LaserWriter® IINT/NTX
Owner's Guide

Apple® LaserWriter II

WARNING

To prevent electrical shock, do not remove the printer cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

Caution: Use of controls or adjustments, or performance of procedures, other than those specified in the manual may result in hazardous radiation exposure.

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. See instructions if interference to radio or television reception is suspected.

Apple® LaserWriter® IINT/NTX
Owner's Guide

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Figures and tables

Radio and television interference

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly—that is, in strict accordance with Apple's instructions—it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J, Part 15, of FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if a "rabbit-ear" television antenna is used. (A rabbit-ear antenna is the telescoping-rod type usually found on television receivers.)

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripheral devices.

If your computer system does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

☐ Turn the television or radio antenna until the interference stops.

☐ Move the computer to one side or the other of the television or radio.

☐ Move the computer farther away from the television or radio.

☐ Plug the computer into an outlet that is on a different circuit than the television or radio. (That is, make certain the computer and the radio or television are on circuits controlled by different circuit breakers or fuses.)

☐ Consider installing a rooftop television antenna with a coaxial cable lead-in between the antenna and the television.

If necessary, consult your authorized Apple dealer or an experienced radio-television technician for additional suggestions.

You may find helpful the following booklet, prepared by the Federal Communications Commission: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

Important   This product was FCC-certified under test conditions that included use of shielded cables and connectors between system components. It is important that you use shielded cables and connectors to reduce the possibility of causing interference to radios, television sets, and other electronic devices. For Apple peripheral devices, you can obtain the proper shielded cable from your authorized Apple dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.
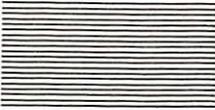
About This Manual

This manual is your introduction to the Apple® LaserWriter® IINT and LaserWriter IINTX printers. All directions for setup, operation, and maintenance pertain to both printers.

The LaserWriter II works with any Macintosh® or Apple IIGS®, and with any Apple IIe computer equipped with an Apple II Workstation Card. If you're new to the Apple world, read your owner's manual before proceeding. You'll need to know basic operations and vocabulary to set up and print with the LaserWriter II.

You can also use the LaserWriter II with an IBM PC or compatible computer. If you are going to be using an MS-DOS machine, be sure to familiarize yourself with its basic operations.

How to use this manual

Use this manual now to set up and begin working with your printer. Use it later as a reference for day-to-day routines and as a guide for maintenance and troubleshooting.

If you are a new owner using a Macintosh computer, you should read Chapters 1 through 3 right away to get started working with your LaserWriter II. Turn to Chapters 4 and 5 when you're ready to learn more about typography and desktop publishing. Read Chapter 6 soon after you purchase the LaserWriter II to learn how to care for your printer.

If you have joined a network that includes LaserWriter IINT or LaserWriter IINTX printers, read Chapters 2 and 3 first, and turn to Chapters 4 and 5 as your needs require.

If you'll be using an Apple II or MS-DOS computer, read Appendix B (for Apple II) or Appendix C (for MS-DOS) instead of Chapter 2. If you are not using a Macintosh, the chapters on fonts and design may or may not be relevant, depending on the type of system you have.

If you have upgraded your LaserWriter IINT to a LaserWriter IINTX, all setup, operation, and maintenance procedures should be familiar to you. You should read Appendix A, though, to find out how to further upgrade your printer.

□ Chapter 1, "Setting Up," gives step-by-step instructions on setting up the LaserWriter II and connecting it to your computer.

□ Chapter 2, "Software Installation," introduces you to the printer software that controls the LaserWriter II, tells you how to install it, and explains the various options you have for managing disk space.

□ Chapter 3, "Using the LaserWriter II," is a reference guide for day-to-day operation.

□ Chapter 4, "All About Fonts," covers the basics of Macintosh typography: **screen fonts** and printer output, the **POSTSCRIPT®** page-description language, the LaserWriter II fonts, and sources for additional fonts.

□ Chapter 5, "Designing with the LaserWriter II," is an introduction to desktop publishing. The chapter includes guidelines for font selection and page organization, followed by examples of documents created with the LaserWriter II. The annotated bibliography at the end of the chapter gives suggestions for further reading.

□ Chapter 6, "Maintenance and Troubleshooting," covers routine maintenance procedures and solutions for minor problems that may occur.

□ Appendix A, "The LaserWriter II Upgrades," covers upgrading a LaserWriter IINT to a LaserWriter IINTX and adding additional **random access memory (RAM)** and a hard disk to the LaserWriter IINTX.

□ Appendix B, "Connecting the LaserWriter II to an Apple II," gives instructions for connecting the LaserWriter II to an Apple IIGS or an Apple IIe.

☐ Appendix C, "Connecting To and Printing With an MS-DOS Computer," gives details on connecting the LaserWriter II to an MS-DOS or other non-Apple computer.

The rest of the appendixes provide background information on the printer itself and on Apple service and support.

☐ Appendix D, "How the LaserWriter II Works" covers the basics of laser printing.

☐ Appendix E, "Specifications and Parts List," contains a physical description of the printers and a list of parts.

☐ Appendix F, "Status Lights, Ports, Expansion Slot, and Switches," describes the printers' warning lights, input ports, expansion slot, and controls.

☐ Appendix G, "The LaserWriter II Fonts," shows the complete character sets for the fonts on the *LaserWriter IINT/NTX Fonts Disk*.

☐ Appendix H, "Service and Support," tells you what you have to do if you need repairs or assistance or want to extend your warranty coverage.

The glossary gives definitions of terms used in this manual. Most terms in the glossary are in **bold** the first time they appear in the text.

For more technical and programming information about the LaserWriter family of printers, you may want to read the following books:

☐ *POSTSCRIPT Language Reference Manual* and *POSTSCRIPT Language Tutorial* from Adobe Systems Incorporated, published by Addison-Wesley Publishing Company, Reading, MA 01867

☐ *LaserWriter Reference,* published by Addison-Wesley Publishing Company, Reading, MA 01867

About the LaserWriter II

The LaserWriter IINT and LaserWriter IINTX are part of the second generation of Apple laser printers. With them you can print both text and graphics at close to typeset quality.

You can develop your documents using any application designed for the Macintosh, including all page-layout and graphics programs. With the appropriate connections, you can also use all such programs designed for MS-DOS computers.

You can use the LaserWriter II to produce **camera-ready** masters for copying or instant printing, transparencies for overhead projection, or detailed layouts and proofs of work that will eventually be typeset. Chapter 5, "Designing With the LaserWriter II," has more information on document design.

Eleven font families are built into the LaserWriter II: ITC Avant Garde®, ITC Bookman®, Courier, Helvetica®, Helvetica Narrow, New Century Schoolbook, Palatino®, Symbol, Times®, ITC Zapf Chancery®, and ITC Zapf Dingbats®. You can also choose from a wide array of fonts available either commercially or as **shareware** or **freeware.** See Chapter 4, "All About Fonts," for details.

You can easily upgrade a LaserWriter IINT to a LaserWriter IINTX. You can also expand the RAM of the LaserWriter IINTX up to 12 **megabytes (MB),** and add a hard disk for optimum performance. See Appendix A, "The LaserWriter II Upgrades," for more information.

Figure P-1
The LaserWriter II

Chapter 1

Setting Up

Do you have what you need?

In addition to this manual, the accessory kit inside the LaserWriter II shipping carton should contain the *LaserWriter II Installation Disk,* the *LaserWriter IINT/NTX Fonts Disk,* a product registration card, and a power cord. You should also find

☐ a U.S. letter-size paper cassette (for 110V printers)

☐ an A-4 paper cassette (for 220V printers)

☐ a cassette top with sliding guides for manual feed

You should also have obtained a **toner cartridge** from your authorized Apple dealer

If you're connecting to a Macintosh, Apple IIGS, or Apple IIe computer, you'll need a LocalTalk™ Locking Connector Kit to connect the printer to a LocalTalk cable system. For the Apple IIe connection, you'll also need an Apple II Workstation Card. See Appendix B for details on connecting Apple II–family computers.

You can connect the LaserWriter II to an IBM PC or compatible computer either serially or via LocalTalk. See Appendix C for full information. Your authorized Apple dealer can supply the appropriate serial connectors.

Your Apple dealer has already installed the LaserWriter II controller board. For this reason the shipping carton has been opened, and the protective plastic bag around the printer has either been removed or is no longer sealed. All the packing material should have been replaced, however.

Choosing a place for the LaserWriter II

Before you set up, choose a work area that's efficient for you and that meets the physical requirements of the printer.

The LaserWriter II runs on ordinary household current. If you haven't experienced electrical problems, such as lights flickering when you use a photocopier or turn on an air conditioner, your electrical service is probably adequate.

Choose a well-ventilated area away from direct sunlight and obvious sources of heat, cold, or humidity. The temperature should be between 50 and 90 degrees Fahrenheit (10 and 32 degrees Celsius) and the relative humidity between 20 and 80 percent.

Don't use devices that produce open flames, such as Bunsen burners or welding torches, near the LaserWriter II. Don't use ammonia-based cleaners, which can react chemically with the toner, on or around the LaserWriter II.

Choose a flat, stable surface for the printer. Be sure to leave adequate room to load and unload the paper cassette and to open the **face-up tray.** Figure 1-1 shows the dimensions of the LaserWriter II and the recommended minimum dimensions of the work area.
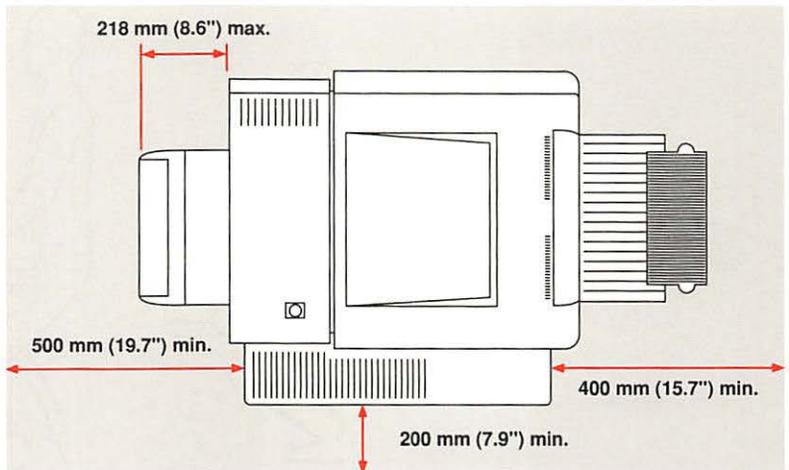
Figure 1-1
Dimensions of the LaserWriter II and the work area

Setting up

Setting up the LaserWriter II to prepare it for printing is simple and straightforward.

Unpacking

1. **Remove the packing material from the top of the LaserWriter II.**

2. **Lift the LaserWriter II.**

Reach into the shipping carton. Get a good grip on the base of the printer, lift it out, and place it on the work surface with the front (the Apple logo side) facing out.

The LaserWriter II weighs about 45 pounds (20.5 kilograms). To prevent back injury, bend your knees when lifting, and get help if you need it. (See Figure 1-2.)
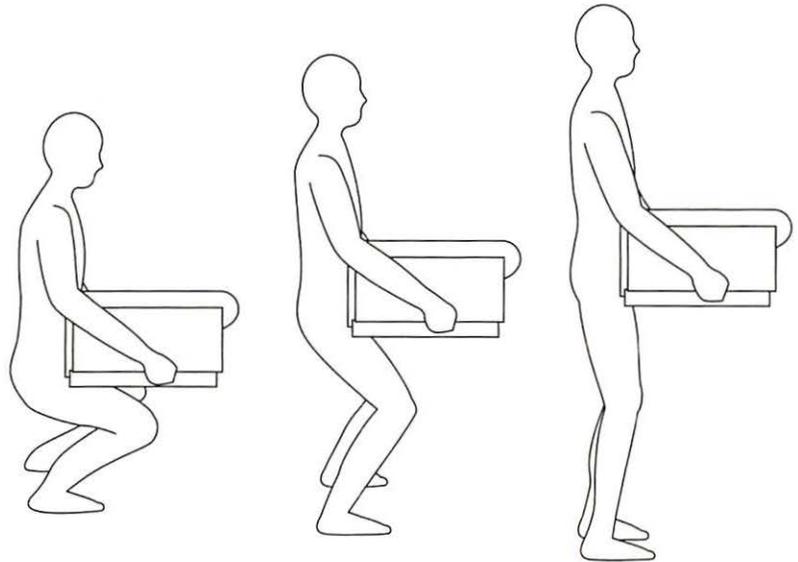
Figure 1-2
Lifting the LaserWriter II

3. If the printer is still in its protective plastic bag, remove it.

4. Remove the packing material from the paper cassette slot.

The safest way to transport the LaserWriter II is in its original carton, so store the box and the packing material for future use.

Opening the LaserWriter II

1. Press the release button on the top of the printer.

This releases the upper section of the printer. (See Figure 1-3.)

2. Lift the top up and to the left as far as it will go.

Press the release button to open ——
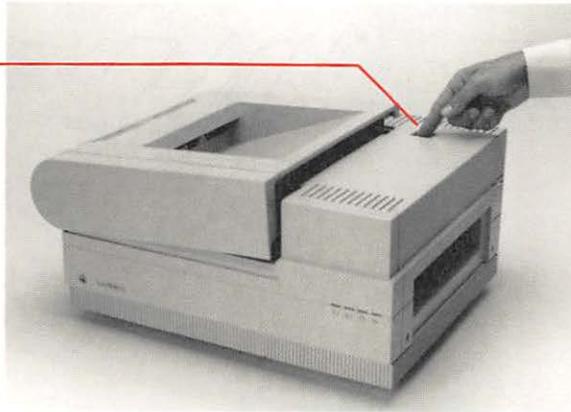
Figure 1-3
Opening the LaserWriter II

Don't touch the exposed electrical contacts or gears shown in the shaded areas of Figure 1-4.

Don't touch the shaded areas
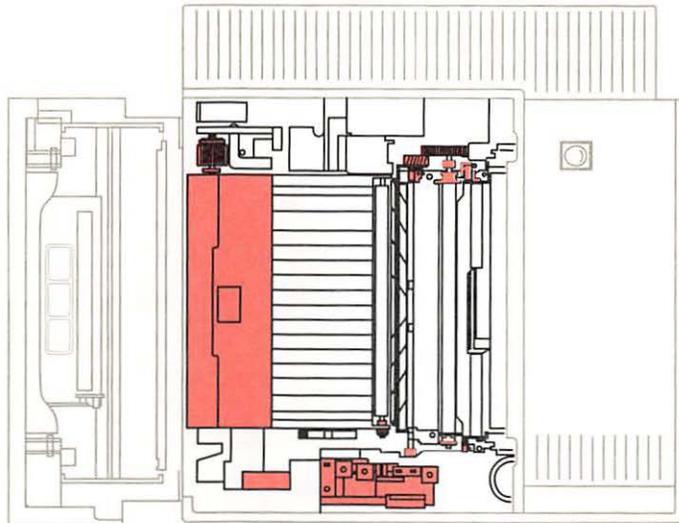
Figure 1-4
The interior of the LaserWriter II

3. Peel off the filament tape and remove the packing material from inside the printer. (See Figure 1-5.)
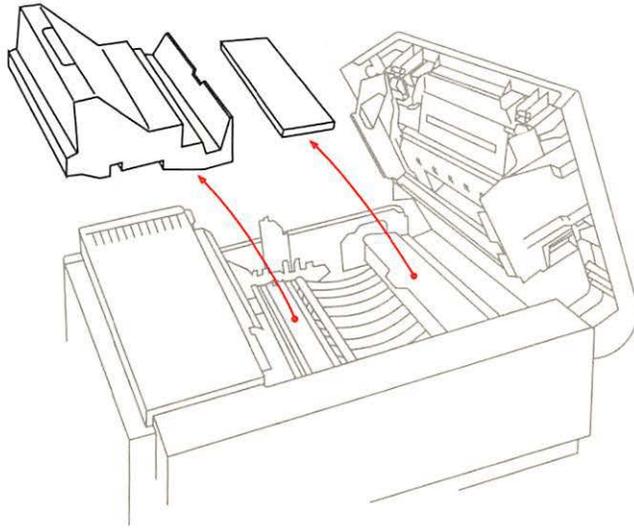
Figure 1-5
Removing the packing material from inside the printer

4. Remove the orange tabs.

Toward the left side of the unit you'll see two orange tabs
extending back from either side of a green felt cover. (See
Figure 1-6.) Remove the tabs and store them with the rest of the
packing material.
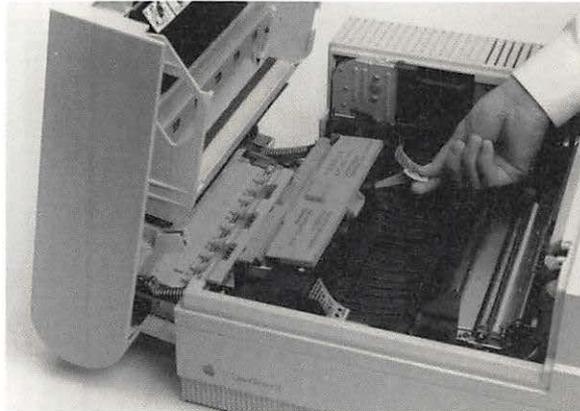
Figure 1-6
Removing the orange tabs

Installing the toner cartridge

The toner cartridge contains the printer's powdered "ink." Each cartridge lasts for approximately four thousand pages, depending on the kind of printing you do. If you use the LaserWriter II to produce a lot of graphic images, as opposed to text, you may find that you need to change cartridges more often.

Important	Follow the steps for this procedure in order. For more detailed information, refer to the instruction guide packaged with the toner cartridge.

1. Open the cartridge box.

Open the cartridge shipping carton, take out the wrapped cleaning pad, and put it aside. Open the sealed metallic bag and remove the cartridge, holding it by the indentation at its wide end (the end without the writing). *Do not touch the shaded area shown in Figure 1-7.*

Don't touch the shaded area
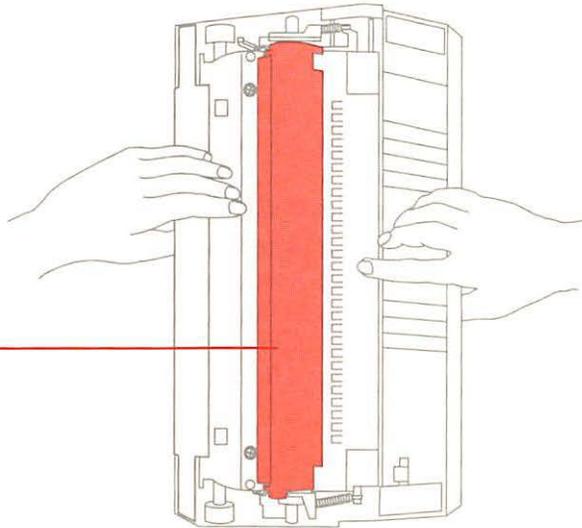
Figure 1-7
The toner cartridge

2. Distribute the toner powder.

Holding the cartridge horizontally (see Figure 1-8), slowly rock it back and forth to a 45-degree angle four or five times to distribute the toner powder.
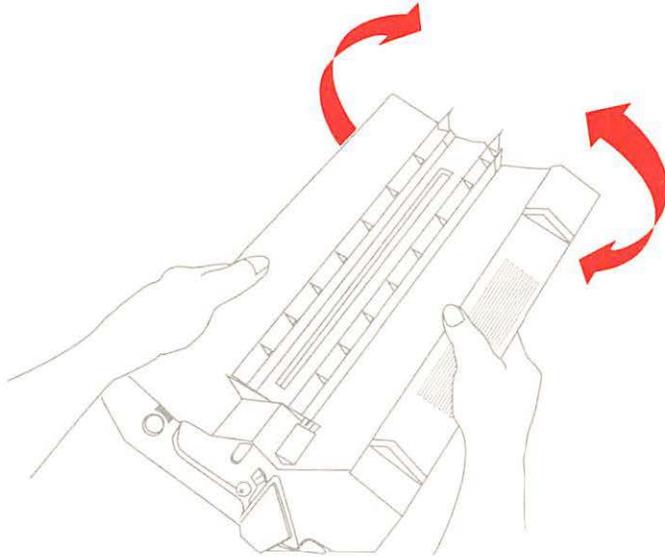
Figure 1-8
Distributing the toner powder

3. Insert the cartridge.

The cartridge fits into the slot on the underside of the raised upper section of the LaserWriter II, as shown in Figure 1-9. Slide it in as far as it will go. Insert it narrow end first, using the directional arrows on the cartridge as a guide. Be sure that it is seated firmly.
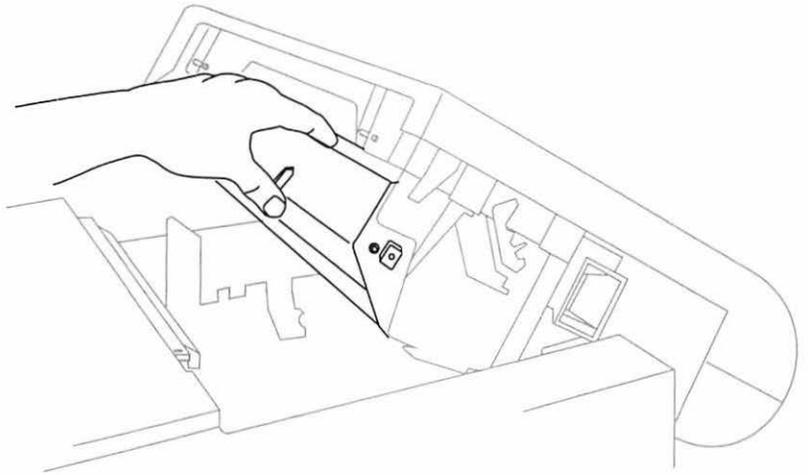
Figure 1-9
Inserting the toner cartridge

4. Loosen the tape tab.

Holding the cartridge in place, flex the black tab gently but firmly until it loosens. (See Figure 1-10.) Don't tear it completely away; you'll need it to pull out the sealing tape.
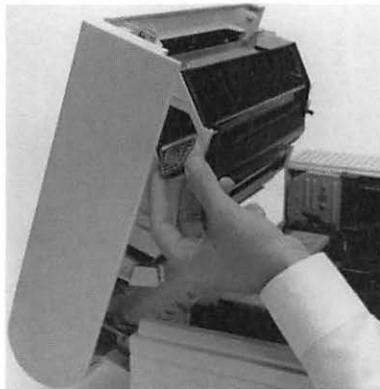
Figure 1-10
Flexing the black tab
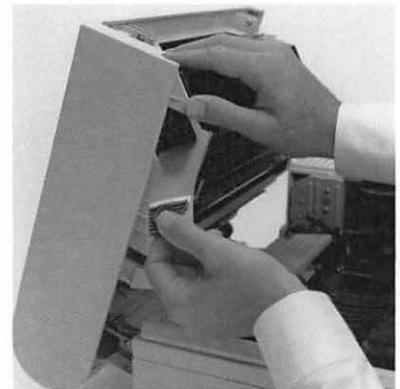
Figure 1-11
Removing the tape from the toner cartridge

5. Remove the tape.

Pull the tab outward until the tape is completely removed, as shown in Figure 1-11. If the tab does come off, grasp the tape itself and pull out.

Be sure to remove the sealing tape *with the cartridge in the printer.* If you insert the cartridge with the tape removed, toner may spill into the printer. For the same reason, avoid transporting the printer with a cartridge installed, and always remove cartridges carefully.

Installing the cleaning pad

The cleaning pad that comes with the toner cartridge continuously cleans the **fixing rollers** while you print.

1. Remove the felt tip from the end of the cleaning pad.

When you change the cartridge and cleaning pad, you'll use the felt tip to clean the fixing rollers. Because the printer is new and doesn't need cleaning, just remove the tip, as shown in Figure 1-12, and discard it.
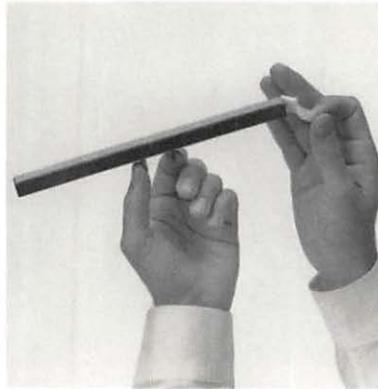
Figure 1-12
Removing the felt tip from the cleaning pad
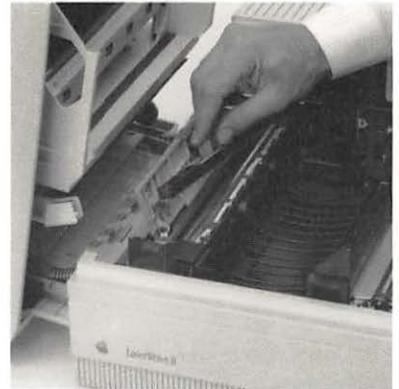
Figure 1-13
Fitting the cleaning pad under the fixing roller cover

2. **Lift the green felt cover that protects the fixing rollers.**

3. **Fit the pad into the groove on the underside of the green cover. (See Figure 1-13.)**

4. **Close the green felt cover.**

5. **Check the print density dial.**

   This is a convenient time to check the print density setting. The print density dial is inside the printer on the left, as shown in Figure 1-14.

The print density dial —————
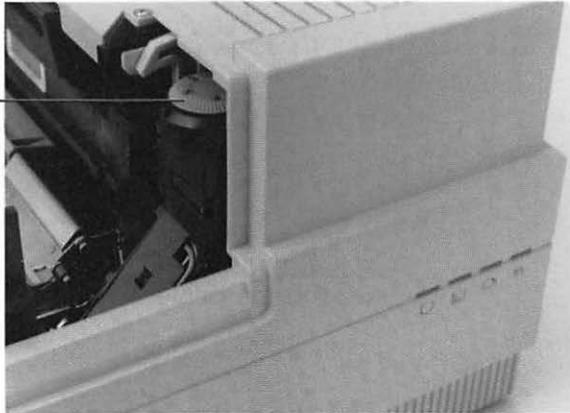
Figure 1-14
The print density dial

   The dial should be set to 5. Position it there if necessary. (You'll use this dial later if your prints are too light or too dark. See Chapter 6 for details.)

6. Close the printer.

Lower the top gently, pushing in its center to close. (See Figure 1-15.) You'll hear a click when it's secure.

Push in the center of the top to close
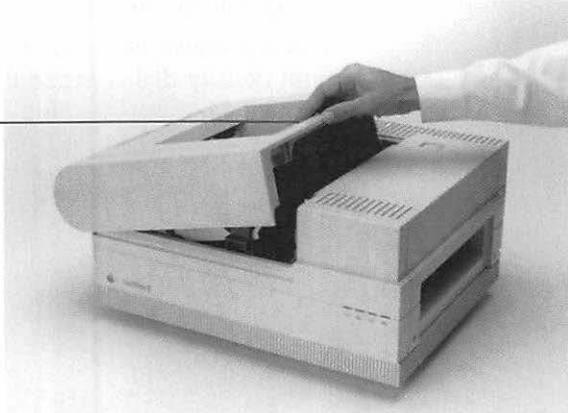
Figure 1-15
Closing the printer

Loading the paper cassette

The 110V LaserWriter II comes with one U.S. letter-size paper cassette. The 220V LaserWriter II comes with one A-4 paper cassette. You can order additional letter-size, as well as legal-size, international-size, or envelope cassettes, from your authorized Apple dealer.

1. Remove the packing material from the cassette.

Peel the filament tape off the cassette, take the top off, and remove the packing material. (See Figure 1-16.)
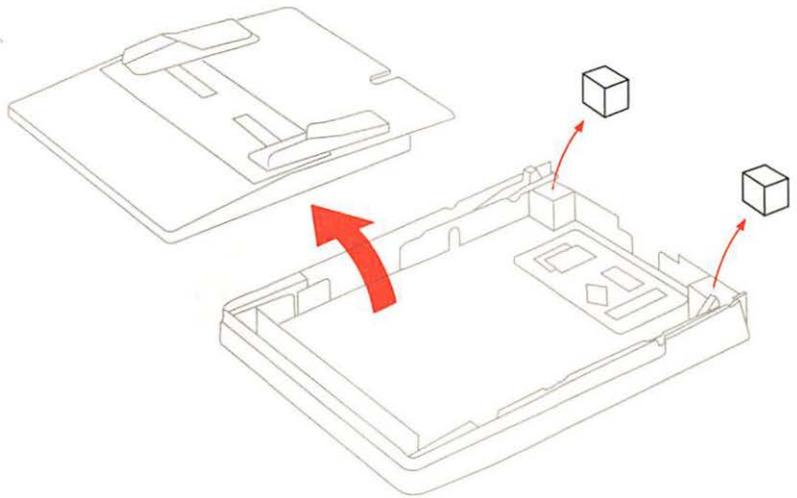
Figure 1-16
Removing the packing material from the cassette

2. Prepare a stack of paper for insertion.

You can load up to 200 sheets of 20-pound photocopier or typewriter paper. Even the edges on all sides before inserting.

