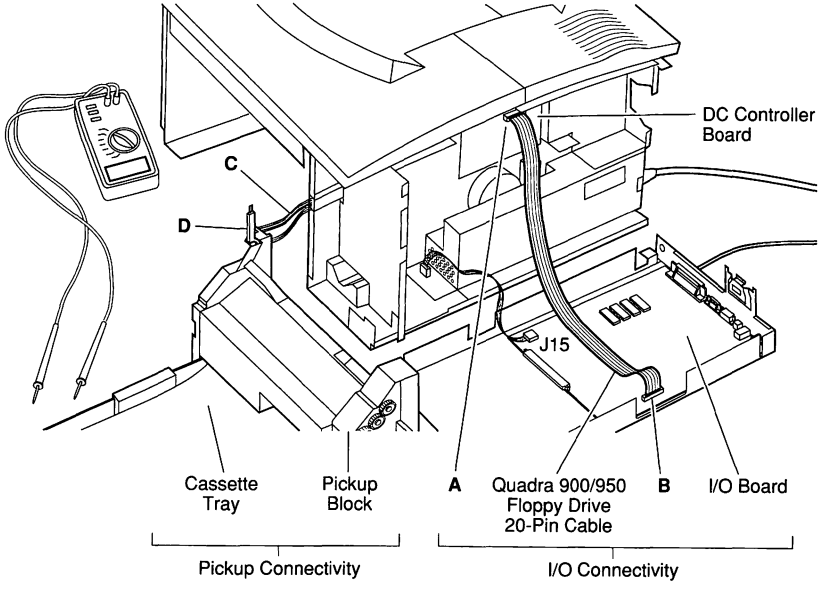


Figure 9 Maintaining Connectivity

Maintaining Pickup Connectivity

The following procedure enables you to take voltage readings from the paper pickup block. Refer to the LaserWriter Pro wiring diagram for an illustration showing the connector layout of the solder-side of the pickup controller board.

1. Disable the startup test page using the LaserWriter Utility.
2. Remove the pickup block.
3. Reconnect cables J601 and J603 (C in Figure 9).
4. Load paper into the cassette tray and install the cassette tray into the pickup block.
5. Press down the top cover interlock actuator and force the interlock switch closed by wedging in the hooked end of the green cleaning brush (D in Figure 9).
6. Reinstall the top cover and cover liner and close the lid.
7. Install the envelope feeder or sheet feeder if you need to test feed from those sources.

▲Caution **Do not let the pickup controller board brush up against the metal chassis while you are performing this procedure.**

Drum Exposure

Make sure you cover the toner cartridge during servicing. Prolonged exposure to light can result in print quality problems. If damage has occurred, store the toner cartridge in a dark place. The drum returns to its normal condition after about 24 hours.

Setting Fuser Rollers

Two small levers at each end of the fuser set the fuser rollers into either a down position (print mode) or an up position (jam-release mode). Apple ships the printer with the rollers in an up position to protect rollers against deformation. The two levers must be set in a down position for proper fusing to take place (see Figure 10). If you are experiencing fusing problems of any kind, first confirm that these levers are in a down position.

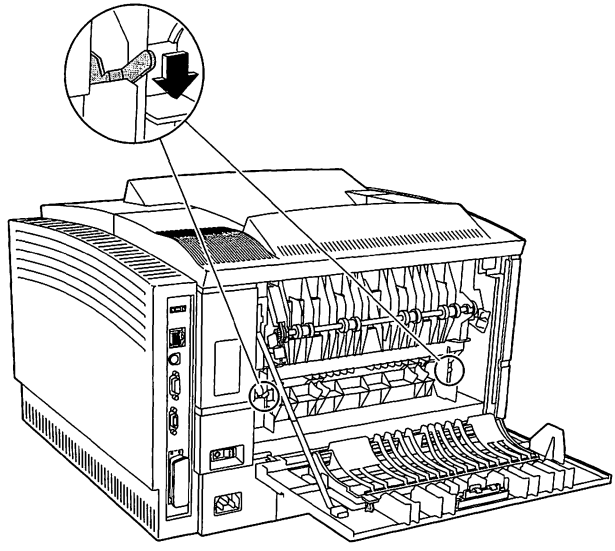


Figure 10 Setting Fuser Rollers

Sensing System

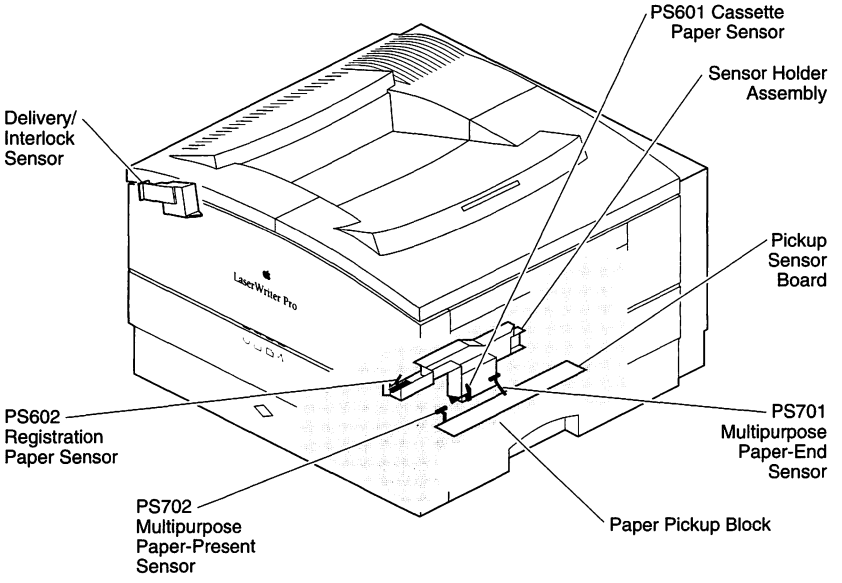


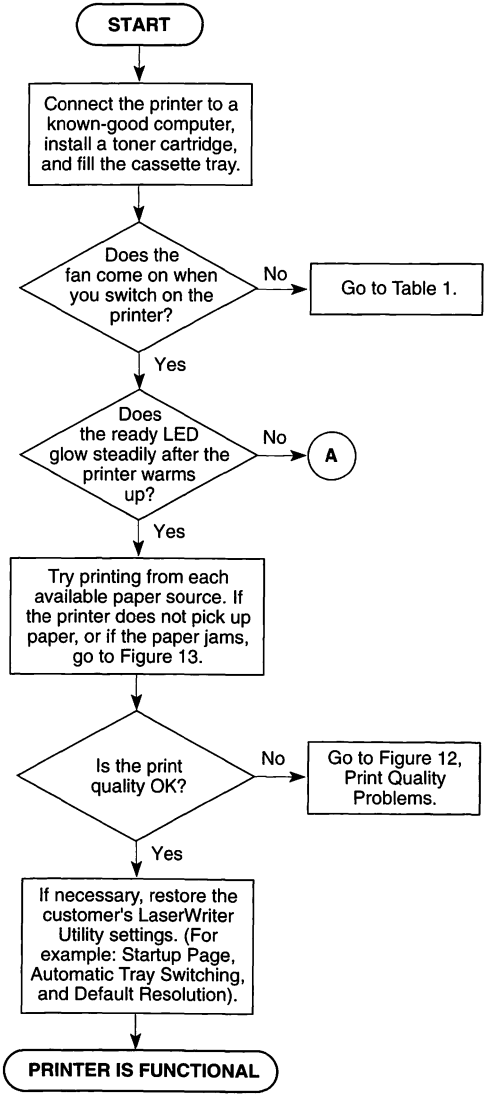
Figure 11 Sensing System

The LaserWriter Pro has four paper sensors and one dual-action sensor (see Figure 11).

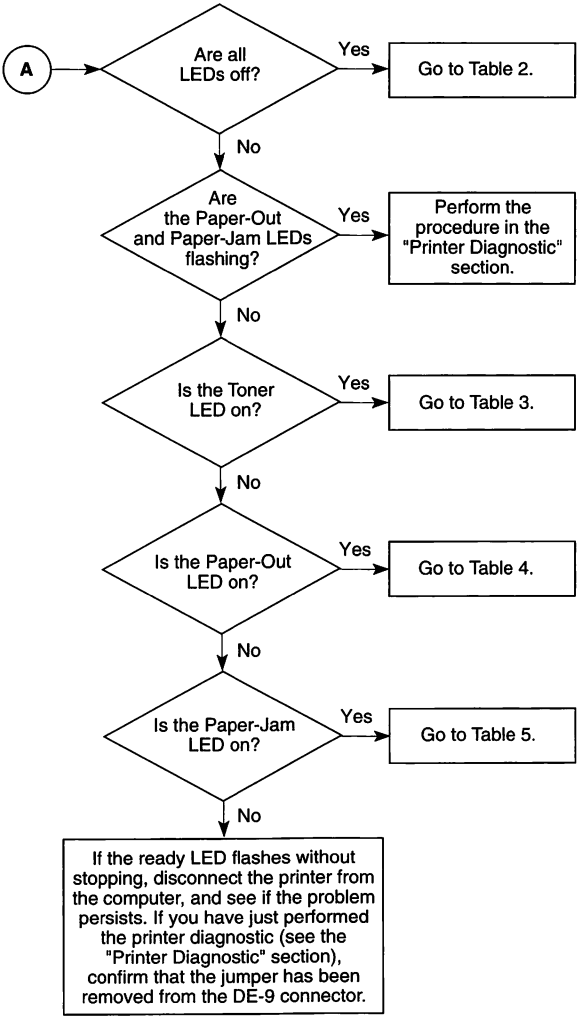
- Cassette paper sensor PS601 senses presence of paper in the cassette.
- Registration paper sensor PS602 senses the arrival of paper at the photosensitive drum.
- Multipurpose paper-end sensor PS701 senses the length of paper that feeds from the multipurpose tray.
- Multipurpose paper-present sensor PS702 senses the presence of paper in the multipurpose tray.
- Delivery/interlock sensor PS201 senses closure of the fuser access door and the exiting of paper from the fuser assembly.

Note The sheet feeder has a paper-present sensor PS851, and the envelope feeder has a paper-present sensor PS931.

LaserWriter Pro 600/630 Troubleshooting Flowchart



LaserWriter Pro 600/630 Print Engine Check (1 of 2)



LaserWriter Pro 600/630 Print Engine Check (2 of 2)

Troubleshooting Tables

Important **As you proceed through the steps in a table, remember to retry the printer each time you change its physical state—such as when you replace a module. If the problem remains, reinstall the original module before proceeding to the next step in the table. Refer as necessary to the wiring diagram that follows the tables.**

Table 1 Fan Does Not Come On When You Start Up the Printer

Step	Check	Result	Action
1	Remove the rear panel and I/O shield. Is the DC controller board cable securely connected to J103 on the power supply?	No	Secure the cable.
2	Is the fan cable securely connected to J209 on the DC controller board?	No	Secure the cable.
3	Do any of the motors rotate after the printer starts up?	Yes	Replace the fan. If the problem persists, replace the DC controller board.
		No	Replace the power supply. If the problem persists, replace the DC controller board.

Table 2 All LEDs Are Off After Printer Warmup (1 of 2)

Step	Check	Result	Action
1	Are the top cover and fuser door closed?	No	Close them completely. In normal operation, no LEDs illuminate if either door is open.
2	Is the plastic tab actuator on the fuser door intact?	No	Replace the fuser door.
3	Is the cover interlock arm on the top cover intact?	No	Replace the cover interlock arm.
4	Remove the rear panel and I/O shield. Is the status panel cable securely connected to J204 on the DC controller board?	No	Secure the cable.

Table 2 All LEDs Are Off After Printer Warmup (2 of 2)			
Step	**Check**	**Result**	**Action**
5	Can you print despite the fact that no LEDs illuminate?	Yes	Check connections between the status panel and the DC controller board. If the connections are secure, replace the status panel.
6	Place probes between J208-2 (GND) and J208-3 (PSNS). Does the voltage rise to 5V as you open the fuser door?	No	Replace the delivery/interlock assembly.
7	Place probes between J201-1 (GND) and J201-7 (+5 V). Does the voltage measure 5 V?	No	Replace the DC controller board.
8	Press the top cover interlock leaf spring. Do you hear the clicking sound of a microswitch when you press the spring?	No	If you have just reassembled the printer after servicing the pickup block, make sure you have installed the black plastic actuator behind the pickup controller board.
9	Remove the top cover and delivery roller assembly. Is the purple cable between the delivery/interlock sensor and the DC controller board securely connected?	No	Secure the cable.
10	Remove the paper pickup block and maintain pickup connectivity. Place probes between J601-11 (GND) and J601-7 (+5V) on the solder-side of the pickup controller board. Does voltage measure 5 V?	Yes No	Replace the pickup controller board. Replace the DC controller board-to-pickup controller board cable.

Table 3 Toner LED Is On After Printer Warmup			
Step	**Check**	**Result**	**Action**
1	Try a known-good toner cartridge. Does the problem persist?	No	Problem solved.
2	Have you recently serviced the printer and has this symptom existed ever since?	Yes	You probably did not fully reseat the high-voltage power supply, high-voltage connecting block, or transfer block assembly. Make sure these modules are securely installed.
3	Remove the toner cartridge and inspect all the toner contacts for damage or excess toner buildup. Are all the contacts clean and in good condition?	No	Clean or repair the contacts if possible. Otherwise, replace the transfer block assembly.
4	Remove the rear panel and I/O shield. Place probes between J210-6 (HVRST) and J210-10 (GND) and switch on the printer. Does the voltage change from 0 to 5 V about one second after the printer starts up?	No Yes	Replace the DC controller board. Perform the first module exchange below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the high-voltage power supply. • Replace the power supply-to-HVPS interface board. • Replace the transfer block assembly. • Replace the DC controller board-to-HVPS cable.

Table 4 Paper-Out LED Is On After Printer Warmup			
Step	**Check**	**Result**	**Action**
1	Are the actuator tabs on the cassette intact?	No	Replace the cassette.
2	Remove the cassette. Is the cassette paper sensing lever broken?	Yes	Replace the sensor holder assembly.
3	Defeat the cassette paper sensing lever by pushing it and holding it in (as if a cassette were present). With your other hand, press the three microswitch leaf springs all at the same time. Does the Ready LED illuminate after a couple of seconds?	Yes	Replace the pickup controller board.
4	Remove the rear panel and I/O shield. Place probes between J201-7 (+5 V) and J201-1 (GND) on the DC controller board. Switch on the printer. Does the voltage measure 5 V?	No	Replace the DC controller board.
5	Remove the paper pickup block and maintain pickup connectivity. Place probes between J601-11 (GND) and J601-7 (+5 V) on the solder-side of the pickup controller board. Does voltage measure 5 V?	No	Replace the DC controller board-to-pickup controller board cable.
6	Place probes between J605-3 (1STS) and J605-5 (GND). Does the voltage measure 5 V?	No	Replace the pickup controller board.
7	Keep the probes in the same position and manually trip the cassette paper sensing lever. Does the voltage drop to 0 V when you trip the lever?	No Yes	Replace the sensor holder assembly. Replace the DC controller board.

Table 5 Jam LED Is On After Printer Warmup (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Is the delivery/interlock sensor snagged?	Yes	Remove the top cover and delivery roller assembly, and unsnag the sensor spring.
2	Is the delivery-sensing lever snagged? (Open the spring-loaded separation guide on the fuser assembly and flick the end of the sensing lever immediately outside the fuser rollers. The lever should move freely.)	Yes	Remove the top cover and delivery roller assembly and see what is snagging the lever. If necessary, remove and dismantle the fuser assembly and replace the delivery-sensing lever.
3	Is the registration-sensing lever snagged? (Remove the toner cartridge and flick the exposed tip of the registration paper sensing lever.)	Yes	If the lever is broken or snagged, remove the pickup block and troubleshoot further. If necessary, replace the sensor holder assembly.
4	Remove the rear panel, I/O shield, top cover, and delivery roller assembly. Is the purple cable between the delivery/interlock sensor and the DC controller board securely connected?	No	Secure the cable.
5	Place probes between J208-2 (GND) and J208-3 (PSNS). Does the voltage rise to 5 V as you open the fuser door?	No	Replace the delivery/interlock assembly.
6	Place probes between J201-7 (+5V) and J201-1 (GND) on the DC controller board. Does the voltage measure 5 V?	No	Replace the DC controller board.

Table 5 Jam LED Is On After Printer Warmup (2 of 2)			
Step	**Check**	**Result**	**Action**
7	Remove the paper pickup block and maintain pickup connectivity. Place probes between J601-7 (+5V) and J601-11 (GND) on the solder-side of the pickup controller board. Does the voltage measure 5 V?	No	Replace the DC controller board-to-pickup controller board cable.
8	Place probes between J605-6 (RESS) and J605-5 (GND). Does the voltage measure 5 V?	No	Replace the pickup controller board.
9	Keep the probes in the same position and manually trip the registration sensor lever. Does the voltage drop to 0 V when you trip the lever?	No Yes	Replace the sensor holder assembly. Replace the DC controller board.

Important **When there is a failure of the fusing system, the DC controller board shuts off current to the fuser roller heater and charges capacitor C202 on the DC controller board to prevent overheating. If there is a failure of the fusing system, you must turn off the power for about 10 minutes, or manually discharge the capacitor before switching power back on.**

Table 6 Fuser Assembly Error (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Remove the rear panel and I/O shield. Is the fuser assembly cable securely connected to J210 on the DC controller board?	No	Secure the cable.
2	Is the power supply firmly seated?	No	Seat the power supply.
3	Remove the fuser assembly and let it cool to room temperature. Measure the resistance between J743-6 and J743-7 on the fuser assembly. (Refer to the wiring diagram for illustration and pin layout of connector J743.) Does the resistance measure between 180 and 280 kΩ?	No	Disconnect J744 and check for same resistance. Replace the thermistor or the connector cable, as needed.

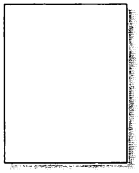
Table 6 Fuser Assembly Error (2 of 2)			
Step	**Check**	**Result**	**Action**
4	Measure the resistance between J743-1 and J743-8 on the fuser assembly. Does the resistance measure approximately 3 Ω or less?	No	If there is continuity through the heater bulb, replace the heater bulb. If there is continuity across the thermoprotector, replace the fuser connector cable. If there is not continuity across the thermoprotector replace the thermoprotector, and proceed to the next step.
5	Reinstall the fuser assembly. Place probes between J212-1 (/FSRD) and TB201-6 (GND) on the DC controller board. Does the voltage change from approximately 5.1 V to 1.5 V a few seconds after the printer starts up?	No	Replace the DC controller board.
6	Place probes between J212-2 (RLD) and TB201-6 (GND). Does the voltage measure approximately 2.1 V?	No Yes	Replace the DC controller board. Replace the power supply.

Table 7 Laser/Scanner Error			
Step	**Check**	**Result**	**Action**
1	Remove the rear panel and I/O shield. Are the laser/scanner cables securely connected at J205 and J206 on the DC controller board?	No	Secure the cables.
2	Remove the top cover and delivery roller assembly. Are all three cables going into the laser/scanner assembly secure?	No	Secure the cables.
3	Remove the two cables that run from the DC controller board to the laser/scanner assembly and check the resistance through each wire. Is the resistance through each wire approximately 1 ohm or less?	No Yes	Replace the defective cable. Perform the first module exchange below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the laser/scanner assembly. • Replace the DC controller board.

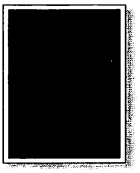
Table 8 Main Motor Error			
Step	**Check**	**Result**	**Action**
1	Remove the rear panel and I/O shield. Is the main motor cable secure at J211 on the DC controller board and at J131 on the main motor?	No Yes	Secure the cable. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the main motor. • Replace the DC controller board. • Replace the main motor cable.

Table 9 Fan Error			
Step	**Check**	**Result**	**Action**
1	Remove the rear panel and I/O shield. Is the fan cable secure at J209 on the DC controller board?	No	Secure the cable.
2	Place probes at J209-1 (FAND) and J209-3 (GND). Does the voltage change from approximately 24.5 to 16 V a few seconds after the printer starts up?	No	Replace the DC controller board.
3	Place the probes at J209-2 (FLOCK) and J209-3 (GND) on the DC controller board. Does the voltage measure 2.2 V or more?	Yes No	Replace the fan. Replace the DC controller board.

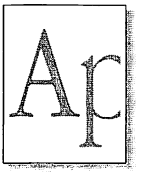
Table 10 I/O Board or Component Errors			
Step	**Check**	**Result**	**Action**
1	Did you receive an I/O board error?	Yes	Replace the I/O board.
2	Did you receive a SIMM error?	Yes	Replace the SIMM. Make sure you adhere to the SIMM configuration guidelines indicated in Figure 4.
3	Did you receive a ROM error?	Yes	Replace the I/O board.



All-Blank Page
See Table 11



All-Black Page
See Table 12



Light/Faded Image
See Table 13

Dark Image
See Table 14

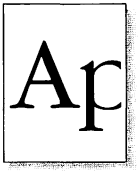
Black Vertical Line(s)
See Table 15

White Vertical Line(s)
See Table 16

Black Horizontal Lines
See Table 17

Bad Registration
See Table 18

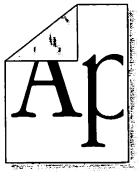
Stairstepping
See Table 19



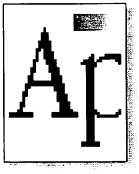
Vertical Distortion
See Table 20

Bad Fusing
See Table 21

Blank Spots
See Table 22

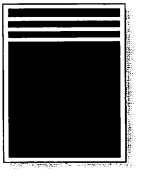


Toner on Back
See Table 23



Grayscale/ Resolution
See Table 24

Repetitive Defects
See Table 25



White Horizontal Stripes
See Table 7

Figure 12 Print Quality Problems

Table 11 All-Blank Page			
Step	**Check**	**Result**	**Action**
1	Is the sealing tape removed from the toner cartridge?	No	Remove the sealing tape.
2	Have you recently installed a laser/scanner unit and has this symptom existed ever since?	Yes	The laser shutter may have been installed incorrectly. The shutter should spring back and forth as you insert the toner cartridge.
3	Does this symptom occur only with envelopes?	Yes	Instruct the customer to adjust margins in the document.
4	Run the printer diagnostic test (see "Printer Diagnostic"). Does the test indicate a specific error?	Yes	Go to the appropriate table, as indicated in Figure 7.
5	Remove the rear panel and I/O shield. Place probes between J210-6 (HVRST) and J210-10 (GND). Does the voltage change from 0 to 5 V about one second after the printer starts up?	No	Replace the DC controller board.
6	Place probes between J210-9 (SLO2) and J210-10 (GND). Does the voltage measure approximately 0.7 V about one second after the main motor starts?	No Yes	Replace the DC controller board. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the high-voltage power supply. • Replace the power supply-to-HVPS interface board. • Replace the transfer block assembly.