3. With the rear of the cassette toward you, slide the stack into the cassette from the right.

The rear of the cassette is wider and solid. The front is narrower and has a cutaway. (See Figure 1-17.)

4. Slide the paper beneath the clip at the left front of the cassette.

Push the paper down if necessary, but don't overload the cassette.

Front of cassette —————————

Clip —————————
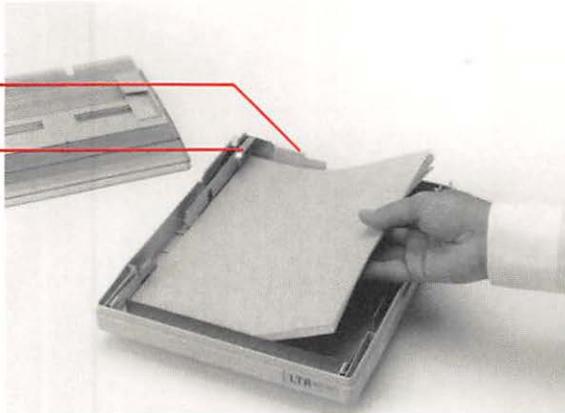
Figure 1-17
Loading the cassette

Load three-hole paper with the holes toward the front (the Apple logo side) of the printer. Use the directional arrows on the cassette as a guide.

Load letterhead paper face up, with the letterhead toward the front of the cassette.

You can expect excellent printing results if you use photocopier paper or most standard typewriter stocks. See "About Paper" in Chapter 3 for details.

Installing the manual feed guide

The top of the paper cassette is also the manual feed guide.

1. Align the sliding paper guides on the manual feed guide with the cassette.

2. Position the manual feed guide in the slots on the paper cassette. (See Figure 1-18.)
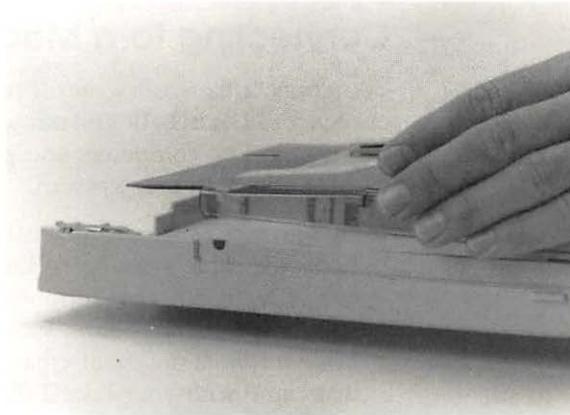
Figure 1-18
Positioning the manual feed guide

Installing the paper cassette

1. Slide the front of the cassette into the slot on the right side of
   the LaserWriter II. (See Figure 1-19.)
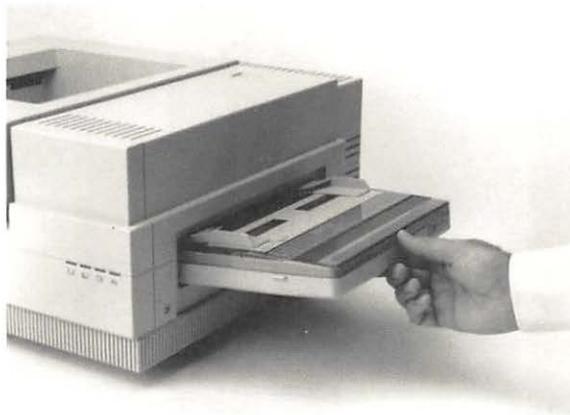
Figure 1-19
Inserting the loaded cassette

2. Push the cassette in until it locks into place.

Connecting to a Macintosh

You connect the LaserWriter II to a Macintosh with **LocalTalk cables** and **LocalTalk connector boxes.** These connectors are one way to link computers and **peripheral devices** in an **AppleTalk network system.**

❖ *By the way:* An AppleTalk network system consists of three parts: the cable system that links devices; the software, built into every Macintosh, that supports the network; and services that networked devices share, such as printers and file servers. For more information about creating a network, refer to the manual that came with your LocalTalk cables and connectors.

1. **Make sure both the printer and the computer are switched off.**

2. **Plug a LocalTalk connector box into the LocalTalk port on the LaserWriter II. (As shown in Figure 1-20, the LocalTalk port is on the right side of the connector panel.)**

3. **Plug a second LocalTalk connector box into the printer port on the Macintosh.**

4. **Connect the two connector boxes with a LocalTalk cable. (See Figure 1-20.)**
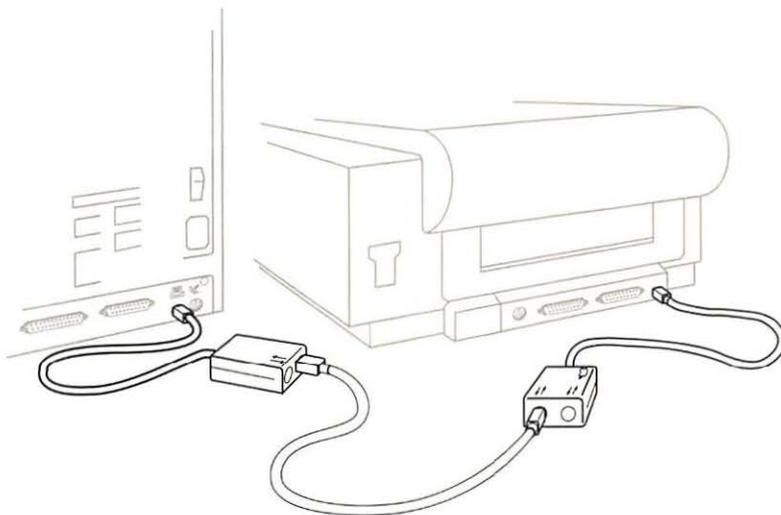
Figure 1-20
The LaserWriter II connected to a Macintosh

Important safety instructions

You're almost ready to plug in your LaserWriter II, but first read
these important safety instructions.

Warning   **This equipment is intended to be electrically grounded.**

The LaserWriter II is equipped with a three-wire grounding
plug—a plug that has a third (grounding) pin. This plug will fit
only a grounding-type AC outlet. This is a safety feature.

If you are unable to insert the plug into the outlet, contact
a licensed electrician to replace the outlet with a properly
grounded outlet.

Do not defeat the purpose of the grounding plug!

For your own safety and the safety of your equipment, always take
the following precautions.

**Be sure the power plug is disconnected (disconnect by
pulling the plug, not the cord):**

☐ if the power cord or plug is frayed or otherwise damaged

☐ if you spill anything into the case

☐ if the LaserWriter II is exposed to rain or any other excess
moisture

☐ if the LaserWriter II has been dropped or if the case has been
otherwise damaged

☐ if you suspect that the LaserWriter II needs servicing or repair

☐ whenever you clean the case (use only the recommended
procedure given below)

Be sure that you always do the following:

☐ Keep the LaserWriter II away from sources of liquids, such as
wash basins, bathtubs, shower stalls, and so on.

☐ Protect the LaserWriter II from dampness or wet weather, such
as rain, snow, and so on.

☐ Read all the installation instructions carefully before you plug
the LaserWriter II into a wall socket.

☐ Keep these instructions handy for reference by you and others.

☐ Follow all instructions and warnings dealing with your system.

To clean the case, do the following:

1. Disconnect the power plug. (Pull the plug, not the cord.)

2. Wipe the surfaces lightly with a clean, soft cloth dampened with water. Use a mild soap or detergent if necessary. Do not use ammonia-based cleaners on or around the LaserWriter II.

Starting up

1. Plug the printer in.

The on/off switch and power cord port of the LaserWriter II are on the left rear corner of the printer. (See Figure 1-21.)

Make sure that the printer is switched off, and then insert the power cord into the port. Plug the other end into a grounded three-hole AC outlet, and turn the printer on.

"O" is off;" I " is on
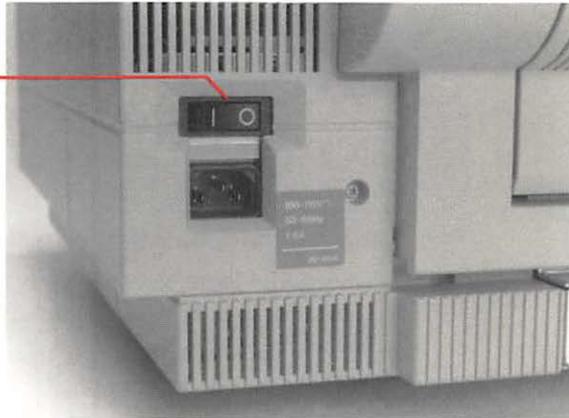
Figure 1-21
The on/off switch and the power cord port

2. Check the test page.

The printer takes a minute or two to warm up, and then it automatically prints a test page. (It prints the test page every time you restart it.)

The test page should look as clear as the example in Figure 1-22, which is from a LaserWriter IINTX connected to a Macintosh, with a hard disk attached to the printer.

For this configuration, the top icon should say POSTSCRIPT, and the second icon from the top should say *AppleTalk*. If not, check the switch settings. See Appendix F for full information.

If the test page is spotty, switch the printer off and on again to print a second page. Try this two or three times if necessary.

If the output doesn't improve, if it's too light or too dark, or if the printer won't print the test page, refer to Chapter 6, "Maintenance and Troubleshooting."

Name: This will be replaced by the name you assign the printer ——————— LaserWriter II NTX

🍎. *L A S E R W R I T E R ® I I   N T X*

Mode: If not POSTSCRIPT, then either Diablo or Hewlett-Packard emulation

PostScript®

Connection system: AppleTalk (LocalTalk) or serial

AppleTalk®

Number of fonts in printer ROM: 35

35 fonts in ROM

Amount of printer RAM:
2 megabytes for the LaserWriter IINT; up to 12 megabytes for the LaserWriter IINTX

2MB RAM

Dedicated hard disk: This box is absent if there is no hard disk connected, or if any dedicated hard disk is switched off (the number of fonts listed is the number of user-installed fonts on the hard disk)

20MB SCSI device
110 fonts on external device

27

Figure 1-22
The LaserWriter II test page

3. Check the status lights

The green Ready/In Use light will flash until the test page is printed. It then glows steadily. All other lights should be off. See Figure 1-23, and also Appendix F for full details.

Ready/In Use light (green)

Low Toner Level light (orange)

Paper Out light (red)

Paper Jam light (red)
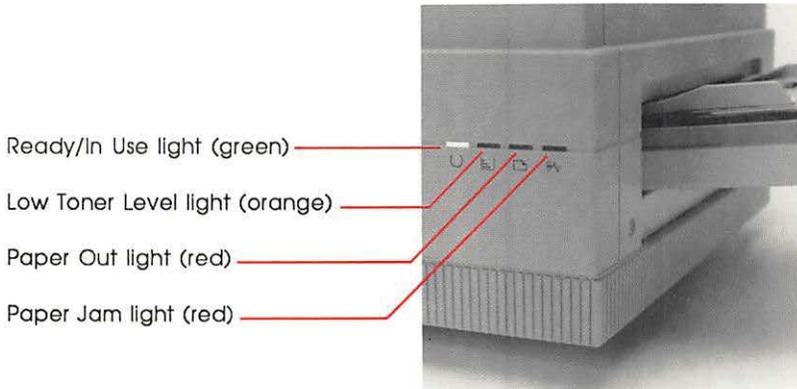
Figure 1-23
The LaserWriter II status lights
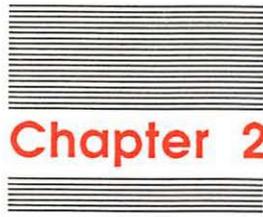
Chapter 2

Software Installation

About printer software

In your LaserWriter II accessory kit you'll find the *LaserWriter II Installation Disk* and the *LaserWriter IINT/NTX Fonts Disk.*

The *LaserWriter II Installation Disk* contains the **printer resource,** the software that controls printer operation. The *LaserWriter IINT/NTX Fonts Disk* contains the LaserWriter II **screen fonts.**

You **install** the fonts and printer resource on **startup disks.** Startup disks contain the **System file** you need to start applications and create documents on the Macintosh.

See your Macintosh owner's guide if you have any questions about creating a startup disk.

Important	Be sure to make copies of the *LaserWriter II Installation Disk* and the *LaserWriter IINT/NTX Fonts Disk* to use in the installation process. Store the originals in a safe place. Your Macintosh owner's guide has instructions on copying disks.

Installing the printer resource

You can install the printer resource on as many startup disks as you need. It's a good idea to update all disks at the same time, to avoid having some disks with outdated software. If you're installing on a hard disk, you'll follow the same procedure, but you should have to do it only once.

Important	Your startup disks should all contain the latest available version of the Macintosh system software. To verify that you have the most recent version, or to update software, contact your authorized Apple dealer.

1. Start the Macintosh with a startup disk.

2. Insert the *LaserWriter II Installation Disk* and open the disk icon.

Select the icon and choose Open from the File menu, or double-click the icon. You'll see the icons shown in Figure 2-1.

You'll use the LaserWriter icon along with the Laser Prep icon to install the printer resource for both the LaserWriter IINT and the LaserWriter IINTX. The Font/DA Mover and the Namer are discussed later in this chapter. The LaserWriter Font Utility application is covered in Appendix A. The TeachText and Read Me icons open files containing supplemental information. You can disregard the LaserWriter IISC icon.
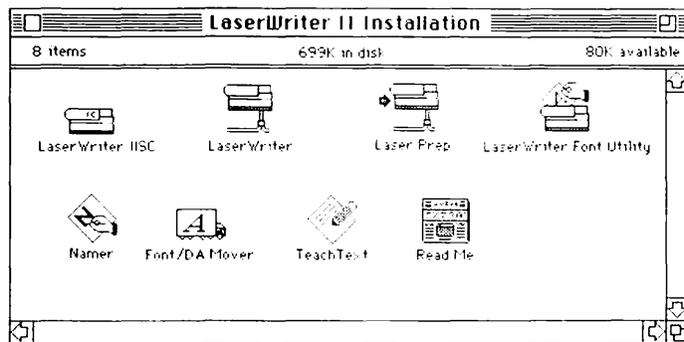
Figure 2-1
Contents of the *LaserWriter II Installation Disk*

3. Drag the LaserWriter and Laser Prep icons to the startup disk icon.

See your Macintosh owner's guide if you need information about dragging icons from one disk to another.

4. Open the startup disk icon.

You'll see the LaserWriter and Laser Prep icons on the desktop. (See Figure 2-2.)
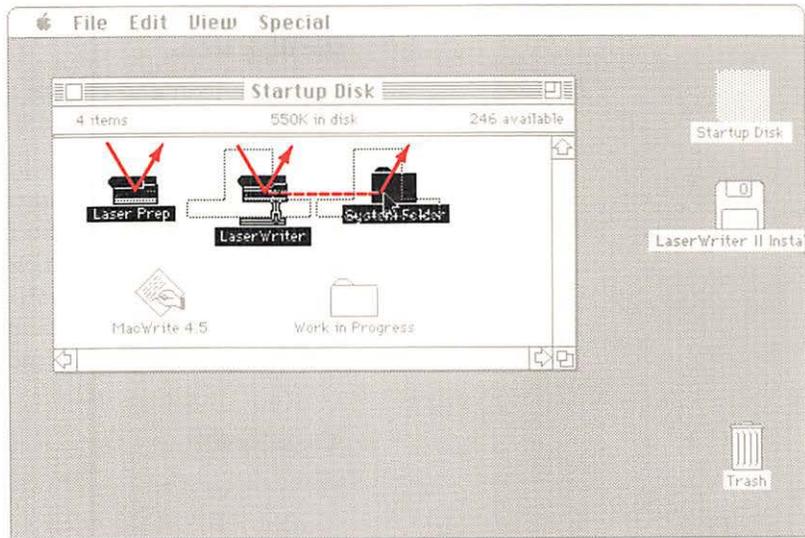
Figure 2-2
The LaserWriter and Laser Prep icons on the desktop

5. Drag the LaserWriter and Laser Prep icons to the System Folder.

This completes the installation procedure. You can now repeat it with another startup disk or proceed to install fonts.

Naming the LaserWriter II

If your AppleTalk network system includes more than one LaserWriter II, you'll find it convenient to give each one a distinguishing name. These names appear in the Chooser desk accessory whenever you choose LaserWriter II as the printer type.

1. Start the Macintosh with a startup disk.

2. Insert the *LaserWriter II Installation Disk*.

3. Open the Namer.

You'll see the LaserWriter II listed (as *LaserWriter IINT or IINTX*) in the Namer dialog box. (See Figure 2-3.)
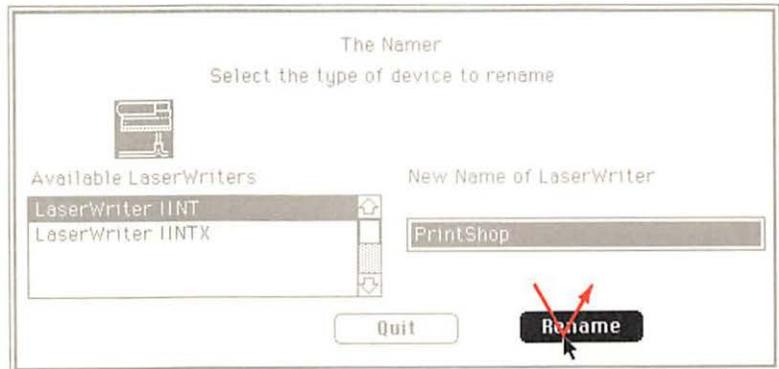
Figure 2-3
The Namer dialog box

4. Select the name *LaserWriter IINT or IINTX*.

5. Type in the new name, and click Rename.

You can use this procedure to name (or rename) all LaserWriter II printers on the network. Be sure to tell everyone who uses the network what the new names are, so that they can find the printers in the Chooser.

Installing fonts

The *LaserWriter IINT/NTX Fonts Disk* contains the LaserWriter II **font file.** The file includes eight widely used font families—ITC Avant Garde, ITC Bookman, Courier, Helvetica, Helvetica Narrow, New Century Schoolbook, Palatino, and Times—as well as three special-purpose fonts—Symbol, ITC Zapf Chancery, and ITC Zapf Dingbats.

These fonts are already installed in the printer's memory, so what you'll be installing are the **screen fonts.**

You install these fonts in the System file on each of your startup disks. The font file contains the 9-, 10-, 12-, 14-, 18-, and 24-point sizes, but you aren't limited to these. The LaserWriter II can scale fonts in a range of sizes limited only by its resolution and by the size of the paper, with no loss of print quality. The installed screen fonts do produce better screen displays, as well as better line spacing in the printed output with some applications. See Chapter 4, "All About Fonts," for more information.

You install fonts on your startup disks using the **Font/DA Mover.**
This application is contained on the *LaserWriter II Installation
Disk.* The easiest way to install fonts is to copy the Font/DA
Mover to your startup disk. The instructions below assume that you
follow this procedure.

Warning	Use only the version of the Font/DA Mover contained on the installation disk. If you have an earlier version on a startup disk, replace it by copying the new version from the installation disk.

1. **Start the Macintosh with a startup disk that includes the LaserWriter II printer resource and the current Font/DA Mover.**

2. **Insert the *LaserWriter IINT/NTX Fonts Disk.***

3. **Open the disk icon.**

   You'll see a "suitcase" icon for the LaserWriter II font file, as well as the icon for the Font/DA Mover.

4. **Open the font file icon.**

   Opening the font file automatically opens the Font/DA Mover. All the fonts in that file are listed on the left, and the list on the right is blank. (See Figure 2-4.)
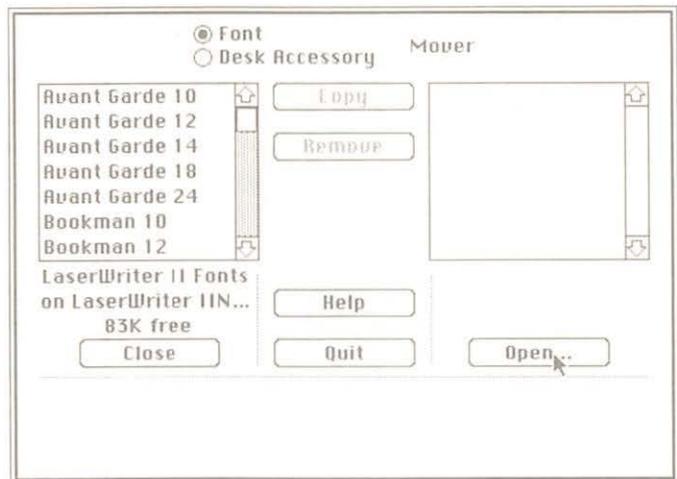
Figure 2-4
The LaserWriter II fonts in the Font/DA Mover

5. Click the Open button below the list on the right.

A dialog box appears with a list of folders on the startup disk. (See Figure 2-5.) You should see the name of the startup disk in top-right corner. If you see the name of the fonts disk instead, click the Drive button.
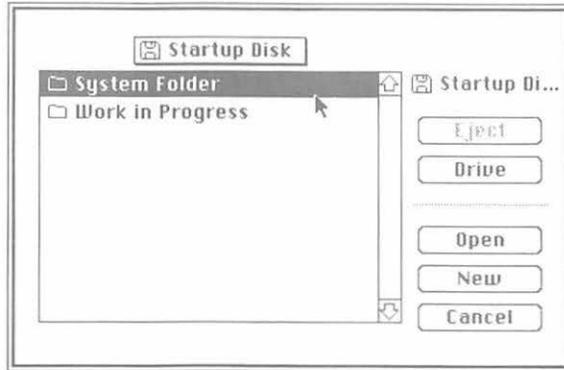
Figure 2-5
The list of folders on the startup disk

6. Open the System Folder.

The System file (rather than the System Folder) is now listed, as shown in Figure 2-6. The fonts are in this file, which is contained in the System Folder.
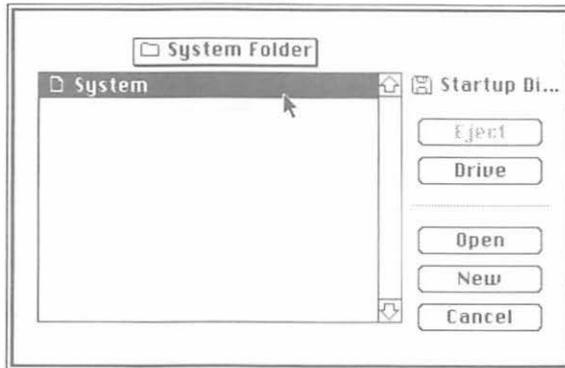
Figure 2-6
The System file

7. Open the System file.

The dialog box disappears, and the fonts currently in the System file are now listed in the column on the right side of the Font/DA Mover. (See Figure 2-7.)
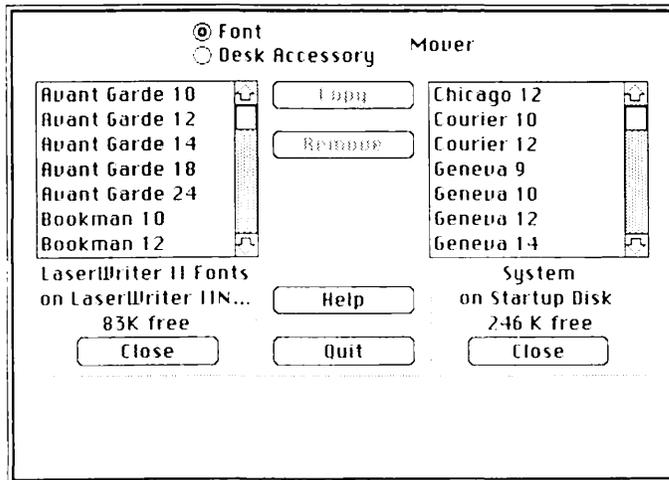
Figure 2-7
The LaserWriter II and System fonts in the Font/DA Mover

8. Select the fonts you want.

Select a single font by clicking its name. (See Figure 2-8.) When you select a single font, the Font/DA Mover displays a sample at the bottom of the dialog box and tells you how much disk space the font occupies.
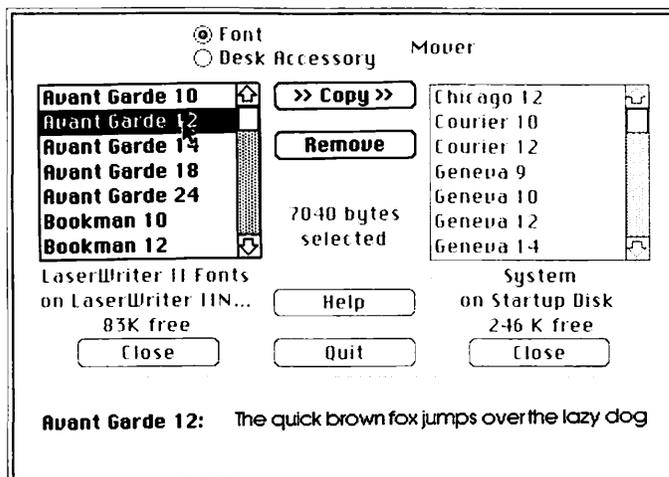
Figure 2-8
Selecting a single font

Select additional fonts by holding down the Shift key while you click each name. You won't see a sample, but you will see a running total of space required.

Select a group of fonts or the entire file by dragging through the group or file.

9. Click Copy to copy the selected fonts to the startup disk.

When you select one or more fonts, the Copy and Remove buttons become highlighted and ready to use. Clicking Copy adds these fonts to the System file on the startup disk.

Managing disk space

If you wish to install all the LaserWriter II fonts, and you don't have a hard disk, you may run short of disk space. The suggestions below should help you solve most space problems.

■ **Install only one or two sizes of each font family.**

Because the LaserWriter II can scale fonts to any size an application supports, you'll still have the full range for printing. As long as you have at least one size of a font family installed as a screen font, your printed results will be good in all sizes. The only difference is that your screen displays may not be as clear.

■ **Remove unneeded fonts.**

Warning Removal is permanent. Be sure to make a copy of the startup disk before beginning this procedure, so that you can reconstruct your font files if you make a mistake or change your mind.

1. Start the Macintosh with the startup disk you want to alter.

2. Insert the *LaserWriter IINT/NTX Installation Disk* and open the Font/DA Mover.

   You should see the fonts on the startup disk in the list on the left.

3. Select the fonts you want to remove.

The amount of space you'll save is shown at the bottom of the Font/DA Mover. The Copy and Remove buttons are highlighted.

4. Click Remove.

You can remove any fonts you wish except Chicago 12-point, Monaco 9-point, and Geneva 9-point and 12-point. The Macintosh uses these fonts for its screen displays.

5. Close the Font/DA Mover by clicking Quit.

■ **Remove unneeded desk accessories.**

1. If you haven't already opened the Font/DA Mover, follow steps 1 through 3 for removing fonts.

2. Click Desk Accessories in the Font/DA Mover. The font list is replaced by a list of desk accessories. (See Figure 2-9.)
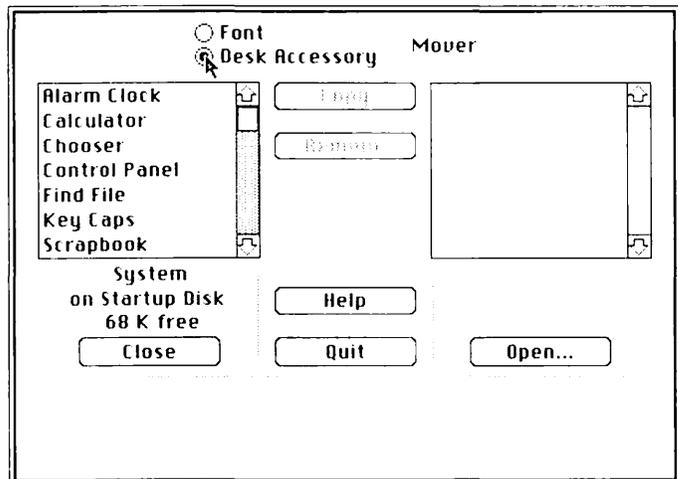
Figure 2-9
The list of desk accessories in the Font/DA Mover

3. Select the desk accessories you want to remove.

The amount of space you'll save is shown at the bottom of the Font/DA Mover. The Copy and Remove buttons are highlighted.

4. Click Remove.

Removal is permanent. Be sure to make a copy of the startup disk before beginning this procedure, so that you can reconstruct your desk accessory files if you make a mistake or change your mind.

5. Close the Font/DA Mover by clicking Quit.

■ **Remove unneeded printer resources.**

Unless you are using more than one type of printer, the LaserWriter printer resource is the only one you need.

Important The LaserWriter printer resource will also work with earlier LaserWriter and LaserWriter Plus printers. You do not need the old LaserWriter resource if you have the new LaserWriter resource (its icon depicts the LaserWriter II) installed.

1. Start the Macintosh with the startup disk you're going to use.

2. Make a backup copy of the disk for safekeeping.

3. Open the System Folder icon.

4. Drag the unneeded printer resources to the Trash.

■ **Remove the Font/DA Mover.**

Once you have finished installing fonts, you can free up space on the startup disk by removing the Font/DA Mover. If you want to change your font selection, however, you may have to install it again.

Creating application disks

If you don't have a hard disk, you'll probably find it convenient to keep your applications on nonstartup disks.

1. Start your Macintosh with the application's master disk.

2. Insert a blank disk and initialize it.

See your Macintosh owner's guide if you need instructions on initializing disks.

3. Give the disk a name that identifies it as an application disk.

4. Open the application disk's icon.

5. Find the icon that represents the application itself.

In most cases, the application icon will be labeled with the application name. (See Figure 2-10.)
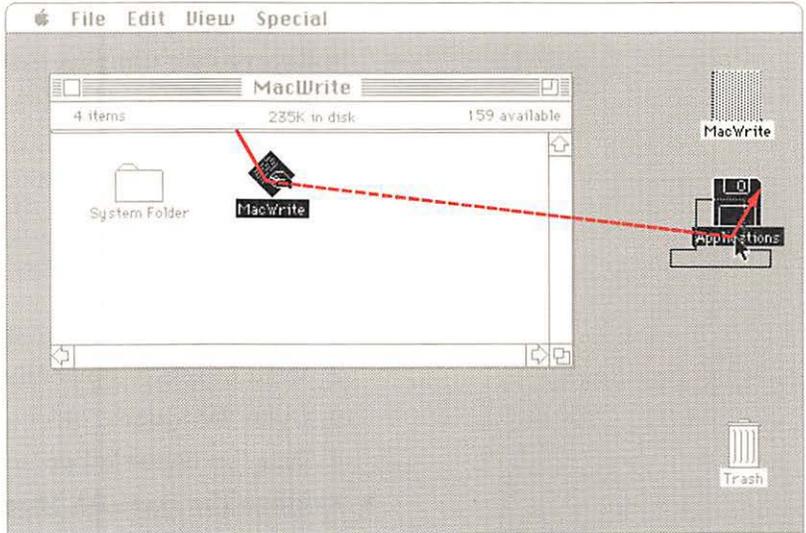
Figure 2-10
An application icon

6. Drag the icon to the new disk.

7. Find icons representing any other files you may need, such as help files, and drag them to the new disk.
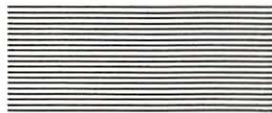
Chapter 3
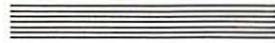
Using the LaserWriter II

Before printing with the LaserWriter II for the first time, check to make sure that the printer is properly connected and that the switches are properly set. Refer to "Connecting to a Macintosh" in Chapter 1 (or to Appendix B, "Connecting the LaserWriter II to an Apple II" or Appendix C, "Connecting To and Printing With an MS-DOS Computer") if you need more information about connections. See Appendix F, "Status Lights, Ports, Expansion Slot, and Switches," for switch information.

Using the Chooser

When you want to print with the LaserWriter II for the first time or after using another printer, you have to use the Chooser. You can do so either directly from the desktop or after opening a document. The following directions assume that you are starting from the desktop. With most applications, the basic procedure is the same if you have a document open, except that you will usually be directed to choose Page Setup after closing the Chooser.

1. **Start the Macintosh with a startup disk that includes the LaserWriter II printer resource.**

2. **Choose Chooser from the Apple menu.**

   You'll see an icon representing the LaserWriter II, as well as icons for any other printer resources on the current startup disk. (See Figure 3-1.)
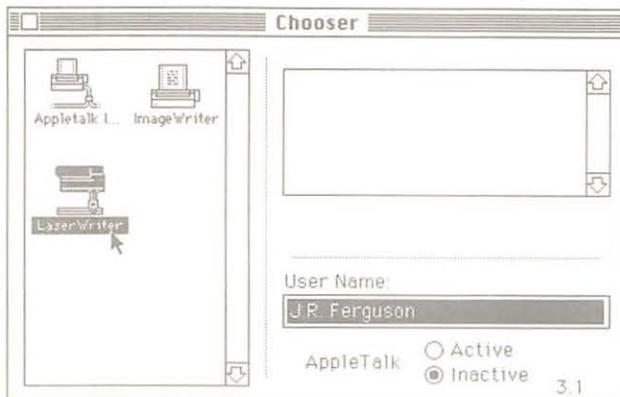
Figure 3-1
The Chooser with the LaserWriter II icon selected

3. Click the LaserWriter II icon.

4. If necessary, activate the AppleTalk software.

If the AppleTalk software is not activated, you'll see a dialog box that asks you if you want to activate it. (See Figure 3-2.) Click OK.

Figure 3-2
The AppleTalk dialog box

A few seconds later, you'll see your LaserWriter II listed by the name you gave it. (See Figure 3-3.) For instructions on naming your printer, see "Naming the LaserWriter II" in Chapter 2.
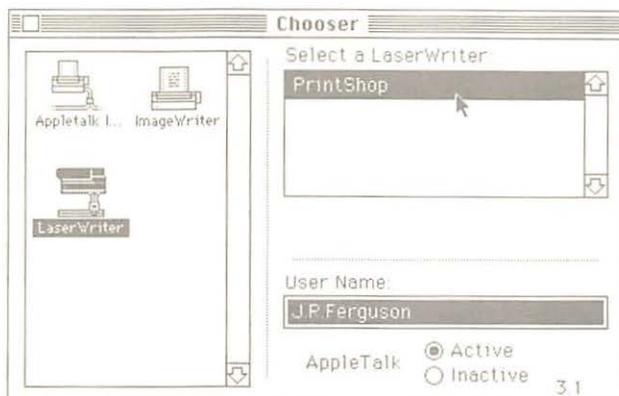
Figure 3-3
The Chooser with the LaserWriter II listed by name

5. Click the appropriate name in the printer list.

6. Type your name in the space after User Name.

Your name will automatically appear in the Chooser from now on, unless you change startup disks.

7. Close the Chooser.

Automatic feed printing

You'll need a startup disk that includes the LaserWriter II printer resource and the appropriate fonts, along with an application disk. The document to be printed can be on either disk.

1. Start the Macintosh with the startup disk.

2. Insert the application disk.

3. Open the document you want to print.

4. If necessary, choose Page Setup from the File menu.

Choose Page Setup for either of the following reasons:

☐ You're changing printers or are using the LaserWriter II for the first time. (In this case you've just closed the Chooser. See the previous section, "Using the Chooser," for details.)

☐ You're changing paper sizes, amount of reduction or enlargement, or page orientation. See "About Page Setup" later in this chapter for more information. (This example presumes that you are not going to change the preset options.)

5. Click OK or press Return.

This confirms the preset options.

Important   Even if you don't want to change any of the preset options, don't skip these steps if you're changing printers or are using the LaserWriter II for the first time. The default settings may be incorrect, which will affect your output.

---

6. Choose Print from the File menu.

7. Verify Automatic Feed.

If necessary, click the Automatic Feed box to reset.

8. Click OK or press Return.

The LaserWriter II will now print one copy of every page of the document, automatically feeding paper from the paper cassette. See "About the Print Dialog Box" later in this chapter for more information.

9. Check your output.

If you're not satisfied with the output, see "Troubleshooting" in Chapter 6.

Face-up and face-down delivery

Most applications print first page first, so that face-down delivery collates properly. Some print first page last, so that face-up delivery is appropriate. You'll need to experiment to determine which is true for a given application.

If you need face-up delivery, simply open the face-up tray, pictured in Figure 3-4. It can hold up to 20 sheets of 20-pound paper.

Warning	Never open the face-up tray when printing is in progress.
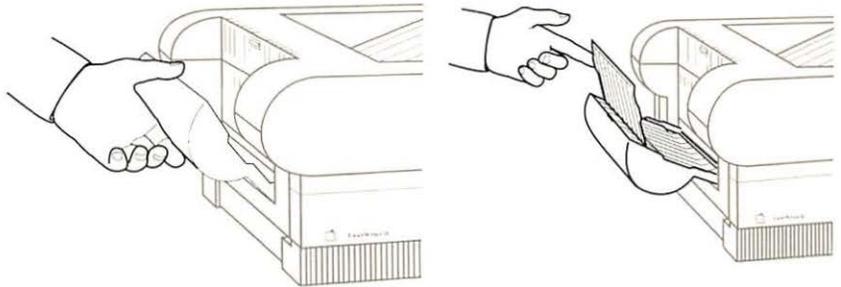
Figure 3-4
The face-up tray

Important	Always open the face-up tray before printing on paper stock heavier than 20 pounds, or on envelopes or transparencies.
	With the face-up tray open, the LaserWriter II can accept stock of up to 36 pounds. See "About Paper" later in this chapter for more information.

Letterhead and three-hole paper

Insert letterhead paper face up with the letterhead entering the printer first. (See Figure 3-5.)
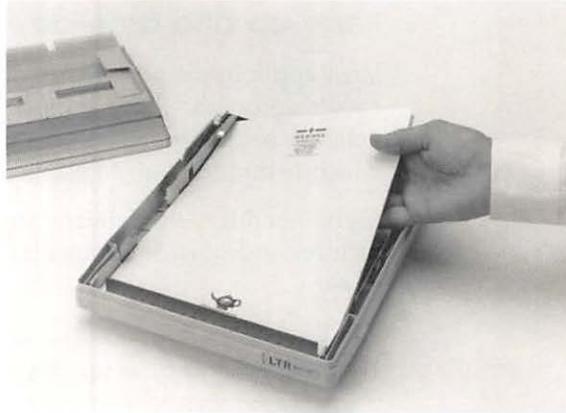
Figure 3-5
Inserting letterhead paper

Insert three-hole paper with the holes toward the front (the Apple logo side) as the paper enters the printer. (See Figure 3-6.)
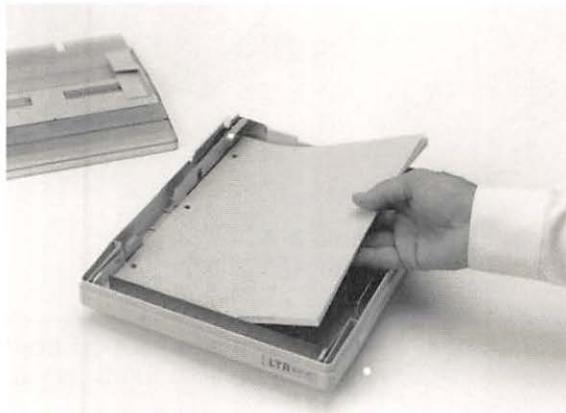
Figure 3-6
Inserting three-hole paper

Automatic envelope printing

You can obtain an envelope cassette from your authorized Apple dealer that allows you to print envelopes (or envelope-shaped paper) using automatic feed.

Important | For best results, be sure to position your address block properly. (See Figure 3-7.)

Type the return address in the upper-left corner ───

Type the address block with an upper margin of approximately 1.5 inches and a left margin that centers it on the screen ───
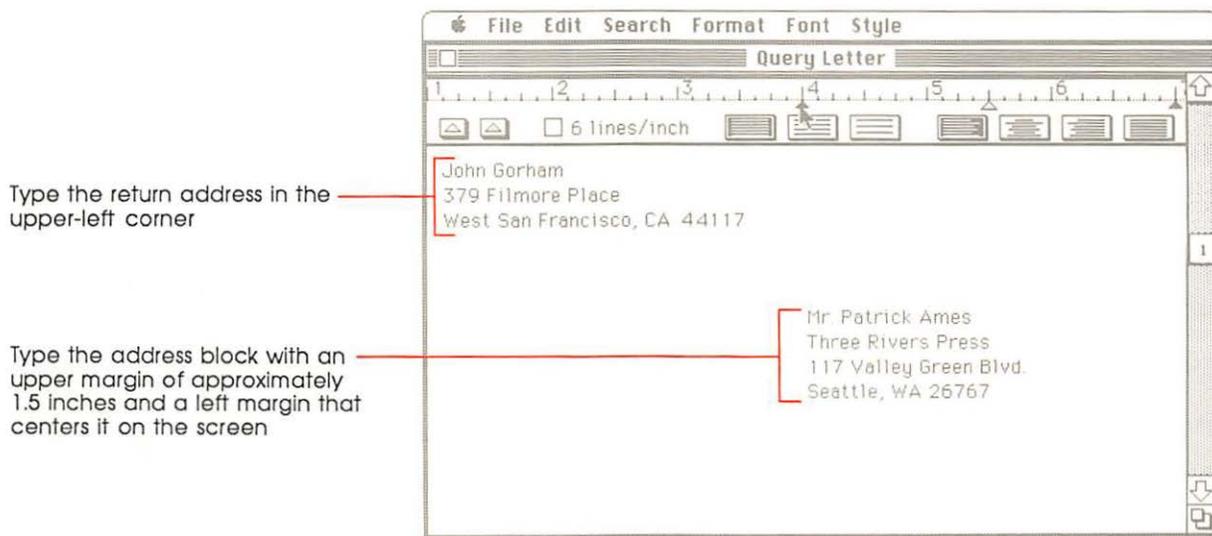
Figure 3-7
Positioning the address block

1. Take out the standard cassette.

2. Load up to 15 envelopes in the envelope cassette.

Stack the envelopes face up and with the top toward the rear as they enter the printer.

3. Adjust the envelope cassette to the size of the envelope.

Adjust the sliding guides so that the envelopes fit snugly but do not bow. (See Figure 3-8.)

Adjust the sliding guides to the size of your envelopes
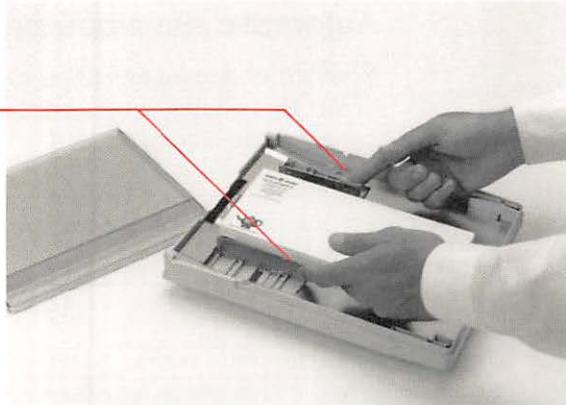
Figure 3-8
The envelope cassette

4. **Insert the envelope cassette.**

5. **Open the face-up tray.**

6. **Open the application and choose Page Setup from the File menu.**

7. **Select the sideways icon. (See Figure 3-9.)**
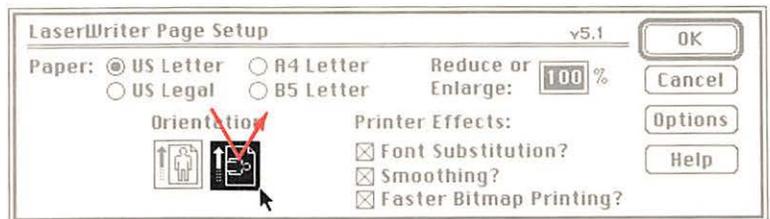
Figure 3-9
Selecting the sideways icon

8. **Print.**

Manual feed printing

Use manual feed when you want to print just a few sheets of a different kind of paper from the kind in the paper cassette.

To prevent paper jams, never try to load a cassette with the wrong paper size. Use manual feed instead.

Never print beyond the edges of the paper. Doing so may damage the printer drum or cause toner to spill into the printer. See "Imageable Area" in Appendix E for details.

1. **If you have not set up the Chooser for the LaserWriter II, follow the steps in "Using the Chooser" earlier in this chapter.**

2. **Open a document and choose Page Setup from the File menu.**

3. **Change the page setup options as needed and click OK or press Return.**

4. **Adjust the manual feed guide to fit your paper.**

   The cover of the paper cassette is also the manual feed guide. If necessary, adjust the sliding paper guides so that your paper fits snugly. *Be sure that the paper is not so loose that it can slide around, or so tight that it bows. Either situation can cause paper jams.*

5. **Choose Print from the File menu and click Hand Feed.**

   Change other print options if you wish, and then click OK or press Return. The red Paper Out light will flash, indicating that the printer is ready to accept paper.

6. **Insert the first sheet of paper.**

   Be sure to slide the paper in until you feel it stop. When the light flashes again, the printer is ready for the next sheet.

Two-sided (duplex) printing

Follow these steps when you want to print on both sides of the paper.

1. Open the face-up tray to minimize paper curling.

2. Following the directions for manual feed, print a page and take it out of the output tray.

3. Insert the paper again, printed side down, with the top of the printed side entering the printer first. (See Figure 3-10.)

Insert paper printed side down ——
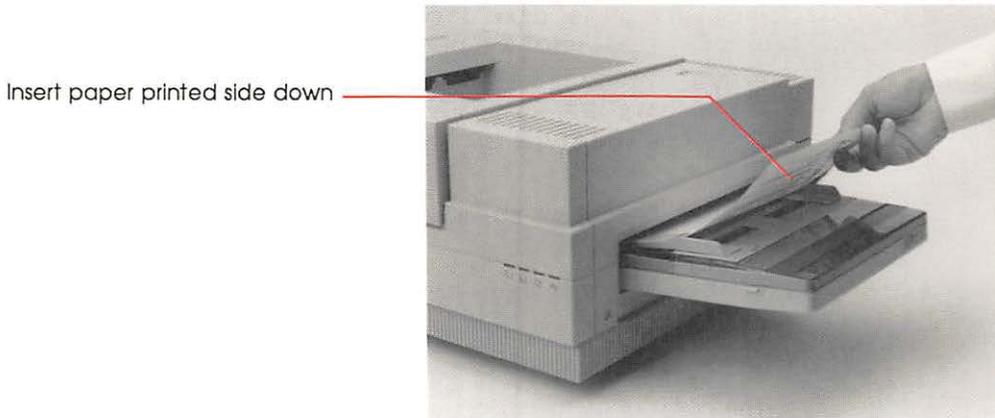
Figure 3-10
Inserting paper for duplex printing

Printing envelopes using manual feed

If you don't have an envelope cassette, use manual feed to print envelopes. Be sure to start from within an application, rather than from the Finder, so that you can change Page Setup.

Important   For best results, be sure to position your address block properly. For guidelines, see Figure 3-7.

1. Choose Page Setup from the File menu, and select the sideways icon.

2. Open the face-up tray.

3. Adjust the manual feed guide to fit the narrow width of the envelope.

4. Choose Print from the File menu and click Manual Feed.

5. Insert the envelopes face up with the top edge to the rear as they enter the printer. (See Figure 3-11.)
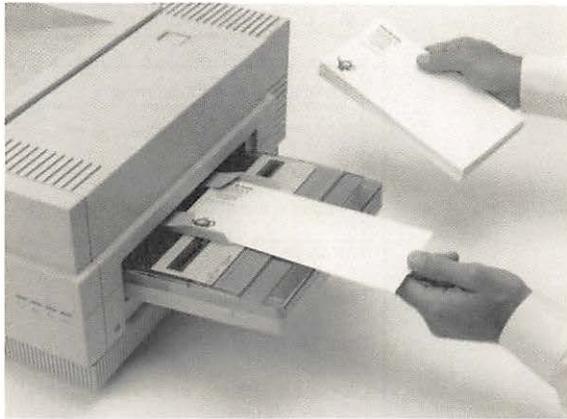
Figure 3-11
Inserting envelopes

Printing from the Finder

You can print directly from the Finder, without opening a document, in either manual or automatic mode. You follow all the same procedures, but you can't change the Page Setup settings.

Select one or more documents to print from the Finder by selecting their icons. The order of printing is left to right, top to bottom.

Important Unless you are using MultiFinder, all documents must have been created with the same application.

Otherwise, the Macintosh will not process the Print command when it encounters a document created with a different application.

About the Print dialog box

Change the settings in the Print dialog box as necessary. (The dialog box may not look exactly like the one pictured in Figure 3-12, but in most applications it will include all the options listed below.)

```
 🍎  File  Edit  Search  Character  Paragraph  Document
```

```
                                letter
┌────────────────────────────────────────────────────────────┐
│ LaserWriter "PrintShop"                    v5.1   ┌────────┐ │
│                                                   │   OK   │ │
│ Copies: 1      Pages: ● All  ○ From:     To:       └────────┘ │
│                                                   ┌────────┐ │
│ Cover Page:    ● No ○ First Page ○ Last Page      │ Cancel │ │
│                                                   └────────┘ │
│ Paper Source: ● Paper Cassette  ○ Hand Feed       ┌────────┐ │
│                                                   │  Help  │ │
└───────────────────────────────────────────────────└────────┘─┘
Randolph Smythe-Winston
1672 Prairie Dog Lane
West San Francisco, CA 94117

Dear Mr. Smythe-Winston:

On behalf of all of us here at the Metropolitan P&E I'd like to thank
you for taking the time to write and tell us about quick-thinking
meter reader Hector Barstow. Hector, a veteran of twenty years,
said it was second nature to him to help out in any way he
could.
Page 1
```

Figure 3-12
The Print dialog box

For more than one copy: Type the number of copies you want.

For a specified page range: Select the From box by clicking it, and then type the number of the first page you want printed. Press Tab to move to the To box (or click it), and then type the number of the last page you want printed.

To print one page only: Type that page number in both boxes.

For manual feed: Click Hand Feed. (See "Manual Feed Printing" earlier in this chapter for full information.)

About page setup

You can change page setup as necessary, or you can confirm the default settings by clicking OK or pressing Return. (The Page Setup dialog box may not look exactly like the one pictured in Figure 3-13, but in most applications it will include all the features listed below. Some applications may offer additional options.)

```
┌─────────────────────────────────────────────────────────────┐
│ ┌─────────────────────────────────────────────┐  ┌────────┐  │
│ │ LaserWriter Page Setup              v5.1     │  │   OK   │  │
│ ├─────────────────────────────────────────────┤  └────────┘  │
│ │ Paper:   ◉ US Letter   ○ A4 Letter   Reduce or ┌────┐      │
│ │          ○ US Legal    ○ B5 Letter   Enlarge   │100 │%  ┌────────┐ │
│ │                                                └────┘   │ Cancel │ │
│ │          Orientation        Printer Effects:           └────────┘ │
│ │          ┌──┐ ┌──┐          ☒ Font Substitution?      ┌────────┐  │
│ │          │▒▒│ │↱ │          ☒ Smoothing?              │Options │  │
│ │          └──┘ └──┘          ☒ Faster Bitmap Printing? └────────┘  │
│ │                                                       ┌────────┐  │
│ │                                                       │  Help  │  │
│ │                                                       └────────┘  │
│ └─────────────────────────────────────────────┘                   │
└─────────────────────────────────────────────────────────────┘
```
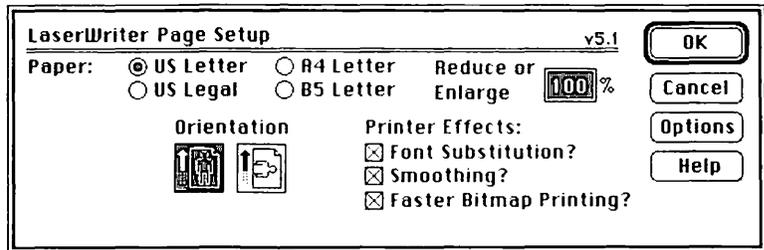
Figure 3-13
The Page Setup dialog box

Paper: Click the button that matches the paper type you're using.

Orientation: Click the sideways icon for horizontal output.

Font Substitution: This option converts the Macintosh fonts Geneva, New York, and Monaco into the LaserWriter II fonts Helvetica,Times, and Courier. (The word spacing will be better if you choose the LaserWriter II fonts directly. See Chapter 4, "All About Fonts," for more information.)

Smoothing: This option minimizes jagged edges on graphic images and on Macintosh screen fonts with no corresponding printer fonts.

Faster Bitmap Printing: This option speeds the printing of graphic images.

(The three previous options, collectively known as *Printer Effects,* are turned on in the default setting. If you experience difficulty printing bitmaps, turn off the Faster Bitmap Printing effect.)

Reduce or Enlarge: Type any percentage of reduction or enlargement from 25 to 400 percent. Your output is automatically scaled to that size.

Options: Clicking the Options button presents a new dialog box, shown in Figure 3-14.
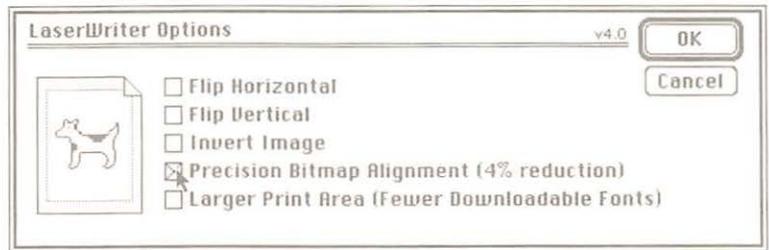
Figure 3-14
The Options dialog box

Flip Horizontal: Reverses the page left to right.

Flip Vertical: Reverses the page top to bottom.

Invert Image: Prints white on black.

Precision Bitmap Alignment: Reduces the size of the printed page by 4 percent for better representation of graphic images.

Larger Print Area: This expands the print area by reducing the minimum margins required.

About paper

The LaserWriter II prints at publication quality on standard photocopier or typewriter paper (16- to 20-pound stock). With the face-up tray open, the printer can accept stock of up to 36 pounds. See "Face-Up and Face-Down Delivery" earlier in this chapter for more information.

You can also expect excellent results on most colored stocks and letterheads.

The LaserWriter II will produce high-quality transparencies for overhead projection. Medium-weight photocopier transparencies work best.

Depending on the type of transparency, the temperature, and the humidity, you may be able to print transparencies using automatic feed. If you experience difficulties, use manual feed instead. Always open the face-up tray when printing transparencies.

Do not use heat-transfer (thermal) transparencies in the LaserWriter II. They will not print properly and may separate in the printer.

To avoid paper problems, be aware of the following potential trouble sources:

□ Temperature. Some letterheads use low-temperature dyes that vaporize and smear at the printing temperatures of the LaserWriter II. Some slick letterheads may come undone in the LaserWriter II.

□ Paper texture. The LaserWriter II may not print sharply on highly textured paper. When you begin printing, try a few sheets to see how you like the quality.

□ Paper finish. Very shiny surfaces may not give good results. Again, try a few sheets and see what happens.

Adding and removing fonts

Use the Font/DA Mover to alter the selection of fonts on any startup disk. You can add additional fonts from the *LaserWriter IINT/NTX Fonts Disk*. Using the same procedures, you can also add non-Apple fonts. By reversing the steps, you can remove previously installed fonts as well as Macintosh screen fonts that you don't use.

For best results, install all sizes that you expect to use. However, the LaserWriter II can scale fonts to any size, even if you have not installed those sizes.

Important Most commercially available fonts come with specific installation instructions. Be sure to follow those instructions, rather than the more general directions given below.

1. **Start the Macintosh with the startup disk you want to alter.**

2. Insert the appropriate font disk.

If you are removing fonts, insert any disk that includes the Font/DA Mover.

If you are adding fonts, insert whatever disk the fonts are on.

3. Open the Font/DA Mover or a font file.

If you are adding fonts, open a font file on the font disk. This automatically opens the Font/DA Mover and lists all the fonts in that file in the list on the left. (See Figure 3-15.)

If you are removing fonts, open the Font/DA Mover. This will list all fonts in the System file on the current startup disk. The fonts are shown on the left, and the box on the right is empty.
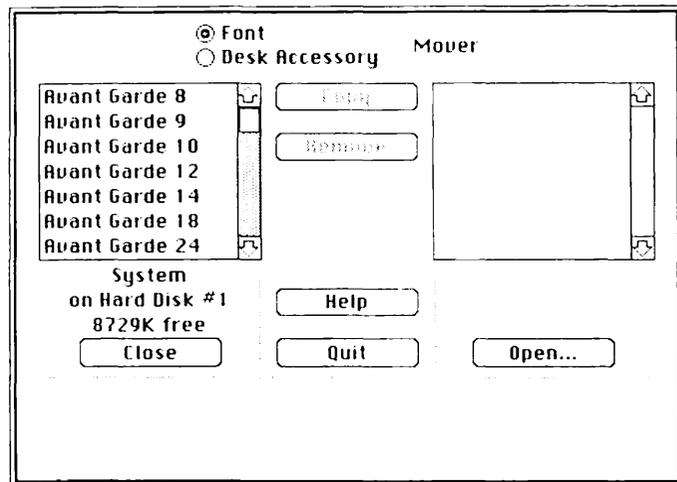
Figure 3-15
The Font/DA Mover window

4. If you are adding fonts, click the Open button beneath the box on the right.

A dialog box appears listing all folders on the startup disk.