Table 12 All-Black Page			
Step	**Check**	**Result**	**Action**
1	Run the printer diagnostic test (see "Printer Diagnostic"). Does the test indicate a specific error?	Yes	Go to the appropriate table, as indicated in Figure 7.
2	Place probes between J210-9 (SLO2) and J210-10 (GND). Does the voltage measure approximately 0.7 V about one second after the main motor starts?	No Yes	Replace the DC controller board. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the high-voltage power supply. • Replace the power supply-to-HVPS interface board.

Table 13 Uniformly Light/Faded Image Over Entire Page			
Step	**Check**	**Result**	**Action**
1	Adjust the density using the LaserWriter Utility. Does the problem persist?	No	Problem solved.
2	Try printing with known-good toner cartridge. Does the problem persist?	No	Problem solved.
3	Run the printer diagnostic test (see "Printer Diagnostic"). Does the test indicate a specific error?	Yes	Go to the appropriate table, as indicated in Figure 7.
4	Replace the transfer roller with a known-good transfer roller. Does the problem persist?	No	Problem solved.
5	Have you recently serviced the printer and has this symptom existed ever since?	Yes	You probably did not fully reseat the high-voltage power supply, high-voltage connecting block, or transfer roller block assembly. Make sure these modules are securely installed.
6	Remove the rear panel and I/O shield. Place probes between J210-9 (SLO2) and J210-10 (GND). Does the voltage read about 0.7 V about one second after the main motor starts?	No Yes	Replace the DC controller board. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the high-voltage power supply. • Replace the power supply-to-HVPS interface board.

Table 14 Uniformly Dark Image Over Entire Page			
Step	**Check**	**Result**	**Action**
1	Adjust the density using the LaserWriter Utility. Does the problem persist?	No	Problem solved.
2	Try printing with know-good paper. Does the problem persist?	No	Problem solved.
3	Run the printer diagnostic test (see "Printer Diagnostic"). Does the test indicate a specific error?	Yes	Go to the appropriate table, as indicated by Figure 7.
4	Clean the printer drum grounding contact and cartridge contact and print a test page. Does the problem persist?	No	Problem solved.
5	Remove the rear panel and I/O shield. Place probes between J210-6 (HVRST) and J210-10 (GND). Does the voltage change from 0 to 5 V about one second after the printer starts up?	No Yes	Replace the DC controller board. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the high-voltage power supply. • Replace the power supply-to-HVPS interface board.

Table 15 Black Vertical Lines, Sharp and Well-Defined			
Step	**Check**	**Result**	**Action**
1	Try a known-good toner cartridge. Does the problem persist?	No	Problem solved.
2	Run the printer diagnostic. Does the diagnostic test indicate a specific error?	Yes	Go to the appropriate table, as indicated in Figure 7.
3	Does the symptom *definitely* occur on a service test page?	No Yes	Replace the I/O board. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the fuser assembly. • Replace the laser/scanner assembly.

Table 16 White Vertical Lines, Sharp and Well-Defined			
Step	**Check**	**Result**	**Action**
1	Try a known-good toner cartridge. Does the problem persist?	No	Problem solved.
2	Is there a hair or other obstruction that can be blocking the laser beam?	Yes	Remove the obstruction.
3	Run the printer diagnostic test (see "Printer Diagnostic"). Does the test indicate a specific error?	Yes No	Go to the appropriate table, as indicated in Figure 7. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the laser/scanner assembly. • Replace the I/O board.

Table 17 Black Horizontal Lines, Sharp and Well-Defined			
Step	**Check**	**Result**	**Action**
1	Try a known-good toner cartridge. Does the problem persist?	No	Problem solved.
2	Does the symptom occur on a service test page?	No Yes	Replace the I/O board. Go to Table 7, Laser/Scanner Error.

Table 18 Bad Registration			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
2	Try printing with less paper at the paper source. Does the problem persist?	No	Problem solved.
3	Run a print from a different paper source. Does the problem persist?	No	Replace or reinstall the faulty pickup roller at the source from which the problem occurs.
4	Remove the rear panel and I/O shield and locate varistor VR202 on the DC controller board. Perform the registration adjustment procedure (refer to *Service Source* for a full description of this procedure). Does the problem persist?	No Yes	Problem solved. Replace the sensor holder assembly.

Table 19 Stairstepping/Vertical Lines Jagged or Shaky			
Step	**Check**	**Result**	**Action**
1	Run a service test page. Does the problem persist?	No	Replace the I/O board.
2	Run the printer diagnostic test (see "Printer Diagnostic"). Does the test indicate a specific error?	Yes	Go to the appropriate Table, as indicated in Figure 7.
		No	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the laser/scanner assembly. • Replace the DC controller board.

Table 20 Vertical Elongation or Foreshortening			
Step	**Check**	**Result**	**Action**
1	Run the printer diagnostic test (see "Printer Diagnostic"). Does the test indicate a specific error?	Yes	Go to the appropriate table, as indicated in Figure 7.
		No	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the main motor. • Replace the DC controller board. • Replace the laser/scanner assembly.

Table 21 Bad Fusing			
Step	**Check**	**Result**	**Action**
1	Are the fuser roller levers in a down position? (See Setting Fuser Rollers under "Troubleshooting the LaserWriter Pro 600/630.")	No Yes	Engage the fuser rollers by setting the two levers in a down position. Go to Table 6, Fuser Assembly Error.

Table 22 Blank Spots/Random Pattern or Location			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
2	Are the humidity conditions within specification?	No	Inform the customer of the changes that are necessary.
3	Are you printing on the correct side of the paper? (Examine the packaging label to see if the manufacturer specifies a print side.)	No Yes	Turn over the paper. Go to Table 21, Bad Fusing.

Table 23 Toner on Back of Page			
Step	**Check**	**Result**	**Action**
1	Is the toner smudge in a small area behind the upper-left corner of the page?	Yes No	Clean or replace the pickup roller. Clean or replace the transfer roller, transfer guide assembly, or lower fuser roller with a dry, lint-free cloth.

Table 24 Cannot Print in PhotoGrade/600 dpi			
Step	**Check**	**Result**	**Action**
1	Are you trying to print in PhotoGrade at 600 dpi?	Yes	The Photograde option is only available if you set resolution to 300 dpi.
2	Restart the printer and inspect the startup page (or use the LaserWriter Utility to run a configuration page). Is there at least 8 MB of RAM installed?	No	You cannot print in PhotoGrade or 600 dpi with less than 8 MB of RAM. If there is one single-sided SIMM installed, someone has downgraded the printer (all LaserWriter Pro printers ship with 8 MB of RAM). If there are two SIMMs installed, run the printer diagnostic (see "Printer Diagnostic") to see if one is bad.
		Yes	Reset default imaging options for the printer with the LaserWriter Utility.

Table 25 Repetitive Defects			
Step	**Check**	**Result**	**Action**
1	Try a known-good toner cartridge. Does the problem persist?	No	Problem solved.
2	Does the symptom occur on a service test page?	No	Replace the I/O board.
3	Is the repetitive staining along the left edge of the paper?	Yes	Clean the feeder rollers with a dry lint-free cloth.
4	Interrupt a print cycle (see Interrupting a Print Cycle under "Troubleshooting the LaserWriter Pro 600/630"). Is the symptom present on the drum?	Yes	Clean or replace the pickup/transfer rollers and guides as required.

Table 26 Printer Picking Up From Wrong Source			
Step	**Check**	**Result**	**Action**
1	Is the selected paper source empty?	Yes	Select paper handling in the LaserWriter Utility and turn off automatic tray switching if you do not want paper to feed from a secondary source when the selected source is empty.
		No	There is a problem with the sensing system. Make sure that automatic tray switching is off and try printing again. If there are jam or pickup problems at that point, refer to Figure 13.

Make sure that the top cover and fuser door are shut, and that a cassette and toner cartridge are installed. Go to the table indicated in Figure 13.

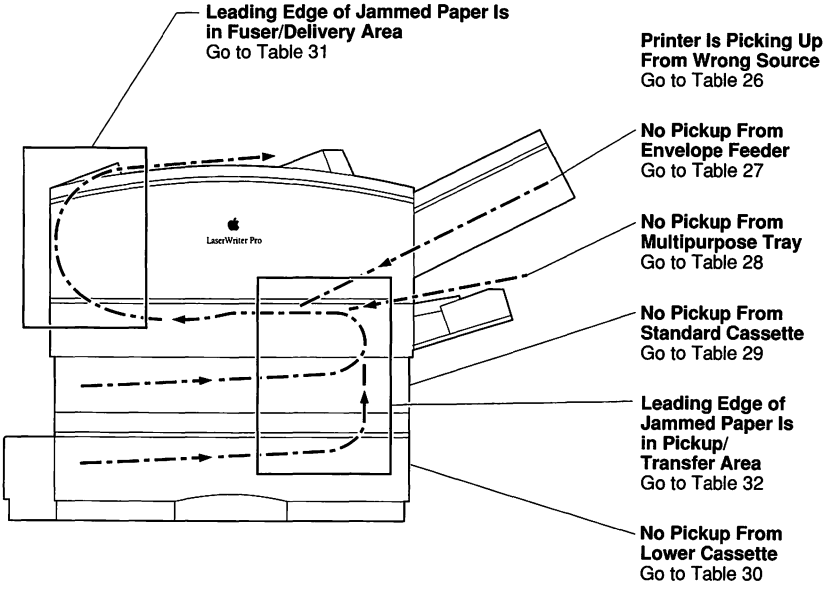


Figure 13 Paper Transport Problems

Table 27 No Pickup From Envelope Feeder			
Step	**Check**	**Result**	**Action**
1	Is paper picking up correctly from the standard cassette?	No	Go to Table 29.
2	Remove the left, right, and bottom covers of the envelope feeder and install the feeder into the printer. Restart the printer. Do the envelope feeder motor and gearing engage after you restart?	Yes	Perform the first module exchange below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the pickup controller board. • Replace the envelope feeder controller board. • Replace the printer interface cable in the envelope feeder. • Replace the printer interface cable in the pickup block.
3	Remove the paper pickup block from the printer and maintain pickup connectivity. You will be taking measurements from the solder-side of the pickup controller board. Place probes between J604-4 (GND) and J604-1 (+24 V). Does the voltage measure 24 V?	No	Replace the pickup controller board.
4	Place probes between J136-1 (+24 VA) and J136-4 (GND) on the receptacle that the envelope feeder plugs into (refer to the wiring diagram for illustration and pin layout of connector J136). Does the voltage measure 24 V?	No Yes	Replace the envelope feeder interface cable. Perform the first module exchange below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the envelope feeder controller board. • Replace the envelope feeder motor. • Replace the printer interface cable inside the envelope feeder.

Table 28 No Pickup From Multipurpose Tray			
Step	**Check**	**Result**	**Action**
1	Is paper picking up correctly from the standard cassette?	No	Go to Table 29.
2	Is the following statement true? Paper picks up correctly if you select Multipurpose Tray in the Print dialog box, but not if you select Manual Feed.	Yes	With Manual Feed you must feed paper a sheet at a time following the on-screen prompt, regardless of whether there is already paper in the multipurpose tray.
3	Is the following statement true? The pickup motor and gearing engage after you try to print to the multipurpose tray, but the multipurpose pickup roller and guide plate never move.	Yes	Replace the multipurpose pickup solenoid.
4	Does the paper-out LED illuminate even though there is paper on the multipurpose tray?	Yes	Inspect the lever for the multipurpose paper-present sensor PS702 (see Figure 11). If is broken or snagged, repair or replace it as needed. If the lever is OK, replace the pickup sensor board.
5	Have you recently serviced the pickup block and has this symptom existed ever since?	Yes	You have probably not reassembled the pickup block correctly, especially if you have removed any of the gearing components. Refer to the *Service Source* left pickup block frame take-apart procedure for more information. Take special note of the components between the multipurpose pickup solenoid and the guide plate spring.

Table 29 No Pickup From Standard Cassette (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Initiate a service test page. Does the printer pick up from the standard cassette?	Yes	Confirm that I/O cable connections are secure and that configuration settings are correct (refer to the user's guide). To make certain that networking or CPU software is not the root problem, confirm through the LaserWriter Utility that the startup page is enabled, and restart the printer. If the startup page prints, there is a software or networking problem away from the printer. If the startup page does not print, replace the I/O board.
2	Do the pickup motor and gearing engage after you restart the printer?	Yes	Confirm that the cassette pickup roller is installed correctly and is in good condition. If the roller is OK, replace the cassette pickup roller solenoid.
3	Remove the rear panel, I/O shield, and right corner panel. Is the pickup controller board cable securely connected to J201 on the DC controller board?	No	Secure the cable.
4	Is the DC controller board cable securely connected to J601 on the pickup controller board?	No	Secure the cable.
5	Is the pickup block motor cable securely connected at J703 on the pickup sensor board?	No	Secure the cable.
6	Disconnect J201 on the DC controller board. Place probes between pins J201-1 (GND) and J201-13 (+24 V) on the male connector on the board. Does the voltage measure 24 V?	No	Replace the DC controller board.

Table 29 No Pickup From Standard Cassette (2 of 2)			
Step	**Check**	**Result**	**Action**
7	Place probes between pins J201-1 (GND) and J201-7 (+5 V) on the male connector on the board. Does the voltage measure 5 V?	No	Replace the DC controller board.
8	Reconnect J201. Remove the paper pickup block and maintain pickup connectivity. Place probes between pins J601-11 (GND) and J601-13 (+24 V). Does the voltage measure 24 V?	No	Replace the pickup controller-to-DC controller board cable.
9	Place probes between pins J601-1 (GND) and J601-7 (+5 V). Does the voltage measure 5 V?	No	Replace the pickup controller-to-DC controller board cable.
10	Place probes between pins J601-1 (GND) and J601-9 (+24 V.) Does the voltage measure 24 V?	No Yes	Replace the pickup controller board. Perform the first module exchange below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the pickup motor. • Replace the pickup sensor board.

Table 30 No Pickup From Lower Cassette			
Step	**Check**	**Result**	**Action**
1	Is paper picking up correctly from the standard cassette?	No	Go to Table 29.
2	Remove the printer from the sheet feeder. Is the pickup roller installed as shown on the label affixed to the sheet feeder housing?	No	Reinstall the pickup roller.
3	Open the lid of the controller block. Is the sensing arm intact and free to swing?	No	Unsnag or replace the arm as needed.
4	Reinstall the sheet feeder and restart the printer. Do the sheet feeder gearing and motor rotate?	Yes	Replace the sheet feeder pickup solenoid. If the problem persists, go to step 7.
5	Do you have another known-good sheet feeder?	Yes	If paper picks up from a known-good feeder, then go to step 7.
6	Remove the printer from the sheet feeder. Remove the printer's top cover, rear panel, and right corner panel. Remove the 4-pin cable from connector J603 along the front edge of the pickup controller board. Place probes between J603-1 (+24 V) and J603-4 (GND) on the pickup controller board. Does the voltage measure 24 V when you switch on the printer?	No Yes	Replace the pickup controller board. Perform the first module exchange below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the sheet feeder controller board. • Replace the sheet feeder controller block. • Replace the sheet feeder motor. • Replace the pickup controller board. • Replace the sheet feeder interface cable.
7	Replace the sheet feeder controller board. Does the problem persist?	No	Problem solved.
8	Replace the sheet feeder controller block. Does the problem persist?	No Yes	Problem solved. Replace the sheet feeder motor.

Table 31 Leading Edge of Jammed Paper Is in Fuser/Delivery Area			
Step	**Check**	**Result**	**Action**
1	Do the delivery rollers turn when you start up the printer?	No	Go to Step 6.
2	Is there crumpled paper just outside the exit point of the fuser assembly?	Yes	A snagged sensing lever is probably the cause of the problem. Remove the top cover and delivery roller assembly, and inspect the delivery/interlock sensor. If the delivery-sensing lever is broken, replace it.
3	Is there accordion-style jamming just short of the paper delivery tray?	Yes	The delivery guide pins might have been installed incorrectly. These are the four small pins on the delivery roller assembly. They should point outward, with the flow of paper.
4	Does jamming occur only when paper feeds from the multipurpose tray?	Yes	Inspect the sensing lever for multipurpose paper-end sensor PS701. Unsnag or replace it if it is damaged. If the problem persists, replace the pickup sensor board.
5	Remove the rear panel and I/O shield. Place probes between J208-2 (GND) and J208-3 (PSNS) on the DC controller board. Does the voltage rise from 0 to 5 V as you open the fuser access door?	Yes No	Replace the DC controller board. Replace the delivery/interlock sensor.
6	Remove the rear panel and I/O shield. Restart the printer and observe the main motor. Does the main motor spin when the printer starts up?	Yes	Trace mechanical drive components from the delivery rollers back to the main motor, taking special note of the delivery drive belt. Clean or replace parts as necessary.
7	Make sure that the main motor is secure at J211 on the DC controller board, then run the printer diagnostic (see "Printer Diagnostic"). Does the diagnostic indicate a main motor error?	Yes No	Go to Table 8. Check main motor drive components for binding or improper installation. Clean or replace parts as required.

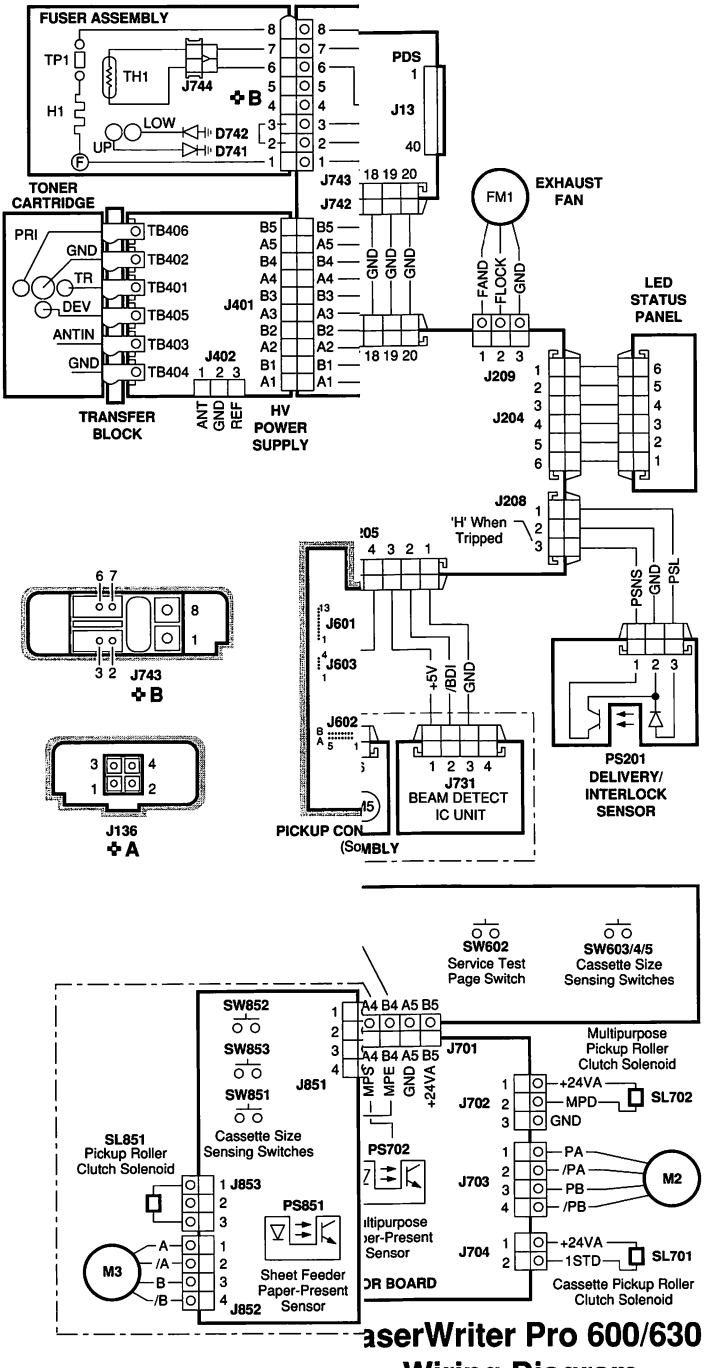
Table 32 Leading Edge of Jammed Paper Is in Pickup/Transfer Area			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
2	Try feeding the paper from one of the other paper sources. Does jamming still occur?	No	Go to Table 33, 34, 35, or 36, as applicable.
3	Remove the toner cartridge, hold the green knob, and lift the delivery guide. Does the registration sensor arm move back and forth freely when you flick it with your finger?	No	Clear it if possible. If the arm is snagged beyond repair, replace the sensor holder assembly.
4	Check for obstructions, especially beneath the upper guide plate situated between the pickup block and the transfer roller. Are there obstructions?	Yes	Clear the obstructions.
5	Is the trailing edge of the jammed paper about an inch short of the registration sensor arm?	Yes	If paper has jammed there, especially if there is no sign of crumpling, there is almost certainly a failure in the delivery sensing system. Go to Table 31.
6	Remove the paper pickup block from the printer and maintain pickup connectivity. You will be taking measurements from the solder-side of the pickup controller board. Place probes between J605-5 (GND) and J605-6 (RESS) and manually trip the registration sensor arm. Does the voltage measure about 5 V (normal) and 0 V (tripped)?	Yes No	Replace the pickup controller board. Replace the sensor holder assembly.

Table 33 Paper Jams in Pickup/Transfer Area When Feeding From the Standard Cassette			
Step	**Check**	**Result**	**Action**
1	Is the black ribbed paper guide firmly seated?	No	Reseat the black ribbed paper guide. If this guide is damaged or unseated, paper may jam at the entrance to the paper pickup block.
2	Is the white passive roller on the cassette OK?	No	Clean the roller so that it forms a smooth gripping surface against the lower feed roller.
3	Is the lower feed roller OK?	No	Replace or reinstall the lower feed roller and /or its gearing. Note that the upper feed rollers serve other paper sources, so they are not likely to be the cause of the problem.

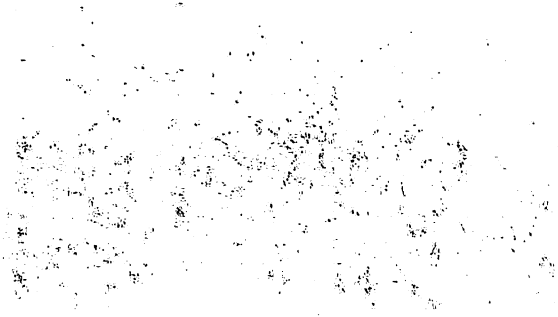
Table 34 Paper Jams in Pickup/Transfer Area When Feeding From the Multipurpose Tray			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
2	Is the multipurpose tray width guide set correctly?	No	Set the guide so that it is snug against the edge of the paper.
3	Is the multipurpose pickup roller slipping when it tries to pull in the paper?	Yes	Reinstall or replace the multipurpose pickup roller. If you have recently taken apart the pickup block gearing and paper has not fed successfully since then, the problem could be incorrect installation of the gears.
4	Are there two sheets at the jam location?	Yes	Replace the multipurpose tray guide assembly.