Open the System Folder and then the System file. (See Figure
3-16.) The dialog box disappears, and the fonts in the System
file are listed on the right.
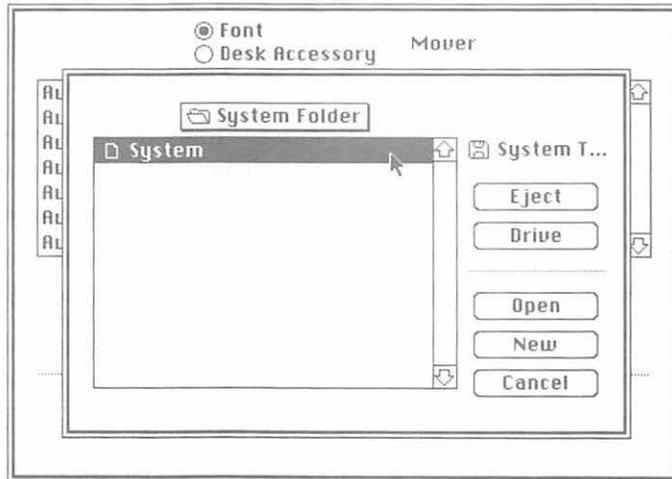
Figure 3-16
The Font/DA Mover dialog box

5. Select the fonts you want to add or remove.

Click to select a single font; hold down the Shift key as you click
additional single fonts; or drag through a group of fonts.

When you select a single font, its name, size, and the space it
occupies on the disk are shown, along with a sample of the font.

When you select more than one font, only the total amount of
disk space occupied by the group is shown.

The Copy and Remove buttons become highlighted when you
select one or more fonts.

6. Click Copy or Remove to add or remove the selected fonts.

□ *Add* fonts by selecting them in a font disk file and clicking Copy.

If you copy a font with the same name as one that is already in the opposite list, that font will automatically be replaced by the selected font.

□ *Remove* fonts by selecting them from the startup font file and clicking Remove.

If you remove all fonts from a file, the file itself will be removed.

You cannot remove 12-point Chicago, 9-point Monaco, or 9-point or 12-point Geneva, because the Macintosh uses these fonts for its screen displays.

Warning   Removal is permanent. Before removing fonts, be sure to make a copy of the startup disk, so that you can reconstruct your font files if you make a mistake or change your mind.

Also, be sure that the fonts you've selected for removal are on the startup disk rather than the font disk.

Chapter 4

All About Fonts

With your Macintosh and a LaserWriter II, you have all the basic hardware you need to produce finished, publication-quality documents or superior proofs and layouts. What it used to take paste-up artists and typesetters to accomplish, you can now do yourself. That's what desktop publishing is all about.

This chapter covers some essentials of Macintosh typography and introduces the LaserWriter II fonts. Chapter 5 gives some rules of thumb for design, as well as examples of documents produced with a LaserWriter IINT and a Macintosh.

If you're an experienced designer, much of this material will be too elementary for you, but you may find these chapters valuable anyway, as an introduction to the capabilities of your new printer.

For those who want to learn more, there are suggestions for further reading at the end of Chapter 5.

Screen fonts, printer fonts, and POSTSCRIPT

All the LaserWriter II fonts are already installed in your printer's memory as **printer fonts** or **outline fonts.** What you installed using the *LaserWriter IINT/NTX Fonts Disk* were the **screen fonts** that the Macintosh uses to produce the screen displays.

When you click Print, the Macintosh sends a description of the screen display to the LaserWriter II in the **POSTSCRIPT** page-description language. The internal computer in the LaserWriter II interprets these commands to create **bitmaps**—dot-by-dot representations of each character—from its outline fonts. The bitmaps are then used to form the final printed output.

Sizes and styles

You installed the screen fonts in 9-, 10-, 12-, 14-, 18-, and 24-point sizes (or a selection of these, if you were conserving disk space), but you can actually print in a much wider range of sizes. The LaserWriter II can scale an outline font into whatever size is needed. The only limitations are **resolution** (below a certain size all parts of a letter "run together"), and the size of the paper.

You installed the fonts in plain style only, but you can also print in **bold,** *italic,* or ***bold italic.*** Just as the computer can create these styles on the screen, the LaserWriter II can create them for printed output.

Depending on the application you're using, you may have access to a number of other styles as well. These may include

underline

outline

shadow

SMALL CAPS

superscript and subscript

Symbol, ITC Zapf Chancery, and ITC Zapf Dingbats may not print in the full range of styles. (Sometimes you can change the style on the screen, but the variation won't show up in your output.)

Printing without a printer font

For best results, you should always format your text in the screen fonts that are appropriate for your printer. Otherwise there's no printer font for the printer to work with.

If you print without the correct printer font in the memory of the LaserWriter II, the printer will still reproduce the screen font. With the Smoothing option on (see "About Page Setup" in Chapter 3), the results may be quite good, but they won't be as good as you would get with the correct printer font. For example, the sentence below is in the Macintosh screen font Chicago, which does not have a corresponding printer font.

The quick brown fox jumped over the lazy dog.

Documents created using the Macintosh fonts Geneva, New York, and Monaco are an exception to this rule. If the Font Substitution option is on in Page Setup, Geneva is automatically converted to Helvetica, New York to Times, and Monaco to Courier. It's still a good idea to work directly in the final font, though, because the word spacing in your output may be too wide with a substituted font.

Using Key Caps

The Key Caps desk accessory is a fast and easy way to preview fonts.

1. Choose Key Caps from the Apple menu.

The Key Caps window appears, along with its title in the title bar.

2. Type a phrase for display in the Key Caps window.

3. Pull down the Key Caps menu.

You'll see a complete list of all the fonts in your System file. (See Figure 4-1.)
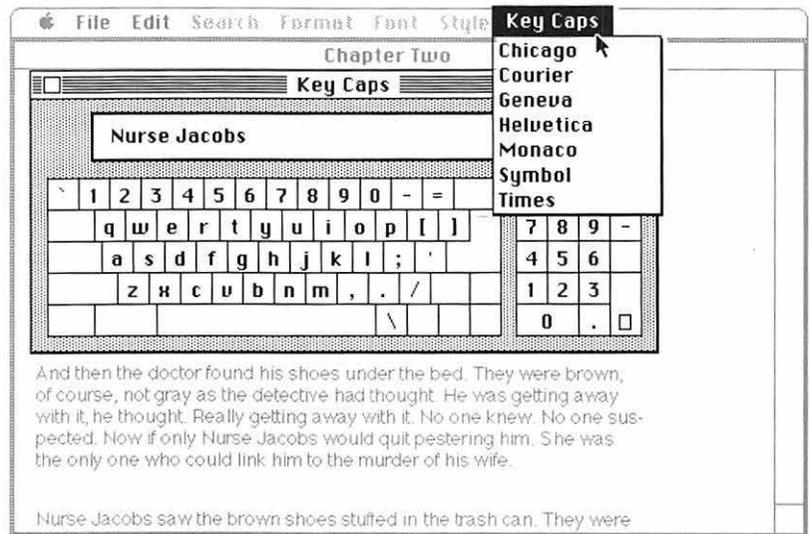
Figure 4-1
The Key Caps window and menu

4. Drag through the list to select each font in turn.

When you want to see an example of the highlighted font, release the mouse button. The text in the Key Caps window is converted to the font you've chosen. (See Figure 4-2.) Note that you can't specify the font size in Key Caps—only the font family.

Figure 4-2
Key Caps in Helvetica

Key Caps is also a good way to explore the options available for each font. Display a font in the Key Caps window, and then hold down the Option key. The keyboard is converted to the option characters. (See Figure 4-3.) Hold down the Shift and Option keys together, and the keyboard displays a different set of options.

Figure 4-3
Helvetica option characters

The LaserWriter II fonts

With the eleven font families built into your printer's **read-only memory (ROM),** you can meet most business and professional needs. The collection is introduced briefly here. Turn to Chapter 5 to see examples of the fonts in use, and to Appendix G to see the full character sets.

Serif fonts

Although there are thousands of type designs, all Latin alphabet font families can be classified as either **serif** or **sans serif.**

Serifs are the strokes at the ends of letterforms. Although they can add much to the appearance of a font, they're not just for decoration. Serifs guide the eye along the printed line, increasing legibility.

The LaserWriter II serif fonts are ITC Bookman, Courier, New Century Schoolbook, Palatino, Times, and ITC Zapf Chancery.

ITC Bookman

ITC Bookman is a classic font family for text. It's easy to read because even large quantities don't look crowded.

This is a sample of 12-point ITC Bookman.

Courier

Courier is the only **monospaced** LaserWriter II font family. In a monospaced font, all the letters occupy the same amount of space on the line. The other fonts are all **proportionally spaced,** meaning that different letters are assigned different spacing according to their size and shape.

```
This is a sample of 12-point Courier.
```

Compare iiii to mmmm in Courier. The two strings are the same length.

Compare iiii to **mmmm** in ITC Bookman. The second string is much longer.

Courier is included in the LaserWriter II font set because some applications will not print in other fonts, and because it is widely used for computer code. It's also the right choice if you want your correspondence to look as though it was produced on a typewriter.

New Century Schoolbook

Like ITC Bookman, New Century Schoolbook is a highly readable font design. As the name suggests, it was originally developed for school textbooks.

This is a sample of 12-point New Century Schoolbook.

Palatino

If you want a formal, weighty look—in a proposal or an annual report, for example—Palatino is an excellent choice. Patterned after the style of ancient stonecutters, it is dignified but easy to read.

This is a sample of 12-point Palatino.

Times

The Times font family is a standard choice for newspapers and other periodicals. It is attractive and easy to read, and its compact design makes it ideal when space is at a premium. (Compare the line length of the sample of Times to that of the other font samples.)

This is a sample of 12-point Times.

ITC Zapf Chancery

ITC Zapf Chancery is more of a specialty font family than a true serif style. It is designed to look handwritten instead of printed, so it's ideal for a calligraphic appearance.

This is a sample of 12-point ITC Zapf Chancery.

Sans serif fonts

Sans serif means "without serifs." These fonts are characterized by simple, striking lines that make them particularly appropriate for titles and headings, or wherever large type is needed. They are also well adapted to spreadsheets and charts. Some designers like the clean, modern look they give to text, but the serif styles are probably more readable in large quantities.

The LaserWriter II sans serif fonts are ITC Avant Garde, Helvetica, and Helvetica Narrow.

ITC Avant Garde

The geometric, symmetrical appearance of ITC Avant Garde makes it a popular choice for display text. The headings in this book are set in various sizes of ITC Avant Garde bold.

This is a sample of 12-point ITC Avant Garde.

Helvetica

Helvetica is more compact and somewhat less stylized than ITC Avant Garde. It is probably the most widely used sans serif design in the world. You'll see it everywhere from advertising headlines to highway signs.

This is a sample of 12-point Helvetica.

Helvetica Narrow

Helvetica is a compact design. Helvetica Narrow is even more so. Because it is highly legible and has an especially clear number set, it is an ideal choice for spreadsheets.

This is a sample of 12-point Helvetica Narrow.

Specialty fonts

The LaserWriter II font file also includes two specialty fonts: Symbol and ITC Zapf Dingbats. Use the Key Caps desk accessory to find the keyboard equivalents for characters in both these fonts. See "Using Key Caps" earlier in this chapter for instructions.

Symbol

The Symbol font family is particularly useful if your work involves science or mathematics.

Τηισ ισ α σαμπλε οφ 12–ποιντ Σψμβολ.

ITC Zapf Dingbats

ITC Zapf Dingbats is a collection of bullets, boxes, and symbols you can use to create decorative borders around your text, add icons for emphasis, and give extra punch to text lists.

➍ ⁹⁹ ☞ ☜ ☆ ✳ → ❲ ✺ ✝ ✴ ✲ △ ◉ ◯ ◻ ◯ ❈ ➢ ❁ ☞ ✎ ✍ ❂ ◻ ➤ ❖ ♡ → ❡ ↕ ➽ ✈ ↩ ⑨ ↕ ♠ ➢ ➾ ❓ ⑪ ☽ → ➥ ↗ ◗ ❀

Obtaining additional fonts

In addition to the fonts available from Apple, you can obtain Macintosh fonts from numerous software developers. You can choose from a wide variety of alphabet fonts, both Latin and non-Latin, symbol fonts for specialized purposes, and novelty fonts for display and decoration.

Commercial sources, shareware, and freeware

You can obtain new fonts from a wide variety of commercial sources. You can also choose from a huge array of public domain fonts. Some of these are **freeware.** You can use them with no obligation to anyone. Others are **shareware.** There is no purchase price, but if you continue to use a font, you're honor-bound to pay the developer either a stipulated fee or a donation.

Installation

For best results, all fonts you install should be designed for LaserWriter II compatibility. Most such fonts come with specific installation instructions. If not, see "Adding and Removing Fonts" in Chapter 3 for instructions. To install fonts on a SCSI hard disk attached to a LaserWriter IINTX, see Appendix A, "The LaserWriter II Upgrades."
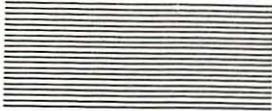
Chapter 5

Designing With the LaserWriter II

With the LaserWriter II you can print high-quality **camera-ready** masters for publishing projects such as letters, memos, presentations, reports, newsletters, and multipage documents such as brochures or even books. This manual, for example, was produced using a LaserWriter IINT. You can also develop accurate layouts and proofs of documents that will eventually be typeset. You can take the work from rough concept to near-final form with your in-house desktop publishing system, going to an outside supplier only for the finished product.

This chapter introduces some basic guidelines for font selection and page organization, followed by examples of documents created for a hypothetical company. The examples were developed with a LaserWriter IINT and a Macintosh Plus, using a variety of page-layout, word-processing, and spreadsheet applications. The illustrations featured in the examples are either images produced with a **scanner** or original art developed with representative graphics applications.

The guidelines, examples, and accompanying notes should give you an idea of the kinds of decisions you need to make to see a document from preliminary layout to final production. At the end of the chapter you'll find some suggestions for further reading.

Font selection

With the built-in fonts of the LaserWriter II, you have a wide range of choices to make any document look its best.

Pick a text font that's easy to read.

Readability is probably the most important consideration in choosing a text font. In addition, the font should look attractive and balanced even in lengthy passages, and it should be reasonably compact.

Although some designers would choose a sans serif font, most would probably opt for a serif design such as Times or ITC Bookman. Serifs enhance readability by guiding the reader along the line. Also, many people find large quantities of sans serif type harsh on the eyes.

The particular choice depends on the document. New Century Schoolbook would be an excellent face for a training manual, as the name implies. Palatino, with its chiseled edges, could be perfect for a prospectus or an annual report.

Choose an eye-catching font for heads.

A main head summarizes an entire page or section. It telegraphs your message to the reader. Subheads are reference points that pull the reader through the text. To do their job, these heads must stand out.

The simplest choice is to use the same font family as for text, but in bold or italic, and perhaps in a larger size.

The clean, geometric lines of sans serif type can make heads stand out even more. Helvetica bold, for example, is a visually striking, easy-to-read font family that's excellent for heads. So is ITC Avant Garde bold, which is the font family used for heads and subheads in this manual.

Be careful when mixing font families.

In general, similar font families don't work well together. Setting some heads in ITC Avant Garde and others in Helvetica would almost certainly be a mistake. So would using one serif font family, such as Times, for text, and another, such as ITC Bookman, for heads.

Use a minimum of font families, sizes, and styles.

It's best to pick one font for text and one or two sizes of that family or another for heads, and leave it at that. Too many fonts, especially when you're new to design, will only result in a disorganized layout that distracts your reader.

Bold and italic can sometimes be useful in text. The first time you use a term, for example, you might want to set it off with one or the other. Sometimes a particular style is called for by the rules of usage. (Book titles, for example, are always set in italic.) But keep style variations to a minimum.

Styles like outline and shadow sometimes work well in heads, but they don't have much place in text, where they interfere with readability and visual balance.

Keep text in charts, graphs, and tables simple.

Charts, graphs, and tables present complicated information in condensed form, so it's important that they be as easy to follow as possible.

Helvetica is simple and readable, and its number set is very clear. Helvetica Narrow is particularly useful because it allows you to condense a large amount of information into a minimal space without sacrificing readability.

Document organization

Successful design depends first on organization. Visual flair, while important, is secondary.

Make a plan.

Decide which elements are the most important, and develop a layout plan that reflects that ranking. You may find it easiest to make a rough layout on paper before you start work at the computer.

Think visually.

Design should communicate your message, not distract from it. All design elements, including illustrations, should be chosen because they reinforce your ideas, rather than for appearance alone.

Keep it simple.

A simple layout is not only easier for you to handle, it's also easier for the reader to take in.

Design the parts with the whole in mind.

You want everything the reader sees at one time to work together, and you want all parts of the document to coordinate. A successful design integrates all elements, so that each contributes to communication. Think at least in terms of a page, and better yet, in terms of two-page spreads, and use those basic units to build the whole.

Don't be afraid to borrow ideas.

Look at layouts you like, think through what you like about them, and then put what you've learned to use.

Get help if you can.

If possible, find someone who knows about design to give you feedback on your preliminary layout. Then incorporate that feedback into your final version.

Experiment.

Try different fonts and different layouts until you arrive at the combination that works best. You can preview your work on the screen, and of course you can also print samples to see how your choices actually look.

Letters and memos

The font flexibility and excellent print quality of the LaserWriter II make it ideal for producing letters and memos. You can print very short runs, including only the original and two or three "carbons," or you can produce masters for photocopying or offset printing.

The letterhead shown in Figure 5-1 includes a variant of the logo seen in all the other examples in this series. The logo is set in Helvetica bold, with the subhead in Helvetica italic.

The electrical pulse extending out from the name reduces in intensity across the page, and the ampersand (&) is screened to match.

You can produce your own logo using any of a number of graphics programs. You can then store the logo in the computer, or have it preprinted on your stationery.

The text of this letter is set in Times, without right **justification.** As a result, the letter looks printed but not overly formal. If you wanted a typewritten look, you could choose Courier instead. Another possibility would be to print the letter in Helvetica to match the logo. The LaserWriter II–Macintosh combination makes it easy to experiment to find the effects you want.

The logo graphic reinforces the ————
company identity

The letterhead includes the logo ————

MP&E〜
Metropolitan Power & Electricity

January 14, 1988

Randolph Smythe-Winston
1672 Prairie Dog Lane
West San Francisco, CA 34117

Dear Mr. Smythe-Winston:

On behalf of all of us here at Metropolitan Power & Electricity, I'd like to thank you for taking the time to write and tell us about quick-thinking meter reader Hector Barstow. Hector, a veteran of 20 years at MP&E, said it was second nature to him to help out in any way he could.

We at MP&E are here to serve our customers. When people like you, Mr. Smythe-Winston, recognize a job well done, it makes all the hard work worthwhile.

Yours sincerely,

Jeannette Ditmar
Assistant Vice-President for Customer Relations

The shaded rule and the address ————
act as a border for the page

1095 East 54th Street NW • North San Francisco • California • 34120 • 415/555-1212

Figure 5-1
A letter

Presentations

With the LaserWriter II you can create high-quality transparencies for overhead projection quickly and easily. You can combine text and graphics as you wish. With high-resolution printing, your presentation will be easy to see, even from across the room. And you can print directly on the transparency.

The overhead in Figure 5-2 was created with a Macintosh application that allows you to turn a routine bar chart into a striking graphic. You can obtain comparable programs from your authorized Apple dealer.

The electrical pulse on the top is derived from the logo. Because the transparency was developed for a hypothetical internal presentation, there was no need to include the company name. Including the visual device, however, helps to reinforce company identity. Combined with the surrounding border, the graphic helps make every transparency look like part of a series.

All text is Helvetica. It recalls the logo, and it's easy to read in the large sizes (18-point or larger) needed for presentations. (Transparencies are viewed, not read, and they should be visible even from the back row.)

The title summarizes the message, and the explanatory text is kept to a minimum. The nature of this kind of document makes simplicity essential.

A minimum of text makes the transparency easy to understand at a glance

The logo element reinforces the company identity and creates continuity in a variety of documents

A border holds the page together

Large print is easy to read from across the room

A Better Bill

							$112				
		$88				$94		$95			
	$83		$78						$90		

BALANCED PAYMENTS — $75

| $60 | | | | | $58 | | | | | $60 | |
| | | | $56 | | | | | | | | $54 |

Summer Air Conditioning Peak

Winter Heating Peak

JUN   JUL   AUG   SEP   OCT   NOV   DEC   JAN   FEB   MAR   APR   MAY
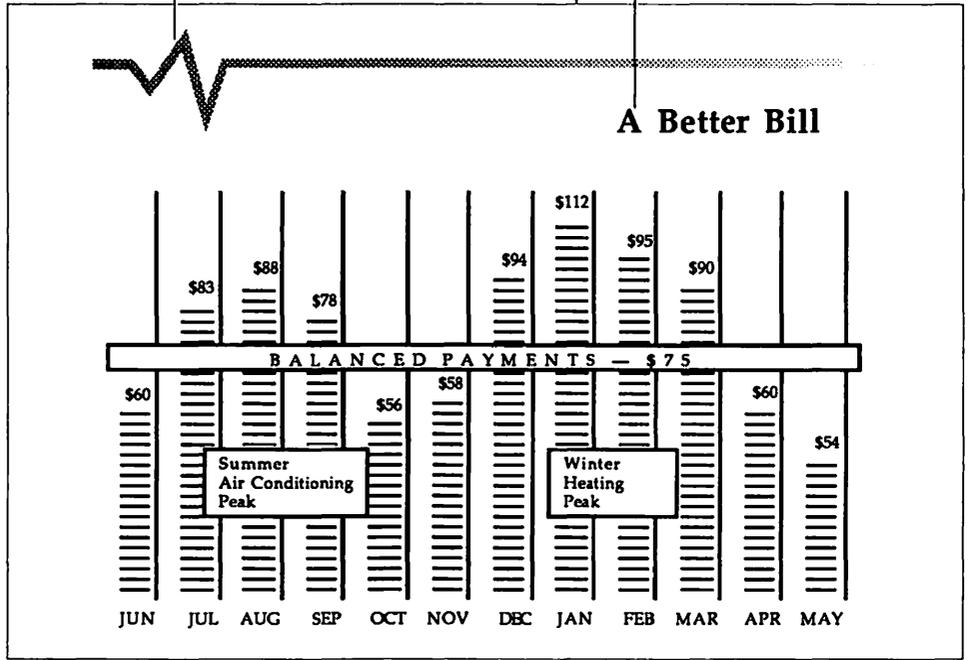
Figure 5-2
An overhead transparency

Reports

Business software applications let you put together reports that combine text, charts, and graphics to communicate far more effectively than you could with words or numbers alone.

The report in Figure 5-3 features the company logo, with the department name as a subhead. The text is New Century Schoolbook, a highly readable font family, and the captions are Helvetica.

The two charts on the first page summarize the financial impact of the hypothetical project. The graphics on the reverse side telegraph the qualities of the product itself. In reality, this report might include considerably more text, but the example shows how a message can be condensed using readily available Macintosh applications.

The photograph was imported with a scanner, a device that converts images into computer-usable form. The schematic diagram was created with a drawing program.

For a short run, this report could be printed on both sides directly on the LaserWriter II. It could also be printed on two separate sheets and then photocopied on both sides.

MP&E ⟋\/

Office of Program Assessment

To: Program Assessment Committee
From: John Smith, Project Evaluator
Subject: Wind power sales

Since MP&E is required to purchase available
has been suggested that we can best integrate
sale of windmills to private investors. This re
design, the Aerospark, which could be produce
contract to our Western California subsidiary.
income per windmill per year, and the project
2000. Please read carefully, and return to me

Projected Income Per Year

$

	200,000	250,000	300,000	350,000	400,000

45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000

☐ 6.5 c/kWh
■ 8.5 c/kWh   Our financial projection of 300,000 kilowatt hours applies
■ 10.5 c/kWh   our SkyPower AeroSpark
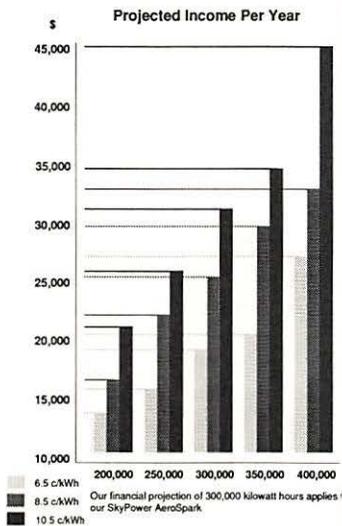
Design

The Skypower Aerospark sustains close to capacity output under a wider range of wind
conditions than earlier designs allowed.

The turbine shaft is mounted on spherical roller bearings to permit fine adjustment of
tip angle, while an auxiliary yaw motor and yaw gear keep the windmill precisely
oriented.

The blades are made of reinforced polyester (a proprietary Skypower technology), and
each blade is equipped with an independent aerodynamic spoiler brake.

The unit can be mounted on a 60-, 72-, or 80-foot steel lattice tower, depending on site
conditions.

One piece, heavy-duty hub
Maintenance-free coupling
Yaw motor and gear
Self-lubricating nacelle blocks
Protective operation brake
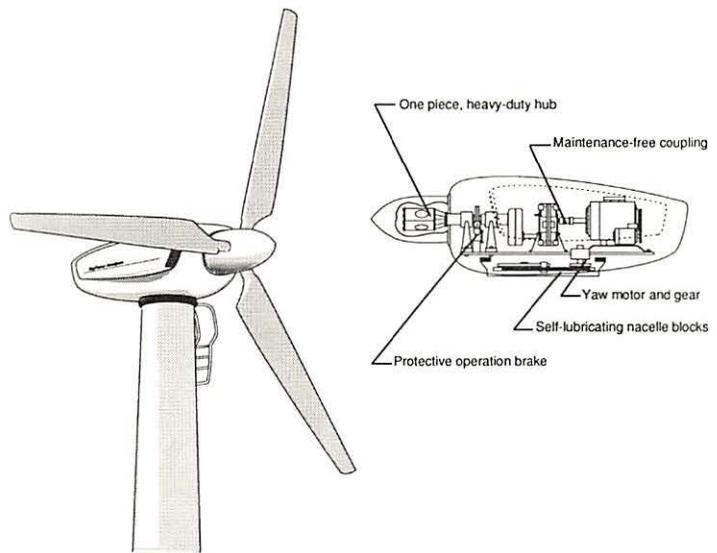
Charts and illustrations
summarize the message

Figure 5-3
A report

Newsletters

Newsletters are an important communication tool for many businesses and organizations. The LaserWriter II offers a convenient and economical way to produce the camera-ready masters.

The newsletter in Figure 5-4 was created with a page-layout program. This kind of application allows you to wrap text around graphics and to move smoothly from column to column or page to page.

The masthead is adapted from the company logo. Along with the other examples in this series, it illustrates the many ways a graphic can be modified without destroying its basic identity.

The headline is set in Helvetica to match the logo. The text is Times. Although it now has many other uses, this font family was designed specifically for newspapers and periodicals, and it remains one of the best choices for that purpose. It's easy to read, and it's also very compact.

The two-column format and the single, centered illustration (created with a drawing program) give the page an open appearance that is inviting to the reader. You might opt for a three-column layout, or include additional graphic elements, but it's best not to overload the page.

The company logo is adapted for the masthead

A two-column layout keeps the page open

The text is Times, for compactness and readability

CURRENTS

Paramount Pass Plant Tops Expectations

MP&E's Paramount Pass Geothermal Pumping Station has been in full operation for less than a year, but it's already taking its place as an important link in the power supply chain.

Using technology developed at the MP&E Boswell Memorial Research Center, the Paramount Pass installation turns geothermal power—locked in the earth by volcanic forces that date back to the age of the dinosaurs–into clean, usable electricity.

According to Everett Zimmer, chief of operations at Paramount Pass, the plant is already producing at a rate of 10,000 megawatts of electricity per year, and is expected to produce double that when peak capacity is reached in 1994. It would take approximately 100 million tons of coal to match that output, say resource development experts, so the new plant helps California and MP&E meet their goals of environmental quality and stability.

Charles Walter Hanrahan, MP&E CEO, notes that progress at Paramount Pass is exceeding expectations. "Thanks to the hard work and skill of everyone involved, we have a plant that will serve us well now and for years to come. Add this to our continuing emphasis on conservation, and MP&E should be able to meet the energy needs of California at our present rates for the unforeseeable future," Hanrahan says.

Myra Daugerty Marks 30 Years in Food Services

For 30 years, Myra Daugherty has been the smiling face at the steam table in MP&E's HQ Cafe. Now all her friends have decided to honor her by declaring December 1 Myra Daugherty Day. According to event organizers Bob Schofield and Monica Hicks, everyone who wants to participate should come to work in an apron and carrying a spatula.

Although Mrs. Daugherty has put five children through medical school, she has no intention of retiring. "It's a great life," she says. "Everybody, high and low, comes to the HQ Cafe, and I get to meet them all. If I were to retire, I'd miss seeing the folks here."

For more information about this gala event, contact Bob or Monica in the Retro-Engineering Department on the third floor.

Promotional Exams

Personnel Services has scheduled open promotional exams in three job categories: Administrative Supervisor II, Security Specialist III, and Engineering Technician IV.

The written exams will be held Tuesday, December 12, from 8:00 to 11:00 A.M. in the Boswell Memorial Auditorium.
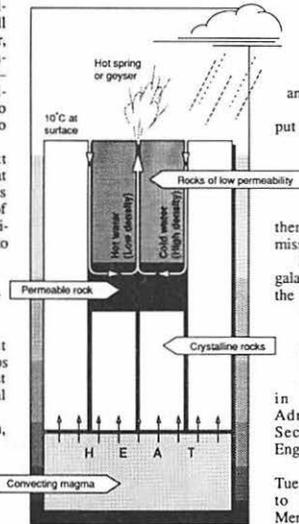
Inside: Last Chance for Low Cost Loans, pg. 2
MP&E Sparks NWC Champions, pg. 3
President's Quarterly Review, pg. 4

Figure 5-4
A newsletter

Multipage documents

You can use your Macintosh to design multipage documents ranging from simple pamphlets to entire books—such as this manual. You can use the LaserWriter II to produce the masters, or you can print proofs and send the completed text out for typesetting. It's also common to combine techniques. The text for a project might be laid out electronically and printed on a LaserWriter II, for example, with photographs and color elements added manually.

The eight-page brochure in Figure 5-5 was first designed with paper and pencil. The designer first decided where to position text and graphics on each page and then implemented her design with a page-layout program. The illustrations and charts were created electronically.

Like the other examples, this brochure incorporates the logo element and uses fonts that are in keeping with it. The logo appears on the back cover, and the screened bar at the bottom of each page is derived from the logo's electrical pulse.

The headlines and text are set in New Century Schoolbook. The headlines are in bold and are in the same point size as the text.

The printed masters (often called *printer's flats*) are four 8½ x 11 pages. Each is divided horizontally, with one brochure page per half. The two-column layout leaves enough space in the center so that no type is lost or cramped when the pages are folded.

The flats would be printed by offset lithography on both sides of two sheets, instead of four. The finished brochure would then be produced by folding the sheets and stapling them together.

To see the individual pages of the brochure, turn to Figure 5-6 on the next two pages.

Two standard-size sheets make the eight pages

Saddlestich binding is inexpensive but strong

Heavy stock is used for the cover

Within the brochure image:

It's
Never
Too Late
To
Insulate

4. Between attic collar beams.
5. Between sloping rafters.
...d studs.
...r joists.

...hoices for insulating
...e are mineral wool

...made out of fiber
...ou buy it in rolls,
...in precut
...batts. It's also avail-
...l for pouring or
...lings, floors, and
...rant to use blowing
...licensed contractor
...cessary equipment.)

...de from treated
...d it is designed
... poured into place.
...excellent insulator,
...to work with than
...roducts.

2

Figure 5-5
A brochure

It's
Never
Too Late
To
Insulate

MP&E—∿—
Metropolitan Power & Electricity
1095 East 54th Street NW · North San Francisco · California · 34120

Save energy and money, too! If your house dates back to the days of cheap energy, installing proper insulation can probably save you 25 percent or more on your heating bills. If you use air conditioning, you'll realize these savings year-round. Even without air conditioning, insulation keeps your home cooler and more comfortable during the summer months.

Headline text summarizes— **Where to insulate.** Match the two following figures
content, for information with your own home layout to make
at a glance your insulation plan. All the number areas should be insulated.

1. Ceilings below unheated areas.

2. Exterior walls, and interior walls between living space and unheated areas like the garage or a storage room. (Contact a licensed insulation contractor for walls enclosed on both sides).

3. Floors above unheated areas.

Where to get help. If you need to hire a contractor for all or part of the job, start with the Yellow Pages. You can also write to the State Department of Consumer Affairs for their booklet, "Blueprint for Building Quality," which details what you should look for when arranging home improvements.

Check with the Better Business Bureau and ask for references before signing anything.

For more information... Call the MP&E Home Hotline at 1-800-555-1212.

Or write:

MP&E
Department of Customer Relations
1095 East 54th Street NW
North San Francisco, CA 34120

1   6

Figure 5-6
The brochure layout
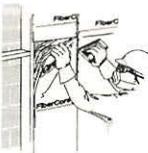
Use an insulation blanket to insulate walls.

Fit one end of the blanket against the top of the framing. Work downward, stapling the edges of the blanket to the wall studs. Make sure the blanket is tight against the framing at the top and bottom. If the blanket has a foil or paper cover, the cover should face toward the interior.

When insulating walls without studs, first attach wooden strips 16 to 24 inches apart, and then staple the blanket to them just as you would with regular studs.
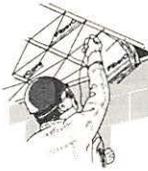
Use batts or blankets to insulate floors.

Push the insulation between the floor joists from below. If it has a foil or paper cover, the cover should face upwards.

Support the insulation by driving nails about two feet apart into the bottoms of the joists and lacing wire around the nails. Seal the insulation against all walls to prevent air circulating between it and the floor.
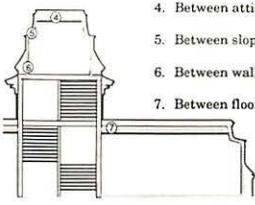
4. Between attic collar beams.

5. Between sloping rafters.

6. Between wall studs.

7. Between floor joists.

What to use.

The two main choices for insulating an existing home are mineral wool and cellulose.
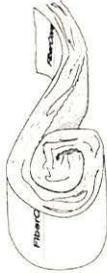
Mineral wool is made out of fiber glass or rock. You buy it in rolls, called *blankets*, or in precut lengths, called *batts*. It's also available in loose fill for pouring or blowing into ceilings, floors, and walls. (If you want to use blowing wool, contact a licensed contractor who has the necessary equipment.)

Cellulose is made from treated scrap paper, and it is designed to be either blown or poured into place. Cellulose is an excellent insulator, but it's harder to work with than mineral wool products.

5

2

The chart below gives you an idea of how the different choices compare. R-values measure the resistance to heat loss and gain. Never buy insulation that isn't plainly marked with its R-value.

Higher R-values are recommended for colder climates. In moderate weather areas, we recommend R-19 insulation for ceilings and R-11 for walls and floors.
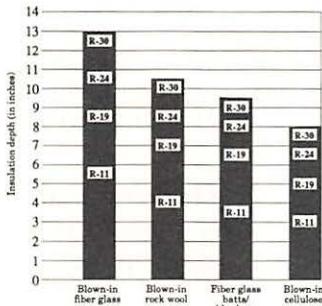
How to do it.

Use batts, pouring wool, or cellulose to insulate your attic.

Simply pour out pouring wool or cellulose and level it with a rake or pole.
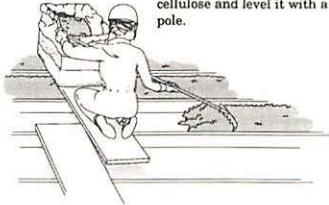
Lay out insulating batts between the joists. If the batts have a foil or paper cover on one side, that side should face down.

Insulation depth (in inches)

	Blown-in fiber glass	Blown-in rock wool	Fiber glass batts/blankets	Blown-in cellulose
R-30	13	10	9	8
R-24	10	9	8	7
R-19	8	7	7	6
R-11	5	4	4	3

3
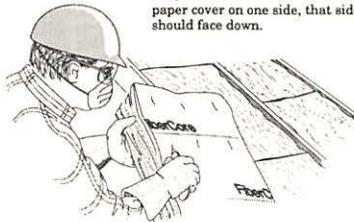
4

Suggestions for further reading

Books on design would fill a library, but here are a few suggestions for further reading.

☐ Bove, Tony, Cheryl Rhodes, and Wes Thomas. *The Art of Desktop Publishing.* New York: Bantam, 1986.

This is a good general overview of desktop publishing, although some of its specific hardware and software coverage either doesn't pertain to the Macintosh world or is out of date.

☐ Carter, Rob, Ben Day, and Philip Meggs. *Typographic Design: Form and Communication.* New York: Van Nostrand Reinhold, 1985.

This is an excellent introduction to typography from the standpoint of the professional designer.

☐ Kater, David A., and Richard Kater. *The Printed Word.* Bellevue, WA: Microsoft Press, 1985.

If you use Microsoft Word, you'll find this book extremely helpful. Even if you don't use the application, the chapter on type is worth a glance.

☐ Rardin, Kevin. *Desktop Publishing on the Mac.* New York: New American Library, 1986.

This book focuses on the Macintosh and on Apple laser printing. Even though some of the hardware and software have changed, most of the discussion is still relevant. The author follows the development of a single large project—the design and production of a newsletter—from idea to completion.

☐ Ulick, Terry. *Personal Publishing with the Macintosh.* Hasbrouck Heights, NJ: Hayden, 1986.

This book concentrates on the PageMaker page-layout application, but even non-PageMaker users will find it an exceptionally clear and concise introduction to layout and design.

The fast-growing desktop publishing field has also begun to generate its own periodicals. Here are two notable examples:

☐ *Publish! The How-to Magazine of Desktop Publishing*

☐ *Personal Publishing: The Magazine for Desktop Publishers*

Both feature new product reviews and articles on specific design problems and solutions.

Chapter 6

Maintenance and Troubleshooting

The LaserWriter II is designed for trouble-free service.
Maintenance requires little more than putting in a new toner
cartridge every four thousand pages or so and performing a few
minor cleaning tasks. The recommended service interval is
100,000 pages. This service can be arranged through your
authorized Apple dealer.

Safety first

The fixing roller assembly (see Figure 6-1) in the LaserWriter II
operates at very high temperatures—around 400 degrees
Fahrenheit. If possible, allow the rollers to cool before performing
routine maintenance and troubleshooting chores.

Fixing rollers ——
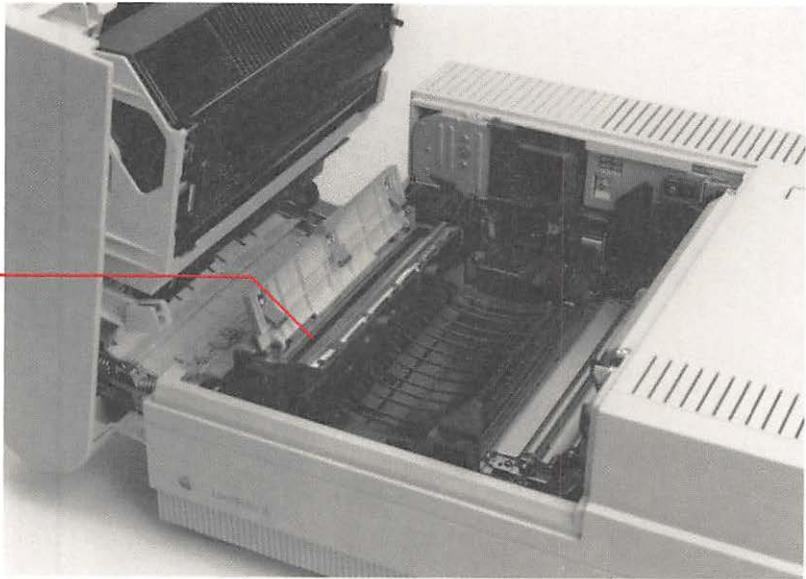
Figure 6-1
The fixing rollers

To prevent damage to the printer, observe the following
precautions:

- **Don't touch the exposed gears or electrical contacts in the shaded areas of Figure 6-2.**
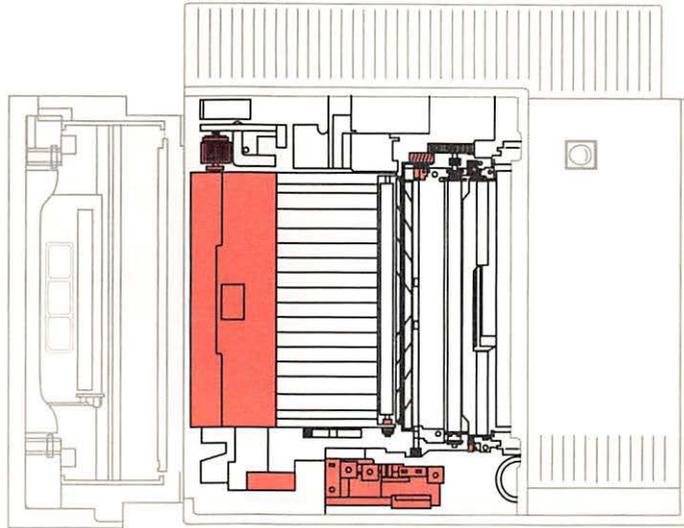
Figure 6-2
Exposed gears and electrical contacts

- **Don't open the light-blocking shutters on the toner cartridge. (See Figure 6-3.)**
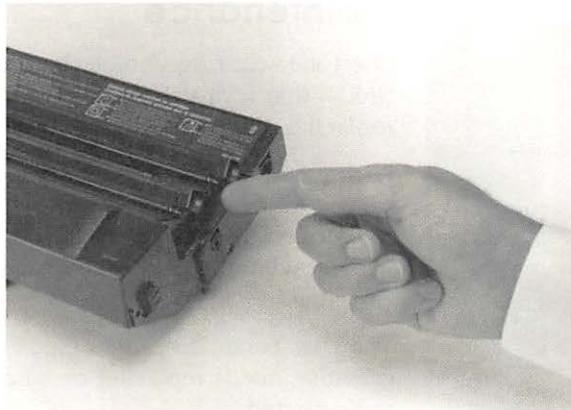
Figure 6-3
The light-blocking shutters

■ **Don't open the drum protection shutter on the toner cartridge. (See Figure 6-4.)**

Don't do this!
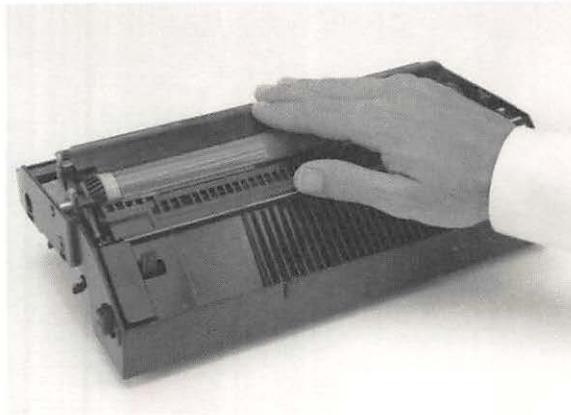
Figure 6-4
The drum protection shutter

■ **Don't lubricate the printer.**
■ **Don't attempt to disassemble the printer.**
■ **Don't place anything on top of the printer.**

Maintenance

The toner cartridge holds the toner powder—the printer's "ink"—that forms the printed images. When the cartridge needs replacing, it's also time for routine maintenance.

Each cartridge should yield about four thousand pages. If you print a lot of graphic designs, you may need to change cartridges more often. If your pages start to look too light, or if you see thin vertical white lines in dark images, it's time to change the cartridge.

The Low Toner Level light (see Figure 6-5) glows orange when the cartridge needs replacing or when the toner powder needs to be redistributed.

Figure 6-5
The Low Toner Level light

If the light comes on in the middle of a printing job, and the output is still satisfactory, continue printing if you wish. You won't harm the printer by doing so.

When the light comes on, take the cartridge out, rock it gently back and forth a few times to redistribute the toner, and reinsert it. (See Figure 1-8.) If the light goes out, continue to use the cartridge for the time being. If the light stays on, change the cartridge and perform the routine maintenance procedures described in the following sections.

Installing a new toner cartridge

1. Remove and discard the used cartridge.

Pull out the cartridge. (See Figure 6-6.) Be careful to keep it horizontal so that no remaining toner powder spills into the printer.
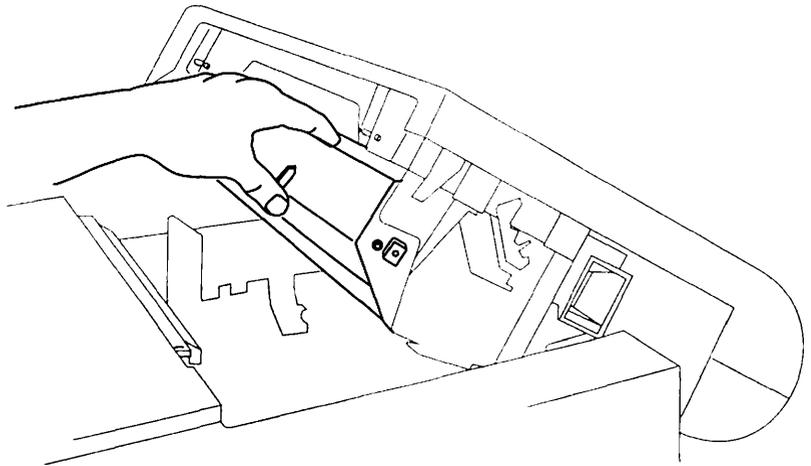
Figure 6-6
Removing the old toner cartridge

2. Install the new cartridge.

You install the new cartridge exactly as you installed the one supplied with the printer. For details, see "Installing the Toner Cartridge" in Chapter 1, or read the guide supplied with the cartridge.

Interior cleaning

Whenever you install a new toner cartridge, you should also clean the interior of the LaserWriter II and replace the cleaning pad. A replacement pad is supplied with each cartridge.

<table>
<tr><td>Warning</td><td>Be very careful during all cleaning operations not to break any of the wires inside the printer.</td></tr>
</table>

1. Open the green felt cover that protects the fixing rollers.

<table>
<tr><td>Warning</td><td>If you have not allowed the LaserWriter II adequate time to cool, the felt cover may be hot, and the fixing rollers will be very hot.</td></tr>
</table>

2. Remove and discard the used cleaning pad.

3. Unwrap the new cleaning pad.

Remove and put aside the cotton swab attached to the pad by a rubber band. You'll use the swab for cleaning the printer wires.

4. Use the end of the new pad to clean the fixing rollers.

Before you install the new pad, clean the fixing rollers by wiping them with the white felt tip at the end of the pad. (See Figure 6-7.)
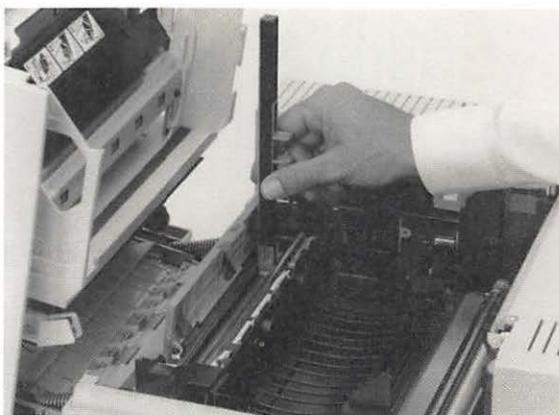
Figure 6-7
Cleaning the fixing rollers

5. **Remove and discard the white felt tip from the end of the cleaning pad. (See Figure 6-8.)**
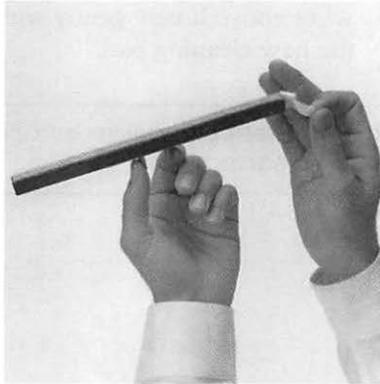
Figure 6-8
Removing the felt tip
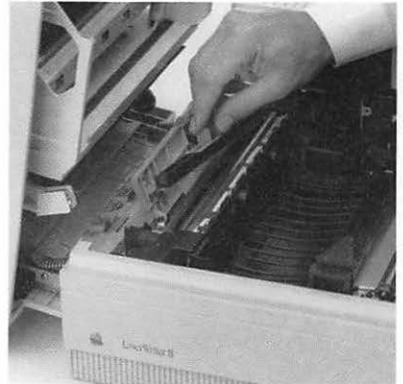
Figure 6-9
Installing the new cleaning pad

6. **Insert the new cleaning pad into the fixing roller assembly. (See Figure 6-9.) Then close the green cover.**

7. **Clean the discharging pins.**

   Use the cleaning brush supplied with the printer to brush any dust off the discharging pins. (See Figure 6-10.) Store the brush in the printer when you're finished.

The discharging pins ——
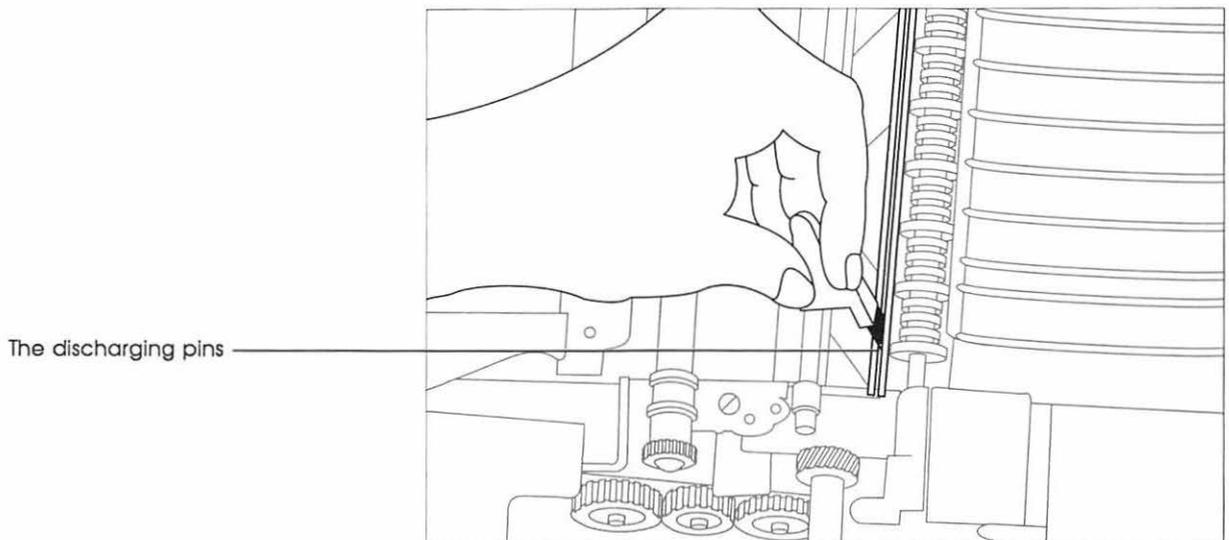
Figure 6-10
Cleaning the discharging pins

8. Wipe the transfer corona wire clean.

The transfer corona wire is the very thin wire in the midsection of the LaserWriter II. (See Figure 6-11.) Wipe it and the diagonal wires above it very gently with the cotton swab supplied with the new cleaning pad.

Figure 6-11
Wiping the transfer corona wire

9. Wipe the transfer guide clean.

Use a clean, soft, slightly damp cloth to wipe off the transfer guide. (It's the metal plate behind the transfer corona wire, shown in Figure 6-12.)

10. Close the LaserWriter II and resume printing.
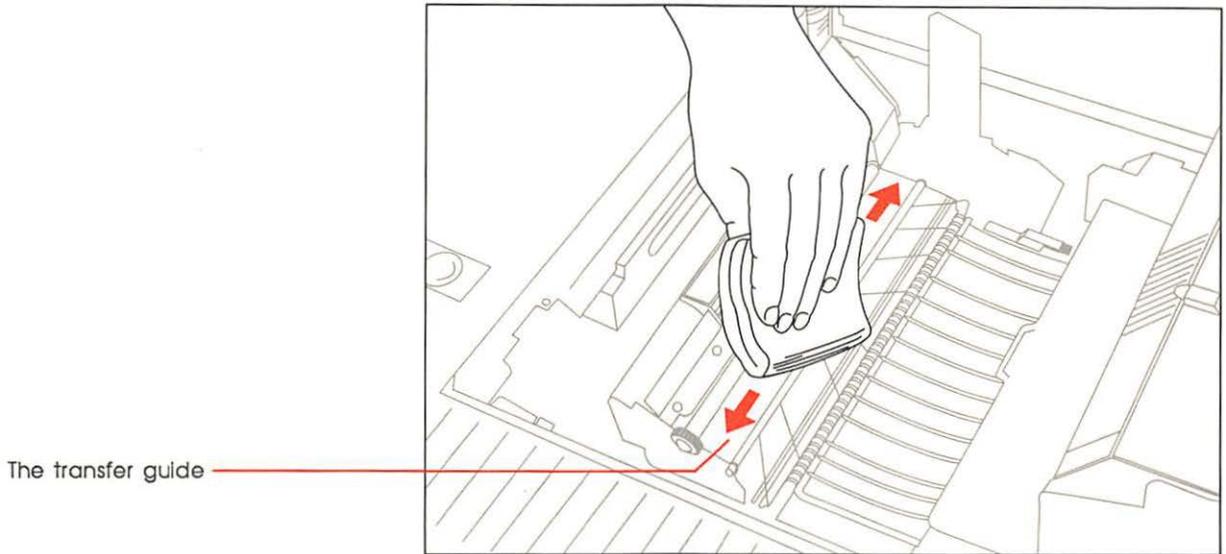
The transfer guide

Figure 6-12
Wiping the transfer guide

Exterior cleaning

Unplug the power cord (see Figure 6-13) and then wipe the exterior of the printer with a clean, soft, damp cloth. Use a mild soap or detergent if necessary, but *never* an ammonia-based cleaner. Be careful not to get any liquid in the power cord port.

Pull the plug, not the cord
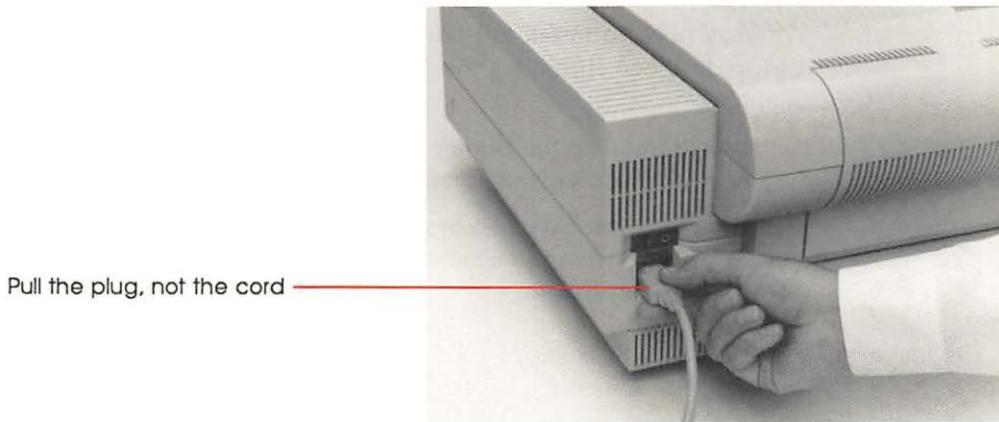
Figure 6-13
Disconnecting the power cord

Warning   Never use ammonia-based cleaners on or around the
LaserWriter II.

Troubleshooting

You're not likely to have many problems with the LaserWriter II,
as long as you follow the routine maintenance procedures in this
chapter. Changing the toner cartridge is usually all that's needed
to keep print quality up to publication standards.

Most operating pitfalls can be traced back to software installation.
To avoid these problems, always use a startup disk that includes
the LaserWriter II printer resource and the appropriate fonts. See
"Installing the Printer Resource" and "Installing Fonts" in Chapter
2 for details.

The Chooser isn't listed in the Apple menu

If the Chooser isn't listed in the Apple menu, the System file on
your startup disk is outdated. If you want to use this disk as a
startup disk, update it before proceeding. You can obtain the
current system software from your authorized Apple dealer.

No LaserWriter icon appears in the Chooser

You may need to install the printer resource on the current
startup disk. See "Installing the Printer Resource" in
Chapter 2.

If you have installed the printer resource, it may not be in the
System Folder. If necessary, drag it there.