Table 35 Paper Jams in Pickup/Transfer Area When Feeding From the Optional Sheet Feeder			
Step	**Check**	**Result**	**Action**
1	Is the black ribbed paper guide firmly seated?	No	Reseat the black ribbed paper guide. If this guide is damaged or unseated, paper may jam at the entrance to the paper pickup block.
2	Is the standard 250-sheet cassette installed and in good condition?	No	Paper fed from the sheet feeder passes through the slit in the standard cassette located 2 inches back from the face plate. Make sure the standard cassette is fully inserted and that no blockage exists in this opening.
3	Are the feeder rollers in the sheet feeder OK?	No	The sheet feeder has one primary and two passive feeder rollers. Because power is reaching the pickup roller, any problem would probably be with binding or obstruction in the roller/gear system. Perform the sheet feeder bypass procedure and observe the functioning of the feeder components (see *Service Source* for additional information).

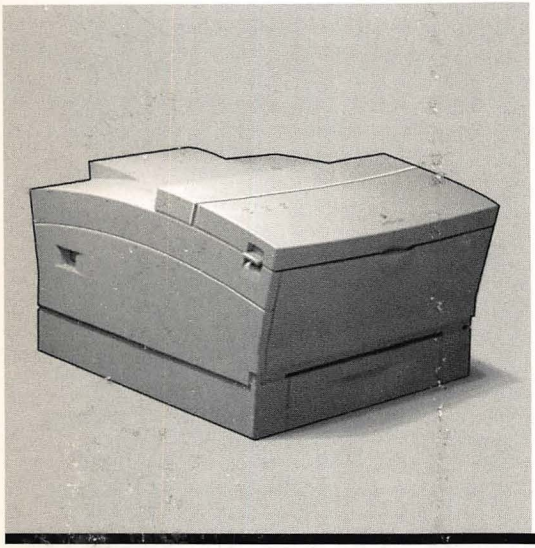
Table 36 Paper Jams in Pickup/Transfer Area When Feeding From the Envelope Feeder			
Step	**Check**	**Result**	**Action**
1	Is the envelope feeder width guide set correctly?	No	Set the guide so that it is snug against the edge of the envelopes.
2	Is the envelope feeder correctly installed into the printer?	No	Reinstall the feeder so that it is mounted solidly onto the black positioning pin in the upper-left corner of the pickup block opening. If the feeder isn't mounted correctly, or if the pin is damaged, the pickup block entrance may not align properly.
3	Have you recently taken the feeder apart and has it exhibited this problem ever since?	Yes	You may not have reinstalled the gear/roller system correctly. Refer to *Service Source* for more information.
4	Is the fork-shaped separation guide installed correctly?	No	There should be a 1.5 mm opening between the separation guide and the primary feed roller. Refer to the Adjustments chapter in the *LW Pro Envelope Feeder* manual on Service Source for more information.



LaserWriter Pro 600/630 Wiring Diagram



LaserWriter Select 300/310



Exploded View

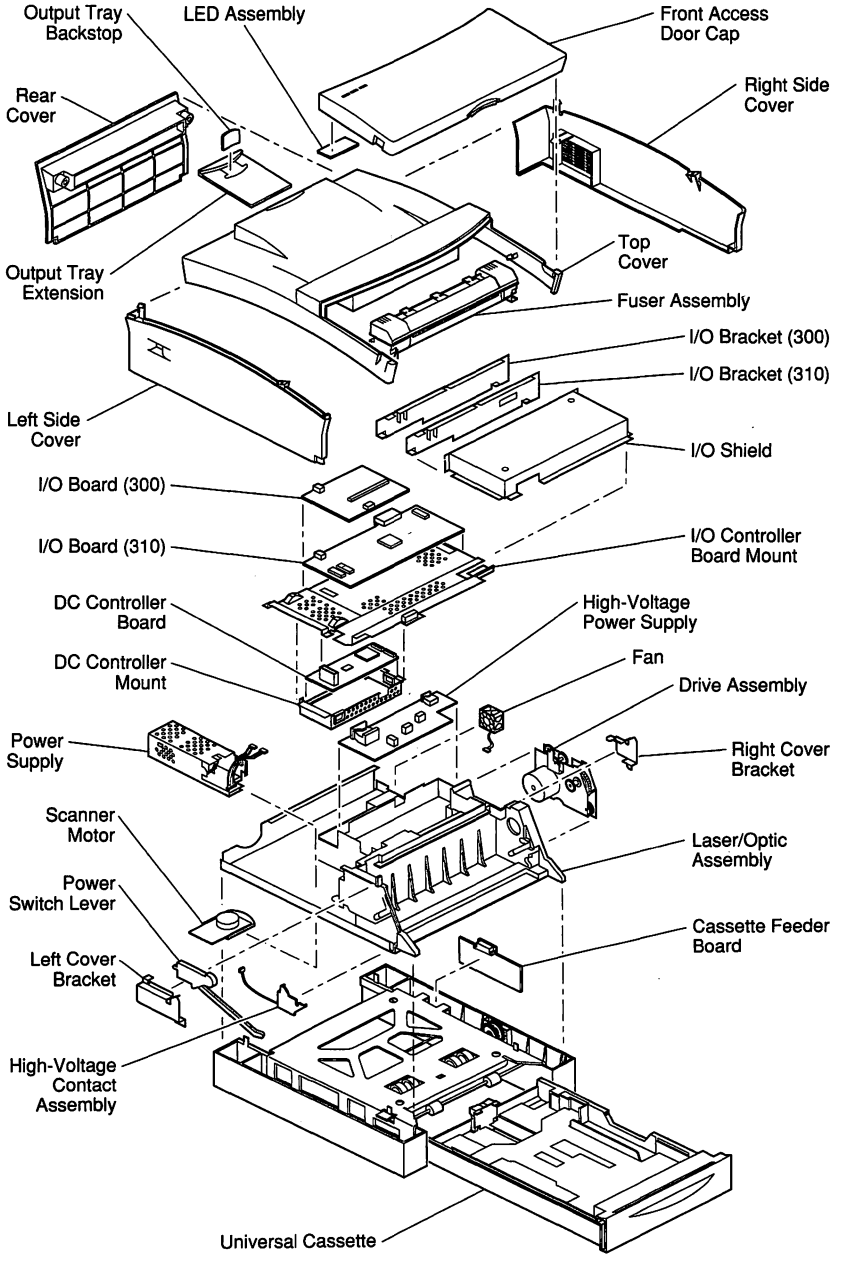


Figure 1 LaserWriter Select 300/310 Exploded View (1 of 2)

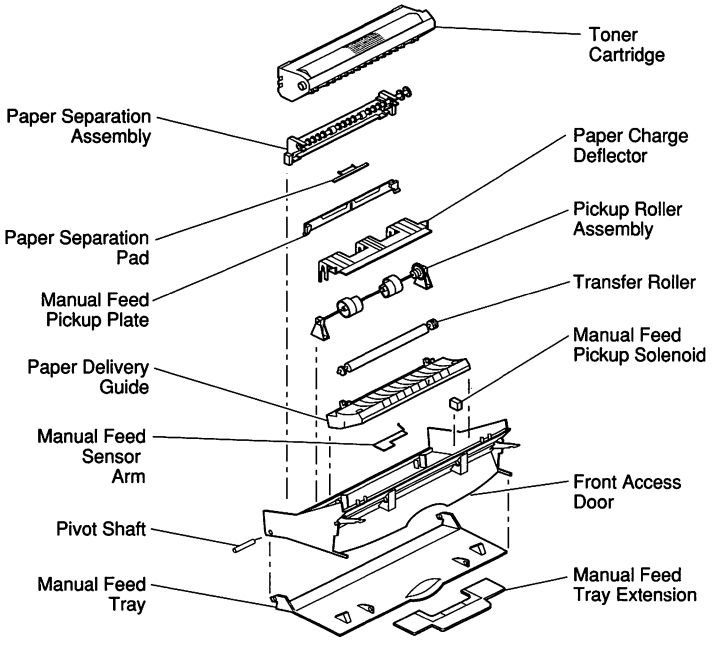


Figure 1 LaserWriter Select 300/310 Exploded View (2 of 2)

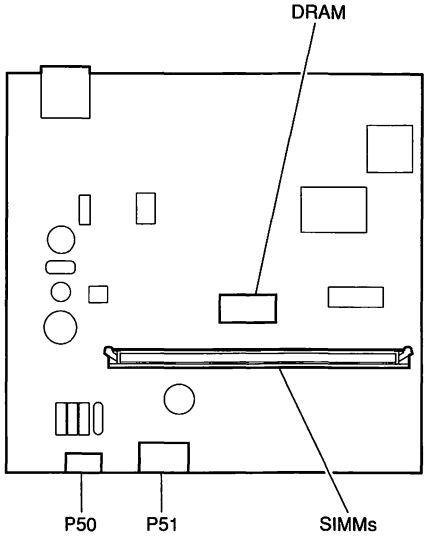


Figure 2 LaserWriter Select 300 I/O Board

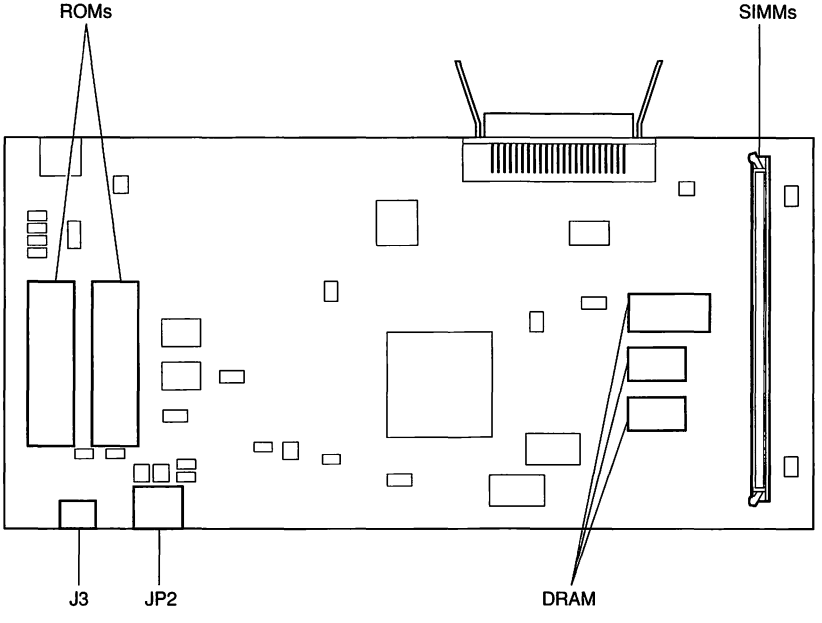


Figure 3 LaserWriter Select 310 I/O Board

Specifications

Print Engine Specifications	
Marking Engine	Fuji Xerox P0 engine
Print Resolution	300 dots per inch (dpi)
Speed	5 pages-per-minute maximum; actual performance depends on the application
Paper Feed	Input: Automatic with paper cassette; automatic or manual with universal tray Output: Face-down
Print Materials	Sizes: letter, legal, A4, B5 Media: 20- to 28-lb. bond paper, letterhead and colored stock, medium-weight transparency material, envelopes, and labels
Paper Capacities	250-sheet universal cassette: letter, A4, B5 250-sheet legal cassette: optional Envelope cassette: optional
Printable Surface	Letter size: 8.0 x 10.5 in. Legal size: 8.0 x 13.0 in. A4: 7.41 x 10.86 in. B5: 7.69 x 10.16 in. Printable area may vary depending upon application
Dimensions	Height: 8.0 in. (25.3 cm) Width: 15 in. (38 cm) Depth: 18.3 in. (46.5 cm) Weight: 26.4 lb. (12 kg)
Operating Requirements	50–90.5° F (10–32.5° C) 20–80% relative humidity
Power Requirements	U.S./Japan: 100–115 VAC, 50–60 Hz Europe/Australia: 220–240 VAC, 50 Hz

I/O Board Specifications		
	Select 300	**Select 310**
Processor	N/A	AMD Am29205; 16 MHz
DRAM	512K, expandable to 1.5 MB or 4.5 MB	1.5 MB, expandable to 5.5 MB
ROM	32K	1 MB, expandable to 2 MB
Interfaces	RS-422	RS-232; Centronics parallel connector
Imaging Languages Supported	QuickDraw	PostScript
Built-in Fonts	39 fonts from the following font families: Avant Garde, Bookman, Chicago, Courier, Geneva, Helvetica, Helvetica Narrow, Monaco, New Century Schoolbook, New York, Palatino, Symbol, Times, Zapf Chancery, and Zapf Dingbat.	13 fonts from the following font families: Courier, Helvetica, Times, and Symbol. Additional PostScript fonts can be downloaded to printer memory.

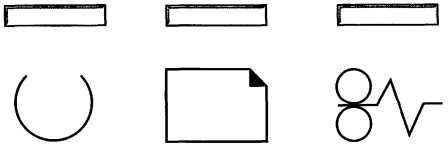


Figure 4 LaserWriter Select 300/310 Status LEDs

The LaserWriter Select has three status LEDs (see Figure 4) located on the top of the printer's front access door:

- Ready – The green Ready LED flashes during printer warmup and when the printer is operating. The LED is steady when the printer is warmed up and ready to print. The LED is off when the printer is not ready, an error condition exists, or the top cover is open.

- Paper-Out – The red Paper-Out LED is on and steady when the printer is out of paper or the paper tray is missing. The LED flashes when the printer is ready to accept manually fed paper.

- Paper-Jam – The red Paper-Jam LED comes on when paper jams inside the printer. The LED remains on until the jam is cleared.

The status LEDs may indicate an error condition within the printer or with the print job. If an error condition exists, the status LEDs indicate the specific error by varying the state of the LEDs (blinking, solid, etc.) These error conditions are driver-specific and may vary depending upon the specific CPU. Check the status of the printer under the Print Monitor of your computer system to determine the specific error condition.

Service Test Page

The LaserWriter Select service test page consists of a line matrix, as shown in Figure 5. The LaserWriter Select printers produce a service test page when you jumper pins P32-1 and P32-2 on the DC controller board. The service test page confirms print engine operation.

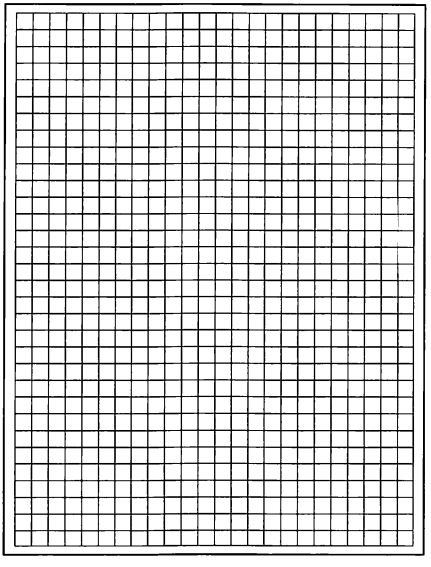


Figure 5 Service Test Page

Note LaserWriter Select 300/310 printers do not produce a startup test page (a page produced when the laser printer is initially switched on).

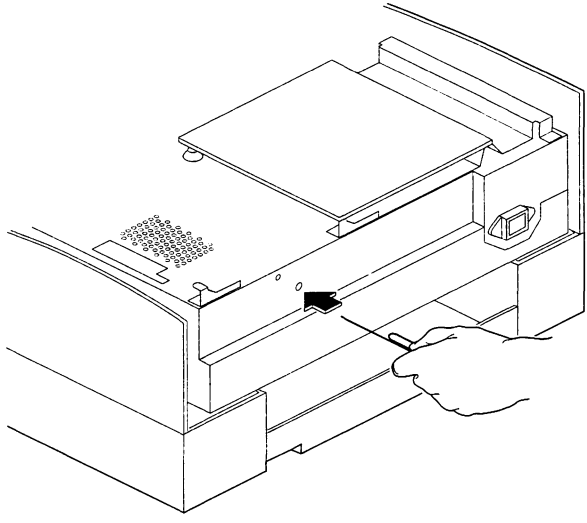


Figure 6 Generating a Service Test Page With I/O Board Intact

To generate a service test page with the I/O board and mount intact, follow these steps:

1. Remove the printer covers.
2. Plug in the printer and switch it on. Wait until the delivery rollers stop rotating.
3. Insert a straightened paper clip in the hole on the back of the I/O board mount, as shown in Figure 6. Move the paper clip back and forth to jumper P32. Remove the paper clip when you hear the fan come on and the transfer rollers begin to rotate. A few seconds later the test page will appear.

To generate a service test page with the I/O board and mount removed, follow these steps:

1. Refer to the Troubleshooting Preparation section under "Troubleshooting the LaserWriter Select." Follow steps 1 through 3.
2. Plug in the printer and switch it on. Wait until the delivery rollers stop rotating.
3. Using a paper clip or jeweler's screwdriver, jumper the two pins at connector P32. (Refer to Figure 7.)

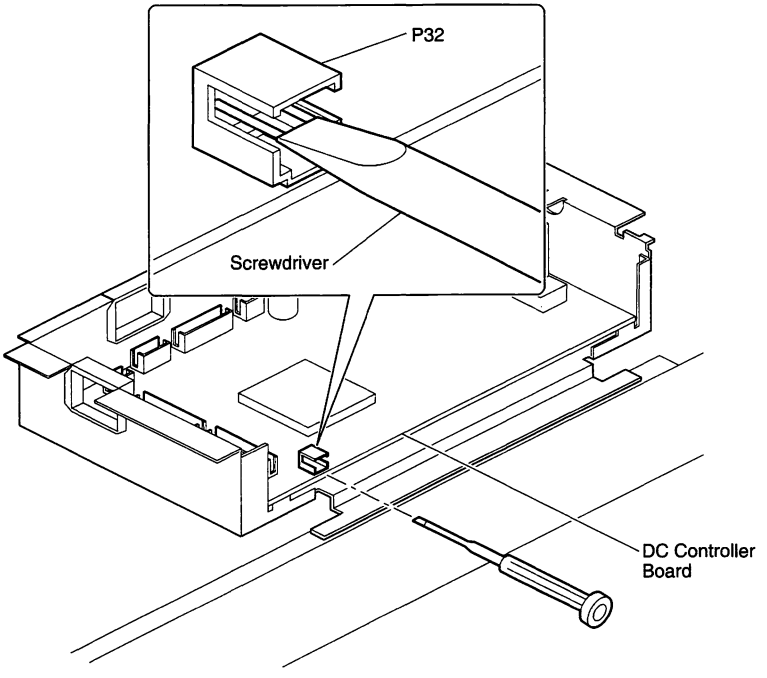


Figure 7 Generating a Service Test Page With I/O Board Removed

4. In order to avoid a paper jam, remove the piece of paper that you previously inserted into the paper delivery sensor (Troubleshooting Preparation, step 3) as soon as the printed page begins to exit the fuser assembly rollers.

RAM Upgrade

The LaserWriter Select 300 has 512K of soldered DRAM. You can upgrade the Select 300 to 1.5 MB by installing a 1 MB SIMM (70 ns or faster) in the DRAM SIMM connector on the I/O board. You can upgrade the printer to 4.5 MB by installing a 4 MB (70 ns or faster) DRAM SIMM.

The LaserWriter Select 310 has 1.5 MB of soldered DRAM. You can upgrade the Select 310 to 2.5 MB by installing a 72-pin, 1 MB (70 ns or faster) SIMM in the DRAM SIMM connector on the I/O board. You can upgrade the printer to 5.5 MB by installing a 72-pin, 4 MB (70 ns or faster) SIMM.

Before you begin troubleshooting, check the printer setup and operating conditions described in the Pre-Power-On Checklist section. If the problem persists, refer to the flowcharts later in this troubleshooting section.

The flowcharts direct you to perform various tasks and refer you to specific troubleshooting tables. Perform each step in the troubleshooting tables in order and refer as necessary to the wiring diagram that follows the tables.

Retry the printer each time you change its physical state—such as when you replace a component—until the problem is resolved. If you replace a module and the problem remains, reinstall the original module before proceeding to the next step in the table.

When the printer is repaired, perform the necessary preventive maintenance before returning it to the customer. Make sure you are familiar with all procedures described in the "Safety" section in the front of this guide before performing any live electrical checks.

Pre-Power-On Checklist

Verify that the following conditions are met before proceeding with the troubleshooting flowcharts or tables:

- Line voltage is OK (115 VAC ± 10%).
- Printer is installed on a solid, level surface.
- Room temperature is between 50–90° F (10–32.5° C).
- Humidity is 20–80%.
- Printer is not located in a hot or humid area, near open flames, or in a dusty location.
- Printer is not exposed to ammonia gas.
- Printer is not in direct sunlight.
- Printer is installed in a well-ventilated area.
- Cables and connectors are OK.
- Toner cartridge is installed and has toner.
- Paper cassette is properly loaded with paper.
- Paper is within specifications.
- Front access door is closed.

Troubleshooting Preparation

In order to troubleshoot the inside of the printer, you must prepare the printer as follows:

1. Remove the printer covers and I/O shield.
2. Remove the I/O board mount and set it at an angle on top of the power supply, as shown in Figure 8.

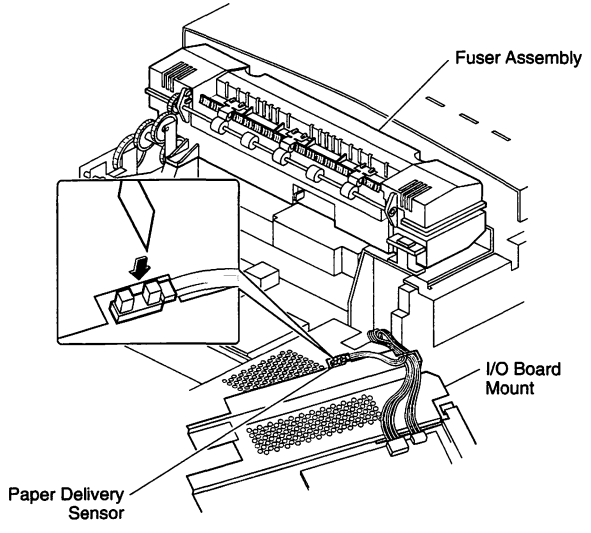


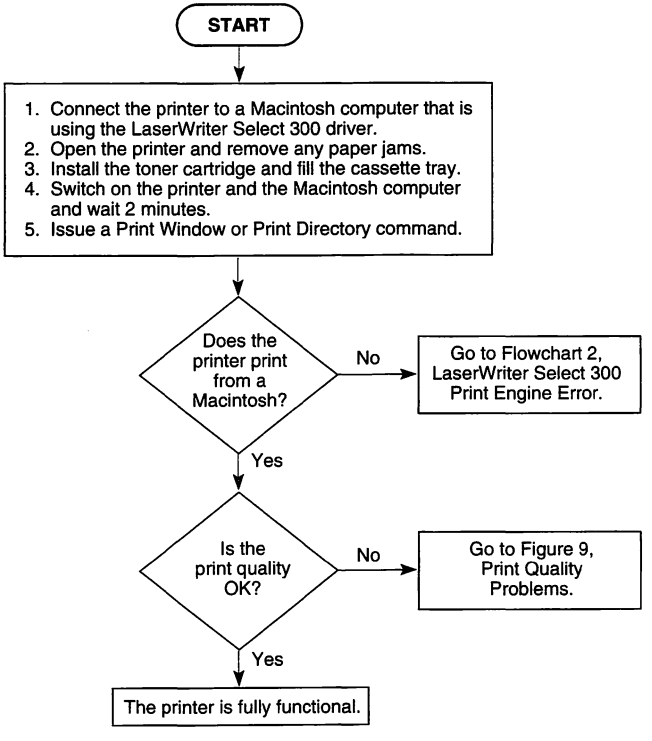
Figure 8 Actuating the Paper Delivery Sensor

Note Be sure to leave the cables that run to the I/O board and the paper delivery sensor connected.

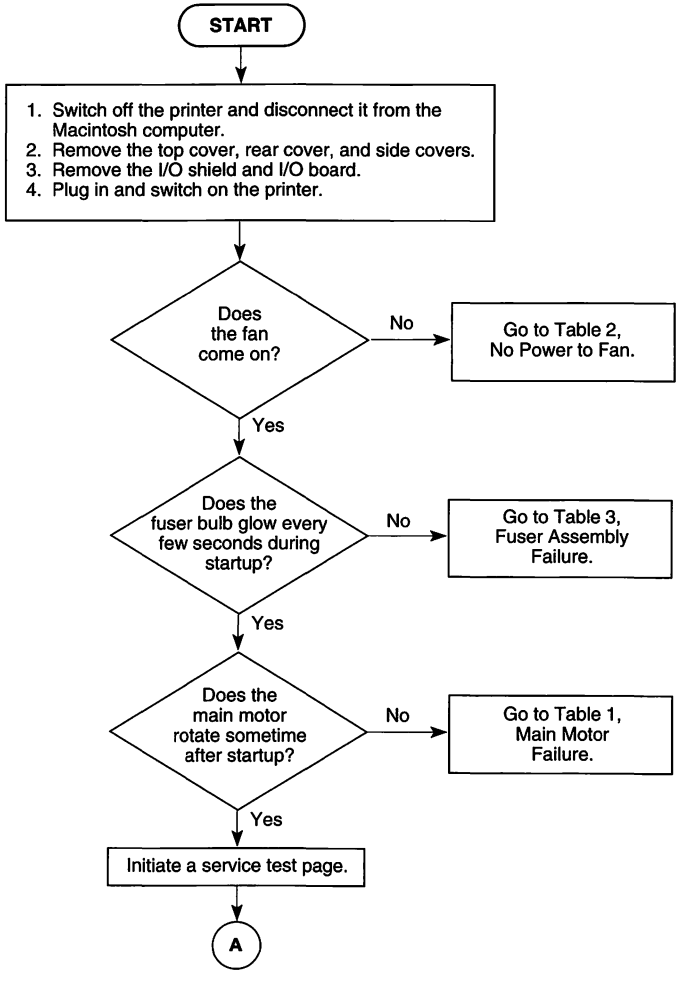
3. Insert a folded piece of paper into the U of the paper delivery sensor (see Figure 8 inset) in order to manually actuate the sensor and put the printer in a ready state.

Note If you try to print a service test page or a page from the Macintosh while the folded paper is in the paper delivery sensor, the paper will jam in the printer. To avoid a paper jam, remove the folded piece of paper from the paper delivery sensor as soon as the printed page begins to exit the fuser assembly rollers. Once the printed page has completely exited the fuser, put the piece of folded paper back in the delivery sensor if you wish to resume troubleshooting the inside of the printer.

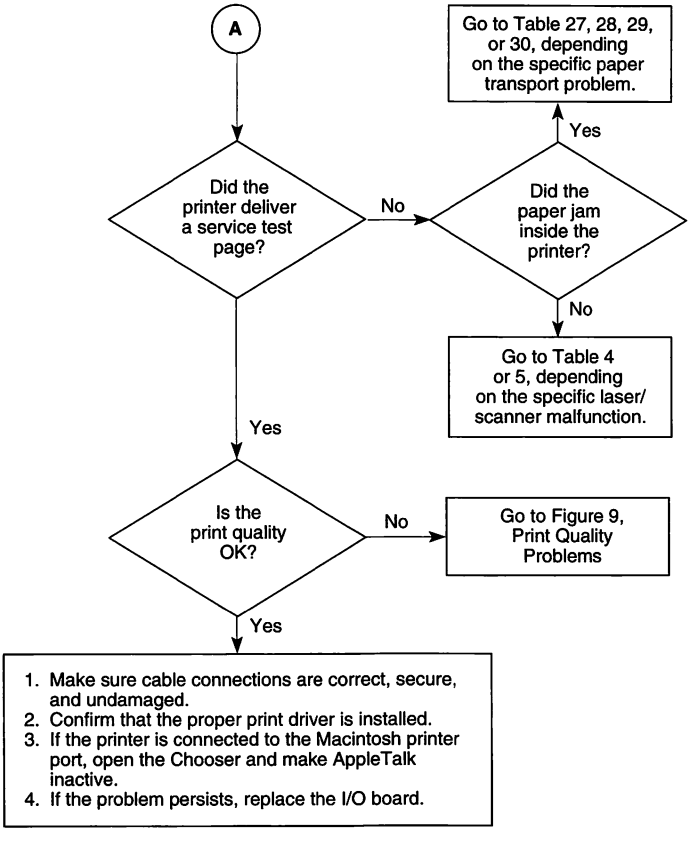
LaserWriter Select 300 Troubleshooting Flowcharts



Flowchart 1 LaserWriter Select 300 Print Engine Check

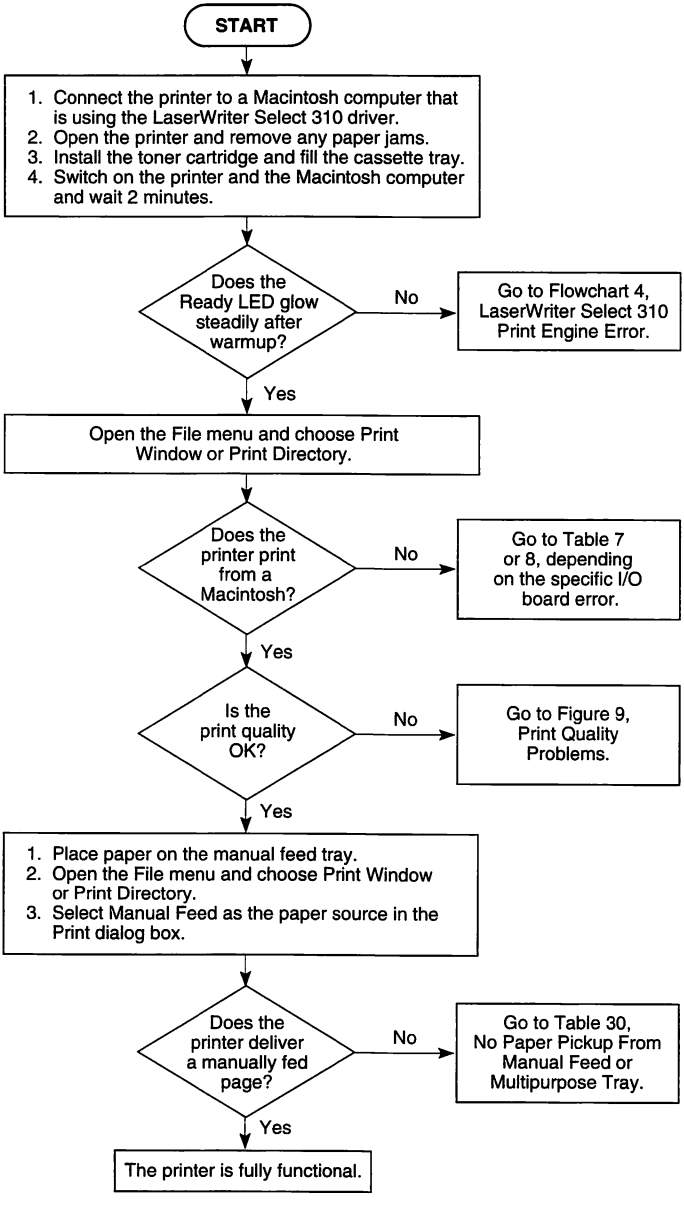


Flowchart 2 LaserWriter Select 300 Print Engine Error (1 of 2)

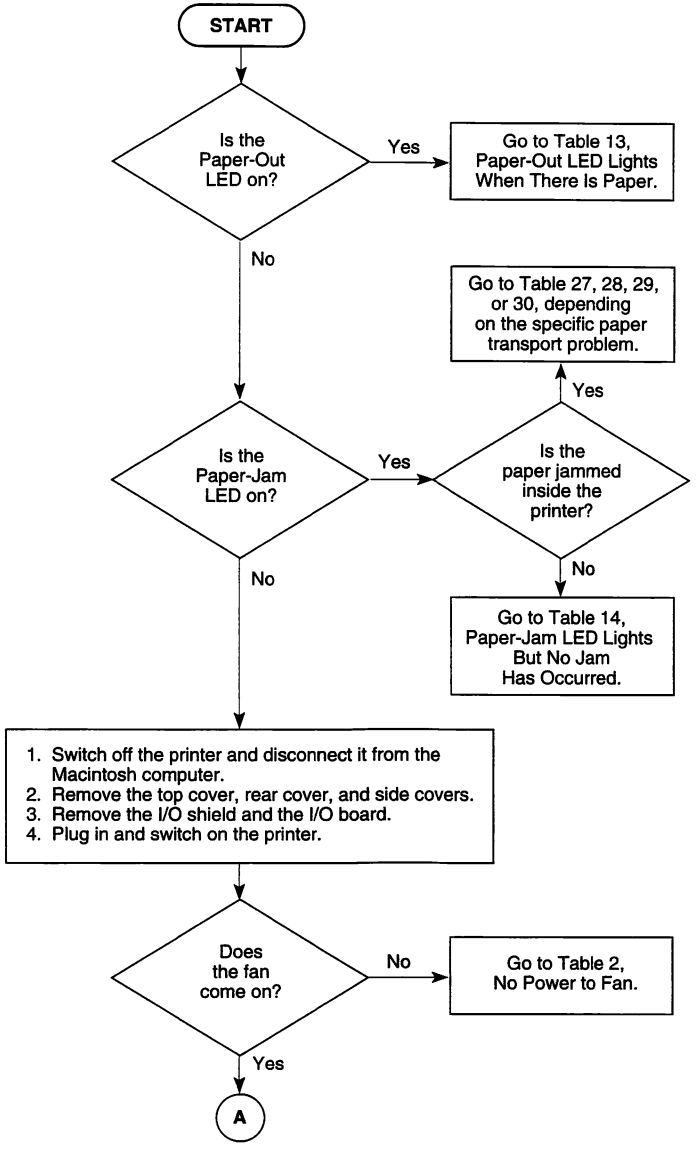


Flowchart 2 LaserWriter Select 300 Print Engine Error (2 of 2)

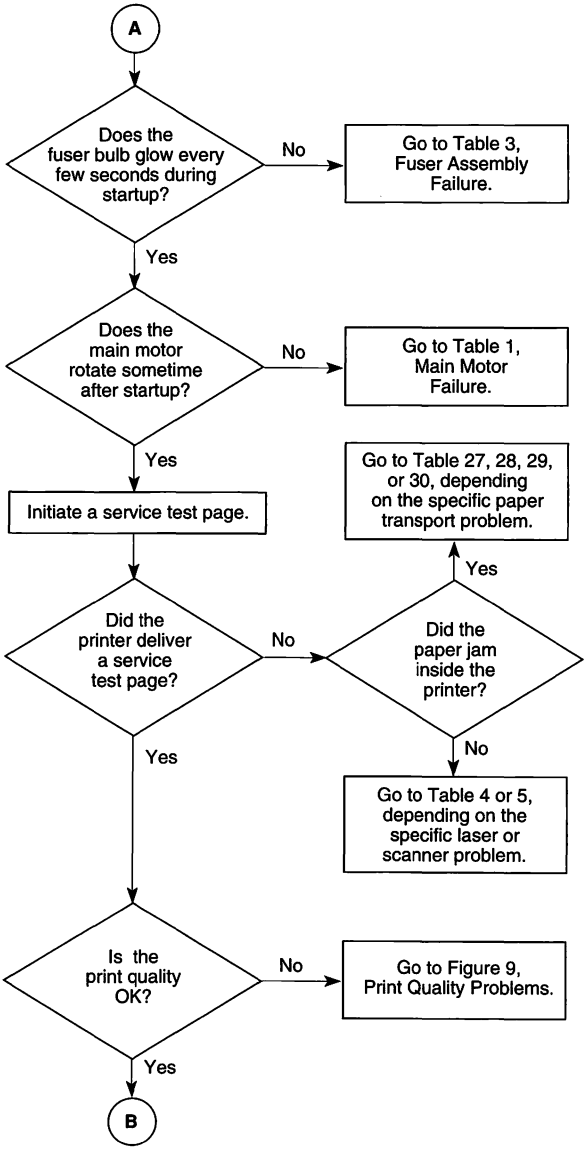
LaserWriter Select 310 Troubleshooting Flowcharts



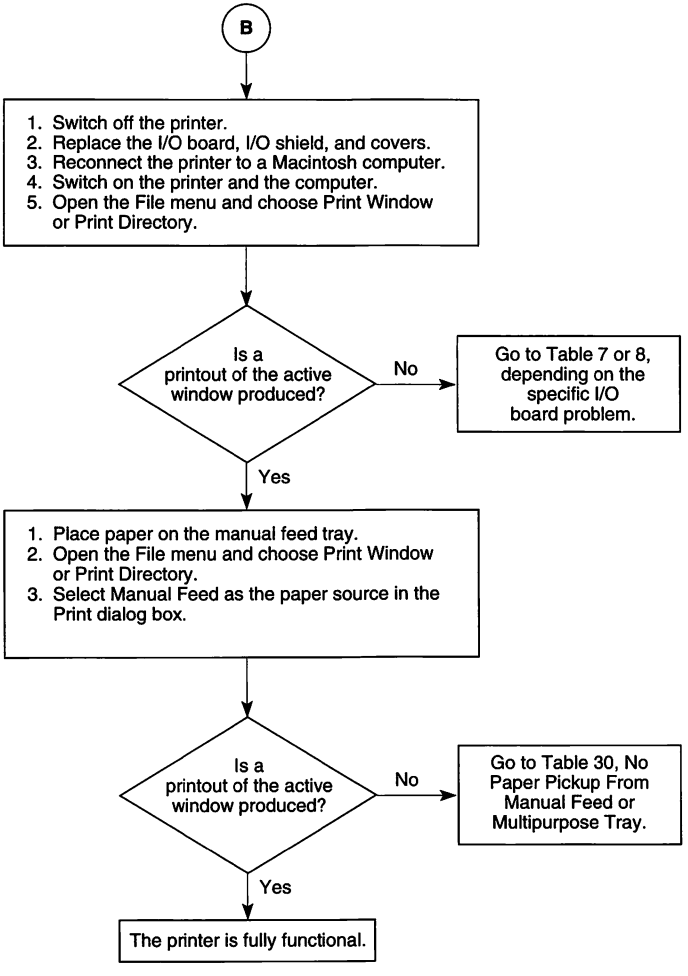
Flowchart 3 LaserWriter Select 310 Print Engine Check



Flowchart 4 LaserWriter Select 310 Print Engine Error (1 of 3)



Flowchart 4 LaserWriter Select 310 Print Engine Error (2 of 3)



Flowchart 4 LaserWriter Select 310 Print Engine Error (3 of 3)

Troubleshooting Tables

Important **As you proceed through the steps in a table, remember to retry the printer each time you change its physical state—such as when you replace a module. If the problem remains, reinstall the original module before proceeding to the next step in the table. Refer as necessary to the wiring diagram that follows the tables.**

Table 1 Main Motor Failure

Step	Check	Result	Action
1	Is connector P14 on the DC controller board making good contact?	No	Reconnect P14 to the DC controller board.
2	Are there any obstructions in the drive assembly gear train or paper path?	Yes	Remove the obstructions.
3	Inspect the drive assembly gear train and replace any damaged gears. (Check the gears on the drive assembly, the fuser assembly, the paper feed roller, and the cassette feeder assembly.) Does the problem persist?	No	Problem solved.
4	Switch off the printer and connect a multimeter between each of the following pairs of pins: • P14-1 (A-COM 24V) & P11-2 (GND) • P14-2 (B-COM 24V) & P11-2 (GND) Does the voltage measure approximately +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
5	Switch off the printer and connect the multimeter between each of the following pairs of pins on the DC controller: • P14-1 (A-COM 24V) & P14-3 (A) • P14-1 (A-COM 24V) & P14-5 (/A) • P14-2 (B-COM 24V) & P14-4 (B) • P14-2 (B-COM 24V) & P14-6 (/B) Does the resistance measure approximately 5 Ω?	No Yes	Replace the main motor. Replace the DC controller board. If the problem persists, replace the main motor.

Table 2 No Power to Fan (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Is a toner cartridge installed in the printer?	No	Install a toner cartridge.
2	Is the AC outlet providing the correct voltage?	No	Try another AC outlet.
3	Is connector P119 making good contact with the paper delivery sensor?	No	Reconnect connector P119 to the paper delivery sensor.
4	Inspect the paper delivery sensor. Does the lever on the fuser assembly cover the paper delivery sensor when no paper is present and uncover the sensor when paper passes through the fuser assembly?	No	Install the paper delivery sensor so that it makes contact with the delivery sensor lever. If the problem persists, replace the delivery sensor lever.
5	Connect a multimeter between each of the following sets of pins and check for the following voltages: P11-10 (+24V, brown wire) and P11-2 (GND, black wire) +24 VDC P11-11 (+24V, brown wire) and P11-2 (GND, black wire) +24 VDC P11-12 (+24V, orange wire) and P11-2 (GND, black wire) +24 VDC P11-5 (+5VB, yellow wire) and P11-2 (GND, black wire) +5 VDC P11-6 (+5VA, blue wire) and P11-2 (GND, black wire) +5 VDC Are the voltages present when you switch the printer back on?	No	Replace the power supply.
6	Switch off the printer, connect a multimeter between connectors P18-3 (+24V) and P18-2 (RTN) on the DC controller, and switch the printer back on. Is the voltage approximately +24 VDC?	Yes	Replace the fan.

Table 2 No Power to Fan (2 of 2)			
Step	**Check**	**Result**	**Action**
7	Switch off the printer and disconnect connector P119 from the paper delivery sensor. Connect the multimeter between connector P119-2 (GND) and P119-3 (+5 VDC) and switch on the printer. Did the voltage measure approximately +5 VDC when you switched on the printer?	No Yes	Check the cable connections between P119 and P16 on the DC controller board. If the connections are secure, replace the DC controller board. Replace the paper delivery sensor.

Table 3 Fuser Assembly Failure (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Is a toner cartridge installed in the printer?	No	Install a toner cartridge.
2	Switch off the printer, connect a multimeter between pins J101-2 and J101-6 on the fuser assembly, and switch on the printer. Does the voltage measure between +90 and +132 VAC when you switch on the printer?	No	Replace the power supply.
3	Switch off the printer, and disconnect connector P11 from the DC controller board. Measure the resistance between connector pins P11-13 (STS) and P11-14 (GND). Is the resistance between 200 KΩ and 350 KΩ at room temperature?	No	Replace the power supply.
4	Measure the resistance between pins J101-2 and J101-6 on the fuser assembly. Is the resistance less than 10 Ω?	No	Replace the fuser heater bulb and the thermoprotector.
5	Connect a multimeter between pins P11-1 (HEAT, red wire) and P11-2 (GND, black wire). Does the voltage measure about +4.2 VDC when you switch on the printer?	No	Replace the power supply.

Table 3 Fuser Assembly Failure (2 of 2)			
Step	**Check**	**Result**	**Action**
6	Connect a multimeter between connector pins P11-1 (HEAT, red wire) and P11-2 (GND, black wire) on the DC controller board. When you open and close the front access door, does the voltage measure about +3.7 VDC with the door open and briefly drop to 0 VDC about five seconds after you close the door?	No	Go to Table 9, Temperature Sensor Assembly Failure.
7	Switch off the printer and disconnect P111 from the high-voltage power supply. Connect a multimeter between connector pins P11-5 (5VB, yellow wire) and P11-2 (GND, black wire) on the DC controller board. Does the voltage measure about +5 VDC when you switch on the printer?	No	Replace the power supply.
8	Switch off the printer and disconnect connector P12 from the DC controller board. Does the fuser heater bulb light when you switch on the printer?	No	Replace the laser/optic assembly.
9	Switch off the printer and disconnect connector P15 from the DC controller board. Does the fuser heater bulb light when you switch on the printer?	Yes	Replace the DC controller board.
10	Connect the multimeter between pins P15-8 (5VB, yellow wire) and P15-9 (5V, orange wire) on the DC controller board. When you remove and insert the toner cartridge, does the resistance change from 0 Ω (cartridge inserted) to infinity Ω (cartridge removed)?	No	Replace the toner cartridge sensor assembly.
11	Connect the multimeter between pins P15-10 (EP CHECK, red wire) and P15-11 (GND, brown wire) on the DC controller board. When you remove and insert the toner cartridge, does the resistance change from 0 Ω (cartridge inserted) to infinity Ω (cartridge removed)?	No	Replace the toner cartridge sensor assembly.

Table 4 Laser Scanner Failure			
Step	**Check**	**Result**	**Action**
1	Are connectors P12 and P19 on the DC controller board properly seated?	No	Reconnect connectors P12 and P19 to the DC controller board.
2	Switch on the printer, wait until the main motor stops rotating, and connect a multimeter between connector P12-11 (/MOT ON) on the DC controller board and chassis ground. Can you hear the scanner motor start to spin?	No	Go to Table 5, Scanner Assembly Failure.
3	Switch off the printer, connect a multimeter between connectors P11-4 (GND, black wire) and P11-5 (5VB, yellow wire) on the DC controller board, and switch on the printer. Is the voltage approximately +5 VDC?	No	Replace the power supply.
4	Switch off the printer and connect a multimeter between P11-5 (5VB, yellow wire) and P12-7 (5VB, black wire) on the DC controller board. Is the resistance less than 5 Ω?	No	Go to Table 10, Toner Cartridge Sensor Failure.
5	Switch off the printer and connect a multimeter between connectors P12-7 (5VB) and P12-6 (GND) on the DC controller board. Does the voltage measure +5 VDC when you switch on the printer?	Yes No	Replace the laser/optic assembly. Replace the DC controller board.

Table 5 Scanner Assembly Failure			
Step	**Check**	**Result**	**Action**
1	Switch off the printer and connect a multimeter between connectors P12-13 (24V) and P12-12 (RTN) on the DC controller board. Does the voltage measure about +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
2	Connect a multimeter between P12-11 (/MOT ON) and P12-10 (GND) on the DC controller board and initiate a service test page. Does the voltage drop to less than +1 VDC during printing and rise to about +4 VDC when the printing stops?	Yes No	Replace the scanner assembly. If the problem persists, replace the laser and scanner motor cable. Replace the DC controller board.