Check to see if you have two System Folders on the disk. If so,
consolidate everything you need in the more current version and
discard the other folder.

The LaserWriter isn't listed in the Chooser

If you see the LaserWriter icon but no LaserWriter II name in the list of printers, one of the following situations may be the cause.

☐ The printer has been turned off. Make sure it is plugged in and turned on, and wait for the test print.

☐ The mode switches are not set correctly. See Appendix F, "Status Lights, Ports, Expansion Slot, and Switches," for more information.

☐ There's a problem in the LocalTalk cable system somewhere between your computer and the LaserWriter II you want to use.

Check to make sure that all the cables are properly connected. See "Connecting to a Macintosh" in Chapter 1, Appendix A, "Connecting the LaserWriter II to an Apple II," or Appendix B, "Connecting To and Printing With an MS-DOS Computer."

If your printer is part of a network, see "Checking the LocalTalk Cable System" later in this chapter.

If you still can't resolve the problem, the printer's electronics or the LocalTalk connector boxes may not be functioning properly. Call your authorized Apple dealer.

The LaserWriter II won't print a test page

Unless you change the POSTSCRIPT parameters, the LaserWriter II will print a test page every time you turn it on. If it doesn't, check the status lights (see Figure 6-14 and Appendix F), and take the requisite steps.

☐ If the Ready/In Use light is off, the printer is disconnected or switched off, or an error condition exists. Check the power cord, the cover, and the on/off switch.

☐ If the Paper Out light is red, the printer is out of paper or the paper tray is not in place. Refill and replace the paper tray. See "Loading the Paper Cassette" in Chapter 1.

☐ If the Paper Jam light is red, see "Correcting Paper Jams" later in this chapter.

□ If the red Paper Jam light is flashing, the printer requires service. See your authorized Apple dealer.

Green Ready/In Use light ⎯⎯⎯⎯⎯⎯⎯⎯

Orange Low Toner Level light ⎯⎯⎯⎯⎯⎯

Red Paper Out light ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Red Paper Jam light ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
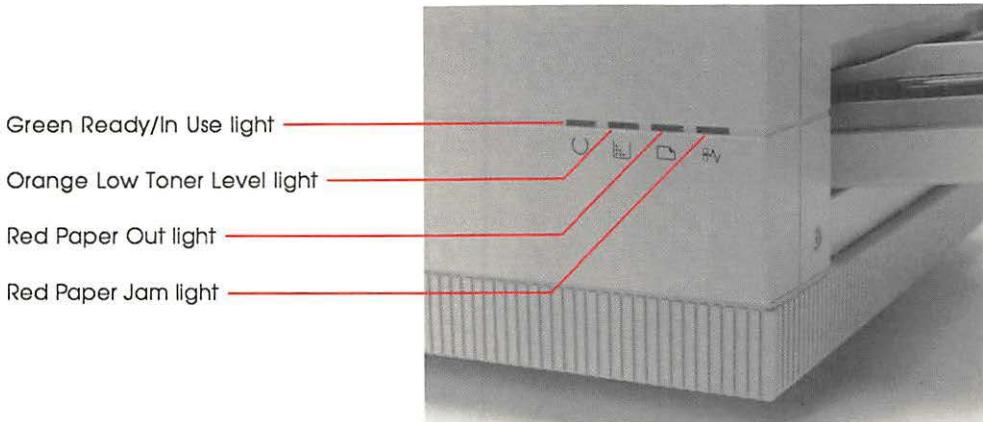
Figure 6-14
The LaserWriter II status lights

The test page is blank

Check the toner cartridge. If the Low Toner Level light is on, you may be completely out of toner powder, or the powder may simply need redistribution. If you have just changed the cartridge, check to make sure that you have removed the sealing tape. (See Figure 1-11.)

The LaserWriter II won't print a document

If you can't print a document, try the following steps.

1. Check the Macintosh status messages.

The status messages tell you if someone else is currently using the printer. They also alert you to problems such as paper jams.

If anyone on the network is using the wrong software, you'll see a status message instructing you to reinitialize the printer. Everyone on the network must use the same printer resource.

2. Go through the entire printing process.

Select the LaserWriter II in the Chooser, and respond to any dialog boxes; choose Print from the File menu and confirm the settings in the Print dialog box.

3. Check the status lights and the toner cartridge.

Follow the steps in "The LaserWriter II Won't Print A Test
Page" and "The Test Page Is Blank" earlier in this chapter.

Checking the LocalTalk cable system

If you or someone else on the AppleTalk network system can't
find a LaserWriter II in the Chooser after selecting the LaserWriter
II as the printer type, *and if everyone is using the most current
printer software,* the problem is usually with the LocalTalk cable
system. Try the following steps:

**1. Check to see that the LocalTalk connector box is firmly
attached to the Macintosh.**

**2. Using a startup disk with the LaserWriter II printer
resource installed, start the computers on either side
of the one with the problem, and check for the
LaserWriter II icon in the Chooser.**

If you find the LaserWriter II, the problem lies between the
computer that shows the LaserWriter II and the computer that
does not.

**3. Check all connections in the affected section of the
network.**

4. Check the layout of the network.

☐ Check for cables not attached to a LocalTalk connector box,
and reconnect as necessary.

☐ Check to make sure that the network forms a line, not a loop.

☐ Check to make sure that the first and last LocalTalk
connector boxes have only one cable leading to each.

Correcting paper jams

The printer's paper path is quite straight, so paper jams are
uncommon, especially in the automatic feed mode.

If you don't adjust the paper guide accurately during manual feed,
paper may jam. To correct a paper jam:

1. Open the printer to see where the jam is.

2. If the jam is in the cassette area, pull the cassette out of the
printer until you can release the paper. (See Figure 6-15.)
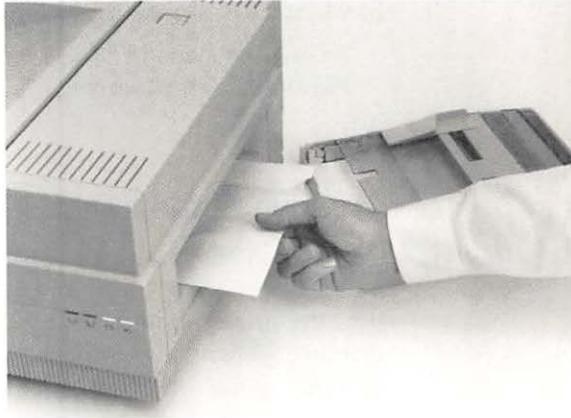
Figure 6-15
Releasing jammed paper from the cassette

3. If the jam is around the print feed area, open the transfer paper lock and free the paper. (See Figure 6-16.)
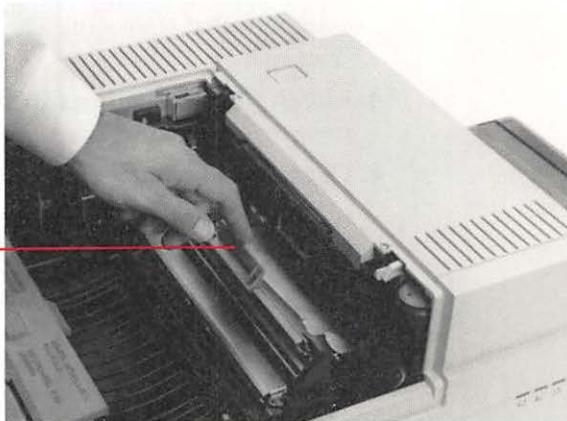
The transfer paper lock ———————

Figure 6-16
Opening the transfer paper lock

4. If the jam is in the fixing roller assembly unit, first open the green felt cover and then pull the paper out. (See Figure 6-17.)

Warning	If the printer has been in use, the felt cover may be hot, and *the fixing rollers will be very hot.*
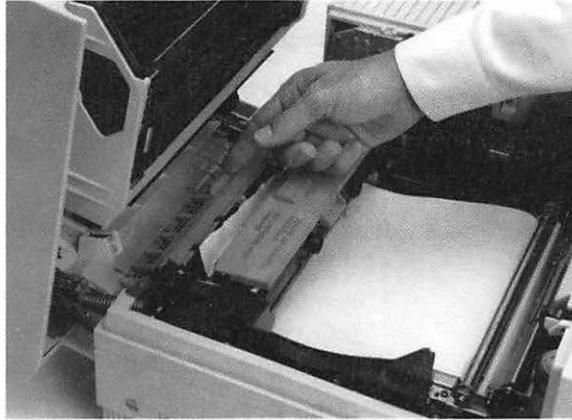
Figure 6-17
Removing jammed paper from the fixing rollers

Correcting image problems

If the image is too light:

1. Check the Low Toner Level light. If it's on, see pages 82–83.

2. Turn the print density dial one step counterclockwise (one number *lower*).

   The print density dial is inside the printer, in the lower-left corner. (See Figure 6-18.)

Turn counterclockwise to increase density, clockwise to decrease density
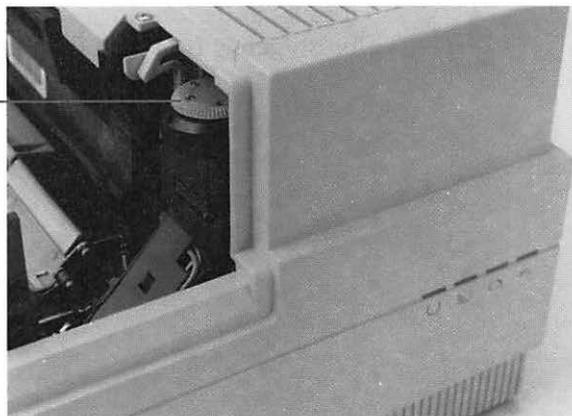
Figure 6-18
Adjusting the print density dial

3. Check to see that the paper is of a recommended type. See "About Paper" in Chapter 3.

If the image is too dark:

Turn the print density dial one step clockwise (one number *higher*).

If white or dark vertical or horizontal lines or stripes appear on the page:

1. Remove the toner cartridge and rock it to a 45-degree angle four or five times to redistribute the toner. Be sure to hold the cartridge horizontally. (See Figure 1-8.)

2. If this doesn't work, install a new toner cartridge. Also install a new cleaning pad and clean the transfer corona wire and transfer guide. See "Installing a New Toner Cartridge" earlier in this chapter.

If stains appear on printer output:

1. Clean the transfer guide, transfer corona wire, and discharging pins exactly as you would if you were installing a new toner cartridge.

   Wipe the transfer corona wire very gently with a cotton swab. Wipe the transfer guide with a soft, clean, damp cloth. Brush off the discharging pins with the cleaning brush stored in the printer. See "Interior Cleaning" earlier in this chapter.

2. Clean the primary corona wire.

   Take out the toner cartridge and insert the cleaning brush into the slot at the cartridge's front. (See Figure 6-19.) Work the brush gently back and forth to clean the wire.
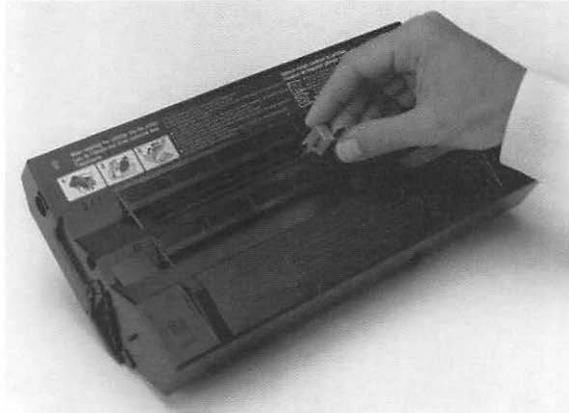
Figure 6-19
Cleaning the primary corona wire

Correcting paper problems

If the paper curls or smears on handling, it is probably not suitable for use with the LaserWriter II. See "About Paper" in Chapter 3.

Appendixes
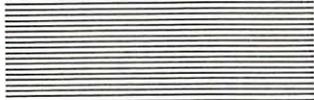
Appendix A

The LaserWriter II Upgrades

To upgrade a LaserWriter IINT to a LaserWriter IINTX, simply have your authorized Apple dealer install a LaserWriter IINTX controller board. The used LaserWriter IINT controller board is your property. If you choose to store it, be sure to do so in a static-free bag, available through your authorized Apple dealer.

When you upgrade to a LaserWriter IINTX, you also have the option of increasing the printer's memory and of adding one or more dedicated hard disks for font management. The benefits of and procedures for doing so are described in this appendix.

Memory upgrades

You can increase the RAM of the LaserWriter IINTX up to 12 MB. You can also add a font expansion card. These memory upgrades are not possible with the LaserWriter IINT.

RAM expansion

You can upgrade the RAM of the LaserWriter IINTX in increments of 1 or 4 MB, up to the 12 MB maximum. The necessary upgrade kits can be installed by your authorized Apple dealer.

Adding RAM means that more fonts can be **downloaded** to the printer at any one time. It also increases the space available for **font caching.** Before the LaserWriter IINTX can print, it converts the POSTSCRIPT outline fonts into bitmaps, which it stores (caches) in RAM. When the demand for RAM exceeds the supply, the printer discards the less recently used bitmaps in favor of the newer ones. When the bitmaps are needed again, the printer must rebuild them. The additional RAM lessens the need for this time-consuming step.

The font expansion card

To expand font capacity in ROM, you'll need to insert an add-on circuit board into the expansion slot of the LaserWriter IINTX. See your authorized Apple dealer for details.

Adding one or more hard disks

You can attach one or more SCSI hard disks to the LaserWriter IINTX. Like the RAM upgrade, the addition of a hard disk increases the space available for font storage and font caching, but the increase in space—and therefore in font-handling flexibility—is much greater.

You initialize the disks and download fonts to them using the LaserWriter Font Utility application on the *LaserWriter IINT/NTX Installation Disk.* The application's help screens contain all the information you need for all procedures.

When you download a font and you have a hard disk attached, you can choose to download it either to the disk or to RAM. Downloading it to the disk stores it there permanently (or until you remove it). This process saves time because you won't have to download it repeatedly over the network. It also saves space on your startup disk, because the font is now on the printer disk rather than in your System Folder.

Font caching is handled automatically by the Font Utility application. Because you can chain together several SCSI hard disks, the space available for font caching is essentially unlimited, and thus the bitmaps are always available.

Initialization allots 20 percent of total disk space to font storage and 80 percent to font caching. The LaserWriter IINTX automatically increases the storage percentage as needed. The Font Utility application warns you when the percentage is high enough to threaten font-caching performance.

Connecting the disks

You connect hard disks to the LaserWriter IINTX following the standard SCSI procedures. For each disk you're connecting, you'll need a **SCSI peripheral cable.** You'll also need a **SCSI cable terminator** for the first disk, and an additional terminator for two or more disks. (No system should include more than two terminators.) Figure A-1 shows the required cables; Figure A-2 illustrates a correctly connected system.

Warning   Each disk must have a unique SCSI ID number. See "Identifying and Initializing Hard Disks" later in this appendix for more information. Do not turn on or attempt to use the printer or any attached hard disk until each disk has been assigned its number.
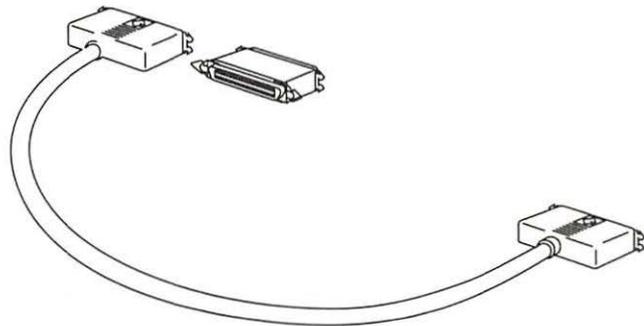
Figure A-1
A SCSI peripheral cable and a SCSI cable terminator
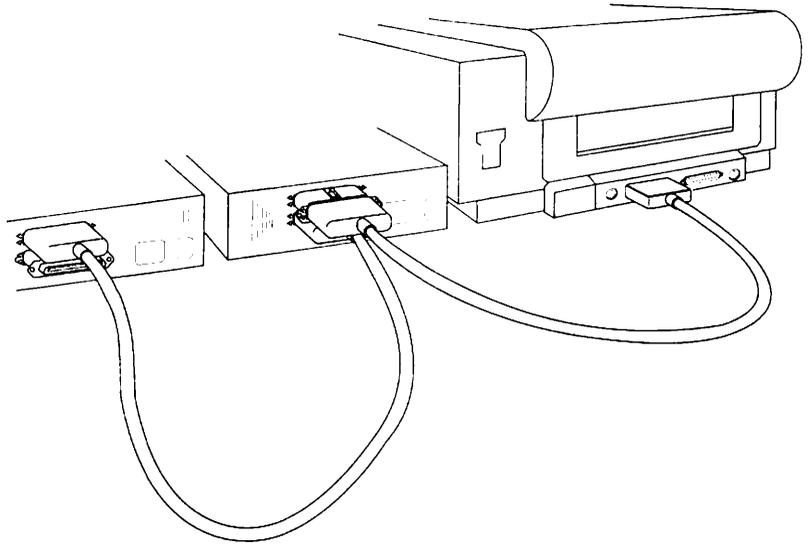
Figure A-2
Two hard disks connected to a LaserWriter IINTx

To connect a single hard disk:

1. Attach either end of a peripheral interface cable to the SCSI port on the LaserWriter IINTX.

2. Snap the wire clips on the SCSI port onto the cable.

3. Attach the other end of the peripheral interface cable to either SCSI port on the hard disk.

4. Snap the wire clips on the SCSI port onto the cable.

5. Attach the end of a cable terminator without clips to the other SCSI port on the hard disk.

6. Snap the wire clips on the SCSI port onto the cable terminator.

To connect multiple hard disks:

1. Attach either end of a peripheral interface cable to the SCSI port on the LaserWriter IINTX.

2. Snap the wire clips on the SCSI port onto the cable.

3. Attach the other end of the peripheral interface cable to the clip end of a cable terminator

4. Snap the clips on the cable terminator onto the cable.

5. Insert the other end of the cable terminator onto either SCSI port on the hard disk.

6. Snap the clips on the SCSI port onto the cable terminator.

7. Attach a second peripheral interface cable to the other SCSI port on the hard disk.

8. Attach the other end of the peripheral interface cable to either SCSI port on the next hard disk.

9. Repeat steps 7 and 8 for each additional hard disk.

10. Attach a cable terminator to the unused SCSI port on the last hard disk.

Chaining different sizes and types of hard disk

You can add different sizes of hard disk to the SCSI chain, but the LaserWriter IINTX must be able to tell what size a disk is. This is possible with all Apple SCSI hard disks, but not with some other brands. These disks cannot be connected to the LaserWriter IINTX.

In addition, there should be no more than two terminators in any SCSI chain. If your non-Apple SCSI hard disk has an internal terminator, you may have to follow the manufacturer's guidelines to disable it.

Identifying and initializing hard disks

You assign each disk a **SCSI ID number** by setting the SCSI ID switch on the back panel of the disk.

Important All SCSI devices must be assigned an ID number from 0 to 7. Each device must have a unique number.

1. **Turn the hard disk off.**

2. **Insert the point of a pushpin or an unwound paper clip into the hole below the switch.**

3. Push gently until the number you want appears.

4. If you go past the number you want, keep pushing until it comes around again.

You initialize the disks simply by choosing the Initialize Disk command from the File menu while using the Font Utility application on the *LaserWriter II Installation Disk*.

Important   The LaserWriter IINTX regards all attached hard disks as a single logical unit. Therefore, if you add a disk to the system, you'll have to reinitialize all your disks and rebuild your font storage. The font cache rebuilds itself automatically.

Also, all disks must be turned on when you want to use any one of them. Otherwise the LaserWriter IINTX won't recognize them.

Appendix B

Connecting the LaserWriter II to an Apple II

You can connect a LaserWriter II to an Apple IIGS using the LocalTalk cable system. You can also connect your printer to an Apple IIe in exactly the same fashion, provided you have installed an Apple II Workstation Card. See the *Apple II Workstation Card User's Guide* for details.

Connecting to the computer

You connect the LaserWriter II to an Apple II using LocalTalk connector boxes, just as you would connect it to a Macintosh. These connectors link computers and peripheral devices in a LocalTalk cable system. For more information about creating a network, refer to the *LocalTalk Cable System Owner's Guide*.

1. **Make sure both the printer and the computer are switched off.**

2. **Plug a LocalTalk connector box into the LocalTalk port on the LaserWriter II.**

3. **Plug a second connector box into the printer port on the Apple II.**

4. Connect the two connector boxes with a LocalTalk cable. (See Figure B-1.)
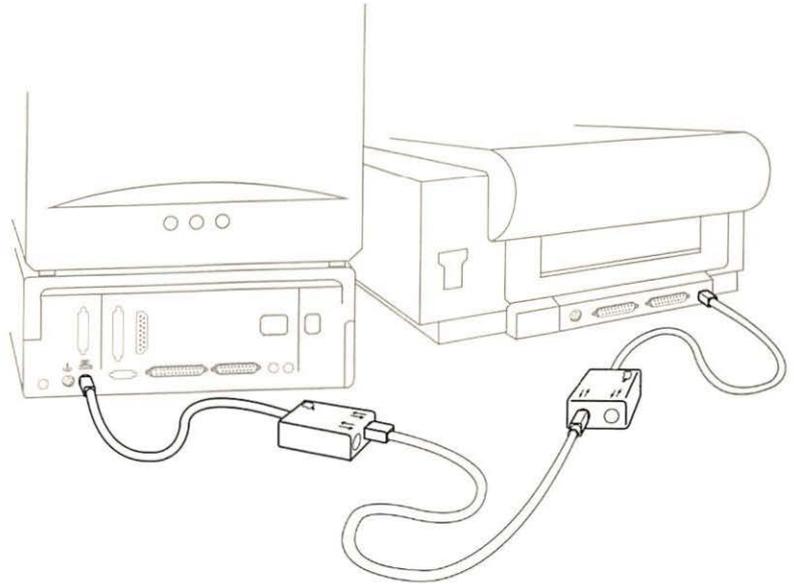
Figure B-1
A LaserWriter II connected to an Apple II

Setting the Control Panel

In order for the computer to use the LocalTalk cable system, the Control Panel must be set for AppleTalk.

1. Open the Control Panel.

See your Apple II owner's guide for detailed instructions.

2. Choose Slots from the Control Panel menu.

3. Set slot 1 (Printer Port) to Your Card.

If you connected the printer to the modem port instead, configure slot 2 to Your Card. This procedure prevents any conflict with step 4.

4. Set slot 7 (Your Card) to Built-in AppleTalk.

Although the LaserWriter II is physically connected to slot 1 or slot 2, the computer now acts as though the printer were connected to slot 7. (See Figure B-2 for the correct Control Panel setup.)

```
┌─────────────────────────────────────────────┐
│ Control Panel                                │
│                                              │
│ ┌──────┐                                     │
│ │Slots │                                     │
│ └──────┘                                     │
│   ✓ Slot 1: Your Card                        │
│   ✓ Slot 2: Modem Port                       │
│   ✓ Slot 3: Built-in Text Display            │
│   ✓ Slot 4: Mouse Port                       │
│   ✓ Slot 5: Smart Port                       │
│   ✓ Slot 6: Disk Port                        │
│   ✓ Slot 7: Built-in AppleTalk               │
│                                              │
│     Startup Slot: 5                          │
│                                              │
│                                              │
│                                              │
│  Select: ← → ↓ ↑      Cancel:Esc      Save:↵ │
└─────────────────────────────────────────────┘
```
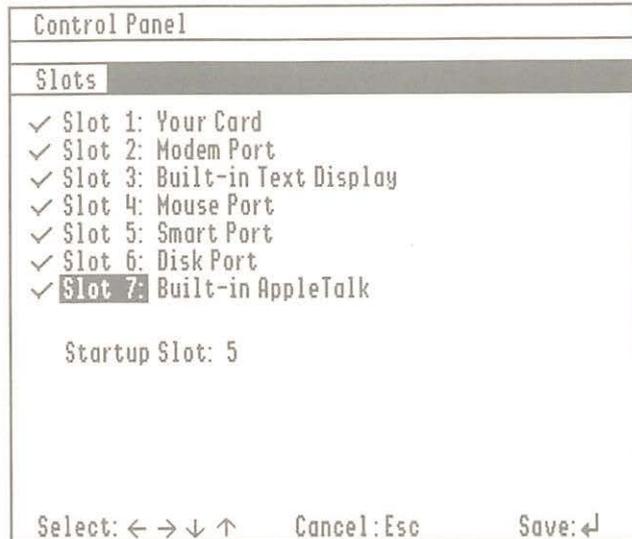
Figure B-2
The Control Panel

Using the Namer

If you're adding a LaserWriter II to an existing network, you'll find it convenient to give it a distinguishing name. If you have only one printer, you don't need to name it unless you want to.

If you're adding an Apple II, rather than a printer, to the network, you should use the name the printer already has. It will be listed in the Chooser by that name. (See the next section, "Using the Chooser.")

1. Turn on the printer you want to name.

2. Start up the Apple II with the workstation disk.

3. Select the Printer Namer application from the menu.

This opens the application. (See Figure B-3.)

```
┌─────────────────────── Namer II V1.2 ───────────────────────┐
│                                                             │
│              Select the type of device to rename           │
│                                                             │
│   Device types:                      Available LaserWriters:│
│  ┌──────────────────────────┐  ┌────────────────────────┐   │
│  │ AppleTalk ImageWriter    │  │ School Laser           │   │
│  │ LaserWriter              │  │ Teacher's Laser        │   │
│  │ AppleTalk ImageWriter LQ │  │                        │   │
│  │                          │  │                        │   │
│  └──────────────────────────┘  └────────────────────────┘   │
│                                                             │
│   New name of LaserWriter    ┌────────────────────────────┐ │
│                              │ My device's name           │ │
│                              └────────────────────────────┘ │
│                                                             │
│                                                             │
│   Select: ↑ ↓        Change windows: Tab        Accept: ↵  │
│                                                             │
└─────────────────────────────────────────────────────────────┘
```
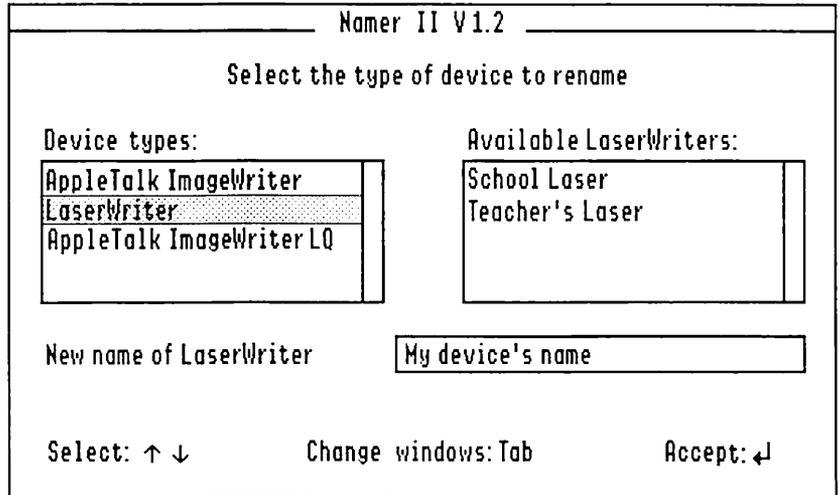
Figure B-3
The Namer

4. Choose the printer type you want to name.

You'll see a list of printers of this type on the right side of the
dialog box.

5. Choose a printer from the list on the right.

The printer name automatically moves to the New Name box.

6. Type in a new name or edit the current name.

7. Click Accept.

8. Click Quit.

Important   If you change the name of any printer, be sure to tell everyone
else who uses the network. You won't have to use the Namer
again unless you want to change a printer's name.

Using the Chooser

The Chooser allows you to designate which network printer you want to use. Once you designate a printer, your choice is recorded on the system disk. You shouldn't have to use the Chooser again unless you want to change printers or unless you are the first person to use a network printer after it is turned off and then on again.