Table 6 Select 300 I/O Board Error			
Step	**Check**	**Result**	**Action**
1	Is the printer currently connected to a Macintosh computer?	No	Connect the printer to a Macintosh computer.
2	Is the serial cable connection secure?	No	Tighten cable connections.
3	Is the LaserWriter Select 300 driver installed in the System Folder?	No	Use the Installer to install the LaserWriter Select 300 driver in the System Folder.
4	Are the LaserWriter Select 300 driver and correct serial port selected?	No	Use the Chooser to select the LaserWriter Select 300 driver and the port (printer or modem) to which the printer is connected.
5	Is the printer connected to the printer port on the Macintosh computer?	No	Make sure that AppleTalk is inactive.
6	Is background printing disabled?	No Yes	Disable background printing (so that error messages display on the screen). Switch the printer off and on again. Install a different LaserWriter Select 300 I/O board.

Table 7 Select 310 I/O Board Error – Serial Connection			
Step	**Check**	**Result**	**Action**
1	Is the serial cable connection secure?	No	Tighten cable connections.
2	Is the serial cable good?	No	Replace the cable.
3	Is the LaserWriter Select 310 driver installed in the System Folder?	No	Use the Installer to install the LaserWriter Select 310 driver in the System Folder.
4	Are the LaserWriter Select 310 driver and correct serial port selected?	No	Use the Chooser to select the LaserWriter Select 310 driver and the port (printer or modem) to which the printer is connected.
5	Is the printer connected to the printer port on the Macintosh computer?	Yes	Make sure that AppleTalk is inactive.
6	Is background printing disabled?	No	Disable background printing (so that error messages appear on the screen). Switch the printer off and on again. If the problem persists, install a different LaserWriter Select 310 I/O board.

Table 8 Select 310 I/O Board Error – Parallel Connection			
Step	**Check**	**Result**	**Action**
1	Are the parallel cable connections correct and secure?	No	Tighten cable connections or refer to the printer's user guide for proper cabling information.
2	Are the parallel cables and connectors good?	No	Replace the defective cables and connectors.
3	Are the software and hardware properly configured to communicate with the parallel port on the printer?	No	Refer to the printer's owner's guide and the computer documentation for proper configuration information. Switch the printer off and on again. If the problem persists, install a different I/O board.

Table 9 Temperature Sensor Assembly Failure			
Step	**Check**	**Result**	**Action**
1	After allowing the fuser assembly to cool to room temperature, remove the fuser assembly from the printer. Measure the resistance between J101-1 and J101-4 on the fuser assembly. Is the resistance between 200 kΩ and 350 kΩ?	No	Replace the sensor assembly.

Table 10 Toner Cartridge Sensor Failure (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Switch off the printer. Connect a multimeter between P15-8 (5VB) and P11-2 (GND) on the DC controller board. Does the voltage measure +5 VDC when you switch on the printer?	No	Go to Table 12, Power Supply Failure (+5VDC).
2	Connect a multimeter between pins P15-8 (5VB, yellow wire) and P15-9 (5V, orange wire) on the DC controller board. When you remove and insert the toner cartridge, does the resistance change from 0 Ω (cartridge inserted) to infinity Ω (cartridge removed)?	No	Replace the toner cartridge sensor assembly.
3	Connect a multimeter between pins P15-10 (EP CHECK, red wire) and P15-11 (GND, brown wire) on the DC controller board. When you remove and insert the toner cartridge, does the resistance change from 0 Ω (cartridge inserted) to infinity Ω (cartridge removed)?	No	Replace the toner cartridge sensor assembly.
4	Remove the toner cartridge sensor cover and observe the toner cartridge sensor PCB and actuator. Does the actuator turn on switches S101 and S100 when you install a toner cartridge and turn off the switches when you remove the toner cartridge?	No	Install a new toner cartridge. If switches S101 and S100 still do not turn on when you install the cartridge, replace the toner cartridge sensor assembly.

Table 10 Toner Cartridge Sensor Failure (2 of 2)			
Step	**Check**	**Result**	**Action**
5	Is there continuity between connectors P15 on the DC controller board and P118 on the toner cartridge sensor board?	Yes No	Replace the DC controller board. Replace the high-voltage/toner cartridge sensor cable.

Table 11 Power Supply Failure (+24 VDC)			
Step	**Check**	**Result**	**Action**
1	Switch off the printer. Connect a multimeter between P11-12 (+24 VDC, orange wire) and P11-2 (GND, black wire) on the DC controller board. Switch on the printer. Is the voltage approximately +24 VDC?	No	Replace the power supply.
2	Switch off the printer. Connect a multimeter between P11-10 (+24 VDC, brown wire) and P11-2 (GND, black wire) on the DC controller board. Switch the printer back on. When you open and close the front access door, does the voltage measure 0 VDC with the door open and +24 VDC with the door closed?	Yes	Replace the DC controller board.
3	Switch off the printer. Connect a multimeter between P11-11 (+24 VDC, brown wire) and P11-2 (GND, black wire) on the DC controller board. Switch the printer back on. When you open and close the front access door, does the voltage measure 0 VDC with the door open and +24 VDC with the door closed?	Yes No	Replace the DC controller board. Replace the power supply.

Table 12 Power Supply Failure (+5 VDC)			
Step	**Check**	**Result**	**Action**
1	Connect a multimeter between the following pairs of pins on the DC controller board: a) P11-5 (yellow wire) and P11-2 (black wire) b) P11-6 (blue wire) and P11-2 (black wire) Does the voltage measure +5 VDC when you switch on the printer?	No Yes	Replace the power supply. Replace the DC controller board.

Table 13 Paper-Out LED Lights When There Is Paper (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Is the paper cassette installed and does it contain paper?	No	Remove the paper cassette tray and fill it with paper. Reinstall the paper cassette tray and make sure it is seated properly.
2	Remove the paper cassette tray and inspect the paper sensing arm. Does the paper sensing arm appear to be damaged?	Yes	Replace the paper sensing arm.
3	While the paper cassette tray is out, inspect the paper cassette size actuators. Do any of the actuators appear to be bent or damaged?	Yes	Replace the cassette feeder board.
4	While the paper cassette tray is out, switch on the printer. Insert the paper cassette tray. Does the main motor rotate when you insert the paper cassette tray?	No	Replace the cassette feeder board.

Table 13 Paper-Out LED Lights When There Is Paper (2 of 2)			
Step	**Check**	**Result**	**Action**
5	Prepare the printer for troubleshooting as described in the Troubleshooting Preparation section under "Troubleshooting the LaserWriter Select." Disconnect P111 from the high-voltage power supply. Connect a multimeter between connector pins P13-1 (NOPAPER1) and P13-4 (GND) on the DC controller board. Remove and insert the paper cassette tray filled with paper. Does the voltage toggle +5 VDC (tray removed) to 0 VDC (tray inserted)?	No Yes	Replace the cassette feeder board. If the problem persists, replace the cassette feeder tray cable. Replace the DC controller board.
6	If an optional paper cassette is installed, connect a multimeter between connector pins P13-3 (NOPAPER2) and P13-4 (GND) on the DC controller board. Remove and insert the paper cassette tray filled with paper. Does the voltage toggle from +5 VDC (tray removed) to 0 VDC (tray inserted)?	No Yes	Replace the cassette feeder board. If the problem persists, replace the expansion feeder cable. Replace the DC controller board.

Table 14 Paper-Jam LED Lights But No Jam Has Occurred (1 of 3)			
Step	**Check**	**Result**	**Action**
1	Is the paper cassette installed and does it contain paper?	No	Remove the paper cassette tray and fill it with paper. Reinstall the paper cassette tray and make sure it is seated properly.
2	Check the fuser/delivery area or paper registration area for paper fragments. Are there any paper fragments or other obstructions?	Yes	Remove the fragments or obstructions.
3	Is the cable that runs to the paper delivery sensor securely connected?	No	Reconnect the cable to the paper delivery sensor.

Table 14 Paper-Jam LED Lights But No Jam Has Occurred (2 of 3)			
Step	**Check**	**Result**	**Action**
4	Initiate a service test page and observe the action of the delivery lever on the fuser assembly. Does the delivery lever swing freely when it passes through the fuser assembly?	No	Replace the delivery sensor lever.
5	Open the front access door and locate the paper registration on the paper charge deflector. Is the paper registration arm damaged or broken?	Yes	Replace the paper sensing arm.
6	Prepare the printer for troubleshooting as described in "Troubleshooting Preparation." Disconnect connector P111 from the high-voltage power supply and connector P16 from the DC controller board. Connect a multimeter between P16-4 (PULLUP 5V) and P16-5 (GND) on the DC controller board. Does the voltage measure +5 VDC when you switch on the power?	No	Go to Step 9.
7	Switch off the printer and reconnect connector P16 to the DC controller board. Connect a multimeter between connector P16-6 (PreReg) and P16-5 (GND) on the DC controller board. Initiate a service test page. Does the voltage drop from +5 VDC to 0 VDC when the paper passes the paper registration sensor?	No	Go to Step 9.

Table 14 Paper-Jam LED Lights But No Jam Has Occurred (3 of 3)			
Step	**Check**	**Result**	**Action**
8	Switch off the printer. Connect a multimeter between P16-3 (EXIT) and P16-2 (GND). Switch on the printer and manually actuate the paper delivery sensor by inserting a sheet of paper between the sensor arms. Does the voltage drop from +5 VDC to 0 VDC when you remove the paper from the sensor?	No	Replace the paper delivery sensor. If the problem persists, replace the delivery sensor cable.
9	Switch off the printer and connect a multimeter between each of the following connector pairs on the DC controller board: a) P11-5 (5VB, yellow) and P11-2 (GND, black) b) P11-6 (5VA, blue) and P11-2 (GND, black) Does the voltage measure +5 VDC when you switch on the printer?	No Yes	Replace the power supply. Replace the DC controller board.

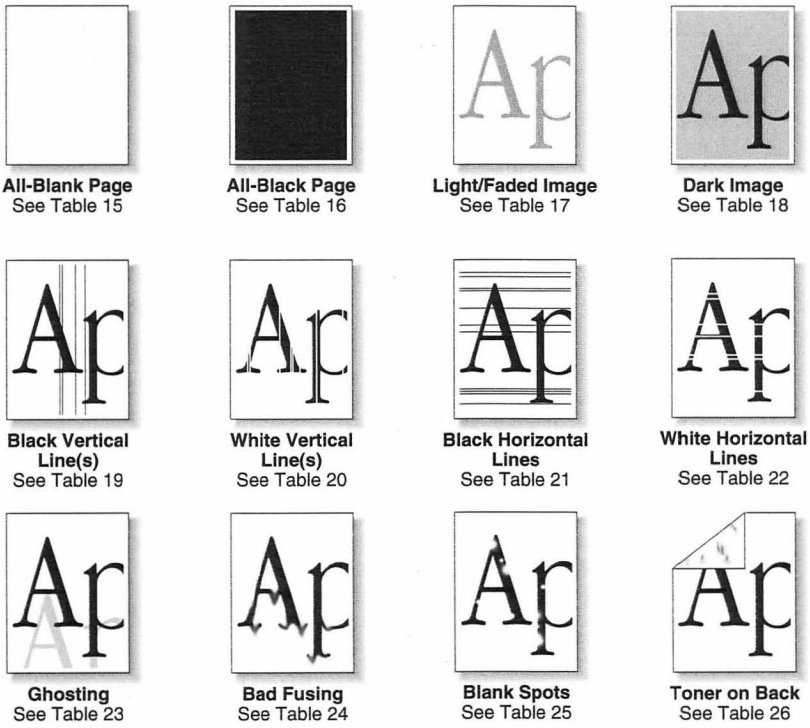


Figure 9 Print Quality Problems

Table 15 All-Blank Page (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Remove the toner cartridge from the printer. Is the toner cartridge sealing tape removed?	No	Remove the sealing tape.
2	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
3	Are the high-voltage contacts making good contact with the toner cartridge?	No	Clean the contacts or replace the high-voltage contact assembly.
4	Remove the toner cartridge from the printer. Is any foreign material blocking the laser beam outlet on the inside of the printer chassis? Is any foreign material adhering to the laser beam access slot on the toner cartridge?	Yes	Remove the foreign material.
5	Inspect the drive assembly gear train. Are any gears damaged?	Yes	Replace the drive assembly.
6	Replace the transfer roller. Does the print quality improve?	Yes	Problem solved.
7	Connect the multimeter between connectors P15-7 and P15-1 on the DC controller board. Does the voltage measure at +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
8	For Steps 8 and 9, remove the top covers, side covers, rear cover, I/O board mount, and the power switch lever. Remove the high-voltage contact assembly and check the continuity on all the high-voltage contacts. Did you find continuity on all the high-voltage contacts?	No	Replace the high-voltage contact assembly.

Table 15 All-Blank Page (2 of 2)			
Step	**Check**	**Result**	**Action**
9	Is there continuity between connector RTN (red wire) on the high-voltage power supply and the red spade connector on the paper delivery guide?	No	Replace the paper delivery guide.
10	Replace the DC controller board. Does the print quality improve?	Yes No	Problem solved. Replace the toner cartridge sensor and high-voltage power supply cable. If the problem persists, replace the high-voltage power supply.

Table 16 All-Black Page			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Are the high-voltage contacts making good contact with the toner cartridge?	No	Clean the contacts or replace the high-voltage contact assembly.
3	Connect the multimeter between connectors P15-7 and P15-1 on the DC controller board. Does the voltage measure at +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
4	Is there continuity between CRU (spring plate) on the high-voltage contact assembly and jack CR on the high-voltage power supply?	No	Replace the high-voltage contact assembly.
5	Is there continuity between P15 on the DC controller board and P111 on the high-voltage power supply?	Yes	Replace the toner cartridge sensor and high-voltage power supply cable.
6	Replace the DC controller board. Does the print quality improve?	Yes No	Problem solved. Replace the high-voltage power supply.

Table 17 Light/Faded Image (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Reload the paper cassette tray with known-good paper. Does the print quality improve?	Yes	Problem solved.
3	Remove the toner cartridge from the printer. Is any foreign material blocking the laser beam outlet on the inside of the printer chassis? Is any foreign material adhering to the laser beam access slot on the toner cartridge?	Yes	Remove the foreign material.
4	Are the high-voltage contacts making good contact with the toner cartridge?	No	Clean the contacts or replace the high-voltage contact assembly.
5	Replace the transfer roller. Does the print quality improve?	Yes	Problem solved.
6	Connect the multimeter between connectors P15-7 and P15-1 on the DC controller board. Does the voltage measure at +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
7	For Steps 7 and 8, remove the top covers, side covers, rear cover, I/O board mount, and the power switch lever. Remove the high-voltage contact assembly and check the continuity on all the high-voltage contacts. Did you find continuity on all the high-voltage contacts?	No	Replace the high-voltage contact assembly.
8	Is there continuity between connector RTN (red wire) on the high-voltage power supply and the red spade connector on the paper delivery guide?	No	Replace the paper delivery guide.

Table 17 Light/Faded Image (2 of 2)			
Step	**Check**	**Result**	**Action**
9	Replace the DC controller board. Does the print quality improve?	Yes No	Problem solved. Replace the toner cartridge sensor and high-voltage power supply cable. If the problem persists, replace the high-voltage power supply.

Table 18 Dark Image Over Entire Page			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Is the transfer roller dirty?	Yes	Replace the transfer roller.
3	Connect the multimeter between connectors P15-7 and P15-1 on the DC controller board. Does the voltage measure at +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
4	Remove the top covers, side covers, rear cover, I/O board mount, and the power switch lever. Remove the high-voltage contact assembly and check the continuity on all the high-voltage contacts. Did you find continuity on all the high-voltage contacts?	No	Replace the high-voltage contact assembly.
5	Replace the DC controller board. Does the print quality improve?	Yes No	Problem solved. Replace the toner cartridge sensor and high-voltage power supply cable. If the problem persists, replace the high-voltage power supply.

Table 19 Black Vertical Lines			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Replace the transfer roller. Does the print quality improve?	Yes	Problem solved.
3	Remove the paper delivery guide. Is the static eliminator on the paper delivery guide properly grounded?	No	Connect the grounding contact to the static eliminator.
4	Remove the fuser assembly and inspect the fuser heater roller. Are there scratches on the fuser heater roller?	Yes	Replace the fuser heater roller or the fuser assembly.

Table 20 White Vertical Lines			
Step	**Check**	**Result**	**Action**
1	Remove the toner cartridge from the printer. Is any foreign material blocking the laser beam outlet on the inside of the printer chassis? Is any foreign material adhering to the laser beam access slot on the toner cartridge?	Yes	Remove the foreign material.
2	Inspect the paper path. Is any foreign material blocking the paper path?	Yes	Remove the foreign material.
3	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
4	Replace the transfer roller. Does the print quality improve?	Yes	Problem solved.
5	Remove the fuser assembly and inspect the fuser heater roller. Are there scratches on the fuser heater roller?	Yes	Replace the fuser heater roller or the fuser assembly.
6	Replace the I/O board. Does the print quality improve?	Yes	Problem solved.

Table 21 Black Horizontal Lines			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Are the high-voltage contacts making good contact with the toner cartridge?	No	Clean the contacts or replace the high-voltage contact assembly.
3	Replace the transfer roller. Does the print quality improve?	Yes	Problem solved.
4	Remove the fuser assembly and inspect the fuser heater roller. Are there scratches on the fuser heater roller?	Yes	Replace the fuser heater roller or the fuser assembly.
5	Connect the multimeter between connectors P15-7 and P15-1 on the DC controller board. Does the voltage measure at +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
6	Remove the top covers, side covers, rear cover, I/O board mount, and the power switch lever. Remove the high-voltage contact assembly and check the continuity on all the high-voltage contacts. Did you find continuity on all the high-voltage contacts?	No	Replace the high-voltage contact assembly.
7	Replace the DC controller board. Does the print quality improve?	Yes	Problem solved.
8	Replace the toner cartridge sensor and high-voltage power supply cable. Does the print quality improve?	Yes	Problem solved.
9	Replace the high-voltage power supply. Does the print quality improve?	Yes	Problem solved.
10	Replace the I/O board. Does the print quality improve?	Yes	Problem solved.

Table 22 White Horizontal Lines (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Check the paper in the paper cassette tray for dampness. Is the paper damp?	Yes	Replace the paper.
2	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
3	Are the high-voltage contacts making good contact with the toner cartridge?	No	Clean the contacts or replace the high-voltage contact assembly.
4	Remove the toner cartridge from the printer. Is any foreign material blocking the laser beam outlet on the inside of the printer chassis? Is any foreign material adhering to the laser beam access slot on the toner cartridge?	Yes	Remove the foreign material.
5	Replace the transfer roller. Does the print quality improve?	Yes	Problem solved.
6	Connect the multimeter between connectors P15-7 and P15-1 on the DC controller board. Does the voltage measure at +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).

Table 22 White Horizontal Lines (2 of 2)			
Step	**Check**	**Result**	**Action**
7	For Steps 7 and 8, remove the top covers, covers, rear cover, I/O board mount, and power switch lever. Remove the high-voltage contact assembly and check the continuity on all the high-voltage contacts. Did you find continuity on all the high-voltage contacts?	No	Replace the high-voltage contact assembly.
8	Is there continuity between connector RTN (red wire) on the high-voltage power supply and the red spade connector on the paper delivery guide?	No	Replace the paper delivery guide.
9	Replace the DC controller board. Does the print quality improve?	Yes No	Problem solved. Replace the toner cartridge sensor and high-voltage power supply cable. If the problem persists, replace the high-voltage power supply.
10	Replace the toner cartridge sensor and high-voltage power supply. Does the print quality improve?	Yes	Problem solved.
11	Replace the high-voltage power supply. Does the print quality improve?	Yes	Problem solved.
12	Replace the I/O board. Does the print quality improve?	Yes	Problem solved.

Table 23 Ghosting			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Is the transfer roller dirty?	Yes	Replace the transfer roller.
3	Remove the fuser assembly and inspect the fuser heater roller and the fuser pressure roller. Are there scratches on either roller?	Yes	Replace the fuser heater roller, the fuser pressure roller, or the fuser assembly.
4	Connect the multimeter between connectors P15-7 and P15-1 on the DC controller board. Does the voltage measure at +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
5	Remove the top covers, side covers, rear cover, I/O board mount, and the power switch lever. Remove the high-voltage contact assembly and check the continuity on all the high-voltage contacts. Did you find continuity on all the high-voltage contacts?	No	Replace the high-voltage contact assembly.
6	Replace the DC controller board. Does the print quality improve?	Yes No	Problem solved. Replace the toner cartridge sensor and high-voltage power supply cable. If the problem persists, replace the high-voltage power supply.

Table 24 Bad Fusing			
Step	**Check**	**Result**	**Action**
1	Check the paper in the paper cassette tray for dampness. Is the paper damp?	Yes	Replace the paper.
2	Is the fuser assembly properly installed and secure?	No	Reinstall the fuser assembly.
3	Install a known-good fuser assembly. Does the print quality improve?	Yes	Problem solved.
4	Install a known-good power supply. Does the print quality improve?	Yes	Problem solved.
5	Install a known-good DC controller board. Does the print quality improve?	Yes	Problem solved.

Table 25 Blank Spots/Random Pattern or Location			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Check the paper in the paper cassette tray for dampness. Is the paper damp?	Yes	Replace the paper.
3	Is the transfer roller dirty?	Yes	Replace the transfer roller.
4	Remove the fuser assembly and inspect the fuser heater roller and the fuser pressure roller. Are there scratches on either of the rollers?	Yes	Replace the fuser heater roller, the fuser pressure roller, or the fuser assembly.

Table 26 Toner on Back of Page			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the print quality improve?	Yes	Problem solved.
2	Does the printer operating environment meet recommended setup and operation conditions?	No	Make recommended changes to printer operating environment or setup. See the Pre-Power-On Checklist section under "Troubleshooting the LaserWriter Select" for recommended setup and operating instructions.
3	Is the transfer roller dirty?	Yes	Replace the transfer roller.
4	Remove the fuser assembly and inspect the fuser heater roller and the fuser pressure roller. Are there scratches on either of the rollers?	Yes	Replace the fuser heater roller, the fuser pressure roller, or the fuser assembly.

Table 27 Paper Jams in Fuser/Delivery Area			
Step	**Check**	**Result**	**Action**
1	Initiate a service test page. Does the test page jam as it leaves the fuser assembly?	No	Problem solved.
2	Is the cable that runs to the paper delivery sensor securely connected?	No	Reconnect the cable to the paper delivery sensor.
3	Initiate another test page and observe the action of the delivery lever on the fuser assembly. Does the lever swing freely when paper passes through the fuser assembly?	No	Replace the delivery sensor lever.
4	Allow the fuser rollers to cool and then remove the fuser assembly. Inspect the fuser rollers. Are the fuser rollers worn or damaged?	Yes	Replace the fuser assembly.
5	Do the fuser rollers rotate without binding?	No	Replace the fuser assembly.
6	Remove the I/O shield, the I/O board, and the I/O board mount. Replace the fuser assembly and disconnect P111 from the high-voltage power supply. Connect a multimeter between connector pins P16-1 (PULLUP +5 V) and P16-2 (GND) on the DC controller board. Does the voltage measure +5 VDC when you switch on the printer?	No	Go to Table 12, Power Supply Failure (+5 V).
7	Verify that the cable that runs to the paper delivery sensor is still securely connected. Connect a multimeter across connector pins P16-3 (EXIT) and P16-2 (GND) on the DC controller board. Manually actuate the paper delivery sensor by inserting a sheet of paper between the sensor arms. Does the voltage drop from +5 VDC to 0 VDC when you remove the paper from the sensor?	Yes No	Replace the DC controller board. Replace the paper delivery sensor. If the problem persists, replace the delivery sensor cable.

Table 28 Paper Jams in Paper Pickup Area (1 of 3)			
Step	**Check**	**Result**	**Action**
1	Reload the paper cassette tray with known-good paper. Does the problem still occur?	No	Problem solved.
2	Does the jam occur when the manual feed or optional multipurpose tray is being used?	Yes	Go to Step 17.
3	Is the paper cassette installed properly in the printer?	No	Reinstall the paper cassette properly.
4	Is the paper cassette loaded with too much paper?	Yes	Remove the excess paper.
5	Are the cassette pickup rollers damaged or worn?	Yes	Replace the cassette pickup rollers.
6	Are the cassette feed rollers damaged or worn?	Yes	Replace the cassette feed roller shaft.
7	Is connector P13 on the DC controller board making good contact?	No	Reconnect P13 to the DC controller board.
8	Is connector P115 on the cassette feeder board making good contact?	No	Reconnect P115 to the cassette feeder board.
9	Are the cassette pickup and cassette feed solenoids securely connected to the cassette feeder board?	No	Reconnect P201 and P202 to the cassette feeder board.
10	Switch off the printer. Connect the multimeter between P13-7 (+24V) and P13-8 (TURN1). Does the resistance measure between 220 and 240 Ω?	No	Replace the cassette feed solenoid.
11	Connect the multimeter between P13-10 (+24V) and P13-11 (FEED1). Does the resistance measure between 110 and 130 Ω?	No	Replace the cassette pickup solenoid.
12	Open the front access door and locate the paper registration arm on the paper charge deflector. Is the paper registration arm damaged or broken?	Yes	Replace the paper registration arm.

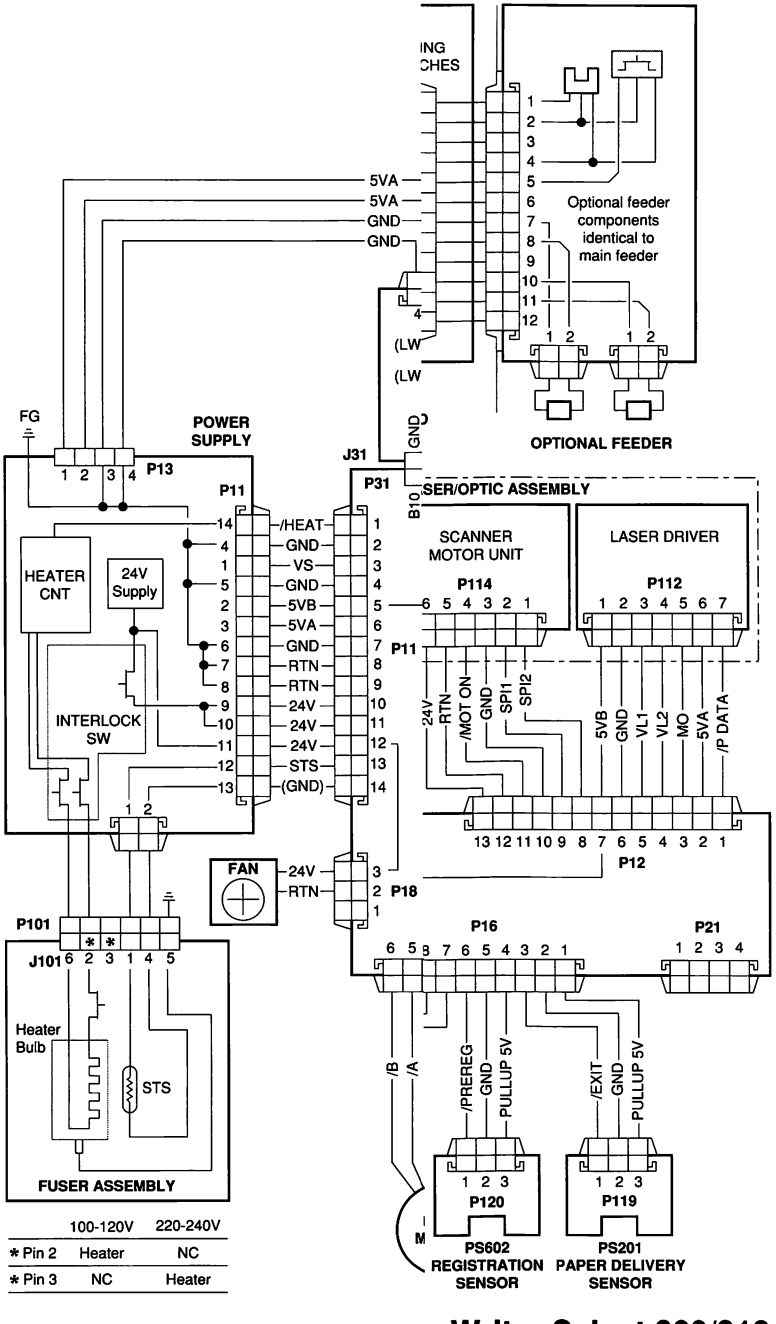
Table 28 Paper Jams in Paper Pickup Area (2 of 3)			
Step	**Check**	**Result**	**Action**
13	Close the front access door and disconnect P16 from the DC controller board. Connect a multimeter between connector pins P16-4 (PULLUP 5V) and P16-5 (GND) on the DC controller board. Does the voltage measure +5 VDC when you switch on the power?	No	Go to Table 12, Power Supply Failure (+5 VDC).
14	Replace the DC controller board. Does the problem still occur?	No	Problem solved.
15	Reconnect connector P16 to the DC controller board. Connect a multimeter between pins P16-6 (/PREREG) and P16-5 (GND) on the DC controller board. Initiate a service test page. Does the voltage drop from +5 VDC to 0 VDC when the paper passes the paper registration sensor?	No	Replace the paper registration sensor located on the paper charge deflector.
16	Does the manual feed or multipurpose tray have too much paper? (The manual feed tray holds one sheet of paper at a time and the multipurpose tray holds 50 sheets of paper.)	Yes	Remove excess paper.
17	Is connector P17 on the DC controller board making good contact?	No	Reconnect connector P17 to the DC controller board.
18	Open the front access door and observe the rollers on the pickup roller assembly. Are the pickup rollers worn or deformed?	Yes	Replace the pickup rollers.
19	Using a paper clip or screwdriver, manually activate the manual feed solenoid. Manually rotate the large black gear on the pickup roller assembly toward the manual feed solenoid. Does the pickup roller rotate without binding?	No	Replace the pickup roller assembly.

Table 28 Paper Jams in Paper Pickup Area (3 of 3)			
Step	**Check**	**Result**	**Action**
20	Disconnect P111 from the high-voltage power supply. Connect the multimeter between connector pins P17-1 (+24 V) and P11-2 (GND) on the DC controller board. Does the voltage measure +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
21	Connect the printer to a Macintosh computer and place a sheet of paper on the manual feed or multipurpose tray. Connect the multimeter between connector pins P17-2 (+24 V) and P11-2 (GND) on the DC controller board. Select Manual Feed and print a page. Does the voltage drop from +24 VDC to 0 VDC when the manual feed pickup solenoid is actuated?	No Yes	Replace the manual feed pickup solenoid. Replace the DC controller board.

Table 29 No Paper Pickup From Cassette (1 of 2)			
Step	**Check**	**Result**	**Action**
1	Is connector P13 on the DC controller board making good contact?	No	Reconnect P13 to the DC controller board.
2	Is connector P115 on the cassette feeder board making good contact?	No	Reconnect P115 to the cassette feeder board.
3	Is cassette feed solenoid connector P202 securely connected to the cassette feeder board?	No	Reconnect P202 to the cassette feeder board.
4	Is cassette pickup solenoid connector P201 securely connected to the cassette feeder board?	No	Reconnect P201 to the cassette feeder board.
5	Remove the paper cassette tray. Visually inspect the paper sensing arm. Does the paper sensing arm appear to be damaged?	Yes	Replace the paper sensing arm.

Table 29 No Paper Pickup From Cassette (2 of 2)			
Step	**Check**	**Result**	**Action**
6	Prepare the printer for troubleshooting as described in the Troubleshooting Preparation section under "Troubleshooting the LaserWriter Select." Switch off the printer. Connect the multimeter between P13-7 (+24V) and P13-8 (/TURN1). Does the resistance measure between 220 and 240 Ω?	No	Replace the cassette pickup solenoid.
7	Connect the multimeter between P13-10 (+24V) and P13-11 (/FEED1). Does the resistance measure between 110 and 130 Ω?	No	Replace the cassette feed solenoid.
8	If only one paper cassette is installed, connect a multimeter between connector pins P13-1 (NO PAPER1) and P13-4 (GND) on the DC controller board. While removing and inserting a paper cassette tray filled with paper, does the voltage toggle from 0 VDC (inserted) to +5 VDC (removed)?	No	Replace the cassette feeder board. If the problem persists, replace the cassette feeder tray cable.
9	Replace the DC controller board. Does the problem still occur?	No	Problem solved.
10	If an optional paper cassette is installed, connect a multimeter between connector pins P13-3 (NO PAPER2) and P13-4 (GND) on the DC controller board. While removing and inserting a paper cassette tray filled with paper, does the voltage toggle from 0 VDC (inserted) to +5 VDC (removed)?	No	Replace the cassette feeder board. If the problem persists, replace the expansion feeder cable.

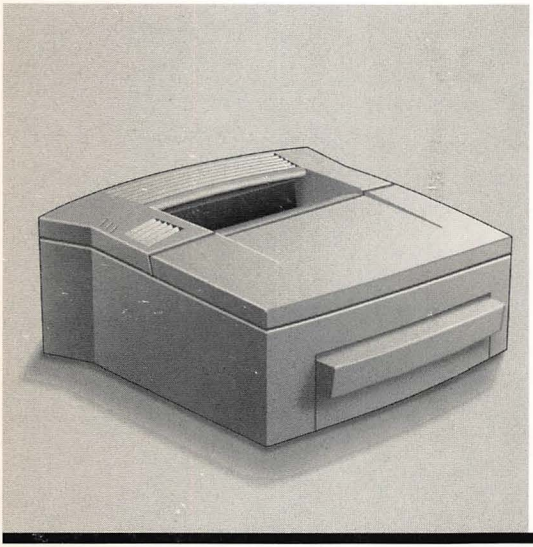
Table 30 No Paper Pickup From Manual Feed or Multipurpose Tray			
Step	**Check**	**Result**	**Action**
1	Is connector P17 on the DC controller board making good contact?	No	Reconnect P17 to the DC controller board.
2	Is connector P16 on the DC controller board making good contact?	No	Reconnect P16 to the DC controller board.
3	Disconnect P111 from the high-voltage power supply. Disconnect P16 from the DC controller board. Connect the multimeter between connector pins P16-7 (PULLUP 5V) and P16-8 (GND) . Does the voltage measure +5 VDC when you switch on the power?	No	Go to Table 12, Power Supply Failure (+5 VDC).
4	Connect the multimeter between P16-9 (No Paper) and P16-8 (GND). Does the voltage measure +5 VDC when you switch on the printer?	No	Replace the DC controller board.
5	Connect the multimeter between P16-9 and P16-8 on the DC controller board. Does the voltage drop from +5 VDC to 0 VDC when you place a sheet of paper on the manual feed tray?	No	Replace the manual feed sensor. If the problem persists, replace the manual feed sensor cable.
6	Connect a multimeter between connector pins P17-1 (24V) and P11-2 (GND) on the DC controller board. Does the voltage measure +24 VDC when you switch on the printer?	No	Go to Table 11, Power Supply Failure (+24 VDC).
7	Switch off the printer. Connect a multimeter between pins P17-1 (24V) and P17-2 (/FEED). Does the resistance measure between 210 and 230 Ω?	No Yes	Replace the manual feed pickup solenoid. Replace the DC controller board.



	100-120V	220-240V
* Pin 2	Heater	NC
* Pin 3	NC	Heater

erWriter Select 300/310 Wiring Diagram

Personal LaserWriter 300



Exploded View

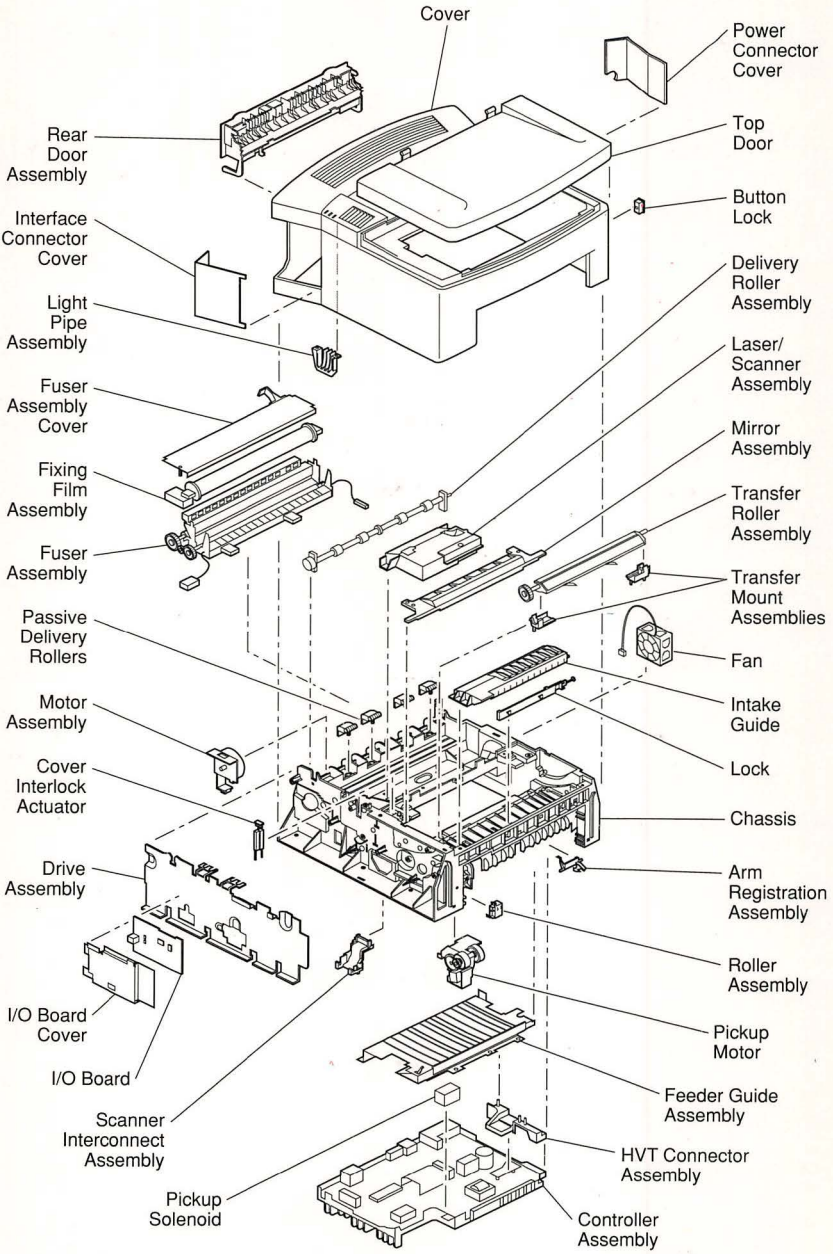


Figure 1 Personal LaserWriter 300 Exploded View

Arm registration assembly	922-0470
Button lock assembly kit	076-0683
Chassis	922-0481
Controller assembly (120V)	661-0029
Controller assembly (240V)	661-0028
Cover assembly	922-0462
Cover interlock actuator	922-0475
Delivery roller assembly	922-0466
Drive assembly	922-0454
Fan	922-0456
Feeder guide assembly	922-0469
Fixing film assembly (110V)	922-0450
Fixing film assembly (220V)	922-0451
Fuse, 125V, 10A (package of 10)	922-0484
Fuse, 201V (package of 10)	922-0485
Fuse, 250V, 3.15A (package of 10)	922-0486
Fuser assembly (110V)	661-0025
Fuser assembly (220V)	661-0026
Grounding plate	922-0480
Hardware kit	076-0455
HVT connector assembly	922-0453
Intake guide	922-0472
Interface connector cover	922-0461
I/O board	661-0030
Laser/scanner assembly	661-0027
Light pipe assembly	922-0465
Lock (package of 5)	922-0473
Mirror assembly	922-0468
Motor assembly	922-0455
Paper pickup roller	922-0474
Passive delivery rollers	922-0467
Pickup motor (pickup assembly)	922-0452
Pickup solenoid	922-0458
Power connector cover	922-0460
Power cord cable (Australia)	922-0493
Power cord cable (Danish)	922-0495
Power cord cable (Israel)	922-0496
Power cord cable (Japan)	922-0497
Power cord cable (Swiss)	922-0494
Power cord cable (U.S.)	922-0491
Power cord cable (UK)	922-0492
Rear door assembly	922-0464
Roller assembly	922-0471

Scanner interconnect assembly 922-0457
Screw kit 076-0456
Top door 922-0463
Transfer mount assembly (left) 922-0477
Transfer mount assembly (right) 922-0478
Transfer roller assembly 922-0476
Universal cassette 922-0459

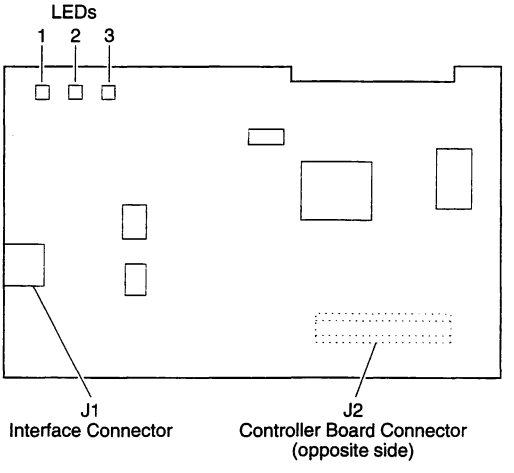


Figure 2 Personal LaserWriter 300 I/O Board

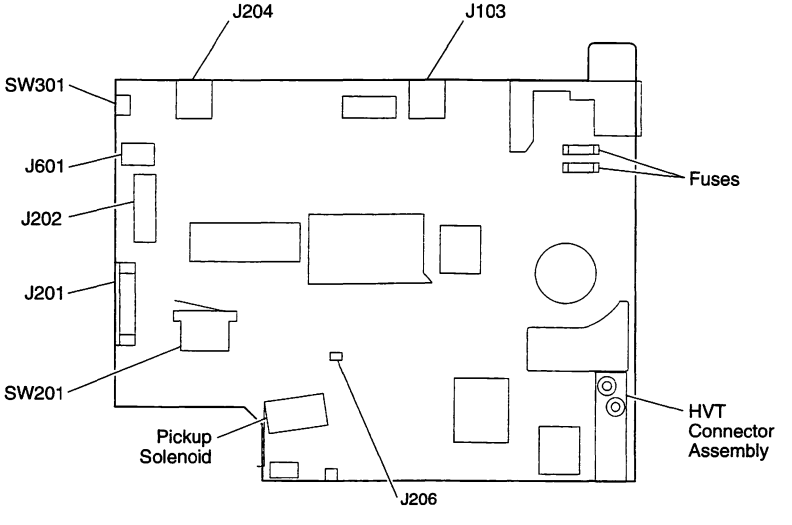


Figure 3 Personal LaserWriter 300 Controller Assembly

Specifications

Printer Specifications	
Engine	Canon engine
Print Resolution	300 dots per inch (dpi)
Speed	4 pages-per-minute maximum; actual performance depends on the application
Paper Feed	Input: Automatic with universal paper cassette; manual feed available for special print materials Output: Face-down or face-up
Print Materials	Cassette feed: 17–20 lb., single sheet, photocopy bond Manual feed: 17–28 lb., letterhead and colored stock, standard-weight transparency material, envelopes, and labels
Paper Capacities	Capacity in: Cassette—100 sheets; Manual—single sheets, envelopes, transparency material, etc. Capacity out: 25 plain sheets (face-down delivery); transparency material, labels, and postcard paper are delivered face-up only and must be removed by hand
Imaging Language Supported	QuickDraw
Macintosh Requirements	Macintosh computer with system 6.0.7 or later
Imageable Area	Maximum printable lines: 8 in. (203 mm) Minimum top and bottom margins: 0.25 in. (6.35 mm) Minimum left and right margins: 0.25 in. (6.35 mm) Printable area may vary depending upon application
Dimensions	Height: 6.3 in. (16.1 cm) Width: 15.2 in. (38.5 cm) Depth: 14.9 in. (37.9 cm) Weight: 15.4 lb. (7 kg) without cartridge
Operating Requirements	50–90.5° F (10–32.5° C) 20-80% relative humidity
Power Requirements	U.S./Japan: 100–120 VAC; 50–60 Hz Europe/Australia: 220–240 VAC; 50 Hz

I/O Board Specifications	
Processor	N/A
RAM	4 MB
DRAM	512K, expandable to 1.5 MB or 4.5 MB
ROM	N/A
Interfaces	RS-422
Printing Protocols	QuickDraw
Built-in Fonts	Avant Garde, Bookman, Chicago, Courier, Geneva, Helvetica, Helvetica Narrow, Monaco, New Century Schoolbook, New York, Palatino, Symbol, Times, Zapf Chancery, Zapf Dingbats

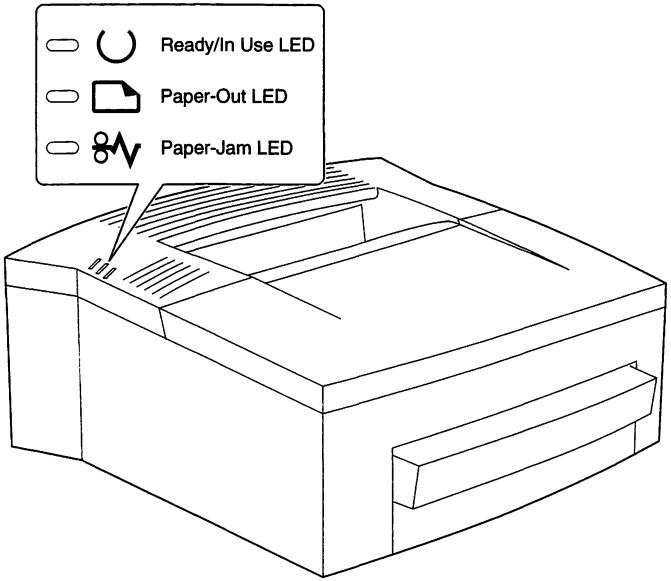


Figure 4 Personal LaserWriter 300 Status LEDs

The Personal LaserWriter 300 has three status LEDs (see Figure 4) located on the top of the printer:

- Ready – The green Ready LED flashes during printer warmup and when the printer is operating. The LED is steady when the printer is warmed up and ready to print. The LED is off when the printer is not ready, an error condition exists, or the top cover is open.
- Paper-Out – The red Paper-Out LED is on and steady when the printer is out of paper or the paper tray is missing and the printer is set for cassette feed.
- Paper-Jam – The red Paper-Jam LED comes on when paper jams inside the printer. The LED remains on until the jam is cleared.