1. Start up the Apple II with the workstation disk.

2. Select Chooser from the Main Menu.

3. Choose LaserWriter as the printer type. (See Figure B-4.)

```
┌──────────────────── Chooser II V 1.2 ────────────────────┐
│                                                           │
│  Device:                          Select a LaserWriter:   │
│  ┌──────────────────────┐         ┌──────────────────────┐│
│  │AppleTalk ImageWriter  │        │School Laser           ││
│  │LaserWriter            │        │Teacher's Laser        ││
│  │AppleTalk ImageWriter LQ│       │                       ││
│  │                       │        │                       ││
│  └──────────────────────┘         │                       ││
│                                    │                       ││
│  AppleTalk zones:                  │                       ││
│  ┌──────────────────────┐         └──────────────────────┘│
│  │First Floor            │         Ports:                  │
│  │Second Floor           │        ┌──────────────────────┐ │
│  │Lab                    │        │AppleTalk             │ │
│  │                       │        │Serial                │ │
│  └──────────────────────┘        └──────────────────────┘ │
│                                                           │
│  User name: Channing                        ┌─────────┐   │
│                                             │Quit  ⌘Q │   │
│                                             └─────────┘   │
│  Select: ↑ ↓        Change windows: Tab        Accept: ↵  │
└───────────────────────────────────────────────────────────┘
```
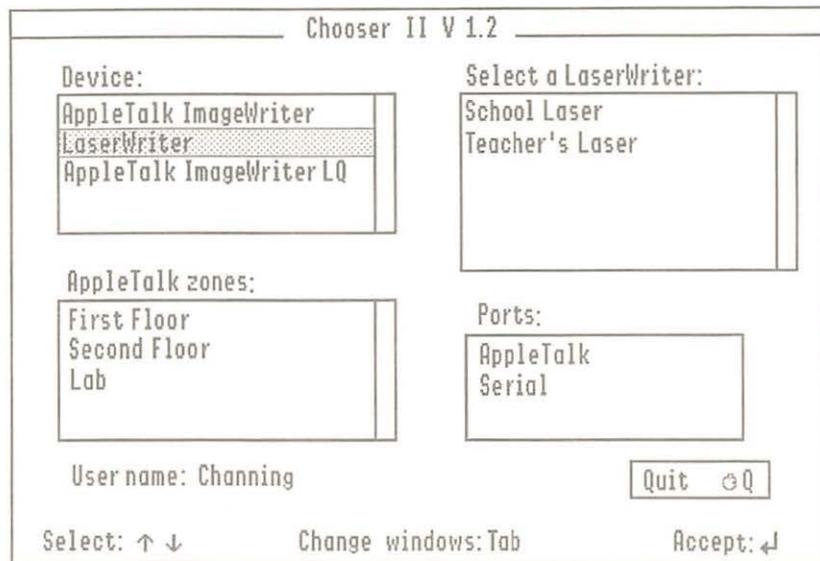
Figure B-4
The Chooser

4. If necessary, choose the correct AppleTalk zone.

If your network is subdivided into several AppleTalk zones, choose the zone your printer belongs to by clicking its name.

5. Choose the printer you want to use.

All LaserWriter printers on the network will be listed on the right. Click the name of the printer you want.

You'll see a message saying "Checking for presence of ImageWriter emulator." If no one has printed with that LaserWriter II since it was turned on, you'll also see the message "Downloading ImageWriter emulator."

The **ImageWriter emulator** is software that allows the Apple II to communicate with the LaserWriter II as if it were an ImageWriter.

6. **Click the User Name box and type your name if it has not already been entered.**

7. **Quit.**

Printing

Different applications have different procedures for printing and different ways of asking for information about the printer. If your application asks for the printer's slot number, choose slot 7. The owner's guide for the application should provide full details. The fonts you can print with will also depend on the application.
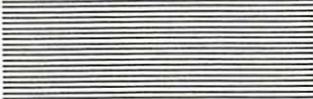
Appendix C

Connecting To and Printing With an MS-DOS Computer

With the right hardware and software, you can use the LaserWriter IINT or LaserWriter IINTX printer to print a document you've created or stored on an MS-DOS computer—that is, any version of the IBM PC or any compatible computer. There are two ways to connect your LaserWriter II to an MS-DOS computer:

□ Install a LocalTalk peripheral card in one of the expansion slots of your MS-DOS computer, connect the computer to an AppleTalk network system, and connect the printer to the same network.

□ Connect a serial port on your MS-DOS computer to the 25-pin socket on your printer.

Using LocalTalk

You can connect an MS-DOS computer to your LaserWriter II through a LocalTalk cable system by following these steps:

1. **Install a peripheral card that adds a LocalTalk port, along with supporting circuitry, to the MS-DOS computer.**

2. **Insert a LocalTalk connector box into that port.**

3. **Plug another connector, from the same network, into the 8-pin socket on the left side of your printer.**

   You can use a LocalTalk connector box to connect your MS-DOS computer directly to your printer. In that case, the computer and the printer are the only two devices on the network.

4. **To activate the AppleTalk software of the LaserWriter II, set switches 1 and 2 in the up position.**

   The switch panel is on the left side of the printer. The LaserWriter IINT has two switches; the LaserWriter IINTX has six.

The LocalTalk PC Card

You can obtain a LocalTalk PC Card from your authorized Apple dealer or representative. This card is a half-size printed-circuit board that fits into one of the slots in your MS-DOS computer.

The LocalTalk PC Card comes with the PC LaserWriter Program, which allows your MS-DOS computer to work with LocalTalk.

□ If you're using an MS-DOS application program, such as Microsoft Word, that produces files in POSTSCRIPT format, the PC LaserWriter Program lets you send those files directly to the LaserWriter II.

□ If you're using certain MS-DOS application programs, such as Lotus 1-2-3, MultiMate, or WordStar, the PC LaserWriter Program lets you specify the format for each file before printing it on the LaserWriter II.

□ If you're using any other application program that creates **ASCII** files **(text files),** you can print those files using the PC LaserWriter Program.

Other peripheral cards

Other suppliers sell peripheral cards that allow you to install a LocalTalk port in your MS-DOS computer.

Before installing such a card, make sure it comes with software that allows you to translate and format your documents for printing on the LaserWriter II.

Using the 25-pin connector

You can connect your MS-DOS computer to the LaserWriter II by connecting the 9-pin or 25-pin serial port on the back of your computer to the 25-pin socket on the printer.

With this connection, you can send files directly to the LaserWriter II from your MS-DOS computer.

□ If you're using an MS-DOS application program, such as Microsoft Word, that produces files in POSTSCRIPT format, you can print them on the LaserWriter II.

□ If you're using MS-DOS software that does not support printing with POSTSCRIPT, you can still print your files by having your LaserWriter IINT or LaserWriter IINTX emulate the Diablo 630 daisy-wheel printer, or by having your LaserWriter IINTX emulate the Hewlett-Packard LaserJet[+] laser printer.

❖ *Note:* The information in this and following sections applies generally to any computer—not just MS-DOS computers—that you connect to your LaserWriter II through the printer's serial port.

Making the connection

Follow these steps to connect your MS-DOS computer to the 25-pin socket on your printer. The 25-pin socket and the switch panel, which contains two switches on the LaserWriter IINT and six switches on the LaserWriter IINTX, are on the left side of your printer.

1. **Connect the COM1 serial port on your computer to the printer's 25-pin socket (the RS-232 port).**

   If another device is already connected to the COM1 port, use the COM2 port.

   Your cable or cables should include one modem eliminator. Note that some serial extension cables have built-in modem eliminators.

   If your computer has a 9-pin serial port, use a 9-to-25-pin adapter cable.

❖ *Note:* If your computer has a standard serial port, such as those supplied with IBM PCs, then you should be able to use standard cables. If not, see Table C-2 for a description of the pin assignments on the RS-232 port of the LaserWriter II.

2. If you have a LaserWriter IINT, set its switches as follows.

☐ If you plan to use MS-DOS software that supports POSTSCRIPT, switch 1 should be in the up position and switch 2 should be down.

☐ If you plan to use the Diablo emulator, switch 1 should be in the down position and switch 2 should be up.

❖ *Note:* For a complete description of LaserWriter II switch settings, see Appendix F, "Status Lights, Ports, Expansion Slot, and Switches."

3. If you have a LaserWriter IINTX, set its switches as follows.

☐ If you plan to use MS-DOS software that supports POSTSCRIPT, switch 2 should be in the down position, and switches 3 and 4 should both be up. Switch 1 can be up or down.

☐ If you plan to use the Diablo emulator, switches 2 and 3 should be in the down position and switch 4 should be up. Switch 1 can be up or down.

☐ If you plan to use the LaserJet[+] emulator, switches 2, 3, and 4 should be in the down position. Switch 1 can be up or down.

4. Switch on the printer.

The LaserWriter II prints a test page, indicating the mode—POSTSCRIPT, Diablo 630, or LaserJet[+]—that you've selected. In addition, the page reports which connector or connectors are set to receive information. If you've followed the instructions above, the page should say *RS-232 9600 Baud.* If the mode or connector is not what you want, switch off the printer, reset the switches, and switch on the printer again.

5. Start up your MS-DOS computer.

6. Type the following two MS-DOS commands.

```
MODE  COM1:96,N,7,1,P

MODE  LPT1:=COM1:
```

This sets the data transfer rate at 9600 Baud with no parity check. It specifies 7 data bits and 1 stop bit. If you later change the printer's data transfer rate, parity check, data bits, or stop bits (as described in "Changing Parameters" later in this appendix), be sure to type a new Mode command to change the parameters on your MS-DOS computer. (See your MS-DOS manual for a full description of the Mode command.)

If your printer is connected to the COM2 port, substitute COM2 : for COM1 :.

❖ *Note:* If you plan to use your printer often to print documents from your MS-DOS computer, include the two Mode commands in your AUTOEXEC.BAT file, the program that runs every time you start up your MS-DOS computer. This sets the printing parameters automatically each time you start up. (For more information about the AUTOEXEC capability, see the owner's guide for your computer or operating system.)

Matching handshakes

Whenever you use a serial connection to send information from one device, such as your MS-DOS computer, to another, such as the LaserWriter II, both devices must be set to recognize the same **handshake.** The handshake tells the computer how to know when to start sending information to the printer.

Important   If the handshake settings on your computer and printer are different, portions of your document may not be printed, particularly if it is a long document.

Your MS-DOS computer normally uses a handshake known as DSR/DTR (also known as *DSR* or *DTR*), but your MS-DOS application program may automatically change the handshake or allow you to reset it.

❖ *Note:* If you're using DSR/DTR but aren't using a standard cable, make sure that the cable connects pins 6 (DSR) and 20 (DTR) on the RS-232 port of the LaserWriter II to their counterparts on the serial port of the MS-DOS computer.

The LaserWriter IINT handshake

The LaserWriter IINT is preset with the XON/XOFF handshake, so if your MS-DOS application program permits, select the XON/XOFF handshake.

If your MS-DOS application program requires the DSR/DTR handshake, you need to change the handshake on the LaserWriter IINT to DSR/DTR by sending the following POSTSCRIPT program from your MS-DOS computer to the printer. See "Sending the Program" later in this appendix for instructions on sending a POSTSCRIPT program to the LaserWriter II.

```
statusdict begin 25 sccbatch exch pop

4 eq {stop} if

serverdict begin 0 exitserver

statusdict begin 25 9600 4 setsccbatch
```

❖ *Note:* To set the handshake for use with the Diablo emulation mode, described later in this appendix, substitute the characters interactive for batch in the two words where batch appears.

This program retains the default printing parameters of the LaserWriter II, other than the handshake. You matched those settings on your MS-DOS computer earlier when you typed the Mode commands. To reset the other parameters, change to the ETX/ACK handshake, or check the handshake, see "Changing Parameters" later in this appendix.

The LaserWriter IINTX handshake

The handshake on the LaserWriter IINTX is determined by switches 5 and 6 on the left side of the printer. To set the DSR/DTR handshake, place switch 5 in the up position and switch 6 in the down position.

If your MS-DOS application program is set to use the XON/XOFF handshake, place switches 5 and 6 in the up position. If the program is set to use the ETX/ACK handshake, place switch 5 in the down position and switch 6 in the up position.

You can also change the handshake, along with other printing parameters, on the LaserWriter IINTX by sending a POSTSCRIPT program from your MS-DOS computer to the printer. In addition, you can send a POSTSCRIPT program to check the handshake and other settings. See "Changing Parameters" later in this appendix.

When you finish

If the LaserWriter II is part of an AppleTalk network system, you may wish to reactivate the printer's AppleTalk software so that computers on that network can use the printer to print documents. To do so, set switches 1 and 2 in the up position.

POSTSCRIPT documents

If you're using an MS-DOS application program that produces POSTSCRIPT files, install the POSTSCRIPT **printer driver.** The printer driver translates your print files into POSTSCRIPT, the page-description language that the LaserWriter II understands.

The installation process varies with the application program. See the manual that came with your application program for instructions.

Diablo emulation

The Diablo 630 emulation mode uses the 25-pin connector. In this mode, the LaserWriter II prints text only, entirely in 12-point Courier.

```
This is an example of 12-point Courier.
All characters and spaces take up the same
amount of space on the line.
```

The LaserWriter II also prints bold characters, when identified by the proper Diablo 630 command sequence (Esc-O), in boldface Courier. Although there is no way for a laser printer to darken a character by double-striking, some MS-DOS applications reinterpret the double-striking command, causing the LaserWriter II to darken characters by widening each stroke.

To set your LaserWriter IINT for Diablo 630 emulation, place switch 1 in the down position and switch 2 in the up position. If you're using the DSR/DTR handshake, be sure to reset the handshake using the POSTSCRIPT program specifically designed for changing the parameters for use with LaserWriter IINT Diablo 630 emulation.

To set your LaserWriter IINTX for Diablo 630 emulation, place switches 2 and 3 in the down position and switch 4 in the up position.

Install the Diablo 630 printer driver on your MS-DOS computer, following the instructions in the manual that came with your application program. You can then print documents as if the LaserWriter II were a Diablo 630 printer.

The LaserWriter II interprets the Control-D key combination as an end-of-file command. If you can, insert the Control-D character at the end of your file. When the printer receives the Control-D character, it immediately prints the last page in your document.

If your MS-DOS application program does not allow you to insert the Control-D character at the end of your file, the LaserWriter II does not immediately print the last page of a document unless the page is full or ends with a form feed (end-of-page) character. Instead, the page is printed as part of the next document (at the top of the first page). *When you're printing documents in close succession, make sure that each one has a final form feed, so they won't run together.* If no other document is ready to print, the LaserWriter IINTX waits for thirty seconds—after last receiving data—before it prints the last page.

The following Diablo 630 features are not recognized by the LaserWriter II:

□ print suppression

□ HY-plot

□ extended character set

□ the ability to download information for print wheels, including program mode

□ the ability to override print wheel spacing (for proportional spacing), although the offset between characters can be changed

□ page lengths other than 11 inches

□ paper feeder control

□ hammer energy control

□ remote diagnostic

□ reverse printing

LaserJet⁺ emulation

The Hewlett-Packard LaserJet⁺ emulation mode of the LaserWriter IINTX uses the 25-pin connector. In this mode you can print text and bitmapped graphics, using the LaserJet's font selection and positioning commands.

To set your LaserWriter IINTX for LaserJet⁺ emulation, place switches 2, 3, and 4 in the down position.

Install the LaserJet⁺ printer driver on your MS-DOS computer, following the instructions in the manual that came with your application program. You can then print documents as if the LaserWriter IINTX were a LaserJet⁺ printer.

The LaserWriter IINTX interprets the Control-D key combination as an end-of-file command. If you can, insert the Control-D character at the end of your file. When the printer receives the Control-D character, it immediately prints the last page in your document.

If your MS-DOS application program does not allow you to insert the Control-D character at the end of your file, the LaserWriter IINTX does not immediately print the last page of a document unless the page is full or ends with a form feed (end-of-page) character. Instead, the page is printed as part of the next document (at the top of the first page). *When you're printing documents in close succession, make sure that each one has a final form feed, so they won't run together.* If no other document is ready to print, the LaserWriter IINTX waits for 30 seconds—after last receiving data—before it prints the last page.

The LaserJet⁺ emulator of the LaserWriter IINTX allows you to print just about anything you could print on the LaserJet⁺, but there are a few minor differences:

☐ The LaserJet⁺ omits characters that overlap the left margin of the paper, but the emulator prints that portion of the character that does not extend into the margin.

☐ The LaserJet⁺ allows you to insert commands to halt printing so that you can insert paper or envelopes manually. The emulator interprets those commands as form feeds.

☐ The emulator does not print the following eleven characters from the LaserJet⁺ Roman-8 symbol set:

Decimal code	Symbol description
127	gray patch for rubout
176	overline
179	degree symbol
227	uppercase D with stroke (Eth)
228	lowercase D with stroke (eth)
240	uppercase Thorn
241	lowercase thorn
247	one-fourth symbol
248	one-half symbol
252	solid black square
254	plus/minus sign

□ Applications that produce justified text with the LaserJet⁺ versions of Helvetica (Helv) and Times Roman (Tms Rmn) fonts may generate slightly ragged output on the emulator.

□ While the LaserJet⁺ prints characters in the closest available point size and pitch for each typeface, the emulator scales the font to the specified size.

□ The line printer font, which is 16.67 pitch Courier, appears with a height of 7.2 points when printed with the emulator, rather than 8.5 points as printed by the LaserJet⁺.

□ The Control-C and Control-T key combinations, which you can normally use to interrupt printing or query the status of the LaserWriter IINTX, cannot be used with the emulator.

Changing parameters

Frequently, when you prepare your computer to send information to another computer or a printer, you need to set several parameters to make sure that information is not garbled or lost during transmission. Earlier, when you typed the first MS-DOS Mode command, you set the data transfer rate, parity check, number of data bits, and number of stop bits to match the settings on your LaserWriter II.

You don't need to know what all those parameters mean. In fact, few computer users do. However, when you are using the 25-pin connector, it is important that the parameter settings be the same on your MS-DOS computer and on the LaserWriter II.

You may never need to reset any of those parameters. However, if for any reason you wish to use other settings than those given earlier, you need to reset the parameters on the LaserWriter II by sending a POSTSCRIPT program to the printer.

The handshake, described earlier, must also be the same on your MS-DOS computer and the LaserWriter II. You use software commands to change the handshake and the printing parameters on the LaserWriter IINT. On the LaserWriter IINTX, you can change the handshake with the same method, or by resetting switches 5 and 6, as described earlier.

Parameters for the LaserWriter IINT

Your LaserWriter IINT is preset to receive information with no parity check, 7 data bits, and 1 stop bit, with the XON/XOFF handshaking protocol. If both switches are down, the data transfer rate is 1200 baud. If both switches are up, the 25-pin port is disabled. In any other switch configuration, the rate is 9600 baud (as set during manufacturing) but can be changed by the program below.

❖ *Note:* If you change any switch setting while your LaserWriter IINT is printing, the printer stops printing immediately.

You can change any of those settings by sending the following POSTSCRIPT program to the LaserWriter IINT:

`statusdict begin 25 sccbatch exch pop`

OPTIONS eq {stop} if

`serverdict begin 0 exitserver`

`statusdict begin 25` **BAUD OPTIONS** `setsccbatch`

❖ *Note:* To change settings for use with the Diablo emulation mode, substitute the characters `interactive` for `batch` in the two words where `batch` appears.

Instead of typing **BAUD** when typing the program, type the data transfer rate, which can be 300, 600, 1200, 2400, 3600, 4800, 9600, 19200, 38400, or 57600.

Use Table C-1 to determine the Options number. Type that number wherever **OPTIONS** appears in the program.

Table C-1
The Options number

Parity	Handshake	1 stop bit		2 stop bits	
		7 data bits	8 data bits	7 data bits	8 data bits
None (Space)	XON/XOFF	0 or 32	64	160	192
	DSR/DTR	4 or 36	68	164	196
	ETX/ACK	8 or 40	72	168	200
Odd	XON/XOFF	33	65	161	193
	DSR/DTR	37	69	165	197
	ETX/ACK	41	73	169	201
Even	XON/XOFF	34	66	162	194
	DSR/DTR	38	70	166	198
	ETX/ACK	42	74	170	202
None (Mark)	XON/XOFF	35	67	163	195
	DSR/DTR	39	71	167	199
	ETX/ACK	43	75	171	203

❖ *Note:* Because the LaserWriter IINT component that registers the options can wear out with excessive use (several thousand changes), change the options only when necessary. The first two lines in the POSTSCRIPT program for resetting the LaserWriter IINT help protect that component by stopping the process if the Options number is already set the way you want it.

To send the POSTSCRIPT program, see "Sending the Program" later in this section.

Parameters for the LaserWriter IINTX

Your LaserWriter IINTX is preset to receive information with no parity check, 7 data bits, and 1 stop bit. If switch 2 is in the down position, the data transfer rate is 9600 Baud. If it's up, the rate is 1200 Baud, unless you have disabled the 25-pin port by placing switches 1 and 2 in the up position.

To set the XON/XOFF handshake, place both switches 5 and 6 in the up position. For DSR/DTR, place switch 5 in the up position and switch 6 in the down position. For ETX/ACK, set switch 5 down and switch 6 up.

❖ *Note:* If you change any switch setting while your LaserWriter IINTX is printing, the printer stops printing immediately.

You can change any of those settings by sending the following POSTSCRIPT program to the LaserWriter IINTX:

```
serverdict begin 0 exitserver
```

```
statusdict begin 25 BAUD OPTIONS setsccbatch
```

Instead of typing **BAUD** when entering the program, type the data transfer rate, which can be 300, 600, 1200, 2400, 3600, 4800, 9600, 19200, 38400, or 57600.

Use Table C-1 to determine the Options number. Type that number where **OPTIONS** appears in the program.

❖ *Note:* The LaserWriter IINTX component that registers the options, unlike its counterpart on the LaserWriter IINT, does *not* wear out with excessive use, so you can change the settings as often as you like.

Sending the program

To send the POSTSCRIPT program, follow these steps:

1. **Use any text editor to type, check, and if necessary correct the program.**

   If you don't have a word-processing application program, you can use EDLIN, a simple text editor built into the MS-DOS operating system and described in your MS-DOS manual.

2. **Instruct the computer to print the file that contains the program.**

   If you created an EDLIN file, use the MS-DOS Print command.

   Instead of printing, the LaserWriter II resets its parameters.

   The changes take effect at the end of the current job, and they remain in effect until you change them again, even if you restart your printer.

You can override the POSTSCRIPT-specified data transfer rate and, on the LaserWriter IINTX, the handshake setting, by resetting the LaserWriter II switches that normally govern those settings. This returns control over those printer settings to the switches, unless you reset them again by sending a POSTSCRIPT program. To reset a switch, move it to the opposite position, wait 30 seconds, and then return it to the desired position.

Checking the parameters

There are two methods of determining the current parameter settings for the LaserWriter II by sending a POSTSCRIPT program.

Short program

You can have the LaserWriter II print the Options number, as defined earlier, by sending this program. Use Table C-1 to determine the settings from the Options number.

```
/Helvetica findfont 14 scalefont setfont

30 500 moveto

(The Options number for the 25-pin port is )show

statusdict begin 25 sccbatch 10 string cvs show

pop showpage
```

❖ *Note:* To check the settings to be used in the Diablo emulation mode on the LaserWriter IINT, substitute the word `sccinteractive` for `sccbatch`.

Long program

You can have the LaserWriter II print the data transfer rate, parity, handshake, data bits, and stop bits by sending this program. If you have never changed the settings, it reports *standard* on the line for data bits. In this case, *standard* means 7 data bits.

```
/Helvetica findfont 14 scalefont setfont

/cr{show 182 currentpoint 20 sub exch pop moveto}def

/tb{show 300 currentpoint exch pop moveto}def

/Which{5 -1 roll 4 exch sub -1 roll cr

3{pop}repeat}def
```

```
statusdict begin 25 sccbatch end 182 650 moveto

exch (Baud :)tb 10 string cvs cr

(Parity:)tb dup 30 bitshift -30 bitshift

(none-space)(odd)(even)(none-mark)  Which

(Handshake:)tb dup 27 bitshift -29 bitshift

(XON/XOFF)(DSR/DTR)(ETX/ACK)(bad value)  Which

(Data bits:)tb dup 25 bitshift -30 bitshift

(standard)(7)(8)(bad value)  Which

(Stop bits:)tb -7 bitshift 0 eq{(1)}{(2)}ifelse

show showpage
```

❖ *Note:* To check the settings to be used in the Diablo emulation mode on the LaserWriter IINT, substitute the word sccinteractive for sccbatch on the fifth line of the program.

Troubleshooting

If, after following the above instructions, you still can't get the LaserWriter II to print properly, try the following techniques:

1. Reset the printer.

Turning the printer off and on resets its memory.

2. Reset each of the switches by moving it to the opposite position, waiting 30 seconds, and then returning it to the desired position.

If you've used any POSTSCRIPT program, such as those shown above, to change the printer settings, this returns control to the switches.

3. Check the version number of your software.

If you're using an MS-DOS application program that's supposed to work with POSTSCRIPT, make sure you have a version that supports POSTSCRIPT *and* that you have the correct version of the printer driver.

Pin assignments

Table C-2 describes the pin assignments on the 25-pin (RS-232) socket of your LaserWriter II. Use the table to find or make a cable to connect the serial port on your MS-DOS computer to the LaserWriter II.

Table C-2
Pin assignments for the 25-pin serial port on the LaserWriter II

Pin	Circuit	Description
1 or 7*	SGnd	Signal ground
2*	Txd	Transmit data
3*	Rxd	Receive data
4	Rts	Request to send
5	Cts	Clear to send
6	DSR	Data set ready
8	DCD	Data carrier detect
20	DTR	Data terminal ready
22	Ring	Ring indicator

* Your LaserWriter II needs only pins 1 (or 7), 2, and 3, 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 20 (DTR) on the RS-232 port of the LaserWriter II must be connected to their counterparts on the serial port of the MS-DOS computer.

How the LaserWriter II Works

The LaserWriter II is a laser printer. It uses laser light, electric charges, and plastic toner powder to produce each finished page of text and graphics.

When you give the Print command on your Macintosh, the computer sends a description of the page through the LocalTalk cable system to the printer. It is sent in POSTSCRIPT, the language the printer uses to recreate the page.

The internal computer in the LaserWriter II uses these commands to create a full-page **bitmap,** a dot-by-dot "guide" to each letter or image. The LaserWriter II then activates the laser, and the pulses of the beam match the map dot for dot.

Through a series of mirrors, the laser light is reflected onto a rotating photosensitive drum. The drum has a negative charge. When the laser light scans the drum, it gives what will turn out to be printed areas a neutral charge, leaving the surrounding areas negative.

The toner is also negatively charged. The drum rotates through it, and the toner particles stick to the neutral (black) areas but avoid the negative (white) areas.

Paper acquires a positive charge when it enters the printer. Opposites attract, so the negatively charged toner jumps onto the paper when the drum rotates over it.

The paper then passes through the fixing rollers, which generate a temperature of about 400 degrees Fahrenheit to fuse the dots onto the paper.

The LaserWriter II forms 300 dots per inch (90,000 dots per square inch), or about 7.4 million dots per page. That's why your finished copy looks as good as it does. And once the printer has the bitmaps in its memory, it can produce page after page at a rate of about eight per minute.

Appendix E

Specifications and Parts List

Specifications

Marking engine

Canon LBP-SX laser-xerographic.

Controller

LaserWriter IINT controller hardware contains an 11.5 MHz 68000 CPU, 1 MB of ROM, 2 MB of RAM, LocalTalk interface, RS-232 serial interface, and Apple Desktop Bus™ (ADB).

LaserWriter IINTX controller hardware contains a 16.7 MHz 68020 CPU, 1 MB of ROM, 2 MB of RAM (expandable to 12 MB), LocalTalk interface, SCSI interface, RS-232 serial interface, Apple Desktop Bus (ADB), and one slot for ROM expansion.

Print quality

300 dots per inch for text and graphics.

Apple fonts

ITC Avant Garde, ITC Bookman, Courier, Helvetica, Helvetica Narrow, New Century Schoolbook, Palatino, Symbol, Times, ITC Zapf Chancery, and ITC Zapf Dingbats.

The LaserWriter II supports printing in plain, bold, italic, and bold italic, with additional styles depending on the application.

Font sizes are limited only by the resolution of the printer and the size of the paper.

Additional fonts

The LaserWriter II can support additional POSTSCRIPT fonts, whether from Apple or from other suppliers.

Speed

Eight pages per minute maximum. Actual speed depends on the images printed.

Interfaces

LocalTalk, RS-232, and RS-422.

Recommended duty cycle

Minimum life expectancy is 300,000 pages, with no monthly page limit. Recommended service interval is 100,000 pages.

Print feed

Automatic with 200-sheet paper cassette. Manual with single-sheet feeder.

Printing materials

16-lb. to 20-lb. photocopy or typewriter bond (60 to 80 g/m^2) in normal mode; up to 36-lb. (135 g/m^2) stock in manual mode with face-up tray open. Accepts most letterhead and colored stock. Accepts medium-weight photocopier transparencies. Envelopes can be printed with manual feed or from the envelope cassette. Labels can be printed using manual feed.

Paper sizes and capacity

Supports U.S. letter, U.S. legal, A4, B5, and envelope cassettes. Each paper cassette holds 200 sheets of 20-lb. (80 g/m^2) paper. Envelope cassette holds 15 envelopes.

Imageable area

Maximum printable line: 205.9 mm (8.1 in.).
Minimum top and bottom margins: 5.0 mm (0.197 in.).
Minimum left margin: 5.0 mm (0.197 in.).
Minimum right margin: 5.0 mm (0.197 in.).

The printer senses cassette size and adjusts to maintain these margins. In the manual feed or envelope cassette mode, the operator must prevent printing beyond the margin to avoid depositing toner on the transfer corona or scraping toner from the drum.

Actual imageable area may vary depending on the application.

Dimensions

Height	22 cm (8.6 in.)
Width	51.3 cm (20 in.)
Width with letter-size cassette	67.8 cm (26.4 in.)
Depth	47.5 cm (18.5 in.)

Weight

20.5 kg (45 lbs.)

Operating environment

Temperature	10 to 32° C (50 to 90° F)
Humidity	20 to 80 percent
Toner cartridge transit environment	-20 to +40°C (-4 to +104°F)

Voltage requirements

U.S./Japan	90V to 126V AC
	50 to 60 Hz
Europe/Australia	198V to 264V AC
	50 Hz

Power consumption

Standby	170 W average
Operating	900 W maximum at 115V
	780 W maximum at 220V
	880 W maximum at 240V

Parts list (including options)

LaserWriter IINT

LaserWriter IINTX

LaserWriter II toner cartridge

LaserWriter II letter cassette

LaserWriter II legal cassette

LaserWriter II A4 cassette

LaserWriter II B5 cassette

LaserWriter II envelope cassette

1 Megabyte LaserWriter IINTX RAM Upgrade Kit

4 Megabyte LaserWriter IINTX RAM Upgrade Kit

LocalTalk Locking Connector Kit

LocalTalk Locking Cable Kit

LocalTalk Custom Wiring Kit

SCSI peripheral cable

SCSI cable terminator

Status Lights, Ports, Expansion Slot, and Switches

Status lights

The four LED status lights on the front panel of the LaserWriter II (see Figure F-1) supply the following information:

□ green Ready/In Use light

Flashes during warmup and operation. Steady when warmed up and ready to print.

□ orange Low Toner Level light

Steady when toner powder needs to be redistributed or when toner cartridge needs replacement. Flashes when cartridge is incorrectly installed.

□ red Paper Out light

Flashes when printer is ready to accept manually fed paper. Steady when the printer is out of paper or paper cassette is not in place.

□ red Paper Jam light

Steady until jam is cleared.

□ red Paper Jam light

Flashes when printer needs service.
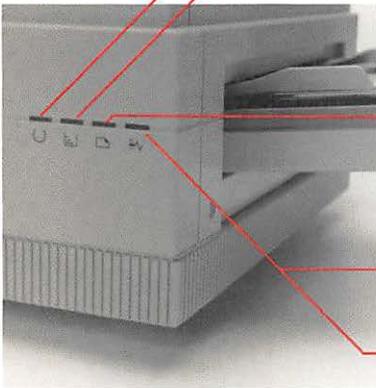
Figure F-1
The LaserWriter II status lights

Ports

The LaserWriter IINT and LaserWriter IINTX connector panels have three ports in common. (See Figure F-2.)

□ The Apple Desktop Bus port may be used for future expansion.

□ The 25-pin serial port is for non-LocalTalk serial connections.

□ The LocalTalk port is for connecting to any computer in a LocalTalk cable system.

In addition, the LaserWriter IINTX connector panel includes a 50-pin SCSI port for attaching a dedicated hard disk. (See Figure F-3.) This port is not to be used for connecting to a Macintosh.

Expansion slot

The LaserWriter IINTX has one expansion slot for ROM expansion.

LaserWriter IINT switch configurations

Switch 1	Switch 2	Meaning
Up	Up	LocalTalk (RS-232 port disabled)
Down	Down	Serial ports (RS-232 and RS-422) 1200 baud only
Up	Down	Serial ports (RS-232 and RS-422) 9600 baud (can be changed by software)
Down	Up	Special Diablo 630 emulation RS-232

Downloading a POSTSCRIPT program can change the switch configuration. If any switches are subsequently changed, the configuration changes to match the new switch settings. If the LaserWriter IINT will not print, check the switch settings and change them as required. If the settings are correct, reverse the switch 1 setting, wait 30 seconds, and switch it back. Then turn the power off and on again. The test page should show the correct choice of either POSTSCRIPT or emulation, and the correct port—either LocalTalk or serial. Do not connect LocalTalk if using serial port configuration.

LocalTalk port ——————

25-pin serial port ——————

Switch bank ——————

Apple Desktop Bus port ——————
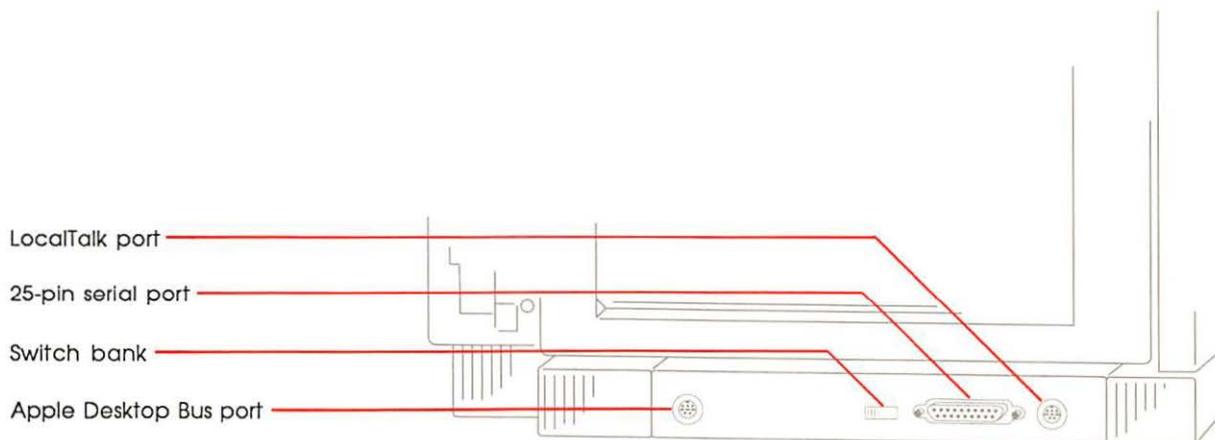
Figure F-2
The LaserWriter IINT connector panel

LaserWriter IINTX switch configurations

Switch 1	Switch 2	Meaning
Up	Up	LocalTalk (RS-232 port disabled)
Down	Up	Serial ports (RS-232 and RS-422) 1200 baud
Up	Down	Serial ports (RS-232 and RS-422) 9600 baud
Down	Down	RS-232 serial port 9600 baud; RS-422 serial port 0 baud

Switches 3 through 6 are used only for non-LocalTalk configurations.

Switch 3	Switch 4	Meaning
Up	Up	POSTSCRIPT batch
Down	Up	Diablo 630
Down	Down	HP LaserJet
Up	Down	POSTSCRIPT interactive

Switch 5	Switch 6	Meaning
Down	Down	XON/XOFF
Up	Up	XON/XOFF
Down	Up	Etx/Ack
Up	Down	DSR

Downloading a POSTSCRIPT program can change the switch
configuration. If any switches are subsequently changed, the
configuration changes to match the new switch settings. If the
LaserWriter IINTX will not print, check the switch settings and
change them as required. If the settings are correct, reverse the
switch 1 setting, wait 30 seconds, and switch it back. Then turn the
power off and on again. The test page should show the correct
choice of either POSTSCRIPT or emulation, and the correct
port—either LocalTalk or serial.

LocalTalk port ——————

25-pin serial port ——————

Switch bank ——————

50-pin SCSI port ——————

Apple Desktop Bus port ——————
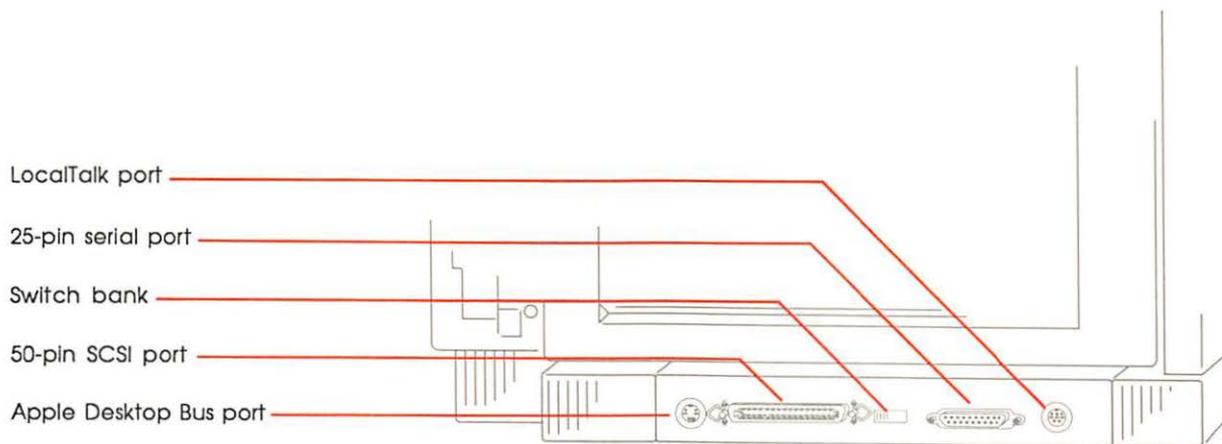
Figure F-3
The LaserWriter IINTX connector panel

Appendix G

The LaserWriter II Fonts

These samples show the full character sets, including option characters, in plain style and 10-point size, for all fonts in the LaserWriter II font file.

All fonts can be scaled to any size compatible with the resolution of the printer and the size of the paper.

ITC Avant Garde

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ITC Bookman

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Helvetica Narrow

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New Century Schoolbook

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Palatino

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Symbol

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ITC Zapf Chancery

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ITC Zapf Dingbats

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ITC Zapf Dingbats

(decorative dingbat glyph samples across eight lines)
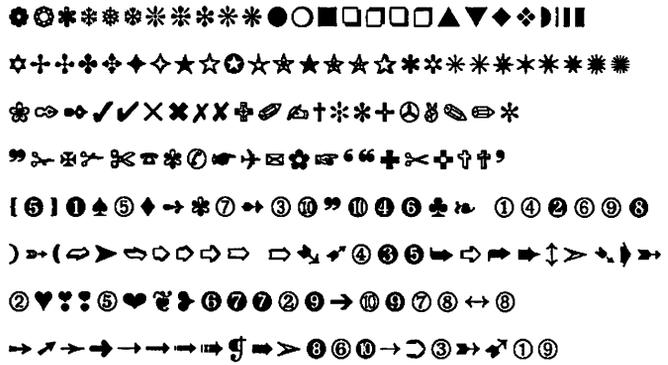
Appendix H

Service and Support

To help you get the best performance from your system, Apple Computer, Inc. has established a worldwide network of full-support authorized Apple dealers. If you need answers to technical questions or information about product updates, your authorized Apple dealer can help you. Apple's Technical Support organization backs each dealer and international technical support group via AppleLink®, a state-of-the-art on-line electronic information service, to ensure prompt, reliable assistance.

Your dealer has the latest information on new hardware and software products as well as product updates. If you wish to upgrade your system, your dealer can help you select compatible components.

If your product requires service, your local authorized Apple dealer is trained and ready to support you. Apple provides factory-quality parts and the latest available diagnostic equipment to the more than three thousand authorized Apple service centers throughout the world. Apple guarantees parts and warranty labor. (Regulations in each country determine the length of warranty. Some restrictions may apply, depending on the country of original purchase.)

If for some reason you cannot return to the authorized dealer from whom you purchased your system, go to the nearest service location. For the location nearest you, in the United States, call (800) 538-9696; in Canada, call (800) 268-7796 or (800) 268-7637. For locations in other countries, either call the Apple headquarters in your country or write to:

Apple Computer, Inc.
Attn: Customer Relations
20525 Mariani Avenue
Cupertino, California 95014
USA

Apple also offers service options designed to meet your needs. One of these is the Apple*Care*® Service Agreement (available in the United States, Canada, and Australia only), which extends full warranty coverage up to three years. Your Apple*Care* contract will be honored at any participating authorized Apple dealer within the country of purchase—an added benefit if you relocate. Local service means time saved in getting your Apple system back to work.

You can purchase Apple*Care* at any time, but it's a good idea to purchase it with your system, or at least before your warranty has expired, to avoid an owner-paid inspection.
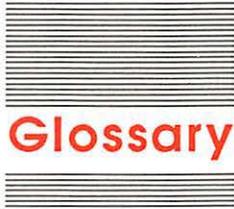
Glossary

AppleTalk network system: An overall networking system (and any software that supports it) linking computers and peripheral devices such as the LaserWriter II.

ascent line: The line defined by the tops of the capital letters in text.

ASCII: Acronym for *American Standard Code for Information Interchange;* pronounced "ASK-ee." A code in which the numbers from 0 to 127 stand for text and control characters.

back panel: See **connector panel.**

back up: To make a spare copy of a disk or of a file on a disk. Backing up your disks and files ensures that you won't lose information if the original is lost or damaged.

bitmap: A dot-by-dot representation of a text character or graphic image.

black tab: A tab on the LaserWriter II toner cartridge that you loosen in order to pull out the tape attached to it. The tape seals the toner into the cartridge and must be removed before the LaserWriter II can print.

button: A visual device, resembling a pushbutton, in a dialog box. You click a button to designate, confirm, or cancel an action.

cable: See **LocalTalk cable** and **SCSI peripheral cable.**

cable terminator: See **SCSI cable terminator.**

camera-ready: Ready for offset reproduction with no modification.

central processing unit (CPU): The "brain" of the computer; the microprocessor that performs the actual computations in machine language.

choose: (1) To pick a command in a menu. (2) To designate a printer in the **Chooser.**

Chooser: A desk accessory that lets you print from any attached printer for which you have a printer resource on the startup disk. You also use the Chooser to designate the port to which a printer is attached.

cleaning pad: A part you install with the toner cartridge to clean the fixing rollers used in the printing process.

connector panel: The rear surface of a computer or peripheral device, which includes the connectors for peripheral devices or for the computer. Also called the **back panel.**

copy-protect: To make a disk uncopyable. Software publishers frequently try to copy-protect their disks to prevent them from being illegally duplicated by software pirates.

CPU: See **central processing unit.**

current startup disk: The disk that contains the system files the computer is currently using. The startup disk icon always appears in the upper-right corner of the Finder desktop.

default: A preset response to a question or prompt. The default is automatically used by the computer if you don't supply a different response. Default values prevent a program from stalling or crashing if no value is supplied by the user.

desk accessories: "Mini-applications" that are available from the Apple menu regardless of which application you're using—for example, the Scrapbook, Key Caps, and the Chooser.

desktop: The Macintosh's working environment —the menu bar and the gray area on the screen. You can have a number of documents on the desktop at the same time.

desktop publishing: A system that provides you with the ability to produce publication-quality documents. A Macintosh, an Apple LaserWriter or LaserWriter II, and page-formatting software provide this capability.

device: Frequently used as a short form of **peripheral device.**

dialog box: A box that contains a message requesting more information from you. Sometimes the message warns you that you're asking your computer to do something it can't do or that you're about to destroy some of your information. In these cases the message is often accompanied by a beep.

disk space: The amount of space available on a disk for storing or processing a document or application.

display: What you see on the screen of your computer.

document: Whatever you create with application programs—a file you can open, modify, view, or save. Compare **file.**

double click: To position the pointer where you want an action to take place, and then press and release the mouse button twice in quick succession without moving the mouse.

download: To load a font into the RAM of the LaserWriter II.

drag: To position the pointer on something, press and hold the mouse button, move the mouse, and release the mouse button. When you release the mouse button, you either confirm a selection or move an object to a new location.

face-up tray: The tray at the left end of the LaserWriter II that is opened for face-up collation or for printing on envelopes, transparencies, or paper stock heavier than 20 pounds.

file: Any named, ordered collection of information stored on a disk. Application programs and operating systems are files. You also make a file when you create text or graphics, give the material a name, and save it on a disk; in this sense, synonymous with **document.**

Finder: The application that creates the desktop. You use it to manage documents and applications, and to get information to and from disks.

firmware: Programs stored permanently in read-only memory (ROM). Such programs are built into the computer at the factory. They can be executed at any time but cannot be modified or erased from main memory.

fixing rollers: The rollers inside the LaserWriter II (under the green cover) that fuse toner to paper. The rollers should be cleaned when the toner cartridge is changed.

font: A collection of letters, numbers, punctuation marks, and other typographical symbols with a consistent appearance, size, and style.

font caching: Storage, either in RAM or on a hard disk, of the bitmapped fonts developed by the LaserWriter II from outline fonts.

Font/DA Mover: An application on the *LaserWriter II Installation Disk* and on one or more font disks that allows you to add fonts to or remove fonts from a disk's System file.

font family: A font in various sizes and styles.

font file: A specific file used with the Font/DA Mover. You copy fonts to and from this file to the System file of the startup disk.

font size: The size of a font of characters in points; equivalent to the distance between the ascent line of one line of text and the ascent line of the next line of single-spaced text. Examples of font sizes are 12-point and 18-point.

font storage: downloading fonts to a hard disk attached to a LaserWriter IINTX.

Font Utility: an application supplied on the *LaserWriter II Installation Disk* which is used to initialize and operate a hard disk attached to a LaserWriter IINTX, or to download fonts to RAM.

freeware: Software that is available for anyone to use at no charge.

graphics: (1) Information presented in the form of pictures or images. (2) The display of pictures or images on a computer's display screen. Compare **text.**

handshake: A protocol that allows devices to exchange information about the connection between them, such as when to start exchanging data.

hard disk: A disk made of metal and sealed into a drive or cartridge. A hard disk can store very large amounts of information.

icon: An image that graphically represents an object, a concept, or a message. For example, an unopened MacWrite document looks like a sheet of paper with lines like writing on it; an unopened MacPaint document looks like a sheet of paper with a paintbrush painting a line.

ImageWriter emulator: An application that allows an Apple II computer to communicate with a LaserWriter or LaserWriter II as if it were an ImageWriter.

install: To add information to the System file or to add new system files, such as the LaserWriter II printer resource, to the System Folder of a startup disk.

installed font: A font in a specific size that you install with installation software or with the Font/DA Mover.

justification: Making all full lines of text the same length in order to create an even right edge.

LocalTalk cable: The insulated wire used to join LocalTalk connector boxes.

LocalTalk cable system: One type of cable system used to link computers and peripheral devices in an AppleTalk network system.

LocalTalk connector box: A piece of equipment consisting of a small white box with a built-in cable that links a device to a LocalTalk cable system.

Macintosh Plus: A Macintosh computer with a built in 800K disk drive and 1 MB of RAM.

Macintosh SE: A Macintosh computer with two built-in 800K disk drives or one 800K disk drive and a built-in hard disk, one expansion slot, and a minimum of 1 MB of RAM.

Macintosh II: A Macintosh computer with a detachable monochrome or color monitor, one or two built-in 800K disk drives, and a built-in 20, 40, or 80 MB hard disk, six expansion slots, and up to 8 MB of RAM.

monospaced font: Any font in which the width of characters is always the same. (*Mono* means one.) In Courier, for example, the letter M is the same width as the letter I. Thus, MMMMM is the same width as IIIII.

MS-DOS: Short form of *Microsoft Disk Operating System*. The operating system used in most 0IBM PC and compatible computers.

Namer: An application that allows you to name (or rename) a printer on an AppleTalk network system.

open: To make available. You open files or documents in order to work with them. When you double-click an icon, or select it and choose the Open command, you cause a window with the contents of that icon to come into view. You may then perform further actions in the window, if it's an active window.

outline font: A POSTSCRIPT font from which the LaserWriter II produces the bitmapped fonts used for printing. Outline fonts can be scaled to any size.

parity: The sameness of level or count, usually the count of 1 bits in each character, used for error checking in data transmission.

peripheral device: Any device (such as a printer) that you attach to your computer.

peripheral interface cable: See **SCSI peripheral cable.**

point: A unit of measurement for sizing type. 12 points equal 1 pica, and 6 picas equal 1 inch; thus, 1 point equals ½2 inch.

port: A socket on the connector panel of the computer or peripheral device where you can plug in a cable to connect to another computer or device, or to a network.

POSTSCRIPT: The page-description language in which a computer communicates to the LaserWriter and the LaserWriter II.

primary corona wire: A wire inside the toner cartridge, to be cleaned if the printed output shows streaks or stains.

print density dial: A dial on the inside of the LaserWriter II that allows you to vary the darkness of printing.

printer driver: A program that lets you print on a corresponding printer. A printer device on an MS-DOS computer fulfills the same function as a **printer resource** on the Macintosh, but you need to install a printer driver for each application program.

printer resource: A program that translates the file you're printing into the language the printer understands. You cannot use a printer unless the correct resource is installed on the current startup disk.

printer fonts: Those fonts resident in the printer's ROM.

printer software: The software that controls the interaction of the computer and the printer. This includes the printer resource, the font software and the Font Utility.

proportionally spaced font: Any font in which different characters have different widths; thus, the space taken up by words having the same number of letters varies. For example, this letter *M* is wider than this letter *I*, so that *MMMMM* produces a wider string than *IIIII*. Compare **monospaced font.**

random-access memory (RAM): Memory in which information can be referred to in an arbitrary or random order. As an analogy, a book is a random-access storage device in that it can be opened and read at any point. RAM usually means the part of memory available for programs from a disk; the programs and other data are lost when the computer is turned off. A computer with 512K of RAM has 512 kilobytes available to the user. Compare **read-only memory.**

read-only memory (ROM): Memory whose contents can be read but not changed; used for storing firmware. Information is placed into read-only memory once, during manufacture; it remains there permanently, even when the computer's power is turned off. Compare **random-access memory.**

resolution: The degree of precision with which an object is represented. A printer's resolution is determined by the number of dots per inch.

ROM: See **read-only memory.**

rules: Lines dividing or bordering a page.

sans serif: Without serifs. Helvetica is a sans serif font family. The Helvetica *M* looks like this: M. See also **serif.**

scanner: A device that converts images into computer-readable form.

screen fonts: The fonts you see on the Macintosh screen.

SCSI: Acronym for *Small Computer System Interface.* Pronounced "SKUH-zee."

SCSI cable terminator: A device that reduces interference on the SCSI network.

SCSI ID number: The identifying number of a SCSI device. All linked SCSI devices must have a unique SCSI ID number.

SCSI peripheral cable: A cable linking two SCSI peripheral devices on a SCSI chain.

SCSI port: The connection point for SCSI cables on SCSI devices.

serif: One of the lines that finish off the main strokes of a letter. The "feet" at the bottom of this letter *M* are serifs. See also **sans serif.**

shareware: Software you can try out without purchasing, but which you are honor-bound to pay for if you continue to use.

slot: A narrow socket inside the computer where you can install peripheral cards.

Small Computer System Interface (SCSI): A specification of mechanical, electrical, and functional standards for connecting peripheral devices such as hard disks, printers, and optical disks to small computers.

smoothing: A printer effect in the Page Setup dialog box that improves the appearance of graphic images and downloaded bitmap fonts.

start up: To get the system running. Starting up is the process of first reading the operating system program from the disk, and then running an application program.

startup disk: A disk with all the necessary program files—such as the Finder and the System file contained in the System Folder—to set the computer into operation.

status lights: Lights on the front of the LaserWriter II that indicate the status of the printer—on, paper jam, processing a job, and so on.

status message: A message the LaserWriter II sends to the computer when you confirm the Print command. The message appears on the screen to tell you the status of your job or alert you to a problem with the printer.

style: A stylistic variation of a font, such as italic, underline, shadow, or outline.

system: A coordinated collection of interrelated and interacting parts organized to perform some function or achieve some purpose—for example, a computer system comprising a processor, a keyboard, a monitor, and a disk drive.

System file: A file that Macintosh computers use to start up and to provide system-wide information.

text: (1) Information presented in the form of readable characters. (2) The display of characters on a display screen. Compare **graphics.**

text file: A file containing information expressed in text form, with the contents encoded in the ASCII format.

toner cartridge: A cartridge that contains the toner powder used in the printing process. Only a LaserWriter II toner cartridge will work with a LaserWriter II.

toner powder: The plastic powder in the toner cartridge that serves as the LaserWriter II's "ink."

transfer corona wire: The wire in the midsection of the printer, to be cleaned as part of regular maintenance.

transfer guide: An area behind the transfer wire, to be cleaned as part of regular maintenance.

white space: That area of a layout that contains no text or graphics, but is nonetheless used as an active design element.

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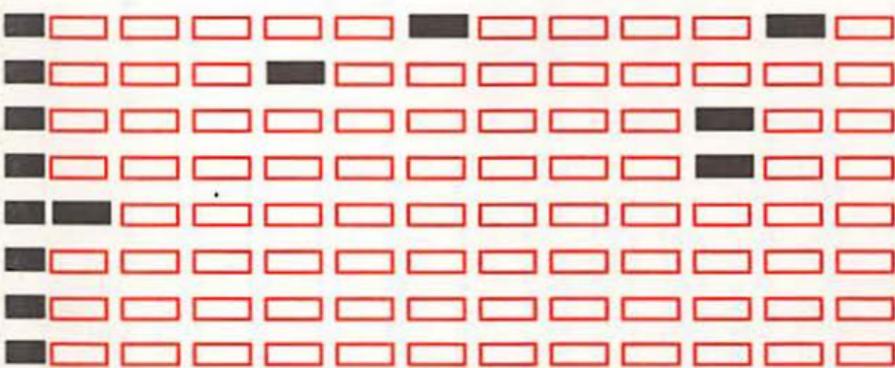
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2. ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

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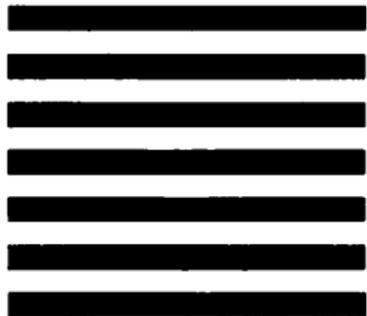
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☐ Would you like to tell Apple what you think about this product? After you have had an opportunity to use this product, we would like to hear from you. You can help us to improve our products by responding to the questionnaire below and marking the appropriate boxes on the card at the right with a #2 lead pencil. If you have more than one response to a question, mark all the boxes that apply. Please detach the card and mail it to Apple. Include additional pages of comments if you wish.

1. Which LaserWriter II model do you have? (**1**=LaserWriter IInt, **2**=LaserWriter IIntx)

2. How would you rate the LaserWriter II overall? (**1**=poor. . .**6**=excellent)

3. Where did you purchase the LaserWriter II? (**1**=dealer, **2**=educational purchase, **3**=corporate purchase, **4**=Value Added Reseller, **5**=other)

4. What computers do you use with the LaserWriter II? (**1**=Macintosh Plus, **2**=Macintosh SE, **3**=Macintosh II, **4**=Apple IIgs, **5**=MS-DOS type, **6**=PS/2 type, **7**=other)

5. What printer does the LaserWriter II replace? (**1**=none, **2**=ImageWriter II, **3**=LaserWriter/LaserWriter Plus, **4**=other Apple printer, **5**=non-Apple printer)

6. Where is the LaserWriter II used most often? (**1**=work, **2**=home, **3**=school, **4**=other)

7. What types of software applications do you use with the LaserWriter II? (**1**=word processing/mail merge, **2**=spreadsheet, **3**=database, **4**=forms, **5**=graphics/technical drawing, **6**=desktop publishing, **7**=other)

8. What other products do you use with the LaserWriter II? (**1**=envelope cassette, **2**=paper feeder, **3**=hard disk, **4**=scanner)

9. How easy was the LaserWriter II to set up? (**1**=difficult. . .**6**=very easy)

10. Did you use the *LaserWriter II* manual to help you set up? (**1**=no, **2**=yes)

11. How helpful was the manual in learning how to use the LaserWriter II? (**1**=not helpful. . .**6**=very helpful)

12. How much of the manual did you read? (**1**=entire manual, **2**=specific chapters, **3**=for reference only, **4**=none of it)

13. How would you rate the manual overall? (**1**=poor. . .**6**=excellent)

14. How easy was the manual to read and understand? (**1**=difficult. . .**6**=very easy)

15. How easy was it to find the information you needed? (**1**=difficult. . .**6**=very easy)

16. Please describe any errors or inconsistencies you may have encountered in the manual. (Page numbers would be helpful.)

17. What suggestions do you have for improving the LaserWriter II?

    Thanks for your time and effort.   030-3274-A

Tuck end flap inside back
cover when using manual.

Apple® LaserWriter® IINT/NTX Owner's Guide