Note The Personal LaserWriter 300 has no on/off switch. Once you plug in the printer, it is on and ready to print.

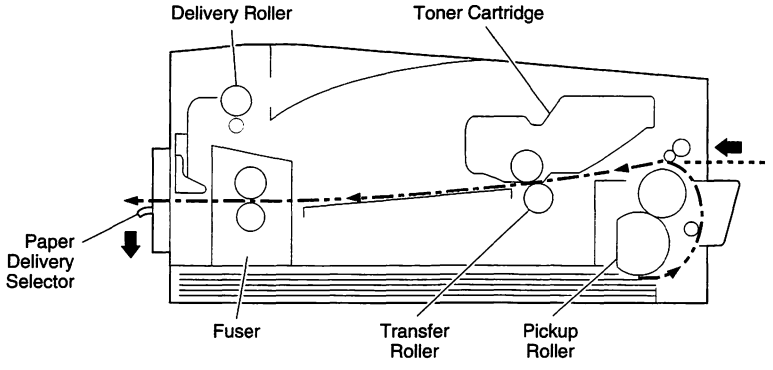


Figure 5 Face-Up Path

Figures 5 and 6 show the two Personal LaserWriter 300 paper paths. Paper enters from the paper cassette or the manual-feed slot and exits to the face-down tray or through the face-up delivery slot.

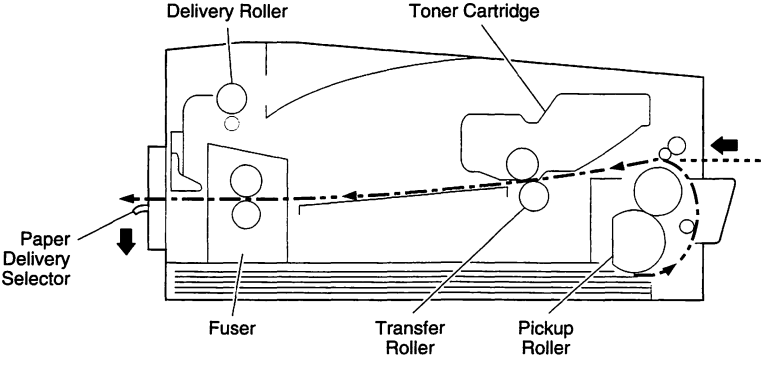


Figure 6 Face-Down Path

When the paper delivery selector is in the down position (see Figure 5), paper is delivered face-up. When the selector is in the up position (see Figure 6), paper is delivered face-down.

lote Default delivery is face-down at the top of the printer.

Sensing System

The Personal LaserWriter 300 has four paper sensors (see Figure 7). Each sensor consists of an actuator and a U-shaped photo interrupter that is soldered to the controller assembly. The paper sensors are actuated when an arm or lever swings against the paper as the paper moves through the printer.

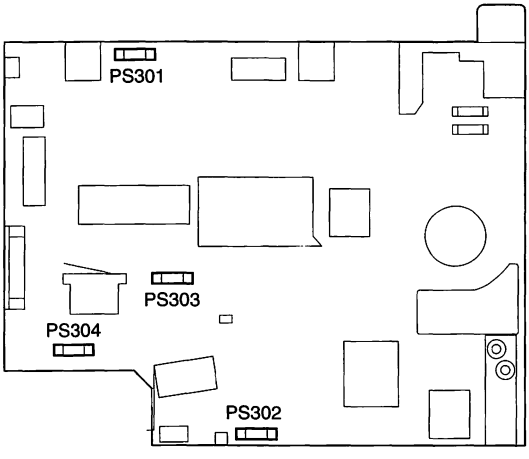


Figure 7 Sensing System

The paper delivery sensor, PS301, detects the passage of paper through the fuser assembly. The registration paper sensor, PS302, detects the presence of paper in the manual-feed slot and detects misfeeds of both cassette-fed and manual-fed paper.

The winding paper sensor, PS303, detects the passage of paper from the photosensitive drum to the fuser. The cassette empty sensor, PS304, detects whether the cassette tray contains paper.

Service Test Page

The Personal LaserWriter 300 service test page, which consists of a series of vertical lines, confirms print engine operation. To print a service test page, follow these steps:

1. Remove the printer cover.
2. Install a toner cartridge and fill the paper cassette tray.

Note You must install the toner cartridge before you plug in the printer, or a paper jam may occur.

3. Plug in the printer and switch it on.
4. Defeat the paper delivery sensor, PS301, with a piece of folded paper, as shown in Figure 8. Insert the paper only until it touches the metal shaft of the fuser. If you insert the paper too far, the sensor remains open and the printer determines that a paper jam exists.

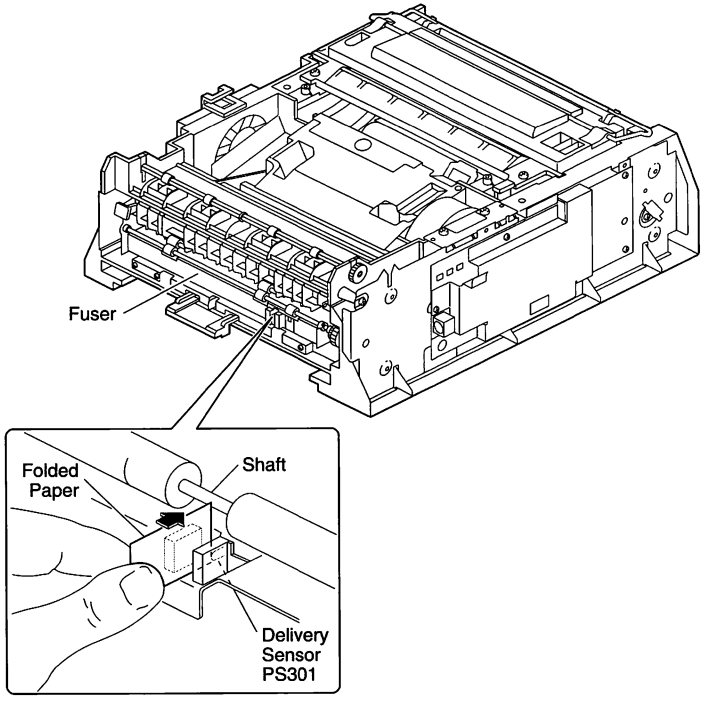


Figure 8 Defeating the Paper Delivery Sensor

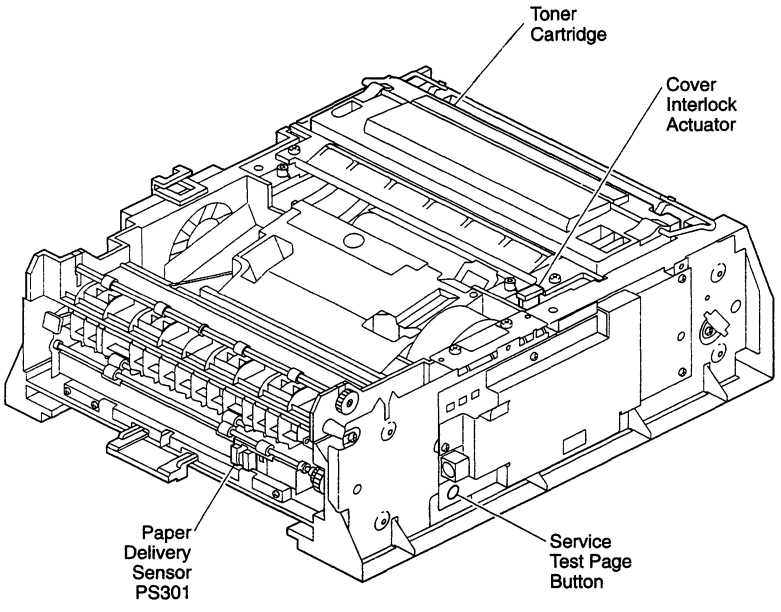


Figure 9 Printing a Service Test Page

5. Cover the toner cartridge with a piece of paper to prevent exposure of the drum.
6. Press down on the toner cartridge and the cover interlock actuator (see Figure 9) while you press the service test page button with a screwdriver.

Note When you press down the cover interlock actuator, the fan should come on and the paper delivery rollers should rotate. If you don't hear the fan, verify that you have properly defeated the paper delivery sensor, that you are holding down the cover interlock actuator all the way, and that the paper cassette is installed.

Note If you do not press down firmly on the toner cartridge during the printing process, the test page may be blank.

The reflecting mirror is factory-adjusted to ensure the correct angle. If you replace the mirror or the laser/scanner assembly, you must readjust the mirror as follows:

1. Align the adjustment scale on the mirror assembly with the mark on the printer chassis, as shown in Figure 10.

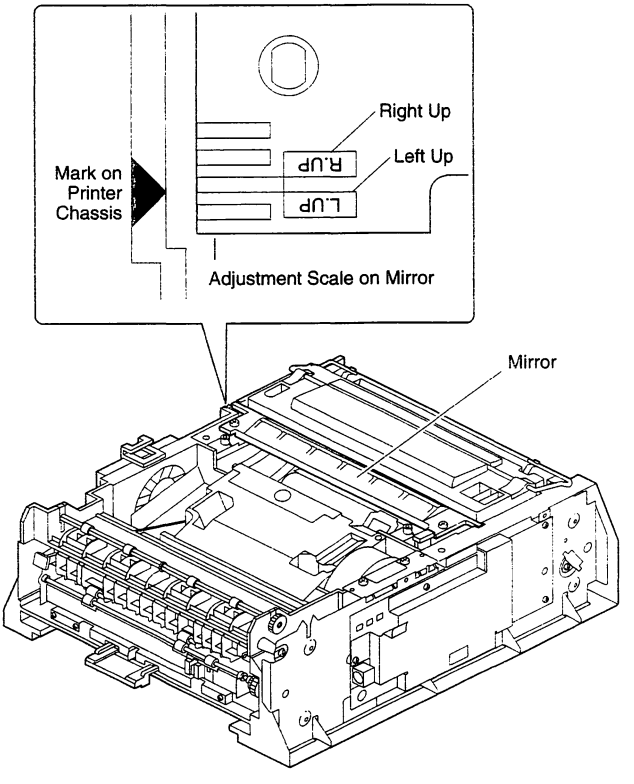


Figure 10 Aligning the Mirror

2. Load the printer with letter-size paper and initiate a service test page as described in the "Service Test Page" section.
3. Using a straight edge, draw a line across the top of each vertical line on the service test page. Place a triangle against the first vertical line on the service test page and trace its top edge, as shown in Figure 11.

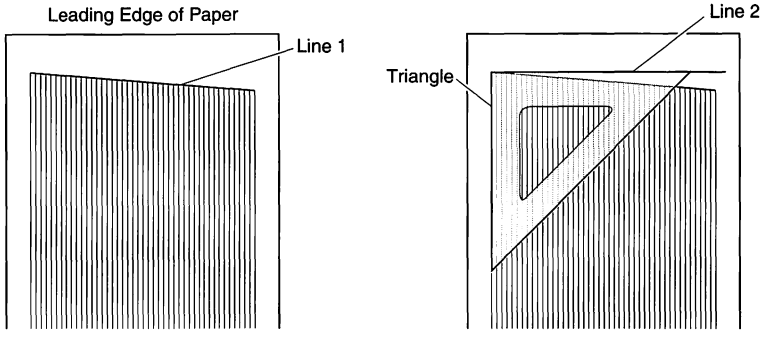


Figure 11 Tracing the Service Test Page

4. Measure the error between line 1 and line 2, as shown in Figure 12.

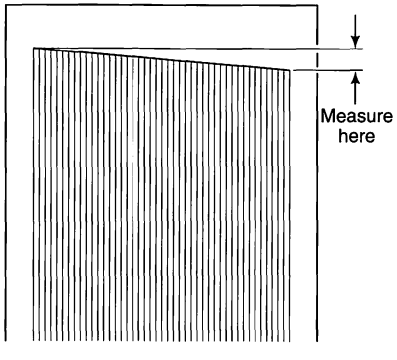


Figure 12 Measuring the Adjustment Error

5. If the error is more than 1.5 mm, shift the scale in 1 mm increments to correct the error. Shift the mirror towards the laser/scanner to move the left side of the image up; shift the mirror away from the laser/scanner to move the right side of the image up (see Figure 13).

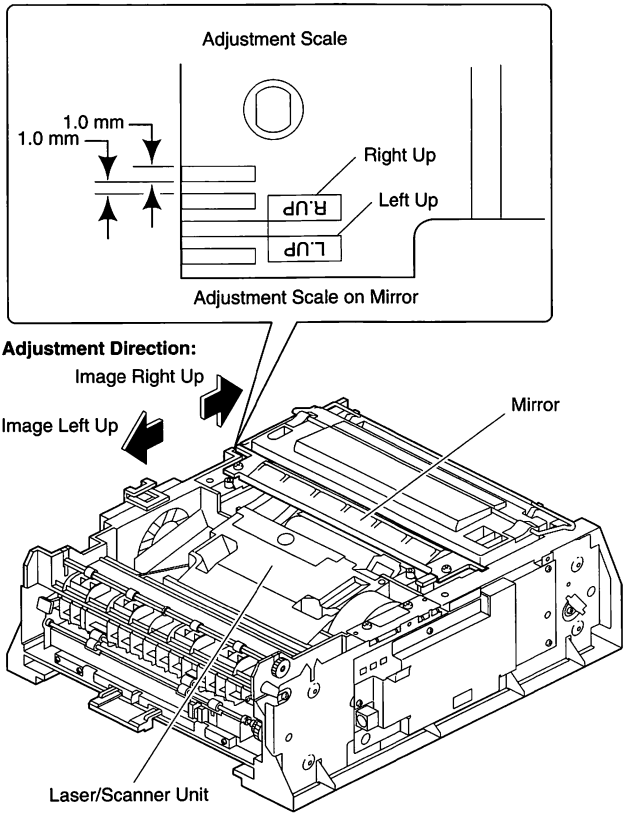


Figure 13 Readjusting the Mirror Alignment

6. Initiate a service test page to verify the adjustment. If the adjusted value is still incorrect, repeat this entire procedure until the error is less than 1.5 mm.

Registration Adjustment

You must adjust the printer registration whenever you replace the controller assembly. The optimum registration is 2 mm, as shown in Figure 14.

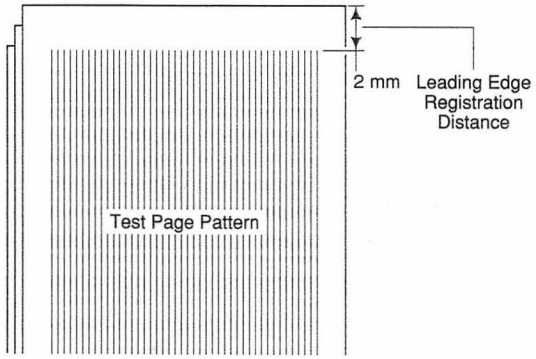


Figure 14 Optimum Registration

If the printer registration is off, you can adjust it as follows:

1. Using a jeweler's screwdriver, reset VR301 on the controller assembly to "0" (see Figure 15).

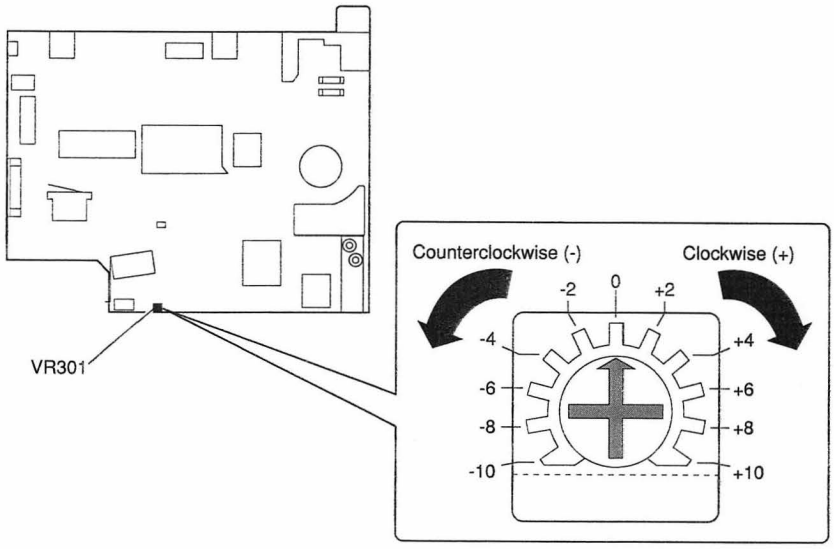


Figure 15 Resetting VR301

2. Switch on the printer and wait for it to warm up.
3. Print three service test pages.
4. Measure the distance from the top of each page to the edge of the printed test pattern.
5. Calculate the average distance by adding the three measurements and dividing by three.
6. Adjust VR301 so that the average value becomes 2.0 mm. For example, if your average distance is 2.6 mm, the difference is 0.6 mm and you should set VR301 to a setting of -2 (see Figure 16).
7. Print three more test pages. If the average registration distance is not 2.0 mm, repeat this procedure.

(+) Clockwise
(Avg. distance < 2.0mm)

Difference (mm)	VR301 Setting
+3.04	-10
+2.74	-9
+2.44	-8
+2.10	-7
+1.83	-6
+1.50	-5
+1.22	-4
+0.90	-3
+0.61	-2
+0.30	-1

(-) Counterclockwise
(Avg. distance > 2.0mm)

Difference (mm)	VR301 Setting
-0.30	+1
-0.61	+2
-0.90	+3
-1.22	+4
-1.50	+5
-1.83	+6
-2.10	+7
-2.44	+8
-2.74	+9
-3.04	+10

Figure 16 Determining the Proper VR301 Setting

Before you begin troubleshooting, check the printer setup and operating conditions described in the Pre-Power-On Checklist section. If the problem persists, refer to the flowchart later in this troubleshooting section.

The flowchart directs you to perform various tasks and refers you to specific troubleshooting tables. Perform each step in the troubleshooting tables in order until the problem is resolved and refer as necessary to the wiring diagram that follows the tables.

Retry the printer each time you change its physical state—such as when you replace a component—until the problem is resolved. If you replace a module and the problem remains, reinstall the original module before proceeding to the next step in the table.

When the printer is repaired, perform the necessary preventive maintenance before returning it to the customer. Make sure you are familiar with all procedures described in the "Safety" section in the front of this guide before performing any live electrical checks.

Pre-Power-On Checklist

Verify that the following conditions are met before proceeding with the troubleshooting flowchart or tables:

- Line voltage is OK (115 VAC ± 10%).
- Printer is installed on a solid, level surface.
- Room temperature is between 50–90° F (10–32.5° C).
- Humidity is 20–80%.
- Printer is not located in a hot or humid area, near open flames, or in a dusty location.
- Printer is not exposed to ammonia gas.
- Printer is not in direct sunlight.
- Printer is installed in a well-ventilated area.
- Cables and connectors are OK.
- Toner cartridge is installed and has toner.
- Paper cassette is properly loaded with paper.
- Paper is within specifications.
- Top access door is closed.
- Rear door assembly is closed.

Troubleshooting Tips

Following are tips for troubleshooting the Personal LaserWriter 300.

Drum Exposure

When the printer cover is removed, the photosensitive drum inside the toner cartridge may be exposed to light. Exposing the toner cartridge to light (even room light for more than 5 minutes) can damage the cartridge and may result in blank spots or black stripes on printed pages. To avoid such exposure, follow these guidelines:

- Don't leave the rear access door open on the printer when the toner cartridge is installed.
- Always cover the toner cartridge when you remove it from the printer.
- Avoid storing open toner packages in areas that are exposed to direct sunlight.
- Always cover the toner cartridge with a piece of paper when printing with the printer cover removed.

Note If the cartridge has been irradiated by ordinary light, you may be able to repair the damage by placing the cartridge in a dark area, such as a drawer, for several hours. However, do not expose the cartridge to direct sunlight.

Avoiding Paper Jams

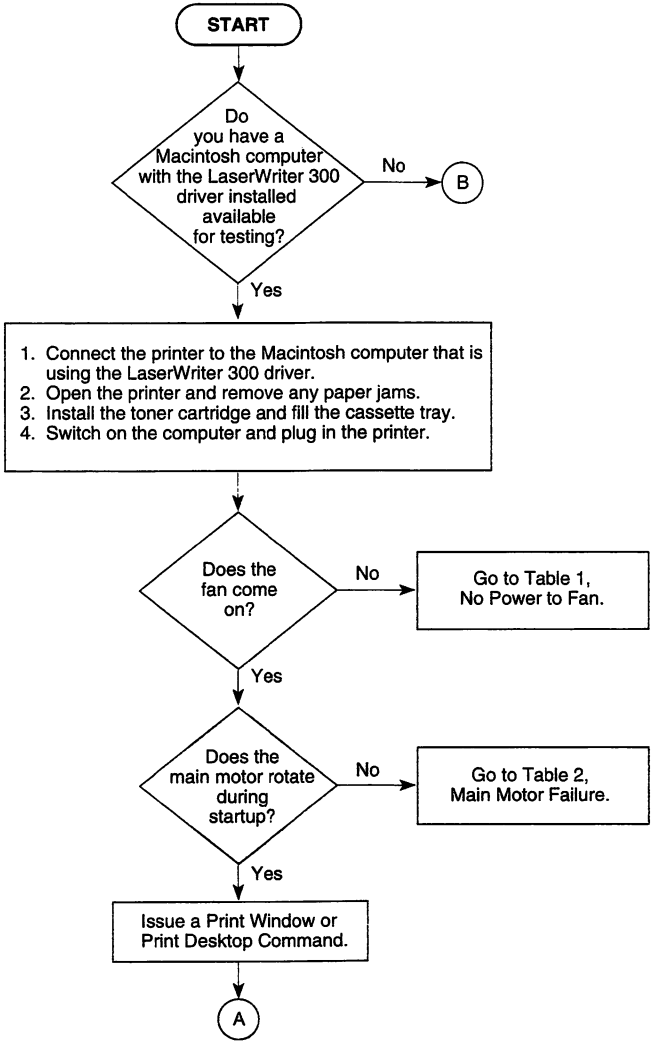
Follow these guidelines to reduce your chances of a paper jam:

- Don't load already printed pages into the paper cassette—always use manual feed for printing the second side of two-sided copies.
- When printing multiple pages via manual feed, wait for the screen prompt before inserting a new sheet into the printer.
- Make sure that the paper cassette is properly loaded with one of the recommended paper types.
- Always install the toner cartridge before plugging in the printer.

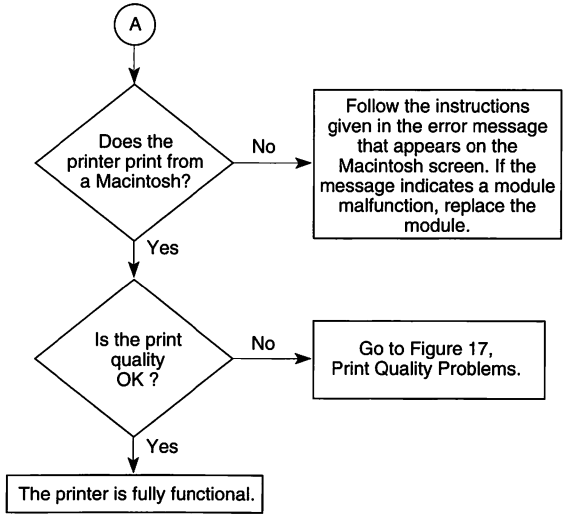
Printing with the Cover Removed

When printing test pages with the printer cover removed, you must press down on the toner cartridge to ensure contact between the HVT connector assembly and the contact points on the toner cartridge. If you do not apply proper pressure during the print cycle, you may get blank pages.

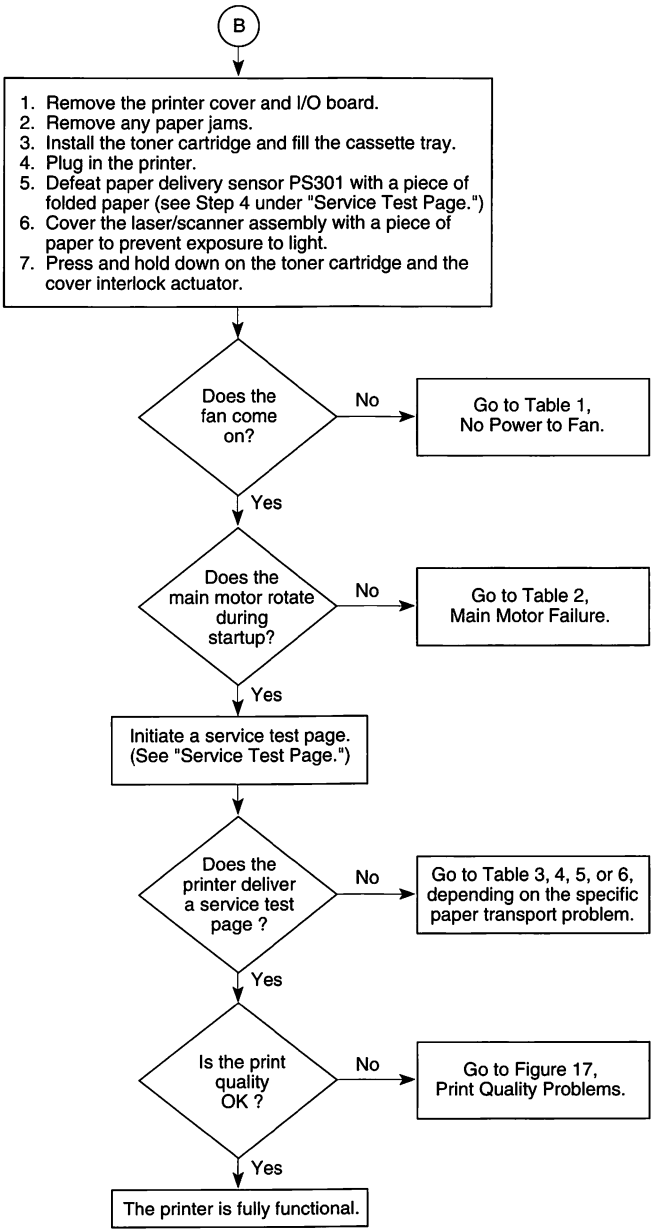
Personal LaserWriter 300 Troubleshooting Flowchart



Personal LaserWriter 300 Print Engine Check (1 of 3)



Personal LaserWriter 300 Print Engine Check (2 of 3)



Personal LaserWriter 300 Print Engine Check (3 of 3)

Troubleshooting Tables

Important **As you proceed through the steps in a table, remember to retry the printer each time you change its physical state—such as when you replace a module. If the problem remains, reinstall the original module before proceeding to the next step in the table. Refer as necessary to the wiring diagram that follows the tables.**

Table 1 No Power to Fan

Step	Check	Result	Action
1	Make sure the toner cartridge is installed and then unplug the printer. Due to the possibility of a capacitor error, wait 4 minutes and then plug in the printer. Does the problem persist?	No	Problem solved.
2	Is the printer cover securely seated and the rear door assembly installed and securely closed? Or, if the cover is removed, do you have the cover interlock actuator depressed and the paper delivery sensor defeated?	No	Reseat the printer cover and/or install and close the rear door assembly. Or, depress the cover interlock actuator and defeat the paper delivery sensor.
3	Is there correct voltage at the outlet?	No	Plug in the printer at an outlet that is supplying the correct voltage.
4	Is the printer's power cord securely connected at the outlet and at the printer end?	No	Secure the power cord.
5	Is the fan cable securely connected to the laser/scanner assembly?	No	Secure the fan cable.
6	Is the fan cable pinched under the top tab that secures the fan to the chassis?	Yes	Make sure the fan cable runs under the side of the tab.
7	Does the voltage between connector J804-3 (FANON) and J804-1 (+12VGND) on the laser/scanner assembly change from 0 V to about 12 VDC when you plug in the printer?	Yes	Replace the fan.
8	Is fuse FU101 on the controller assembly blown?	Yes No	Replace the fuse. Replace the controller assembly.

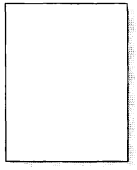
Table 2 Main Motor Failure			
Step	**Check**	**Result**	**Action**
1	Is the motor properly seated and making good contact with the controller assembly?	No	Reseat the motor so that it makes good contact with the controller assembly.
		Yes	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the motor. • Replace the controller assembly.

Table 3 No Paper Pickup from Cassette Tray			
Step	**Check**	**Result**	**Action**
1	Have you set the printer for cassette-feed in the Print dialog box?	No	Select the Cassette option in the Print dialog box.
2	Was the toner cartridge installed before you plugged in the printer?	No	With the toner cartridge installed, unplug the printer and plug it back in again.
3	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
4	Remove excess paper from the cassette tray. Does the problem persist?	No	Problem solved.
5	Is the paper pickup roller worn or deformed?	Yes	Replace the paper pickup roller.
6	Replace the pickup solenoid on the controller assembly. Does the problem persist?	No	Problem solved.
7	Is the fuser assembly properly seated and making good contact with the controller assembly?	No	Reseat the fuser assembly so that it makes good contact with the controller assembly.
8	Remove the fuser assembly and measure the resistance between connectors J204-1 and J204-2. Does the resistance measure approximately 440 KΩ?	No	Replace the fuser assembly.
9	Is there continuity between connectors J103-1 and J103-2?	No Yes	Replace the fuser assembly. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the controller assembly. • Replace the pickup motor.

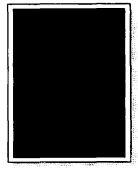
Table 4 No Paper Pickup From Manual-Feed Slot			
Step	**Check**	**Result**	**Action**
1	Is the printer set up for manual feed?	No	Select the Manual Feed option in the Print dialog box.
2	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
3	Remove excess paper from the manual-feed slot. Does the problem persist?	No	Problem solved.
4	Is the arm registration assembly broken?	Yes	Replace the arm registration assembly.
		No	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the pickup motor. • Replace the controller assembly. • Replace the fuser assembly.

Table 5 Paper Jams in Pickup/Transfer Area			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
2	Was the toner cartridge installed before you plugged in the printer?	No	With the toner cartridge installed, unplug the printer and plug it back in again.
3	Is the paper wrinkled or damaged?	Yes	Check the inside of the printer for physical obstructions and make sure that all paper feed assemblies are installed correctly.
4	Inspect the arm registration assembly. Is it jammed or broken?	Yes	Replace the arm registration assembly.
5	Inspect the winding paper sensor on the feeder guide assembly. Is it jammed or broken?	Yes	Replace the feeder guide assembly.
6	Does the paper jam when you print a service test page?	Yes No	Replace the fuser assembly. Replace the pickup motor. If the problem persists, replace the controller assembly.

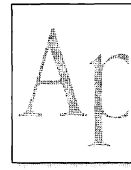
Table 6 Paper Jams in Fuser/Delivery Area			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
2	Is the paper wrinkled or damaged?	Yes	Check the inside of the printer for physical obstructions.
3	Inspect the winding paper sensor on the feeder guide assembly. Is it jammed or broken?	Yes	Replace the feeder guide assembly.
4	Inspect the delivery roller assembly and passive delivery rollers. Are they installed correctly and in good working order?	No	Replace or reseat the delivery roller assembly and/or passive delivery rollers.
5	Remove the rear door assembly and inspect the operation of the paper delivery selector. Does the assembly move freely?	No	Replace the rear door assembly.
6	Test the paper delivery sensor in the fuser assembly. Does it appear to be jammed or broken?	Yes No	Replace the fuser assembly. Replace the controller assembly. If the problem persists, replace the fuser assembly.



Blank Page
See Table 7

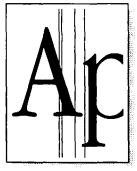


All-Black Page
See Table 8



Light/Faded Image
See Table 9

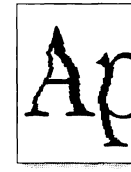
Dark Image
See Table 10



Black Vertical Line(s)
See Table 11

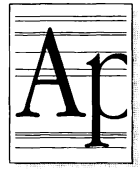
White Vertical Line(s)
See Table 12

Irregular Black Line
See Table 13



Stairstepping
See Table 14

Horizontal Banding
See Table 15

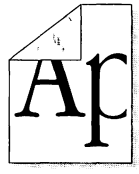


Black Horizontal Lines
See Table 16

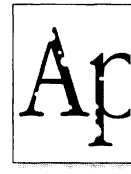
Bad Registration
See Table 17

Skewed Print
See Table 18

Bad Fusing
See Table 19



Toner on Back
See Table 20



Blank Spots
See Table 21

Figure 17 Print Quality Problems

Table 7 All-Blank Page			
Step	**Check**	**Result**	**Action**
1	Has the sealing tape been removed from the toner cartridge, and is the cartridge free from any other obstructions?	No	Remove the sealing tape or other obstructions from the toner cartridge.
2	If the printer cover is removed, make sure you are pressing down on the toner cartridge during the printing process so that the toner cartridge is making solid contact with the HVT connector. Does the problem persist?	No	Problem solved.
3	Are the metal contact points on the toner cartridge or HVT connector assembly dirty?	Yes No	Clean the contact points with a soft, dry cloth. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the controller assembly. • Replace the laser/scanner assembly.

Table 8 All-Black Page			
Step	**Check**	**Result**	**Action**
1	Replace the controller assembly with a known-good controller assembly. Does the problem persist?	No Yes	Problem solved. Replace the laser/scanner assembly.

Table 9 Uniformly Light/Faded Image Over Entire Page			
Step	**Check**	**Result**	**Action**
1	Remove the toner cartridge and rock it back and forth to distribute the toner evenly. Does the problem persist?	No	Problem solved.
2	Adjust the print density via the Options button in the Print dialog box, and print about a dozen test pages with known-good paper. Does the problem persist?	No	Problem solved.
3	Replace the toner cartridge with a known-good cartridge. Does the problem persist?	No	Problem solved.
4	Are the metal contact points on the toner cartridge or HVT connector assembly dirty?	Yes	Clean the contact points with a soft, dry cloth.
		No	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the transfer roller assembly. • Replace the HVT connector assembly. • Replace the controller assembly. • Replace the laser/scanner assembly.

Table 10 Uniformly Dark Image Over Entire Page			
Step	**Check**	**Result**	**Action**
1	Adjust the print density via the Options button in the Print dialog box, and print about a dozen test pages with known-good paper. Does the problem persist?	No	Problem solved.
2	Are the metal contact points on the toner cartridge or HVT connector assembly dirty?	Yes	Clean the contact points with a soft, dry cloth.
		No	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the controller assembly. • Replace the laser/scanner assembly.

Table 11 Black Vertical Lines, Sharp and Well-Defined			
Step	**Check**	**Result**	**Action**
1	Try printing with a known-good toner cartridge. Does the problem persist?	No	Problem solved.
2	Does the problem only occur when you print from the Macintosh (that is, the problem definitely does *not* occur on service test pages)?	Yes	Replace I/O board.
		No	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the fuser assembly. • Replace the laser/scanner assembly.

Table 12 White Vertical Lines, Sharp and Well-Defined			
Step	**Check**	**Result**	**Action**
1	Is there any type of physical obstruction near the laser opening that could be casting a shadow on the photosensitive drum?	Yes	Remove the obstruction.
2	Does the problem occur only when you print from the Macintosh (that is, the problem definitely does *not* occur on service test pages)?	Yes No	Replace the I/O board. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the pickup motor. • Replace the laser/scanner assembly. • Replace the mirror assembly.

Table 13 Vertical Banding, Irregular and Smudged Black Lines Over Image			
Step	**Check**	**Result**	**Action**
1	Replace the toner cartridge. Does the problem persist?	No	Problem solved.

Table 14 Stairstepping/Vertical Lines Jagged or Shaky			
Step	**Check**	**Result**	**Action**
1	Is the laser/scanner assembly properly seated and making good contact with the scanner interconnect assembly?	No	Reseat the laser/scanner assembly.
2	Is the scanner interconnect assembly properly seated and making good contact with the controller assembly?	No	Reseat the scanner interconnect assembly.
3	Does the problem appear when you print a service test page?	No Yes	Replace the I/O board. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the laser/scanner assembly. • Replace the controller assembly.

Table 15 Horizontal Banding, Evenly Spaced Smudged Black Lines Over Image			
Step	**Check**	**Result**	**Action**
1	Interrupt a print cycle and inspect the photosensitive drum. Does the fault appear on the drum?	Yes No	Replace the toner cartridge. Replace the fuser assembly.

Table 16 Black Horizontal Lines, Sharp and Well-Defined			
Step	**Check**	**Result**	**Action**
1	Are the lines evenly spaced?	Yes	Replace the toner cartridge.
		No	Replace the laser/scanner assembly.

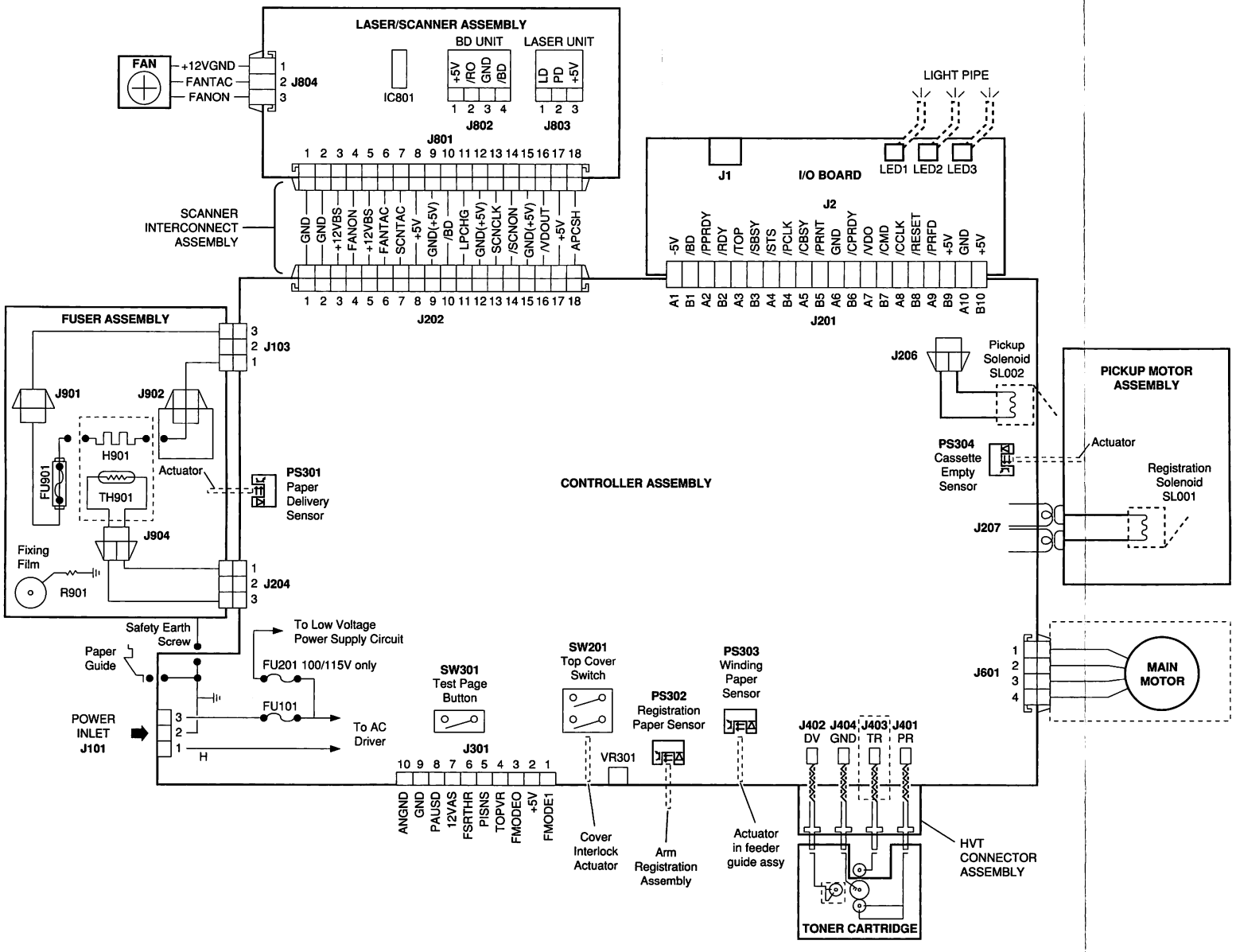
Table 17 Bad Registration			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper. Does the problem persist?	No	Problem solved.
2	Remove the excess paper from the cassette tray or manual-feed slot. Does the problem persist?	No	Problem solved.
3	Perform the registration adjustment (see "Registration Adjustment"). Does the problem persist?	No	Problem solved.
		Yes	Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Clean or replace the pickup roller as needed. • Replace the pickup motor. • Replace the arm registration assembly if broken. • Replace the controller assembly.

Table 18 Skewed Print			
Step	**Check**	**Result**	**Action**
1	Adjust the mirror assembly (see "Mirror Adjustment"). Does the problem persist?	No	Problem solved.

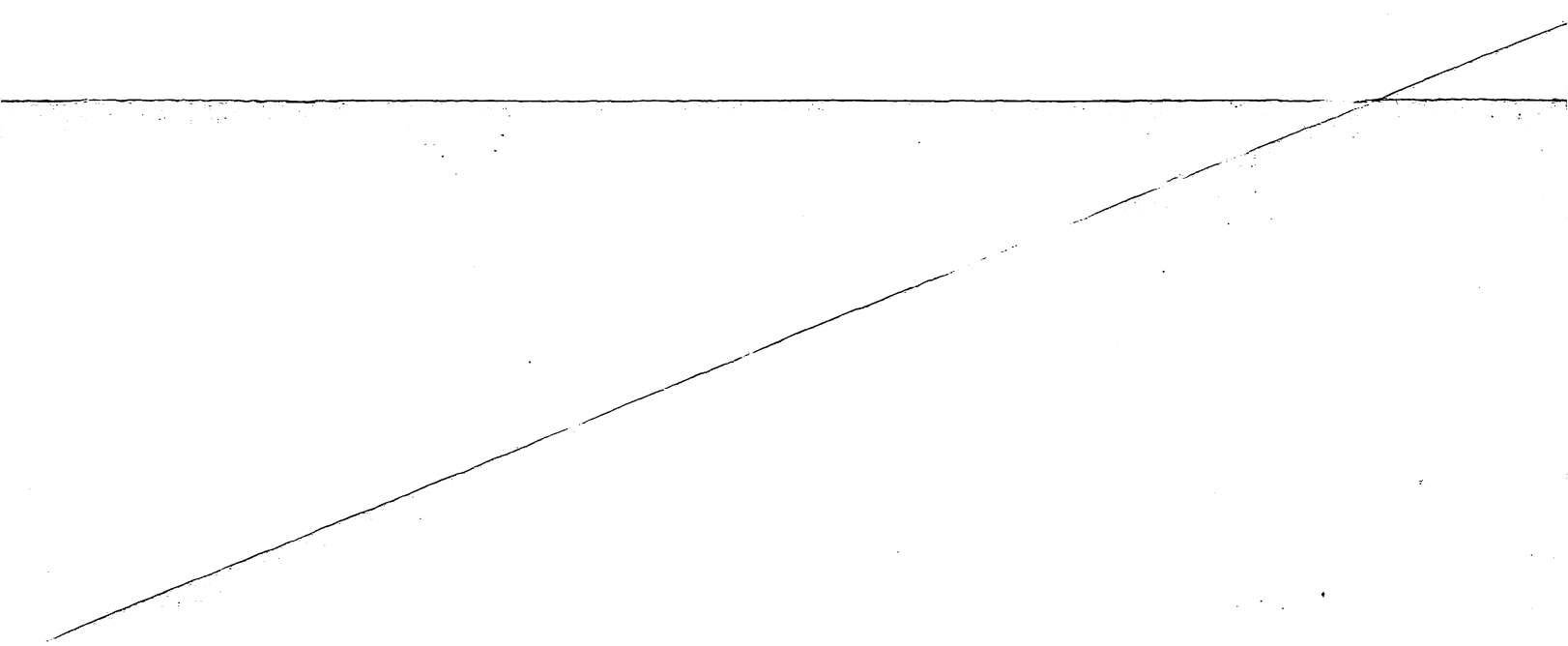
Table 19 Bad Fusing			
Step	**Check**	**Result**	**Action**
1	Try printing with dry, known-good paper. Does the problem persist?	No	Problem solved.
2	Clean the transfer roller using dry, lint-free paper only. Does the problem persist?	No Yes	Problem solved. Perform the first module exchange listed below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the fuser assembly. • Replace the transfer roller.

Table 20 Toner on Back of Page			
Step	**Check**	**Result**	**Action**
1	Clean the transfer roller using dry, lint-free paper only. If the roller cannot be cleaned, replace it. Does the problem persist?	No	Problem solved.
2	Clean the transfer guide assembly. Does the problem persist?	No	Problem solved.
3	Clean the feeder guide assembly. Does the problem persist?	No Yes	Problem solved. Replace the fuser assembly.

Table 21 Blank Spots, Random Pattern or Location			
Step	**Check**	**Result**	**Action**
1	Try printing with known-good paper and be sure to print on the correct side of the paper if applicable. Does the problem persist?	No	Problem solved.
2	Clean all the metal contact points on the toner cartridge and on the HVT connector assembly. Does the problem persist?	No Yes	Problem solved. Perform the first module exchange below. If the problem persists, reinstall the original module and perform the next exchange: • Replace the transfer roller assembly. • Replace the controller assembly.



Personal LaserWriter 300 Wiring Diagram



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